

IS MUSICAL EMOTION AN ILLUSION?

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The power of music to arouse garden-variety emotions has attracted attention from musicians, psychologists, and philosophers over decades. Despite its widespread acknowledgement, there is no agreement on how pure music with no propositional content can induce such a wide range of emotions. Jenefer Robinson coined this problem the puzzle of musical emotion.¹ In this essay, I will first discuss why musical emotion is a puzzle. Then, Jesse Prinz's perceptual theory of emotion and his solution to the puzzle will be discussed.² Prinz regards an emotion as an embodied appraisal, and a musical emotion as an illusory embodied appraisal which is a by-product of the adaptive emotion system. I argue that it is problematic to regard musical emotions as illusions for two reasons: 1) the bodily responses aroused by music are not specific enough to produce an illusion of a real emotion; 2) musical emotion is adaptive by itself in the sense that it is a mirroring-based simulation of the emotion represented by music, and such mirroring system plays an important role in interpersonal emotion communications.

I. THE PUZZLE OF MUSICAL EMOTION

The puzzle of musical emotion refers to the idea that garden-variety emotions can be aroused by pure music. By pure music, I mean instrumental music with no lyrics. This restriction is to ensure that what arouses the emotion is the music by itself, but not the

¹ Robinson (2005).

² Prinz (2004).

propositional contents of the lyric. ‘Garden-variety emotions’, on the other hand, is a term coined by Peter Kivy, to refer to a wide range of emotions which music is supposed to arouse, such as joy, sadness, fear, and anger.³

Many studies have shown that music arouses different emotional bodily changes in the subjects. For example, Lundqvist et al discovered that happy music generated more zygomatic facial muscle activity, greater skin conductance, and lower finger temperature than sad music.⁴ Rickard found that emotionally powerful music elicited significantly larger number of chills in the subject than relaxing music.⁵ On the other hand, music is widely used in the mood induction procedures of different psychological studies. For example, Adaman and Blaney used music to induce elation and depression in subjects in order to test the effect of mood on creativity.⁶ Yan used music to induce disgust in subjects in order to test the effect of mood on moral judgment.⁷ So, it is at least empirically plausible to claim that music can arouse garden-variety emotions. The question is how.

Proponents of the cognitive theory of emotion have a difficult time answering this how-question. For example, Martha Nussbaum claims that emotion is a value judgment about an intentional object. Her grief about the death of her mother is a judgment that “a person of enormous value, who was central in my life, is there no longer.”⁸ Other cognitivists, such as Solomon and Gordon, share the idea that emotion must be about something. In other word, every emotion has an intentional object which arouses it. If this is true, it is not clear how pure music can arouse emotions. Music cannot be the right intentional object of emotion. When you listen to a sad piece of music, your sadness is not about the music since music is not a suitable object of sadness, normally understood. When a piece of music gives you a feeling of fear, you make no judgment that the music is threatening you. In short, musical emotion is a puzzle because emotion should be, or should involve, an appraisal about its intentional object, but music cannot be the appropriate intentional object of emotion due to its lack of propositional content.

³ Kivy (1989).

⁴ Lundqvist et al (2009).

⁵ Rickard (2004).

⁶ Adaman & Blaney (1995).

⁷ Yan (2008).

⁸ Nussbaum (2001), p.39.

