The Differences in Emotional Experiences Between Music Perception and Music Production

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Abstract:

Whether it's on a busy sidewalk street or in an elevator, music can be heard anywhere you listen. Music is a large part of our daily lives, and is an essential factor in wellbeing and happiness. It is currently known that music has a large impact on our emotions and mood. However, what is not yet clear is the differences that playing versus listening to music has on emotions. This literature review aims to analyze the effects that playing or listening to music can have on our emotions, and whether these effects differ depending on whether one is alone or in a group. This paper will also explore the multiple ways that emotional responses to music can vary based on an individual's current mental state. By examining previous studies with varying methodology (e.g., EEG and ECG studies), this paper will delve into the details regarding emotional differences when perceiving versus producing music. The findings indicate that there is a variety of felt emotions which differ based on factors such as setting, background, and current mental state.

Keywords: Music, emotions, emotional experiences, music therapy.

Introduction:

Music has been around for millenia, dating back to at least 40,000 years ago, long before ancient civilizations were formed [18]. Music has played a crucial role in human society, and has roots in the development of culture, communication, and expression [10]. This paper will focus specifically on music's role in evoking emotions. The impact of music on human emotions is a rapidly growing field, with researchers, musicians, and psychologists from all around the world investigating its effects.

The therapeutic and stress-relieving effects of music are being increasingly studied, with music therapy becoming a reliable and increasingly popular option for regulating emotions and reducing negative ones [5]. Music therapy is the practice of using music as a tool in the treatment of various illnesses [14]. Although it is already known that music has an impact on emotions, it is less clear how specific factors such as playing versus listening to music affects emotional experiences. Therefore, this comprehensive review will answer the question: What are the differences in emotional experiences between music perception and music production? There are a variety of ways for people to interact with music - whether through Spotify, a local band, or even just listening to a street musician. Even these small moments have the power to change our moods. Understanding music's benefits has the potential to improve one's overall quality of life.

This paper will examine the impact that listening to/playing instrumental or vocal music, setting, listening/playing in a group versus alone, and producing versus listening to music in individuals with neurological disorders has on emotional experiences. This review will do so by compiling, analyzing, and drawing conclusions from previous studies and reviews done on this topic.

Methods:

This review was conducted using three databases: ProQuest, JStor, and Google Scholar. The goal of the search was to find any relevant studies or reviews conducted in the past 30 years. The inclusion criteria used were: (1) articles available as full texts; (2) articles written in English; (3) articles including the effect of music on emotions; and (4) articles published from years 1995 - 2025. The exclusion criteria used were: (1) articles published before 1995, and (2) articles not available as a full text.

This review synthesizes data from the 13 articles that were included. Information on the authors, year of publication, participant information (sample size, characteristics), country, methods, results, and limitations were all extracted. There are five studies that explore listening to instrumental and vocal music, three studies on setting, three studies on playing as a group and alone, and four studies on the effects of music in individuals with neurological disorders.

Most of the research came from Western countries. Based on the purpose of this review, the analysis focuses on: (1) effects of music on human emotions; (2) the characteristics of the participants; (3) the type of music played; and (4) the setting the study took place.

Literature Review:

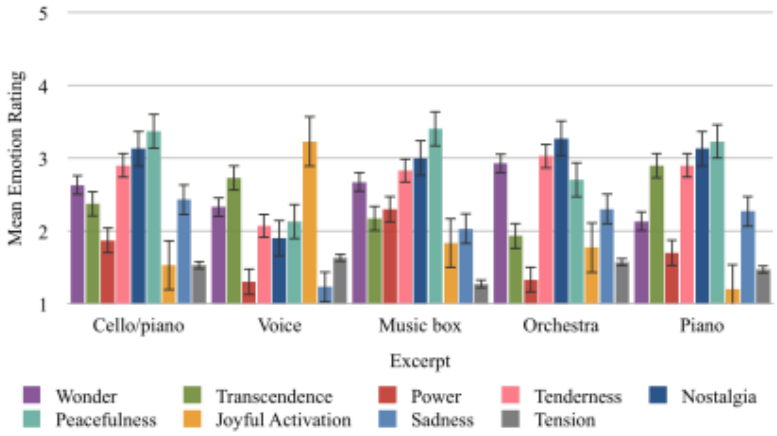
Section 1: Listening to instrumental versus vocal music

