RESEARCH PAPER

The Influence of Music on Emotional Regulation: A Thematic Review

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Abstract

Emotion regulation is a key concept in psychology. It refers to the ways people influence the emotions they experience, when they experience them, and how those emotions are expressed. One of the most influential frameworks in this area is Gross's (1998) process model, which distinguishes between antecedent-focused strategies, such as cognitive reappraisal, and response-focused strategies, such as expressive suppression. Music occupies a unique position within this framework. It can act both as an emotional stimulus that creates feelings and as a tool that people intentionally use to manage those feelings. This dual role makes music psychologically fascinating, but it also makes it difficult to study. A single listening experience can both generate an emotion and help regulate that same emotion. Rather than viewing music as a simple influence on mood, this review treats it as a psychological process in which emotion, cognition, and sound interact with one another.

The review is organised around eight interconnected themes: (i) emotion-regulation strategies and their classification; (ii) adaptive and maladaptive outcomes of music use; (iii) personality traits and individual differences; (iv) neurobiological mechanisms; (v) cognitive reappraisal and coping processes; (vi) everyday and therapeutic uses of music; (vii) musical mechanisms, including feature-dependent and individual-dependent effects; and (viii) the moderating roles of age, gender, and musical genre.

Keywords: Music, Emotional regulation, Thematic analysis

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Introduction

Music is an important part of everyday life and is closely connected to human emotions. People often use music to relax, improve their mood, cope with stress, or express feelings. This suggests that music is not only a source of entertainment but also a tool for managing emotions. Emotion regulation refers to the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions Gross's (1998). Emotion regulation refers to the ways people influence and control their emotional experiences and expressions. Because difficulties in emotion regulation are linked to mental health problems such as anxiety and depression, understanding effective regulation strategies is important. Music is widely used for this purpose due to its accessibility and emotional impact. However, its effects are not always positive, as music can sometimes reinforce negative emotions rather than reduce them.

This literature review critically examines research on music-based emotion regulation. It focuses on five key areas: the neurobiological mechanisms underlying music's emotional effects, adaptive and maladaptive regulation strategies, the use of music in everyday life and therapy, the influence of cultural and individual factors, and the implications for clinical populations, particularly individuals with anxiety and depression.

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Methodoloy

Relevant literature was identified through searches of major academic databases and publisher platforms, including PsycINFO, PubMed, Frontiers, SAGE

Journals, and Google Scholar. Search terms included combinations of music, emotion regulation, mood regulation, affect regulation, cognitive reappraisal, music therapy, and neuroimaging. The search focused on peer-reviewed empirical research and theoretical publications written in English. No strict date limits were applied so that both foundational studies, such as Gross (1998), and more recent research could be included. Studies that focused only on music perception, musical performance, or general wellbeing without a specific emphasis on emotion regulation were not included as core sources.

The analysis was conducted using a thematic approach on nineteen core studies by excluding those that could not be verified through an original published record, or that did not meet the standard of a peer-reviewed publication . Each study was read carefully and coded according to the emotion-regulation strategies, individual differences, mechanisms, outcomes, and moderating factors it discussed. Rather than reviewing studies one at a time, sources were grouped according to recurring concepts and patterns. Through this process,

eight interconnected themes were identified. The relationships between these themes are summarised in the conceptual model presented in the Thematic Synthesis section.

THEMATIC ANALYSIS

Theme :1 Regulatory Strategies — Typology and Functions

Contributing papers: Saarikallio (2011); Baltazar & Saarikallio (2019); Randall & Rickard (2017); Cook, Roy & Welker (2019); Lee, Ridder & Lindvang (2026); Chong, Kim & Kim (2024).

1.1 The Strategy Taxonomy

One of the most important contributions to this area comes from the strategy taxonomy developed by Saarikallio(2011). Based on qualitative interviews with twenty-one adults aged between (21-70) years the study identified several different ways people use music to manage their emotions. These strategies include Entertainment, which helps maintain or increase positive feelings; Revival, which restores energy and alertness; Diversion, which shifts attention away from upsetting thoughts; Strong Sensation, which intensifies emotional experiences; Discharge, which allows negative emotions to be expressed and released; Mental Work, which supports reflection and emotional processing; and Solace, which provides comfort during difficult times.

These strategies later became part of the Music in Mood Regulation framework and remain one of the most widely used ways of understanding music-based emotion regulation. However, even at this stage it is important to recognise that these categories are not always clearly separated in real life. People often use several strategies at the same time, and the field has not yet fully resolved how much overlap exists between them.

1.2 How Strategies Are Used in Everyday Life

Randall and Rickard (2017) provide useful insight into how these strategies operate in daily life. Using the MuPsych mobile experience-sampling application, they collected real-time data from 327 participants as they went about their normal activities. Because listening behaviour was recorded as it happened, the study had strong ecological validity and reduced the recall bias often found in retrospective self-report research.

The findings showed that people were most likely to use music for emotion regulation when they were already experiencing negative emotions. This suggests that music often functions as a coping tool for dealing with distress rather than simply enhancing an already positive mood. The study also found that strategy use was highly flexible. The way people used music changed depending on the time of day, the activity they were engaged in, and the social context in which listening took place.

1.3 Linking Strategies to Underlying Mechanisms

Baltazar and Saarikallio (2019) extended this work by examining how these regulatory strategies actually produce their effects. Using correspondence analysis on data from 571 participants, they identified three broad forms of musical engagement: Cognition, Feelings, and Body. These dimensions gave rise to six related clusters: Cognitive Work, Entertainment, Affective Work, Distraction, Revival, and Focus on Situation.

The importance of this study lies in the fact that it goes beyond simply renaming existing strategies. Instead, it focuses on the processes that sit underneath them. The findings suggest that the effectiveness of a strategy depends not only on the emotional goal being pursued but also on the type of engagement that the music encourages. This relationship between strategies and mechanisms is explored in greater detail in Theme 7.

1.4 Genre as a Strategic Resource

Cook, Roy and Welker (2019) connect the strategy literature to the characteristics of the music itself. Their study examined how the genre preferences of 794 university students related to their use of music for emotion regulation. The researchers found that a preference for energetic and rhythmically driven music was positively associated with every regulatory function they measured.

This finding suggests that certain types of music may be particularly effective at changing emotional states. It also highlights an important point: strategies and musical content cannot be viewed separately. The kinds of music people prefer may influence which regulatory functions are available to them and how effectively those functions operate.

1.5 A Field Still Defining Its Concepts

Despite the progress made through these different taxonomies and models, Chong, Kim and Kim (2024) argue that the field still lacks conceptual clarity. In their scoping review of forty-seven studies, they found that researchers often fail to distinguish between emotions that are simply evoked by music and emotions that are actively regulated through music. They also noted that many studies treat music as a single, uniform variable without examining its individual components.

