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Research Article

Perceptual differences between AI and human compositions: the impact of musical factors and cultural background

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Abstract

The issues of what Artificial Intelligence (AI) can and cannot do in the field of music are among the important topics that both music researchers and AI experts are curious about. This study offers a significant analysis within the context of the growing role of AI technologies in music composition and their impact on creative processes. It contributes to the literature by positioning AI as a complementary tool to the composer's creativity and by enhancing the understanding of cultural adaptation processes. The study aims to identify the perceptual differences between AI and composer compositions, examine the musical and cultural foundations of these differences, and uncover the factors that influence the listener's experience. In the research design, a mixed-method approach was adopted, combining qualitative and quantitative research methods. In the quantitative phase, a double-blind experimental design was employed to ensure that participants evaluated composer and AI works impartially. In the qualitative phase, participants' opinions were gathered. The participants were 10 individuals aged between 19 and 25, with diverse cultural and educational backgrounds; 6 had received formal music education, while 4 were casual listeners. The data collection instruments included a structured interview form and the Assessment Scale for Perceptual Factors in Musical Works. During the research process, each participant evaluated two AI and two composer works in 20-minute standardized listening sessions. All listening sessions were conducted using professional audio equipment. The analysis revealed that composer works scored significantly higher than AI works across all categories ($p<.05$). Notable differences were observed, particularly in the categories of emotional depth ($\overline{X}_{composer} = 4.6$, $\overline{X}_{AI} = 3.1$) and memorability ($\overline{X}_{composer} = 4.4$, $\overline{X}_{AI} = 3.2$). The study concluded that composer works were more effective than AI compositions in terms of emotional depth, structural coherence, and cultural resonance. Additionally, cultural background and music education emerged as significant factors shaping perceptual differences. Future research should broaden the participant pool and incorporate neurocognitive data to facilitate a deeper understanding of perceptual mechanisms. Furthermore, the development of AI systems for use in music should include the integration of Transformer and RNN-based advanced learning models, the implementation of traditional music theory principles, the enhancement of emotional expressiveness, the improvement of cultural adaptation capacities, and the refinement of real-time interaction mechanisms.

Keywords

Artificial Intelligence, cultural effects, music composition, perceptual differences

Introduction

The discipline of musicology represents a broad academic field encompassing fundamental research areas such as cultural studies, structural analysis, harmony, composition, organology, and music technologies (Harper-Scott and Samson, 2021; Cook, 2020). Among these research domains, particularly the field of music technologies has undergone a notable evolution with the recent development of artificial intelligence (AI) applications. AI systems are already capable of simulating the human voice (Aylett et al., 2020) and modeling musical instrument acoustic properties (Schoner et al., 2020), stylistic transformations between different musical forms (Wang et al., 2019), and musical compositions with textual input (Huang et al., 2020). The dynamics of the post-pandemic period and very recent AI tech developments have brought the field of music technologies to the forefront of musicology research (Webster

and Mertens, 2022). As a result of this maturation process, "AI and music" focused studies proliferated in academic literature and institutional research projects. As a result, various ethical and aesthetic debates have arisen around the developments of AI-assisted music production (Sturm et al., 2019; Miranda, 2021). As researchers in musical-aural examination, there has been significant inquiry on variables related to musicology fundamental parameters of musical perception (Agres et al., 2021), sensory perception (Pearce and Wiggins, 2020), cognitive perception (Peretz et al., 2020), and social-conceptually (cultural representation) (Born and Devine, 2019) factors in AI-streams of music compositions. As a result, it moves to emphasise the need for cultural dynamics to be considered outside of technical paradigms (Clarke and Doffman, 2019). This study involves a systematic investigation of auditory differences between a professional composer-made piano piece versus the piano pieces generated by AI-based systems. The differences are explored through both musical parameters and cultural backgrounds that affect these differences, which makes implications for future compositional strategies. Theoretical Framework The theory underlying this research is an interdisciplinary perspective assessing music perception and its relevance to artificial intelligence (AI) and the creativity of the composer. Music perception includes cognitive and emotional processes that account for how people react to a musical stimulus (Greenberg et al., 2022). Therefore, two key terms need discussing for perceiving the audio and musical differences in AI- produced versus composer-made songs: AI Creativity and Musical Perceptual Difference and Cultural Framework.

AI Creativity includes originality and expressive power, as well as the intellectual processes involved in producing pieces of intellectual work typically attributed to composer thoughts (Cope, 1987,2003; Fernández and Vico, 2013). AI music is a simulation of these creative processes which emerges from things like data-based learning and style imitation (Laney and Collins, 2017). This leads to a rethink about creativity's definitions and metrics: "Which parts of creative processes could be mirrored by AI so that it can imitate composer works? becomes a more and more pressing issue.

Musical Perceptual Difference is based on individuals' cultural backgrounds, musical education, and experiences (Hong, 2022). The Cultural Framework in Music[1] suggests that composers' aesthetic judgments are shaped not only by technical characteristics of musical structures but also by cultural norms and contexts (Simonetta et al., 2022). The crucial point here is incorporating cultural compatibility theories (Dubnov et al., 2021) into this study's conceptual foundations to explain how Western and Eastern musical traditions differ in the perception of AI versus composer compositions.

Research on music perception (Giordano, 2011; Jones, 2010; Koelsch and Siebel, 2005; Leman and Maes, 2014; McDermott, 2004; Koelsch, 2005; Stevens, 2012; Tirovolas and Levitin, 2010), has comprehensively measured features like harmony (Stolzenburg, 2013), rhythm and melody (Daniel, 2016) within specific musical styles or cultures. However, AI-generated music faces unique challenges in emotional nuances and applications in creative composition tasks. The most significant challenge is their inability to adequately reflect emotional expressions (Camurri et al., 1999). Despite standardized coding schemes like nuance marks in piano works, AI remains insufficient in replicating the anthropomorphic expression and multidimensional emotion present in

[1] The Cultural Framework in music perception integrates aesthetic judgment with cultural norms and contextual understanding. This theoretical framework, as developed by Simonetta et al. (2022) and elaborated by Dubnov et al. (2021), demonstrates how cultural backgrounds fundamentally shape musical appreciation and interpretation, particularly when comparing AI-generated and human-composed works. Cultural factors extend beyond technical considerations to influence both creation and reception of musical compositions (Hong, 2022).

composer-written works. Their MIDI-based representations particularly result in limited nuanced expression, lacking the Composer's Touch[2] that emotionally engages with listeners.

The Fundamental Idea in this study is that listeners with different musical backgrounds and cultural experiences will demonstrate varying abilities in perceiving differences between AI-generated and composer-composed works. This difference indicates that understanding perceptual differences is vital for preserving musical traditions, regulating creative labor, and promoting cultural heritage. As AI's role in music grows, studies investigating its perceptual impact encourage interdisciplinary research and become necessary for preserving artistic authenticity. At this stage of the study, although the main area is technology and AI in musicology, it is beneficial to look at the musicological framework due to its relationship with culture.

