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"Is it Created by AI?: An Experimental Investigation of Viewers' Differentiation and Perceived Effectiveness of AI in Promoting a Non-profit Cause"

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ABSTRACT:

The expeditious development of Generative Artificial Intelligence (AI) has allowed for an easier application of this technology in crafting communication campaigns. To investigate whether AI is helping or hindering the effectiveness of the communication process to persuade the public to act on a non-profit cause, a comparative experimental study is designed. Through a 2 (AI-generated vs. human-generated) x 3 (text only vs. text and image congruent vs. text and image incongruent) experimental research, we examined participants' ability to differentiate between AI-generated content vs. human-generated content and their effects. Results from N = 700 participants sampled through Prolific.co indicated that participants could not differentiate between AI-generated and human-generated promotional text; however, they were able to differentiate between the images. Regarding effects, participants perceive human-generated content as more effective, authentic, trustworthy, and appealing through negative emotions, such as worry and anger. Although the study applied the Media Effects research framework through an experimental design, the findings are limited by the non-representative data collection through Prolific.co. The study provides empirical support for the application of generative AI in digital communication, internet marketing and advertising, and higher education in fields of promotional content generation. The study offers experimental support from the audience perspective to the conversation on the feasibility of AI applications in digital content generation in the fields of non-profit marketing and advertising.

Keywords:
Artificial Intelligence, Media Effects, Experimental Design, AI Content Creation; Digital Marketing

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1. INTRODUCTION

Artificial intelligence (AI) has emerged as a rapidly advancing field, gaining significant scholarly and industrial attention since the early 2000s (Kučinskas, 2024; Shao et al., 2022). Over time, AI has developed new capabilities, such as autonomous decision-making and algorithmic machine learning (Dwivedi et al., 2021). There are countless AI products that are accessible to the public at no cost, such as ChatGPT and DeepAI. They can generate persuasive content, including text, images, and videos, for content creation and digital communication. There is an abundance of current applications of AI technology in digital marketing, including collecting customer data, finding ideal customers, creating personalized content, predicting customers' potential actions, interacting with customers, such as through chatbots, and preventing data leaks (Capatina et al., 2020; Haleem et al., 2022; Murgai, 2018; Nair & Gupta, 2020; Tauheed et al., 2024; Ziakis & Vlachopoulou, 2023). As AI becomes more sophisticated, the question arises if the technology can supplement or hinder the creativity of human communication and digital content creation (Galloway & Swiatek, 2018). Despite research into the benefits and current applications of AI (Dwivedi et al., 2022; Haleem et al., 2022; Islam et al., 2024; Nair & Gupta, 2020; Tauheed et al., 2024), researchers also focused on the challenges of AI (Braga & Logan, 2017; Galloway & Swiatek, 2018; Kučinkas, 2024; Martin & Parmar, 2024; Yuon & Jin, 2021), thus demonstrating the importance of understanding whether the overall impact of AI on digital content creation is positive or negative and where the role of AI lies in digital communication.

Although there has been research into the applications of AI technology in content creation and digital communication (Capatina et al., 2020; Haleem et al., 2022; Manoharan, 2024; Murgai, 2018; Nair & Gupta, 2020; Tauheed et al., 2024; Ziakis & Vlachopoulou, 2023), several key questions remain unanswered. First, can people differentiate AI-generated promotional content from human-generated content? Second, is AI or human-generated persuasive content viewed as more effective? To generate answers to these questions, an experimental study was designed to investigate participants' ability to differentiate between AI-generated and human-generated content and to examine their perceived message effectiveness, authenticity, emotional reaction, and perceived trustworthiness of promotional content generated by AI and humans.

Existing research on AI applications in digital communication and content creation has predominantly employed qualitative approaches, with relatively limited incorporation of experimental methodologies (Haleem et al., 2022; Murgai, 2018; Nair & Gupta, 2020; Ziakis & Vlachopoulou, 2023). While this provides valuable insights, incorporating experimental approaches could offer a concrete understanding of AI's effectiveness in these areas. A 2 (AI-generated content vs. human-generated content) x 3 (text only vs. text and image congruence vs. text and image incongruence) experimental structure was incorporated to separate text and images. This allows for the investigation of the two content formats respectively, allowing for more clarity in understanding whether text, images, or a combination of the two are more effective in content creation when employed by AI and/or humans.

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2. LITERATURE REVIEW

2.1 Digital Marketing and AI

Traditional digital communication campaign methods have been increasingly supplemented or replaced with digital marketing on platforms such as Instagram, Twitter, YouTube, and Facebook. Digital marketing has allowed consumers and businesses to connect to an extent not seen before, as there is increased conversation between customers and brands (Alves et al., 2016). Digital marketing can be effective at increasing consumer attitudes, which is important because as consumers develop a positive attitude towards a person or brand, the more likely they are to develop a purchase intention (Duffett, 2017). Among adolescents, digital marketing has been found to positively affect cognitive, affective, and behavioral attitudes (Duffett, 2017). Kabadayi and Price (2014) found that personality traits and types of mass communication and individual interaction on social media, specifically Facebook, can elicit affective responses, including liking and commenting. He et al. (2021) found that forms of digital marketing, including conversation, storytelling, as well as consumer interaction and participation, have a positive correlation with the brand attitudes and brand personality perceptions of consumers.

Digital marketing has been proven to be an effective tool to change consumers' attitudes and behaviors; however, advancements in technology, such as AI, have the potential to enhance digital marketing. As AI develops and becomes more advanced in information processing, more trend prediction and personalization can occur, which can attract more targeted consumers (Kučinkas, 2024). AI is the "sophisticated application of technology, whereby a machine demonstrates human cognitive functions, such as learning analysis and problem-solving" (Galloway & Swiatek, 2018, p. 735). AI technologies, such as ChatGPT, have potential applications in digital marketing. AI technology can simulate human intelligence; it encompasses multiple forms of technology, including "natural language processing, machine learning, deep learning, and computer vision" (Nair & Gupta, 2020; Haleem et al., 2022, p. 120).

