



PART 2

Read the text below and answer questions 14–26.

MUSIC, EMOTION, AND THE BRAIN

A

Neuroscientists have long been interested in why music can produce chills, tears, or an abrupt lift in mood. Unlike many laboratory stimuli that are brief and static, music unfolds as a time-based pattern. This matters because the brain is a predictive organ: it continuously forms expectations about what will happen next and updates those expectations when events arrive earlier, later, or differently than anticipated. In music psychology, this has been described as affective forecasting, where the listener's emotional state partly depends on what they believe is about to occur. When the next note, chord, or rhythmic accent confirms a prediction, the result can feel satisfying; when it violates a prediction but then becomes intelligible, the surprise can feel pleasurable rather than confusing.

B

One influential account links musical pleasure to reward circuitry, particularly the nucleus accumbens and related nodes in the dopaminergic system. Imaging studies have reported increased activity in these networks during moments listeners rate as highly enjoyable, especially when tension builds and then resolves. The experience commonly described as aesthetic chills (frisson) is often discussed in this context: a brief wave of excitement that coincides with an apparent “peak” in musical meaning. The body can respond as well. Physiological arousal may be reflected in heart rate changes, shifts in breathing, and measures such as skin conductance. Importantly, these bodily reactions can occur even when listeners cannot articulate what specific feature caused them, suggesting that the emotional system can register musical structure without requiring conscious explanation.

C

However, emotion in music is not only “in the notes”. Context can dominate interpretation. The same melody may feel comforting at a memorial service yet seem merely decorative in a supermarket, even if its acoustic profile is unchanged. Personal associations add another layer: a song tied to a childhood memory or a relationship can trigger strong feelings within seconds, while an unfamiliar piece may leave the same listener emotionally neutral despite containing similar musical devices. Memory systems therefore interact with prediction systems. A familiar track does not simply replay sound; it reactivates a network of learned expectations and autobiographical meaning, which can magnify or redirect the feeling the music appears to “express”.



D

Researchers also distinguish between perceived emotion and felt emotion. A listener may recognise that a piece sounds “sad” or “angry” while not actually experiencing sadness or anger. This gap helps explain a puzzle that looks contradictory on the surface: people sometimes seek out sad music. If the sadness is perceived as an aesthetic quality rather than as a personal threat, the listener may instead feel calm, pleasure, or catharsis. In controlled studies, participants can reliably label emotional character even when their self-reported feelings are different, implying that identification and experience are separable processes that draw on partly different cognitive resources.

E

Individual differences complicate any single model. Musical training can sharpen sensitivity to harmony and timing, which may alter how quickly a listener detects expectancy violations. Personality traits and current mood can influence intensity of response, while cultural conditioning shapes what counts as tension, stability, and release in the first place. Enculturation matters because musical systems differ in scale structure, tuning, and stylistic conventions. A chord progression that sounds predictable to a listener raised on one tradition may sound surprising to someone with a different musical history. As a result, the same passage can generate different emotional trajectories across listeners, not because their brains are fundamentally different, but because their learned prediction models differ.

F

Therapeutic applications draw on these mechanisms but also reveal their limits. In clinical and rehabilitation settings, music has been used to support movement training after neurological injury, to reduce anxiety before medical procedures, and to regulate arousal in people with sleep difficulties. These outcomes are often attributed to rhythmic predictability, attentional capture, and the capacity of familiar music to stabilise mood. Yet effects vary widely. Music is not a universal medicine, and success depends on selection, delivery, and the fit between the patient’s preferences and the clinical goal. A recurring finding in applied work is the importance of agency: when patients can influence the choice of music or the timing of listening, benefits are more likely to be sustained than when music is imposed as a one-size-fits-all intervention.

G

Technology is expanding research beyond controlled laboratory settings. Wearables can record physiological arousal while people listen in daily life, helping scientists examine emotion in the environments where music is actually consumed. At the same time, machine-learning models are being developed to predict an emotional profile from



acoustic features at scale, potentially mapping large catalogues in ways human raters cannot. These tools raise concerns about privacy and about reducing complex feelings to simplified labels. They also intersect with a continuing debate: is music-induced emotion primarily biological or primarily learned? Most researchers now reject both extremes. The brain supplies general mechanisms for prediction, reward, and arousal, while culture and experience teach listeners what to predict and what a musical style signifies. The most defensible position treats musical emotion as an interaction between shared neural systems and learned expectations, evaluated with multiple methods rather than a single measure.

Questions 14–18

Which paragraph contains the following information? Choose the correct letter, **A–G**. **NB** You may use any letter more than once.

14 The position that music-related feeling cannot be explained fully by biology alone or learning alone, but by their interaction.

15 An example showing that the same melody can be experienced differently when the listening situation changes.

16 A description linking intense musical pleasure to reward networks and measurable bodily arousal.

17 The distinction between recognising an emotion expressed by music and personally experiencing that emotion.

18 The idea that emotion is connected to what the listener expects to happen next in the unfolding sound.

Questions 19–22

Choose **TRUE** if the statement agrees with the information given in the text, choose **FALSE** if the statement contradicts the information, or choose **NOT GIVEN** if there is no information on this.

19 The passage suggests that musical emotion can depend partly on the listener's anticipation of upcoming events.

20 The passage reports that frisson activates the nucleus accumbens in exactly 72% of listeners in a 2021 study.

21 The passage states that physiological reactions may occur even when listeners cannot explain what in the music triggered them.



22 The passage suggests that therapeutic outcomes are more likely to last when patients have a sense of control over the listening process.

Questions 23–26

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the text for each answer.

How music produces emotional responses

Enjoyable musical moments are linked to reward circuitry, including the **23** Strong reactions such as aesthetic chills are sometimes described as **24** The emotional meaning of the same track may shift sharply depending on **25** New large-scale tools raise ethical concerns about **26** when collecting listening-related data.

Answer Key

14. G

15. C

16. B

17. D

18. A

19. TRUE

20. NOT GIVEN

21. TRUE

22. TRUE

23. nucleus accumbens

24. frisson

25. context

26. privacy