

Influence of ethnicity on aesthetic preferences for lip characteristics in Caucasian male and female faces

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Summary Background: In an era where globalization and social media significantly reshape beauty standards, it is imperative to delve into the subjectivity of beauty and attractiveness. The lips, a key element in facial aesthetics, contribute significantly to the perception of attractiveness, and also have a profound impact on an individual's self-esteem.

Objective: To analyze the influence of ethnicity on the aesthetic preferences for lip characteristics, among male and female faces.

Materials and methods: This study encompassed a sample of 231 study participants (153 women and 78 men) with an average age of 23.2 ± 2.8 years, representing ethnicities such as

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African, Caucasian, Middle Eastern, and South Asian. Participants were asked to rate a series of images showcasing various lip variants, providing insights into their aesthetic preferences.

Results: Demographic analysis revealed gender and ethnic variations in aesthetic preferences for all the investigated lip parameters. Women were 2.42 times more likely than men to prefer no Cupid's indentation on a female model ($p = 0.0019$).

Conclusions: The study underscores the importance of understanding cultural influences on beauty standards and challenges the notion of a universal beauty ideal. The evolving role of social media trends, such as Cupid's bow indentation elimination, raises questions about the dynamic nature of aesthetic preferences among different ethnicities.

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The influence of ethnicity on individual perceptions of beauty and attractiveness is a significant aspect to explore, particularly concerning lip aesthetics. Investigating this impact will provide valuable insights into the cultural nuances that shape beauty standards.^{1,2}

Globalization and migration have contributed to increased diversity of patient population in every doctors' practice. This also applies to plastic surgeons, aesthetic medicine professionals, and dermatologists and highlights the need for multi-cultural understanding in aesthetics. This challenges professionals to meet the different needs of patients from different ethnic and cultural backgrounds.^{3,4} Notably, ethnicity, demographics, and occupational factors have been reported to play a substantial role in shaping people's views on beauty, prompting questions on the subjectivity of beauty, and whether ethnic factors persist in determining aesthetic preferences.

The attractiveness of male and female faces is intricately linked to the appearance and proportion of key facial features, including the eyes, nose, and lips. The lips serve as a crucial anatomical landmark for the lower third of the face, varying in volume, shape, color, movement, and proportions, all of which impact the expression of emotion. The appearance of one's lips can even influence one's self-esteem.⁵⁻⁷ Previous discussions have outlined ideal lip features, emphasizing the significance of the relationship between the upper lip, lower lip, and chin in defining facial beauty.⁸

The golden ratio, often signified using the Greek letter phi (ϕ), has been known and studied for centuries. Ancient Greek mathematician Euclid provided one of the first written definitions of the golden division in his mathematical treatise "Elements" around 300 BC.

In "De divina proportione," Pacioli discussed the mathematical properties and aesthetic significance of the golden ratio, which is 1:1.618, highlighting its presence in art, architecture, and nature, which was later used by Leonardo da Vinci.⁹⁻¹² However, this ratio, which is based on the physical attributes of Caucasians, may not accurately represent other ethnicities.^{13,14} Studies, including those by Holland et al., have challenged the association between facial attractiveness and the golden ratio.¹⁵ Frank et al. conducted a study according to which the ideal ratio is an upper-to-lower lip ratio of 1:1.6, which was consistent with the previous reports. However, their study had a limitation, as the group they examined included only Germans

(Caucasians).¹⁶ To address this potential factor influencing the results, we planned to examine similar aspects (lips proportions); however, as the respondents are from different ethnicities, the results may reflect the social and cultural conditioning of most modern multi-cultural societies.

This study aimed to examine ethnic differences in the aesthetic preferences regarding lip proportions (height-to-width and upper-to-lower lip ratio) and shape (Cupid's bow indentation) in female and male Caucasian faces. Furthermore, it sought to determine whether individuals from different ethnic backgrounds exhibit variations in their aesthetic preferences and if the observers' ethnicity plays a role in shaping these preferences.

