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Artificial Intelligence

Aesthetically Ideal Breasts Created With Artificial Intelligence: Validating the Literature, Racial Differences, and Deep Fakes

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Abstract

Background: A female's breasts are integrally tied to her identity and sense of femininity. Despite extensive study of breast aesthetics, there is no discrete formula for the "ideal breast" to guide the aesthetic surgeon. Racial and cultural differences heavily influence preferences in breast morphology. Artificial intelligence (AI) is ubiquitous in modern culture and may aid in further understanding ideal breast aesthetics.

Objectives: This study analyzed AI-generated images of aesthetically ideal breasts, evaluated for morphologic differences based on race, and compared findings to the literature.

Methods: An openly accessible AI image-generator platform was used to generate images of aesthetically ideal Caucasian, African American, and Asian breasts in 3-quarter profile and frontal views using simple text prompts. Breast measurements were obtained and compared between each racial cohort and to that of previously described ideal breast parameters.

Results: Twenty-five images were analyzed per racial cohort, per pose (150 total). Caucasian breasts were observed to fit nicely into previously described ideal breast templates. However, upper-to-lower pole ratios, nipple angles, upper pole slope contours, nipple–areolar complex positions, and areolar size were observed to have statistically significant differences between racial cohorts.

Conclusions: Defining the aesthetically ideal breast remains a complex and multifaceted challenge, requiring consideration of racial and cultural differences. The AI-generated breasts in this study were found to have significant differences between racial groups, support several previously described breast ideals, and provide insight into current and future ethical issues related to AI in aesthetic surgery.

Level of Evidence: 5

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A female's breasts are integrally tied to her identity, broadcasting her femininity to the world. Female breasts have played a major role in the interplay between the sexes throughout history. Evolutionarily, male preferences have helped select for the development of permanently enlarged breasts in females.[1] Societally, a female's breasts influence the perception of her attractiveness,[2] reproductive and lactational efficiency, and sexual desire.[3] Given the importance of breast morphology, it is no surprise that approximately 720,500 cosmetic female breast operations took place in the United States in 2022.[4] Theoretically, cosmetic breast enhancement should move a female closer to achieving ideal breast aesthetics.

Breast aesthetics have been extensively studied, yet there is no concrete formula for what constitutes the "ideal breast." Defining ideal breasts is a complex undertaking with innumerable variables at play, including well-known racial, gender, and cultural differences.[5-9] Patients and their plastic surgeons even view the ideal breast shape differently.[10] Many scientific descriptions of ideal breast aesthetics use physical measurements made on a patient's body; however, the lay population bases judgment on visual appearance.

Breast morphology can be broken down into 3 basic components when evaluating breast images: breast shape, nipple position, and areolar proportions. Ideal upper-to-lower pole ratios (U:L), nipple angles, upper and lower pole contours, nipple–areolar complex (NAC) locations, and nipple/areolar proportions have been described.[11-15] No description can be perfectly applied across cultures and races, and it is likely that many "ideals" exist.

With the explosion of artificial intelligence (AI) in modern culture, AI may prove to be a useful tool in understanding ideal breast aesthetics. AI is being investigated in every subfield of plastic surgery[16] and has been used to predict risk factors[17] and cosmetic results[18] in breast augmentation. If AI image generators produced images of ideal female breasts with racial nuances and aesthetic parameters consistent with previous descriptions, it would support the plastic surgery literature.

The aim of this study is to analyze how "ideal" the images generated by AI are when prompted to produce aesthetically ideal breasts, evaluate for any morphologic differences based on race, compare the findings to the literature, and discuss societal implications.

METHODS

With institutional review board approval, an AI image-generator platform that is openly accessible to the lay population (Catbird, NewCompute, Inc., New York, NY) was used to generate images of fictitious females with aesthetically ideal breasts. A commercial license was obtained for image publication. Both 3-quarter profile and frontal poses were utilized, consistent with previous breast aesthetics literature. The text prompt used to generate these images was as follows: "A topless Caucasian woman with perfect aesthetically ideal breasts standing in 3-quarter profile view." This prompt was then minimally altered to "frontal view" and "African American" and "Asian" to generate images of Caucasian, African American, and Asian females standing in both 3-quarter profile and frontal views.

