THE PLEASANT EMOTION OF SAD MUSIC

Ai Kawakami[1,2,3], Kiyoshi Furukawa[1,2,3], Kazuo Okanoya[2,3,4]

[1]School of Fine Arts, Tokyo University of the Arts, Tokyo, Japan
[2]Emotional Information Joint Research Laboratory, RIKEN BSI, Saitama, Japan
[3] JST, ERATO, OKANOYA Emotional Information Project, Tokyo, Japan
[4] Graduate School of Arts and Sciences, The University of Tokyo, Tokyo, Japan
kazuookanoya@gmail.com

Abstract

In general, sad music is thought to cause us to experience sadness, which is considered an unpleasant emotion. As a result, the question arises as to why we listen to sad music if it evokes sadness. We hypothesized that felt and perceived emotion may not actually coincide in this respect: sad music would be perceived as sad, but the experience of listening to sad music would evoke positive emotions. A total of 44 participants listened to musical excerpts and provided data on perceived and felt emotions by rating 62 descriptive words or phrases related to emotions on a scale that ranged from 0 (not at all) to 4 (very much). The results revealed that the sad music was perceived to be more tragic, whereas the actual experiences of the participants listening to the sad music induced them to feel more romantic, more blithe, and less tragic emotions than they actually perceived with respect to the same music. Thus, the participants experienced ambivalent emotions when they listened to the sad music. After considering the possible reasons that listeners were induced to experience emotional ambivalence by the sad music, we concluded that the formulation of a new model would be essential for examining the emotions induced by music and that this new model must entertain the possibility that what we experience when listening to music is vicarious emotion.

Keywords: sad music, ambivalent emotion, vicarious emotion

1. Introduction

Why do we listen to sad music? Sad music induces sadness in listeners, and sadness is normally considered an unpleasant emotion that people wish to avoid. For instance, people hope to avoid misfortunes, such as the death of a loved one. However, people sometimes "lose themselves" in the beautiful sounds of sad music and even enjoy listening to it. Musicologists have been puzzled by this contradiction (Levinson, 1997), which has also been discussed in the field of philosophy. Although this contradiction has increasingly captured the attention of psychologists in recent years, few studies have investigated the issue empirically (Garrido & Schubert, 2011; Huron, 2011; Schubert, 1996; Vuoskoski, Thompson, Mcilwain, & Eerola, 2012).

In the field of emotional psychology, sadness is considered to be an affective state with negative valence. The dimensional model of emotion is one of the current models of emotion and is a circumplex model (Russell, 1980). This model suggests that emotion is a mixture of two dimensions, and various emotions can be located in a two-dimensional space with respect to coordinates of valence and arousal (Lang, 1995) or positive activation and negative activation (Watson & Tellegen, 1985). According to Russell and Feldman-Barrett (1999), emotions, including happiness, sadness, anger, fear, disgust, and surprise, can be mapped along several dimensions, such as pleasant–unpleasant and activation–deactivation. In such two-dimensional (two-axis) affective

models, sadness is generally located in the third quadrant, in the same position as displeasure and deactivation emotions (Russell, 2003).

Although sadness is generally understood as negative and unpleasant in the psychology of emotion, sadness in the field of artistic appreciation may have different features or may be perceived differently. For example, in the field of drama, in which both comedy and tragedy are popular, sadness as a focus of a piece is not necessarily to be avoided. On the contrary, sadness as a central theme is fundamental to the aesthetic experience of drama. In the same manner, the type of sadness that is evoked by sad music appears to be pleasant in its own way. In fact, it is reported that some of the most beautiful and profound listening experiences are associated with sad music (Gabrielsson & Lindström, 1993). Given all of these factors, it is difficult to conclude that sadness is an unpleasant emotion when we experience it as a reaction to an artistic form such as music. Hence, the definition of sadness that is typically employed in the psychology of emotion is viewed as inappropriate for use in artistic contexts. In this study, we attempt to promote a better understanding of sadness in relation to listening to music by investigating both perceived emotion and felt emotion.