In digital marketing, AI can lead to a competitive advantage by delivering real-time, relevant insights about customers on an individualized basis, and it is mainly involved with lead conversation and user retention (Haleem et al., 2022; Murgai, 2018). For instance, AI technology can sort through massive quantities of data to find ideal customers and predict how likely they are to be attracted to a company's advertisement (Murgai, 2018). Business innovation and productivity are intertwined with AI, as organizations can save money, time, and other resources by using the tool (Haleem et al., 2022). AI is useful for quick data collection by marketers, specifically customer-related data, including demographic, behavioral, and sales data (Capatina et al., 2020). According to Nair and Gupta (2020), AI can lead to smarter content creation and curation. AI tools in digital marketing allow for more personalized content creation, which means that consumers can be attracted by content that is designed to be more relevant to them (Nair & Gupta, 2020). When potential customers see personalized content that they are interested in,

they are more likely to engage in conversations with the brand. To further boost customer engagement and interest, digital marketers can use AI chatbots (Pragnashee & Reddy, 2024). AI tools can process the data, and as more data is gathered, better recommendations can be made. AI allows data to be collected from external sources to create original content, which connects to content curation (Nair & Gupta, 2020). There are several segments of AI applications in marketing ranging from real-time pricing management to product design (Haleem et al., 2022).

There are many uses of AI in Public Relations (PR), including creating promotional content, analyzing data for trends, and managing administrative tasks (Toteva, 2023). Mardhika (2023) argues that AI can help with media monitoring, which helps PR firms collect as much information as possible about what is going on in the media in a more efficient way. AI can be used for fact checking, predicting crises, newswriting, and predicting trends in consumption (Kaleel & Alomari, 2023). AI technologies are also reported to be used to write the first drafts in PR, yet humans are often expected to edit and revise AI-generated content (Mardhika, 2023).

2.2 AI-generated Text vs. Images

Advancements in AI technology have substantially improved its capacity to generate high-quality, human-like text; however, prior studies report mixed findings regarding the extent to which AI-generated outputs are perceived as authentically human. Jakesch et al. (2019) found that when participants are presented with all AI-generated profiles, they are trusted as much as human-written profiles, demonstrating how AI-text is becoming more integrated and accepted in today's digital landscape. However, Jakesch et al. (2019) asserted that when people are presented with AI and human-written profiles, they do not trust the profiles believed to be written by AI. This demonstrates the continued debate about how to best integrate AI-generated text with human-generated text. Kreps et al. (2020) found that individuals are mostly unable to distinguish between human and AI-generated text, showing the sophistication and realism of AI language models. In contrast, Sardinha (2024) found that there are large disparities between human-generated and AI-generated text; for example, the study found that AI has issues incorporating narrativity into its writing, but the author notes that despite differences AI writing may appear human to the average reader.

Since AI is becoming increasingly sophisticated in its capabilities, it may have developed sufficiently to write quality content instead of merely checking and supplementing human-designed content. Based on the research about the growing capabilities of AI text generation and the findings that individuals are mostly unable to distinguish AI and human-generated text (Jakesch et al., 2019; Kreps et al., 2020), the following hypothesis was developed.

H_1: Participants cannot differentiate between AI-generated persuasive text messages and human-generated persuasive text messages.

Along with advances in AI-generated text, there have been improvements in AI-generated images. There are a variety of text-to-image AI generators that can produce images from simple

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text prompts, including DeepAI, DALL-E-2, Crayon, and Midjourney (Göring et al., 2023). These technologies allow people of varying skill levels, including artists and non-artists, to produce images that are high quality (Lyu et al., 2022). Lyu et al. (2022) found that AI technology can "imitate artistic presentation techniques very well" (p. 16). Some participants viewed AI-generated images as more professional than a painting created by an actual artist. Aktay (2022) concluded that AI-generated images tend to be effective in terms of color, aesthetics, and liveliness and that AI can generate images of abstract and concrete concepts.

Some AI generators produced more appealing images while others produced more realistic images. However, real photographs captured by people tended to be better rated even when AI generators tended to match the image to the text prompt well (Göring et al., 2023). Additionally, most participants were able to distinguish between the real photos and those generated by AI, specifically regarding realism (Göring et al., 2023). Yadav et al. (2024) found that AI image generators have limitations, including feature blending, duplicating details, color bleeding, and incorrect visual elements.

A number of the current research studies support the idea that people are unable to differentiate between human and AI-generated images (Cooke et al., 2024; Hausken, 2024; Zhu et al., 2024); however, since less sophisticated free AI image generating technology was used with less realism in this study, the following hypothesis was developed.

H_2: Participants can differentiate between AI-generated persuasive images and human-generated persuasive images.

2.3 Media Effects of AI-generated Promotional Content

The Media Effects research framework is a theoretical approach used to understand how media content influences audiences' attitudes, behaviors, and perceptions. It examines the short-term and long-term effects of media exposure, including how different forms of media affect individuals or societal groups (Neuman & Guggenheim, 2011). The researched effects of media programs in this framework include perceived message effectiveness, perceived authenticity, emotional appeal, and perceived trustworthiness.

Perceived message effectiveness is "what people's beliefs are about the effectiveness of the message" (Noar et al., 2010, p. 23). Perceived message effectiveness is often measured by identifying if there are changes in the target audience's behaviors, beliefs, or attitudes (Dillard et al., 2007). According to Yzer et al. (2015), perceived message effectiveness is operationalized differently depending on what is being studied. Noar et al. (2010) found that perceived message effectiveness is influenced by gender, race, and educational level to a small but significant extent. However, personal utility, cognitive reactions, and affective reactions impact perceived message effectiveness to a larger extent than demographic characteristics (Noar et al., 2010).

A common question surrounding the use of AI is whether it has higher or lower perceived effectiveness compared to human-generated content. Karinshak et al. (2023) investigated if GPT-

3 could generate effective pro-vaccination content, and they found that GPT-3's messages were inconsistent in their quality; however, GPT-3's work could be leveraged by humans to create persuasive and effective content. Lu (2025) discovered that AI-generated content is less effective when addressing entrenched beliefs. Dai et al. (2023) found that human communicators create more effective and persuasive narrative messages than AI communicators. Since AI-constructed messages can have inconsistent quality and participants may have entrenched beliefs about mothers facing crises during war, it is hypothesized that AI-constructed content will have a lower perceived message effectiveness.

