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Consumers' Affective and Cognitive Responses Toward Artificial Intelligence Artworks
- Focused on the Role of Surprise, Threat, and Anthropomorphism -

인공지능 예술에 대한 소비자 감정과 인식
: 놀라움과 위협감의 매개효과 및
의인화의 역할을 중심으로

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ABSTRACT

Consumers' Affective and Cognitive Responses Toward Artificial Intelligence Artworks

- Focused on the Role of Surprise, Threat, and Anthropomorphism -

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Art has long been considered a creative domain that is exclusive to human beings, but now people are exposed to artworks created by artificial intelligence (AI). AI can be an autonomous artist and also collaborate with other human artists. It is becoming more important to understand how people feel and think toward artworks created by AI because AI technology is rapidly developing, and AI is seeking to take over domains that are considered to be exclusive to humans. The current research examines whether consumers' emotion of interest differs based on the types of artist(s) (AI artist vs. AI and human collaboration vs. human artist) and further examines the effect of anthropomorphism.

In study 1, it is proposed that consumers' emotion of interest will differ whether the artworks are created by (1) an AI artist, (2) a collaboration between an AI artist and a human artist, or (3) a human artist. Surprise and perceived threat to

human uniqueness are suggested as mediators for explaining the effect of artist type on consumers' interest. In study 1, 473 participants showed the highest interest when the artist was AI and the lowest interest when the artist was human. There was a significant difference in interest between the AI condition and the human condition. But there was no significant difference in interest between the AI condition and the collaboration condition, and between the collaboration condition and the human condition. The effect of artist type on consumers' interest is driven by surprise and perceived threat to human uniqueness.

In study 2, it is proposed that consumers' interest in the artist's paintings will differ whether the artist is (1) an anthropomorphic AI, (2) a non-anthropomorphic AI, or (3) a human. This effect is suggested to be serially mediated by surprise and interest in the artist. In study 2, 290 participants showed higher interest in anthropomorphic AI's paintings than a non-anthropomorphic AI's or human artist's paintings. But there was no significant difference in consumers' interest in the artist's paintings between the non-anthropomorphic condition and the human artist condition. Results support that the effect of anthropomorphism on consumers' interest in the artist's paintings is serially mediated by surprise and interest in the artist.

This research makes theoretical contributions to the literature on AI and marketing by providing information that people are surprised but also threatened by AI art. Consequently, people are interested in art created by AI more than art created by other types of artists. This research makes another theoretical contribution by identifying the underlying psychological mechanisms that are affective and cognitive. The effect of anthropomorphism also suggests that people feel more interest in anthropomorphic AI's paintings than human's or non-anthropomorphic

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AI's. This research also has a practical implication because companies that make AI art or conduct AI art projects can establish strategic plans for those who may be most interested in AI artworks.

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I. INTRODUCTION

With the rapid development of technology, artificial intelligence (AI) is being incorporated into more aspects of our lives. In particular, AI is challenging our belief that creativity is a valuable asset that only human beings have. Complex algorithms are generating unique art, awe-inspiring music, and realistic movie scripts that are quite similar to those that are man-made. People began to pay more attention to AI's creativity after a painting by an AI was sold at Christie's for $432,500 (Solly 2018). People were quite shocked because people believed that AI can be smart with numbers, but not be creative. However, we can see many examples of AI being active in the creative realm. People even show difficulty in distinguishing works created by AI from works created by humans. There were contests where people had to choose whether the poem was written by an AI or a human, and people could not figure out who wrote the poem (Robitzski 2018). Also, a Japanese AI program co-authored a novel that passed the first round of selection for a literary prize (Olewitz 2016). It is thus very important to realize that although AI initially started off copying and learning existing works, it can now autonomously create unique works with quality comparable to humans.

Many AI firms are putting their efforts in bringing the creative works by AI to the public. AI art galleries are opening their own small online auctions where artworks are sold at reasonable prices as well as high prices (Pulse9 Inc 2020). People can buy AI artworks and also display them at home or in their workplaces. Even a New York City hotel, Sister City Hotel, is playing music created by an Icelandic singer Björk and Microsoft AI in the lobby (Romano 2020). Many artists are also trying to collaborate with AI. For example, an artist Doomin and an AI art

algorithm 'Imagine AI' collaborated and created two art pieces of Dokdo Island (Kim 2019). Doomin finished the top half of the painting, and Imagine AI finished the bottom half. Although the consumption of AI-created works is in its early stage, the general public is becoming more familiar with these new types of creative works. Thus, it has become important to understand how people feel and perceive AI as an artist, a composer, and a journalist.

In this research, we focus on one domain of human creativity, art. Art requires creativity, which is a defining feature of humans that distinguishes people from nonhuman beings such as animals and robots. It has also long been considered a domain that is exclusive to humans. But now people are being exposed to many unfamiliar and unexpected artworks created by AI. The rapid development of technology and increasing familiarity in AI emphasizes the importance of understanding consumers' affective and cognitive responses. Also, AI art-related companies, AI art galleries, or AI art projects (e.g., Artomatix, Pulse9's AI.A, Google Magenta) that are trying to publicize AI art can implement better strategies if they understand consumers.

The current research was conducted to achieve the following objectives. First, consumers' affective and cognitive responses toward AI creative artworks will be identified. Specifically, consumers' emotion of interest can change whether the artwork is created by (1) an AI artist, (2) a collaboration between an AI artist and a human artist ('collaboration' will be used throughout the study), or (3) a human artist. It is predicted that interest will be significantly higher when the artist is AI than when it is human. Surprise and perceived threat to human uniqueness will be examined as the underlying mechanisms for mediating the effect of artist type on consumers' interest (Study 1). Next, the effect of anthropomorphism will be discussed. It is

predicted that consumers' interest in the paintings will differ whether the artist is (1) an anthropomorphic AI, (2) a non-anthropomorphic AI, or (3) a human. This study proposes that consumers will be more interested in the paintings created by an anthropomorphic AI compared to a non-anthropomorphic AI or a human. Surprise and interest in the artist will be examined as the underlying mechanisms for serially mediating the effect of anthropomorphism on consumers' interest in the paintings (Study 2).

II. THEORETICAL BACKGROUND

2.1 Computational Creativity

Creativity is generally defined as the ability to come up with new and valuable ideas in a surprising or unfamiliar way (Runco and Jaeger 2012). People believe that creativity is a unique characteristic of humans, and this belief is quite strong. However, we can now see machines or computers participating in the creative field not just as mere tools but as creative entities. The advanced technology is stimulating a new understanding of creativity and a new subfield of AI called computational creativity. Computational creativity is the application of computer technologies to create things that were thought to be possible for only humans (Colton et al. 2009). There are two types of creativity; psychological creativity (P-creativity), which means novelty with respect to a particular individual, and historical creativity (H-creativity), which means novelty with respect to the whole human history (Boden 1998). Boden (1998) suggested that AI should focus on P-creativity and then develop this to reach H-creativity. Currently, AI can make something new from combinations of familiar ideas (combinational creativity) and come up with new results from adapting a certain style (exploratory creativity). Also, it can transform a structured conceptual space (transformational creativity) (Boden 1998). An example would be Google's DeepDream, which uses a convolutional neural network to generate a unique style of dreamy visual images (Marzano and Novembre 2017).

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2.2 Artificial Intelligence Art

Computer-generated art has existed for quite some time. The artist Harold Cohen, one of the pioneers in the field of computer-generated art, experimented with computer simulations using a computer program named AARON (Cohen 1995). Many researchers continuously developed algorithms to generate more sophisticated and meaningful art. Several deep networks have been used to generate novel images, and a representative example is Generative Adversarial Networks (GAN; Goodfellow et al. 2014). GAN uses two sub-networks, a generator and a discriminator. The study explains that GAN trains itself with multiple images of paintings by understanding and replicating existing artworks (generator) but preventing itself from creating works that are too similar to already existing artworks (discriminator). A research team at Rutgers University proposed a new system called Creative Adversarial Networks (CAN), which 'maximizes deviation from established styles and minimizing deviation from art distribution' (Elgammal et al. 2017). Surprisingly, people could not easily distinguish CAN-generated artworks from human-created artworks.

