Human Art vs AI Art, a Potential Danger for Artist? : Artistic and Economic Evaluations across Multiple Art Genres

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Abstract

AI image-generators have recently introduced themselves into the world of digital art. These platforms make it possible for everybody to generate art. This generated art could replace the artworks of artists. This could threaten the cultural and economic status of artists. This paper presents an experiment with an within subjects design in which 73 participants were asked to evaluate the artistic and economic value of digital artworks (Which were created by AI, but labelled as “made by human” or “made by AI”) from five different art styles : Impressionism, Expressionism, Surrealism, Realism and Abstract Art. The present study found that humans have a preference for human made art above AI-generated art, in artistic and economical values. Participants preferred impressionist and expressionist artworks and they preferred abstract artworks the least. Lastly, the effect of genre was bigger when participants focused on “economic value” or “human made art”. This research shows that artists still have a job that is valued and that people are willing to pay more for a human artwork. However, it is important to do more research to understand what kind of impact AI can have for the future of artists.

Introduction

In recent years, Artificial Intelligence (AI) has taken the (digital) world by storm (Zhao et al., 2024). AI has entered different sectors and is already starting to make a significant impact in various of them such as business and industry (Bharadiya et al., 2023), healthcare (Bohr & Memarzadeh, 2020), the banking sector (Kochhar et al., 2020) and the creative sector (Amankwah-Amoah et al., 2024). Recent advancements in AI have raised concerns among some artists regarding the future of human-driven creative industries. AI's ability to analyze data, recognize patterns, and build predictive models has allowed it to outperform humans in various tasks. AI has also entered the world of art with advanced online platforms such as DALL-E2, Midjourney and Stable Diffusion. These platforms make it possible for anyone with a smartphone or PC to create high-quality art by entering simple text instructions (Cousins, 2023).

Artists and experts are concerned about the impact art generators could have on the cultural and economic status of artists. Artists have studied and practiced their profession for a long time, but art generators can generate images in a matter of seconds. A lot of artists rely on online sales of their digital works, but they are losing clients due to the easy access and acceptable quality of art generators (Aris et al., 2023). While AI-generated images may not fully convey human emotions, the large volume of commercially produced AI art entering the

market could lessen the need for human artists in practical scenarios such as graphic design or advertising. This shift in the art world might result in human art being valued less (Jiang et al., 2023). This cultural shift makes it important to know how AI art is judged and to what extent it poses a danger to artists. The present study offers a first step in this question, by investigating whether the economic and artistic value of human and AI-generated art differs.

Theoretical Framework

Previous research indicates that people evaluate the value of artwork based on the guidelines available to them, with information about the creator being one of the most significant factors (Fortuna & Modliń, 2021). When people know who the creator of an artwork is, they evaluate artistic value and price estimation on the basis of how much effort is put in (Mazzone & Elgammal, 2019). Human art is considered as requiring more effort than AI-art (Horton, 2023). In music, for example, there is a bias named the composer bias, which states that listeners like music less when they think it was composed by an AI. This is believed to be because a human has put more effort in making music than an AI has (Shank et al., 2023). Also research about other forms of art such as poetry, find a preference for human made art because of the amount of effort that is perceived to be put in (Hitsuwari et al., 2023). When evaluating the aesthetic value of artwork, people consider the effort, skill and creativity that has been put in (Bellaiche et al., 2023). When comparing human art with AI-art, one gets the feeling that a human has put in more effort than an AI. To restore their inner conflict about how to evaluate the painting, one uses effort justification to convince themselves that the human painting has a higher aesthetic value because of the effort, creativity and skill that has been put in. When evaluating the artwork's economic value, people also look at how much effort and resources the artist has put in (Kruger et al., 2004). When the artist invested significant effort or resources in making, people are motivated to justify that effort by viewing the human painting as more desirable or valuable.