Authenticity "loosely refers to the quality of being genuine, real, and true"; however, research has found that "authenticity is a multidimensional construct, as judgments are highly context specific, subjective, and dependent on the audience" (Lee & Eastin, 2021, p. 823). Perceived authenticity has been used to determine the effectiveness of social media influencers as brand endorsers (Lee & Eastin, 2021). The perceived authenticity of brands is also influenced by whether brands are intrinsically or extrinsically motivated, as brands that are seen as being intrinsically motivated have increased perceived authenticity in the eyes of consumers (Cinelli & LeBoeuf, 2020). Pelet et al. (2020) found that perceived authenticity increases purchase intent. They also found that the marketing of content and products, such as the visual complexity and color, influence perceived authenticity (Pelet et al., 2020).

Researchers have been seeking to understand if AI-generated content or human-generated content has higher perceived authenticity. Kučinskas (2024) found that products that were disclosed as having involved AI in their creation had lower perceived authenticity than human-generated products. However, contrary to these findings, Kirkby et al. (2023) found that text disclosed as being AI-generated was not seen as having lower authenticity compared to human-generated text. These differences can be explained through Kučinska's (2024) research investigating the use of AI in product development, whereas Kirkby et al. (2023) investigated the use of AI in marketing.

Bui et al. (2024) discovered that perceived authenticity was higher for images created by humans; however, AI-generated content still had significant perceived authenticity, particularly if it was not labeled. Kirk and Givi (2025) found that if consumers perceive emotional marketing messages as being written by AI instead of humans, customer loyalty and positive word of mouth are reduced. Emotional communications created by AI are viewed as morally inauthentic, which leads to moral disgust (Kirk & Givi, 2025). This AI-authorship effect only appears when AI authors emotional, not factual, communications (Kirk & Givi, 2025). Based on these research studies, since AI is creating emotional content relating to expressing emotions and feelings about mothers experiencing crisis during war, it is hypothesized that there will be a lower perceived authenticity of AI-generated messages.

Emotional appeal is a dimension used to investigate the effectiveness of digital marketing campaigns. Emotions are important in marketing because they can lead to greater audience

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engagement, which can potentially lead to a more effective campaign (Barton, 2020). Emotions have a mediating role in narrative persuasion, and identification can evoke emotions (Hoeken & Kinkeldam, 2014). Advertisers and marketers continue to use emotional content to garner attention and make advertisements more memorable (Niazi et al., 2012). Consumers on social media are affected by emotional and rational advertising appeals. Whether negative or positive emotions are used, emotional appeal has been connected to the intention to buy (Rahman & Pial, 2020). A positive relationship was found between emotional advertisements and attitude toward the product and expressive advertisement, which can lead to a greater purchase intention. The more positively individuals feel about the advertisement, the more likely they are to feel positive about the brand (Niazi et al., 2012).

The question of whether AI-constructed messages are more or less emotionally appealing than human-constructed messages is important in determining the effectiveness of AI in digital marketing. In health marketing communication, human representatives and AI chatbots perform comparably in all emotional contexts, while the chatbot was rated as having lower interaction satisfaction when anger was elicited (Tsai et al., 2021). Zhang et al. (2024) found that AI-generated digital tourism content produced lower quality content in terms of emotional appeal and empathy. Song et al. (2024) found that AI-generated advertisements with rational appeals increased tourists' visit intention, while declared human creators were more effective at creating emotional appeals. The hypothesis was developed based on the research of Zhang et al. (2024) and Song et al. (2024) because their designs most closely align with the design of this study, as it analyzes AI-generated advertisements.

Perceived trustworthiness is another dimension used to analyze the effectiveness of marketing campaigns. In communications, trustworthiness connects to "the listener's degree of confidence in, and level of acceptance of, the speaker and the message" (Ohanian, 1990, p. 41). Priester and Petty (2003) explain that trustworthy endorsers are perceived to be sincere and honest. When individuals consider a source to be trustworthy, they are more likely to be persuaded to see the point of view of the communicator. Another factor that influences perceived trustworthiness is the experience that an individual has with a phenomenon, such as AI or e-commerce (Corbitt et al., 2003). Corbitt et al. (2003) found that level of education, country of origin, and income all play a role in an individual's capacity to trust. Priester and Petty (2003) discovered that trustworthiness can influence individual attitudes, which means that it is connected to marketing effectiveness. Endorsers who are viewed as low in trustworthiness incite more elaboration of the product-related information in an advertisement compared to endorsers who are viewed as high in trustworthiness (Priester & Petty, 2003).

The question arises if AI-constructed or human-constructed messages are viewed as more trustworthy. Durán and Pozzi (2025) argue that trust in AI is impossible, as AI lacks emotions and motivations. This connects to AI in digital marketing by providing potential explanations for why AI-generated content may be seen as less trustworthy because the intentions behind the content

are unclear to viewers. According to Dai et al. (2023), when discrediting myths about the COVID-19 vaccine, AI communicators were viewed as less credible than human communicators, and the AI communicator had less influence on participants' attitudes. Jakesch et al. (2019) conducted three experiments and discovered that when participants thought that they were viewing Airbnb profiles created by AI and humans, they viewed the hosts who were labeled as or thought to be written by AI as untrustworthy. However, when the participants saw either all AI-generated profiles or all human-generated profiles, there was no difference in trustworthiness scores (Jakesch et al., 2019). Most of the prior research (Durán & Pozzi, 2025; Dai et al., 2025; Jakesch et al., 2019), supports the belief that AI is less trustworthy than humans, thus a hypothesis was generated. Based on research into the Media Effects framework, the following hypotheses were developed:

H_3: Compared with the human-constructed text-only promotional message, the AI-constructed text-only promotional message has a lower effectiveness among the viewers.

H_4: Compared with the human-constructed text-only promotional message, after viewing the AI-constructed text-only promotional message, participants will have significantly lower (a) perceived authenticity, (b) emotions, and (c) perceived trustworthiness of the messages.

H_5: Compared with the human-constructed text and image promotional message, the AI-constructed text and image promotional message has a higher or lower effectiveness among viewers.

H_6: Compared with the human-constructed text and image promotional message, after viewing the AI-constructed text and image promotional message, participants will have significantly lower (a) perceived authenticity, (b) emotions, and (c) perceived trustworthiness of the messages.