In summary, we hypothesized that felt emotion would not necessarily correspond to perceived emotion, especially in response to music in a minor key (hypothesis 1). Because listeners with substantial musical experience have been found to evaluate music in a minor key as more pleasant when rating felt emotion than when rating perceived emotion in our previous study (Kawakami et al., 2013), we hypothesized that when people listened to minor-key music, those with more musical experience would feel more pleasant emotion than would be indicated by their reported perceptions of the same sad music (hypothesis 2).

2. Method

2.1. Participants

Forty-four people (25 females and 19 males) participated in our experiment (mean age of 25.3 years; SD = 6.6). Seventeen of these individuals were professional musicians or college students who were majoring in music (the "musician group"; n = 17). The other 27 participants were working people or college students who were not majoring in music (the "non-musician group"; n = 27).

2.2. Materials

Three types of musical excerpts of approximately 30 seconds each were used. We used the following pieces as musical stimuli: 1) Glinka's La Separation (F minor), 2) Blumenfeld's Etude "Sur Mer" (G minor), and 3) Granados's Allegro de Concierto (C sharp major, but the excerpt was in G major). Because we aimed to investigate whether the perceived emotions evoked by minor-key (sad) music differed from the felt emotions evoked by the same music, we transposed Granados's Allegro de Concierto, which is normally in the key of G major, into G minor. Furthermore, because it appeared that using music in a major key would allow for a helpful comparison of the two keys for each work of music, we also transposed Glinka's La Separation into F major and Blumenfeld's Etude "Sur Mer" into G major, as the original music for those music was in F minor and G minor, respectively (see the appendix for information regarding the scores). The excerpts were played at the following tempos: quarter note = 80 in Glinka's La Separation, half note = 72 in Blumenfeld's Etude "Sur Mer," and quarter note = 70 in Granados's Allegro de Concierto.

2.3. Self-report measures

We used 62 emotion-related descriptive words and phrases to measure both perceived and felt emotions. These descriptive words and phrases were used to measure perceived emotion by Hevner (1936) and Taniguchi (1995) and to measure felt emotion by Zentner, Grandjean, and Scherer (2008). The participants rated the two types of musical emotions after listening to each musical excerpt by rating these descriptive words and phrases on a scale ranging from 0 (not at all) to 4 (very much).

2.4. Procedure

The experiment was conducted with each individual participant in a sound-insulated room. The listeners engaged in four tasks individually. In the first task, they listened to the music either in the major or minor key and rated either perceived or felt emotion using the 62 emotion-related descriptive words and phrases. In the second task, the listeners rated the same type of emotion as in the first task. If they rated perceived emotion in the first task, they also judged perceived emotion in the second task but listened to the music in a key that differed from the key in the first task. In the third task, the participants rated the remaining emotion (i.e., the emotion that they did not address in the first and second tasks) using the 62 emotion-related descriptive words and phrases after listening to the music either in a major or minor key. Finally, the listeners rated the same emotion that they answered in the third task after listening to the music in the key that differed from that of the third task. In a preliminary task occurring prior to this actual rating process, the participants had practiced rating descriptive words or phrases on a scale ranging from 0 (not at all) to 4 (very much) for both perceived and felt emotions; the participants employed the numerical keypad after listening to each of the four types of music subsequently used in the four actual rated tasks, although different music was used.

2.5. Statistical analysis

The data that we obtained in our experiment were analyzed in two stages. First, we sorted the 62 emotion-related descriptive words and phrases by performing a factor analysis. This procedure enabled us to determine the characteristics of some factors that were extracted from the analysis. Then, for each factor that was extracted through factor analysis, we conducted an ANOVA with the following design: musical emotion (perceived vs. felt) × key (major vs. minor) × musical experience (musicians vs. non-musicians) for each factor. The first two factors of the ANOVA were repeated measures, and the last factor was a between-subjects factor. The factor analysis and ANO-VA were performed using SPSS for Windows (version 19.0), and p-values of less than 0.05 were considered significant.