Musicological Framework this study adopts both analytical and experimental approaches commonly used in musicology. The musicological framework is based on examining technical elements used in composition processes and evaluating their effects on listeners. From a musicological perspective, central examination of a work, culture, and individual can be explained through these basic musicological concepts:

Melodic Structure, drawing from Menninghaus and colleagues' (2018) work, can be conceptualized as a multi-layered organization shaped by conscious selection and combination of phonetic and prosodic elements, evaluated through quantitative measurements obtained from automatic correlations of syllable pitch and duration relationships, reflecting the mutual interaction between poetic metric order and musical melody, influencing composers' compositional preferences, and directly related to aesthetic perception. The repetition, complexity, and memorability of melodic structures used in composer and AI compositions are examined (Collins and Laney, 2017).

Harmonic Richness[3] has received notable academic attention in recent years, particularly from the perspective of psychophysical principles and their implications for understanding musical perception

A study of musical rhythmic structures as potential sources of juxtapositional perceptual interest and emotional interest. Dynamic movement: addressing the role of dynamic change on the dramatic effect of the work (Xia et al., 2020)

How music creates Emotion and Emotional Depth[4] is a staple academic interest in recent years; A deeply grounded desire in using music or understanding what makes music to sound appealing to a particular listener (Susino, 2015). This result aligns with our qualitative analysis of the musical expression by composer-composed works, which can deliver greater emotional depth than compositions generated by computers through AI (Ragot et al., 2020).

Cultural Implications are evaluated through their effects on perception, with tonal harmony and structural integrity in Western music, and modal flexibility and rhythmic complexity in Eastern music (Nettl, 2015). This helps understand the role of listeners' cultural origins in music perception.

Music Technology has important roles in revealing perceptual differences. These concepts are also necessary when

[2] Composer's Touch: Can be seen as the whole range of qualitative features that contribute to the individual identity of a composer, that reveal individual taste and artistry in the realization of a given piece of music (Beht and Drabkin, 1987).

[3] Harmonic Richness has received significant academic focus, especially in terms of psychophysical rules and its effects on musical perception (Yaozhu et al., 2019).

[4] Emotional Depth in musical composition encompasses the intricate layering of psychological resonance, cultural significance, and expressive sophistication that characterizes human-created works.

examining technical limitations and potential advantages of AI models (Webster, P. R., and Mertens, G. (2022). All these concepts provide an important context for musicological discussions evaluating AI's role in music (Fernández and Vico, 2013).

Related Literature

Work on perceptual differences between AI-generated and composer- created works explores AI capabilities and limitations in creative processes. Such studies encompass melodic qualities, neural network representations of music (Li et al., 2022), the connections between AI-driven models and the complice mechanisms of composers (Hernandez-Olivan and Beltrán, 2021), and the elements that distinguish between composer and machine art from an aesthetic framework (Samo and Highhouse, 2023). Such are being produced in ever-greater numbers to show how hard it is to tell AIgen works from compgenerated (Collins and Laney, 2017). For instance, Ferreira et al. (2023) that, on average, participants struggled to accurately identify AI-generated music. Preference has tended to work the other way, with art generated by a composer being preferred; this is mostly attributable to anthropocentric bias and the attitudes towards creativity (Hong et al., 2022). Dallas and Morreale (2020) concluded that including vocals or composer production in music generated by AI did not significantly enhance listeners' appreciation. This leads to important questions on authorship and copyright concerns with AI art (Deltorn and Macrez, 2018). It is all the more critical to confront these issues as AI questions traditional boundaries of creativity and intellectual property

Another major topic that is significant to this study is perceptual differences, and the role of creativity. Creativity happens by virtue of perceptual difference, while perceptual difference—central to understanding the psychological and cultural dimensions of creativity—shakes up our thinking about the difference between AI-generated and composer-made works. While psychological studies tend to attribute the experience of creativity to the rational insight of the composer, new evidence suggests that how creativity is experienced is mostly a cultural and context-dependent idyll. To take one example, neural network resolution learning models show that even when AI reaches technical parity with composer musicians, much of the way we evaluate creativity is grounded in composer culture. Simonetta et al. The perceptual gap between MIDI-based representations and live performances is among the key challenges (Seder & Masek, 2022) that AI tools face in rendering the artistic expressivenession4 embedded in the composercomposed works. In another study, Zhu et al. (2023) talked about AI's shortcomings in synthesizing holistic musical narratives, as well as generating new motifs.

The results of these studies demonstrate that AI systems excel at creating sophisticated compositions, but remain stuck in an eternal loop of replication, honing existing trends learned from historical data rather than pursuing novelty. One limitation that arises is the repetition of the same loop cycles over and over. Therefore, AI systems should be considered from a much broader cultural canvas, and avoid Texas roll (& roll) where the old paradigms still apply (Prabhakaran and Hutchinson 2022). Differences in perception of solo piano compositions, therefore, greatly rely on interpretation by AI but also on cultural backgrounds of the composers.

While thinking about cultural background, it helps to discuss the Evaluation Methodologies[5]: Subjective and Objective Approaches[6]. Xiong et al. (2023) suggest that methods for evaluating music composed by AI systems can be split into two categories. In general terms, subjective evaluations

[5] Evaluation methodologies used in musical perception and cultural studies include systematic and repeatable measurement methods (Greenberg et al., 2022).

[6] The use of both subjective and objective approaches in the assessment of musical experience provides a more holistic understanding (Simonetta et al., 2022).

assess listeners' emotional and aesthetic reactions, and objective evaluations are based on quantifiable parameters like harmony, rhythm, and structural unity. The researchers highlight the need more balanced integration of the two methods, which can help overcome intrinsic difficulties in capturing standardized subjective evaluations in other cultural and individual contexts.

An example of this well-rounded approach to education can be seen at the Juilliard School[7], which now incorporates musical analysis into their music education curriculum by stressing how to examine compositions from both technical and emotional angles. The framework benefits the theory of music perception in that it provides an intuitive platform to understand such distinctions, perhaps best exemplified in John Cage's "4'33" and its reception in Eastern versus Western audiences. The history of AI in music composition dates back to the 1950s and algorithmic procedures, employing stochastic methods and rule-based systems (Fernández and Vico, 2013; Roads, 1985). These initial methods set the stage for more sophisticated techniques such as neural networks, evolutionary algorithms, and transformer-based models. Research that is further developed on style mimicry and collaborative composition, systems which either imitate particular music or collaborate with composer composers (Cope, 1987; Stolyarov, 2019). Even with these advances, AI-generated compositions tend to fall short of the emotional depth and cultural nuance[8] found in compositions by human artists. Though AI can generate technically complex music, it lacks the intent and expressiveness that characterize composer creativity. This distinction underscores the need for cognitive processes to be integrated with machine learning algorithms to improve the authenticity and cultural significance of AI-generated music.

Furthermore, previous work illustrates a relationship between emotional responses to music with cultural dynamics (regarding how the cultural learned influences the emotional responses to music) and the fact AI compositions are more hailed as "technical" pieces chewed out by machine but lacking of the emotional qualities that characterizes composer pieces (Ragot et al., 2020). These cultural dynamics have presented the challenges AI music creation has to overcome to compose music that will appeal to a global audience. Overcoming these perceptual gaps with the help of cultural elements would be beneficial for the AI systems so that more composer-centric and culturally oriented compositions can be developed.

Cognitive and Behavioral Studies on AI and composers works are also relevant to the literature review research and information. The predominant focus of cognitive studies on how listeners tell the difference between AI and composer-composed works The works of composers are generally more preferred among younger participants in studies than AIgenerated works, but their specific ability to identify AIgenerated music is dependent on their cultural and educational backgrounds (Hong, 2022). It also discusses biases and preferences primarily through an emphasis on the creativity of the composers and the necessity of contextual and cultural understanding of the composition and reception of musical works.