Material and methods

Study sample

A total of 231 surveys were collected, with the study participants averaging 23.23 ± 2.83 years in age (range: 16-30 years). Among these, 66.2% (153) identified as women, and 33.8% (78) as men. Participants were sourced from the English Division Department of the Medical University, representing diverse ethnic backgrounds. The ethnic distribution included 30.3% ($n = 70$) Caucasians, 24.7% ($n = 57$) Middle Eastern individuals, 16.9% ($n = 39$) African Americans, 13.9% ($n = 32$) South Asians, and 14.3% ($n = 33$) from Hispanic or mixed/multiple ethnic groups.

Survey

The study design involved a web-based anonymous online survey. The self-designed questionnaire included demographic questions and photography-rating questions prepared using *Google Forms* (<https://forms.gle/BWrDthw2C4TEw33x7>), which was electronically distributed in February 2023 among the 3rd through 5th year English Division students via university mail. Demographic questions included age, declared gender (*female/male/other*), level of education (*primary, secondary, basic vocational, student, and higher*), medical education (*yes/no*), sexual orientation (*heterosexual/homosexual/bisexual/other/prefer not to answer*), ethnicity, and region of

Table 1 Demographic parameters of the study participants.

n = 231			
Variable	Subgroup	n	%
Gender	Male	78	33.8
	Female	153	66.2
Age, years	Mean	23.23	
	Standard deviation	2.83	
Ethnicity	Caucasian	70	30.3
	Middle Eastern (Arabic)	57	24.7
	African American	39	16.9
	South Asian	32	13.9
	Mixed or multiple ethnic groups/other	22	9.5
	+East Asian	6	2.6
Region of residence	+Hispanic	5	2.2
	Europe	125	54.1
	Africa	19	8.2
	North America	16	6.9
	South America	5	2.2
	Asia	66	28.6

residence (descriptors as in Table 1). These questions were followed by photography-rating questions. Photographs featuring a Caucasian woman and a Caucasian man were selected from the Adobe Stock database. These images were then edited using Adobe Photoshop 2021 (Adobe Inc., San Jose, California, USA) to create 20 distinct visualizations, comprising 10 female and 10 male faces, each showcasing varied lip proportions and shapes. This process ensured a diverse range of facial representations for the study. Study participants were asked to rate the attractiveness of the faces. The rating scale ranged from 1 to 5 and was classified with 1 = "Very Unattractive"; 2 = "Unattractive"; 3 = "Neutral"; 4 = "Attractive"; 5 = "Very Attractive" for photographs of female and male faces.

The following proportions were investigated in the study:

1. *Upper lip-lower lip proportion*: 1:1, 1:1.6, 1:2, and 1.6:1 (Figure 1a [female], Figure 2a [male])
2. *Lip height-lip width proportion*: 1:2, 1:2.5, and 1:3 (Figure 1b [female], Figure 2b [male])

Last question was to sort faces with three different variants of Cupid's bow indentation: 0%, 50%, and 75% (Figure 1c [female], Figure 2b [male]). Owing to the potentially minimal differences between the pictures, the question was designed to show the different variants next to each other and the participants were asked to sort the faces from the most to the least attractive.

Statistical analysis

Kruskal-Wallis and Mann-Whitney U tests were employed to analyze the differences between the participants' ethnicities and genders, respectively. Pearson's chi-square tests and odds ratio calculations were used for qualitative image

ratings across different gender and ethnic groups. Statistical analysis was carried out using Statistica v.13.3 (Statsoft, Cracow, Poland).

Results

Demographic characteristics of the analyzed sample are presented in Table 1. Owing to the fact that only 2 students declared their orientation to be different than *heterosexual*, their data were excluded from the analysis, so the sample comprised a homogenous group in this aspect. Demographic analysis of patient responses revealed distinct patterns in preferences for various lip parameters.

