

RESEARCH REPORT

Title of report: The Impact of AI in Advertisements on the Consumer

Keywords: Artificial Intelligence, AI-Generation, Consumer Perception, Advertising, Graphic Design

1. Research Question.

Does the use of AI-generated artwork in advertising have a significant effect on the consumer's reaction to the advertisement and/or advertised product?

2. Hypothesis.

The inclusion of artificially generated media in an advertisement will have a negative correlation with the consumer's perception of the advertised product. Additionally, the known inclusion of AI-generated media in an advertisement will further amplify these attitudes. The use of AI can be truthfully disclosed or untruthfully disclosed as well—disclosure regardless of truth is believed to negatively impact advertisement/product attitude.

Independent Variable:

- Type of advertisement: whether the advertisement includes AI-generated artwork or not (traditional media/AI-generated artwork)

Moderator:

- No disclosure: the art is not prefaced by any disclosure regarding whether it is AI-generated or not
- Disclosure as AI: whether the shown advertisements are disclosed as the use of AI-generated artwork
- Disclosure as non-AI: whether the shown advertisements are disclosed as not using AI-generated artwork

Dependent variable:

- Opinion of advertisement: The consumer's impression of the shown advertisement

Proposed Effect:

- Advertisements that feature AI-generated media will have different impression ratings than traditional advertisements. AI-generated media that disclose the use of AI will have an additional impact. Truthful disclosures will have larger impacts than untruthful disclosures as consumers may be more wary when there is an obvious discrepancy between the art and disclosure. Initially, recall was planned to be measured, but this was seen as inconsequential in comparison to consumer opinion.

3. Research Background.

In the past couple of years, AI-generated content has become prevalent and wholly accessible. From multimillion corporations to schoolchildren, everyone has access to AI art tools. Due to its sheer recency, though, we have yet to see even a fraction of the full extent of its commercial use.

The impetus behind leveraging these artificial images stems from one primary reason: the need to streamline/automate the content creation process, in turn enabling the rapid production of endlessly diverse content in an efficient yet cost-effective manner. These generative AI programs offer countless applications across every domain, from marketing to education to entertainment.

In the future, using AI-generated media could replace the corporate need for commissioning artists or licensing stock photos. Costs could be cut drastically. Today, companies budget for yearly salaries and licensing fees; tomorrow, they will budget for the acquisition cost of the latest AI package. Economically, this transition could be done rather easily. If a new process has fewer costs than an old process, why not upgrade?

The deciding factor comes from the elements of authenticity and public opinion. If the public opinion towards AI is negative to the point of hurting product/advertisement effectiveness, that may be the only blockade from an extensive transition to AI.

How does the public perception of AI art affect advertising? Rather unsurprisingly, studies have shown that the public perception of AI art is largely negative—its use is seen as an alternative that trivializes human creativity.¹ Furthermore, it could have a potentially disastrous effect on the American workforce and economy. An aforementioned large-scale shift towards AI from artists could be disastrous. On the internet today, many are wary of AI art being secretly utilized by companies already.²

Due to just how new this technology is, little to no studies have yet been made (or, at least, made publicly available) regarding consumer-perception attitudes and AI. One related study conducted by Ayers et al. in 2023 involved healthcare professionals evaluating anonymized responses to medical questions—some generated by physicians and others by ChatGPT.³ Responses generated by ChatGPT received higher quality ratings—it would not be inconceivable for AI art to be received similarly. Upon further study, Zhang and Renee Richardson Gosline, senior lecturer and research scientist respectively, explored how

¹ Millet, K., Buehler, F., Du, G., & Kokkoris, M. D. (2023). Defending humankind: Anthropocentric bias in the appreciation of AI Art. *Computers in Human Behavior*, 143. <https://doi.org/10.1016/j.chb.2023.107707>

² Weatherbed, J. (2023, October 9). *Disney's Loki faces backlash over alleged use of Generative AI*. The Verge. <https://www.theverge.com/2023/10/9/23909529/disney-marvel-loki-generative-ai-poster-backlash-season-2>