There have been prior studies examining the evaluation of AI art. For example, a study by Bellaiche and colleagues (2023) wanted to know whether and why we preferred human art over AI art. They examined participants' judgments about the artworks based on four assessment criteria : Beauty, Depth, Liking and value. The human artworks got rated higher in all of the four criteria. In the remainder of their study, it examined whether there were moderators (Emotion, Story, Effort, and Time to create) for this effect. The story and perceived effort behind artworks moderated creator label effects (Human vs AI), but only for likability and beauty. Research by Park and McGee (2023) also investigated evaluations of artworks. The aim of their research was to explore generation Z's perspectives on AI-

generated art. In this study both views towards the AI artist and the evaluation of AI-created artworks were examined. A ratings test and a questionnaire were administered to identify any perceptual biases against AI artists, and to uncover the criteria gen Z uses to evaluate the value of AI artworks. To test the evaluation of the artworks, four criteria were used : Liking, beauty, novelty and meaning. There was no significant difference between AI art and human art. The findings indicate that Generation Z holds a neutral stance towards AI artists and generally reacts somewhat positively to AI-created paintings. So some research has already been done into how one evaluates the artistic and economic values of AI art. However, the current research also looks at how economic and artistic value differ.

Given that people are motivated to justify the significant effort and resources invested by human artists by viewing their paintings as more desirable or valuable (2004), it is important to note that most of the existing research on the human evaluation of art primarily focuses on the artistic evaluation of the artworks and only a few focus on evaluation of the price. For example, research of Fortuna et al. (2023) that focused on art made by AI, human and cyborg artists and how humans would estimate the price of these paintings. These authors investigated whether paintings were worth more if it was created by an AI, human or cyborg artist and whether the perceived value depended on the context of the evaluation. It was found that the perceived value of a painting varies based on the type of creator and the evaluation context. Specifically, paintings by human artists are valued significantly higher when the comparison context was a painting made by an AI rather than another human. Additionally, people tend to value artwork created by a cyborg similarly to human-created art when the comparison context involves a human, and similarly to robot-created art when the context involves an AI. As this research is one of the only ones that focuses on price evaluation regarding AI and human art, it is important to further investigate how people price AI paintings compared to human paintings. Furthermore, there is already some existing research about artistic evaluation of AI art. Hong and curran (2019), for example, examined how people perceive artwork created by AI and how knowledge of the artist's identity affects individuals' evaluation of art. The study discovered that artworks created by humans were considered higher in artistic value than those created by AI. Moreover, simply knowing that a piece of art was created by AI generally did not affect participants' evaluations of its artistic value. However, if participants held a belief that AI cannot create art, this belief significantly influenced their evaluations.

Ragot and colleagues (2020) also investigated the artistic value of artworks made by AI and humans, but focused on four dimensions: liking, perceived beauty, novelty, and meaning. A

priming effect is examined using two distinct groups: one group is shown artworks labelled as created by AI, while the other group is shown artworks labelled as created by a human artist. Ultimately, paintings believed to be created by humans are rated significantly higher than those thought to be made by AI. The results indicated a negative bias against AI and a preference for human creators. Latikka and colleagues (2023) explored whether attitude towards AI had an impact on the artistic evaluation of art. It was found that participants with a positive attitude towards AI rated the AI's artworks higher than participants with a more negative attitude towards AI, which suggests that AI attitude could have an influence on art evaluation of AI artworks.

The present study also focuses on the artistic and economic value of paintings made by AI and humans, but the present study makes use of paintings from different movements of art, such as abstract art, impressionism, expressionism, realism and surrealism. Every arts movement gets evaluated differently (Pratt, 2012). An expressionist painting can arouse different feelings than an abstract painting (Chatterjee, 2024). They have different characteristics thus they get evaluated differently by people (Goldman, 2004). characteristics such as a different colour palette and different techniques used such as line style, colour mixing, edge softness, colour reflection,
parallel lines and gradients often indicate the artistic genre of the painting (Zujovich et al., 2009).