Most of the previous researches (Chamberlain et al. 2018; Hong and Curran 2019; Kirk et al. 2009; Ragot and Martin 2020) showed negative perceptions toward AI art or computer art. Images that were photoshopped were rated as less aesthetically pleasing compared to images that were labeled as originating from an art gallery (Kirk et al. 2009). Aesthetic ratings of the paintings were lower when the image source was a computer (vs. human) (Chamberlain et al. 2018). Also, overall evaluations of human-created artworks and AI-created artworks were found to be different (Hong and Curran 2019; Ragot and Martin 2020). Similar results were

shown in other creative fields such as music (Moffat and Kelly 2006). From a general perspective, people are less likely to trust and rely on algorithms for subjective (vs. objective) tasks (Castelo et al. 2019), and people prefer handmade products to machine-made products (Fuchs et al. 2015). However, there are conflicting results that show a positive bias toward computer art (Elgammal et al. 2017).

The view that computer art or AI art is less liked and negatively evaluated than human-created works is quite consistent, although there are some conflicting results. People may prefer human-created works because they find more intention and love in the works created by humans. But the development in AI art will continue in the future, and it is important to find out what may bring out the positive feelings and thoughts from the consumers. Rather than focusing on general evaluations and aesthetic ratings, this study will concentrate on the fact that AI art is incongruent with our thoughts about creativity and art. Relevant emotions are surprise and interest, which will be discussed in the next section.

2.3 Surprise and Interest – Incongruent Emotions

People generally have a strong belief that creativity is something that only humans have. But AI is now becoming capable of creating artworks. This may be an unexpected and unfamiliar situation for many people, and it can be considered 'schema-incongruent.' 'Schema' is defined as a cognitive framework that organizes information about a topic, a concept, or a particular stimulus (Fiske and Linville 1980). People tend to become defensive when they encounter novel and unexpected situations (Jonas et al. 2014) and also feel threatened due to schema inconsistencies (Mendes et al. 2007). However, schema incongruency is not always disliked.

Previous literature has shown that people like moderate incongruency (Mandler 1982; Meyers-Levy and Tybout 1989) and may even approach novel and unexpected items such as surrealist art (Swami et al. 2012) and innovative products (Noppers et al. 2015).

When people face cognitive incongruity, they experience epistemic emotions that are induced by unexpected information that is incongruent with their pre-existing knowledge and beliefs (Marshall and Brown 2006). A representative example of epistemic emotions is surprise. Researchers have controversial opinions over whether or not surprise is an emotion because it does not have a valence (Ortony et al. 1988). But recent studies view surprise as a short-lived neutral emotion (Kim and Mattila 2010; Vanhamme and Snelders 2001). Surprise is one of the first reactions due to schema-incongruous information, and it has a core appraisal of novelty, complexity, and unfamiliarity (Scherer 2001). Surprise can become positive or negative after being evaluated (Noordwier and Breugelmans 2013) and may shift to another emotion such as interest or confusion (Silvia 2009). If the situation is easy to understand, then one will experience interest while the opposite would induce confusion. This particular emotion is also relevant to consumers' feelings toward artificial intelligence (Shank et al. 2019). People are surprised by the rapid development in technology, and especially AI's active participation in art is incongruent with their beliefs about creativity. Castelo et al. (2019) showed that people are less likely to rely on algorithms conducting subjective tasks such as art. Thus, people may feel that an AI drawing a painting is something unexpected and unfamiliar and view it as incongruent with their current knowledge structure about art and creativity.

After experiencing surprise, people may further evaluate the situation they encountered, and their emotions may shift to interest. Interest is usually experienced when one appraises a stimulus as novel and easy to understand (Berlyne 1970; Silvia 2005). It is an emotion associated with curiosity, exploration, and information seeking (Fredrickson 1998; Izard and Ackerman 2000; Tomkins 1962). It is also a response to aesthetic objects, which is distinguished from pleasure in that it is induced when one faces a novel but comprehensible stimuli (Silvia 2012; Turner and Silvia 2006). It is likely that people will be interested in AI art because it is something that is not entirely familiar to the general public yet. But since we have been exposed to AI and have seen many instances where AI showed incredible performances, people would not have to process a lot of thinking over the fact that an AI can draw a painting. It may not be familiar, but it is not hard to understand. Understanding consumers' interest may help in probing potential consumers to explore more information about AI art and thus increase their liking.

In this study, interest will be divided into interest in the artist and interest in the artist's paintings. Consumers use many external cues to evaluate something, and artist information may be one cue that can be used to evaluate the paintings. Although little research has been done on how artist information can affect consumers' feelings and thoughts, it has been shown that artist authenticity affects attitude toward the artist, the painting, and thus consumers' behavioral intentions (Moulard et al. 2014). Smith and Newman (2014) also showed that the information on the number of creators involved in creating the artwork could influence peoples' judgments. As most consumers are not experts in art, they have to rely on external cues to help them evaluate art (Lowengart 2010), and artist information can be

helpful. It is expected that people will become most interested when the artist is an AI than when it is human. The schema-incongruent phenomenon of an AI creating art will lead to surprise, which will further lead to interest. Also, interest in the artist may likely lead to interest in the paintings themselves. This can be supported by the law of contagion, which explains that the qualities of an individual are transferred to the object when the individual interacts or touches the object (Argo et al. 2006; Belk 1988).

2.4 Perceived Threat to Human Uniqueness

From a broad perspective, people categorize themselves as human beings, which is their ingroup, while robots or computers are categorized as an outgroup (Złotowski et al. 2017). It is generally believed that people are motivated to perceive their group as positively distinct from others (Marques et al. 1998; Tajfel 1970). This belief is well aligned with the current literature on perceived threat toward algorithms or robots. A renowned theory of threat toward nonhuman beings such as robots can be explained by the uncanny valley theory, which is a theory of the feelings of discomfort, uneasiness, and eeriness when robots look too human-like (Mori 1970). Anthropomorphism, which is the imbuement of human-like characteristics to nonhuman objects (Epley et al. 2007), usually has positive effects (Mourey et al. 2017; Riek et al. 2009; Salem et al. 2013). But if the familiarity increases until it reaches a point where the object becomes too human-like, people may feel negative emotions (Mori 1970).

According to previous literature, people felt stronger eeriness when they encountered virtual reality characters who were autonomous compared to those

characters that were scripted (Stein and Ohler 2017). Ferrari et al. (2016) supported this, showing that when people interact with robots that had the highest similarity to humans, people raised a big concern about the possible damage the robots can cause. Also, when people were given information about the abilities of robots, they felt threatened and expressed less support for robotics research (Yogeeswaran et al. 2016). Specifically, there can be realistic threats and identity threats (Stephan and Stephan 2000). They explained realistic threats as threats to existence, power, and well-being of the ingroup, and identity threats as threats to the values of the ingroup. These two types of threats were also discussed in researches that observed how people perceive robots (Yogeeswaran et al. 2016; Złotowski et al. 2017). When robots are sufficiently human-like and integrated into society, they may not only be perceived as threatening to human jobs and resources (realistic threat) but also be perceived as threatening to human identity (Yogeeswaran et al. 2016). If the robots are autonomous (vs. non-autonomous), people will feel more threatened (Złotowski et al. 2017).

2.5 Anthropomorphism

Anthropomorphism is a tendency to attribute human-like traits such as motivations, intentions, or emotions to nonhuman agents (Epley et al. 2007). Simply put, it is an attribution of human appearances, characteristics, and behaviors to nonhuman agents like computers and robots (Duffy 2003). Among the various ways to anthropomorphize a nonhuman agent, one way is to attribute physical characteristics to the agent. People tend to perceive robots more likable when the robots are anthropomorphized by showing hand and arm gestures physically (Salem

et al. 2013). Anthropomorphism can also be realized through attributing mental states. According to Waytz et al. (2010), people treat nonhuman beings as more like a human-like agent when they are perceived to have a mind. This is also supported by other research findings, such that people are less willing to replace a product that seems to have a mind (Chandler and Schwarz 2010), and trust autonomous vehicle more than a normal car (Waytz et al. 2014). There is also neuroscientific evidence that when people make judgments about anthropomorphized nonhuman being, the same brain region used for making judgments about humans are activated (Castelli et al. 2000).