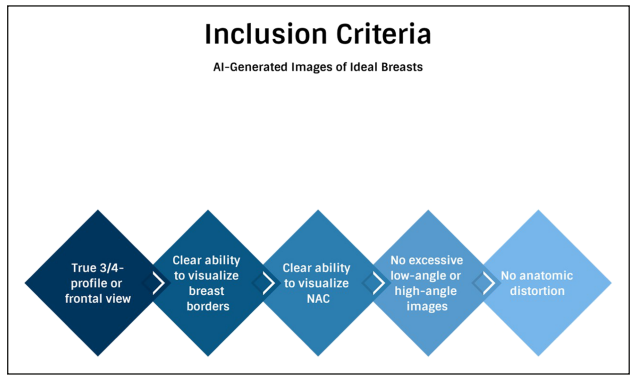

Figure 1. The 5 components of the inclusion criteria utilized in this study. Other examples of excluded images include those where the female's hair was covering the upper breast border, and those where the female's arm was bent and covering the lower breast border. ¾-profile, 3-quarter profile; NAC, nipple–areolar complex.

The AI models used are latent text-to-image diffusion models, trained with millions of images, which were specifically designed to generate high-quality photorealistic images of people given any text input. The models were created and trained by the lay population—for the lay population—with likely negligible influence from the plastic surgery literature.

The generated images were then filtered based on the following inclusion criteria (Figure 1): true 3-quarter profile or frontal view, clear ability to visualize the upper, lower, medial, and lateral breast borders, clear ability to visualize the nipple and areola, no excessive low- or high-angle images, and no anatomic distortion (Supplemental Figure 1). Twenty-five consecutive images that met inclusion criteria for Caucasian, African American, and Asian females were compiled in both 3-quarter profile and frontal views (150 images in total) and used for analysis.

Adobe Photoshop 2023 (Adobe Inc., San Jose, CA) was used to obtain breast measurements for each racial cohort. Measurements were made using pixels as a unit of length which standardized measured lengths across all images, which did have variation in overall image size. Consistent with previous descriptions, 3-quarter profile images were used to evaluate breast shape (Figure 2). The upper and lower pole proportions were measured from the upper and lower breast borders relative to the nipple, respectively. Nipple angle was measured from a 180° line extending from the center of the nipple. The shape of the upper pole slope (UPS) and tightness of the lower pole convexity

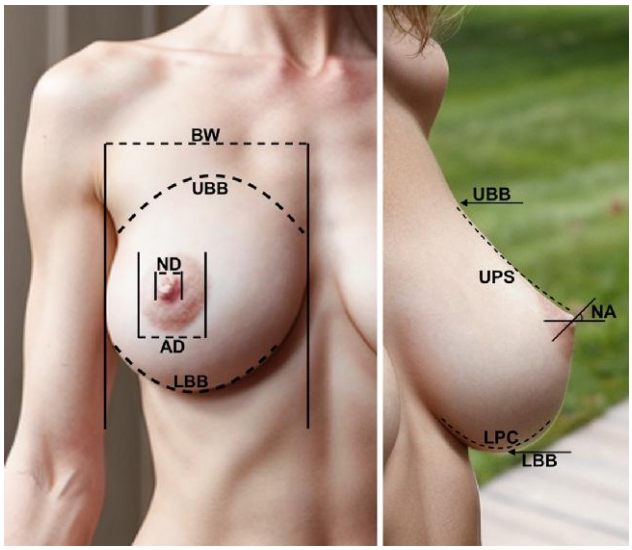

Figure 2. Two example Caucasian images showing the important breast landmarks used for measurement. Left (A) A frontal image from the study showing how the base width (BW) was measured from the lateral breast border to the medial breast border; the areolar diameter (AD) and nipple diameter (ND) are also shown; breast height was measured from the highest point along the upper breast border (UBB) to the lowest point along the lower breast border (LBB). Right (B) A 3-quarter profile image from the study showing the UBB and LBB landmarks; a concave upper pole slope (UPS) and tight lower pole convexity (LPC) are also shown; the nipple angle (NA) was measured relative to a 180° line emanating from the center of the nipple. Of note, UPS and LPC contours were evaluated subjectively. These images were generated using Catbird.

(LPC) were also noted. Frontal images were used to evaluate NAC position and nipple/areolar size (Figure 2). Medial, lateral, upper, and lower breast proportions were measured from the medial, lateral, upper, and lower breast borders relative to the nipple, respectively. Areolar diameter to base width proportions and nipple-to-areolar diameter proportions were also measured on frontal view.