Hypotheses

This present study is focusing on three hypotheses. The first hypothesis is that AI-generated digital artworks receive a more negative evaluation of artistic value than human made digital art works. It is believed that AI-generated artworks receive a more negative assessment of artistic value, because previous research showed this (Ragot et al., 2020) and because of effort justification among participants. The second hypothesis is that AI-generated digital art works receive a more negative evaluation of economic value than human made digital art works. It is believed that AI-generated artworks receive a more negative assessment of economic value, because previous research also showed this (Fortuna et al., 2023) and because of effort justification among participants. The third hypothesis is that artworks from the movements expressionism, impressionism, abstract art, surrealism and realism receive a more negative evaluation when it is believed to be made by an AI. This is supported by previous research which found that there is a more negative evaluation of a painting's artistic and economic value if it is thought to have been created by an AI (Ragot et al.,2020; Fortuna

et al., 2023). Finally, as an exploratory additional question, this study examines whether adding AI attitude as a covariate has any influence on the evaluation of art.

Method

Participants

The participants were recruited using a convenience sample, and all were approached via social media. The study involved 105 participants. Among them, 35 participants were excluded. This was because these participants had only filled in the demographic details. The final sample consisted of 70 participants, with 35 of the participants male, 34 participants female, and 1 participant preferred not to say. The age ranged from 17 to 77, with a mean age of 41. The most common study backgrounds were Social Sciences (25.7%) and Economics and Business (14.3%).

Measures

Artistic and economic value

Each question measured the artistic and economic value of the musical and digital art pieces on a slider scale from 0 to 100. Above each block, the following instruction was given: 'Use the slider to indicate your evaluation from 0 (no artistic/economic value) to 100 (extremely high artistic/economic value)'. The stimulus material consisted of 12 music pieces and 20 artworks. The artworks were made by AI and were collected from google images. It was carefully checked whether there were any paintings that were too similar. Considering that different artistic styles may affect the experimental results, it is chosen to collect paintings for various genres of art, including, impressionism, expressionism, surrealism, realism and abstract art. The AI compositions used in the experiment were collected via YouTube, specifically a channel named AVIA. Considering that different music genres may affect the experimental results, various genres of music, including classical, pop, and rock, have been selected. The music pieces are edited in audio with a duration between 14 and 30 seconds to ensure individuals listen to the audio entirely before answering the questions.

AI Attitude Scale (AIAS-4 scale)

The attitudes towards AI are measured by the AIAS-4 scale (Grassini, 2023). This scale was founded after revising the AI Attitude Scale, which consisted of 5 items. After the revision, one item was excluded, and the scale consisted of 4 items. After excluding item 4,

Cronbach's alpha increased from .83 to .90, indicating high internal consistency (Cronbach, 1951; Field, 2018). Participants rate their agreements on a 10-point Likert scale (1 = not at all, 10 = completely agree). A 10-point scale was used for high retest reliability, ease of use, and a good level of granularity (Coleman et al., 2000). An example question is ''*I think AI technology is positive for humanity*''.

Procedure

An online survey was conducted via Qualtrics that is accessible on a laptop and smartphone. The inclusion criteria for participating in this survey was the ability to read and understand the English language on a B2 level. The experiment was conducted in English to reach internationals and to preserve the validity and reliability of the AIAS-4 attitude scale, which was initially in English. The participants were provided an information letter and informed consent before filling in the demographic details. These letters provided information about the study's goal, duration, and anonymity. Also, the participants could ask questions beforehand by giving the researchers' e-mail addresses. After filling in the demographics, the participants were informed about retrieving several music and art pieces through an instruction letter.

