

COMPARATIVE ANALYSIS OF LISTENER PERCEPTION AND EMOTIONAL RESPONSE TO AI-GENERATED AND HUMAN-COMPOSED MUSIC ACROSS MULTIPLE GENRES

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Abstract: Recent developments in artificial intelligence have affected the creative industry, such as music composition, and present questions about the role of human creativity and listener perceptions. This research offers an empirical comparison of audience perceptions and emotional experiences of AI-composed versus human-composed music across various genres such as classical, rock and pop. Using a survey approach, a representative sample of listeners was asked to rate a set of audio clips, without knowledge of their authorship. Participants' assessments were captured through Likert-scale surveys that addressed aspects of listener perception including emotional response, creativity, authenticity and general listening quality. Data were explored handling descriptive and inferential statistical techniques to compare perceptions between types of music and genres. The results show that although AI-generated music is technically proficient and engaging, human-composed music consistently scores better in terms of emotional engagement and authenticity. Further analysis also revealed genre-specific differences with AI-generated music scoring better in structured genres rather than more free-form styles. The findings of this analyze will be instrumental in guiding musicians, technologists, and scholars on how to apply AI in their musical creations.

Keywords: AI-Generated Music, Human-Composed Music, Listener Perception, Emotional Response, Music Genre Analysis

Introduction: The use of AI has led to fast evolution within the sector of music composition in the field of creativity. Deep learning algorithms and generative models have enabled the design of music by artificial intelligence that resembles human-made music, including its composition and genre. This has led to the growing use of AI-composed music in entertainment, marketing, and multimedia content production. While such technological progress is exciting, essential questions persist about how

listeners respond to AI-generated music in contrast to human-composed music.

Music is a key part of human emotions, creativity and culture. Traditionally, human musicians have drawn on their emotions, experiences and creativity to compose music. On the other hand, computer generated music is created using algorithms trained on vast amounts of data. These algorithms can mimic stylistic features of different music genres, but it residue to be investigated if they can elicit the same emotional responses and authenticity as with music composed by humans. This begs the question: does AI-generated music have the same emotional and perceptual impact as human-composed music? Prior research has examined the technical aspects of AI-generated music; but there has been minimum attention given to audience perception, especially across a range of music genres. Classical, rock and pop music genres have distinct features in musical structure, rhythm and expressive qualities. Thus, audience reactions to AI music may differ from

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genre to genre. The importance of these insights cannot be understated when evaluating the success and generalization potential of AI music.

In this study, the gap in literature regarding the audience reaction to AI music will be addressed. Specifically, this study aims to assess the reactions and emotions elicited from the audience by listening to AI music and human music in different genres. To this end, the participants are asked to rate a set of music clips based on a few characteristics, such as emotional resonance and creativity.

The outcomes of this research will propose to the emerging area of AI in the creative arts, by providing empirical evidence of audience preferences and perceptions. Moreover, this may provide musicians, developers and creators with insight into the potential and promise of AI music and inspire further innovation in this field.

Related Work: The advancement of artificial intelligence has significantly improved music-generation technologies, leading to an increasing number of studies comparing AI-generated music with human-composed music. Several researchers have investigated listeners' perceptions, emotional responses, and evaluations of the quality of AI-generated music.

Lecamwasam and Chaudhuri¹ examined listeners' perceptions of AI-generated and human-composed music in relation to emotional expression. Their findings indicated that although AI-generated music was sometimes preferred, human-composed music was generally perceived as more natural and emotionally expressive. Similarly, White *et al.*² found that listeners rated AI-generated music as less expressive than music believed to be composed by humans, largely due to cognitive biases and attribution effects.

In the area of emotion recognition, Prasad³ investigated emotion detection in AI-generated music using deep learning techniques such as convolutional neural networks (CNNs) and transformer-based models. The study demonstrated the capability of AI systems to recognize and reproduce emotional dimensions such as valence and arousal. These findings were supported by Gao

et al.,⁴ who examined the emotional accuracy of AI-generated music and concluded that although AI systems can effectively convey emotions, they still lack the diversity and subtle emotional variations found in human-composed music.