3. Results

3.1. Factor analysis

The 62 emotion-related descriptive words and phrases were investigated via a factor analysis. Four factors were extracted, accounting for 62.83 % of the total variance. The number of factors extracted was determined based on interpretability. An oblique rotation was performed, and the 62 emotion-related descriptive words and phrases with factor loadings are reported in Table 1. Sixteen emotion-related descriptive words or phrases, such as gloomy, meditative, and miserable, were included in Factor 1, "tragic emotion" Twenty other words or phrases, such as overwhelmed, agitated, and stimulated, were included in Factor 2, "heightened emotion" In the third factor, "romantic emotion," there were 15 words or phrases, such as fascinated, dear, and in love. Because the 11 words or phrases in the fourth factor included merry, animated, and feel like dancing, we labelled it "blithe emotion."

Table 1. Factor Loading of 62 Emotion-Related Descriptive Words or Phrases

	Emotion-related words or phrases	Factor 1	Factor 2	Factor 3	Factor 4
32	Gloomy	**1.04**	-0.15	-0.05	0.20
24	Meditative	**1.04**	-0.14	-0.04	0.19
48	Miserable	**1.03**	-0.07	0.02	0.14
45	Disconsolate	**0.98**	-0.03	-0.07	0.09
26	Blue	**0.96**	-0.05	-0.10	0.17
17	Sorrowful	**0.90**	0.06	0.02	-0.04
8	Sad	**0.85**	0.06	0.05	-0.13
5	Sentimental	**0.85**	0.04	0.21	-0.07
55	Wistful	**0.85**	0.01	0.14	-0.11
62	Melancholic	**0.79**	0.06	0.15	-0.16
36	Tearful	**0.71**	0.16	0.25	-0.12
18	Irritated	**0.63**	0.05	-0.26	0.22
37	Nervous	**0.59**	0.25	-0.24	0.22
60	Grave	**0.51**	0.39	0.09	-0.24
49	In awe	**0.49**	0.36	0.24	-0.02
31	Sensual	**0.42**	0.27	0.41	-0.09
54	Overwhelmed	0.05	**0.82**	-0.11	-0.09
27	Agitated	-0.23	**0.81**	-0.08	0.05
25	Stimulated	-0.05	**0.81**	-0.27	0.03
20	Feeling of transcendence	-0.04	**0.79**	0.15	-0.11
56	Passionate	0.04	**0.76**	0.01	0.11
2	Chills	0.08	**0.74**	-0.03	-0.15
3	Energetic	-0.25	**0.73**	-0.20	0.34
21	Strong	0.12	**0.70**	-0.22	0.13
50	Lofty	-0.08	**0.69**	0.36	-0.16
40	Heroic	-0.24	**0.68**	-0.13	0.06
12	Fiery	0.18	**0.66**	-0.29	0.14
39	Inspired	0.03	**0.63**	0.07	0.13
10	Filled with wonder	0.13	**0.61**	-0.31	0.06
51	Determined	0.16	**0.60**	-0.23	-0.07
9	Impatient	0.04	**0.52**	-0.45	0.27
28	Moved	0.25	**0.50**	0.40	0.16
29	Feeling of spirituality	0.15	**0.50**	0.49	-0.07
44	Tensed	0.33	**0.48**	-0.23	-0.05
38	Dazzled	0.20	**0.47**	0.33	-0.05
57	Solemn	0.32	**0.36**	0.30	-0.32
11	Fascinated	-0.21	0.08	**0.76**	-0.01
4	Dear	0.26	-0.23	**0.72**	0.22
22	In love	0.36	-0.11	**0.71**	0.06
15	Serene	-0.04	-0.35	**0.69**	0.12
46	Admiring	-0.15	0.30	**0.69**	0.08
6	Soothed	-0.07	-0.22	**0.66**	-0.18
41	Graceful	-0.21	0.15	**0.65**	0.04
33	Delicate	0.53	-0.05	**0.64**	-0.001
13	Tender	-0.18	-0.20	**0.64**	0.15
34	Relaxed	-0.29	-0.12	**0.64**	-0.09
23	Dreamy	-0.04	0.02	**0.61**	0.29
14	Nostalgic	0.27	-0.32	**0.60**	0.18
19	Allured	-0.11	0.48	**0.50**	-0.22
43	Satisfied	-0.36	0.26	**0.48**	0.21
1	Happy	-0.37	0.05	**0.45**	0.34
52	Merry	0.03	-0.01	0.05	**0.81**
59	Animated	-0.28	0.16	-0.04	**0.70**
7	Feel like dancing	-0.11	0.08	0.12	**0.70**
61	Bouncy	-0.21	0.10	0.13	**0.69**
16	Amused	-0.21	-0.01	0.22	**0.68**
58	Easy passion	-0.05	-0.06	0.11	**0.62**
53	Joyful	-0.25	-0.01	0.25	**0.60**
35	Cheerful	-0.35	-0.01	0.25	**0.54**
42	Gay	-0.28	0.24	0.11	**0.52**
30	Triumphant	-0.34	0.34	0.05	**0.51**
47	Whimsical	0.20	0.01	-0.05	**0.47**