A related perspective comes from Lee, Ridder and Lindvang (2026), whose meta-ethnographic review of music listening among university students describes emotion regulation as an ongoing process of emotional awareness rather than a single regulatory act. Together, these studies highlight an important issue within the literature. Existing taxonomies provide a useful framework for understanding music-based emotion regulation, but the mechanisms connecting music and regulation still require further theoretical clarification.

A further limitation is that much of the evidence on regulatory strategies relies heavily on self-report measures. As a result, it is difficult to know how accurately individuals can identify and describe their own regulatory processes. Future research would benefit from clearer conceptual definitions as well as greater use of real-time and observational methods, which could provide a more accurate picture of how music is used to regulate emotion in everyday life.

Theme 2: Adaptive versus Maladaptive Outcomes

Contributing papers: Carlson et al. (2015); Groarke & Hogan (2018); Saarikallio (2011); Chin & Rickard (2014); Carvalho, Cera & Silva (2022); Morgan & Marroquín (2024).

2.1 Not All Music Use Leads to Positive Outcomes

A common belief in music psychology is that listening to music generally improves mood and promotes wellbeing. However, the evidence reviewed here suggests that this is not always the case. Saarikallio (2011) argued that the effects of music-based emotion regulation depend on the strategy being used, the characteristics of the individual, and the context in which the music is used.

The strategy of Discharge provides a good example. Listening to music in order to convey, amplify or release negative emotions may help some individuals process difficult feelings. For others, however, it may strengthen those emotions and prolong distress rather than reduce it. This suggests that the distinction between adaptive and maladaptive use is not always clear-cut. A strategy that appears harmful in one situation may serve a useful short-term coping function in another.

Viewed through Gross's (1998) process model, Discharge resembles a response-focused strategy because it acts on emotions that have already developed. This may help explain why it can sometimes maintain negative emotional states rather than preventing them from escalating.

2.2 Neurobiological Evidence for Maladaptive Regulation

Carlson et al. (2015) provided empirical evidence for the potentially maladaptive effects of certain music-regulation strategies. The study combined measures of depression, anxiety, and neuroticism with functional magnetic resonance imaging (fMRI) in a sample of 123 participants, of whom 56 completed brain scans.

The findings showed that frequent use of Discharge was associated with higher levels of anxiety and neuroticism. Among male participants, greater reliance on Discharge was also linked to reduced activation of the medial prefrontal cortex during music listening. This brain region plays an important role in self-monitoring, cognitive control, and cognitive reappraisal.

These findings suggest that habitual use of Discharge may be linked to neural patterns associated with emotional vulnerability rather than effective emotional processing. However, because the neuroimaging sample was relatively small, the results should be interpreted with some caution.

2.3 The Importance of Strategy and Musical Sophistication

Chin and Rickard (2014) demonstrated that the relationship between music use and wellbeing depends largely on the type of emotion-regulation strategy involved. In a study of 637 participants, they applied Gross's distinction between reappraisal and suppression and found that the same engagement with music could be associated with either positive or negative outcomes depending on the strategy being used.

Their mediation analysis suggested that regulatory strategy plays a key role in shaping outcomes. However, because the study used a cross-sectional design, the findings remain correlational and do not establish causality. Carvalho, Cera and Silva (2022) added experimental evidence to this discussion. After inducing anger in participants, they found that music supported cognitive reappraisal but reduced the effectiveness of distraction. Importantly, these effects were observed only among individuals with higher levels of musical sophistication. When considered together, these studies point to a similar conclusion. The effectiveness of music-based emotion regulation depends not only on the strategy being used but also on the listener's relationship with music. Neither factor appears sufficient on its own.

2.4 Adaptive Functions, Wellbeing, and Mental Health

While some evidence highlights the risks of maladaptive music use, other studies demonstrate its positive potential. Groarke and Hogan (2018) explored this using the Adaptive Functions of Music Listening Scale, developed with a sample of 1,191 participants. They found that stronger use of music for affect regulation—including stress management, anxiety reduction, and sleep improvement—was significantly associated with higher levels of subjective, psychological, and social wellbeing. These adaptive functions were positively related to cognitive reappraisal but showed no significant relationship with suppression. Morgan and Marroquín (2024) examined this issue from a clinical perspective. In a sample of 146 adults, they found that the relationship between music-based emotion regulation and symptoms of depression and anxiety was influenced by individuals' broader use of adaptive and maladaptive emotion-regulation strategies. Taken together, these studies suggest that music-based emotion regulation exists on a continuum ranging from adaptive to maladaptive outcomes. Where an individual falls on this continuum appears to depend largely on their existing regulatory habits, coping strategies, and personal characteristics.

The contrast between the findings is informative rather than contradictory. Groarke and Hogan (2018) highlight the wellbeing-enhancing potential of music, whereas Carlson et al. (2015) identify circumstances in which music may reinforce emotional distress. Viewed together, these findings suggest that the benefits of music-based emotion regulation are more conditional and context-dependent than some optimistic accounts imply.

As with much of the literature reviewed, however, the predominance of cross-sectional research means that the direction of causality remains uncertain.

Theme 3:
Individual Differences

Contributing papers: Carlson et al. (2015); Groarke & Hogan (2018); Baltazar & Saarikallio (2019);

Saarikallio (2011); Randall & Rickard (2017); Carvalho, Cera & Silva (2022)

3.1 Neuroticism and Trait Anxiety

Carlson et al. (2015) provide evidence that personality plays an important role in how people use music for emotion regulation. Individuals with higher levels of neuroticism and trait anxiety were significantly more likely to use the strategy of Discharge, and this relationship was particularly strong among men. Their neuroimaging findings also showed reduced activation of the medial prefrontal cortex in men who frequently used Discharge. Similar patterns have been observed in individuals with high levels of neuroticism.

These findings raise the possibility of a cyclical relationship. Emotional vulnerability may increase reliance on Discharge, while repeated use of this strategy could further weaken effective emotion regulation over time. However, this remains a theoretical interpretation rather than a confirmed causal process, as the direction of the relationship has not yet been established.