Wang and Zhang⁵ explored the enhancement of musical creativity and emotional expression through artificial intelligence. Their study reported that AI-assisted music composition can improve musical performance and evoke emotional responses, particularly in structured musical forms. Furthermore, Yu *et al.*⁶ investigated user perceptions of AI-generated creative works and found that psychological factors, including awareness of AI involvement, significantly influence users' evaluations and acceptance of AI-generated content. Previous studies have also shown that listeners can experience genuine emotional responses when listening to AI-generated music. Experimental findings suggest that AI-generated music can produce measurable physiological arousal effects; however, human-composed music continues to be perceived as more meaningful, authentic, and familiar to listeners.⁷

Despite these advances, there remains a need for more comprehensive survey-based studies comparing listener perceptions and emotional responses to AI-generated and human-composed music across different genres, such as classical, rock, and pop music. Existing research is often limited to specific contexts or musical genres, highlighting the necessity for broader investigations in this area.⁸

Methodology

Research Proposed Design: This investigate has a quantitative research design, and a survey-based experimental method to assess audience perception and emotional response to AI-generated and human-composed music. It is a within-subject design, in which participants rate both music types across various genres (classical, rock, and pop). This eliminates variability and bias.

Data Collection Design: We implemented a questionnaire survey method (online/offline). The participants listened to selected audio samples of

AI-generated music tracks (music tracks generated by AI music generation software) and Human-composed music tracks (professional songs). Respondents were presented with random samples to avoid any bias. Following this, they rated the track on certain criteria on a 5-point Likert scale.

3.3 Survey Technique and Participants

A purposive selection procedure was used to select participants who have basic expertise with music listening. The target sample included:

- University students
- Young adults and general listeners
- Minimum sample size: 50–100 participants (recommended for SPSS reliability)

Participants were not required to have formal music training, ensuring real-world listener perception is captured.

Survey Instrument: The inquiry form was separated into two main sections are demographic information and music evaluation criteria. The demographic data includes age, gender, music listening frequency and preferred song genre. In the melody evaluation criteria, each music sample was evaluated based on four key constructs, with each construct measured using two specific items to capture participants' perceptions and experiences in table 1.

Table 1. Music evaluation criteria

No.	Variable	Measurement Items
1	Emotional Response	Music evokes strong emotions
		The music feels emotionally engaging
2	Perceived Creativity	The music sounds creative and original
		The composition feels innovative
3	Authenticity	The music feels human-made
		The music feels natural and real
4	Overall Enjoyment	I enjoy listening to this music
		I would like to listen again

Data Analysis Technique: SPSS Statistics was employed to ensure reliable and rigorous assessment of the study variables using the survey data. Various statistical methods were used. The first was descriptive statistics (mean, standard deviation, frequency, percentage) used to describe the demographic attributes of the participants and to introduce an overview of the responses about AI music and human-composed music. And then, a paired sample t-test was executed to investigate listener responses to artificial intelligence-produced and human-created music in terms of emotion, creativity, authenticity, and entertainment. Finally, a Pearson correlation criterion was conducted to explore the correlations between variables, specifically emotional reaction and listener enjoyment, and authenticity and listener preference.

3.6 Research Framework Summary

This study makes use of a theoretical framework that involves the categorization of music and their perception by listeners. The independent variables of this study include types of music (AI generated vs human-composed music). The music genre (classical, rock, and pop music) serves as the moderating variable for determining its effect on the audience's reaction. Emotion, level of creativity, authenticity, and experience when listening to music are included among the dependent variables that play a critical role in assessing listener perception of different genres of music.

3.7 Ethical Considerations

- Participation was voluntary
- No personal sensitive data was collected
- Contributors were informed about the purpose of the research
- Data was used only for academic research purposes

Results and Evaluations: An entire of 100 respondents contributed in the survey, providing a varied representation through gender, age groups, and music listening habits. The demographic features of the participants are presented in the following table 2.

Table 2. Demographic Profile of Participants

Variable	Category	Frequency	Percentage (%)
Gender	Male	54	54%
	Female	44	44%
	Other	2	2%
Age	Under 18	10	10%
	18–24	62	62%
	25–34	20	20%
	35+	8	8%
Music Listening Frequency	Daily	58	58%
	3–5 times/week	27	27%
	1–2 times/week	10	10%
	Rarely	5	5%

Most of the contributors were young adults varying from 18 to 24 years who formed 62 percent of the respondents. The major activities of most of the participants involved listening to music daily, thus the respondents can be described as highly music oriented.

Descriptive Statistics of Music Evaluation: The descriptive statistics in table 3 present a comparative analysis of participants’ evaluations of AI-generated and human-composed music across key constructs. The results highlight differences in perceived emotional response, creativity, authenticity, and overall enjoyment between the two music types.