Descriptive statistics were calculated for each racial cohort. One-way analysis of variance (ANOVA) with post hoc pair-wise *t* tests using Bonferroni correction was used to evaluate for differences between the racial groups based on breast shape, nipple position, and NAC proportions. One-sample *t* tests were then used to compare these measurements for each racial group to various previously described aesthetic ideals in the plastic surgery literature.[11-15,19,20] R statistical software (v. 4.3.1, R Core Team, Vienna, Austria) was used for analysis, and a *P*-value <.05 was considered statistically significant.

RESULTS

Overall, the breasts generated across all racial groups were realistic and aesthetically pleasing with ample size, excellent projection, and slight glandular ptosis (Supplemental Figures 2-7). Some females were observed to have potentially excessively large breasts for their body frame. Largely, the females were found to have attractively thin and athletic builds, but occasionally had unrealistically muscular body tones.

Descriptive statistics varied by racial group (Table 1). Caucasian breasts had a mean U:L ratio of 45.8/54.2, mean nipple angle of 21.5°, 88% ($n = 22$) straight or concave UPS, and 100% ($n = 25$) tight LPC on 3-quarter profile view (Figure 3). On frontal view, Caucasian breasts had mean NAC position ratios of 46.7/53.3 (upper to lower) in vertical axis and 26.9/73.1 (lateral to medial) in horizontal axis, mean areolar diameter to breast width ratio of 29.6%, and mean nipple diameter to areolar diameter ratio of 28.8%.

African American breasts had a mean U:L ratio of 51.4/48.6, mean nipple angle of 10.9°, 64% ($n = 16$) convex UPS, and 100% ($n = 25$) tight LPC on 3-quarter profile view (Figure 4). On frontal view, African American breasts had mean NAC position ratios of 51.9/48.1 (upper to lower) in vertical axis and 26.7/73.3 (lateral to medial) in horizontal axis, mean areolar diameter to breast width ratio of 33.0%, and mean nipple diameter to areolar diameter ratio of 27.9%.

Asian breasts had a mean U:L ratio of 52.7/47.3, mean nipple angle of 10.5°, 96% ($n = 24$) straight or convex UPS, and 100% ($n = 25$) tight LPC on 3-quarter profile view (Figure 5). On frontal view, Caucasian breasts had mean NAC position ratios of 52.2/47.8 (upper to lower) in vertical axis and 26.5/73.5 (lateral to medial) in horizontal axis, mean areolar diameter to breast width ratio of 31.6%, and mean nipple diameter to areolar diameter ratio of 29.8%.

The results were compared between racial groups and to previously described aesthetic ideals (Tables 1, 2). U:L ratios differed significantly between all 3 groups ($P < .001$), and Caucasian breasts had significantly smaller upper poles when compared with Asian ($P < .001$) and African American ($P < .001$) breasts (Figure 6). Nipple angles differed significantly between all 3 groups ($P < .001$), and Caucasian breasts had significantly more skyward-pointing nipples when compared with Asian ($P < .001$) and African American ($P < .001$) breasts. UPS contours differed significantly between all 3 groups ($P < .001$), and Caucasian breasts had significantly more concave UPS when compared with Asian ($P = .02$) and African American ($P < .001$) breasts. NAC positions were similarly lateralized in the horizontal axis of the breast mound. However, Asian ($P < .001$) and African American ($P = .001$) breasts had significantly higher NAC positions when compared with Caucasian breasts on frontal view. Areolar diameter to breast width ratios differed significantly across all 3 groups ($P = .007$), and African American breasts had significantly larger areolas when compared with Caucasian breasts ($P = .006$).