3.2 Empathy and Musical Sophistication

Baltazar and Saarikallio (2019) examined individual characteristics that are more directly related to musical engagement. They found that people with higher levels of musical sophistication and empathy were more likely to rely on individual-dependent mechanisms when regulating emotions. These included personal memories, emotional associations, and identification with song lyrics. Such mechanisms were particularly important for cognitive forms of regulation, including reflection and cognitive reappraisal. In contrast, individuals with lower levels of musical engagement relied more heavily on feature-dependent mechanisms such as tempo, rhythm, and other structural elements of music. Carvalho, Cera and Silva (2022) provided experimental support for these findings. After inducing anger in participants, they found that the emotion-regulation benefits of music-based reappraisal appeared only among individuals with higher musical sophistication. However, because the study focused on a single induced emotion and used a relatively modest sample size, caution is needed when generalising the results. Taken together, these studies suggest that the depth of an individual's relationship with music influences the types of regulatory processes that are available to them and how effectively those processes function.

3.3 Current Mood as an Intra-Individual Factor

Randall and Rickard (2017) offer a more dynamic perspective by focusing on momentary emotional states rather than stable personality traits. Using real-time experience-sampling methods, they found that participants were significantly more likely to use music for emotion regulation when they were experiencing negative moods, regardless of their personality characteristics. This finding highlights that music use is influenced not only by enduring personal traits but also by immediate emotional needs. In other words, people often turn to music because of how they feel at a particular moment rather than simply because of who they are. The study also carries an important methodological implication. Research that relies solely on retrospective self-report measures may risk confusing temporary situational influences with stable individual differences. Real-time methods may therefore provide a more accurate picture of why people use music for emotion regulation.

3.4 Lifespan and Developmental Differences

Saarikallio (2011) contributes a developmental perspective to the discussion of individual differences. Although the main emotion-regulation strategies remained relatively consistent across adulthood, the ways in which people used those strategies changed over time. The study identified age-related differences as well as changes associated with major life events such as illness, bereavement, and other significant transitions. One notable finding was that many individuals reported relying more heavily on music after retirement, particularly for reflection, emotional stability, and maintaining a sense of personal identity. These findings suggest that individual differences in music-based emotion regulation are not fixed characteristics. Instead, they continue to develop and adapt across the lifespan in response to changing circumstances and experiences.

3.5 Synthesis: Why Individual Differences Matter

Across the studies reviewed, individual differences emerge as a central factor in understanding music-based emotion regulation. No emotion-regulation strategy can be considered inherently adaptive or maladaptive in all situations. Its effectiveness depends on a combination of factors, including personality traits, current emotional state, level of musical engagement, and stage of life. As a result, the same listening behaviour may benefit one person while proving ineffective—or even harmful—for another. This helps explain why research findings in this area are often inconsistent. Treating music listening as a single, uniform behaviour overlooks the substantial variation between individuals. The implications extend beyond research. In clinical and therapeutic settings, effective music-based interventions require an understanding of the individual's personality, emotional needs, musical preferences, and preferred regulatory strategies. Personalised assessment is therefore not simply beneficial but essential. At the same time, an important limitation remains within the current evidence base. Traits such as empathy, neuroticism, and musical sophistication have largely been examined separately. Much less is known about how these characteristics interact with one another. Consequently, existing findings provide only a partial understanding of the ways personal characteristics influence music-based emotion regulation.

Theme 4:

Neurobiological Mechanisms

Contributing papers: Carlson et al. (2015) [Primary]; Ferreri et al. (2019); Hou et al. (2017); Sena Moore (2013); Sena Moore, Burbach & Hanson-Abromeit (2025); Baltazar & Saarikallio (2019) [Partial]

4.1 The Medial Prefrontal Cortex as a Regulatory Hub

Carlson et al. (2015) provide the strongest neurobiological evidence discussed in this review. Using functional magnetic resonance imaging (fMRI) with fifty-six participants, the researchers examined patterns of brain activity during music listening, with particular attention to the medial prefrontal cortex (mPFC). This brain region is widely recognised as being involved in emotional self-regulation, self-reflection, and cognitive reappraisal. By investigating how the mPFC responded during music listening, the study linked music-based emotion regulation to broader neuroscientific theories of emotional control. The findings suggest that the processes involved in regulating emotions through music may overlap with the neural systems that support emotion regulation more generally.

4.2 Discharge, Diversion, and Gender Differences in mPFC Activity

One of the study's most notable findings was that men who frequently used the strategy of Discharge showed reduced activation of the medial prefrontal cortex while listening to music. This pattern may indicate lower engagement of adaptive regulatory processes. Interestingly, the same effect was not observed among women. Instead, women who frequently used Diversion showed increased activation in the medial prefrontal cortex. This finding suggests that redirecting attention through music may actively engage prefrontal regulatory systems in women. These results are particularly important because reduced activity in the medial prefrontal cortex has previously been linked to depression, borderline personality disorder, and high levels of neuroticism. Finding a similar pattern among individuals who regularly use Discharge suggests that some listening strategies may be associated with neurobiological processes linked to emotional vulnerability.

However, caution is needed when interpreting these findings. The results are correlational and based on a relatively small sample. They should not be taken as evidence that Discharge causes emotional vulnerability, only that the two appear to be associated.

4.3 Reward, Dopamine, and the Mesolimbic System

While Carlson et al. (2015) focus on prefrontal control systems, Ferreri et al. (2019) examine the role of reward processes in musical emotion. These studies operate at different levels of analysis. Whereas Groarke and Hogan (2018) conceptualise emotion regulation through self-reported wellbeing outcomes, Carlson et al. and Ferreri et al. investigate the underlying neural and biological mechanisms. Rather than competing explanations, these perspectives can be viewed as different ways of understanding the same phenomenon. Ferreri et al. (2019) used a double-blind pharmacological design to directly manipulate dopamine availability. Their findings demonstrated a causal relationship between dopamine activity and the emotional rewards produced by music. Increasing dopamine levels enhanced reported pleasure and emotional arousal, whereas reducing dopamine activity decreased both responses, including the experience of musical chills. This study provides an important biological explanation for the mood-enhancing and motivational effects of music that appear throughout the wider literature. It complements the prefrontal account by showing that music-based emotion regulation may depend not only on cognitive control systems but also on reward-related structures within the mesolimbic pathway. Importantly, this is one of the few studies in the field that provides genuinely causal evidence. Much of the broader literature relies on correlational findings, making this contribution particularly valuable.

4.4 Converging Evidence and Its Limitations

Several review-level studies help place these findings within a broader context. Hou et al. (2017) examined the neural mechanisms involved in both emotion regulation and music-evoked emotions. Their review concluded that music influences both cortical and subcortical brain systems involved in generating and regulating emotions. They also highlighted the potential value of music therapy for individuals experiencing emotional dysregulation. Similarly, Sena Moore (2013) reviewed evidence relating to music therapy and concluded that music affects neural systems involved in emotional processing. Listening, singing, and musical improvisation were all identified as potentially beneficial for emotion regulation. However, the review also acknowledged an important limitation: improvements in emotion regulation were often inferred rather than directly measured.