2.4 Challenges of AI Usage in Digital Communication

Previous research has found that AI-generated digital marketing content, compared with human-generated alternatives, has the following issues: a lack of authenticity and transparency (Galloway & Swiatek, 2018), a lack of creativity and emotional intelligence (Galloway & Swiatek, 2018), and a lack of sincerity (Youn & Jin, 2021). The role of AI in PR is being debated; currently, many organizations are using AI for subscriber analysis and storytelling (Galloway & Swiatek, 2018). One challenge of using AI in PR is that PR relies on building relationships with stakeholders, and it is argued by Scott (2018) that AI cannot do this, as consumers perceive AI to have lower authenticity and transparency (Galloway & Swiatek, 2018). In terms of the authenticity of AI, consumers often perceive AI-generated content and products as lacking in genuineness and originality compared to human-constructed content and products (Kučinkas, 2024). Kučinkas (2024) found that consumers are more skeptical of the authenticity of AI-generated content because of the perception that humans spend more time working on content, therefore increasing the quality and reliability of the content or product.

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In terms of the transparency of AI, consumers have ethical concerns about how AI is implemented because of a lack of knowledge about what models of AI are being used and how they operate (Martin & Parmar, 2024). The lack of transparency surrounding the use of AI further impacts consumers' perceptions that AI-generated content is inauthentic, as they do not understand how the content is created. Lynch (2018) argues that people build trust with humans and not AI, which could limit the effectiveness of AI messages (Galloway & Swiatek, 2018). Individuals lack of trust in AI may stem from the lack of knowledge about how AI is used in content creation.

Another challenge of AI in digital marketing is that many argue that AI cannot replace human creativity, as humans have emotional intelligence that AI lacks (Galloway & Swiatek, 2018). Braga and Logan (2017) argue that AI lacks emotions, passions, goals, experience, values, imagination, and curiosity. Humans have real-world experiences that AI lacks, and these experiences shape how human-generated content is created to appeal to certain emotions of the target audience. AI has intelligence in the form of logic, yet it lacks the sense of self that humans possess to make their content distinct (Braga & Logan, 2017).

Consumers desire to purchase from brands that they view as having five personality traits including sincerity, competence, sophistication, ruggedness, and excitement (Youn & Jin, 2021). It can be a challenge for AI to exhibit all five of these personality traits, especially sincerity (Youn & Jin, 2021). Hoeken and Sinkeldam (2014) found that the more people identify with the main characters of stories, the more emotions are evoked and the more likely their attitude will be impacted. This has implications in the role of AI in digital marketing, as consumers may not identify with AI-constructed content as much as humans-constructed content. This may lead consumers to not purchase the product or donate to a cause.

2.5 Congruence vs. Incongruence of AI and Human-generated Content

Congruence between AI and human-generated work in promotional messages is another potential challenge in the use of AI in digital marketing and content creation. Image-text congruence has been defined by Cao et al. (2025) as "the degree to which the two media formats holistically adhere to the general focus of the plot" (p. 2). Connecting to digital marketing research, the congruence between AI and human generated text and images relates to how well the two formats communicate the same message in a cohesive format. Yang and Jiang (2021) found that ad-media congruence when advertisements are on Instagram increases consumers' engagement intentions. Argyris et al. (2020) found that visual congruence is a crucial factor for how influencers increase engagement on Instagram. Cao et al. (2025) found that higher text-image congruence leads to an increase in consumer preference towards a product because of relevancy, which is when there is a high degree of fluency between the text and images. Prior research into congruence can be connected to the use of AI in digital marketing. AI technology that generates text is currently more advanced than the technology that produces images, which

often leads advertisers to use a mix of AI and human contributions (i.e. AI-generated text and human-generated images). This can lead to a lack of congruence in content creation, which previous research (Argyris et al., 2020; Yang & Jiang, 2021; Cao et al., 2025) has shown can make advertisements less effective and convincing.

Based on the research of Cao et al. (2025) and the concept of relevancy, hypotheses were developed. When AI and human-generated text and images are used in combination, it can decrease the relevancy of the promotional message due to the lack of fluency between the design and messaging (Cao et al., 2025). To test the impact of congruence on AI-generated and human-generated promotional content, the following hypotheses were proposed:

H_7: Compared with text-image congruent promotional messages (i.e. both text and image are created by humans or AI), text-image incongruent promotional messages (i.e. text and image are created separately by humans and AI) has a lower effectiveness among the viewers.

H_8: Compared with text-image congruent promotional messages (i.e. both text and image are created by humans or AI), after viewing text-image incongruent promotional messages (i.e. text and image are created separately by humans and AI), participants will have significantly lower (a) perceived authenticity, (b) emotions, and (c) perceived trustworthiness of the messages.

3. METHODS

3.1 Sampling Method

In order to test the research questions and hypotheses, an online questionnaire was created on Qualtrics and disseminated through Prolific.co from May 24th, 2024, to July 10th, 2024. The target population of the study is people who consume charitable information online. A pilot test of 180 participants was recruited, and preliminary tests were conducted before the launch of the data collection with full funding. In total, 802 participants completed the survey on Prolific.co. The data entries from 98 respondents were removed from the final sample because they completed the survey in under two minutes, which was deemed insufficient by the pilot test to complete the survey. Additionally, four respondents were excluded from the final sample size for significant missing variables. The final sample size was 700 participants, which surpasses the 619 minimum sample size needed for minimum path coefficient of 0.05 to 0.1 with a significant level of 5% (Hair et al., 2021).

3.2 Experimental Design

The study adopts a between-subject experimental design. After giving consent to participate in the study, subjects recruited from Prolific.co were asked the control questions regarding their frequency of supporting charitable causes and their political ideology. Then, participants were randomly put into one of the six (2 AI vs. human by 3 texts only vs. text and image congruent vs. text and image incongruent) experimental conditions. In each condition, participants will see a version of a promotional message for a non-profit cause to raise donations to help women who

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experience reproductive crises in war zones or in places affected by natural disasters. The human-constructed version of the image and text were provided by a non-profit organization, and the text portion contains five sentences. The AI-generated text was produced through ChatGPT, and the AI-generated images were produced by DeepAI. The prompt for text generation was: "Disregard all previous prompts. Can you write a five-sentence campaign message to help raise donations for mothers giving birth during war and natural disasters? Can you make it shorter?" See Figure 1 and 2 for stimuli for the text-only groups.