Table 1. Descriptive Statistics and Comparison Based on Race

	Asian	African American	Caucasian	*P*-value (overall)	*P*-value (Asian vs African American)	*P*-value (Asian vs Caucasian)	*P*-value (African American vs Caucasian)
3-quarter profile view							
n	25	25	25				
Upper pole % (mean (SD))	52.65 (4.24)	51.41 (3.56)	45.84 (3.86)	<.001[a]	.79	<.001[a]	<.001[a]
Lower pole % (mean (SD))	47.35 (4.24)	48.59 (3.56)	54.16 (3.86)	<.001[a]	.79	<.001[a]	<.001[a]
Nipple angle, degrees (mean (SD))	10.52 (7.36)	10.90 (7.79)	21.52 (7.07)	<.001[a]	1	<.001[a]	<.001[a]
Upper pole slope (%)				<.001[a]	1	.02[a]	<.001[a]
Concave	1 (4.0)	1 (4.0)	8 (32.0)				
Convex	12 (48.0)	16 (64.0)	3 (12.0)				
Straight	12 (48.0)	8 (32.0)	14 (56.0)				
Lower pole convexity (%)	25 (100.0)	25 (100.0)	25 (100.0)				
Frontal view							
n	25	25	25				
Medial NAC proportion % (mean [SD])	73.46 (2.91)	73.26 (2.40)	73.06 (3.16)	.88			
Lateral NAC proportion % (mean [SD])	26.54 (2.91)	26.74 (2.40)	26.94 (3.16)	.88			
Upper NAC proportion % (mean [SD])	52.23 (5.45)	51.92 (4.38)	46.67 (3.49)	<.001[a]	1	<.001[a]	<.001[a]
Lower NAC proportion % (mean [SD])	47.77 (5.45)	48.08 (4.38)	53.33 (3.49)	<.001[a]	1	<.001[a]	<.001[a]
Areolar diameter to breast width % (mean [SD])	31.55 (3.81)	33.02 (3.09)	29.55 (4.41)	.007[a]	.523	.2032	.0057[a]
Nipple to areolar diameter % (mean [SD])	29.77 (4.31)	27.85 (5.19)	28.75 (3.40)	.304			

[a]Statistically significant values. NAC, nipple areolar complex; SD, standard deviation.

Nipple diameter to areolar diameter ratios did not differ across racial groups.

When compared with the previously defined ideal U:L ratio of 45:55, Caucasian breasts did not differ ($P = .18$); however, Asian ($P < .001$) and African American ($P < .001$) breasts had significantly larger upper poles. When compared with the previously defined ideal U:L ratio of 55:45, Caucasian ($P < .001$), Asian ($P = .03$), and African American ($P < .001$) breasts differed significantly. When compared with the previously defined ideal U:L ratio of 65:35 for Asian females, Asian breasts had significantly smaller upper poles ($P < .001$). When compared with the previously defined ideal nipple angle of 20°, Caucasian breasts were similar ($P = .29$); however, Asian ($P < .001$) and African American ($P < .001$) breasts had significantly more straightward-pointing nipples. When compared with the previously defined ideal NAC position ratios of 50:50 (upper to lower) and 40:60 (lateral to medial), all groups had significantly more lateral NAC positions ($P < .001$), and Caucasian breasts had significantly lower NAC positions ($P < .001$), while Asian ($P = .03$) and African American breasts ($P = .02$) had significantly higher NAC positions. When compared with the previously defined ideal areolar diameter to breast width and nipple diameter to areolar diameter ratios of 29%, Caucasian breasts were similar ($P = .54$, $P = .72$); however, Asian ($P = .003$) and African American ($P < .001$) breasts had significantly larger areolas.

DISCUSSION

Throughout the last several decades, considerable attention has been paid toward trying to define the morphology of the aesthetically ideal female breast in order to guide plastic surgeons as they attempt to optimize the cosmesis of their patients. Despite several high-quality attempts to distill ideal breast aesthetics into something easily quantifiable, there exists an incredible amount of variability in terms of what breast characteristics may be deemed "perfect." It seems more likely that there are many iterations of aesthetically ideal breasts which are heavily influenced by an individual's culture, race, and body type. In this study, AI