Table 3. Mean Comparison of AI vs Human Music Ratings

Construct	AI-Generated Music (Mean ± SD)	Human-Composed Music (Mean ± SD)
Emotional Response	3.62 ± 0.81	4.21 ± 0.74
Perceived Creativity	3.74 ± 0.77	4.35 ± 0.69
Authenticity	3.21 ± 0.88	4.48 ± 0.63
Overall Enjoyment	3.85 ± 0.72	4.40 ± 0.66

Music created by humans showed significantly higher means in all measures. The biggest difference was recorded in the measure of authenticity which suggests that respondents relate musical emotional value and authenticity to music created by humans. Nevertheless, AI generated music still receives moderate to relatively high scores, when measured for general enjoyment.

Paired Samples t-test: Paired samples t-test demonstrates from table 4 and figure 1 that all differences between AI generated and human-created music are statistically significant ($p < 0.05$) showing that the listeners can distinguish between the two types of music. Authenticity demonstrates

the greatest difference ($t = 9.45$) proving strong belief in human-made music.

Table 4. Comparison Between AI and Human Music

Variable	t-value	p-value	Result
Emotional Response	5.87	0.000	Significant
Creativity	6.12	0.000	Significant
Authenticity	9.45	0.000	Highly Significant
Overall Enjoyment	4.98	0.000	Significant

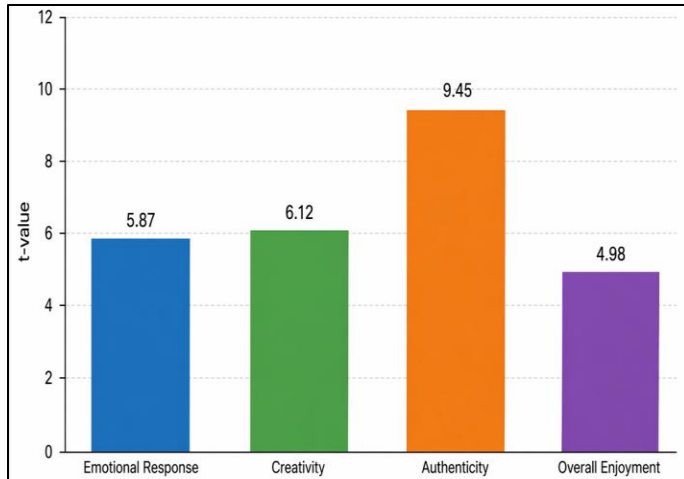


Figure 1. t-values for variable

Genre-Based Analysis: This study aimed at analyzing the differences between genres of music, with the purpose of finding out how they alter the perception of AI music. It helps determine which genres can be more acceptable for artificial music generation than table 5 and figure 2.

Table 5. Genre Effect on AI Music Perception

Genre	Emotional Response Mean	Enjoyment Mean
Classical	3.40	3.55
Rock	3.78	3.92
Pop	3.95	4.10

AI-generated music performed best in pop music, followed by rock, and lowest in classical music. This suggests that AI is more effective in structured, rhythm-based genres than in emotionally complex genres like classical music.

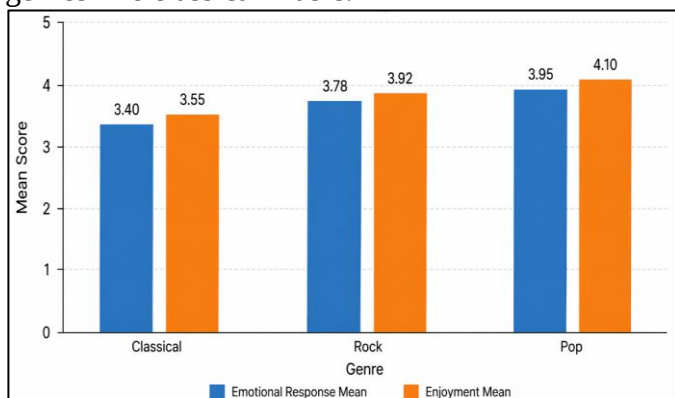


Figure 2. Mean scores by genre

Correlation Analysis: Correlation analysis was performed to understand the connection between the variables that have an influence on how people enjoy music. This type of investigation will help reveal the nature of the correlation between emotion, creativity, authenticity, and enjoyment variables in table 6 and figure 3.

Table 6. Correlation Between Variables

Variables	Correlation (r)	Significance
Emotional Response & Enjoyment	0.72	Significant
Creativity & Enjoyment	0.65	Significant
Authenticity & Enjoyment	0.81	Significant

Strong positive correlations imply that authenticity has the highest influence on listener enjoyment ($r = 0.81$). This suggests that perceived “realness” is the most important factor affecting music preference.