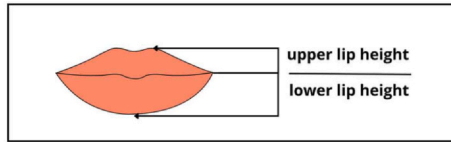
Upper lip - lower lip proportions

In general, for male and female models, the highest mean score was obtained for the ratio 1:1.6. Gender-related differences in the preferences for lip proportions were analyzed, revealing no significant differences in ratings for female faces. However, this contrasted with the assessments of male lips, where male study participants consistently gave lower scores, apart from that for the 1.6:1 proportion, women rated worse (for 1:1 proportion: 2.88 ± 1.25 in males vs. 3.32 ± 1.12 in females with $p = 0.0035$; for 1:1.6 proportion: 2.96 ± 1.24 in males vs. 3.58 ± 1.03 in females with $p = 0.0000$; for 1:2 proportion: 2.44 ± 1.21 in males vs. 3.18 ± 1.18 in females with $p = 0.0003$; and for 1.6:1 proportion: 1.62 ± 1.02 in males vs. 1.45 ± 0.82 in females). Regarding ethnic variations, South Asian participants stood out, consistently rating lip proportions of 1:1 and 1:1.6 higher for female and male faces when compared to African American and other ethnic groups ($p = 0.0016$). Notably, South Asian women rated these proportions significantly higher than men across various ethnicities, with $p = 0.0023$. (Figure 3, Tables 2 and 3) In terms of consistency across genders and ethnicities, no notable differences were observed in the preferences for 1.6:1 and 1:2 lip proportions in female model lips. Yet, it was observed that female study participants generally provided more favorable ratings than males for different lip proportions in male model lips.

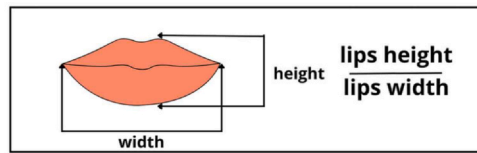
Lip height to lip width proportion

Gender-related differences were apparent in the evaluation of lip proportions, with the female study participants rating the 1:2.5 lip proportion on female and male faces more attractively than their male counterparts (female height/width 1:2.5 proportion: 3.72 ± 0.89 in females vs. 3.41 ± 1.00 in males [$p = 0.0014$]; male height/width 1:2.5 proportion: 3.87 ± 0.89 in females vs. 3.26 ± 1.18 in males ($p < 0.001$). Ethnic variations also played a significant role in these aesthetic preferences. South Asian participants, for instance, found the 1:2.5 lip proportion on female faces more appealing than did African participants, as indicated by a statistically significant difference ($p = 0.0199$). Conversely, Middle Eastern study participants perceived the 1:3 female lip proportion as less attractive compared to other ethnic groups, a preference distinct in its deviation from the norm

(a)



(b)



(c)

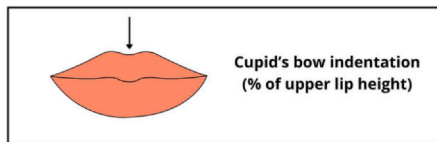


Figure 1 Female lip proportions for the upper lip-lower lip proportion (1a), lip height-lip width proportion (1b), and Cupid's bow indentation proportion (1c). Images were sourced from a photobank of Adobe Stock (stock.adobe.com).