A developmental perspective is provided by Sena Moore, Burbach and Hanson-Abromeit (2025). Their Musical Contour Regulation Facilitation model proposes that music supports the development of emotion regulation during early childhood through a combination of bottom-up and top-down neural processes. Within this model, musical tempo is considered particularly important in shaping regulatory development. Baltazar and Saarikallio's (2019) mechanistic framework offers a further extension. Their model suggests that feature-dependent mechanisms may engage reward and sensory systems, including structures such as the nucleus accumbens, whereas individual-dependent mechanisms may involve memory and self-referential systems, including the hippocampus and medial prefrontal cortex. At present, however, direct neurobiological evidence supporting this distinction remains limited. Although these studies collectively provide valuable insights into the biological foundations of music-based emotion regulation, several limitations remain. Many neuroimaging studies rely on relatively small samples and focus on a restricted number of brain regions. Furthermore, neural activation alone cannot demonstrate successful emotion regulation. Changes in brain activity must be supported by behavioural evidence before firm conclusions can be drawn. Larger and more diverse studies are therefore needed to strengthen the current evidence base.

The neurobiological findings discussed in this theme help explain the biological foundations of music-based emotion regulation. However, brain activity alone cannot fully explain how individuals actively regulate

and interpret their emotional experiences through music. To understand how listeners create meaning, reinterpret emotions, and cope with difficult experiences, it is necessary to examine the cognitive processes involved. Theme 5 therefore turns to cognitive reappraisal and coping theory, providing a psychological perspective that complements the neurobiological evidence.

Theme 5:
Cognitive Reappraisal and Coping Theory
Contributing papers: Gross (1998); Groarke & Hogan (2018); Baltazar & Saarikallio (2019); Saarikallio (2011); Chin & Rickard (2014)

5.1 Gross's Process Model as the Theoretical Foundation
Gross's (1998) process model provides the main theoretical framework for understanding emotion regulation within this review. The model distinguishes between antecedent-focused strategies, which are used before an emotional response is fully developed, and response-focused strategies, which are used after an emotion has already occurred. One of the most widely studied antecedent-focused strategies is cognitive reappraisal, which involves changing the way a person interprets an emotional situation. Research has consistently linked reappraisal to lower levels of anxiety and depression, greater resilience, and improved wellbeing. In contrast, expressive suppression involves inhibiting the outward expression of emotion after it has been experienced and is generally associated with less favourable outcomes. This distinction between reappraisal and suppression provides an important framework for evaluating music-based emotion-regulation strategies and understanding why some forms of music use appear more beneficial than others.

5.2 Music as a Tool for Cognitive Reappraisal
Several studies suggest that music can support cognitive reappraisal. Groarke and Hogan (2018) provide particularly strong evidence for this relationship. In their validation study of the Adaptive Functions of Music Listening Scale, affect-regulation scores were significantly and positively associated with cognitive reappraisal, as measured by the Emotion Regulation Questionnaire. In contrast, no significant relationship was found between music-based regulation and expressive suppression. These findings suggest that the benefits of music are more closely linked to constructive emotional processing than to emotional avoidance or inhibition. Chin and Rickard (2014) reached a similar conclusion using a different methodological approach. Their mediation analysis showed that reappraisal explained the positive relationship between music engagement and wellbeing, whereas suppression was associated with poorer outcomes. Although the findings from these studies converge, it is important to recognise their limitations. Groarke and Hogan relied on correlational survey data, while Chin and Rickard used mediation modelling to explore possible mechanisms. Both studies apply Gross's framework successfully, but neither is able to establish the direction of causality. As a result, the evidence demonstrates a consistent relationship between music use and reappraisal rather than proving a direct causal effect.

5.3 Mental Work and Cognitive Work as Forms of Reappraisal
Saarikallio (2011) identified Mental Work as a strategy in which individuals use music to reflect on and process emotionally significant experiences. This process closely resembles cognitive reappraisal because it involves reconsidering emotional situations and deriving new meaning from them. Baltazar and Saarikallio (2019) expanded this idea through their concept of Cognitive Work, a regulatory cluster centred on reflection, interpretation, and meaning-making. They argued that these processes are supported primarily by individual-dependent mechanisms such as autobiographical memories and the personal significance attached to lyrics. These findings suggest that music-facilitated reappraisal is often highly personal. Its effectiveness may depend less on the objective characteristics of the music and more on the listener's personal experiences, memories, and emotional connections to it. At the same time, an important limitation should be acknowledged. Several studies infer the presence of reappraisal from broader patterns of behaviour rather than measuring the cognitive process directly. While the overall relationship between music and reappraisal appears convincing, the precise cognitive mechanisms involved remain insufficiently understood and require further experimental investigation.

5.4 Beyond Reappraisal: Music and Broader Coping Processes
Although cognitive reappraisal is a central concept within emotion regulation, it represents only one aspect of broader coping theory. Looking beyond reappraisal reveals what may be one of the most significant limitations in the current literature. Traditional coping models distinguish between emotion-focused coping, which aims to manage emotional responses to a stressor, and problem-focused coping, which aims to address or change the source of the stress itself. When viewed through this framework, almost all of the music-regulation research reviewed here falls within the category of emotion-focused coping. Across the nineteen studies examined, music is repeatedly shown to help individuals calm themselves, redirect attention, increase energy, or reinterpret emotional experiences. However, none of the studies provide direct evidence that music helps people actively solve the problems causing their distress. This imbalance is rarely discussed explicitly, yet it has important implications. If music primarily helps people manage emotional reactions rather than resolve the underlying stressor, then describing it as a comprehensive emotion-regulation tool may overstate its effects. A more cautious interpretation is that music functions mainly as an emotion-focused coping resource. It may still influence problem-focused coping indirectly. For example, reducing emotional arousal could make decision-making easier, while enhancing motivation might help individuals persist

with difficult tasks. However, these possibilities remain theoretical rather than empirically demonstrated. Consequently, one of the most valuable directions for future research would be to investigate whether music can support active problem solving, decision-making, and behavioural adaptation during stressful situations. Such work would benefit from behavioural measures rather than relying solely on self-reported emotional outcomes. Until stronger evidence becomes available, the safest conclusion is that music appears to regulate how people experience stress more reliably than it changes how they respond to the source of that stress.