Instrumental:

One study [1] collected data from 144 American participants aged 12-76. The researchers aimed to understand the effect that different genres of music would have on emotions. Before the study began, participants were asked to fill out a questionnaire designed to assess mood, tension, and mental clarity. Participants were then placed in separate rooms and listened to 15 minutes of music. After listening, participants were then instructed to fill out a second questionnaire to assess their post-music perception emotions. This study found that listening to classical (instrumental) music led to an increase in reported mental clarity and relaxation and decreased hostility, fatigue, sadness and tension [1].

A different study [2] collected data from 30 participants aged 18-34 years, the majority of whom were musicians. They were asked to listen to five different musical excerpts, four of which were instrumental pieces. The researchers found that peacefulness, nostalgia, and tenderness were the emotions that were felt the most, and tension, joyful activation, and power were felt the least when listening to solo instrumental pieces. However, when listening to a complete orchestra piece, the most commonly felt emotions were nostalgia, tenderness, and wonder (See Figure 1) [2].

Figure 1 [2]: Graph showing average emotion ratings for different musical instruments.



A third study [13] aimed to explore the differences between the emotional states of arousal, joy, and calmness, among three different groups (children, experienced musicians, and older adults), when listening to live versus pre-recorded classical music. A total of 379 Swedish participants were recruited and split into their respective age groups. Researchers used Visual Analogue Scales (VAS) to collect and record participant data. The study found that arousal decreased and calmness increased in the younger children, while joy had a significant increase in the older children when listening to live music. Changes in arousal, calmness, and joy, were increased among experienced musicians according to VAS ratings. In older adults who were accustomed to the classical genre, there was a relatively low change in emotions when listening to the pre-recorded music. However, there was a much more significant impact on the emotions among older adults when listening to live classical music [13].

These studies found that instrumental music has a largely positive effect on the emotions of the listener. However, the specific emotions felt can vary based on the type of instrumental music listened to (eg. solo and orchestral) and the age of the listener.

Vocal:

One source [2] aimed to examine the effects on emotional experiences when listening to vocal music. By asking participants (majority were musicians) to fill out a questionnaire, researchers discovered that joyful activation was by far the most felt emotion in response to vocal music [2].

Another study [3] collected data from Portuguese and Swedish participants aged 18-44 in order to investigate the effect of lyrics on emotions. Participants listened to six musical stimuli and then ranked their induced emotions on 13 scales representing 12 emotions and emotional intensity. The musical stimuli was classified as sad lyrical folk music. Results found that there were significant emotional differences between the two groups. The Portuguese group reported an effect in sadness-melancholy and nostalgia-longing. The Swedish group only felt surprise-astonishment. There was no effect on happiness-elation ratings in both groups [3].

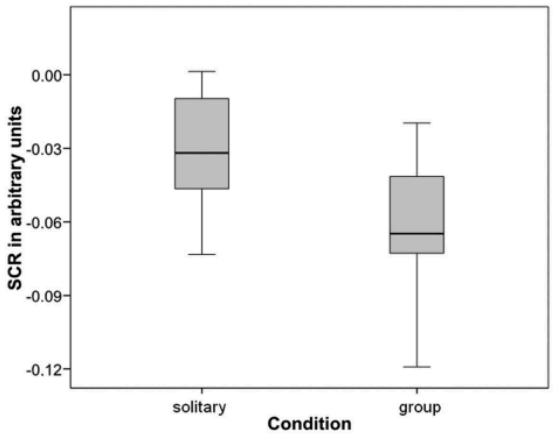
A different study also studied the effects of American rock music on American participants. By using self-reported data, researchers found that listening to grunge rock music led to a significant decrease in caring, mental clarity, and relaxation [1].

These studies explore different aspects of listening to vocal music. The first study explored the differences between perception of music throughout different cultures, while the second source found the negative effects of certain vocal music types on listeners' emotions.