Music training is also known to improve perceptual sensitivity to decorrelated compositional features such as harmonic cohesion (Shank et al., 2023). However, there are also individual differences, such as age and exposure to different musical traditions, which contribute to these perceptions. Insights into these signals of meaning can help AI deployed in creative spaces align with composer aesthetic norms more closely. Understanding these factors can guide us

[7] Juilliard School, established in 1905, is a prestigious music, dance, and drama conservatory with worldwide recognition (Ross, 2020).

[8] Cultural nuance" - presented as a distinguishing feature of human compositions

towards narrowing the void that exists between the artificial and human creativity in musical composition, while accounting for the multifaceted relationships of cultural, educational, and personal aspects that shape musical recognition and enjoyment.

Problem of Research

Exposing distinctions between AI and composer-composed pieces sheds light on an important dichotomy in music generation and reception, constituting our key focus here. These sends the implications of the AI role on the genre of music which further stresses the issue of creative processes and what it means to be a composer in contribuiring in creating music. By examining melodic complexity, harmonic richness, rhythmic variety, emotional impact, and cultural considerations, this article will thus advance understanding of music technology, cross-cultural studies, and music education. As such, it intends to write a guiding reference for the realization of artificial systems, along with the safeguarding of the worth of a composer creativity. In list of research questions, the research aims to investigate the degree to which people perceive and react to music composed by a human composer, in contrast to music that is generated using AI, including various musical parameters and wide range of musical genres from popular to high culture. As the paradigm of what makes something musically valuable is challenged by the evolution of AI, therefore this investigation is particularly relevant. The study also aims to emphasize human context in this dialogue, focusing on how perceptual and creative differences can impact the overall experience, in ways that may retain the value of human creativity despite the growing presence of technology.

The main problem of this study:

- Do musical factors and cultural diversities have an impact on perceptual differences between AI-generated and composer-made piano compositions?

Sub-problems of this research:

- Can participants distinguish AI-generated music from composer-made music?
- How do musical factors (e.g., timbre, motif, rhythm) influence recognition?
- Do cultural backgrounds and individual differences (e.g., musical education, age) affect recognition performance?

Method

Research Model

This study employs a descriptive research approach to investigate perceptual differences between AI-generated and composer-made piano music. The primary goal is to understand how listeners distinguish between these two types of compositions, identify musical elements (e.g., timbre, motif, rhythm) affecting their perceptions, and evaluate how cultural backgrounds, music education, and individual differences shape these processes. It has adopted a descriptive and experimental research approach to examine perceptual differences between composer-composed works and AI-generated piano music.

This research has adopted a comprehensive research model that combines experimental, descriptive, and mixed methods to examine perceptual differences between composer-composed music and artificial intelligence-generated music. In the study, bias was minimized by ensuring that participants did not know whether the pieces they listened to were composed by a composer or artificial intelligence. Composer and artificial intelligence works were matched in terms of tonality, tempo, and style for fair comparison.

The research model is based on a mixed-method approach incorporating both qualitative and quantitative data collection and analysis methods.

Participants

The participant group consists of 10 individuals representing different cultural, educational, and experiential perspectives. A total of 17 participants were involved in the study. It was observed that 7 out of the 17 individuals did not respond carefully to the questions in the listening sessions due to data security concerns. Therefore, the analysis covers the 10 individuals who participated. The characteristics of individuals whose data were evaluated are presented in Table 1. For qualitative research quotations, participants were coded in the format Participant No-Age-Gender. For example: P1-22-F.

Table 1. Participant characteristics and codes

No	Age	Gender	CBG	MEL	Notes	Codes
1	22	Female	West	Advanced	Conservatory student, piano expertise	P1-22-F
2	19	Male	Asia	Intermediate	Conservatory student, piano expertise	P2-19-F
3	22	Female	West	Beginner	Conservatory student, piano expertise	P3-22-F
4	19	Male	West	No Education	Regular classical music listener	P4-19-M
5	20	Female	West	Advanced	Has classical music performance background	P5-20-F
6	24	Male	East	Intermediate	Familiar with traditional rhythms	P6-24-M
7	25	Female	West	No Education	Interested in traditional music	P7-25-F
8	19	Male	Asia	Beginner	Plays instrument as hobby	P8-19-M
9	23	Female	East	Advanced	Modern and classical music education	P9-23-F
10	20	Male	West	No Education	Interested in film music	P10-20-M

CBG: Cultural Background **MEL**: Music Education Level

Age Range; representing young and middle-age groups between 19 and 25 years old, aimed at exploring generational differences in musical perception. A balanced gender distribution was ensured to maintain diversity.

Music Education; 6 participants have received formal music education ranging from beginner to advanced level. 4 participants have not received formal education but are frequent listeners exposed to various genres.

Cultural Background; selected from Western and non-Western cultural contexts to provide a cross-cultural perspective on music perception. Western- Eastern Participants are considered based on Cultural Framework. This refers to participants who are "familiar with Western music tradition" and "familiar with Traditional Turkish/Eastern music tradition" and "interested in European music forms" and "interested in Anatolian music culture", "interested in Far Eastern (Asian) music culture".

Exclusion Criteria; the study excluded professional composers to focus on general listener perceptions and ensure findings reflect the experiences of non-expert participants, consisting only of students with music education.

Selection Rationale; the participant pool was designed to examine how individual differences (e.g., music education and cultural background) influence the perception and evaluation of musical elements such as timbre, rhythm, motif, and emotional impact.

Data Collection Tools

Semi-structured Interview Form

The Semi-structured Interview Form was developed by the researcher to identify perceptual differences between AI generated music and composer-made music, the musical and cultural foundations of these differences, and factors affecting listener experience. The final version of the form

was completed after obtaining opinions from two experts on the draft interview form. The Semi-structured Interview Form consists of 7 open-ended questions (See Appendix 1). For example, the question "Do you think the piece you listened to was composer-made or generated by artificial intelligence? What are the distinctive features that formed this opinion?" aims to understand how participants evaluate musical perception processes and distinguishing characteristics.

Assessment Scale for Perceptual Factors in Musical Works

This scale was prepared to evaluate factors perceived by the listener in a musical work (melodic complexity, harmonic richness, rhythmic variety, emotional depth, and memorability) (See Appendix 3). The scale is a 5-point Likert type, ranging from Very Low (1 point), Low (2 points), Normal (3 points), High (4 points), to Very High (5 points).

Data Analysis

Analysis of Qualitative Data

In the research, opinions obtained through the semi-structured interview form were subjected to content analysis. Direct quotations from participants' views were presented using coding to support the quantitative data findings. Qualitative data obtained from participants' responses to open-ended questions and focus group discussions were examined using thematic analysis. During thematic coding, participant views were classified around specific themes. For example, Melodic complexity highlighted the theme that composer compositions were balanced and memorable; while AI compositions were either too simple or unnecessarily complex. Additionally, regarding emotional depth, it was noted that composer compositions created stronger emotional responses, while AI compositions were found mechanical and superficial. Direct quotations from participants were analyzed for each theme to present supporting evidence.