Correlations among factors	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	—	0.29	-0.30	-0.69
Factor 2		—	-0.02	0.08
Factor 3			—	0.31
Factor 4				—

3.2. ANOVA

- **Factor 1 (tragic emotion)**

The ANOVA revealed significant main effects for key [$F_{(1, 42)} = 298.72$, $p < 0.001$], musical emotion [$F_{(1, 42)} = 12.14$, $p = 0.001$], and musical experience [$F_{(1, 42)} = 11.77$, $p = 0.001$]. More importantly, there was a significant two-way interaction between key and musical emotion [$F_{(1, 42)} = 26.26$, $p < 0.001$].

The significant two-way interaction led to a post-hoc analysis that indicated that the ratings of perceived emotions and felt emotions in sad music (music in a minor key) were significantly different [$F_{(1, 43)} = 22.16$, $p < 0.001$]. For tragic emotion, the perceived emotions were rated as stronger than the felt emotions (mean ratings: 2.50 and 2.08, respectively) when the participants listened to the sad music.

- **Factor 2 (heightened emotion)**

The ANOVA revealed a significant main effect for key [$F_{(1, 42)} = 37.05$, $p < 0.001$]. Heightened emotion, including feeling overwhelmed, agitated, and stimulated, was rated higher in sad music than in happy music (music in a major key), with mean ratings of 1.69 and 1.22, respectively.

- **Factor 3 (romantic emotion)**

There was a significant main effect for key [$F_{(1, 42)} = 104.18$, $p < 0.001$]. More importantly, there was a significant two-way interaction between key and musical emotion [$F_{(1, 42)} = 5.37$, $p = 0.025$].

The significant two-way interaction led to a post-hoc analysis that indicated that the ratings of perceived emotions and felt emotions in sad music were significantly different [$F_{(1, 43)} = 5.07$, $p = 0.03$]. For romantic emotion, the felt emotions were rated as stronger than the perceived emotion (mean ratings: 1.31 and 1.04, respectively) when the participants listened to the sad music.

- **Factor 4 (blithe emotion)**

There were significant main effects for key [$F_{(1, 42)} = 193.96$, $p < 0.001$] and for musical experience [$F_{(1, 42)} = 10.02$, $p = 0.003$]. More importantly, there was a significant two-way interaction between key and musical emotion [$F_{(1, 42)} = 15.30$, $p < 0.001$].

The significant two-way interaction led to a post-hoc analysis that indicated that the ratings of perceived emotions and felt emotions in sad music were significantly different [$F_{(1, 43)} = 5.07$, $p = 0.03$]. For blithe emotion, the felt emotions were rated as stronger than the perceived emotions for sad music (mean ratings: 0.40 and 0.24, respectively). In contrast, the analysis indicated that the ratings of the perceived emotions were higher than those of the felt emotions (mean ratings: 2.27 and 1.98, respectively) in happy music [$F_{(1, 43)} = 8.25$, $p = 0.006$].