Section 2: How setting affects emotional responses to music

One study [6] attempted to understand how the setting (listening to music with others versus alone) would affect emotional responses. This study explored these impacts among 14 participants, all of whom were amateur musicians, and used classical music as the stimulus. Participants then listened to classical music both alone and then in a group setting with the other participants. The study used questionnaires to assess the intensity of different emotions felt before and after listening to the excerpts, and also used a device with a button that participants pressed whenever they felt a chill, which is associated with a strong emotional experience. Additionally, a skin conductance measuring device was used to measure participants sweating and change in blood flow, which is correlated with emotional arousal and orienting responses. The study found that both the number of chills and the skin conductivity were higher when listening alone, showing that emotional experiences were enhanced when listening alone. This can perhaps be attributed to the fact that many participants reported preferring listening to music alone (See Figure 2) [6].

Figure 2 [6]: Box plot showing skin conductivity rate alone compared to in a group.



A different study [9] aimed to examine the differences in emotional responses when listening to music alone. Researchers gathered 41 participants, some with musical training and others without. They created two playlists titled A and B. The participants were divided into two groups; Group 1 listened to playlist A alone and playlist B together, while Group 2 listened to playlist B alone and playlist A together. The study used 0-100 scale sliders on participants' smartphones to collect data on responses to the music. Researchers then performed a repeated-measures analysis of variance (ANOVA) to analyze how participants' emotional responses differed when listening alone compared to a group setting. The

researchers found that pleasure, beauty, and interest in the music was significantly higher when participants listened alone compared to with a group. There was no significant difference in valence and familiarity. Additionally, emotion evocation was positively associated with pleasure for the solo condition. On the other hand, pleasure was associated with mood regulation in the group condition. It was also found that people with more empathy had higher pleasure levels than people with lower empathy levels, and more empathy also had a positive correlation with feeling connected in a group setting (See Figure 3) [9].

Figure 3 [9]: Rating of behavioural measures in a solo versus group setting.

A third study [15] focused on the roles that music choice and social context play in emotional reactions to music. Fifty university students aged 20-43 years old participated in the experiment. They listened to 16 pieces of music, eight of which were chosen and eight of which were randomly sampled from Spotify. Additionally, to study the role of social context, half of the participants were asked to bring a close friend or partner to the music listening sessions. Participants were asked to fill out a questionnaire assessing emotional responses after each piece of music was played. The study found that the largest emotional increases were in enjoyment-pleasure, nostalgia-longing, and happiness-elation when listening to self chosen music. On the other hand, randomly sampled music had higher ratings of anger-irritation, disgust-contempt, and boredom-indifference. When listening to the music excerpts with a close friend or partner, there were higher average ratings of enjoyment-pleasure, admiration-awe, and happiness-elation [15].

When compared with each other, these three studies had varying results, with some concluding that increased positive emotions were felt when listening alone, while others finding that increased positive emotions were felt when listening together. This can perhaps be attributed to the specific people the music is being listened to with; for example, heightened positive emotions are felt when listening with a close friend or significant other, while diminished positive emotions are felt when listening in a group of strangers.

Section 3: Playing music in a group versus alone

Playing as a group:

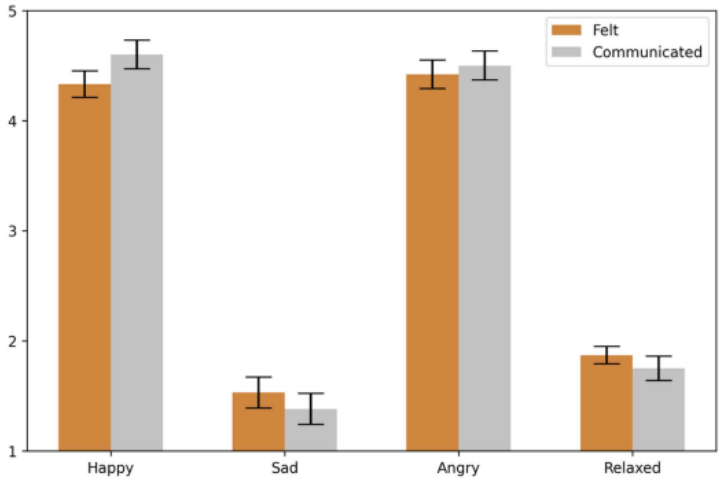
One study [4] researched the emotions that performers experience when performing as a group for an audience. Nineteen British musicians who were professionally trained or training in classical music were selected. The study found a difference between emotional and expressive playing. Emotional playing was described as genuine playing while feeling raw emotions and directly feeling the music. However, it was also associated with getting carried away and losing control of the performance. On the other hand, expressive playing was described as bringing out the structure of the piece and playing it with the composer's intention that the score describes. Due to these results, it was concluded that while on stage, although it is still possible to feel strong emotions, performers often feel diminished emotions in order to focus on the performance and not get carried away [4].