³ Ayers, John W., et al. "Comparing Physician and Artificial Intelligence Chatbot Responses to Patient Questions Posted to a Public Social Media Forum." *JAMA Internal Medicine*, vol. 183, no. 6, 2023, pp. 589-596. doi: 10.1001/jamainternmed.2023.1838.

individuals perceive work created by both generative AI and humans.⁴ The study found that content generated by generative/augmented AI was perceived as higher quality than those produced by human experts, an outcome contrary to expectations from previous algorithm aversion & predictive AI research. Furthermore, disclosing the source of content production reduced the perceived quality gap between human and AI-generated content, driven primarily by human favoritism rather than an aversion to AI. While previous research has delved into AI-generated content, there has been a notable absence of research covering AI-generated images.

A study such as this would provide insight on whether the seemingly negative stigma of AI translates to advertising and advertised products, and if the transition from traditional art/media to artificial art should be made based on consumer reaction. Companies contemplating the implementation of generative artificial intelligence must first gauge public perceptions regarding work produced by AI, humans, and a combination thereof.

4. Method.

Experimental Design

The independent variables used in the study will be the type of advertisement shown to the subject (whether it will include traditional artwork or AI-generated artwork), as well as a disclosure of whether the artwork is artificially generated acting as a moderator. This will create the following outcomes:

- Design
 - AI artwork – not disclosed at all
 - No AI artwork – not disclosed at all
 - No AI artwork – disclosed as not AI
 - AI artwork – disclosed as AI
 - No AI artwork – disclosed as AI
 - AI artwork – disclosed as not AI

Measures

IV: Type of Advertisement Shown – Traditional Art or Artificial Art

Mod: Disclosure of Artificial Imagery – Disclosed as AI/Not AI/Not disclosed

DV: Opinion of Advertisement – Scale 0-10 of consumer attitude towards ad

Procedures

A sample of 80-100 subjects should be taken to conduct this study. While small in scale, this will provide a reasonable number of responses to see a general trend in consumer reaction. This study can be done over online forms featuring digital advertising, as most of today's advertisements are online. The form will consist of the following:

- A set of 6 advertisements – 3 including artificially generated images and 3 including traditional media
- A response section – after each image, a response measuring quantitatively 0-10 of attitude towards each advertisement & product will be given. 0 could be

⁴ Zhang, Yunhao, and Renee Gosline. "Human Favoritism, Not AI Aversion: People's Perceptions (and Bias) Toward Generative AI, Human Experts, and Human-GAI Collaboration in Persuasive Content Generation." SSRN, 20 May 2023, <https://ssrn.com/abstract=4453958>.

labeled as “Not Appealing” and 10 as “Very Appealing,” which while basic, provide a baseline for how consumers could reasonably interpret advertising. This will be repeated for the entire set of images.

Following these stages and responses, enough data will be gathered to see how each consumer viewed each advertisement and product. After every respondent’s reaction is measured, a general trend can be constructed from the data.

Data Collection

The survey was distributed through various online platforms including social media and instant messaging. The information in the survey was randomized to maintain the most accurate results – with each prompt (no disclosure, AI disclosure, and non-AI disclosure), participants were shown a random AI or non-AI image, with no repeating images. This ensures that the data is not biased toward any specific advertisement.

To manipulate the type of advertisement shown to participants and the disclosure of whether the artwork is artificially generated, we implemented a randomized survey format consisting of two blocks. Each block included prompts for no disclosure, AI disclosure, and non-AI disclosure conditions.

In the first block, participants were randomly presented with three advertisements featuring AI-generated artwork. Conversely, the second block presented participants with three advertisements featuring real human-generated artwork. This randomization ensured that each participant encountered a diverse range of advertisements across different conditions, minimizing bias towards specific images while eliminating the need to match specific images with disclosure prompts during data analysis.