Analysis of Quantitative Data

In the research, independent variables were the producer of the work (composer or artificial intelligence), participants' cultural background, and music education status. Dependent variables were determined as participants' perception of musical elements. Control variables included tonality, tempo, listening environment, and sound level. All listening sessions were conducted in a standardized environment providing high-quality sound. MP3 audio recordings with 256 Bit Sample Rate were played to participants using HS80 reference monitors.

Participants consisted of individuals with different cultural and educational backgrounds. Thus, the effect of cultural and individual factors on perception could be examined. The study both revealed differences between composer and artificial intelligence music and evaluated how elements such as cultural background and music education shaped these perceptions.

Such approach enabled a systematic, multidimensional vision of the fundamental similarities in the music written by composer and artificial intelligence that were formed in the context of education and culture at a given time period, as well as the potential extent to which artificial intelligence might reflect composer's compositions in the context of emotion or artistic originality.

As the scale used in the research did not fulfil the normal distribution assumption and the participants of the study were less than 50, the non-parametric Mann-Whitney U test was conducted (Field, 2018; Pallant, 2020). This approach aligns with guidance about analyzing small samples of data, as outlined in Field (2018) Discovering Statistics Using IBM SPSS Statistics, and through considering non-parametric test selection principles, as discussed by Pallant (2020) SPSS Survival Manual.

For quantitative data, perceptual differences were evaluated within the context of the

study on a 5-point Likert scale. Man-Whitney U test was used to analyze the collected data. Providing an appropriate way to test differences between groups whenever normality assumptions are not met and when sample size is limited (n<50) (Field, 2018; Pallant, 2020). The Mann-Whitney U test was used to assess perceptual tests for composer produced and artificial intelligence generated compositions The test compared the mean ranks of the evaluations made by participants in two different states (composer and AI composition) to determine whether there was a statistically significant difference between them.

Reporting on Mixed Methods

Here, it uses Mixed Methods, whether the Qualitative or Quantitative analysis methods in combination had the following results. In this paper, we tried to back up the Quantitative Findings with Qualitative Interpretations.For example, composer compositions scoring high in the melodic complexity category was explained through participants' qualitative comments (e.g., composer melodies being found memorable and harmonious). Additionally, different types of data (e.g., Likert scores and open-ended opinions) were tested to see if they supported each other in understanding perceptual differences. Through these methods, the study conducted in-depth analysis both numerically and semantically, and the results obtained were presented in a statistically significant and thematically consistent manner.

Process

The study adopted a double-blind experimental design where participants evaluated piano compositions without knowing whether they were composer-made or AI-generated. Composer-created compositions and pieces generated by an AI system were carefully matched in style and tonal characteristics to ensure a fair comparison. ***Evaluated Basic Musical Elements*** are shown in Figure 1.

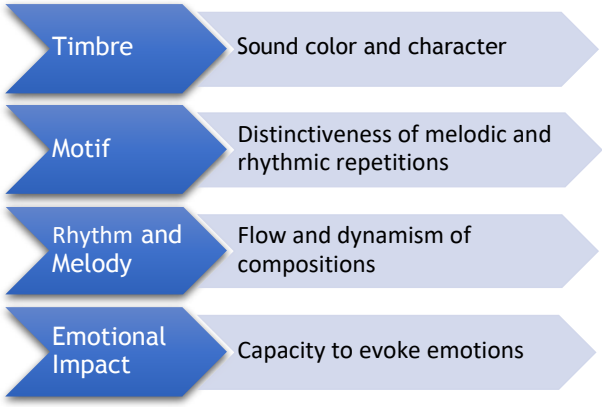

Figure 1. Musical elements evaluated in the research

Listening Session Conditions; each listening session lasted 20 minutes, and participants listened to two AI compositions and two Composer pieces lasting approximately one minute each, varying in length. Sessions were conducted under standard conditions to minimize external influences.

Composition Characteristics, Composer-composed works were found to have emotional depth and motifs developed in a progressive process rather than repetitive content, being New Age style piano pieces in A minor, in Adagio or Moderato tempos.

AI Compositions were used in the study as works generated by AI that imitated the same tonal (A minor) and tempo (Adagio and Moderato) characteristics, maintaining stylistic consistency.

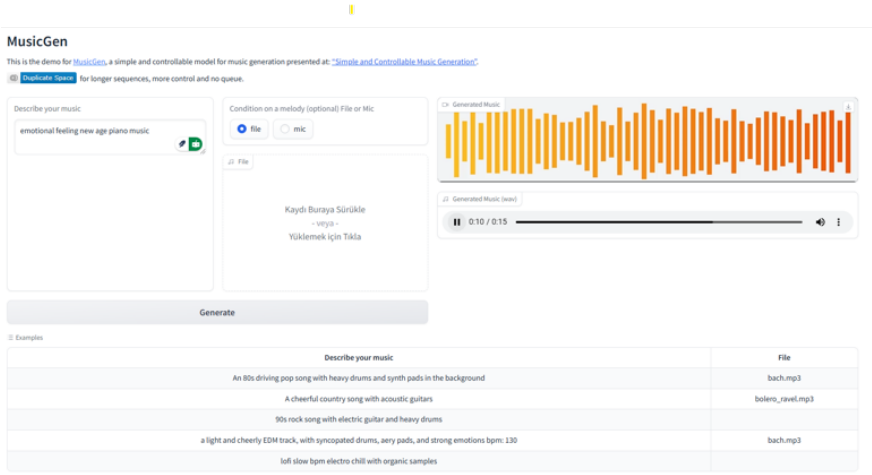

Photo 1. AI composition phase using the MusicGen model

Photo 2. A photo of listening sessions

Listening sessions were organized in the conservatory concert hall with a quality sound system, using Yamaha HS80 reference monitors. Listening distances were standardized. All audio recordings were edited using Izotope RX with Noise Gate and Normalize processes to completely eliminate external noise.

Data Collection and Analysis Procedures, during listening sessions, participants attended structured listening sessions in an environment free from distracting elements. After the sessions, participants were asked to complete a semi-structured interview form addressing their perceptions of the compositions. This study was conducted over a 4-month period between March 1, 2024-July 1, 2024.

Ethics

Ethics committee approval was obtained with Decision No. 2024/375 in accordance with the Social and Human Sciences Scientific Research and Publication Ethics Committee of R.T. Afyon Kocatepe University.

Findings and Discussion

Qualitative Findings

In the content analysis of participants' opinions about the compositions they listened to, it was determined that 5 sub-themes emerged under the theme of musical characteristics.

Theme 1. Musical Characteristics of Compositions

Sub-theme 1. Melodic Complexity

Composer-composed works were described as harmonious and emotionally evocative pieces with well-developed motifs and balanced repetition. In contrast, AI compositions were evaluated as either overly simple and repetitive or unnecessarily complex (chaotic).

> "I think melodies composed by the composer develop motifs that make them both memorable and interesting. AI pieces feel either too simple or too chaotic." (P4-19-M)

> "AI melodies generally feel mechanical and predictable, lacking the sophisticated structure of composer-composed works." (P1-22-F)

Theme 2. Harmonic Richness

Harmonies in composer-composed works were praised for perfectly blending with the melody, being coherent with each other, and seeming layered as if telling a story. AI harmonies, although functional, were generally evaluated as predictable and lacking in expression and nuance.