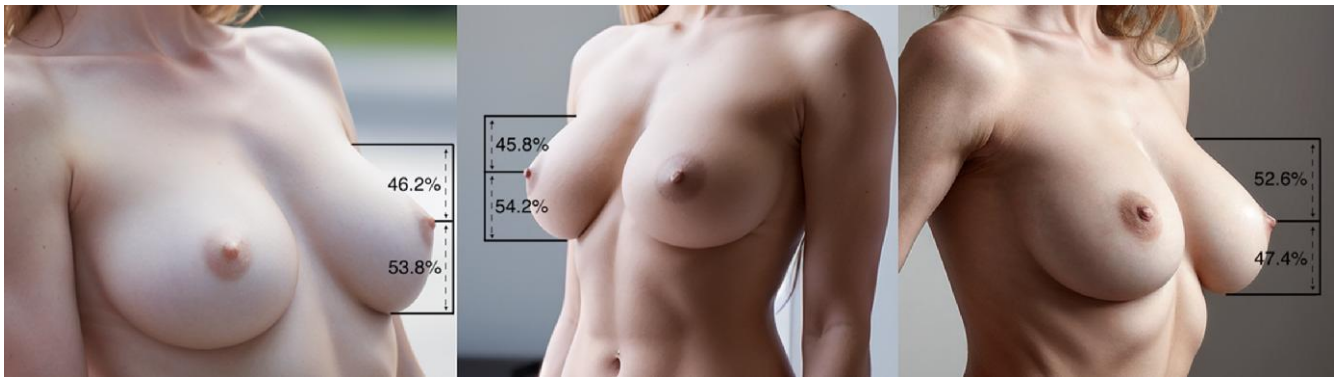

Figure 3. Three of the 25 Caucasian images in 3-quarter profile view used for analysis are shown. Left (A) A straight upper pole slope (UPS) and tight lower pole convexity (LPC) can be seen; a nipple angle of 18.4° was observed. Center (B) A slightly convex UPS and tight LPC can be seen; a nipple angle of 20.6° was observed. Right (C) A straight UPS and tight LPC can be seen; a nipple angle of 8.6° was observed. These images were generated using Catbird.

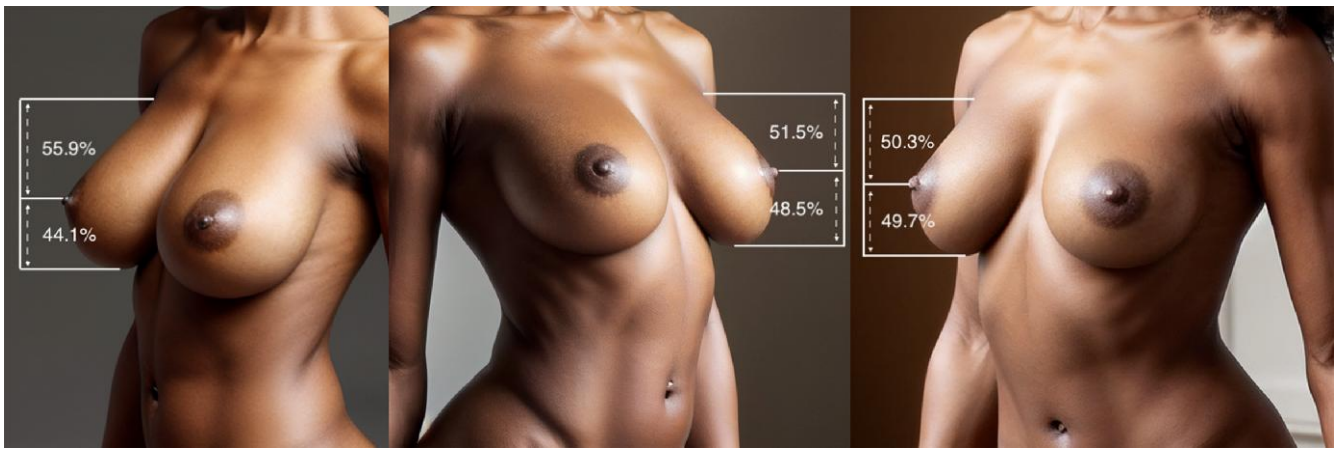

Figure 4. Three of the 25 African American images in 3-quarter profile view used for analysis are shown. Left (A) A straight upper pole slope (UPS) and tight lower pole convexity (LPC) can be seen; a nipple angle of 18.4° was observed. Center (B) A convex UPS and tight LPC can be seen; a nipple angle of 12.5° was observed. Right (C) A straight UPS and tight LPC can be seen; a nipple angle of 13.3° was observed. These images were generated using Catbird.

has been successfully used to generate images of realistic and aesthetically pleasing breasts of fictitious Caucasian, African American, and Asian females. Interestingly, these images corroborate several previously described aesthetic breast ideals.[11-15,20] However, the significant differences in breast morphology found between racial groups in this study further supports the notion that breast aesthetics are not 1-size-fits-all.