For each advertisement presented, participants were instructed to rate their attitude towards the advertisement on a scale from 0 to 10, where 0 indicated "Not appealing" and 10 indicated "Very appealing". This standardized rating scale allowed for a quantitative assessment of consumer attitudes toward both AI-generated and human-generated advertisements.

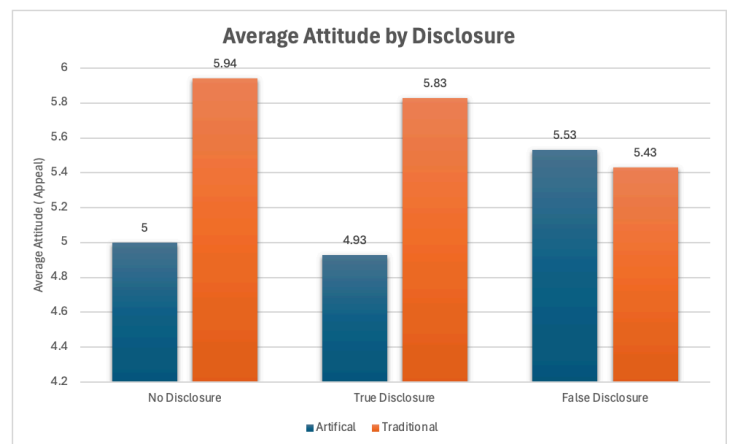
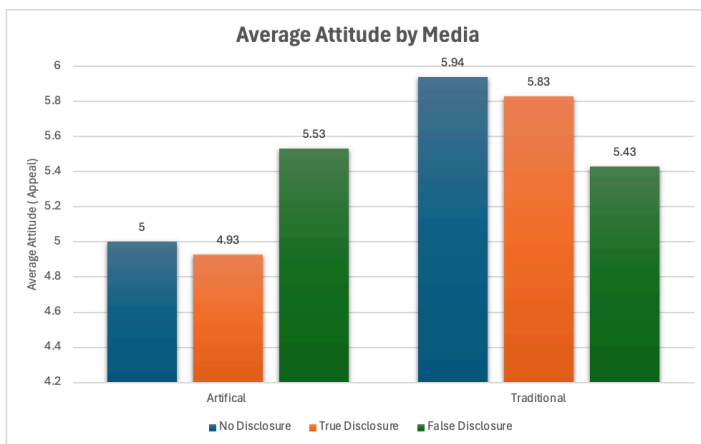
Participants

Eighty-one participants 20 to 67 years old (66% female, $M_{age}=28$) participated in the survey. Data collection spanned one week.

5. Data Analysis/Observed Results.

The provided data shows a slight decrease in opinion ratings for AI-generated artwork when the disclosure is made, especially when the disclosure is true. This aligns with the hypothesis that the inclusion of AI-generated media, especially when disclosed, may have a negative impact on consumer perception. In our control group of non-disclosed content, the appeal rating of the human-generated media was nearly 10% higher than the artificially generated media. It is interesting to note that the average rating for all questions was around 5, indicating that participants neither strongly liked nor disliked the advertisements or products presented to them.

However, when true disclosure is introduced, indicating that the artwork is AI-generated, there is no significant difference in appeal ratings compared to the control group with no disclosure. This finding suggests that consumers' attitudes toward advertisements remain consistent regardless of whether they are aware of the AI-generated nature of the content. The most striking results emerge when false disclosures are introduced. In this condition, AI-generated artwork experiences a remarkable increase in appeal when falsely presented as human-generated, with a notable 10.6% boost in ratings. Conversely, human-generated media experiences a significant decrease in appeal of 8.6% when falsely disclosed as AI-generated.



Moreover, for men, the true disclosure of AI-generated content led to a more pronounced decrease in ratings compared to women, suggesting that men may have a slightly more negative perception of AI-generated content when its origin is disclosed. Conversely, women's preferences for AI-generated media versus human-generated media were less influenced by false disclosure, indicating that their perceptions may be less affected by misleading information about the media's origin.