4. Discussion

4.1. Perceived vs. Felt Emotion

We used three-way ANOVA to test our hypothesis that felt emotion would not necessarily correspond to perceived emotion, especially in response to music in a minor key (hypothesis 1). Our results showed a significant two-way interaction between key and musical emotion in tragic, romantic, and blithe emotion. Post-hoc analyses revealed that although the sad music was perceived as more tragic, the listeners did not actually experience the tragic emotion (e.g., gloomy, meditative, and miserable) to an equivalent degree. Moreover, the participants felt more romantic emotion (e.g., fascinated, dear, and in love) and blithe emotion (e.g., merry, animated, and feel like dancing) than they perceived such emotions when listening to the sad music.

In short, when the participants listened to the sad music, they indeed felt tragic emotion, but the degree to which they actually felt this emotion was lower than that for which they perceived it. Additionally, the listeners experienced romantic and blithe emotions more than they perceived these particular emotions when they listened to the sad music. In view of our results, we consider hypothesis 1 to be confirmed.

4.2. The effects of musical experience

The difference between felt and perceived emotions was not affected by musical experience in this study. Our hypothesis was that when people listened to minor-key music, those with more musical experience would feel more pleasant emotions than they would perceive with respect to the sad music (hypothesis 2), but this hypothesis was not supported by our results.

Independent of their musical experience, the listeners felt less gloomy, meditative, and miserable as well as more fascinated, dear, in love, merry, animated, and inclined to dance when they listened to sad music compared with their actual perceptions of the same music. The reason that musical experience was not important in the difference between the perceived and felt emotions for the sad music could lie in the musical stimuli that we used. Because the musical stimuli used by Kawakami et al. (2013) consisted of only a few measures (from one to four measures), they lacked ecological validity. By contrast, the musical stimuli in this experiment were excerpts from existing musical pieces (from nine to 19 measures). Therefore, the listeners were able to capture more information about the musical structures for the music to which they were listening than they was allowed by the musical stimuli in the experiment by Kawakami et al. (2013). As a result, the participants may have been able to react to the aesthetic aspects of the sad music, regardless of their musical experience, leading to the disappearance of the difference between the musicians and non-musicians regarding perceived and felt emotion in relation to the sad music. Given the familiar phenomenon that people, regardless of their musical experience, can enjoy sad music in everyday life, it seems natural that we did not find a difference between the musicians and non-musicians regarding perceived and felt emotions.

4.3. Sad music induces ambivalent emotions

In the psychology of emotion, as a rule, sadness is classified as unpleasant in an evaluative dimension (unpleasant–pleasant). If an emotion with properties that are similar to those of a sad perceived emotion were evoked in listeners, then they would experience more unpleasant emotion when they listened to the sad music. If sad music actually evokes only unpleasant emotions in listeners, then why do people listen to sad music? Green, Baerentsen, Wallentin, Roepstorff, and Vuust (2008) found that although minor-key music was judged to be sadder than major-key music, the former was rated as more likeable than the latter. It is peculiar that people appear to love stimuli that induce only unpleasant emotions.

Although musicologists have experienced difficulties in attempting to explain why people listen to sad music (Levinson, 1997), the findings from this study may be able to provide possible answers to the question of why people listen to sad music. In accordance with an earlier study that revealed minor-key music to be perceived as sad (Hevner, 1935), the perceived emotions in this study were rated as more unpleasant (e.g., more gloomy, meditative, and miserable) than the felt emotions with respect to the sad music. Additionally, the participants actually experienced gloomy, meditative, and miserable emotions when they listened to the sad music, although the degree of felt emotions was lower than that of the perceived emotions. In addition, the participants felt fascinated, dear, in love, merry, animated, and inclined to dance when listening to the same music. Overall, consistent with the suggestion of Bigand, Vieillard, Madurell, Marozeau, and Dacquet (2005), sad music was not systematically associated with unpleasant emotions in this study. Rather, the participants experienced ambivalent emotions when they listened to sad music. Because sad music elicits both tragic and pleasant emotion in listeners, people may choose to spend a significant amount of time listening to sad music and even enjoying it (Schubert, 1996; Vuoskoski et al., 2012).