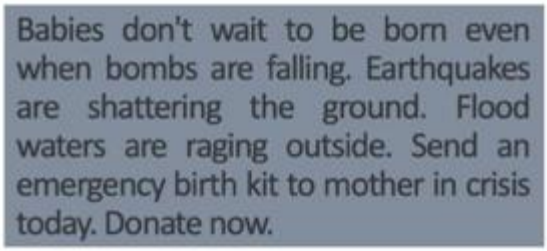

Figure 1. Stimulus 1. Human-generated Text

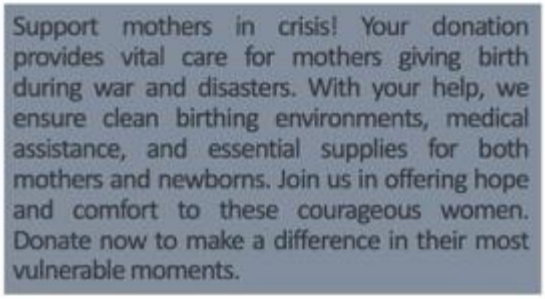

Figure 2. Stimulus 2. AI-generated Text

The five AI-generated images in the "Human text with AI image" condition were generated by putting human-generated text into DeepAI sentence by sentence, and the five AI-generated images in the "AI text with AI image" condition were generated by putting AI-generated text through ChatGPT into DeepAI sentence by sentence. The four conditions of stimuli were displayed in the following figures (see Figure 3 to Figure 6).

3.3 Measures

Effectiveness. To measure how effective the promotional messages were for the participants, a 5-point scale ranging from "1 = strongly disagree" to "5 = strongly agree" was incorporated on six items, including "The message changed my thoughts on sexual and reproductive health for women in need", "The message was effective in communicating the struggles of women who give birth during war and natural disasters", "The message made me aware of the struggles of women who give birth during war and natural disasters", "I would like to donate after seeing the message", "I would like to buy an emergency birth kit for women who give birth during the war and natural disasters", and "The message was effective in persuading me to donate to help women who give birth during war and natural disasters" ($M = 3.171$, $SD = .933$, $\alpha = .880$). The scale is modified from Noar et al.'s research on the perceived message effectiveness (2010).

Authenticity. To measure the perceived authenticity of the promotional content from the perspective of the participants, a 5-point scale ranging from "1 = strongly disagree" to "5 = strongly agree" was used for seven items, including "Seems kind and good hearted", "Is sincere", "Comes off very genuine", "Is down-to-earth", "Is unique", "Has distinctive characteristics", and

"The message is original and not a copy of someone else's work" (M = 3.350, SD = .863, α = 0.867). The scale is modified from Lee and Eastin's research on the perceived authenticity of social media influencers (2021).

Positive Emotions. To measure if the promotional content resulted in positive emotions for the participants, a 5-point scale ranging from "1 = strongly disagree" to "5 = strongly agree" was used for three items, including "Happy", "Relaxed", and "Satisfied" (M = 2.056, SD = .891, α = 0.905). The scale is modified from Hoeken and Sinkeldam's discussion of how emotions can be evoked in narrative persuasion (2014).

Negative Emotions. To measure how the promotional messages incurred negative emotions for the participants, a 5-point scale ranging from "1 = strongly disagree" to "5 = strongly agree" was incorporated on five items, including "Worried", "Scared", "Angry", "Surprised", and "Shocked" (M = 2.795, SD = .854, α = 0.772). The scale is modified from Hoeken and Sinkeldam's research (2014).

Trustworthiness. To measure the degree of trustworthiness participants felt the promotional messages incurred, a 5-point scale ranging from "1 = strongly disagree" to "5 = strongly agree" was incorporated on five items, including "Dependable", "Honest", "Reliable", "Sincere", and "Trustworthy" (M = 3.311, SD = .811, α = 0.935). The scale is modified from Ohanian's research on the trustworthiness of celebrity endorsers (1990).

AI Differentiation. To measure if participants were able to determine whether the message that they saw was constructed by AI, two questions were asked: "What do you think the likelihood is that the text above was generated by AI?" and "What do you think the likelihood is that the above images have been constructed by AI?". The answers ranged from "1 = extremely unlikely" to "5 = extremely likely".

Control Variables. To measure the preexisting condition of the participants regarding their level of support to charitable causes and political alignment, two control questions were asked before the experiment: "In general, how often do you support charitable causes? (1 = never, 5 = always, M = 2.330, SD =.885,)", and "Overall, which political ideology do you most closely align with? (1 = liberal, 5 = conservative, M = 2.369, SD = 1.133,)". None of the control variables have a significant difference among different experimental groups.

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Figure 3. Stimulus 3. Human-generated Text with Human-generated Image

Figure 4. Stimulus 4. AI-generated Text with Human-generated Image

Figure 5. Stimulus 5. Human-generated Text with AI-generated Image

Figure 6. Stimulus 6. AI-generated Text with AI-generated Image

3.4 Manipulation Check

Among the pilot test of 180 participants, 171 effective data entries were received and 9 were discarded with significant missing variables. Immediately after participants viewed the promotional messages in one of the six stimuli, two questions were asked: "What do you think the likelihood is that the text above was generated by AI?", and "What do you think the likelihood is that the above images have been constructed by AI?". ANOVA analyses were performed, and a significant difference was detected among the six groups on both the question on text ($F = 4.637$, $df = 5$, $p<.001$) and the question on image ($F = 10.637$, $df = 5$, $p<.001$).

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4. RESULTS

4.1 Sample Demographics

To develop a deeper understanding of the sample demographics of the final sample of N = 700, see Table 1. The following variables are the sample demographics used: gender, income, education, age, and ethnicity.

Table 1. Sample Demographics

Variable	Categories	N	Percentage
Gender	Male	235	33.6%
	Female	452	64.6%
	Non-binary / third gender	10	1.4%
	Prefer to self-describe	2	0.3%
Income	Below $25,000	88	12.6%
	$25,000-$49,999	122	17.4%
	$50,000-$74,999	139	19.9%
	$75,000-$99,999	102	14.6%
	$100,000-$149,999	128	18.3%
	$150,000 or more	102	14.6%
	Prefer not to say	19	2.7%
Education	Some high school or less	7	1.0%
	High school diploma or GED	66	9.4%
	Some college, but no degree	145	20.7%
	Associates or technical degree	88	12.6%
	Bachelor's degree	266	38.0%
	Graduate or professional degree	126	18.0%
	Prefer not to say	1	0.1%
Age	Under 18	0	0%
	18-24 years old	98	14.0%
	25-34 years old	226	32.3%
	35-44 years old	182	26.0%
	45-54 years old	117	16.7%
	55-64 years old	63	9.0%
	65 or older	14	2.0%
Ethnicity	White or Caucasian	551	78.7%
	Black or African American	74	10.6%
	American Indian / Native American or Alaska Native	19	2.7%
	Asian	69	9.9%
	Native Hawaiian or Other Pacific Islander	1	0.1%
	Other	31	4.4%
	Prefer not to say	9	1.3%

4.2 Correlations

In an examination of the relationship among key variables, a two-tailed Pearson's correlation was conducted. Results indicated significant and positive correlations among the tested variables. See Table 2 for detailed correlation results.