> "The composer's composition tells a story with harmonies that enhance emotional depth." (P5-20-F)

> "AI harmonies generally feel monotonous and lacking inspiration." (P6-24-M)

Sub-theme 3. Rhythmic Variety

At this stage of the study, rhythms in composer-composed works stood out with their dynamic and interesting characteristics, including syncopation and timing variations. AI rhythms were criticized for being excessively repetitive and static.

> "The rhythms of the composer's composition are surprising and impressive. AI rhythms are monotonous." (P8-19-M)

> "I think AI rhythms give a mechanical feeling and their execution makes them less impressive." (P3-22-F)

Sub-theme 4. Emotional Depth

In the study, composer-composed works were consistently described as emotionally deep with dynamic transitions and expressions that create a strong connection. While AI compositions were sometimes appreciated for their experimental harmonic approaches and nature within tonality, they were generally seen as mechanical and lacking originality.

> "The piece I think was composed by the composer resonated with me emotionally, gave me goosebumps, and left a lasting impression." (P5-20-F)

> "AI music, though interesting, feels lacking in emotional complexity." (P7-25-M)

Sub-theme 5. Memorability

Composer-composed works were evaluated as more memorable thanks to motif development and structural harmony. Meanwhile, AI compositions, though sometimes interesting, were found to lack the depth needed to sustain long-term memory.

> "I think I could remember the composer-composed melodies hours later. AI pieces seem like they'll be quickly forgotten." (P10-20-M)

> "I think AI compositions are less memorable." (P9-23-F)

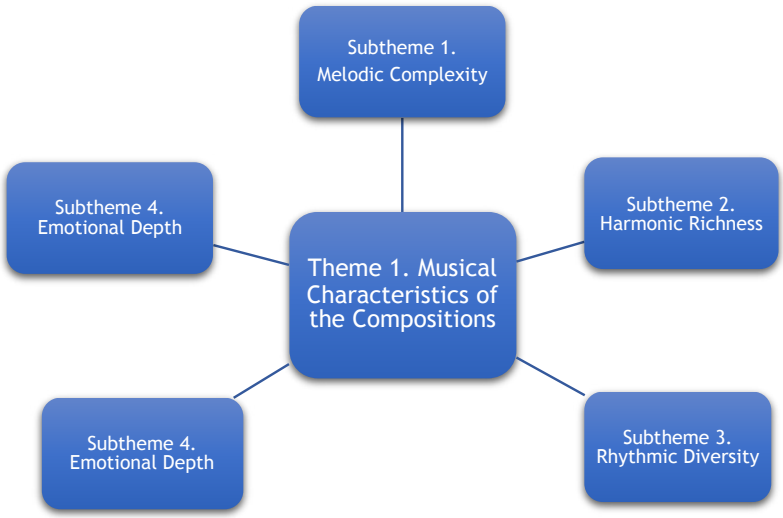

Figure 2. The graphical representation of the theme and subthemes derived from the content analysis of participants' views regarding the musical features of compositions produced by the composer and by AIt

The results of this study, while largely consistent with the existing literature, also offer unique insights into the perceptual differences between piano pieces produced by artificial intelligence and those composed by humans. The themes identified in this article (melodic complexity, harmonic richness, rhythmic diversity, emotional impact, and memorability) align with the findings of previous researchers (see also Hong, 2022; Simonetta et al., 2022). These researchers have noted that human works tend to exhibit greater complexity in terms of melodic development and emotional depth. Particularly noteworthy is that participants in the present study consistently described AI-composed music as either "very simple" or "meaninglessly complex," supporting the assessments by Zhu et al. (2023) regarding AI's limitations in producing balanced narratives in music. This study highlights another important dimension to the puzzle of disparities between expectations on either side, manifested by varying degrees of awareness and sensitivity on the part of participants from diverse cultural groups (Western, Eastern, and Asian) to these disparities. This confirms the results of Ragot et al. (2020) on the ways that cultural dynamics shape emotional response to music but pushes their work further by looking at the perspective of human and AI composition. The validated idea that AI-generated rhythms are mechanical and sufficient emotional depth is absent relates strongly to the findings of Dallas and Morreale (2020) in relation to this theme, however, the current paper offers more nuanced insights as to how this limitation especially appears in their piano music. In contrast, we find that while AI systems have made significant advances in technical compositional abilities, they fail to replicate the emotional and cultural nuances that are intrinsic to human music creativity.

Theme 2. Cultural Context and Sensitivity

This section addresses the interplay of these things — culture, address, and perceptions of musical education, and with which they approach evaluation of harmony, rhythm, and melody, between works written by AI and by the composer Thus, the cultural context of the subject plays a major role in how both the AI-generated and the composer's piano pieces are perceived and distinguished. Not just by principles of music that apply to all music, but also by the distinctive aesthetic and emotional preferences, and cognitive scaffolding of music, that each culture's music brings to the ears of those born into that tradition.

Subtheme 1. Eductive and Cultural Dimensions

Those with conservatory-level musical training appreciated the complexity and nuance of the works of the composer, and they were generally able to quickly identify and criticize the simpler structures found in AI compositions. Cultural backgrounds, along with preferences regarding tonal predictability and innovation, influenced how both AI and composer works were evaluated.

> "I can immediately recognize the constantly repeating patterns in AI compositions because, thanks to my classical music training, I am more sensitive to such structural features." (P1-22-F)

Subtheme 2. Distinctive Features

Participants defined mechanical repetitions and a lack of naturalness as the distinguishing markers of AI music.

> "There is no natural flow in the melodies generated by AI; it feels mechanical as if it were calculated by a machine." (P5-20-F)

Subtheme 3. Musical Knowledge

Formal training and knowledge of harmonic progression and tonality heightened sensitivity to rhythmic subtleties.

> "My ability to understand the subtle details and transitions in the harmonic structure is directly related to my music training. This makes it easier for me to distinguish between AI and the composer's pieces." (P9-23-F)

Subtheme 4. Cultural Diversity

Western participants (those who prefer listening to Western music) appreciated the tonal structure, whereas non-Western participants appreciated experimental elements.

> "My familiarity with Eastern music allows me to more easily accept unconventional sound combinations." (P6-24-M)

Looking at these findings, it was stated that participants who were accustomed to modal and atonal structures, especially in Turkish music, tended to favor experimentation, while participants who were knowledgeable about and fond of tonal structure placed greater emphasis on musical elements when distinguishing AI-generated music from the composer's works.

> "My habit of listening to modal music makes it easier for me to appreciate different timbres and experimental approaches." (P8-19-M)

Participants felt and emphasized the complex interaction between cultural contexts and individual perceptions.