Design

In this research, a within-subject experiment is conducted. The design consists of 2 conditions: an AI condition and a human condition. All participants are exposed to each condition. Furthermore, the design consists of two blocks[1]. Block one covers 12 music pieces; six were AI-labelled, and six were human-labelled. As for the AI and human-labelled music pieces, the genre of the first two was classical, the second two were rock, and the last two were pop music. Block two covers 20 digital art pieces, ten AI-labelled and ten human-labelled. Every two questions addressed a different art genre. The art genres were surrealism, abstract art, impressionism, realism, and expressionism. Emoticons of a robot or a human were used to emphasize the block's label.

The manipulation of the experiment entails the presentation of the stimuli (music piece/art piece), which are all generated by AI and are unknown to the participants. This is to avoid subjective interpretations of the quality of the music and art pieces. The manipulation ensures the evaluation is based on the provided labels (AI vs. human). The stimuli are

counterbalanced across the different labels and the blocks are counterbalanced to minimize the impact of factors such as fatigue in experimental results (APA, 2018).

An introductory text is provided before the experiment to facilitate this manipulation. This introduction letter states that the Kunst Vorm Instituut (KVI), a cultural institute conceptualized through ChatGPT, has sought the assistance of students from Utrecht University to examine how individuals evaluate music and art pieces created by AI compared to those made by humans. The letter specifies that the KVI has provided a selection of music and art pieces generated by AI and those produced by students at their institute.

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[1]. The current study is combined with a study by a fellow student with the same research goal but then focuses on evaluating digital art created by humans versus AI.

Results

A repeated measures ANOVA was conducted to investigate the effects of genre (impressionism, expressionism, surrealism, realism, and abstract art), artist (AI vs. human), and value type (artistic vs. economic) on the evaluation of art with AI attitude added as a covariate. There was a significant main effect of the artist on the evaluation of art, $F(1, 64) = 47.357$, $p < .001$, $\eta^2 = .425$, with a MSE of 739.87. When art was considered to be made by an AI, the artworks got rated lower than when the art was considered to be made by a human. The average artistic value was 42.41 (Sd =16.83) for AI art and 53.36 (Sd =15.12) for human art. The average economic value was 38.20 (Sd =17.02) for AI art and 48.64 (Sd = 16.05) for human art. The main effect of value was also significant, $F(1, 64) = 22.023$, $p < .001$, $\eta^2 = .256$, with a MSE of 316.45. When participants evaluated the artistic value, the artworks got rated higher than when economic value was evaluated. There was a significant main effect of genre on the evaluation of art $F(4, 256) = 17.435$, $p < .001$, $\eta^2 = .214$, with a mean square error (MSE) of 361.22. Out of all the genres, impressionism artworks were rated the highest and abstract artworks the lowest. The averages per genre are indicated in table 1 below.

Table 1

Average evaluation per genre

	Artistic value AI	Artistic value Human	Economic value AI	Economic value human
Impressionism	47.26	61,83	41,22	57.34
expressionism	44,98	57.34	39.91	52.54
Surrealism	43.15	59.49	35.46	53.86
Realism	42.18	45.88	37.69	42.30
abstract art	37.52	42.25	36.73	39.22

There was a significant interaction effect between genre and artist, $F(4, 256) = 13.424$, $p < .001$, $\eta^2 = .173$, with a MSE of 246.20. The effect of genre on the ratings was bigger when the artist was a human. A significant interaction effect between genre and value was found, $F(4, 256) = 3.324$, $p = .011$, $\eta^2 = .049$, with a MSE of 58.19. The effect of genre on the evaluation was bigger when the focus was on economic value. The interaction effect between artist and value was not significant, $F(1, 64) = 0.200$, $p = .656$, $\eta^2 = .003$, with a MSE of 126.07. There was no significant three-way interaction effect between genre, artist, and value, $F(4, 256) = 0.496$, $p = .739$, $\eta^2 = .008$, with a MSE of 50.48. A repeated measures ANCOVA was conducted, including AI attitude as a covariate. The analysis showed that AI attitude did not have a significant effect on the evaluation of artworks, $F(1, 60) = 3.426$, $p = .068$, $\eta^2 = .055$, with a MSE of 4025.01.