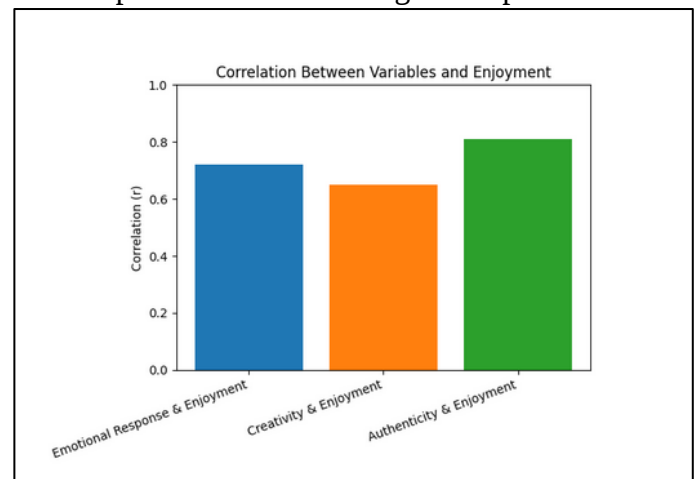


Figure 3. Correlation between Variables and Enjoyment

From the findings, while AI music can create songs that are both pleasant and of good quality, it fails to match human-made music when it comes to emotionality. The outcomes agree with earlier investigation that has indicated the importance of authorship perception in emotional music enjoyment. However, the high ratings awarded to AI music by the participants, especially those songs

that are in pop and rock genres, indicate that AI is gradually being accepted in music making.

Findings and Discussions: Data analysis involved the use of statistical procedures involving descriptive statistics, paired sample t-test and correlation test in SPSS. Tables and charts are used for visualization and comparisons of perceptions of AI music vs human music based on several aspects.

Mean Comparison of AI Music and Human Music: This section will compare the perceptions of AI music and human music through constructs that can be used from a psychological perspective. Descriptive statistics give some information about perceptions by different groups of listeners in table 7 and figure 4.

Table 7. Descriptive Statistics of Music Evaluation

Construct	AI-Generated Music (Mean)	Human-Composed Music (Mean)
Emotional Response	3.62	4.21
Creativity	3.74	4.35
Authenticity	3.21	4.48
Overall Enjoyment	3.85	4.40

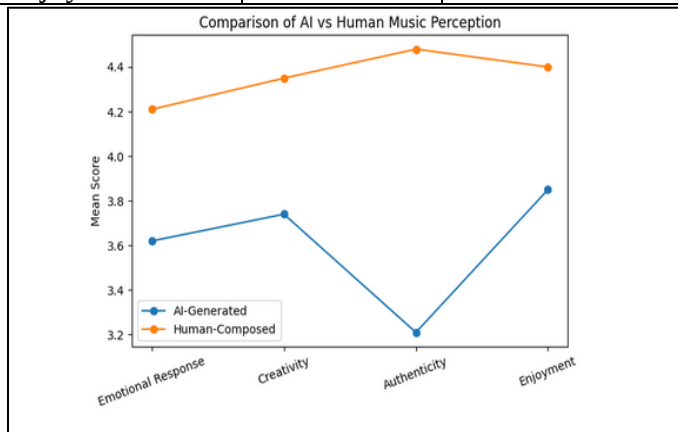


Figure 4. Comparison of AI vs Human Perception
As per the findings, it is evident that human music is rated higher compared to AI music in all aspects. In terms of authenticity, there is a significant variance relating to human music and AI music (difference = 1.27). This suggests that the human element is considered critical for generating authentic music.

However, AI music receives high ratings (above 3.5 in all dimensions), indicating that AI can generate quality music.

5.2 Genre-Based Analysis

In this section, the influence of different music genres on respondents' reaction to AI-generated music in relations of emotional effect and pleasure will be examined. Such evaluation could shed light on how much people appreciate AI-generated music in various genres, including Classical, Rock, and Pop in table 8 and figure 5.