II. PRINZ'S PERCEPTUAL THEORY OF EMOTION AND ITS SOLUTION TO THE PUZZLE OF MUSICAL EMOTION

Prinz's perceptual theory of emotion regards musical emotion as an illusion and explains how music can arouse emotions without being the real intentional object of these emotions.⁹ In this section, I will introduce Prinz's theory of emotion and explain why musical emotion is an illusion under his account. As a neo-Jamesian, Prinz suggests that emotions are embodied appraisals which represent important organism-environment relations by registering the bodily changes caused by an external stimulus. Borrowing from Lazarus¹⁰, Prinz understands those organism-environment relations related to emotions as core relational themes. For example, the core relational theme of anger is "a demeaning offense against me and mine"¹¹ and of fright is "facing an immediate, concrete, and overwhelming physical danger."¹² Drawing on Dretske's causal theory of mental representation,¹³ Prinz argues that emotion can represent these core relational themes because the corresponding bodily changes are reliably caused by them. So, by registering the bodily changes, an emotion represents a core relational theme. Prinz writes, "Each emotion is both an internal body monitor and a detector of dangers, threats, losses, or other matters of concern. Emotions are gut reactions; they use our bodies to tell us how we are faring in the world."¹⁴ Take fear as an example. When a bear is approaching us, our embodied appraisal represents the bear as "a threat" by registering the bodily changes, such as beating heart, sweating palms, wide open eyes, trembling, released adrenaline, which are reliably caused by a threatening bear. This embodied appraisal, according to Prinz, is the fear.

In response to the puzzle of musical emotion, Prinz acknowledges that emotion can be aroused by music even though the listener is totally aware of the fact that there is nothing for her to be emotional about. He said, "Consider sadness evoked by nonvocal music. In the hands of a good composer, a D-minor chord can send listeners into the abyss. Listeners know that there has been no loss, but the floodwaters of despair well

⁹ Given that Prinz thinks that musical emotions are illusory, he will probably deny that music can arouse *garden-variety* emotions, and indeed any emotions at all.

¹⁰ Lazarus (1991), p.122

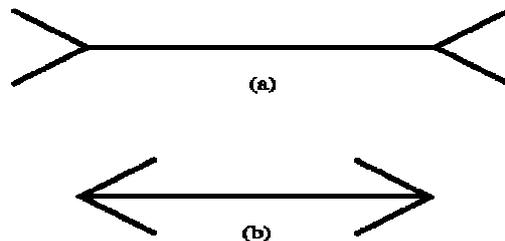
¹¹ Ibid.

¹² Ibid.

¹³ Dretske (1981), (1986).

¹⁴ Prinz (2004), p.69.

up inside them.”¹⁵ Prinz explains this phenomenon by regarding musical emotion as illusion. It is an illusion because, unlike typical emotion which tracks bodily states that are reliably caused by a core relational theme, the bodily states for which musical emotion tracks are not caused by a real core relational theme, even though the listener feels that it is. For example, fear is supposed to be an embodied appraisal which represents “a threat” by registering the fearful bodily changes reliably caused by a threatening object. However, a musical emotion of fear falsely represents the music as “a threat” by registering the fearful bodily changes aroused by the music. In this sense, musical emotion is an illusion. Moreover, this illusion will not go away even if the listener is aware of the illusory nature of her emotion. Prinz explains this feature of musical emotion by regarding emotion as informationally encapsulated. Following Fodor,¹⁶ Prinz thinks that “If a perceptual illusion persists even after we learn that it is an illusion, then it resides in a processing system that is not directly influenced by knowledge.”¹⁷ Take the Müller-Lyer illusion as an example:



Line (a) looks longer than Line (b). If we measure the two lines with a ruler or cover the arrows at the ends of both lines, we will find that the lengths of the two lines are identical. However, even if we realize that our impression that (a) is longer than (b) is caused by the direction of the arrows at their ends, we still can't help seeing (a) as longer than (b). In other words, our illusion doesn't go away even after we learn that it is an illusion. In this sense, Prinz holds that the perception of the lengths of the Müller-Lyer lines is informationally encapsulated. Musical emotion, as a kind of perceptual illusion, is similarly encapsulated. Even if we realize that the representation of the musical emotion is falsidical, say (i.e. there is no threat

¹⁵ Ibid, p.235.

¹⁶ Fodor (1983)

¹⁷ Prinz (2004), p.233.

confronting us when the music makes us feel fear), we can't help perceiving the music as representing a real core relational theme, say, a real threat. Such musical illusion is a special case where our system of emotion goes wrong. Prinz regards it as an advantage of his perceptual theory of emotion that allows for this possibility on the grounds that no perceptual system can be infallible.