Playing alone:

One review [12] analyzed previously published studies to determine the role of emotions in practicing an instrument alone. Eleven studies were reviewed, and the researchers found that positive mood, pleasure, and interest derived from playing enjoyable pieces led to more engagement when practicing. Negative feelings such as annoyance and boredom that were associated with less enjoyable practice tasks led to less engagement when practicing. Some musicians also reported feeling negative emotions such as anxiety and tension when performing publicly, and stated that individual practice leads to the decrease of these emotions over time. This positive practice engagement led to successful performances, bringing out positive feelings such as relaxation, enjoyment, and pride [12].

A second study [16] researched the relationship between emotions felt as compared to emotions communicated among playing musicians. 11 expert musicians from a variety of different countries that played different genres of music were recruited for this study. Participants were asked to prepare one short piece for each of four investigated emotions: happiness, sadness, anger, and relaxation. Researchers used electrocardiogram signals (ECG), electroencephalogram signals (EEG), and brief questionnaires to analyze the felt versus communicated emotions. The study found that there was no significant difference between felt and communicated emotions. It was also found that happy and angry emotions were felt and communicated significantly more than sad and relaxed emotions were (See Figure 4) [16].

Figure 4 [16]: Intensity of emotions felt versus communicated.



Both studies examine different sides to individual playing. The first review finds that negative emotions can be felt during certain practicing tasks; however, practicing alone can also lead to positive emotions when performing. Conversely, the second study explored the similarities between felt and communicated emotions when playing alone.

Section 4: Producing versus listening to music in individuals with neurological disorders

One review [7] analyzed 25 studies to determine the effects of music and music therapy on individuals with neurological disorders. The review found that there was a positive effect on lessening issues with mood, anxiety, and depression in patients with dementia. The same results held when looking at stroke patients or individuals with other neurological disorders, such as ALS, chronic quadriplegia, and acquired brain dysfunctions [7].

A different study [8] gathered 14 participants with acquired neuro-disabilities to examine the effects of music therapy on their emotions. Mood was measured pre and post session using the Bipolar Form of the Profile of Mood States (POMS-BI). The POMS-BI is a test used to determine mood states and feelings in participants. The four mood state categories the experiment measured were composed-anxious, agreeable-hostile, elated-depressed, and energetic-tired. Participants each attended one music therapy session per week for a period of two weeks. Results showed that there was a significant difference in the positive direction for composed-anxious, agreeable-hostile, and energetic-tired [8].

A different study [11] collected data from 17 Austrian participants ages 10-18 with varying mental disorders. They aimed to understand the effect that different types of music related interventions (MuRI) would have on individuals' emotions. The participants were split into two groups: one group sang well-known songs directed by a choir master, and the second group participated in music listening sessions provided by a trained musical therapist. After these sessions, mood state was assessed using the Multidimensional Mood Questionnaire (MDBF). A comparison of the MDBF from both groups revealed that there was a significant difference in the calmness dimension, with the music listening group having a larger difference than the singing group. There was no significant difference in the alertness

dimension. Additionally, after five days, the music listening group experienced further improvement in calmness [11].

A fourth study [17] focused on exploring the effects of music therapy in emotional wellbeing on patients with Parkinson's Disease. 32 patients participated in this study. They were broken up into two groups of sixteen; one group had weekly music therapy sessions, while the other group underwent physical therapy. Participants were then given questionnaires to assess overall emotional health after the sessions. Although physical therapy was still helpful with mobility, it was found that music therapy had a significant positive impact on wellbeing and quality of life, particularly in areas such as motivation, awareness, and responsiveness [17].