Table 2. Pearson's Correlation Test Results

Variables	E	A	PE	NE	T
Effectiveness (E)	1				
Authenticity (A)	.637***	1			
Positive Emotions (PE)	-.032	.071	1		
Negative Emotions (NE)	.339**	.228***	-.218***	1	
Trustworthiness (T)	.593**	.683**	.070	.205**	1

Note: p<.001***. p<.01**. p<.05*

4.3 Experimental Results

To test the hypotheses, a series of ANOVA tests and Bonferroni post-hoc analyses were performed. The comparative analysis results indicated that there is a significant difference of all measured dependent variables (see Table 3).

Table 3. ANOVA Results Among all Six Group

Variables	SS	df	MS	F	p
Effectiveness	36.04	5	7.208	8.733***	<.001
Authenticity	43.893	5	8.779	12.789***	<.001
Positive Emotions	21.809	5	4.362	5.676***	<.001
Negative Emotions	10.903	5	2.181	3.031*	<.05
Trustworthiness	39.571	5	7.914	13.055***	<.001
AI Differentiation - Text	87.505	5	17.501	22.039***	<.001
AI Differentiation - Image	242.031	5	48.406	36.544***	<.001

Note: SS = Sum of Squares; df = degrees of freedom; MS = Mean Square; F = F statistic; p = p-value, p<.001***. p<.01**. p<.05*.

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To future test whether participants were able to differentiate between AI-generated content and human-generated content, a series of Bonferroni post-hoc analyses were performed. The results indicated that participants were able to differentiate text but not images, supporting H1 and H2 (see Table 4).

Table 4. Post Hoc Analysis on AI Differentiation

Variables	Group 1	Group 2	MD	SE	p
AI Differentiation - Text	H-Text Only	AI-Text Only	0.104	0.117	n.s.
	H-Text+H-Image	AI-Text+H-Image	-0.15	0.118	n.s.
	H-Text+AI-Image	AI-Text+AI-Image	-0.183	0.115	n.s.
AI Differentiation - Image	H-Text+H-Image	H-Text+AI-Image	-1.238*	0.152	<.001
	AI-Text+H-Image	AI-Text+AI-Image	-1.486*	0.149	<.001

Note: H- = Human-generated; AI- = AI-generated; MD = Mean Difference (Group 1 - Group 2); SE = Standard Error; p = p-value, *p*<.001***, *p*<.01**, *p*<.05*, n.s.= not significant.

Table 5. Post Hoc Test Results to test H_3-H_6

Variables	Group 1	Group 2	MD	SE	p
Effectiveness	H-Text Only	AI-Text Only	0.10122	0.11931	n.s.
	H-Text & Image	AI-Text & Image	0.74083*	0.11839	<.001
Authenticity	H-Text Only	AI-Text Only	0.04242	0.1088	n.s.
	H-Text & Image	AI-Text & Image	0.71625*	0.10796	<.001
Positive Emotions	H-Text Only	AI-Text Only	-0.31059	0.11512	n.s.
	H-Text & Image	AI-Text & Image	-0.11504	0.11423	n.s.
Negative Emotions	H-Text Only	AI-Text Only	0.33009*	0.11139	<.05
	H-Text & Image	AI-Text & Image	0.19102	0.11052	n.s.
Trustworthiness	H-Text Only	AI-Text Only	-0.03191	0.10225	n.s.
	H-Text & Image	AI-Text & Image	0.65333*	0.10146	<.001

Note: H- = Human-generated; AI- = AI-generated; MD = Mean Difference (Group 1 - Group 2); SE = Standard Error; p = p-value, *p*<.001***, *p*<.01**, *p*<.05*, n.s.= not significant.

Post hoc analysis revealed that participants had significantly different perceived effectiveness, authenticity, and trustworthiness when viewing human-generated text and image content compared with AI-generated text and image content. Regarding emotions, participants had significantly different negative emotions when viewing text-only messages. The results rejected H3, H4a, H4c, and H6b, and supported H4b, H5, H6a, and H6c (see Table 5).

Post hoc analysis revealed that participants had significantly different perceived effectiveness, authenticity, and trustworthiness when viewing text and image generated by both AI and human. The results partially supported H7, H8a, and H8c and rejected H8b (see Table 6 for details).

Table 6. Post Hoc Test Results for Text-Image Congruence vs. Incongruence

Variables	Group 1	Group 2	MD	SE	p
Effectiveness	H-Text & Image	AI-Image + H-Text	0.19558	0.12034	n.s.
	H-Text & Image	AI-Text+H-Image	0.36879*	0.11983	0.033
	AI-Text & Image	AI-Image + H-Text	-0.54526***	0.11785	<.001
	AI-Text & Image	AI-Text+H-Image	-0.37204*	0.11733	0.024
Authenticity	H-Text & Image	AI-Image + H-Text	0.21359	0.10974	n.s.
	H-Text & Image	AI-Text+H-Image	0.67384***	0.10928	<.001
	AI-Text & Image	AI-Image + H-Text	-.50266***	0.10747	<.001
	AI-Text & Image	AI-Text+H-Image	-0.04241	0.10699	n.s.
Positive Emotions	H-Text & Image	AI-Image + H-Text	0.0009	0.11612	n.s.
	H-Text & Image	AI-Text+H-Image	-0.17202	0.11562	n.s.
	AI-Text & Image	AI-Image + H-Text	0.11594	0.11371	n.s.
	AI-Text & Image	AI-Text+H-Image	-0.05698	0.11321	n.s.
Negative Emotions	H-Text & Image	AI-Image + H-Text	-0.07392	0.11235	n.s.
	H-Text & Image	AI-Text+H-Image	0.06323	0.11187	n.s.
	AI-Text & Image	AI-Image + H-Text	-0.26494	0.11002	n.s.
	AI-Text & Image	AI-Text+H-Image	-0.12779	0.10953	n.s.
Trustworthiness	H-Text & Image	AI-Image + H-Text	0.09593	0.10313	n.s.
	H-Text & Image	AI-Text+H-Image	0.56807***	0.10269	<.001
	AI-Text & Image	AI-Image + H-Text	-0.55740***	0.10099	<.001

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AI-Text & Image	AI-Text+H-Image	-0.08526	0.10055	n.s.