III. WHY IS MUSICAL EMOTION NOT AN ILLUSION?

III.i. *Musical bodily responses are not specific enough to represent the core relational theme of fully-fledged emotions*

According to Prinz, emotions represent core relational themes by registering bodily responses because the latter are reliably caused by the emotional stimulus. On the other hand, an emotion could *misrepresent* a core relational theme; the bodily responses registered could be aroused by something unrelated to the core relational theme of a paradigmatic emotion, but still be identical to the bodily responses aroused by the paradigmatic emotion. Notice that the sameness of bodily responses is essential here. If the bodily responses aroused by music are not the same as the bodily responses aroused by a real emotional stimulus, then by registering the musical bodily responses, we are not illusively representing the core relational theme of music as the core relational theme of a real emotional stimulus; instead, we are representing a totally different core relational theme. Take a sad piece of music as an example. Only if the sad music arouses the same weeping as real sadness does would our brain illusorily register these responses as being caused by a real loss, which represents the core relational theme of sadness, say, an irrevocable loss. If the bodily response aroused by the sad music is very different from that aroused by a real sadness, our brain will not illusorily register them as being caused by a real loss. Instead, our brain will register them as being caused by something else; a different core relational theme, say, a mild disturbance, may then be represented.

So, how much are the bodily responses aroused by music similar to the bodily responses of a real emotion? Philosophers have long recognized that musical emotions are not comparable to real emotions. While Stephen Davies says that musical emotion can only be “a weaker version of ordinary emotions,”¹⁸ Jerrold Levinson suggests that:

¹⁸ Davies (1994), pp.299-307.

[Musical emotion] is not in truth a case of full-fledged emotion. This is mainly because music neither supplies an appropriate object for an emotion to be directed on nor generates the associated beliefs, desires, or attitudes regarding an object that are essential to an emotion being what it is.¹⁹

Concerning their corresponding bodily responses, the discrepancy between musical bodily responses and real emotional bodily responses could be understood in two ways.

First, musical emotions fail to produce some important bodily responses aroused by fully-fledged emotions. In defence of the ability of music to affect physiology, Robinson²⁰ cites numerous researches, showing that negative music is associated with: changes in heart rate, blood pressure, skin conductance, and finger temperature;²¹ decreased heart and pulse rates;²² changes in skin conductivity resistance;²³ changes in cardio-respiratory activity;²⁴ and changes in hormonal activity.²⁵ Although this list may sound comprehensive, it misses out two important components of a fully-fledged emotion; namely, facial expression and action tendency. Paul Ekman, the inventor of the Facial Action Coding System (FACS), sees the face as “the primary theatre” of emotion.²⁶ He argues that every basic emotion has a unique set of facial expressions, which are controlled by thousands of muscles. Nico Frijda defines action tendency as “states of action readiness that prepare and guide actions for achieving a particular relation with the object that the emotion is about (relations such as proximity, being remote from, or opposing).”²⁷ For example, the action tendency of fear is to flee, of anger is to fight, and so on. Frijda thinks that these action tendencies “are among the main features for assigning major emotion category labels to one’s own emotions and those of other people or animals.”²⁸ Scherer and Zentner, after reviewing various researches on the relation between music and emotional responses, conclude that “evidence for the production or motor patterns and action tendencies by music” and

¹⁹ Levinson (1997), p.222.

²⁰ Robinson (2005).

²¹ Krumhansl (1997).

²² Bartlett (1996).

²³ Zimmy & Weidenfeller (1963).

²⁴ Nyklicek et al. (1997).

²⁵ Peretz (2001), Huron (2001).

²⁶ Ekman (1992).

²⁷ Frijda (2009), p.2.

²⁸ Ibid.

“evidence for the facilitation of facial expression via music” are “rare.”²⁹ A possible explanation of this rarity is that the association between musical emotion and action tendency and facial expression is too weak for psychologists to work on. Even the exceptional study conducted by Witvliet and Vrana which shows that the innervations of the zygomatic muscle or corrugators muscles on our faces are stimulated by different kinds of music fails to convince that musical emotion produces facial expression similar to paradigmatic emotion.³⁰ As suggested by Ekman, the facial expression of any basic emotion is controlled by thousands of muscles, of which the zygomatic and corrugators muscle are only two.³¹ In short, lacking the corresponding facial expressions and action tendencies, musical emotions can hardly be regarded as fully-fledged emotions.