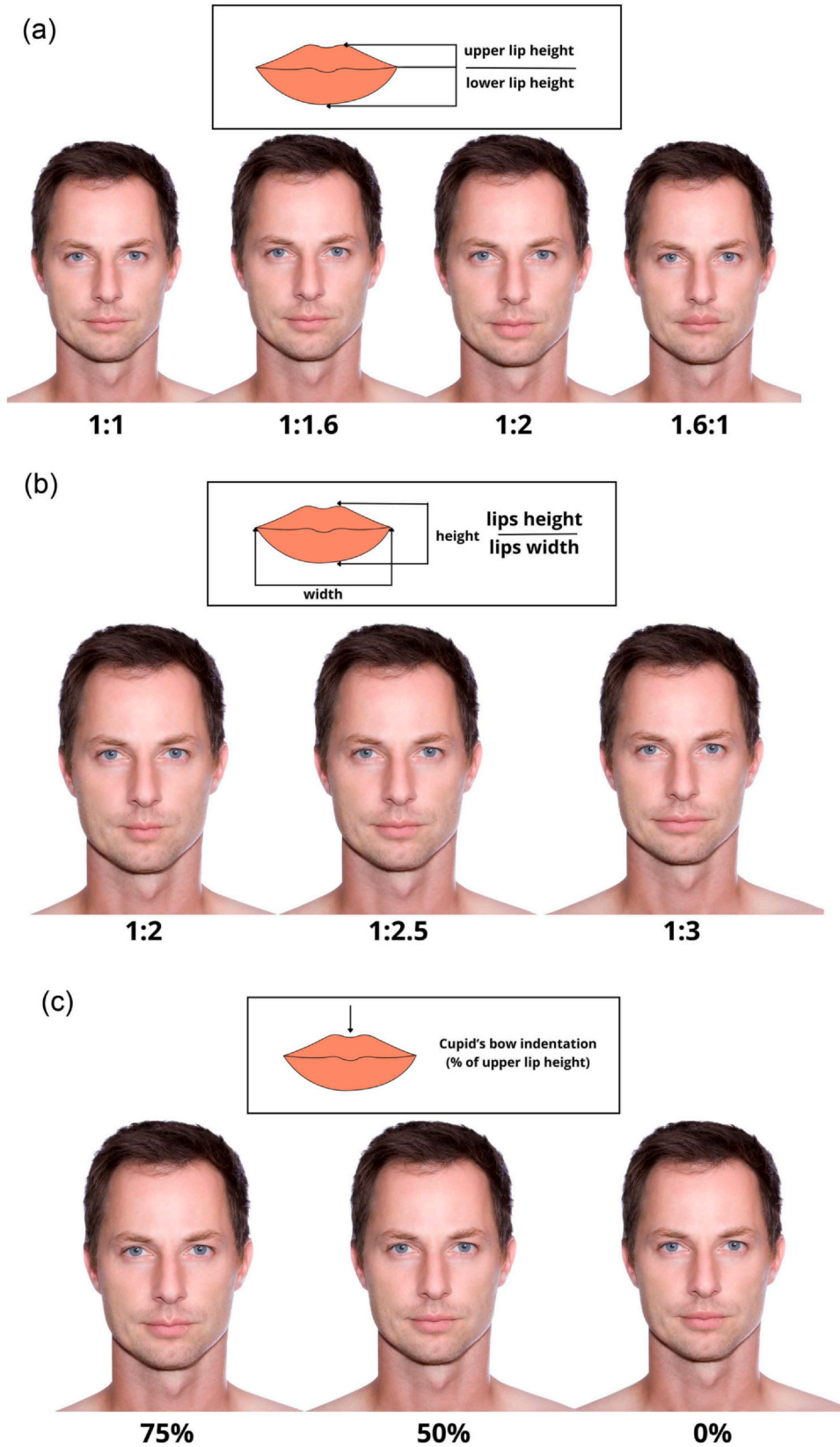


Figure 2 Male lip proportions for the upper lip-lower lip proportion (2a), lip height-lip width proportion (2b), and Cupid's bow indentation proportion (2c). Images were sourced from a photobank of Adobe Stock (stock.adobe.com).