Previous researches on anthropomorphism have been diverse. Prior works have shown positive sides of anthropomorphism (Aggarwal and McGill 2007; Aggarwal and McGill 2012; Kim and Kramer 2015; Mourey et al. 2017), and also negative sides of anthropomorphism (Kim et al. 2017; Hur et al. 2015). This study focuses on the positive side of anthropomorphism. Especially in the domain of AI, the importance of anthropomorphism has been emphasized since it can increase likeability and familiarity as long as it does not go too far and become uncanny. It is predicted that if AI that can create artworks is described to be human-like, people will be likely to feel more interested. Specifically, non-anthropomorphic AI is described as a mere machine that operates as programmed. Although AI is a technology that emulates human-like qualities and characteristics, being described as a mere machine may decrease the degree of surprise that people feel when compared to highly anthropomorphized AI. On the other hand, highly anthropomorphized AI may induce a different effect. People are still aware that AI is not human, but the attributed human-like qualities may make AI creating art more interesting. The partially human-like form of AI can activate schema incongruency

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and surprise people more, which would lead to more interest.

Many researches about anthropomorphism have been conducted, but there are not many researches in the consumer behavior literature about anthropomorphism of artificial entities. It is important to thoroughly discuss consumers' affective and cognitive responses because AI is becoming more prevalent in our lives. Prior works have shown that anthropomorphism will stimulate human schema with visual and linguistic portrayals (Epley et al. 2007; Guthrie 1993), which will affect the behaviors and evaluations of anthropomorphized entities (Aggarwal and McGill 2007; Chandler et al. 2010). By understanding how people think about creative AI, it will help us understand more about how AI firms can bring out positive perspectives from consumers.

III. RESEARCH MODEL

3.1 Hypotheses

In study 1, it is hypothesized that there will be an effect of artist type on consumers' emotion of interest. Consumers will show more interest in paintings drawn by an AI artist compared to paintings drawn by collaboration or a human artist. Also, consumers will show more interest in paintings when created by collaboration than a human artist. Thus, the following hypotheses are developed:

H1a. Consumers show higher interest when the artworks are created by an AI artist than when created by AI and human collaboration or a human artist.

H1b. Consumers show higher interest when the artworks are created by AI and human collaboration than a human artist.

In order to explain the effect of artist type on consumers' interest, surprise and perceived threat to human uniqueness are proposed as possible mediators. Consumers are more likely to be surprised when the paintings are drawn by an AI artist. AI creating art is incongruent with our pre-existing schema of art and is still not familiar to the general public. On the other hand, people may feel threatened because an AI creating art challenges our belief that creativity is a unique characteristic of human beings. Thus, the following hypotheses are developed:

H2a. The effect of artist type on consumers' interest is mediated by surprise.

H2b. The effect of artist type on consumers' interest is mediated by perceived

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threat to human uniqueness.

Study 2 will observe the effect of anthropomorphism on consumers' interest in the artist's paintings. It is important to discuss anthropomorphism because it influences consumers' judgment by activating human schema, which may lead to positive or negative consequences. Study 2 focuses on the positive effect of anthropomorphism. If the artist is an anthropomorphic AI, it is likely that consumers will feel more interest in the artist's paintings than when the artist is a non-anthropomorphic AI or when the artist is human.

In study 2, surprise and interest in the artist will be observed as the mediators. Although study 1 observed perceived threat to human uniqueness, study 2 focuses on observing surprise in a deeper level and observe interest in a detailed manner by separating them into interest in the artist and interest in the artist's paintings. It is proposed that surprise will lead to interest in the artist, which will consequently lead to interest in the artist's paintings. Thus, the following hypotheses are developed:

H3a. Consumers show higher interest when the artworks are created by an anthropomorphic AI than when created by a non-anthropomorphic AI or a human artist.

H3b. Consumers show higher interest when the artworks are created by a non-anthropomorphic AI than a human artist.

H4. The effect of anthropomorphism on consumers' interest in the artist's paintings is serially mediated by a) surprise and b) interest in the artist.

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3.2 Overview of Studies

Study 1 was conducted to provide evidence for the four proposed hypotheses (H1a-H2b). Consumers' interest is compared between three conditions of artist type, which are (1) AI, (2) collaboration, and (3) human. Specifically, participants in each condition will read a short scenario that contains general information about an artist. Then, the participants in the three groups will see the same two paintings but receive different information about the artist based on the condition they are assigned to. Lastly, the mediation effect will be observed, where surprise and perceived threat to human uniqueness will be proposed as mediators for the parallel mediation (see Figure 1).

Figure 1. Research Model (Study 1)
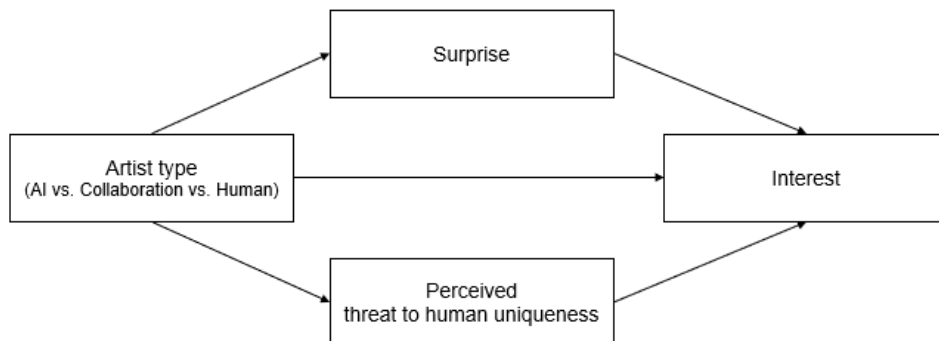
Study 2 was conducted to provide evidence for the four proposed hypotheses (H3a-H4b). In this study, anthropomorphism is the focal issue. In order to effectively observe the effect of anthropomorphism, consumers' interest in the paintings is compared between three conditions of anthropomorphism, which are (1) an anthropomorphic AI, (2) a non-anthropomorphic AI, and (3) a human.

Specifically, participants will read a short scenario explaining about the artist and then see two abstract paintings in the same manner as study 1. Lastly, the serial mediation effect will be observed, where surprise and interest in the artist will be proposed as mediators for the serial mediation (see Figure 2).
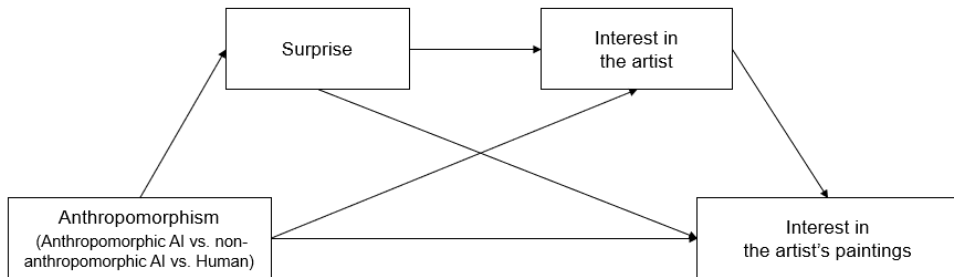

Figure 2. Research Model (Study 2)

IV. STUDY 1

The purpose of study 1 is to observe whether consumers' emotion of interest in the paintings differs depending on artist type. The study also aimed to see if surprise and perceived threat to human uniqueness serve as mediators to explain the effect of artist type on consumers' interest. Additionally, study 1 will observe whether painting type changes the effect of artist type on consumers' interest. Participants in study 1 were first asked to read a short scenario about the artist and see two paintings drawn by the indicated artist type. Painting type (representational vs. abstract) was manipulated to see if the effect of artist type on consumers' interest changes. In the end, debriefing was conducted (Appendix F).

It is predicted that consumers' interest will be high in the order of AI, collaboration, and human. Also, there will be a significant mediating effect. When the artist is AI, people will feel more surprised and sequentially feel more interest. But perceived threat to human uniqueness may mitigate interest and pull down the effect of artist type on consumers' interest. Furthermore, the effect of artist type on consumers' interest will not depend on painting type.