Understanding the training methodologies and image generation mechanisms underpinning AI models is essential to comprehend their societal impact. Generative Adversarial Networks (GANs) are a class of AI models utilized in this study which consist of 2 neural networks: a generator and a discriminator. During training, the generator aims to create images that closely resemble real data (often millions of images of real people paired with corresponding text descriptions), while the discriminator endeavors to differentiate between real and generated images.[21] The 2 networks engage in a competitive process, with the generator striving to improve its output quality until the discriminator can no longer distinguish between real and generated samples.

A compelling aspect of this study is that it utilized an openly accessible AI image-generating platform. Thus, any individual from the lay population could have produced the same images if they inserted the same text prompts into the models. Furthermore, the models were not trained for medical purposes; they were trained by developers from the lay population with the goal of generating highly realistic and diverse images of humans. This is important because the models are, therefore, an indirect representation of society's perception of ideal breasts—a critical component

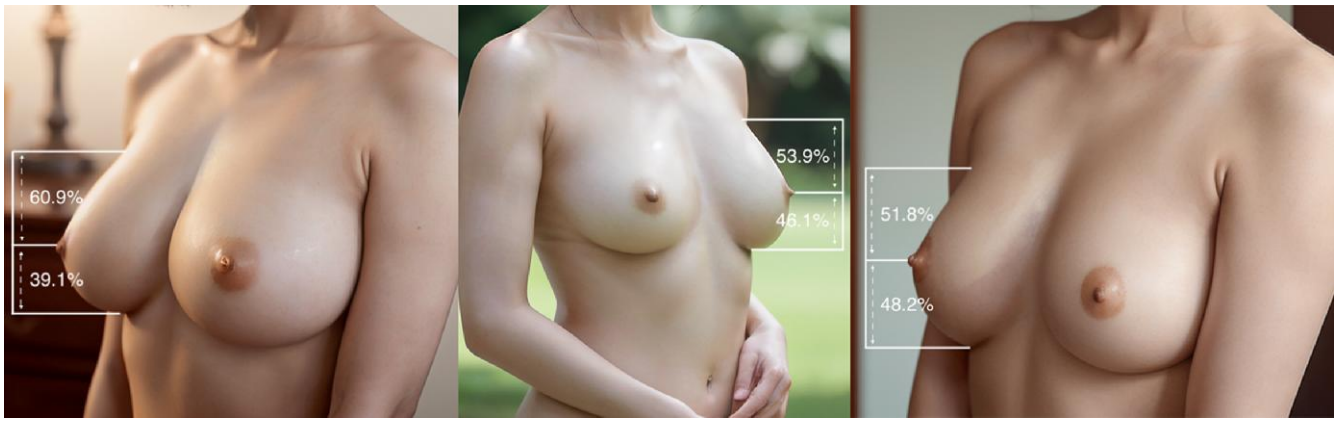

Figure 5. Three of the 25 Asian images in 3-quarter profile view used for analysis are shown. Left (A) A convex upper pole slope (UPS) and tight lower pole convexity (LPC) can be seen; a nipple angle of 0° was observed. Center (B) A convex UPS and tight LPC can be seen; a nipple angle of 0° was observed. Right (C) A straight UPS and tight LPC can be seen; a nipple angle of 11.3° was observed. These images were generated using Catbird.

Table 2. Comparison of Racial Groups to Previously Described Aesthetic Breast Ideals

	Asian	African American	Caucasian
Three-quarter profile view			
P-value vs U:L = 45:55	<.001[a]	<.001[a]	.18
P-value vs U:L = 55:45	.03[a]	<.001[a]	<.001[a]
P-value vs U:L = 65:35	<.001[a]		
P-value vs nipple angle 20°	<.001[a]	<.001[a]	.29
Frontal view			
P-value vs NAC horizontal axis ratio 40:60	<.001[a]	<.001[a]	<.001[a]
P-value vs NAC vertical axis ratio 50:50	.029[a]	.022[a]	<.001[a]
P-value vs areolar diameter to breast width = 29%	.0027[a]	<.001[a]	.54
P-value vs nipple to areolar diameter = 29%	.38	.28	.72

This table displays results from statistical comparison of each racial group to previously described ideal aesthetic breast parameters. Statistically significant findings represent racial cohorts that differed significantly from the literature. Upper-to-lower pole ratios (U:L) of 45:55,[11-13] 55:45,[1,9] and 65:35 for Asian breasts[20] have been described. Ideal nipple areolar complex (NAC) positions of 40:60 (lateral to medial) and 50:50 (upper to lower) on the breast mound have been described.[14] Ideal areolar diameter to breast width and nipple diameter to areolar diameter ratios of 29% have been described.[15] [a]Statistical significance ($P < .05$).

that drives the decision making, goals, and preferences of aesthetic breast surgery patients. How representative these images are of the real population is not known, however, and heavily relies on the size, diversity, and generalizability of the dataset used to train the AI models.