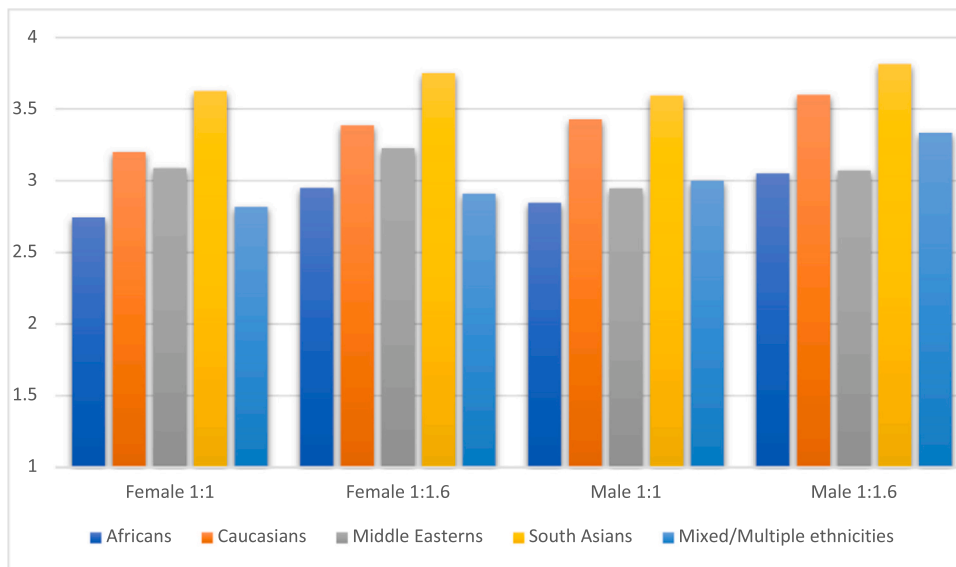


Figure 3 Bar graph showing the average rating of the upper lip-lower lip proportions between different ethnicities. Only statistically significant differences are included.

Table 2 Analysis of the scores of proportions of female lips in relation to observers' sex, ethnicity, and their interaction.

Proportion	Aesthetic rating (mean ± SD)	p*	p**	p***
Upper to lower lip				
② 1:1	3.10 ± 1.0	0.5140	0.0016	0.0021
① 1:1.6	3.26 ± 1.0	0.6572	0.0019	0.0023
③ 1:2	3.03 ± 1.1	0.2542	0.4158	0.4094
④ 1.6:1	1.93 ± 1.1	0.2751	0.5851	0.5754
Height to width				
② 1:2	2.52 ± 1.2	0.9949	0.1177	0.1970
① 1:2.5	3.61 ± 0.9	0.0342	0.0199	0.0041
③ 1:3	2.23 ± 1.1	0.2746	0.0148	0.0604

*Mann-Whitney U test for sex
 **Kruskal-Wallis test for ethnicity
 ***Kruskal-Wallis test for sex paired with ethnicity
 Bold values are the ones that had statistically significant difference (p < 0.05).

(p = 0.0148). Additionally, when evaluating the 1:3 proportion of male lips, African American study participants exhibited a preference for this proportion, rating it higher than the Caucasians, Middle Eastern, and South Asians, highlighting the diverse perspectives on lip aesthetics across different ethnicities (p = 0.0041; Figure 4).

Cupid's bow indentation proportions

The absence of Cupid's bow indentation in female lips was most favored by 113 study participants, which was closely followed by a 50% indentation preferred by 95 participants. Significantly, female study participants were 2.42 times more likely than males to prefer no indentation on a female

Table 3 Analysis of the scores of proportions of male lips in relation to observers' sex, ethnicity, and interaction.

