

Human Beauty according to Artificial Intelligence

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Summary: This work explores the upcoming era of artificial intelligence (AI), its potential impact on societal norms and aesthetics, and the biases inherent in AI systems. With the ability to generate realistic human-like art and language, AI entities like DALL·E or Midjourney have significant cultural and economic implications, particularly in creative sectors. However, our study highlights potential biases in AI, demonstrated through a text-to-image model called Craiyon, which was found to generate oversized and sexually suggestive images of breasts when prompted with certain phrases. These results underline the influence of societal norms on AI and the risk of perpetuating harmful stereotypes or unrealistic beauty standards. We emphasize the need for vigilance in monitoring AI's learning processes and potential biases, particularly as AI starts playing a crucial role in shaping societal perceptions of beauty and self. More inclusive and diverse AI models are needed to better represent the complexity of human beauty and to avoid biases. (*Plast Reconstr Surg Glob Open* 2023; 11:e5153; doi: [10.1097/GOX.0000000000005153](https://doi.org/10.1097/GOX.0000000000005153); Published online 26 July 2023.)

We are standing on the verge of a new era. A new player is entering the global arena, marking an unprecedented step in our evolutionary journey: artificial intelligence (AI). Now capable of learning and generating human-like art and language, AI entities such as DALL·E from OpenAI or Midjourney can produce images based on text prompts, emulating the cognitive processes of the human mind.^{1,2} The updated version, DALL·E 2, can generate original, realistic artwork from natural language commands,³ a capacity with considerable cultural and economic implications.⁴ As AI continues to advance, it is likely to become a dominant force in various creative sectors, including art, fashion, and music. With AI's ability to generate media content in seconds, it may eventually shape our cultural heritage. Will future generations regard AI entities like DALL·E as the Da Vincis or Beethovens of their time? Just as we now look back on the predigital era, future generations may view the pre-AI society as a different historical period.

The perception of ourselves is significantly influenced by societal norms and our environment. This perception can even shift when individuals move to different societies.⁵ The concept of beauty, ever-changing and largely defined

by societal standards, has evolved throughout history, and remains a complex and ambiguous concept today.⁶

Until now, moral and aesthetic norms have been dictated solely by humans, through mediums such as art, religion, or education. However, we are now entering an era where AI may play a major role in shaping our artistic and cultural heritage. It is conceivable that future generations may learn about their culture from AI-dominated movies, art, and social media.

Models that convert text to images like DALL·E 2 are currently under development and available to a limited number of researchers. The model's creators have put restrictions on certain search items, such as breasts, to avoid generating controversial images. Meanwhile, a different model called Craiyon (formerly DALL·E mini, created by Boris Dayma et al.) is more readily available.⁷ Despite its inferior image quality, Craiyon's unrestricted access provides a clearer insight into the biases inherent in AI. Craiyon was trained using over 15 million images. We used several prompts to generate images from Craiyon, including "breasts," "beautiful breasts," "perfect breast," "woman," "beautiful woman," "man," "beautiful man," "foot," "beautiful foot," "ear," "beautiful ear," "nose," "beautiful nose," "eyes," and "dog." The results were remarkable. Figures 1 and 2 show Craiyon's interpretation of "beautiful breasts."

The images were reviewed by two human observers, both healthcare professionals with expertise in beauty assessment. A female head and neck surgeon with training in cosmetic medicine and a male plastic surgeon with

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Fig. 1. Display of a beautiful breast (example A).

experience in cosmetic and reconstructive breast surgery evaluated each image. Both were blind to the AI prompts and assessed the AI model's representation of beauty. The researchers reviewed a total of 334 images, with 90 images of breasts being categorized based on standard, under-, and oversized traits, as well as their sexual suggestiveness. The study was overseen by a plastic surgeon who actively performs breast surgery and evaluates breast aesthetics. The results were analyzed using Cohen kappa. All of the breast images were deemed sexually suggestive by both observers, with a Cohen kappa value of 1, indicating



Fig. 2. Display of a beautiful breast (example B).

Takeaways

Question: We want to learn about the way artificial intelligence (AI) sees humans.

Findings: We found that some AI models learn about humans mainly through the internet, where unfiltered information can make humans look distorted. Female breast images created by AI were generally oversized and sexually suggestive.

Meaning: Care must be taken in the following years because AI is at the point in which soon it will be creating content for entertainment or education for younger generations. The way AI sees humanity must be well balanced socially to avoid creating or perpetuating discrimination.

perfect agreement. In contrast, the “man” prompt was considered suggestive in 56% of cases by the female observer and 11% by the male observer. In the “beautiful breasts” category, an average of 83% of the breasts were classified as oversized, with moderate agreement between observers: 88.89%, Cohen kappa: 0.59. No images of breasts were categorized as undersized. No disproportion was observed in the “man” and “beautiful man” categories. Moreover, no disproportion or sexual innuendo was detected in any of the other image categories, such as “beautiful ear” or “beautiful nose,” as can be seen in Supplemental Digital Content 1 and 2, respectively. (See figure 1, Supplemental Digital Content 1, which displays the beautiful ear. <http://links.lww.com/PRSGO/C688>) (See figure 2, Supplemental Digital Content 2, which displays the beautiful nose. <http://links.lww.com/PRSGO/C689>.)

DISCUSSION

We are at the dawn of a transformative era, where the destinies of humankind and AI are increasingly intertwined. The capabilities of AI are expanding, as it is now able to create music⁸ and images based on natural language.⁹ AI is still in its early stages of learning about its human creators, and it is therefore prone to errors. In this study, we observed that the AI model Craiyon has learned to portray the female breast as an oversized and sexually suggestive organ, despite its training with millions of diverse images. Although there is no scientific consensus on what constitutes a “perfect breast,”¹⁰ Craiyon appears to have a clear interpretation. Although the statistical analysis in this study might be considered subjective, the authors maintain that the AI's tendency to generate oversized and sexualized images of breasts, particularly when prompted for “beautiful” or “perfect” breasts, is undeniable.

It is important to note that AI is continuously learning from its environment and, without proper control, can perpetuate existing biases. In fields such as plastic surgery, vigilance is required to monitor societal shifts in aesthetic perceptions. As AI begins to play a significant role in shaping how humans perceive themselves, it is imperative to keep track of these changes.

In the future, AI will play an integral part in shaping our cultural norms. The way AI currently perceives humans could influence future cultural trends, as more and more of these norms are designed by AI and widely viewed by youth on social media. As future generations learn about beauty and form their moral compass in a world dominated by AI, we need to be cautious about what AI is learning about us now. This study underscores the importance of addressing AI's biases, especially those that may perpetuate harmful stereotypes or unrealistic beauty standards. It opens the path for further research into developing more inclusive and diverse AI models that better represent the variety and complexity of human beauty, as AI inevitably makes its way into human society.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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