These findings highlight the nuanced interplay between disclosure and consumer perceptions. False disclosure of AI-generated content as human-generated appears to positively influence consumer attitudes towards AI-generated artwork, while the reverse effect is observed for human-generated media falsely labeled as AI-generated. This suggests that consumers may hold biases or preconceptions regarding AI-generated content, which can be influenced by the information presented to them.

In order to determine if participant's attitude willingness towards AI-generated content and non-AI generated content differs depending on the type of disclosure, we conducted an ANOVA test to confirm these differences. The results revealed a statistically significant difference among the disclosure conditions ($p < 0.05$). notable distinction in attitudes towards both AI-generated and non-AI generated content under the truthful disclosure condition. Specifically, participants rated non-AI generated content more favorably ($M = 5.84$) compared to AI-generated content ($M = 4.91$) when the truth about their origin was disclosed. This suggests that, on average, participants perceive non-AI photos more positively than AI-generated photos

when they are informed about the origin of the artwork which highlights the impact of truthful disclosure on consumer perception.

This aligns with the statistically significant difference found in the ANOVA analysis, indicating that there is indeed a meaningful variation in consumer perception between truthful disclosure of AI ads. However, no significant differences were observed across the other groups (Truthful Disclosure vs. False Disclosure, AI False Disclosure vs. Non-AI False Disclosure, AI Truthful Disclosure vs. Non-AI False Disclosure).

6. Implications/Discussion.

Interpretation of Expected Results:

The anticipated results of this research hold significant implications for both advertisers and consumers in the context of the growing use of AI-generated artwork in advertising. If the expected results align with the hypothesis, indicating a negative correlation between AI-generated media and consumer perception, it would confirm the concerns raised in the background research regarding the potential backlash against AI-generated content due to perceptions of it trivializing human creativity and posing risks to employment in creative industries. Additionally, the findings would underscore the importance of disclosure in managing consumer attitudes toward AI-generated artwork in advertisements. The observed decrease in opinion ratings for AI-generated artwork when true disclosure is made suggests that consumers may indeed hold biases against AI-generated content, as indicated by previous studies on public perceptions of AI.

Discussion of Alternative Results:

However, it's essential to consider alternative results that may arise from the study. If the data show no significant difference in consumer perception between AI-generated and traditional artwork, it could suggest that consumers are unable to discern between the two types of content or that they may not inherently hold negative biases against AI-generated media. This outcome would challenge the assumption that consumers automatically view AI-generated content unfavorably. Conversely, if the study reveals a preference for AI-generated artwork, it could indicate a shifting landscape where consumers increasingly accept and even embrace AI-generated content, contrary to the prevailing negative perceptions.

Limitations and Future Directions:

Despite the careful design of this research, several limitations should be acknowledged. Firstly, while adequate for initial insights, the sample size of 81 subjects may not fully capture the diversity of consumer attitudes towards AI-generated content. Future research could benefit from larger sample sizes and more diverse participant demographics to enhance the generalizability of the findings. Additionally, the study's reliance on online forms featuring digital advertising may limit the ecological validity of the results, as

consumer reactions to advertisements in real-world settings may differ. Future studies could incorporate methods such as eye-tracking or neuroimaging to provide deeper insights into consumer responses to AI-generated content.

Furthermore, the study focuses solely on static imagery in advertisements, neglecting other forms of AI-generated content such as videos or product descriptions. Exploring the impact of AI-generated content across different mediums and contexts could yield valuable insights into the broader implications of AI in advertising. Additionally, considering the potential influence of cultural and geographical factors on consumer attitudes toward AI-generated content, future research could adopt a more nuanced approach by conducting cross-cultural studies to assess variations in consumer perception.

In conclusion, while this research offers valuable insights into the impact of AI-generated artwork in advertising on consumer behavior, further exploration is needed to fully understand the complexities of this phenomenon and its implications for the future of advertising and creative industries.