Figure 1

Interaction effect of artist and genre

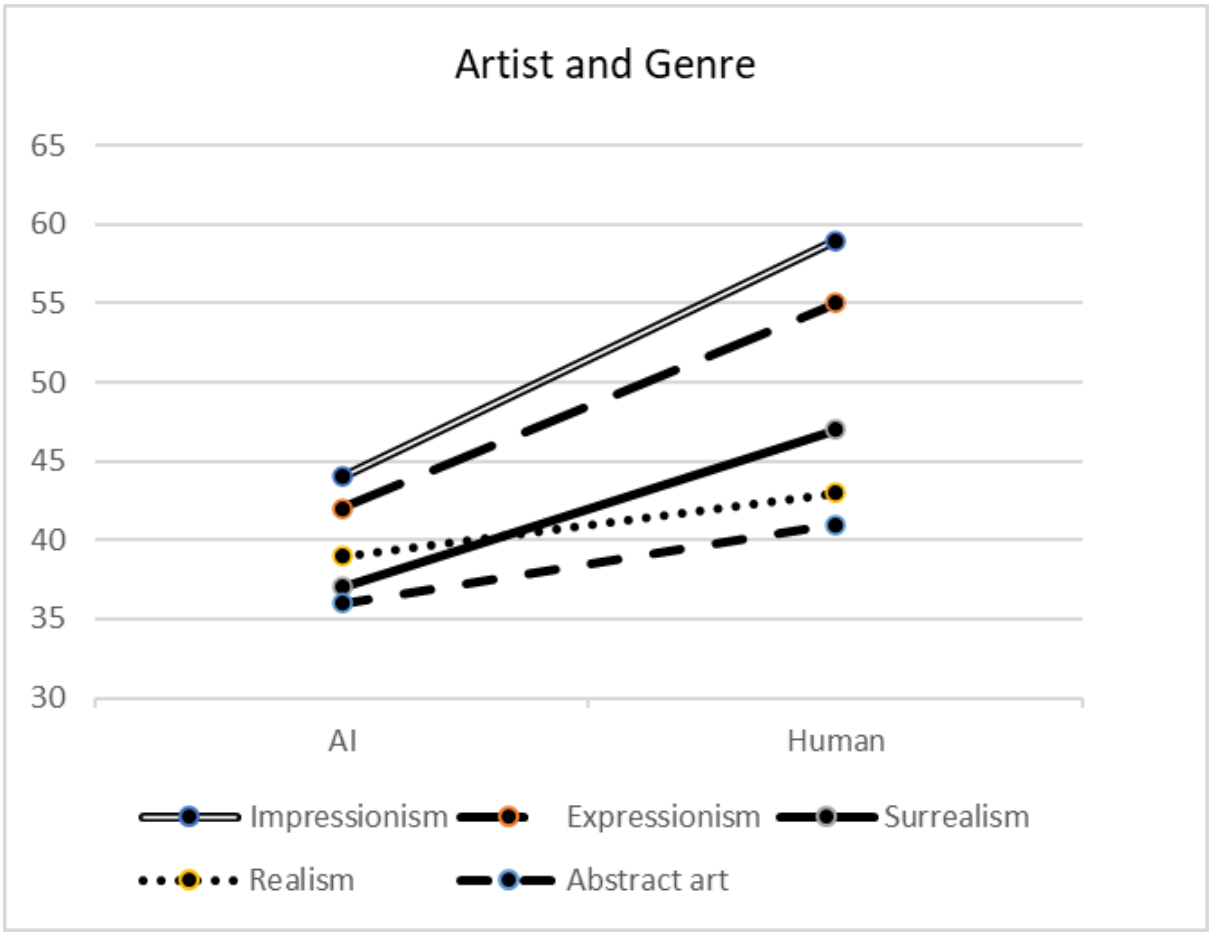
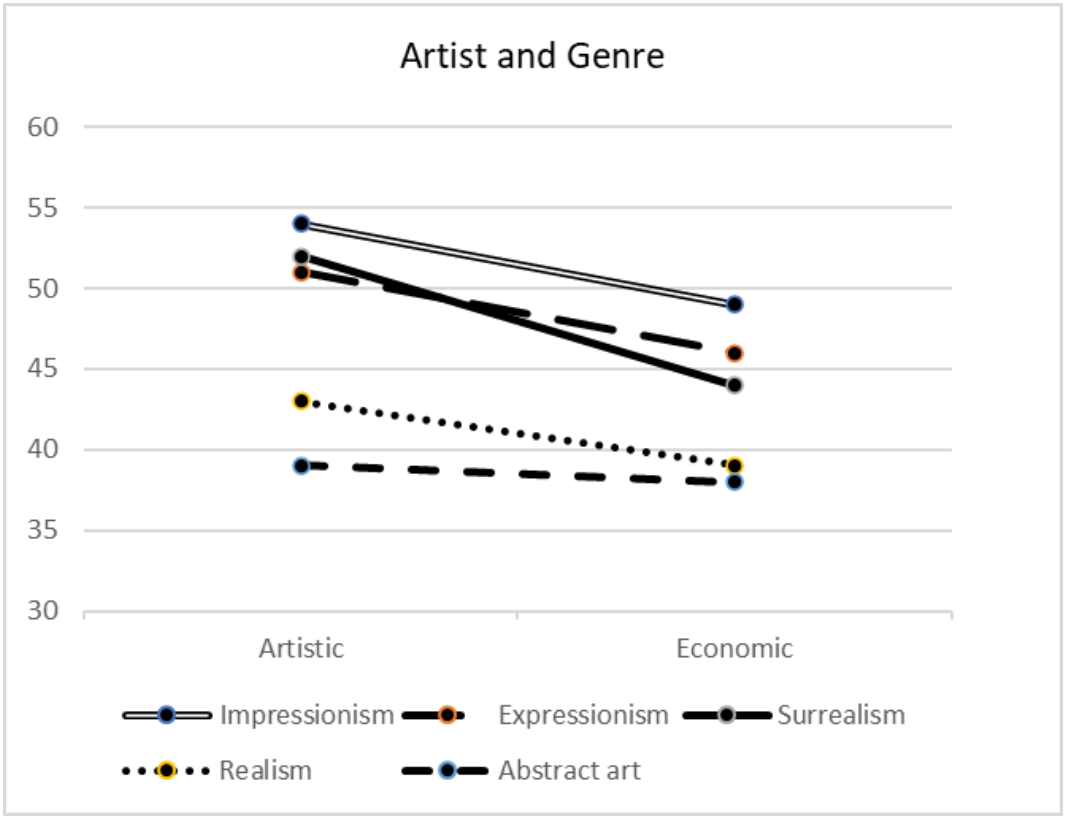