When compared to each other, all four studies show a significant increase in quality of life and calmness levels in patients with neurological disorders.

Discussion:

The research conducted on emotional experiences when listening to instrumental music compared to vocal music reveals that instrumental music influences calmness, mental clarity, and relaxation. In particular, when listening to full orchestra and band pieces, wonder, nostalgia, and joy, were the most commonly felt emotions. When listening to solo pieces however, peacefulness and tenderness were the most felt emotions.

Additionally, it was found that experienced musicians have a higher change in calmness and joy, while younger children have a moderate change in calmness, and older adults have the least change in emotions. This may be because of generational differences in music perception. When listening to vocal music, it was found that the type of music and the cultural background of the people listening to the music played a large part in the emotional response to it. When people from a European background were exposed to folk music, they had a surprise response. However, when people with Latin American backgrounds listened to the same music, they had an emotional response in sadness and nostalgia. It was also found that the type of music played a role in emotional experiences. For example, when American participants were exposed to a grunge-rock music style, they experienced a significant decrease in caring, mental clarity, and relaxation. It is important to note that finding recent studies which pertain to this topic was difficult, so results may not capture emotional experiences when listening to more modern styles of music.

The research carried out on how the setting music is listened to affects emotional responses finds that listening to classical music alone often leads to an increase in emotions compared to listening to music as a group. Pleasure, beauty, and interest, were felt with much greater intensity when listening to music alone. However, another study had contrasting results, and found that higher amounts of positive emotions were felt when listening to musical excerpts with a close friend or significant other. A major limitation to the first study was that it was done during Covid. Therefore, when participants listened to music in a group, they were wearing masks which could have affected their ability to visually connect with each other (i.e., not being able to attune to orofacial gestures and expressions), potentially skewing results. Additionally, only classical music was listened to, and as such, the effects of vocal music and listening to music live as compared to recorded was not studied.

The research which explored how playing music as a group versus alone affects emotions shows that playing as a group when performing often leads to diminished emotional responses. This may be due to performance anxiety and focusing on conveying emotions to the audience rather than personally feeling them. When practicing as a group but not performing for others, it was found that emotional playing was much higher, meaning that musicians let themselves feel the music. On the other hand, it was found that practicing alone brought out negative feelings such as boredom and less engagement due to practicing less enjoyable tasks. However, some musicians felt that although practice was less enjoyable, it lowered performance anxiety and led to positive feelings when performing, such as lowered tension, increased relaxation, pride, and joy. It is important to acknowledge that it was difficult to find studies specifically about emotions felt when practicing alone. This means that there was less data to use, which could mean a more narrow and exclusive set of results.

The research conducted on the emotional experiences when listening to music in individuals with neurological disorders primarily focuses on this through music therapy. It was found that music therapy significantly helped improve mood and lessened anxiety and depression. Additionally, when participants listened to music together as part of a music therapy session, calmness levels significantly increased. There was also a significant decrease in anxious, hostile, and tired levels as a result of the music therapy sessions. One of the main limitations of these studies are the low number of participants, typically under 20, and the shorter duration of the music therapy sessions, which did not usually last more than a month.

Conclusion:

Overall, this review emphasizes the critical ways that music affects our emotions and overall quality of life. Through collecting and synthesizing studies written on this topic, this paper investigated the different emotions felt when playing as compared to listening to music. The review has found that music therapy along with listening to various genres of music in a variety of different settings can have a significant positive impact on emotional experiences. Although there are a variety of findings in this paper, there are also many limitations and room for future studies on the topic. Firstly, this review does not take into account the way participants' personality, culture, and upbringing can play a role in the way music is perceived. To address this, future studies should explore the connection between emotions evoked by music and the various aspects of a person's life. Secondly, this paper found contrasting study results about emotional experiences when listening to music as a group versus alone. In the future, more studies using more modern technology could be conducted to determine the true way that setting affects emotional responses. Additionally, it would be beneficial to find the way that emotional experiences differ in a variety of different concert settings (eg. choir, band, orchestra, pop star). Moreover, future research should include the differences when listening to music live instead of recorded.

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