> "My musical preferences and cultural background profoundly affect the way I evaluate compositions." (P2-19-M)

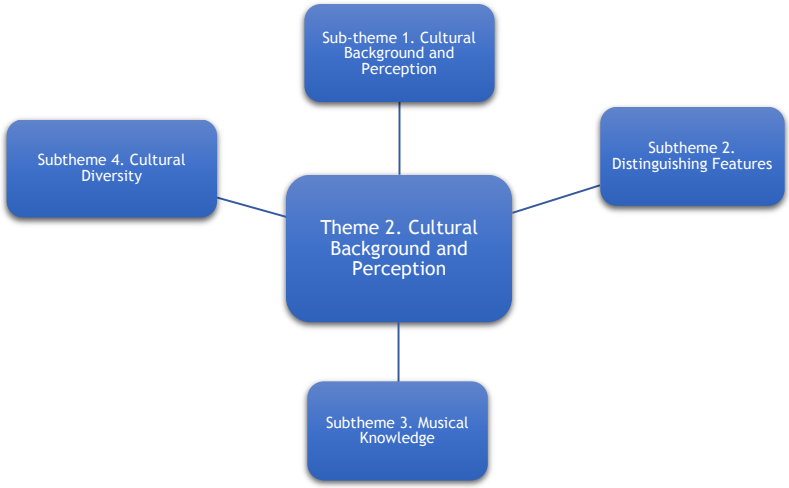

Figure 3. The graphical representation of the theme and subthemes derived from content analysis of participants' views on the perceptual and cultural factors involved in distinguishing compositions by the composer and by AI

The study creates an output to provide feedback to AI systems that they need to better mimic the emotional depth and structural consistency of composer creativity. The recommendation to train music models that pay attention to emotional depth and structural consistency in the development of AI music models should be considered by those who produce these models. As such, there is a push to take these systems further, beyond engrained repetitions of composers and into the creative space they occupy. One of the most challenging aspects of genuine creative music involves the integration of power of emotional expression, which is mainly embodied in energetic variations, understated timbral hints and sensitive harmonic modulations (Huang et al., 2024). Likewise, the construction of an overarching structural project in terms of thematic development, motivic coherence, and a coherent musical narrative remains a major difficulty for AI-based generative models (Yang & Lerch, 2020).

Theme 3. Music Education and Culture

Music education plays a significant role in the perception and differentiation of compositions, enhancing the ability to distinguish between AI and the composer's music. While educated listeners are more attuned to subtle elements such as harmony and motif development, untrained listeners have focused on surface-level features like tempo and repetition.

Subtheme 1. Musical Educational Background

Participants with formal training recognized harmonic progressions and dynamic changes in the works composed by the composer. AI compositions were generally described as less impressive and mechanical.

Participants without previous musical training found AI compositions appealing due to their predictability and accessibility, while they perceived the composer's works as more complex and challenging.

> "If I had not received any music education, I might not have been able to distinguish the composer's piece from the AI piece. This allowed me to notice the emotional depth and structural integrity in the composed works; in my opinion, AI pieces lacked these qualities." (P1-22-F)

> "As someone without previous music training, I found it easier to follow AI music, but the pieces lacked emotion." (P5-20-F)

Subtheme 2. Musical Cultural Interaction

Cultural context plays a key role in selecting a piece to listen to, shaping an individual's musical preferences and evaluative capacity (Morrison & Demorest, 2009). For instance, in the tables, participants identified as Western (i.e., those who prefer listening to Western music) prioritized harmonic resolution and narrative structure, whereas Eastern participants highlighted modal flexibility and rhythmic complexity. The listening habits cultivated within a participant's cultural context led them to describe AI compositions as emotionally flat due to a lack of harmonic complexity and tonal development. Eastern listeners appreciated the structural consistency of AI compositions, but emphasized the absence of traditional modal variations and rhythmic dynamism.

> "I think there is a mistake in harmonic progression in AI compositions. For this reason, I couldn't connect with them emotionally." (P7-25-F)

> "In my opinion, AI compositions lack traditional modes and do not reflect our nature. However, their rhythmic variations were interesting." (P6-24-M)

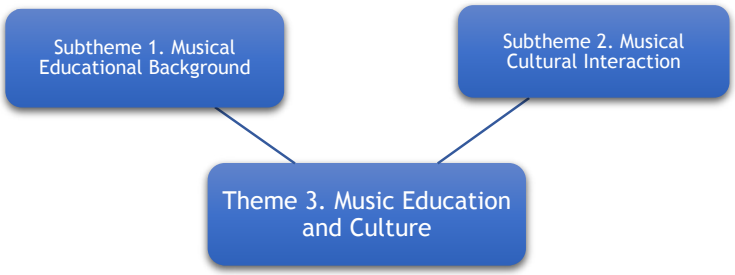

Figure 4. The graphical representation of the theme and subthemes derived from the content analysis of participants' views on the music educational background and musical cultural interaction in distinguishing between the compositions by the composer and by AI

Theme 4. Differences in Musical Preferences

Subtheme 1. Harmony and Rhythm Preferences

Cultural differences were also reflected in preferences for harmony and rhythm. Western listeners preferred harmonically rich compositions with clear resolutions, whereas Eastern listeners appreciated rhythmic complexity and experimental structures. The works composed by the composer received higher scores among all cultural groups for their harmonic richness and rhythmic innovations.

AI compositions were criticized for repetitive rhythms and a lack of harmonic depth but were appreciated in some contexts for their experimental structures.

> "The emotional shifts in the composer's pieces were unforgettable, and the AI pieces felt bland and unsuccessful. (P6-24-M)

> "AI music sounded very interesting at first but has no feeling so it got boring quickly. (P3-22-F)

Subtheme 2. The Role of Emotional Perception

Emotional resonance emerged as a critical factor distinguishing the composer's and AI compositions. While the works composed by the composer elicited stronger emotional responses through dynamic transitions, phrasing, and harmonic interplay, AI compositions were generally perceived as superficial.

The works composed by the composer were described as emotionally profound, forming a narrative that resonated with listeners. AI

compositions were perceived as mechanical, though some participants appreciated their structural simplicity.

> "The emotional transitions in the composer's pieces made them unforgettable, while the AI pieces felt flat and uninspired." (P9-23-F)

> "AI music was initially intriguing, but its lack of emotional depth made it less appealing over time." (F4-19-M)

Figure 5. Graphical representation of the theme and subthemes derived from the content analysis of participants' views on musical preferences in distinguishing between the compositions by the composer and by AI

In this context, the study's findings can be related to the existing literature as follows:

The findings of this research regarding the role of educational background in musical perception align with the studies conducted from a cognitive neuroscience perspective by Peretz et al., (2012). This latter finding particularly supports the claims of Pearce and Wiggins (2020) regarding the importance of education in the perception of musical structure—specifically the success participants that were musically trained had in distinguishing compositions by AI and human composers. Similar to Simonetta (2022) et al., observations, trained listeners were able to better identify harmonic progressions and dynamic changes that discusses the perceptual gap between MIDI-based representations and live performances.

This role with the determining impact of cultural back ground of musical perception emerged in our study follows the cultural compatibility theory founded through Dubnov et al., (2021). The Western listeners' preference for harmonic resolution and Eastern listeners' preference for modal flexibility are consistent with the findings of Greenberg et al., (2022) showed based on their large study, with data from 53 countries. That means musical perception is determined by cultural codes rather than only by generalized principles.

Our conclusions about the emotionless nature of AI-composed works seem to correlate with experimental studies on evaluating works of music composed by AI, including those by Hong et al., (2021). You even feel stronger emotions when listening to compositions by the composer, supporting the judgments of Shank et al., (2023) on AI composers bias. These results show that, despite AI's technical ability, it is, as Camurri et al., (1999).

The repetitive structures and limited creative capacity of the AI-composed pieces identified within our study are consistent with Zhu et al. (2023) about problems with AI music generation systems. As suggested by Huang et al., (2024), this highlights the need for more emotionally nuanced and structurally coherent AI systems.