Against this backdrop, why do we experience ambivalent emotions when we listen to the sad music? We consider the following possibility.

4.4. Vicarious emotions in relation to art

Is the "unpleasant" emotion (e.g., sadness) experienced through art actually unpleasant at all? As Eerola and Vuoskoski (2011) noted, although sadness is generally considered to be an unpleasant emotion, sadness in the context of music might not be classified as unpleasant in an equivalent manner. In the context of art, emotion-evoking processes may differ from those of day-to-day emotions. Thus, the sadness that we experience while listening to sad music may differ from that which we experience in our daily lives, as Scherer (2004) proposed when discussing the distinction between goal-oriented utilitarian emotion and aesthetic emotion. In fact, some researchers have denied that music can induce common "everyday emotions" (e.g., sadness, happiness, and anger; Kivy, 1990; Konečni, 2003; Scherer, 2003).

Given this reasoning, what is the difference between day-to-day emotions and emotions that are evoked by music? In the emotions that we experience in daily life, an actor who experiences emotions has a direct relationship with the object or situation by which the emotion is aroused. In contrast, when we listen to music, a person is safe from any threat or danger that the music represents (Zentner et al., 2008). Thus, the emotions that we experience when we listen to music may be characterized as vicarious property. When we feel a certain type of emotion when listening to music, there is no objective or situation that acts as a cause to induce emotion as in everyday life. Rather, the composer, performer, or music itself that expresses emotion may be the entity that enjoys the direct relationship with the originating situation. The felt emotion of music can be regarded as a vicarious emotion if we conceptualize our experience of the emotion, which originated with the composer, performer, or music itself, as occurring through a mechanism such as sympathy. In contrast to the emotions of everyday life, such a vicarious emotion would not be accompanied by any essential pleasantness or unpleasantness that provides incentives to approach or avoid it.

4.5. A new model of musical emotion

It seems unsuitable to consider sad emotions through music in a traditional emotion model, such as the two-dimensional affective model with two axes (e.g., pleasant–unpleasant and aroused–sleepy) because such a model assumes everyday-life emotions—i.e., emotions elicited in non-musical contexts. Such traditional models cannot represent the vicarious nature of musical emotions. Therefore, the adoption of a new model appears essential for understanding musical emotion.

Figure 1 shows the two-dimensional affective space (pleasant–unpleasant, direct–vicarious). The horizontal axis shows the emotional evaluation of experienced emotion, and the vertical axis shows the relationship with the object causing the emotion. The relationship axis represents the manner in which an individual relates to the stimuli that elicit the emotion, which is exactly what differentiates the emotions of everyday life from those that occur when listening to music; this axis frames "direct" and "vicarious" as polar opposites. Thus, emotions that are experienced in everyday life would be located in the first and second quadrants in Figure 1. The emotions that are felt when listening to music are considered below.

As defined in an existing theory of emotion, emotions experienced in everyday life are distributed widely across the first and second quadrants—i.e., from pleasant to unpleasant. For example, sad emotions in daily life would be mapped in the second quadrant, as shown in Figure 1. In contrast, felt emotions in music, including both sad and happy music, would be located primarily in the fourth quadrant. Given that the emotions elicited by music are vicarious, they cannot include unpleasant experiences and would even be almost pleasant because of the cognitive processes associated with listening to music. Therefore, the sad emotions that listeners feel when listening to sad music could be mapped in the fourth quadrant, as shown in Figure 1.

In this study, we clarified that people listen to sad music because it evokes ambivalent emotions in listeners. Furthermore, we suggested new model of musical emotion.
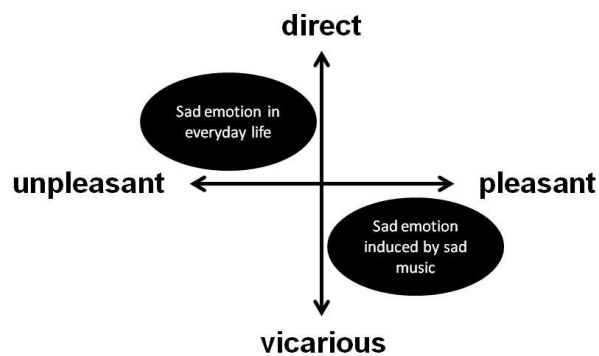
Figure 1. New model of musical emotion.