Theme 6:
Everyday versus Therapeutic Music Use
Contributing papers: Randall & Rickard (2017); Carlson et al. (2015); Groarke & Hogan (2018); Sena Moore (2013); Morgan & Marroquín (2024); Peters et al. (2024)

6.1 Everyday Music Use: Reactive and Context-Dependent
Randall and Rickard (2017) suggest that everyday music listening is often reactive in nature. People are most likely to turn to music when they are already experiencing negative emotions, using it in response to an immediate emotional need rather than as part of a planned strategy. This pattern supports the idea that music functions as a form of self-help or self-medication. In many situations, people use music as a readily available coping resource, much like talking to a friend, going for a walk, or exercising. Everyday music listening is typically personal, self-directed, and shaped by the demands of the situation at hand.

6.2 Music Use and Wellbeing in Non-Clinical Populations
Groarke and Hogan (2018) examined the relationship between music use and wellbeing in non-clinical populations. Their findings showed that regular use of adaptive music-listening functions was positively associated with wellbeing. Importantly, this was a correlational relationship rather than evidence that music directly caused improvements in wellbeing. Participants who frequently used music for stress management, anxiety reduction, and social connection reported higher levels of subjective, psychological, and social wellbeing. Although causality cannot be established, the findings suggest that having a flexible range of music-based regulation strategies may contribute to emotional resilience and longer-term psychological health.

6.3 Clinical Implications and Structured Intervention
Carlson et al. (2015) extend the discussion beyond everyday listening by considering its potential clinical implications. They highlight both the widespread burden of anxiety and mood disorders and the accessibility of music as a possible regulatory tool. However, their findings also raise an important concern. Frequent use of Discharge was associated with higher anxiety and reduced activation of prefrontal regulatory regions. This suggests that unstructured emotional venting through music may reinforce negative emotional states in some vulnerable individuals. This distinction highlights an important difference between everyday music use and therapeutic intervention. Self-directed listening is guided primarily by personal preference and immediate emotional needs, whereas therapeutic approaches involve professional guidance, clearly defined goals, and opportunities for reflection and processing. Viewed through Gross's (1998) process model, structured intervention may help shift individuals away from response-focused forms of regulation and towards antecedent-focused strategies such as cognitive reappraisal, which are generally associated with more adaptive outcomes. Sena Moore (2013) supports the use of listening, singing, and improvisation within therapeutic settings while also emphasising the need for stronger evidence linking these activities directly to improvements in emotion regulation.

6.4 Evidence for Therapeutic Effectiveness
Additional support for music-based interventions comes from Peters et al. (2024). In a meta-analysis of eight randomised controlled trials involving 441 participants, they reported a small-to-moderate positive effect of musicking on emotion regulation ($d = 0.45$). Both active participation and passive listening appeared to contribute to these benefits. At the same time, the findings should be interpreted carefully. The effect size was based on only eight studies, and the included trials varied considerably in design and methodology. As a result, the estimate is best viewed as encouraging rather than definitive. The contrast between Peters et al. (2024) and Randall and Rickard (2017) is particularly informative. Randall and Rickard capture how people use music spontaneously in everyday life, whereas Peters et al. evaluate structured and goal-directed interventions under controlled conditions. The difference between these contexts reflects the very purpose of therapeutic music use: to apply music in a deliberate and systematic way to support emotional outcomes. Morgan and Marroquín (2024) help connect these two perspectives. Their findings suggest that the relationship between music-based emotion regulation and symptoms of depression and anxiety is influenced by an individual's wider repertoire of emotion-regulation strategies. In other words, the effectiveness of music depends not only on the music itself but also on how it fits within a person's broader approach to managing emotions. Taken together, these studies indicate that both the benefits and risks of music-based emotion regulation depend on the strategies being used and the context in which they occur. Whether music is used independently or within a structured therapeutic framework appears to make an important difference. An important gap remains, however. None of the studies directly compare self-directed music use with therapist-guided intervention within the same population. As a result, the added value of structured therapeutic support remains largely untested and represents a promising direction for future research.

Theme 7:
Mechanisms of Music-Based Emotion Regulation
Contributing papers: Baltazar & Saarikallio (2019) [Primary]; Fernández-Sotos et al. (2016); Cook, Roy & Welker (2019)

7.1 Two Types of Musical Mechanisms
Baltazar and Saarikallio (2019) introduced an important distinction between feature-dependent and individual-dependent mechanisms of music-based emotion regulation. Feature-dependent mechanisms arise from the structural characteristics of the music itself, such as tempo, rhythm, mode, timbre, and dynamics. These features tend to produce relatively similar emotional responses across different listeners, regardless of their personal experiences. In contrast, individual-dependent mechanisms are based on the listener's personal relationship with the music. These include autobiographical memories, emotional associations, and identification with song lyrics. As a result, the same piece of music can have very different effects on different people. According to this framework, emotion regulation through music occurs through the interaction between the objective features of the music and the subjective meanings that listeners attach to it.

7.2 Connections Between Strategies and Mechanisms
Baltazar and Saarikallio's (2019) correspondence analysis revealed a clear pattern linking regulatory strategies to specific mechanisms. Cognitive strategies such as Cognitive Work and Focus on Situation were strongly associated with individual-dependent mechanisms. These strategies relied heavily on personal memories, reflection, and meaning-making. In contrast, strategies focused on improving mood or restoring energy, such as Entertainment and Revival, were more closely linked to feature-dependent mechanisms. These effects appeared to operate through structural aspects of music, including tempo, rhythm, and melody. This distinction suggests that different forms of emotion regulation rely on different processes. Cognitive forms of regulation seem to depend on personally meaningful engagement with music, whereas mood enhancement and energising effects can often be achieved through the more universal emotional impact of musical structure.

7.3 Experimental Evidence for Feature-Dependent Effects
Fernández-Sotos et al. (2016) provide experimental support for the feature-dependent side of the model. By manipulating tempo and rhythmic units and asking participants to evaluate musical fragments on dimensions such as tension and expressiveness, the researchers demonstrated that structural characteristics of music can systematically influence emotional responses. Importantly, the effects of these musical features were moderated by personality traits, particularly neuroticism and extraversion. This finding connects Theme 7 with the individual-difference evidence discussed in Theme 3 and suggests that even feature-dependent mechanisms are not completely independent of the listener. Cook, Roy and Welker (2019) extend this evidence by examining musical genres. Their findings indicate that energetic and rhythmically driven styles of music support a wide range of regulatory functions, further highlighting the importance of musical structure in shaping emotional outcomes. Although the evidence supporting this two-mechanism framework is compelling, most of it remains correlational. The model provides a strong theoretical explanation of how music-based emotion regulation may operate, but direct causal evidence is still limited. Future research would benefit from experimental studies comparing personalised music selections with standardised music selections in order to test these mechanisms more directly.