Proportion	Aesthetic rating (mean ± SD)	p*	p**	p***
Upper to lower lip				
②1:1	3.17 ± 1.2	0.0098	0.0106	0.0082
①1:1.6	3.37 ± 1.1	0.0002	0.0060	0.0003
③1:2	2.93 ± 1.2	0.0000	0.7895	0.0036
④1.6:1	1.51 ± 0.9	0.2504	0.0750	0.0366
Height to width				
③1:2	1.85 ± 1.0	0.1126	0.1082	0.2003
①1:2.5	3.66 ± 1.0	0.0001	0.6751	0.0060
②1:3	2.24 ± 1.3	0.0789	0.0041	0.0037

*Mann-Whitney U test for sex
 **Kruskal-Wallis test for ethnicity
 ***Kruskal-Wallis test for sex paired with ethnicity.
 Bold values are the ones that had statistically significant difference (p < 0.05).

model (p = 0.0019), though no ethnic differences were noted.

For male lips, a 50% Cupid's bow indentation was deemed most attractive by 130 study participants, with no indentation as the second choice. The preferred sequence was 50% indentation as most attractive, no indentation as medium, and 75% as least attractive. African Americans notably preferred no indentation compared to Caucasians (p = 0.0024), highlighting distinct ethnic preferences in male lip features (Figure 5).

Discussion

Lips, functionally and aesthetically significant, have been subject to various studies that reveal their role in enhancing

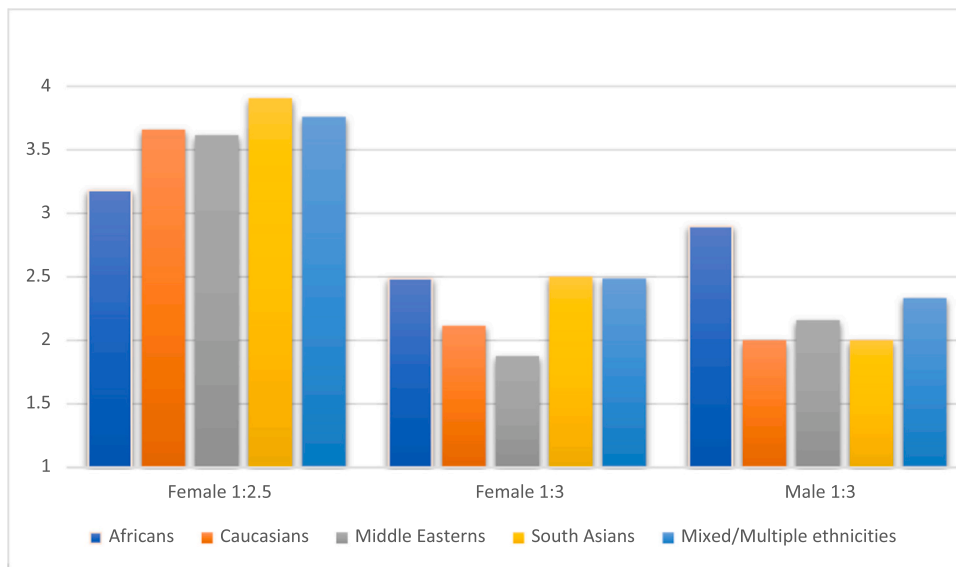


Figure 4 Bar graph showing the average rating of the lip height-lip width proportions between the different ethnicities. Only statistically significant differences are included.