Figure 2

Interaction effect of value and genre



Discussion

The present study examined the evaluation of AI-generated and human-created artworks across different genres (impressionism, expressionism, realism, abstract art and surrealism) in terms of both artistic and economic value. The analysis revealed several significant effects of genre, artist type (AI vs. human), and value type (artistic vs. economic) on participants' evaluations.

Main findings

There was a significant main effect of artist type on the evaluation of digital artworks. The type of artist had an impact on how high participants would rate an artwork. The present study found that human-created art consistently got evaluated higher, both for economic and artistic value. This is in line with prior research about a preference for human-created artworks when evaluating artistic value (Ragot et al., 2020) and economic value (Fortuna et al., 2023). There was a significant main effect of value type on the evaluation of artworks. Artistic value was rated significantly higher than economic value. There was a significant main effect of genre on the evaluation of digital artworks. Different art styles elicited different

evaluations of appreciation. Impressionism, expressionism and surrealism were liked the most and realism and abstract art were liked the least, suggesting a preference for Impressionist, expressionist and surrealist artworks.

Cognitive dissonance could be an explanation for the main effect found for artist type. Cognitive dissonance theory suggests that when one experiences conflicting thoughts or beliefs, one feels uncomfortable and seeks to resolve this inner conflict (Festinger, 1957). This also applies to art evaluation. Perceived effort is a huge factor in the appreciation and valuation of art (Kruger et al., 2004). When in cognitive dissonance, this perceived effort needs to be justified by oneself (Aronson, 1969). Justification of effort is a form of cognitive dissonance in which one gives greater value to outcomes that require greater effort to obtain (Lydall et al., 2010). In the case of effort justification, conflict arises when one puts a lot of effort into something but feels like the outcome doesn't match the effort that has been put in. To ease this discomfort, one tends to convince themselves that the outcome is actually more valuable than we initially thought, aligning our attitude with the effort we invested. This helps us feel better about the situation and reduces the sense of contradiction between the effort expended and the perceived reward (Klein et al., 2005). This could be an explanation as to why participants rate human artworks higher than AI-generated artworks.

The found effect of value type can be explained by intrinsic and extrinsic motivation. Intrinsic motivation refers to doing something because it is inherently interesting or enjoyable and extrinsic motivation refers to doing something because it leads to a separable outcome (Ryan & Deci, 2000). Artistic value is related to intrinsic motivation because art appreciation involves engagement on a deep and emotional level (Fenner, 2008). Connecting on a deep and emotional level could have influenced the participants to give higher ratings. Economic value is more related to extrinsic motivation, because it is less related to personal experience (Acar, 2014). When evaluating economic value, factors such as market demand or investment potential are considered (Beech, 2015). Participants might not be aware of the current market prices which could result in them being more conservative and giving lower scores. Artistic value got rated higher because participants could have used intrinsic motivations to evaluate their rating and economic value got rated lower because participants could have used extrinsic motivations to evaluate their rating.

There was a significant effect of genre type on evaluation of art, in which impressionism was rated high and abstract art rated low. An explanation for the low scores of abstract art may lie in the fact that abstract art is generally compared more with AI and less with the subjective and emotional content of an author (Chiarella et al., 2022). Evaluations of AI tend to be lower than humans (Shank et al., 2023; Fortuna & Modliński, 2023). So abstract art may also receive lower scores because they are compared more with AI. An explanation

for the high scores of impressionism artworks may lie in the skill it takes to make impressionist paintings and in the high market value impressionist paintings currently have (Cupchik, 2020). This could be because of anchoring. Anchoring refers to the alignment of an evaluation with a previously considered benchmark (Bahník, Englich & Strack, 2016). When an artwork with a specific genre is associated with having a high value, people are anchored to this value and will adjust their evaluation of the painting. This could be the reason, the impressionist artworks were rated the best in the present study.

While prior research already investigated artistic and economic value of AI artworks, the current study highlighted the difference between artistic and economic evaluations of artworks. This provides a deeper understanding of how people assign different value types to AI-generated and human-made artworks, something that has not been thoroughly discussed in previous studies. Current research also reflected the new insight of evaluations of specific genres within AI artwork. To the best of knowledge, no research has yet been conducted into the assessment of AI artworks with specific art styles. Impressionist paintings are evaluated as the most positive and abstract paintings the least. These genre preferences could have implications for the development and promotion of AI artworks in the future.

Other findings

The present study also found interaction effects between genre and artist type. This means that the influence of artistic genre on art evaluation differed depending on whether the artist was perceived as a human or an AI. The human artworks tended to be more positively evaluated across all 5 genres, indicating a preference for human art above AI art regardless of the artistic style. This is in line with research that concludes that human artworks get better evaluations because of the amount of effort that has been put in (Mazzone & Elgammal, 2019).