7.4 Implications for Therapeutic Music Selection
This framework also has important practical implications for therapeutic and clinical applications. When the goal is cognitive reappraisal, emotional reflection, or meaning-making, personally meaningful music may be the most effective choice because it activates individual-dependent mechanisms. In these situations, personal memories, associations, and emotional connections become central to the regulatory process. By contrast, when the aim is immediate mood improvement, stress reduction, relaxation, or anxiety management, music selected for its structural characteristics may be sufficient. Feature-dependent mechanisms can often produce these effects without requiring strong personal associations and may therefore be more easily applied across different individuals. These findings suggest that matching the type of music to the specific regulatory goal may improve the effectiveness of music-based interventions and therapeutic practice. The mechanisms discussed in this theme help explain how music influences emotions through both its structural characteristics and the personal meanings attached to it. However, these mechanisms do not operate in the same way for everyone. Factors such as age, gender, cultural background, and musical preferences may shape how individuals respond to music and how effectively emotion regulation occurs. Theme 8 therefore examines the moderating variables that influence individual responses to music-based emotion regulation.

Theme 8:
Gender, Age, Genre, and Cultural Context as Moderating Variables
Contributing papers: Carlson et al. (2015); Groarke & Hogan (2018); Saarikallio (2011); Randall & Rickard (2017); Cook, Roy & Welker (2019); Ning (2023)
The final theme concerns factors that shape when, how, and for whom music-based emotion regulation is effective. Across the literature, demographic characteristics, musical preferences, and cultural context emerge as important moderators. These variables do not determine emotional outcomes on their own; rather, they influence the likelihood that particular regulation strategies will be adopted and whether those strategies prove adaptive or maladaptive in practice.

8.1 Gender Differences: Questionnaire and Real-Time Findings

Gender emerged as an important moderating factor across several studies, although the strength of its influence appeared to depend on the research method used. Using questionnaire data from 1,191 participants, Groarke and Hogan (2018) found that women scored significantly higher on affect-regulation functions of music listening. This finding is consistent with broader psychological research suggesting that women are generally more likely to use emotion-focused coping strategies. Carlson et al. (2015) also reported gender differences at both behavioural and neurobiological levels. The relationship between Discharge and anxiety varied between men and women, and different patterns of prefrontal brain activation were observed during music listening. However, Randall and Rickard (2017) reported a different picture. Using real-time experience-sampling methods, they found that gender differences were much less pronounced. Instead, an individual's current mood was a stronger predictor of music use than gender. The contrast between these findings is informative. The questionnaire-based results of Groarke and Hogan (2018), together with the neural and behavioural differences reported by Carlson et al. (2015), appear somewhat inconsistent with the more limited gender effects observed by Randall and Rickard (2017). One possible explanation is that some differences identified through self-report measures reflect variations in what people are willing to disclose rather than substantial differences in actual behaviour. At present, this interpretation remains speculative. Future research combining self-report, behavioural, and real-time measures within the same sample would help clarify the extent to which gender genuinely influences music-based emotion regulation.

8.2 Age-Related Changes Across the Lifespan

Saarikallio (2011) provides a detailed account of how age influences music-based emotion regulation. Although the core set of regulatory strategies remained relatively stable across adulthood, the frequency and purpose of their use changed over time. Older adults were more likely to use music for comfort, emotional support, and reflection. The study also found that major life events could temporarily alter patterns of music use across all age groups. One particularly important transition was retirement. As the structure provided by work decreased, music often took on a larger role in maintaining emotional stability, daily routine, and a sense of personal continuity. These findings suggest that while the basic strategies people use remain broadly similar throughout adulthood, the functions and meanings attached to music continue to evolve across the lifespan.

8.3 Genre as a Moderator of Emotional Outcomes

Cook, Roy and Welker (2019) identify musical genre as another important moderating factor. Their findings showed that a preference for energetic and rhythmically driven music was positively associated with every form of music-based emotion regulation examined in the study. This suggests that the characteristics of the music itself may influence its regulatory potential. In other words, emotional outcomes are shaped not only by the listener's age, gender, or personality but also by the type of music being used. At the same time, these findings should be interpreted cautiously. The study relied on self-reported genre preferences and used a cross-sectional design, making it difficult to determine causal relationships. Genre therefore operates as a stimulus-level moderator, complementing person-level factors such as age and gender.

8.4 Cultural Context and Methodological Limitations

An important limitation across much of the literature is the heavy reliance on young to middle-aged, non-clinical participants from predominantly Western societies. Cultural expectations surrounding emotional expression, gender roles, and musical engagement may influence emotion regulation in ways that current Western-focused research does not fully capture. In addition, clinical populations may differ significantly from non-clinical groups in both their emotional needs and their responses to music-based interventions. Ning (2023) provides a useful counterpoint to this Western-centred evidence. In a questionnaire study examining participation in Tibetan Guozhuang folk music and dance among college students, most participants reported that the activity supported emotional regulation, reduced stress, and promoted mental wellbeing. The majority also described experiencing positive emotional states during participation. These findings suggest that the regulatory functions identified in Western research may also be present in culturally specific and collective musical practices. At the same time, they indicate that cultural meaning, social participation, and shared traditions may influence the mechanisms through which regulation occurs. Taken together, the evidence suggests that gender, age, genre, and cultural context all play meaningful roles in shaping responses to music based emotion regulation. However, these effects should be interpreted cautiously until they have been examined in more culturally diverse populations using a wider range of research methods.

Integration of Themes

Cognitive reappraisal (Theme 5) emerges as one of the most adaptive pathways identified in this review. However, its effectiveness depends heavily on the individual-dependent mechanisms discussed in Theme 7, including personal memories, emotional meaning, and the significance that listeners attach to particular pieces of music. The distinction between everyday and therapeutic music use (Theme 6) further shows that the same regulatory strategy can produce beneficial or harmful outcomes depending on the context in which it is used and whether professional guidance is available. In addition, the moderating influences of gender, age, genre, and cultural context (Theme 8) shape how these processes operate, although the strength of these effects often varies according to the methods used to measure them.

A central observation running through the literature is that music functions both as an emotional stimulus and as a regulatory tool. This dual role is one of the key reasons why music-based emotion regulation is so complex. A single listening experience can simultaneously generate an emotional response and serve as a way of managing that response. As a result, music-based emotion regulation cannot be understood as a single, uniform process. Instead, it is better viewed as a network of interconnected processes shaped by regulatory strategies, individual characteristics, neurobiological mechanisms, musical engagement, and contextual influences. Depending on how these factors interact, outcomes can range from enhanced wellbeing and resilience to the reinforcement of distress. What makes music particularly distinctive among emotion-regulation tools is its ability to operate through sensory, cognitive, emotional, and social pathways at the same time.