They have significant implications and indicate we need to revisit AI's role in music production, to focus more on the cultural and emotional aspect. There is more work to be done exploring the effect of AI systems on the creative process, as suggested by Yang and Lerch (2020).

Factors	Composed Work	N	Mean ($\overline{X}$)	Mean Rank	Rank Sum	U	p
Melodic Complexity	Composer	10	4.3	14.25	142.50	12.50	.03*
	AI	10	2.8	6.75	67.50		
Harmonic Richness	Composer	10	4.5	14.85	148.50	6.50	.01*
	AI	10	3.0	6.15	61.50		
Rhythmic Diversity	Composer	10	4.0	13.90	139.00	16.00	.04*
	AI	10	2.9	7.10	71.00		
Emotional Depth	Composer	10	4.6	15.20	152.00	3.00	.001*
	AI	10	3.1	5.80	58.00		
Memorability	Composer	10	4.4	14.55	145.50	9.50	.02*
	AI	10	3.2	6.45	64.50		

Note: According to the results of the Mann-Whitney U test, inter-group differences for all perceptual factors are statistically significant (p<.05)

As seen in Table 2, the U-test was applied to evaluate the significance of the differences between the Composer and AI compositions for each criterion. The works composed by the Composer scored significantly higher in all categories (p<.05). This indicates that participants distinguished the musical elements of the works composed by the Composer in terms of melodic complexity, harmonic richness, rhythmic variety, emotional depth, and memorability.

The perceived musical element scores of the works composed by the Composer were as follows: Emotional Depth ($\overline{X}$=4.6), Harmonic Richness ($\overline{X}$=4.5), Memorability ($\overline{X}$=4.4), Melodic Complexity ($\overline{X}$=4.3), and Rhythmic Variety ($\overline{X}$=4.0). The perceived musical element scores of the works composed by AI were as follows: Memorability ($\overline{X}$=3.2), Emotional Depth ($\overline{X}$=3.1), Harmonic Richness ($\overline{X}$=3.0), Rhythmic Variety ($\overline{X}$=2.9), and Melodic Complexity ($\overline{X}$=2.8).

Melodic Complexity

Composer-created works were praised for their intentional motif creation and balanced, harmonious melodic development contributing to emotional depth. In contrast, AI compositions were criticized as either overly simple (relying on repetitive patterns) or irregular and lacking emotional resonance. Some participant perspectives are noted below. While quantitative analysis was conducted at this stage, participant views are included here to demonstrate consistency with qualitative analyses.

> "Melodies composed by the composer develop motifs that make them both memorable and engaging. AI pieces feel either too simple or too chaotic." (P3-22-F)

> "AI melodies are usually too predictable, which makes them feel mechanical and repetitive." (P5-20-F)

Harmonic Richness

Composer-created works were characterized by layered and emotionally rich harmonies that seamlessly integrated with melody, adding depth and narrative structure. AI harmonies were generally perceived as predictable, mechanical, and lacking cohesion with melody.

> "Composer's harmonies merge with the melody to add depth and a sense of storytelling." (P8-19-M)

> "AI harmonies mostly feel monotonous and begin to sound the same after a while." (P6-24-M)

Rhythmic Variety

Composer-created works were praised

for their dynamic rhythmic patterns that enhanced emotional engagement and maintained listener interest. AI compositions were characterized as repetitive and static, with faster tempos described as excessively mechanical.

> "The rhythms in composer-created works offer variety and keep the listener engaged. AI rhythms feel predictable." (P4-19-M)

> "The repetitiveness of AI rhythms starts to feel monotonous after a while." (P2-19-M)

Emotional Depth

Composer-created works were consistently evaluated as emotionally rich, featuring dynamic transitions, harmonious melody-harmony interaction, and expressive motifs that established profound listener connection. AI compositions were generally described as mechanical and superficial, though some participants appreciated their experimental approaches.

> "Composer-created works with emotional transitions particularly resonated with me much more." (P9-23-F)

> "AI lacks emotional depth. It feels more like a mechanical process." (P7-25-F)

Memorability

Composer-created works were assessed as more memorable due to their intentional motif development and emotional structures. AI compositions, while sometimes initially interesting, proved less effective long-term due to repetitive patterns and limited development.

> "Composer melodies stay in my mind even hours after listening. AI pieces are easily forgotten." (P10-20-M)

> "AI songs are interesting to read at first, but not memorable because they lack depth. (P1-22-F)

The works created by composers significantly outperformed those made by AI for every criterion measured ($p<0.05$). This is to show the advantages of the composer music in emotional engagement, structural coherence, and artistic depth. Though the occasional AI composition was honored for its simplicity or experimental details, they were generally criticized for being predictable, emotionless or mechanically executed. This scrutiny offers useful suggestions to improve future AI music systems so that they better reflect the richness, complexity, and emotionality inherent to works composed by humans.

These findings are consistent with the basic results from Hong et al., (2021): their study also revealed that composer works were more effective than AI compositions in both emotional depth and structural integrity. Additionally, Shank et al., (2023) experimental study found similar evidence that listeners perceived AI music to be more mechanical and shallow. These findings are consistent with those of Simonetta et al., (2022)'s challenge of the ability of AI to express intention as articulated by composer in his work detailing some of the challenges AI faces in musical creativity.

Emotional Depth and Memorability were the categories displaying the most considerable disparities. This puts weight on emotional and structural elements in composer-made work. Although the AI compositions were praised for their innovation, they have also been criticized for their predictability, lack of emotional engagement, and lack of structural coherence. Subsequent refinements to AI models ought to work toward closing the perceptual quality gap by implementing improvements to emotional expressiveness and dynamic variety.

The predominance of differences in Emotional Depth and Memorability persists with Camurri et al., (1999) early observations about the limits of AI in mimicking displays of emotion. Zhu et al., (2023) similarly pointed out challenges that AI systems need to overcome in developing holistic and

memorable musical narratives. Ragot et al., (2020) found that AI compositions are typically seen as more technical and devoid the emotional qualities found in composer productions. This highlights the need for developments towards an emotional depth and sustainable impact capacity in future AI music production systems.

Conclusion

A study exploring how participants differentiated between AI-produced and composer-written music, based on interviews with 10 participants, identified four key themes. With "Musical Characteristics of Compositions" as the main theme, five sub-themes that emerged were: melodic complexity, harmonic richness, rhythmic variety, emotional depth, and memorability. Across these categories, participants unanimously praised the production of composer works as being far superior to AI compositions.

The tematic "Cultural Background and Perception" included four sub-themes (cultural-educational effects, distinguishing characteristics, musical knowledge, and cultural diversity) and showed how the cultural background of participants influenced their musical perceptions. Participants in the "Music Education and Culture" theme (one of three explored) suggested that musical education and culture have a major impact on how we perceive music, although the musically untrained apparently struggle to differentiate between AI and composer works while musically trained participants excelled in identifying human handiwork.

Exploring the sub-themes of harmony-rhythm preferences and emotional perception provided further insights, revealing differences between the assessment of works created by AI compared to those composed by the human hand. The quantitative data confirmed that the composer works substantially rated higher than the AI compositions with delta scores of all five physical categories (melodic complexity, harmonic richness, rhythmic variety, emotional depth, and memorability) ($p<0.05$). Differences were especially stark in emotional depth ($\overline{X}_{composer}=4.6$, $\overline{X}_{AI}= 3.1$) and memorability ($\overline{X}_{composer}=4.4$, $\overline{X}_{AI}= 3.2$).