Secondly, concerning those bodily responses which are shared by musical emotion and paradigmatic emotion (such as change of heart rate, skin conductance responses, and so on), I argue that we have no reason to believe that their potency is identical or similar to each other. In other words, I think it cannot be true that the power of an emotion aroused by music is as strong as the power of an emotion aroused by a natural stimulus. Even though a piece of music could make us sad, it is of no comparison to the grief aroused by the death of a loved one. Most, if not all, studies discussed above show a qualitative, but not a quantitative agreement between the bodily responses of musical emotion and paradigmatic emotion. Assume that heart rate is the only bodily response caused by fear. The fear aroused by music is in qualitative agreement with the fear aroused by a natural stimulus if and only if both fears cause an increase in heart rate. They are in quantitative agreement if and only if they increase the heart rate by the same amount. Only if two emotions are in quantitative agreement could we say that their bodily responses are identical to each other. A qualitative agreement is not enough for such identity because different emotions may share the same qualitative trend of bodily changes. For example, both anger and fear would lead to an increase heart rate. The same direction of trend does not mean that their ability to affect heart rate is the same. Scherer and Zentner, while acknowledging Krumhansl’s discovery of the bodily responses music can produce,³² admit that “the matching of the emotion-specific physiological responses pattern...

²⁹ Scherer & Zentner (2001), p.378.

³⁰ Witvliet & Vrana (1996).

³¹ Ekman (1992).

³² Krumhansl (1997).

were far less encouraging.”³³ For, “While, in some cases, the changes for a particular parameter went in a similar direction as the theoretically postulated ones, it would be difficult to argue that complete physiological response patterns, prototypical for ‘discrete’ or ‘basic’ emotions, were found.”³⁴ In order to establish a quantitative agreement between the bodily responses aroused by musical emotion and paradigmatic emotion, psychologists would have to use very naturalistic induction of emotion (e.g., put a subject in a genuinely dangerous situation) and measure the aroused bodily responses to see if the quantity of change, not just the trend, is identical to those aroused by music. No such experiment has ever been done yet. That means we have no empirical evidence to support the idea that the potency of the bodily responses aroused by paradigmatic emotion and musical emotion are identical to each other.

In short, there is no evidence suggesting that musical emotion can arouse facial expression and action tendency as paradigmatic emotions do. Nor is there evidence supporting the idea that the potency of the bodily responses aroused by music is the same as those aroused by a natural stimulus. So, I conclude that musical bodily responses are not identical to natural emotional bodily responses. If this is true, then the registering of the former would not be regarded as an illusive registering of the latter, which means there would not be a misrepresentation of musical core relational theme as a real core relational theme. Instead, a different core relational theme would be represented by the registering of a different set of bodily changes aroused by music. In this sense, musical emotion is not an illusion.

III.ii *Musical Emotion as a Mirroring-Based Simulation of the Emotion Represented by Music*

By arguing that musical emotion as an illusion, Prinz suggests that it is nothing more than a side effect which ‘hitchhikes’ on the adaptive emotion system. It does not serve any evolutionary function by itself. Following Alvin Goldman, I argue that musical emotions are adaptive in the sense that they are a mirroring-based simulation mechanism that helps us to read others’ emotions.³⁵ Social psychologists have long recognized the importance of reading others’ emotions. Correctly detecting the anger

³³ Scherer & Zentner (2001), p.375.

³⁴ Ibid.

³⁵ Goldman (2006).

of enemies may help us decide whether we should fight or flee. Reading the fearful expression of other conspecifics may help us notice that a predator is approaching. Disgust is another good example. Bloom says, “Vomit serves as a form of nonverbal communication, one that bypasses conscious reasoning. When you vomit, it is like shouting, ‘We may have eaten poisonous food. Everyone, stop eating, and empty your stomachs!’”³⁶ The question is, what role do musical emotions play in such life or death mindreading situations?