Note: H- = Human-generated; AI- = AI-generated; MD = Mean Difference (Group 1 - Group 2); SE = Standard Error; p = p-value, $p<.001$***, $p<.01$**, $p<.05$*, n.s.= not significant.

5. DISCUSSION

This experimental study was conducted to understand if people can differentiate between AI and human-generated promotional content of a nonprofit cause and to compare the effectiveness of AI and human-generated promotional content message effectiveness, authenticity, positive and negative emotional appeal, and trustworthiness. Results indicated that participants were able to differentiate images created by AI and humans, but they were not able to differentiate text-only promotional messages even when the text is displayed in combination with AI-generated or human-generated images. The effectiveness of messages in different conditions also varies.

5.1 Differentiation and Effectiveness of Text-only Promotional Messages

The post hoc analysis on AI differentiation revealed that when digital marketers utilize human-generated text or AI-generated text to create content for nonprofits, there are no significant differences in terms of perceived effectiveness, authenticity, positive emotions, and trustworthiness. In contrast to the challenges of AI use presented by Braga and Logan (2017), Galloway and Swiatek (2018), Jakesch et al. (2019), Kučinkas (2024), and Youn and Jin (2021), the experiment's results revealed that AI can effectively be used in content creation when the content is text-only.

The findings of Haleem et al. (2022), Kreps et al. (2020), and Nair and Gupta (2020) can explain why there are no significant differences between AI and human-generated text effectiveness; they emphasize how the capabilities of AI are growing (i.e. through the development of natural language processing), allowing for AI-generated text to be more sophisticated and human-like. This sophistication and modernization of AI technology can explain why participants could not differentiate between AI and human-generated text. As AI becomes integrated into the digital world, more people are becoming AI literate, which can lead to increased perceived authenticity and trustworthiness of AI-generated text. AI-generated text is becoming more familiar to readers, similar to how human-generated text is widespread.

Since the participants could not differentiate between AI and human-generated text only content, there are implications for the digital marketing and public relations fields. Public relations specialists and digital marketers can use AI technology to generate text-only promotional content, as people cannot tell the difference between AI and human-generated text. This can allow text-only content to be generated faster, so businesses can have more advertisements to increase their brand recognition. Less human effort may be needed to create

effective digital marketing campaigns, which is consistent with the findings of Islam et al. (2024). Businesses can save time, energy, and resources by hiring fewer digital marketers and using AI. This is particularly relevant for small businesses, which often have fewer resources, including human capital. Using AI to generate text-only promotional messages can allow small businesses to quickly and efficiently promote their messages.

This has implications in higher education as well, as students studying subjects, such as business, marketing, or communications, need to learn how to effectively use AI to create promotional content alongside learning to write content on their own. This could involve creating courses in which students learn more about the platforms that are best at generating AI text and how to create specific prompts to generate detailed and effective content. A further implication in higher education is the necessity for communications, marketing, and business professors to undergo professional development in how to effectively use AI tools to generate well-written digital content. Thus, students can be well-educated on how to use AI tools effectively. Universities' AI-use policies could be edited to allow students to use AI on certain assignments that are specified by professors so that students can begin to learn how to interact with and utilize AI when creating written content.

The post hoc analysis also revealed that human-generated text-only content is more effective at generating negative emotions in the viewers compared to AI-generated text-only content. This demonstrates that human-generated text has more negative emotional appeal compared to text created by AI, which is supported by the findings of Tsai et al. (2021) and Song et al. (2024). Human-generated text may be able to better express negative emotions, such as sorrow and sadness, because despite the sophistication of the current AI development, humans still have higher emotional intelligence, creativity, and sincerity compared to AI (Galloway & Swiatek, 2018; Youn & Jin, 2021). This finding has implications for digital marketers, specifically when they are creating non-profit campaigns. Non-profit campaigns often rely on eliciting negative emotions, such as sadness, fear, anger, and shock, to encourage viewers to feel empathy; when viewers feel empathy, it can embolden them to donate to the nonprofit. Thus, it may be worth the investment for nonprofits, compared with other industries, to hire humans to create their digital marketing campaigns as opposed to using AI.

5.2 Differentiation and Effectiveness of Text and Image Promotional Messages

According to the post hoc analysis on AI differentiation, people can differentiate between the images generated by AI and humans. Participants were more likely to view human text with AI images and AI text with AI images as being generated by AI compared to human text and human images and AI text and human images. This shows that AI images are easier to detect than AI text.

These results can be explained by the lack of realism that AI-generated images have, as the AI generators are not advanced enough to create aesthetic, accurate images (Göring et al..,

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2022). AI generators can have difficulty creating realistic photos of people, as they often either turn out too cartoon-like or distort the proportions to make it clear that the image was not taken by a human. The effectiveness of advertisements relies on connecting to viewers, especially through eye-catching images. If nonprofits' advertisements contain images that are unrealistic because they were generated by AI, it can make viewers question whether the issue is real or if the proposed solution is reliable. Thus, viewers may view AI-generated images as untrustworthy and inauthentic. Nonprofits must also consider the implication of using AI to create images of vulnerable populations, as it may be seen as misrepresenting and exploiting the suffering of these groups.

It is positive that AI cannot fully imitate human-constructed images regarding the ethical implications involved with the authenticity of AI produced images, especially if people cannot differentiate between what is AI and human-constructed. AI technology has enabled images to be faked and manipulated (Hsu & Myers, 2023). AI platforms, such as Midjourney, can create images that are so realistic that they are almost indistinguishable from human-generated images. This can fuel disinformation online, such as when people believed that an earthquake occurred in the Pacific Northwest based on AI images even though this event never happened (Hsu & Myers, 2023).