4.1 Method

A total of 473 participants ($M_{Age} = 33.26$; 59.8% females; three participants did not properly indicate their age) from Prolific were randomly assigned to the conditions of a 3 (artist type: AI vs. Collaboration vs. Human) × 2 (painting type: representational vs. abstract) between-subjects design. Initially, 482 participants were recruited, but 9 participants who did not fulfill the manipulation checks were

eliminated.

The participants were randomly assigned to one of the six conditions of 3 artist types × 2 painting types. First, the participants read a short paragraph of general information about the artist (see Appendix A). Regarding the artist type, participants in the AI condition read that due to the rapid progress in computer science, AI is becoming more capable of conducting creative tasks, and they are creating unique and distinct artworks as an autonomous artist. Participants in the collaboration condition also read a similar scenario to the AI condition, except that the artists are AI and human. Participants in the human condition read a general description of consumers' interest in art and contemporary artist's efforts in sharing new ideas and unique, distinct artworks to the general public. The texts in the scenarios were similar across the three conditions except that the artist was different based on the condition. After reading the description of the artist, the participants saw paintings that correspond to their assigned painting type condition (Appendix B). In addition, participants in each of the AI, collaboration, and human artist conditions are assigned to either representational or abstract painting type condition. Each painting type condition has two paintings, where one is actually drawn by AI and human collaboration and the other is drawn by a human artist.

The paintings were chosen based on advice given by three art experts. The three experts were asked to categorize several paintings into representational or abstract art, and one of the experts rated the paintings based on complexity, fluency, emotion, and arousal. Four paintings that were neutral on these four characteristics were chosen. The two paintings shown in the representational art condition were "The End of Patience" by Leonid Afremov and "NYC Alleyway" by Paintly AI with

You Jin (credits to Pulse 9's AI.Art gallery, AI.A). The two paintings shown in the abstract art condition were "Abstract Flower #4" by Lim Chae Seok (used AI NABI; credits to Pulse 9's AI.Art gallery, AI.A) and "Abstracting" by Alessandro Zanetti.

After reading the scenario and viewing two paintings, participants were asked to answer their interest in the artist's paintings (see Appendix C). Interest was measured with two items using a 7-point Likert scale (1="not at all" to 7="completely"): "The artist's paintings made me feel curious" and "I would be interested in seeing other paintings by the artist(s)" (α= .854; adapted from Silvia 2005). Then, surprise and perceived threat to human uniqueness were measured subsequently as the mediating variables. Surprise was measured with five items using a 7-point Likert scale (1="not at all" to 7="completely"): "The artist's paintings are better than I expected," "I am surprised at the artist's paintings," "I am amazed at the artist's paintings," "I am astonished at the artist's paintings," and "The experience of seeing the artist's paintings is surprising" (α = .938; adapted from Ludden et al. 2009; Ludden et al. 2012). Perceived threat to human uniqueness was measured with three items using a 7-point Likert scale (1="not at all" to 7="completely"): "The experience was threatening to human distinctiveness," "The experience was threatening to human uniqueness," and "The experience was threatening to human creativity" (α = .952; adapted from Yogeeswaran et al. 2016; Złotowski et al. 2017).

In addition, participants responded to three questions on their art expertise. The questions used in the current study were adapted from Chamberlain et al. (2018), encompassing three questions: "Have you ever worked/studied in an art-related field?" ("Yes" or "No"), "How many art-related classes have you taken at the high

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school level or above?" ("0" to "6 or above"), and "On average, you visit art galleries about once every:" ("almost never" to "week"). The participants also answered two questions asking their general knowledge and familiarity with AI. Two items using a 7-point Likert scale (1="not at all" to 7="completely") were asked: "Do you think you know well about artificial intelligence?" and "Are you familiar with artificial intelligence as an artist?" Lastly, in order to see if the participants paid careful attention to the study, the same manipulation checks were conducted twice. The question for the manipulation check was first asked after the participants viewed the paintings and again before they answered the expertise question at the end of the survey. The participants had to indicate who the artist was among the four choices of (1) AI, (2) Human, (3) AI and Human, and (4) None of the above.

4.2 Results and Discussion

Preliminary Analyses

First of all, participants in different groups were examined whether they differ in art expertise and AI familiarity. Participants in the AI, collaboration, and human conditions did not differ in art expertise ($F < 1$) and AI familiarity ($F < 1$). Secondly, it was examined whether the effect of artist type depends on the painting type (representational vs. abstract). A two-way ANOVA was conducted, and the two-way interaction effect turned out to be nonsignificant ($F < 1$). This finding indicates that participants' interest in representational and abstract paintings does not differ. Thus, the data across the two painting types was aggregated.

Interest

A one-way ANOVA revealed a significant difference across the three conditions ($F(2, 470) = 3.263$, $p < .05$; see Figure 3). Planned contrasts showed that participants in the AI condition ($M_{AI} = 4.42$, SD = 1.69; $t(470) = 2.55$, $p = .011$) showed more interest than participants in the human condition ($M_{human} = 3.91$, SD = 1.86). But there was no significant difference between the AI and collaboration conditions (4.42 vs. 4.20; $t(470) = 1.11$, $p = .267$) and between the collaboration and human conditions (4.20 vs. 3.91; $t(470) = 1.45$, $p = .147$).
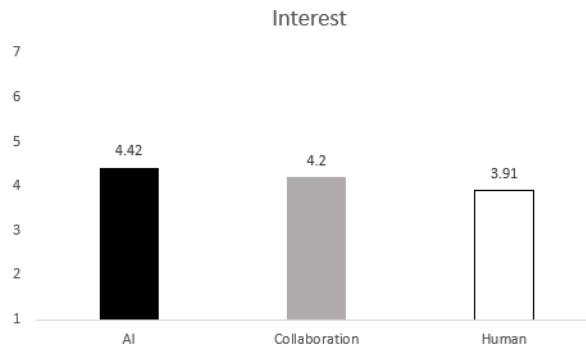
Figure 3. Results for Study 1: Main Effects

Surprise

A one-way ANOVA revealed a significant difference across the three conditions ($F(2, 470) = 17.83$, $p < .001$; see Figure 4). Planned contrasts showed that participants in both AI ($M_{AI} = 4.52$, SD = 1.64; $t(470) = 5.86$, $p < .001$) and collaboration ($M_{collaboration} = 3.82$, SD = 1.67; $t(470) = 2.07$, $p = .040$) conditions were more surprised than did those in the human condition ($M_{human} = 3.44$, SD = 1.59). There was also a significant difference between the AI and collaboration conditions (4.52 vs. 3.82; $t(470) = 3.85$, $p < .001$).

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Perceived threat to human uniqueness

A one-way ANOVA revealed a significant difference across the three conditions ($F(2, 470) = 27.069$, $p < .001$; see Figure 4). Planned contrasts showed that participants in both AI ($M_{AI} = 2.41$, SD = 1.71; $t(470) = 6.96$, $p < .001$) and collaboration ($M_{collaboration} = 2.21$, SD = 1.55; $t(470) = 5.66$, $p < .001$) conditions perceived more threat to human uniqueness than did those in the human condition ($M_{human} = 1.30$, SD = .76). However, there was no significant difference between the AI and collaboration conditions (2.41 vs. 2.21; $t(470) = 1.30$, $p = .195$).
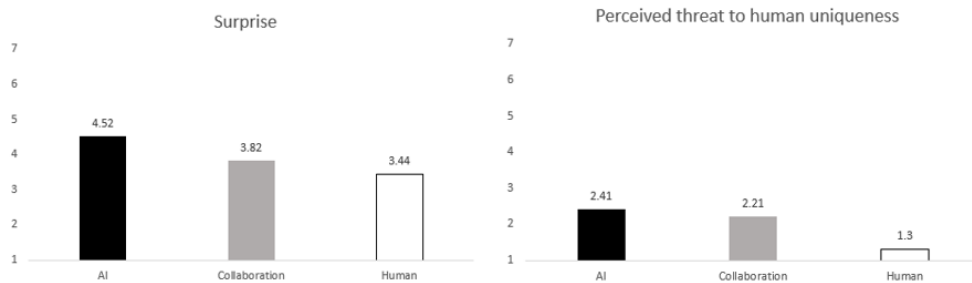
Figure 4. Results for Study 1: Mediators