The present study also found interaction effects between genre and value. The effect of genre on the evaluation was bigger when the focus was on economic value. When evaluating economic value one uses extrinsic motivations. A person might, for example, be evaluating an artwork on the basis of how much it could sell at an auction, or at how much the painting will be worth over time. Participants consider factors such as market demand or investment potential (Beech, 2015), but participants might not be aware of the market prices which could result in them being more conservative and giving lower scores across all genres. Lastly, the present study found no significant result when adding AI attitude as a covariate. This

contradicts the findings of prior research in which a positive attitude towards AI made people rate AI artworks higher (Latikka et al., 2023). An explanation for this contradiction could be the stimuli used in the studies. The AI-generated artworks in the present study may vary in quality or style compared to those in previous research. If the AI artworks in the present study were less impressive or harder to differentiate from human-created art, participants' attitudes towards AI might have impacted their evaluation.

Limitations and follow-up research

A limitation of the present study could be that the evaluations could have been impacted by the order in which the paintings were presented. It is striking that the ratings of both economic and artistic value go down the further a genre is presented in the questionnaire. This could be the case because of cognitive load. Cognitive load refers to the amount of mental effort and working memory resources required to process information (Kalyuga, 2011). When the cognitive load is high, task performance goes down (Schnotz & Kürschner, 2007). Task performance goes down because a high cognitive load causes attention loss (Sweller, 2011). Participants first had to listen to music pieces before they had to rate artworks, which could already have led to prior fatigue. There were also quite a lot of artworks that had to be rated, which could have resulted in a high cognitive load. This high cognitive load could have resulted in less attention for the task of rating the artworks. With task performance going down, participants could have rated artworks lower.

A second limitation is that not every art genre is included in the questionnaire. Although five of the most used styles are featured in the present study, they may not capture the full range of artistic styles and could limit the applicability of the findings to other artistic styles. A lot of different art styles are a trend in the last decades, such as pop art or pixel art (Elkheshen, 2021). When including art styles such as the latter, there could have been different results. The present study encourages further research to examine how other art genres made by AI get evaluated.

The present study found a preference for human art above AI art. In further research it would be interesting to see if this preference for human made art is found in other types of art, such as in video making or music. This could be a valuable insight for artists and content creators. Furthermore it would be interesting to examine longitudinal trends in AI appreciation. It may be the case that the preference for human made art changes over time. Lastly, it could be that the preference for human made art above AI art is different in other

cultures. There are countries in the world where AI is used and known less than in the Netherlands. It could be interesting to investigate what preferences people in other countries have. Countries in Africa, for example, are less digitized (Yoon, 2020) and are therefore probably not aware of characteristics of AI art. Understanding the impact of AI art in multiple cultures will better the understanding of the evaluations of AI and human art. The last limitation is that there were only 4 paintings per genre. two for AI and two for humans. This is a small sample to draw a big conclusion from, especially when no previous research has been done on art styles in combination with AI. Therefore, future research is encouraged to replicate the current study to confirm the effects found

Conclusion

The most important findings of the present study are that humans have a preference for human made art above AI art. Furthermore, the present study found that there was an effect of genre on the evaluations of art, especially impressionism and expressionism got rated high and abstract art got rated low, both for the AI and human condition. Lastly, interaction effects were found between value type and genre and genre and artist. The effect of genre on the ratings was bigger when the artist was a human and the effect of genre on the evaluation was bigger when the focus was on economic value. All in all, this research has added valuable knowledge to the scientific field. It confirmed the bias towards AI art that prior research found and it added valuable information about art genres. Understanding the preference for human-created art can be valuable for market strategies and promotion of artworks, but also for AI developers. However, more research is needed to draw a full conclusion on how AI art ,and in specific genres within AI art, are evaluated. This research emphasizes that artists still have a job that is valued and that people are willing to pay more for a human artwork. However, it is important to also keep an eye on the rise of AI in the art industry and to do more research into it to understand what kind of impact it can have for the future of artists.

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