Although Gross's (1998) process model provides the main theoretical foundation for this review, the findings also connect with several related psychological frameworks. Considering these perspectives together helps provide a more complete understanding of how music-based emotion regulation operates.

Mood Management Theory (Zillmann, 1988) aligns closely with the reactive mood-repair patterns reported by Randall and Rickard (2017) and with the preference for energetic, arousing musical genres identified by Cook, Roy and Welker (2019). From this perspective, listeners actively select music that helps move them from an unpleasant emotional state towards a more positive one.

Theories of affect regulation that focus on valence and arousal also fit well with the feature-dependent mechanisms discussed in Theme 7. Studies such as Fernández-Sotos et al. (2016) demonstrate how structural musical elements, including tempo and rhythm, can influence emotional arousal independently of personal experience.

Coping theory, discussed in Theme 5.4, places music primarily within the category of emotion-focused coping rather than problem-focused coping. This distinction helps explain why the strongest evidence concerns music's ability to manage emotional experiences rather than directly change stressful situations.

Finally, Self-Determination Theory (Ryan & Deci, 2000) offers a useful perspective on the developmental findings reported by Saarikallio (2011). The increased use of music following retirement can be interpreted as a way of supporting psychological needs for autonomy, identity, and continuity during a major life transition. None of these frameworks replaces Gross's model. Instead, each highlights a different aspect of music-based emotion regulation and helps explain why the phenomenon appears in the forms described throughout the literature.

Conflicting and Inconsistent Findings

Although many findings converge, it would be misleading to present the literature as completely consistent. Several important tensions remain.

The clearest example concerns gender differences. Questionnaire-based studies suggest that women use music for affect regulation more frequently than men (Groarke & Hogan, 2018), while Carlson et al. (2015) identified gender-related behavioural and neurobiological differences. However, Randall and Rickard's (2017) real-time experience-sampling study found that current mood was a much stronger predictor of music use than gender, with only limited gender differences emerging.

These findings are difficult to reconcile. One possibility is that questionnaire measures capture differences in self-perception or willingness to report emotional behaviour rather than differences in actual behaviour. Alternatively, real-time methods may overlook patterns that become visible only over longer periods. At present, the discrepancy remains unresolved, and the evidence does not clearly favour either explanation.

A second area of inconsistency concerns the value of specific regulation strategies. Discharge, for example, appears beneficial for some individuals because it allows emotional expression and release, yet it is also associated with increased anxiety and reduced prefrontal activation in others (Carlson et al., 2015; Saarikallio, 2011). The same strategy can therefore produce very different outcomes depending on the individual and the context.

A third tension relates to underlying mechanisms. Baltazar and Saarikallio (2019) emphasise the importance of individual-dependent processes such as personal meaning and autobiographical memory, whereas Fernández-Sotos et al. (2016) demonstrate strong feature-dependent effects of tempo and rhythm. These perspectives are only partly reconciled by evidence showing that personality influences responses even to structural musical features. Rather than treating these inconsistencies as weaknesses, they may be better understood as evidence of the complexity of music-based emotion regulation itself. Many apparent contradictions across studies likely reflect genuine differences in participants, contexts, methods, and measurement approaches rather than simple disagreement about the underlying phenomenon.

Limitations

Despite the crucial contributions of the reviewed studies, some limitations must be taken in to consideration. First, much of the literature relies heavily on self-report measures and retrospective assessments. Such methods are vulnerable to recall bias, inaccurate self-perception, and social-desirability effects, making it difficult to determine how accurately participants identify and report their own regulatory processes. Second, many studies use cross-sectional designs, which limit causal inference. As a result, it is often unclear whether music use influences emotional functioning or whether pre-existing emotional and personality characteristics shape the ways individuals use music. Third, neurobiological evidence remains relatively limited. Although studies such as Carlson et al. (2015) provide valuable insights, the neuroimaging component was based on a comparatively small sample. In addition, direct neuroscientific evidence supporting the distinction

between feature-dependent and individual-dependent mechanisms remains scarce. Finally, the methodological diversity that strengthens the field also creates challenges. Differences in study design, measures, theoretical frameworks, and outcome variables make direct comparison difficult and may contribute to some of the inconsistencies observed across the literature.

Taken together, these limitations suggest that the evidence base is promising but still developing. Future research would benefit from longitudinal and experimental designs, larger and more diverse samples, stronger behavioural measures, and greater integration of neurobiological and psychological approaches to better understand how and when music supports emotion regulation.

Research Gaps and Future direction

Although the literature reviewed provides valuable insights into music-based emotion regulation, several important gaps remain across the thematic areas identified in this review.

Within Theme 3 (Individual Differences), research has demonstrated the importance of personality-related factors such as neuroticism, empathy, and musical sophistication. However, these characteristics have largely been examined independently of one another. No study has yet adopted a comprehensive multivariate framework capable of testing how these traits interact to influence strategy selection, regulatory mechanisms, and emotional outcomes. As a result, current understanding of individual differences remains fragmented.

In Theme 4 (Neurobiological Mechanisms), neurobiological research has primarily focused on the medial prefrontal cortex and, separately, on dopaminergic reward pathways. While these findings are valuable, emotion regulation depends on a broader neural network. Brain regions such as the amygdala, anterior cingulate cortex, and hippocampus have rarely been examined systematically within the same study. Future research would benefit from whole-brain approaches that investigate how multiple neural systems interact during music-based emotion regulation.

A significant gap also exists within Theme 6 (Everyday versus Therapeutic Music Use). Although evidence suggests that structured music-based interventions may offer benefits beyond everyday listening, no study has directly compared self-directed and therapist-guided music use within the same population. Consequently, the added value of professional guidance remains largely assumed rather than empirically demonstrated.

Within Theme 7 (Musical Mechanisms), the distinction between feature-dependent and individual-dependent mechanisms has received substantial theoretical and correlational support. However, direct experimental validation remains limited. Future studies should compare personalised and standardised music selections while holding regulatory goals constant in order to determine the relative contribution of these two mechanisms.

Theme 8 (Gender, Age, and Genre as Moderators) also contains unresolved questions. Most notably, questionnaire-based studies report stronger gender differences than real-time experience-sampling research. It remains unclear whether this discrepancy reflects genuine behavioural differences or methodological artefacts associated with self-report measures. Studies combining questionnaire, behavioural, and real-time methods within the same sample would help clarify this issue.