Mediation analyses

To test the mediation effect, a bootstrapping analysis using the PROCESS with 5,000 samples was conducted (Model 4; Hayes 2013). Results based on bootstrapped 95% confidence intervals confirmed that both surprise (ab = .13, SE = .068, CI[.0039, .2704]) and perceived threat to human uniqueness (ab = -.09, SE = .023, CI[-.1393, -.0493]) completely mediated the effect of artist type on consumers' interest. The artist type affected surprise, which in turn, affected consumers' interest. The artist type also affected perceived threat to human uniqueness, which affected consumers' interest (see Figure 5).
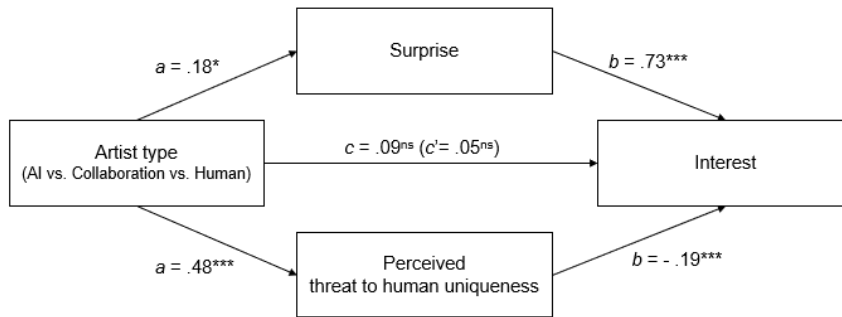
NOTE.—Significance levels are denoted by * at p < .1 and ** at p < .05 and *** at p < .01.

Figure 5. Results for Study 1: Mediation Analysis

Discussion

      Results of study 1 support the effect of artist type on consumers' interest. Participants in the AI condition (vs. collaboration condition or human condition) were more likely to feel surprised and thus show more interest. Participants in the human condition showed the least surprise and interest. Furthermore, the parallel mediation analysis revealed that the main effect is mediated by surprise and perceived threat to human uniqueness. The main effect can be explained by the interplay between the positive effect of surprise and negative effect of perceived threat to human uniqueness. Additionally, multiple comparison analyses (Scheffe tests) were conducted, which showed similar results to the planned contrasts even though the overall p-values slightly increased. The next study focuses on whether consumers' interest is contingent on the degree of anthropomorphism. Interest will be specifically discussed by observing both interest in the artist and interest in the artist's paintings.

V. STUDY 2

The purpose of study 2 was to observe whether consumers' emotion of interest in the artist's paintings differs based on the degree of anthropomorphism. This study compared an anthropomorphic AI, a non-anthropomorphic AI, and a human artist. The study also aimed to see the role of interest in the artist. This study aims to show that participants will feel surprise after learning who the artist is and seeing the paintings, which will affect their interest in the artist and thus the paintings. Participants in this study were first asked to read a short scenario about the artist and see two paintings drawn by the indicated artist in the similar manner to study 1. In the end, debriefing was conducted (Appendix F).

5.1 Method

A total of 290 participants (M_{Age} = 32.48; 55.2% females) from Prolific were randomly assigned to the conditions of a one-factor (anthropomorphism: anthropomorphic AI vs. non-anthropomorphic AI vs. Human) between-subjects design. Initially, 301 participants were recruited, but 11 participants who did not fulfill the manipulation checks or did not want their responses to be used for the research were eliminated.

Participants were randomly assigned to one of the three conditions of anthropomorphism and read a short paragraph of general information about the artist (see Appendix D). Participants in the anthropomorphic AI condition read a short passage about an AI named 'Aiden' who was given a gender (male). In this condition, a first-person language was used to maximize the degree of anthropomorphism. In

the non-anthropomorphic AI condition, the AI artist was not given a name nor a gender, and it was objectively described by using the third-person language. The degree of anthropomorphism was also manipulated by using languages that correspond to each condition. The anthropomorphic AI condition used dialogical cues that are usually associated with humans (e.g., create, inspiration). The non-anthropomorphic AI condition used dialogical cues that are associated with computers or robots (e.g., produce, generate, programmed patterns). The scenario in the human condition is similar to the one in the anthropomorphic AI condition. It used a first-person language and used dialogical cues that are associated with humans. The only difference was that the artist was described as a human and was not given a name. The overall structure and content of the scenario in the three conditions were similar. Next, participants were shown two paintings in a sequential manner. The two paintings shown are the same as those used in the abstract painting condition of Study 1. In each condition, participants saw the paintings which had an artist label beside it.

After reading the scenario and viewing the paintings, participants were asked to answer their interest in the artist's paintings (see Appendix E). Interest in the artist's paintings was measured with four items using a 7-point Likert scale (1="not at all" to 7="completely"): "I want to learn more about the artist's paintings," "I would be interested in seeing other paintings by the artist," "I would like to know more about the artist's paintings," and "I would like to explore more about the artist's paintings" (α= .966; adapted from Silvia 2005). Then, interest in the artist was measured with six items using a 7-point Likert scale (1="not at all" to 7="completely"): "I want to learn more about the artist," "I am curious about the

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artist," "I would like to know more about the artist," "I am curious about the how the artist creates the paintings," "I am curious about the potential of the artist," and "I would like to explore more about the artist" (α= .963; adapted from Silvia 2005). In the next section, surprise was measured with five items that were used in Study 1 (α= .935).

In order to see if the participants paid careful attention to the study, the same manipulation checks were conducted twice. The question for the manipulation check was first asked after the participants viewed the painting and again before they answered questions on their art expertise at the end of the survey. The participants had to indicate who the artist was among the three choices of (1) Artificial Intelligence, (2) Human, and (3) None of the above. Manipulation check questions regarding anthropomorphism were asked in order to see if the degree of anthropomorphism was effectively manipulated. The questions were: "The artist seems to have a free will," "The artist seems to have a mind," "The artist seems to have desires," "The artist seems to have intentions," "The artist seems to have a consciousness," and "The artist seems to have beliefs" (α= .957; adapted from Herak et al. 2019). In addition, participants responded to two questions on art expertise: "How many art-related classes have you taken at the high school level or above?" ("0" to "6 or above"), and "On average, you visit art galleries about once every:" ("almost never" to "week"). Participants' general knowledge and familiarity of AI was also asked with questions that were used in Study 1. Results showed that participants in anthropomorphic AI, non-anthropomorphic AI, and human conditions did not differ in art expertise (F < 1) and AI familiarity (F < 1).

5.2 Results and Discussion

Anthropomorphism Manipulation Check

Six items that were used to measure the degree of anthropomorphism were averaged. A one-way ANOVA was conducted and the results showed a significant difference across the three conditions ($F(2, 287) = 106.397$, $p < .001$). Planned contrasts showed that participants in both human ($M_{human} = 5.56$, SD = 1.18; $t(287) = 14.50$, $p < .001$) and anthropomorphic AI ($M_{anthropomorphic} = 3.71$, SD = 1.71; $t(287) = 5.69$, $p < .001$) conditions deemed the artists to be more human-like than the artist in the non-anthropomorphic AI condition ($M_{non-anthropomorphic} = 2.55$, SD = 1.35). Also, the artist in the human condition was evaluated to be more human-like than the artist in the anthropomorphic AI condition (5.56 vs. 3.71; $t(287) = 8.87$, $p < .001$). Thus, the anthropomorphism manipulation was effectively conducted.