The breast images generated in this study display remarkable fidelity to real photographs, mimicking natural breast variations, including asymmetries between breasts on the same female. The GAN models effectively captured the intricate interplay of breast shape, NAC position, and NAC size to produce aesthetically pleasing breasts for all 3 racial groups (Supplemental Figures 2-7). However, the important racial differences produced by the models can help guide aesthetic surgeons toward achieving optimal cosmesis when operating on females from these racial groups (Figure 7). Caucasian breasts had smaller and more concave upper poles, lower NAC positions, smaller NAC sizes, and more skyward-pointing nipples compared to African American and Asian breasts. These findings further support the notion that there are real racial differences in aesthetic breast ideals, support several previously described ideal breast parameters, and highlight knowledge gaps in the field.

Like many aspects of the plastic surgery literature, descriptions of ideal breast parameters are largely specific to Caucasian females and often incorrectly generalized. Mallucci's validated template of the ideal breast is based on Caucasian models in 3-quarter profile view, despite querying a diverse group of observers.[11-13] This template includes an U:L ratio of 45:55, skyward-pointing nipple (mean 20°), straight or concave UPS, and tight LPC. Lewin's description of ideal NAC position being 50:50 in the vertical and 40:60 (lateral to medial) in the horizontal dimensions of the breast used Swedish females.[14] Furthermore, Caucasian models were used when describing ideal areolar diameter to base width and nipple to areolar diameter ratios (both 29%).[15] It is therefore not surprising, and thus validating, that the Caucasian breasts in this study fit almost perfectly into these ideal templates, while African American and Asian breasts displayed several significant differences (Figure 7).

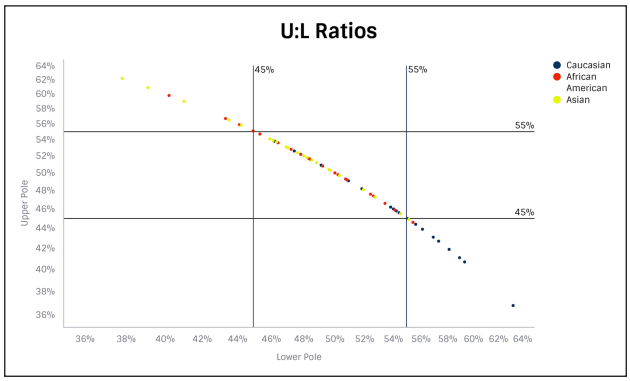

Figure 6. A bubble chart displaying the distribution of upper-to-lower pole (U:L) breast ratios for all 75 3-quarter profile view images for all 3 racial groups. Reference lines for previously described U:L ratios of 45:55[11-13] and 55:45.[19] The distributions for all 3 racial groups differed significantly ($P < .001$). Notably, the distribution for Caucasian breasts is dense around the 45:55 ideal ($P = .18$), and African American ($P < .001$) and Asian breasts ($P < .001$) are densely distributed in areas with significantly larger upper Poles. Of note, a reference line for the previously described ideal Asian U:L of 65:35[20] is not included as the Asian breasts in this study had significantly smaller upper Poles ($P < .001$).