References

Bigand, E., Vieillard, S., Madurell, F., Marozeau, J., & Dacquet, A. (2005). Multidimensional scaling of emotional responses to music: The effect of musical expertise and of the duration of the excerpts. *Cognition and Emotion*, 19(8), 1113-1139.

Eerola, T., & Vuoskoski, J. (2011). A comparison of the discrete and dimensional models of emotion in music. *Psychology of Music*, 39(1), 18-49.

Gabrielsson, A., & Lindström, E. (1993). On strong experiences of music. *Musikpsychologie: Jahrbuch der Deutschen Gesellschaft für Musikpsychologie*, 10, pp. 118-139.

Garrido, S., & Schubert, E. (2011). Individual Differences in the Enjoyment of Negative Emotion in Music: A Literature Review and Experiment. *Music Perception*, 28(3), 279-296.

Green, A. C., Baerentsen, K. B., Stodkilde-Jorgensen, H., Wallentin, M., Roepstorff, A., & Vuust, P. (2008). Music in minor activates limbic structures: a relationship with dissonance? *Neuroreport*, 19(7), 711-715.

Hevner, K. (1935). The affective character of the major and minor modes in music. *American Journal of Psychology*, 47, 103-118.

Hevner, K. (1936). Experimental studies of the elements of expression in music. *American Journal of Psychology*, 48, 246-268.

Huron, D. (2011). Why is sad music pleasurable? A possible role for prolactin. *Musicae Scientiae*, 15(2), 146-158.

Kawakami, A., Furukawa, K., Katahira, K., Kamiyama, K., & Okanoya, K. (2013). Relations between musical structures and perceived and felt emotion. *Music Perception*, 30(4), 407-418.

Kivy, P. (1990). *Music Alone: Philosophical Reflections on the Purely Musical Experience*. Ithaca, New York: Cornell University Press.

Konečni, V. J. (2003). Review of Music and emotion: Theory and research, edited by P. N. Juslin & J. A. Sloboda. *Music Perception*, 20, 332-341.

Lang, P .J. (1995). The emotion probe: Studies of motivation and attention. *American Psychologist*, 50, 372-85.

Levinson, J. (1997). Music and negative emotion. In J. Robinson (Ed.), *Music, and meaning* (pp.215-241). Ithaca, NY: Cornell University Press.

Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, 39, 1161-1178.

Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, 110, 1, 145-172.

Russell, J. A., & Feldman-Barrett, L. (1999). Core affect, prototypical emotional episodes, and other things called emotion: dissecting the elephant. *Journal of Personality and Social Psychology*, 76(5), 805-819.

Scherer, K. R. (2003). Why music does not produce basic emotions: A plea for a new approach to measuring emotional effects of music. In *Proceedings of the Stockholm Music Acoustics Conference 2003*, ed. R. Bresin, 25-28. Royal Institute of Technology.

Scherer, K. R. (2004). Which emotions can be evoked by music? What are the underlying mechanisms? And how can we measure them? *Journal of New Music Research*, 33, 239-251.

Schubert, E. (1996). Enjoyment of unpleasant emotion in music: An associative network explanation. *Psychology of music*, 24(1), 18.

Taniguchi, T. (1995). Construction of an affective value scale of music and examination of relations between the scale and a multiple mood scale. *The Japanese Journal of Psychology*, 65(6), 463-470.

Vuoskoski, Thompson, Mcilwain, & Eerola. (2012). Who Enjoys Listening to Sad Music and Why? *Music Perception*, 29 (3), 311-317.

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, 98, 219-35.

Zentner, M., Grandjean, D., & Scherer, K. R. (2008). Emotions evoked by the sound of music: Characterization, classification, and measurement. *Emotion*, 8(4), 494-521.