Interest in the artist's paintings

A one-way ANOVA revealed a significant difference across the three conditions ($F(2, 287) = 3.979$, $p < .05$; see Figure 6). Planned contrasts showed that participants in anthropomorphic AI condition ($M_{anthropomorphic} = 3.99$, SD = 1.95; $t(287) = 2.82$, $p < .01$) showed more interest than participants in the non-anthropomorphic AI condition ($M_{non-anthropomorphic} = 3.21$, SD = 1.95). But there was no significant difference between the anthropomorphic AI and human conditions (3.99 vs. 3.60; $t(287) = 1.40$, $p = .163$) and between the non-anthropomorphic AI and human conditions (3.21 vs. 3.60; $t(287) = 1.37$, $p = .172$).
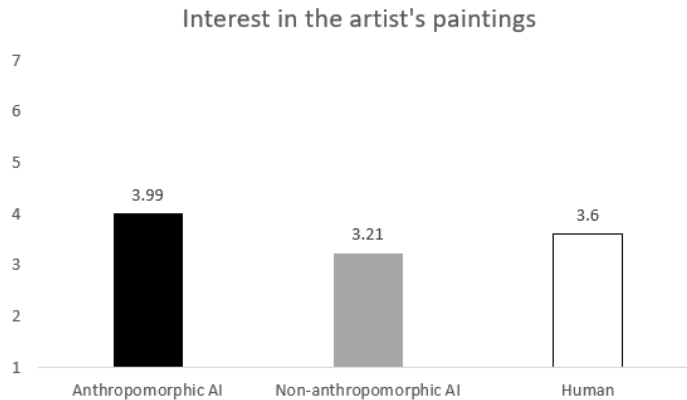
Figure 6. Results for Study 2: Main Effects

Surprise

A one-way ANOVA revealed a significant difference across the three conditions ($F(2, 287) = 4.49$, $p < .05$; see Figure 7). Planned contrasts showed that participants in anthropomorphic AI condition ($M_{anthropomorphic} = 4.22$, SD = 1.73) were more surprised than did those in the non-anthropomorphic AI ($M_{non-anthropomorphic} = 3.83$, SD = 1.70; $t(287) = 1.37$, $p < .1$) condition and those in the human condition ($M_{human} = 3.50$, SD = 1.51; $t(287) = 2.99$, $p < .005$). But there was no significant difference between the non-anthropomorphic AI and human conditions (3.83 vs. 3.50; $t(287) = 1.37$, $p = .173$).

Interest in the artist

A one-way ANOVA revealed a significant difference across the three conditions ($F(2, 287) = 7.69$, $p = .001$; see Figure 7). Planned contrasts showed that interest in the artist is significantly higher in the anthropomorphic AI condition ($M_{anthropomorphic} = 4.31$, SD = 1.87; $t(287) = 3.92$, $p < .001$) than the non-anthropomorphic AI ($M_{non-anthropomorphic} = 3.28$, SD = 1.84). There was a marginally

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significant difference between the anthropomorphic AI condition and the human condition regarding consumers' interest in the artist (4.31 with SD = 1.87 vs. 3.79 with SD =1.82; $t(287) = 1.93$, $p = .054$). Also, there was a marginally significant difference between the human condition and the non-anthropomorphic AI condition regarding consumers' interest in the artist (3.79 vs. 3.28; $t(287) = 1.91$, $p = .057$). The results also showed that regarding interest in the artist, the order of non-anthropomorphic AI condition and human condition was reversed when compared to surprise.
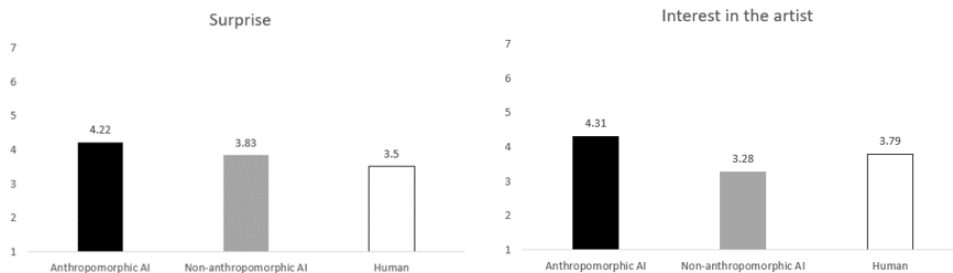
Figure 7. Results for Study 2: Mediators

Mediation analyses

To test the serial mediation effect, a bootstrapping analysis using the PROCESS with 5,000 samples was conducted (Model 6; Hayes 2013). The model uses the degree of anthropomorphism as the independent variable (1=anthropomorphic AI, 2=non-anthropomorphic AI, 3=human), surprise and interest in the artist as mediators, and interest in the artist's paintings as the dependent variable. Results based on bootstrapped 95% confidence intervals confirmed that surprise and interest in the artist serially mediate the effect of anthropomorphism on consumers' interest in the artist's paintings (95% CI[-.3081, -.0591]). The degree of anthropomorphism increased surprise and then interest in the

artist, which led to increase in interest in the artist's paintings (See Figure 8).
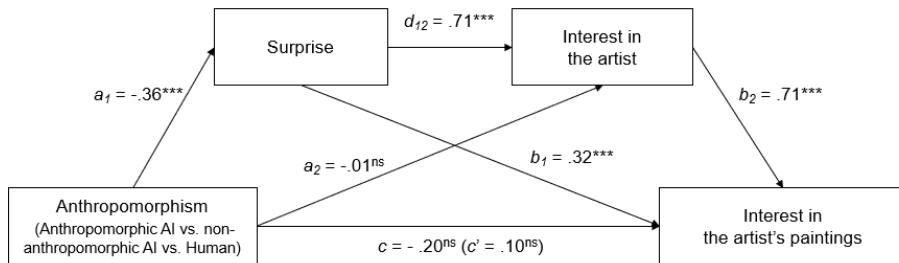
NOTE.—Significance levels are denoted by * at p < .1 and ** at p < .05 and *** at p < .01.

Figure 8. Results for Study 2: Mediation Analysis

Discussion

Results of study 2 support the effect of anthropomorphism on consumers' interest in the artist's paintings. Participants who were presented the anthropomorphic AI condition (vs. non-anthropomorphic condition or human condition) were more likely to feel surprised, show more interest in the artist, and thus show more interest in the artist's paintings. Furthermore, the mediation analysis revealed that the main effect is serially mediated by surprise and interest in the artist. Interestingly, the order of the non-anthropomorphic AI condition and human condition is reversed in regard to surprise and interest in the artist.

VI. GENERAL DISCUSSION

Art created by AI is becoming more familiar to the public, and the development of AI technology is an inevitable change that we must go through. This change is raising the importance of understanding how people feel and think toward AI creativity and AI artworks. Study 1 investigated consumers' emotion of interest based on the type of artist(s). The results of study 1 showed that consumers' interest is high in the order of AI, collaboration, and human artists. Consumers' interest in AI-created artworks was significantly higher than the human-created artworks. But there was no significant difference in interest between artworks created by an AI artist and by collaboration. There was also no difference in interest between artworks created by collaboration and by a human artist. The effect of artist type on consumers' interest was explained by the interplay between positive effect of surprise and negative effect of perceived threat to human uniqueness.

Study 2 focused on whether consumers' interest depends on the degree of anthropomorphism. Consumers showed more interest when the paintings were created by an anthropomorphic AI than a non-anthropomorphic AI or a human artist. But there was no significant difference between a non-anthropomorphic AI artist and a human artist. The effect of anthropomorphism on consumers' interest in the artist's paintings was shown to be serially mediated by surprise and interest in the artist.

6.1 Theoretical and Practical Implications

This research makes several fundamental contributions. First, it makes a theoretical contribution by adding to the literature that examines consumers'

affective and cognitive responses toward AI. Especially in the art domain, AI can be an autonomous artist and also collaborate with human artists. Study 1 observed how people feel and think toward AI and collaboration artworks, which has not been discussed much in previous researches. Some studies observed comprehension, collaboration, and competition which are the three dimensions on how consumers relate to anthropomorphized entities (Yang et al. 2019) and observed the supporting role of AI in a medical domain (Longoni et al. 2019). But they are theoretical papers or did not directly measure consumers' responses toward collaboration. Also, Study 2 makes a theoretical contribution by adding to the literature on consumers' responses toward anthropomorphic entities. The current study focused on attributions of mental attributes to nonhuman beings. This subtle approach in understanding consumer responses shows a meaningful result in how anthropomorphism can affect consumers' interest in the AI paintings.

Another theoretical contribution is the identification of the underlying psychological mechanisms. Most of the previous literature on consumers' responses toward AI art focused on aesthetic ratings and evaluation, and most did not provide empirical evidence for the underlying reasons. But in this study, surprise, which is a type of epistemic or knowledge emotion, was investigated along with perceived threat to human uniqueness as mediators. The artist type affected surprise, which in turn, affected consumers' interest. The artist type also affected perceived threat to human uniqueness, which in turn, affected consumers' interest. Interest in the artist was also investigated in the study in order to capture the connection between surprise and interest in the artist's paintings. The degree of anthropomorphism increased surprise and then interest in the artist, which led to increase in interest in the artist's

paintings.