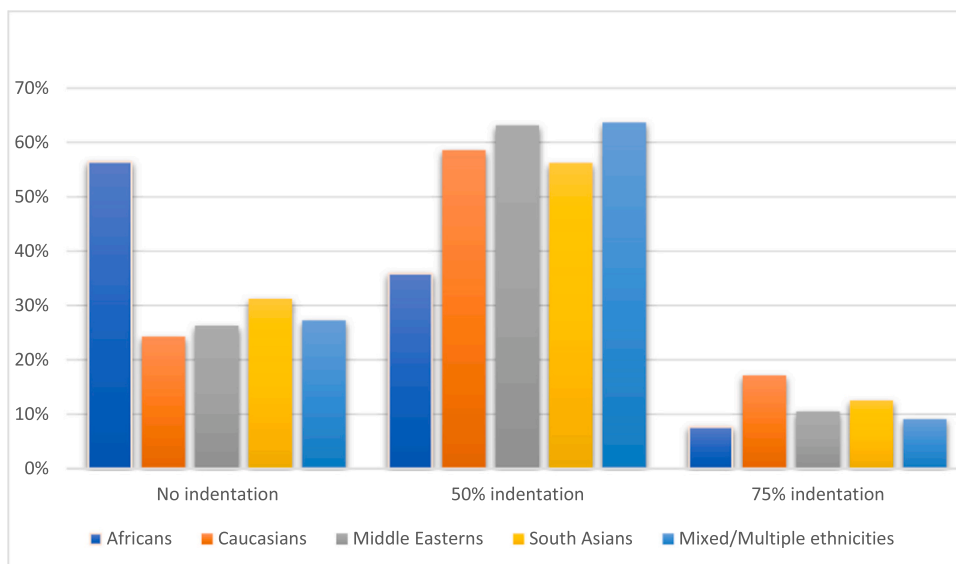


Figure 5 Bar graph showing the average rating of the Cupid's bow indentation proportions (ranked as 1 = "most attractive") between the different ethnicities. Only statistically significant differences are included.

femininity and attractiveness in women.¹⁷⁻²⁰ Hyperfeminine features, encompassing plump lips, a thin jaw, a small chin, large, widely spaced eyes, a small nose, and high cheekbones, are associated with estrogen-derived traits, suggesting reproductive advantages. Conversely, heterosexual women often prefer men with testosterone-associated features such as thin lips, prominent chins, square jaws, heavy brows, and abundant hair.²⁰ Understanding the influence of ethnicity on aesthetic preferences for lip characteristics contributes to the development of more inclusive beauty standards, offering valuable insights for medical practitioners dealing with patients from diverse backgrounds.²¹

In the contemporary era, the impact of globalization and social media on beauty standards is undeniable. Digital

platforms expose individuals to diverse cultural influences, potentially blending aesthetic preferences across ethnicities.²² Interestingly, female models with a Cupid's bow showing 0% indentation were preferred by women over men. The Cupid's bow, typically has a "U" or "V" shape, is rarely flat.²³ This preference may be influenced by social media trends promoting "Cupid's bow elimination," "Russian doll lips," and "overdrawn lips," leading to the use of lip fillers to alter the distance between the nasal base and upper lip vermilion border, reducing the perceived indentation. The widespread influence of a particular beauty ideal on social media has the power to shape a completely new and impactful standard of beauty. Moreover, globalization has facilitated cultural exchange that has resulted in the transfer of cultural preferences for attractive facial features, not

only within the same ethnicity but it has also extended to other ethnicities.²⁴ Simultaneously, individuals have developed new preferences for interethnic interactions.

Aesthetic preferences for lip characteristics also exhibit gender variation within the Caucasian population. Societal expectations and cultural influences often dictate ideal lip features for men and women, with subjective elements such as lip size, shape, and symmetry influenced by cultural, regional, or individual preferences. Our study highlights that the most attractive lip ratio for women and men is 1:1.6, aligning with the existing literature.⁹⁻¹² Similarly, upon analyzing the lip width in relation to facial width, it was reported that lips wider and/or narrower than average are perceived as less attractive.²⁵ This was substantiated by the results of this study, where the 1:2.5 proportion of the lip height-lip width proportion was rated as the most attractive, regardless of the observer's ethnicity. However, preferences differed among ethnic groups, with the African Americans finding various lip proportions and larger sizes more desirable. In contrast, the 1:3 proportion was favored in the lip height-lip width proportion for male and female lips. These findings align with those in literature showing that African Americans naturally tend to have fuller lips in profile and prefer fuller, protruding lips, possibly influenced by the increased exposure to certain lip characteristics.^{26,27}