According to Levitin, and also Cross, music is an authentic expression of emotion.³⁷ A strong interpretation of this claim suggests that music expresses an emotion by authentically revealing the emotion of the composer. This cannot be true for two reasons. First, the composer can fail to express her emotion in the music. Second, she can express an emotion in the music without feeling it herself.³⁸ A weak interpretation would be that music represents an emotion by reliably co-occurring with an emotion. In this sense, music is like the beeping of a smoke detector which represents a fire by reliably co-occurring with a fire. The beeping is a signal of the *presence* of a fire only. It tells us nothing about where the fire starts, when it starts, or who starts it. By the same token, music is a signal of the *presence* of an emotion only. It tells us nothing about whether the emotion is possessed by the composer, the performer, the listener, or anyone else. In other words, the weak interpretation avoids the question of whose emotion is being expressed by the music. No matter who possesses the emotion, as long as the emotion reliably co-occurs with the music, the music represents the emotion. Numerous studies have shown that different features of music are closely associated with different emotions. For example, Ohala, and also Gussenhoven, have shown that lower sounds are usually associated with confidence, dominance, or aggression, whereas higher sounds are associated with submission, subordination, absence of threat, and uncertainty.³⁹ Wider prosodic contours produced with more effort are associated with enthusiasm, obligingness, authority, and insistence, whereas narrower contours produced with less effort are associated with lack of commitment and enthusiasm. Juslin found that small vibrato extent is associated with sadness and tenderness, whereas medium-large vibrato extent is

³⁶ Bloom (2004), p.157.

³⁷ Levitin (2008), Cross (2008).

³⁸ For further objections see Robinson (2005).

³⁹ Ohala (1994), Gussenhoven (2002).

associated with anger and happiness.⁴⁰ All these studies show that music can be an authentic expression of emotions in the weak sense.

Following Goldman, I argue that we read the emotion represented by a piece of music by simulating the same emotion in ourselves through a mirroring system.⁴¹ The vocal mirror neurons in us fire when the music we hear is an authentic expression of emotions. Such firing will generate an emotion mirroring the emotion represented by the music. This mirrored emotion is the musical emotion. The mechanism of musical emotion is adaptive because the same mechanism is used to read emotions from others' vocal expression. Mirroring systems were first discovered in monkeys by Rizzolatti et al.⁴² Action mirror neurons fired not only when the monkeys performed the associated actions, they also fired when an observing monkey watched other monkeys performing the actions. A similar mirroring system was discovered in humans by Rizzolatti et al.,⁴³ and was believed to be located in the rostral part of the inferior parietal lobule, the caudal sector of *par opercularis* and the adjacent part of the premotor cortex. Moreover, vocal mirror neurons were discovered by Kohler et al.⁴⁴ These neurons, which locate in the premotor cortex, fire both when the subjects perform an action and when they hear a sound related to that action. I suggest that this is how the mechanism of musical emotion works. Music is an authentic expression of emotions. When one hears the music, the relevant vocal mirror neurons fire and put us into an emotion similar or identical to the emotion represented by the music. Take a piece of scary music as an example. With a fast tempo, large tempo variability, minor mode, high pitch, and staccato articulation, such a piece of music authentically represents the emotion of fear. These features of the music, on the other hand, trigger the firing of the vocal mirror neurons of subjects and put the subjects into the emotion of fear. The same mechanism explains why we feel sad when we hear someone weep and feel happy when we hear someone laugh.⁴⁵ This mechanism of reading emotions from vocal expressions is of utmost importance for the survival of organisms. In this sense, musical emotions are adaptive and are not "illusions" in Prinz's sense.

⁴⁰ Juslin (2010).

⁴¹ In this sense, what the emotion expresses is identified by the emotions it arouses in us, and hence, it is a kind of weak arousal theory.

⁴² Rizzolatti et al (1996).

⁴³ Rizzolatti et al (2001).

⁴⁴ Kohler et al (2002).

⁴⁵ Without the presence of the natural emotional stimulus (e.g. a real threat), the musical emotion aroused by the vocal mirror neurons will usually have a lower intensity and shorter duration than paradigmatic emotions.

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