This broad analysis engages with the developing field of artificial intelligence and musical composition while keeping an eye on the cultural and perceptual dimensions that shape the users experience. These results indicate pathways for AI music generation systems, but without losing sight of the aesthetics that define human musical creativity.

Steps taken to synthesise qualitative and quantitative methods, enabling thorough data provision and exploration, that contribute knowledge on both machine ability and humans composing music.

Recommendations

Recommendations for Future Research

In this study, a design was created where the works composed by AI were perceptually compared to those composed by the Composer.

- Future studies should expand the participant base and include neurocognitive data to gain a deeper understanding of perceptual mechanisms.
- Instead of including individuals with differences in a single group, an experimental design could be implemented by creating separate groups with specific characteristics (Western music, Eastern music, education levels).
- The cultural diversity of music was addressed within the context of Turkish music in Turkey. Comparative experimental designs could be conducted in different countries and through various music cultural identities.
- Interviews could be conducted by reaching participants from different universities and regions.

- Perceptual factor comparison studies could be conducted on different AI applications instead of the one used in the research.

- It may be recommended to examine the perceptual differences between composer and AI music with larger participant groups."

Recommendations for Practitioners

- This research specifies important musical perception factors that can be included in the informed training of music producers working with AI systems.

- However perceptual factors play a crucial role in the production of AI music so awareness seminars about its impact can be conducted for the music educators.

- Developers of music technology can use these insights to create advanced algorithms that improve the user experience and embed profound emotional characteristics of music composed by humans.

- These insights can encourage media and entertainment industry professionals in developing top-of-the-shelf AI music that offers composer-machine collaboration.

- The results can be used to design interactive environments for games, virtual reality, and music therapy that create feelings that linger and stay.

Research Limitations

We investigate perceptual differences between piano compositions written by AI vs those written by a composer in terms of timing, pitch, dynamics, tonality, motif recognition, and complexity. With a focus on cognitive recognition processes in listening sessions, the research includes various cultural perspectives. The study focuses on piano music and does not generalize to other genres (e.g. orchestral or electronic music). While the study's participant pool was culturally diverse, it exclusively included individuals formally educated in music, although the study deliberately excluded professional composers. Listening sessions lasted from several seconds to one minute, possibly restricting perceptual adaption to AI music.

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Appendix 1. Semi-Structured Interview Form

Semi-Structured Interview Form
Research Objective: This interview aims to understand how participants perceive music produced by artificial intelligence (AI) versus composer-created music, their processes of distinguishing between these two types of music, and which musical elements influence perception. Participants' musical experiences, cultural backgrounds, and perceptions of creative expression will be evaluated.
Age: **Gender:** **Education Level: Musical Training?** (Yes/No)
Level of Musical Training (If any):
Cultural Background:
Level of Engagement with Cultural Music:
Interview Questions
Question 1. Do you think the piece you listened to was composer-created or AI-generated? What are the distinctive features that led to this conclusion?
Question 2. Which musical characteristics (rhythm, melody, timbre, motif, etc.) were particularly notable to you in the piece you listened to? Can you share what these characteristics suggested to you about the piece?
Question 3. Were there any specific elements or feelings that suggested this music might have been AI-generated? If so, how would you describe these characteristics?
Question 4. How did your musical background or education provide an advantage in your process of identifying or distinguishing this music (if any)? When you consider how you analyzed the music, can you observe the influence of this knowledge?
Question 5. Do you believe AI-generated music can carry the creative expressiveness or emotional capacity characteristic of human composers? Why do you think this way?
Question 6. Do you think having a different cultural background influenced your process of identifying or distinguishing this music? Did your cultural musical background contribute to your perception of AI music?
Question 7. Did your preexisting thoughts or expectations about AI-generated music influence your listening and evaluation process? How?

Appendix 2. Analysis Guidelines for Semi-Structured Interview

	Analysis Guidelines for Semi-Structured Interview
Questions	Descriptive Analysis Foundations
Question 1	Responses will be analyzed to understand participants' cognitive processes in distinguishing between AI and composer-made music. Special attention will be paid to how participants evaluate musical elements such as timbre, rhythm, and melodic structure.
Question 2	Through descriptive analysis of musical characteristics identified by participants, evaluation will focus on determining which elements are most distinctive and what fundamental differences emerge between AI and composer-created music.
Question 3	Analysis will focus on identifying elements that participants consider indicative of AI-generated music. Particular emphasis will be placed on factors such as mechanicality, repetition, and lack of naturalness.
Question 4	The study will examine whether participants possess musical education or knowledge and evaluate how this knowledge level influences their ability to distinguish between AI and composer-created music.
Question 5	Participant perspectives on AI music's emotional and creative potential will be analyzed, evaluating how AI music compares to composer-specific creative expression.
Question 6	Research will examine how participants' cultural backgrounds influence their music perception and evaluation processes, analyzing how AI music is perceived through various cultural lenses.
Question 7	Analysis will focus on how preconceptions or expectations about AI music shape participants' evaluative processes.
Analysis Plan	
This analytical methodology will categorize participant responses thematically into distinct categories. Key emerging themes include:	
Distinguishing Characteristics: Assessment of elements participants highlight when differentiating between composer-created and AI music (e.g., mechanicality, lack of naturalness, repetitive structure). **Role of Musical Knowledge:** Evaluation of whether musical knowledge or education enables participants to conduct deeper musical analysis. **Cultural Background Impact:** Analysis of cultural background's influence on music perception; examination of how different cultural musical elements create distinctions in AI music recognition. **Emotional Expression Perception:** Analysis of participants' perception of emotion and creative expression in AI music; interpretations regarding both types of music's creative expression potential. **Prejudices and Expectations:** Examination of participants' preconceptions or expectations regarding AI music and their impact on the perceptual process.	

Appendix 3. Perceptual Factors Evaluation Scale for Musical Works

Perceptual Factors Evaluation Scale for Musical Works					
Very Low (1 point), Low (2 points), Normal (3 points), High (4 points), Very High (5 points)					
Dimensions	**1**	**2**	**3**	**4**	**5**
Dimension 1. Melodic complexity					
Dimension 2. Harmonic richness					
Dimension 3. Rhythmic variety					
Dimension 4. Emotional depth					
Dimension 5. Memorability					

Biodata of Author

Associate Professor Dr. **Seyhan Canyakan** began his academic journey after completing his basic education in Bergama, gaining admission to Niğde University's Faculty of Education, Department of Music Education Piano Division in 1998. Following graduation, he commenced his teaching career in 2002. In 2008, he gained recognition for his work in theatre music, composition, and studio productions, with four of his compositions being featured in a literary work. He has achieved international success in electronic music, with his compositions being published worldwide and utilized in various projects. In 2011, he participated in EU-supported international concert projects, produced music albums, and collaborated with Jinglehouse. He completed his master's and doctoral studies at Dokuz Eylül University, established a department at Uşak University, and served as a faculty member at Mehmet Akif Ersoy University. The composer, who produces works across a broad spectrum including Turkish and electronic music, is known for his international media and game music compositions. He is married with two children.

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