This study has important managerial implications. Researches on AI art are scarce, and most of them showed a negative bias toward AI art. This study shows the positive side of AI, which can suggest directions that the AI art companies or galleries may have to pursue in order to provide favorable artworks to consumers. Considering that people are not familiar with AI, it may be difficult to bring out positive consumption behaviors for the time being. It would then be important for the companies to focus on consumers' emotion of interest, which is expected to help greatly in forming an innovative consumer segment. Leading consumers to become more interested in AI and promoting them to explore more will naturally increase consumers' knowledge of AI. Such steps will be necessary in order to lead consumers to have positive attitude toward AI art which may lead to purchasing behavior of AI artworks. AI art companies or galleries can effectively plan strategies to strengthen positive emotions such as surprise and interest. At the same time, the companies need to alleviate negative perception of AI art such as perceived threat to human uniqueness.

6.2 Limitations and Further Research

In order to remove confounding effects from the paintings themselves, two paintings were shown in each artist type condition. However, showing two paintings could have confused the participants in evaluating the paintings. One could have been interested in the first painting but not as much in the second painting and vice versa. Although two paintings were used for more advantages, it might be needed to find other alternatives to resolve the confusion. Another limitation is that it did not

go further to observe actual purchase intentions or behaviors. The study took a piecemeal approach, but future research may include consumers' intentions or behavior in a more comprehensive manner. Conducting field research will also help in generalizing the results found in this study.

Future studies may observe moderating effects to see if surprise can be strengthened or perceived threat to human uniqueness can be mitigated. A possible moderator would be consumers' art expertise. It has been shown that evaluations of art differ significantly based on art expertise (Leder et al. 2012), and experts may be more surprised while novices may not be as strongly affected as experts. By introducing moderators, it may be possible to specifically examine consumers' interest, perceived threat to human uniqueness, and consequently their behaviors. Another possible approach in understanding consumers would be considering factors such as price. Recently, many AI art galleries are able to provide art at reasonable prices. Soon, AI artworks will be provided to the consumers at a more reasonably low price. If the price of AI art is lower than the price of human-created art, will consumers prefer AI art more? Individual differences in purchasing artworks will be an important moderator that can suggest how AI art-related companies can target potential consumers. In the strategic point of view, AI art companies and art galleries need to find ways to transform consumers who are negative toward AI art into loyal customers.

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VIII. APPENDIX

A. Study 1 Artist Type Manipulation

AI condition
Due to the rapid progress in computer science, Artificial Intelligence (AI) is becoming more capable of conducting creative tasks that are previously thought to be done by only human beings. Especially in the domain of art, AI is capable of creating unique and distinctive works on its own as an autonomous artist. An AI artist conceptualizes the overall idea, draws a rough sketch, and finishes the painting.
Collaboration condition
Due to the rapid progress in computer science, Artificial Intelligence (AI) is becoming more capable of conducting creative tasks that are previously thought to be done by only human beings. Especially in the domain of art, AI is collaborating with human artists to create unique and distinctive artworks together. An AI artist conceptualizes the overall idea and draws a rough sketch, and a human artist finishes the painting or vice versa.
Human condition
Due to the new trend of modern art, modern artists are receiving more attention and the general public's interest in art is constantly growing. Many contemporary artists try to share their new ideas with the public and create their own unique and distinctive works. An artist conceptualizes the overall idea, draws a rough sketch, and finishes the painting.

B. Study 1 & 2 Painting Type Manipulation

Representational art condition (Study 1)	
Scenario	Now you will see two paintings that are classified as 'representational art.' Representational art describes artworks that clearly depict real objects and their physical appearances in reality.
Paintings	• "The End of Patience" by Leonid Afremov • "NYC Alleyway" by Paintly AI with You Jin (credits to Pulse 9's AI.Art gallery, AI.A)
Abstract art condition (Study 1 & 2)	
Scenario	Now you will see two paintings that are classified as 'abstract art.' Abstract art describes artworks that do not attempt to depict a visual reality but instead use visual language of shape, color, form, and line to create a composition.
Paintings	• "Abstract Flower #4" by Lim Chae Seok (used AI NABI; credits to Pulse 9's AI.Art gallery, AI.A) • "Abstracting" by Alessandro Zanetti

C. Study 1 Questionnaire

Variable	Question	Reference
Interest	The artist's paintings made me feel curious	adapted from Silvia 2005
	I would be interested in seeing other paintings by the artist(s)	
Surprise	The artist's paintings are better than I expected	adapted from Ludden et al. 2009; Ludden et al. 2012
	I am surprised at the artist's paintings	
	I am amazed at the artist's paintings	
	I am astonished at the artist's paintings	
	The experience of seeing the artist's paintings is surprising	
Perceived Threat to Human Uniqueness	The experience was threatening to human distinctiveness	adapted from Yogeeswaran et al. 2016; Złotowski et al. 2017
	The experience was threatening to human uniqueness	
	The experience was threatening to human creativity	

D. Study 2 Artist Type Manipulation (Anthropomorphism)

Anthropomorphic AI condition
My name is Aiden. I am an artificial intelligence (AI) artist. I create unique and distinctive works on my own like a human being. I am delicate, experienced, and also appreciative when creating my artworks.   When I draw a painting, I conceptualize the overall idea, draw a rough sketch, and give a final touch on my own. I also consistently invent new types of painting styles to improve myself as a creative artist.   Based on my knowledge of existing artworks, I use my mind to create new art and to portray my inspirations. I carefully choose the optimal colors from the wide range of existing shades in order to create the final artworks.
Non-anthropomorphic AI condition
Artificial intelligence (AI) is a computer algorithm. It generates unique and distinctive works on its own by using machine learning. It is precise, skillful, and efficient when creating its own artworks.   When the AI generates a painting, it uses algorithms to program the overall structure, make a rough sketch, and produce the final output. It is also equipped with new types of painting styles to become more advanced.   Based on the inputs of existing artworks, it uses computer programs to generate new art and to depict its programmed patterns. It is trained to choose the exact colors from the wide range of existing shades in order to produce the final output.
Human condition
I am a contemporary artist who try to share my new ideas with the public. I create unique and distinctive works on my own. I am delicate, experienced, and also appreciative when creating my artworks.   When I draw a painting, I conceptualize the overall idea, draw a rough sketch, and give a final touch on my own. I also consistently invent new types of painting styles to improve myself as a creative artist.   Based on learning through my past experiences, I use my mind to create new art and to portray my inspirations. I carefully choose the optimal colors from the wide range of existing shades in order to create the final artworks.

E. Study 2 Questionnaire

Variable	Question	References
Interest in the artist's paintings	I want to learn more about the artist's paintings	adapted from Silvia 2005
	I would be interested in seeing other paintings by the artist	
	I would like to know more about the artist's paintings	
	I would like to explore more about the artist's paintings	
Interest in the artist	I want to learn more about the artist	
	I am curious about the artist	
	I would like to know more about the artist	
	I am curious about how the artist creates the paintings	
	I am curious about the potential of the artist	
	I would like to explore more about the artist	
Surprise	The artist's paintings are better than I expected	adapted from Ludden et al. 2009; Ludden et al. 2012
	I am surprised at the artist's paintings	
	I am amazed at the artist's paintings	
	I am astonished at the artist's paintings	
	The experience of seeing the artist's paintings is surprising	
Anthropomorphism	The artist seems to have a free will	adapted from Herak et al. 2019
	The artist seems to have a mind	
	The artist seems to have desires	
	The artist seems to have intentions	
	The artist seems to have a consciousness	
	The artist seems to have beliefs	

F. Debriefing

Thank you for your participation! Your participation is greatly appreciated.

Earlier in the consent form, we informed you that the purpose of the study was to understand individuals' opinions on various paintings. In actuality, our study is about understanding the effect of artist information on consumers' emotions and thoughts. Although the participants received different information about the artist(s), all of the participants were shown the same two paintings, where one is drawn by a human artist and the other is drawn by a collaboration between an artificial intelligence artist and a human artist.