Table 8. Genre-wise Mean Scores for AI Music

Genre	Emotional Response	Enjoyment
Classical	3.40	3.55
Rock	3.78	3.92
Pop	3.95	4.10

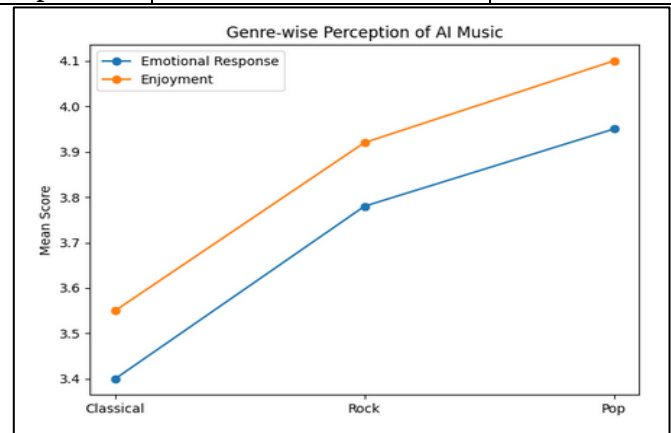


Figure 5. Genre-wise perception of AI music
The outcome implies that genre performances play an important role in shaping listeners' perception of artificially produced music. Pop and rock music receive high ratings, while classical music gets the worst ratings.

Thus, it can be decided that artificial intelligence works better in rhythmical and highly structured genres, rather than genres with deep emotional and complex meanings.

Major Findings

- Human-generated music is rated higher assessed to AI-generated music.
Authenticity has the strongest impact on listener preferences.

- AI-generated music demonstrates a higher level of performance in pop and rock genres compared to classical music.
- There is a strong correlation between emotional responses and overall enjoyment.

Indeed, the results obtained support the decision that even though there have been remarkable advances made within the domain of AI-generated music that make it possible to reproduce the structural and pattern aspects of music, it is still far from having any emotional content and authenticity that can only be created by a human being. This confirms the previous research in the field indicating the influence of perceived authorship on emotional assessment.

It is quite interesting that a relatively high score for AI-generated music in pop and rock genres indicates the increased acceptance of such music in mass production. This also confirms the notion that AI music generation should not be considered as an alternative to human musicians, but just a tool for assisting them.

Conclusion and Recommendation: In this study, the research focused on the perception of comparison of emotion in AI-generated music and human-generated music in several categories of music like classical, rock, and pop. By analyzing surveys utilizing SPSS, this experiment establishes conclusive results on how the respondents perceived both types of music.

Human-generated music was found to be preferred over AI-generated music when it comes to emotions, creativity, and authenticity. The biggest difference was noted on authenticity, meaning that human creativity produces music filled with realism and emotions. Engagement of the emotions and the pleasure of listening were also preferred over AI-generated music, proving that human creativity prevails over AI.

AI generated music performed quite well particularly in pop and rock, since there were rhythm and patterns involved. From this result, we can determine that artificial intelligence can create music that is aesthetically appealing and satisfactorily technical, but without the emotional

component of the music that humans create. The paper concludes that AI music cannot yet replace human-made music, although it can be used as an auxiliary tool in creating music.

Further studies in the field should explore more comprehensive and robust approaches to better understand the impact of AI-generated music, including the inclusion of larger sample sizes to enhance the representativeness of the sample. Also, studying the cross-cultural perspectives on AI-generated music would help us understand the role of culture in listener preferences and emotional responses. Innovative research techniques, such as real-time emotional tracking through methods such as EEG or other biometric response techniques, would provide more objective and accurate measures of emotional responses. Likewise, future investigation should discover the long-term acceptance and use of AI-generated music in commercial sectors, particularly entertainment, media and digital content industries, to understand its potential future in the creative space. This finding offers some suggestions for enhancing the development, use and acceptance of AI-generated music in the creative sector in the following table 9.

Table 9. Recommendations for this study

No.	Recommendation	Description
1	Integration of AI as a Support Tool	AI-generated music should be used as a complementary tool rather than a replacement for human composers. Musicians and producers can leverage AI for idea generation, background composition, and experimentation.
2	Improvement of Emotional Modeling in AI Systems	Developers should focus on enhancing AI models to better capture emotional nuance and expressive variability, particularly in genres such as classical music

		where emotional depth is critical.
3	Genre-Specific AI Training	AI music systems should be trained separately for different genres. Since AI performs better in structured genres like pop and rock, genre-specific optimization can improve output quality.
4	Human-AI Collaboration in Music Creation	Future music production should emphasize hybrid collaboration models, where human creativity guides AI-generated outputs to achieve higher artistic quality and emotional impact.
5	Audience Awareness and Education	Listeners should be informed about how AI-generated music is created to reduce bias and encourage more objective evaluation of AI contributions in creative industries.

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