Beyond the individual themes, two broader gaps run throughout the literature. First, the heavy reliance on non-clinical samples means that the applicability of the current framework to clinical populations remains uncertain. Conditions such as anxiety disorders, depression, post-traumatic stress disorder (PTSD), and borderline personality disorder involve significant difficulties in emotion regulation, yet comparatively little research has examined how the mechanisms identified in this review operate within these groups.

Second, the literature remains heavily concentrated in Western cultural contexts. Cross-cultural research is needed to determine whether the strategy taxonomies, regulatory mechanisms, scale dimensions, and moderating variables identified in existing studies generalise across different cultural settings. Such work would help establish whether music-based emotion regulation reflects universal psychological processes or whether it is shaped more strongly by cultural norms, values, and musical traditions.

Taken together, these gaps suggest that the next stage of research should move beyond establishing that music can regulate emotion and focus instead on identifying for whom, under what conditions, through which mechanisms, and within which cultural and clinical contexts these effects occur.

Conclusion

This review aims to bring together and critically evaluate both empirical and theoretical research on music-based emotion regulation. In doing so, it connects two important areas of psychology: the psychology of emotion and the psychology of music. Across the studies reviewed, three main levels of explanation repeatedly emerge and provide a link between emotion and music. At the cognitive level, music appears to support reflection, meaning-making, and cognitive reappraisal. At the affective level, it influences mood, emotional intensity, and arousal. At the neurobiological level, it activates reward systems and prefrontal brain regions that are also involved in emotion regulation and emotional difficulties. These levels are not treated as competing explanations but as interconnected parts of the same psychological process. Looking at them together helps connect emotion theory, individual differences, and research on music within a single framework.

Reference

1. Baltazar, M., & Saarikallio, S. (2019). Strategies and mechanisms in musical affect self-regulation: A new model. *Musicae Scientiae, 23(2),* 177–195. https://doi.org/10.1177/1029864917715061
2. Carlson, E., Saarikallio, S., Toiviainen, P., Bogert, B., Kliuchko, M., & Brattico, E. (2015).

Maladaptive and adaptive emotion regulation through music: A behavioral and neuroimaging study of males and females. *Frontiers in Human Neuroscience,* 9, 466. https://doi.org/10.3389/fnhum.2015.00466

3. Carvalho, M., Cera, N., & Silva, S. (2022). The "ifs" and "hows" of the role of music on the implementation of emotional regulation strategies. *Behavioral Sciences, 12(6),* 199. https://doi.org/10.3390/bs12060199
4. Chin, T. C., & Rickard, N. S. (2014). Emotion regulation strategy mediates both positive and negative relationships between music uses and well-being. *Psychology of Music, 42(5),* 692–713.https://doi.org/ 10.1177/0305735613489916
5. Chong, H. J., Kim, H. J., & Kim, B. (2024). Scoping review on the use of music for emotion regulation. Behavioral Sciences, 14(9), 793. https://doi.org/10.3390/bs14090793 6.
6. Cook, T., Roy, A. R. K., & Welker, K. M. (2019). Music as an emotion regulation strategy: An examination of genres of music and their roles in emotion regulation. *Psychology of Music, 47(1)*, 144–154. https://doi.org/10.1177/0305735617734627
7. Fernández-Sotos, A., Fernández-Caballero, A., & Latorre, J. M. (2016). Influence of tempo and rhythmic unit in musical emotion regulation. *Frontiers in Computational Neuroscience*, 10, 80. https://doi.org/10.3389/ fncom.2016.00080
8. Ferreri, L., Mas-Herrero, E., Zatorre, R. J., Ripollés, P., Gomez-Andres, A., Alicart, H., … Rodriguez-Fornells, A. (2019). Dopamine modulates the reward experiences elicited by music. Proceedings of the National Academy of Sciences, 116(9), 3793–3798. https://doi.org/10.1073/pnas.1811878116
9. Groarke, J. M., & Hogan, M. J. (2018). Development and psychometric evaluation of the Adaptive Functions of Music Listening Scale. Frontiers in Psychology, 9, 516. https://doi.org/10.3389/fpsyg.2018.00516
10. Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. Review of General Psychology, 2(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271
11. Hou, J., Song, B., Chen, A. C. N., Sun, C., Zhou, J., Zhu, H., & Beauchaine, T. P. (2017). Review on neural correlates of emotion regulation and music: Implications for emotion dysregulation. Frontiers in Psychology, 8, 501. https://doi.org/10.3389/fpsyg.2017.00501
12. Lee, J., Ridder, H. M. O., & Lindvang, C. (2026). Exploring the continuum of music listening for emotion regulation with university students: A meta-ethnography. Nordic Journal of Music Therapy, 35(1), 23–47. https://doi.org/10.1080/08098131.2025.2488756
13. Morgan, R. M., & Marroquín, B. (2024). Music listening as emotion regulation: Associations with other emotion regulation strategies and symptoms of depression and anxiety. *Musicae Scientiae, 28(3)*, 591–605. https://doi.org/10.1177/10298649231214537
14. Ning, H. (2023). Analysis of the value of folk music intangible cultural heritage on the regulation of mental health. *Frontiers in Psychiatry,* 14, 1067753. https://doi.org/10.3389/fpsyt.2023.1067753
15. Peters, V., Bissonnette, J., Nadeau, D., Gauthier-Légaré, A., & Noël, M.-A. (2024). The impact of musicking on emotion regulation: A systematic review and meta-analysis. *Psychology of Music*, *52(5),* 548–568. https://doi.org/10.1177/03057356231212362
16. Randall, W. M., & Rickard, N. S. (2017). Reasons for personal music listening: A mobile experience sampling study of emotional outcomes. *Psychology of Music, 45(4),* 479–495. https://doi.org/ 10.1177/0305735616666939
17. Saarikallio, S. (2011). Music as emotional self-regulation throughout adulthood. *Psychology of Music, 39(3),* 307–327. https://doi.org/10.1177/0305735610374894
18. Sena Moore, K. (2013). A systematic review on the neural effects of music on emotion regulation: Implications for music therapy practice. *Journal of Music Therapy, 50(3*), 198–242. https://doi.org/10.1093/jmt/ 50.3.198
19. Sena Moore, K., Burbach, K., & Hanson-Abromeit, D. (2025). A theory of intervention model to define the essential characteristics of music to support emotion regulation development in early childhood. *Frontiers in Neuroscience, 19*, 1568789. https://doi.org/10.3389/fnins.2025.1568789
20. Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55(1),* 68–78. https://doi.org/ 10.1037/0003-066X.55.1.68
21. Zillmann, D. (1988). Mood management through communication choices. *American Behavioral Scientist, 31(3),* 327–340. https://doi.org/10.1177/000276488031003005