The first painting is "The end of patience" by Leonid Afremov. The second painting is "NYC Alleyway" by Paintly AI with You Jin (credits to Pulse 9's AI.Art gallery, AI.A). We decided to show the same paintings since the focus of our research is the differences in artist information rather than the paintings themselves. In this study, we expected that respondents will show different responses whether the artist(s) is(are) (1) human, (2) artificial intelligence, or (3) both artificial intelligence and human (collaboration).

We apologize for having misled you about the artist's information, but we hope you understand the reason for it. Had we told you what our aim was correctly, your answers might not have accurately captured your feelings and thoughts. We also hope you do not discuss this study with anyone else who is currently participating or might participate in this survey in the future.

 Now that you know the more specific purpose of our study, we will ask for your consent in participation again and provide the opportunity to cancel your responses. If you agree that your responses will be used as research data only, please click the first checkbox below. If you disagree, please click the second checkbox. Additionally, if you have any questions or concerns regarding this study, its purpose or procedures, please feel free to send an email to yiceleste@gmail.com

Study 1 (Abstract painting condition)

Thank you for your participation! Your participation is greatly appreciated.

Earlier in the consent form, we informed you that the purpose of the study was to understand individuals' opinions on various paintings. In actuality, our study is about understanding the effect of artist information on consumers' emotions and thoughts. Although the participants received different information about the artist(s), all of the participants were shown the same two paintings, where one is drawn by a collaboration between an artificial intelligence artist and a human artist, and the other is drawn by a human artist.

The first painting is "Abstract Flower #4" by Lim Chae Seok (used AI NABI; credits to Pulse 9's AI.Art gallery, AI.A). The second painting is "Abstracting" by Alessandro Zanetti, licensed under CC BY-NC 4.0. We decided to show the same paintings since the focus of our research is the differences in artist information rather than the paintings themselves. In this study, we expected that respondents will show different responses whether the artist(s) is(are) (1) human, (2) artificial intelligence, or (3) both artificial intelligence and human (collaboration).

We apologize for having misled you about the artist's information, but we hope you understand the reason for it. Had we told you what our aim was correctly, your answers might not have accurately captured your feelings and thoughts. We also hope you do not discuss this study with anyone else who is currently participating or might participate in this survey in the future.

Now that you know the more specific purpose of our study, we will ask for your consent in participation again and provide the opportunity to cancel your responses. If you agree that your responses will be used as research data only, please click the first checkbox below. If you disagree, please click the second checkbox. Additionally, if you have any questions or concerns regarding this study, its purpose or procedures, please feel free to send an email to yiceleste@gmail.com.

Thank you for your participation! Your participation is greatly appreciated.

Earlier in the consent form, we informed you that the purpose of the study was to understand individuals' opinions on various paintings. In actuality, our study is about understanding the effect of artist information and anthropomorphism on consumers' emotions and thoughts. Although the participants received different information about the artist, all of the participants were shown the same two paintings. One is drawn by a collaboration between an artificial intelligence artist and a human artist, and the other is drawn by a human artist.

The first painting is "Abstract Flower #4" by Lim Chae Seok (used AI NABI; credits to Pulse 9's AI.Art gallery, AI.A). The second painting is "Abstracting" by Alessandro Zanetti, licensed under CC BY-NC 4.0.   We decided to show the same paintings since the focus of our research is the differences in artist information rather than the paintings themselves. In this study, we expected that respondents will show different responses whether the artist is (1) human or (2) artificial intelligence (highly/low anthropomorphized).

We apologize for having misled you about the artist's information, but we hope you understand the reason for it. Had we told you what our aim was correctly, your answers might not have accurately captured your feelings and thoughts. We also hope you do not discuss this study with anyone else who is currently participating or might participate in this survey in the future.

Now that you know the more specific purpose of our study, we will ask for your consent in participation again and provide the opportunity to cancel your responses. If you agree that your responses will be used as research data only, please click the first checkbox below. If you disagree, please click the second checkbox. Additionally, if you have any questions or concerns regarding this study, its purpose or procedures, please feel free to send an email to yiceleste@gmail.com.

요약(국문초록)

최근 들어 사람들은 인공지능이 창작한 예술 작품에 더 노출되고 있다. 기술이 빠르게 발전하고 인공지능이 일반 대중에게 더 친숙해지고 있기 때문에 사람들이 인공지능으로 만든 예술 작품에 대해 어떻게 느끼고 생각하는지 이해하는 것이 중요해지고 있다. 특히 예술은 오랜 시간 동안 인간의 고유한 창작 영역으로 여겨져 왔기 때문에 연구의 필요성은 커지고 있다. 본 연구는 (1) 예술가의 유형 (인공지능 vs. 인공지능과 인간 간의 협업 vs. 인간)과 (2) 인공지능 예술가가 의인화된 정도 (의인화된 인공지능 vs. 의인화되지 않은 인공지능 vs. 인간)가 소비자의 흥미(interest)에 미치는 영향을 확인하고자 한다.

연구 1에서는 소비자들의 흥미가 예술가의 유형에 따라 다르게 나타나는지 살펴보고자 한다. 구체적으로, 예술가가 인공지능일 때 흥미가 가장 크게 나타나고 예술가가 인간일 때 흥미가 가장 낮게 나타날 것으로 예상된다. 예술가의 유형이 소비자의 흥미에 미치는 영향을 매개하는 변수로써 놀라움과 인간의 고유성에 대한 위협감을 제시하고자 한다. 연구 1 (n = 473)은 예술가의 유형이 소비자들의 흥미에 미치는 효과를 검증하였다. 참가자들의 흥미는 인공지능, 협업, 인간 예술가 순으로 컸으며, 인공지능 조건과 인간 조건 사이에서 유의미한 차이가 있는 것으로 나타났다. 그러나 참가자들의 흥미는 인공지능 조건과 협업 조건, 그리고 협업 조건과 인간 조건 사이에서 큰

차이가 없는 것으로 나타났다. 한편으로, 예술가 유형이 소비자의 흥미에 미치는 영향은 놀라움과 인간의 고유성에 대한 위협감에 의해 매개되었다. 구체적으로, 놀라움과 인간의 고유성에 대한 위협감은 예술가가 인공지능일 때 가장 높았고, 인간일 때 가장 낮았다.

연구 2에서는 예술가가 의인화된 정도에 따라 소비자들의 흥미가 달라지는지 확인하고자 한다. 소비자들의 흥미는 예술가가 의인화된 인공지능일 때 가장 클 것이며, 의인화의 정도가 예술가의 작품에 대한 소비자의 흥미에 미치는 영향은 놀라움과 예술가에 대한 흥미에 의해 연속적으로 매개될 것으로 예상된다. 연구 2 (n = 290)는 의인화된 인공지능 예술가의 작품에 대한 소비자들의 흥미에 미치는 영향을 살펴보았다. 참가자들은 의인화되지 않은 인공지능이나 인간의 예술 작품보다 의인화된 인공지능의 작품에 더 큰 흥미를 보였다. 이러한 주효과는 놀라움과 예술가에 대한 흥미에 의해 연속적으로 매개됨을 확인하였다.

이 연구는 인공지능 예술에 대한 소비자들의 감정적 그리고 인식적 반응을 분석하였다. 특히, 예술가의 유형이 소비자의 흥미에 미치는 효과는 놀라움과 인간의 고유성에 대한 위협감에 의해 매개되었다. 또한, 의인화가 예술가의 작품에 대한 소비자의 흥미에 미치는 효과는 놀라움과 예술가에 대한 흥미에 의해 매개된다는 정보를 제공함으로써 인공지능과 마케팅에 관한 문헌에 기여한다. 결과적으로 사람들은 인공지능이 창작한 작품에 흥미를 가지며, 특히 의인화된 인공지능 예술가일 경우 의인화되지 않은 인공지능과 인간이 예술가일

때보다 소비자들의 흥미를 더 이끌어낸다는 점을 확인하였다. 인공지능 예술을 창작하거나 인공지능 예술 프로젝트를 진행하는 기업들은 이 정보를 바탕으로 효과적인 전략을 세울 수 있다는 점에서 이 연구는 실질적인 시사점을 보이고 있다.