There is a notable shift in beauty standards, transforming full lips from once being considered unattractive to becoming a sought-after feature among women in general.²⁸ This shift has particularly inspired black women to celebrate the beauty of their lips, leading to a growing desire to address the aging of their lips.^{29,30} In contrast to White women who often seek to augment the size of their lips, black women are more inclined to pursue augmentation to restore their lip size to that of their youth. As women of African descent age, they tend to develop wrinkles primarily in the body of the lip below the vermillion border. This occurrence is attributed to the volume loss in the upper lip, while the lower lip generally maintains its youthful appearance. This trend reflects a nuanced approach to aesthetic procedures, with black women focusing on restoration rather than mere augmentation of lip size.³¹

Diverse cultural and ethnic backgrounds contribute to varying perceptions of attractiveness, particularly in the context of lips. Asians and Caucasians, for instance, may hold different standards for what constitutes appealing lips. Jang et al. have outlined a specific upper-to-lower lip ratio of 1.43 for an attractive Asian individual, a finding corroborated by the H2 rule.^{32,33} Our study revealed that South Asians exhibit a preference for the 1:1.6 ratio in the upper lip-lower lip proportion. This phenomenon may be elucidated by perceptual adaptation, a process rooted in experience that remodels our environmental perception.³⁴ Research has indicated that even minimal exposures, lasting only minutes, can alter an individual's perception of attractiveness.³⁵ Constant exposure to a westernized society may have impacted these individual's aesthetic preferences. Our findings are in general congruent with a recent study showing that Vietnamese individuals living permanently in Europe share perceptions of facial attractiveness that are similar to those of participants of European origin, and they have adopted some, though not all, of "European" beauty standards.³⁶ Similarly, our study focused on a sample of various ethnic origin, but all participants lived in

European countries for a few years and were exposed to similar visual stimuli, especially on social media. However, our results focused on a small but ethnically diverse part of the face, thereby elucidating that differences regarding aesthetic preferences still exist, and they apply to the way observers evaluate "foreign" faces.

Our study distilled the influence of ethnicity on an isolated part of the face. It is crucial to acknowledge the complexity of the face. Beyond lip morphology, a comprehensive exploration should encompass the aging process of the lips across diverse ethnicities, smile aesthetics, and dynamic relationships between the lips and other facial features, such as the nose, chin, cheeks, and overall facial structure. Montes, in his observations of Latino patients, highlights that expectations from aesthetic procedures are more strongly associated with the socioeconomic status and educational level than with ethnicity. The influence of socioeconomic and educational factors could eclipse any potential impact of ethnic background on an individual's preferences for specific cosmetic procedures and their desired outcomes.³⁷ However, our study has some limitations. In assessing aesthetics, a three-dimensional visualization could have been considered, which could have influenced the results. Here, we used two-dimensional images. Also, there are other variables that influence perception of lips aesthetics, e.g., the color of lips, smile, and angle of opening showing the teeth. Therefore, further research including these aspects should be conducted. Similarly, it would be worth including faces from different ethnicities to observers from different ethnicities to examine the influence of ethnicity on aesthetic preferences more comprehensively.

Conclusion

Our study emphasizes the importance of understanding cultural influences on beauty standards, challenging the notion of a universally applicable ideal. It shows that cultural diversity influences aesthetic preferences of faces among residents from different ethnicities and exposed to similar "beauty patterns." There has been an interesting tendency among women which favors the lack of an indentation of the Cupid's bow as the most attractive appearance of the female, but not male, lips. However, African women prefer a lip without an indentation on the male model as well, which can be referred to as primary ethnic differences. Through an exploration of the impact of contemporary social media trends, the research prompts a thoughtful examination of the evolving dynamics in aesthetic preferences. Additionally, the study significantly contributes to the development of more comprehensive beauty standards, particularly valuable for healthcare practitioners dealing with diverse patient populations.

Ethical approval

Not required.

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Conflict of interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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