Since AI cannot fully replicate the image creation of humans, people in the field of digital marketing need to develop their creativity and abilities to capture, create, and edit images. Thus, it is recommended that educators in higher education focus more on teaching students how to effectively use images in the marketing profession, particularly in the field of digital content creation. AI not being capable of completely imitating human-created images also has implications for digital marketing professionals, as it provides evidence that AI is not at the development stage where it can lead to the potential unemployment and deskilling of employees who photograph and edit images. Businesses still need to train and hire photographers and editors to curate promotional content that involves images.

The post hoc test results revealed that the combination of human text and images is viewed as more effective, authentic, and trustworthy compared to AI text and images, which confirms the research conducted by Dai et al. (2023) and Kučinskas (2024). Thus, when using a combination of text and images in digital marketing, humans are more effective than AI.

Human-generated text and images may be viewed as more authentic because people can express and appeal to emotions better than AI (Song et al., 2024). Humans have a deeper contextual understanding and emotional awareness that is key in digital advertising, especially for nonprofits that often promote multifaceted issues. Additionally, human-generated text and images may be seen as more authentic because pictures captured by people are often more photographic as opposed to cartoonish (see Figure 4 and Figure 5). For instance, in the experiment, the participants who viewed images generated by humans were able to see the faces of real babies and the extensive damage caused to actual buildings due to war. This enhances the

feelings of connection for the viewers, as they feel more immersed in a real situation, which can strengthen the authenticity of the advertisement. Connecting to authenticity, people may think that the advertisement is more trustworthy if they perceive that the creator of the advertisement has a deep knowledge or connection to the issue presented. Humans build trust through forming relationships with other humans and understanding their experiences. AI, for now, cannot build relationships, thus creating a lack of trustworthiness for viewers.

The results indicate that developing human skills remains relevant in the digital marketing field, specifically when creating more advanced campaigns involving text and images. At this stage of AI advancement, AI technologies cannot match human skill sets, such as creativity and emotional understanding. Thus, digital marketing techniques are still essential to be taught in higher education, and human digital marketing professionals are still irreplaceable and indelible.

5.3 Congruence Matters in Human-generated Content

The post hoc analysis of text-image congruence vs. incongruence revealed that content that is congruent, specifically human-generated text and images, is more effective, authentic, and trustworthy than incongruent content. However, AI congruent content (i.e. AI-generated text and images) is less effective, authentic, and trustworthy compared to incongruent content (i.e. AI-generated text and human-generated images). These results indicate that there is a hierarchy in terms of perceived effectiveness, authenticity, and trustworthiness when choosing to incorporate humans or AI in the construction of promotional content. Overall, human text and images have proven to be the most effective. However, it is more effective for there to be incongruence (i.e. AI image and human text) compared to using solely AI for image and text generation. Thus, congruence matters but not when using only AI-generated content.

These results can be explained by how AI-generated content is viewed with less intentionality and hard-work compared to human-generated content, which creates lower authenticity (Galloway & Swiatek, 2018; Kučinkas, 2024). AI has difficulty building connections with people because many perceive AI as having the inability to understand them, as it does not have emotions or real-life experiences. This affects the effectiveness of AI-generated advertisements because advertisements often rely on connecting with viewers to inspire them to purchase a product or donate funds to support a charitable cause. AI may have a lack of trustworthiness since most people do not understand how AI operates or how it acquires its knowledge (Martin & Parmar, 2024). Content that is completely generated by humans is therefore more effective, authentic, and trustworthy. Humans have the ability to connect with viewers and develop their ethos.

Content that has an AI-generated portion is less effective, authentic, and trustworthy than human-generated content because it has a component of AI that can lead viewers to question the advertisement; however, the human component still increases the effectiveness, authenticity, and trustworthiness compared to content that is completely generated by AI due

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to the presence of a trusted, credible, and original human voice. Based on these findings, it is recommended that digital marketers use human-generated text and images to maximize the effectiveness of digital marketing campaigns. However, if a business is interested in exploring the use of AI technology to be more financially efficient, the mix of human and AI is more effective than using solely AI to generate text and images. Particularly for nonprofits, which often have limited marketing budgets and resources, using a mix of human-generated and AI-generated digital content could be effective. For instance, AI tools could expedite the content creation process in marketing by generating ideas and drafting content variations; the human digital marketing experts can refine these drafts, making them more detailed, targeted, and emotional. Having a human editor is essential to capture emotional nuances and brand subtleties, as well as edit content for errors and plagiarism. Thus, the organization can save time and resources while also ensuring that its messages are effective, trustworthy, and authentic.

5.4 Theoretical Implications

These findings add value to the Media Effects framework by providing empirical evidence regarding the effectiveness of AI, specifically in the digital marketing of a non-profit cause. AI is a media platform unlike previous media platforms. Humans no longer need to create and curate digital media content. AI can generate media information for users that is not generated by humans, including text and images. However, AI tools have effects on humans as evidenced by the participants being unable to differentiate between human-generated text and AI-generated text.

Unlike previous media platforms, AI has a high potential for spreading misinformation quickly and efficiently, which connects to the trustworthiness and authenticity of the generated content. The findings that AI-generated text and images were viewed as less authentic and trustworthy compared to human-generated text and images reveals that people are wary of misinformation or disingenuous content.

This research adds to the discourse on the relationship between perceived trustworthiness, authenticity, and emotional appeal on the effectiveness of AI-constructed digital marketing messages. The results of this study demonstrate that AI can have a similar effect as humans in generating positive emotions in viewers; however, it cannot elicit negative emotions in the same way. This adds to the Media Effects framework by providing empirical evidence to the lack of emotional intelligence AI has when dealing with negative emotions. AI lacks the emotional complexity to understand how to elicit nuanced emotions, such as negative ones.

6. LIMITATIONS

The study is not flawless in its design. First, the sample of the study was from the United States. Thus, future researchers are highly recommended to test the research questions and hypotheses in a non-English speaking context. Second, the message selected in this research

focuses on promoting a non-profit cause. Future research can test the validity and authenticity of AI-generated content in a corporate context. Third, ChatGPT 3.5 and DeepAI were used in the stimuli-generation of this study. With the rapid development of AI technology, it is recommended that future researchers use more updated and recent AI software to produce fresh outcomes in research on AI effectiveness in digital marketing.

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