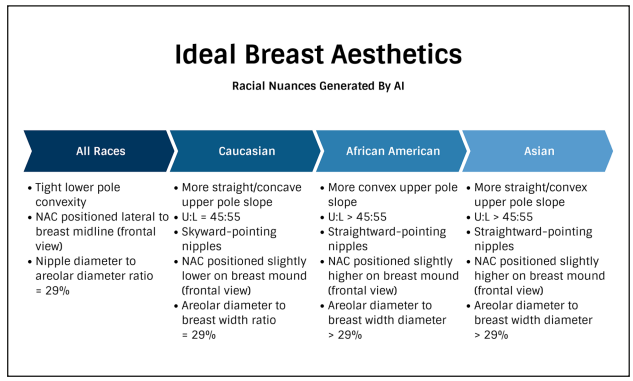

Figure 7. A chart displaying racial similarities and differences in ideal breast aesthetics observed in this study. All breasts were noted to have nipple areolar complexes (NAC) lateral to the breast midline on frontal view, tight lower pole convexities, and nipple diameter to areolar diameter ratios near 29%. These findings may represent general ideal principles. Notably, Caucasian breasts were found to fit into Mallucci's ideal template.[11-13] African American breasts were observed to have more convex upper pole slopes (UPSs), upper-to-lower pole (U:L) ratios larger than 45:55, straightward-pointing nipples, and the largest areolas. Asian breasts were observed to have more straight/convex UPSs, upper-to-lower pole (U:L) ratios larger than 45:55, straightward-pointing nipples, and larger areolas compared to Caucasian breasts. AI, artificial intelligence.

Ideal Asian breasts have been previously described as having an ideal vertical proportion of the breast footprint of 65:35 (upper-to-lower pole), straightward-pointing nipples, and a more straight/convex UPS.[20] Although the Asian breasts in this study had significantly smaller upper poles than the suggested ideal of 65% (Table 2), the upper poles were significantly larger than 45%, the nipples were significantly more straightward-pointing than skyward-pointing, and the UPSs were significantly more straight/convex than concave. The AI-generated Asian breasts fit nicely into this suggested template and support the notion that Asian and Caucasian breasts have different ideal parameters.

Unfortunately, there is a paucity of literature analyzing ideal African American breast aesthetics. We found no articles directly discussing the topic, several articles that asked black populations to evaluate non-black breasts,[11-13,19] and 1 study that evaluated African American breasts as part of an racially heterogenous group of models.[22] Notably, the African American females in this study were found to have relatively curvy and more toned body types coupled with large upper poles, substantial UPS convexity, and larger areolas when compared with the Caucasian females. Anecdotally, African American patients often place heavy importance on maintaining a curvaceous figure, which is consistent with their preference for curvier back and buttock aesthetics.[23] Notwithstanding, the AI-generated African American breasts further suggest that ideal African American breast aesthetics is its own entity worthy of future study.

These results demonstrate the ability to generate realistic, aesthetically ideal, and diverse breasts using AI, bringing to light larger societal implications. "Deep fake" images are ubiquitous in mainstream media. Advertisers frequently enhance the appearance of models and plastic surgeons can easily edit patient images on a smartphone.[24] This study illustrates that GAN modeling can produce an infinite amount of fake preoperative and postoperative patient photographs. Plastic surgeons have the capability to market images of "patients" who do not exist, potentially exaggerating postoperative expectations and perceived surgeon experience. Furthermore, patients will inevitably bring edited, deep fake, and AI-generated images into a plastic surgeon's office and desire unachievable aesthetic outcomes. Judicious guidance from plastic surgery societies and governing bodies, as well as candid conversations with patients, are needed to combat these serious ethical issues that have and will continue to impact the field of plastic surgery as these technologies become even more available and powerful.

There are several limitations to this study. Although the breast measurements were made by the same individual (A.L.W.) using the same methods, subjectivity exists in determining various breast landmarks—particularly the upper breast border. Because these images were created by AI, it

was impossible to control for the model's positioning, image angle, and lighting which likely influenced the results to a minor degree. Furthermore, we do not know the exact details as to how the utilized AI models were trained, and therefore are not able to assess any biases present in their respective datasets. However, the fact that Caucasian and Asian AI-generated breasts fit nicely into previously described racial breast ideals is reassuring in terms of generalizability. Another limitation to this study is that we were not able to account for variations in body type and BMI, variables known to significantly influence breast aesthetics.[25] An interesting future study would entail utilizing AI to generate ideal breasts of thin, overweight, and obese females of the same race and analyzing them for morphologic differences; furthermore, ideal breasts could be compared between body types—ie, ideal breasts of females with hourglass figures likely differ from females with pear-shaped figures.

CONCLUSIONS

Defining ideal breast aesthetics is a complex task and many racial and cultural differences exist. This study shows that AI can generate realistic breasts of Caucasian, African American, and Asian females who validate several previously described aesthetically ideal templates. Importantly, these findings highlight specific racial differences in ideal breast morphology that can guide aesthetic surgeons. This study also sheds light on ethical issues in the field of plastic surgery as deep fake images continue to infiltrate mainstream culture.

Supplemental Material

This article contains supplemental material located online at www.asjopenforum.com.

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