

Do perceptions of beauty differ based on rates of racism, ethnicity, and ethnic generation?

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SUMMARY

The perception of beauty is a complex issue influenced by a variety of factors, including societal norms and cultural backgrounds. While much research exists on beauty standards, the relationship between racist beliefs and beauty perceptions remains underexplored. This study aims to fill this gap by examining how racist beliefs, ethnicity, and generational status influence perceptions of beauty. We surveyed 77 participants, asking them to rate facial images on a 9-point Likert scale and answer questions measuring racist beliefs and questions to obtain demographic information. Results indicated that, on average, participants held moderate racist beliefs, and beauty ratings were fairly high. Regression analyses showed that racist beliefs did not significantly predict beauty perceptions, accounting for less than 1% of the variance. However, differences in racist beliefs emerged between first- and second-generation individuals, as well as between South Asian and Caucasian participants. South Asian participants exhibited slightly higher levels of racist beliefs and rated their own ethnicity as more attractive. The findings suggest that generational differences and cultural backgrounds influence attitudes toward race and beauty. These results underscore the importance of understanding these factors in addressing racism and promoting inclusivity. The study's insights can inform policies and initiatives to promote diversity and combat racism in societal domains, including media representation, education, and community programs.

INTRODUCTION

Although beauty is universally defined as the state of being attractive, the criteria defining which specific features are considered attractive varies across cultures. Perceptions of beauty depend on factors such as geographic region, tradition, religion, age, gender, and socioeconomic status (1). Each person's perception of beauty is influenced by their environment and perceptual adaptation, a way in which the nervous system can change how it responds to sensory input (2). In the context of our work, a person's perception of beauty can be influenced by past encounters and interactions. Researchers have found that perceived physical attractiveness is significantly associated with wealth, relationship length and quality, being judged to be fit and healthy, and being socially desired by others (3-14).

Additionally, recent findings have shown that beauty can also be attributed to educational attainment, social capital, social network structures, and occupational status (3-14).

Race may also be a potential factor in perceived attractiveness. According to the APA Dictionary of Psychology, racism is a form of prejudice that assumes that the members of racial categories have distinctive characteristics and that these differences result in some racial groups being inferior to others (15). Racist beliefs can lead to a decrease in opportunities among marginalized groups. In a study analyzing the effect of skin color on dating habits, lighterskinned Black women were more valued by Black men and enjoyed more economic and social advantages than darkerskinned women (16). Notably, earnings disparities based on perceived attractiveness exceed the gap in earnings between Black and White Americans (17). Among African Americans, this perceived attractiveness earnings gap may rival the gender gap in earnings (17). Research also shows that individuals with Afrocentric features are often rated as less attractive and are more likely to face discrimination in hiring, even when qualifications are identical (18). Furthermore, a large-scale analysis of online dating preferences found that racial biases significantly affect who people choose to date, with White, Black, and Asian individuals all showing strong in-group preferences and biases against other racial groups (19). A study highlighted that a White-Asian woman reported feeling treated differently after revealing her Asian heritage, indicating the impact of racial stereotypes on perception and treatment (20). Racial stereotypes found in the media can affect how people of color are perceived and treated by others (21). This evidence demonstrates how societal biases are continuously reinforced and disseminated.

Racism can lead to decreased self-esteem among populations and even self-harm (22). Empirical evidence shows that multiple ethnic and racial groups have demonstrated an association between women's lighter skin tone and educational attainment, wages, and marital success (23-26). This drives many dark-skinned women to aspire to lighter skin, reflecting the pervasive notion that it is more desirable (27). Similarly, South Korean women often experience heightened consciousness about the size and shape of their faces, influenced by media that idealizes certain facial features as the standard of beauty (28). In a related trend, South Asian American women have reported that attributes such as light, clear skin and minimal body hair are considered attractive, further illustrating the pressures to conform to specific beauty ideals across different ethnic groups (29). These examples highlight how various ethnic communities are influenced by and often engage in practices to align with prevailing beauty standards. However, research suggests that a positive and affirming racial identity can help

mitigate these pressures. For instance, African American women with a strong racial identity are more likely to experience body satisfaction and less likely to engage in disordered eating, despite the pervasive nature of sexism and racism (30). Conversely, those who lack this protective identity may internalize dominant beauty standards, leading to negative effects on self-esteem and body image (31).

Subsequently, racist beliefs may differ based upon how recently an individual and their family immigrated to the United States. First-generation immigrants, who were born outside the United States, may have different perspectives compared to second-generation immigrants, who were born in the United States but have at least one foreign-born parent (32). Third generation and higher immigrants include those with two parents or grandparents born in the United States (33). There are many differences between first- and secondgeneration immigrants of a specific ethnicity, including demographic characteristics, views on identity, attitudes toward social values, and personal experiences in the United States (34). About half (47%) of first-generation immigrants feel that America is more racist than most other countries, compared to 37% of second-generation immigrants and 29% of other native-born Americans who are not secondgeneration immigrants (35).

These generational differences in attitudes experiences reflect broader trends across various age cohorts in the United States. Generational cohorts—groups of people who experience similar historical and social events at comparable ages—can significantly influence attitudes, values, and perceptions (36). Each cohort, from Baby Boomers to Generation Z, exhibits distinct characteristics shaped by their unique social and cultural contexts. Baby Boomers (1946-1964) often prioritize tradition and stability, while Generation X (1965–1980) reflects a mix of traditional and progressive views influenced by significant social changes like the Civil Rights Movement (37). Millennials (1981–1996) and Generation Z (1997-2012) tend to be more diverse and inclusive, shaped by greater exposure to multiculturalism and social justice initiatives (37, 38). Research indicates that younger generations generally demonstrate more acceptance of diversity and are less likely to hold overt racist beliefs, reflecting the evolving social landscape that promotes inclusivity and diversity in contemporary society (39).

The primary research question of this study was to examine whether perceptions of beauty vary based on rates of racism, ethnicity, and ethnic generation. Our study aimed to investigate if older generations of immigrants are more likely to uphold traditional beauty standards and racist beliefs compared to more recent generations, who may be more likely to assimilate closer to the American Identity and conform to different beauty ideals. The majority of studies conducted on racial influences of beauty have focused on Asian ethnicities or college student populations. Unlike these studies, this research investigated potential differences in perceptions of beauty and racist beliefs across multiple ethnic groups while also considering immigrant generational status, an often overlooked factor in such research. We aimed to assess whether certain ethnic groups exhibit higher levels of prejudices and if these beliefs significantly influence perceptions of beauty. Further, we intended to examine whether there are significant differences in beliefs and perceptions between generational cohorts, and whether there have been changes

over time. Our hypothesis predicted that participants will rate individuals from their own ethnicity as more attractive, and that older generations will demonstrate higher levels of racist beliefs compared to younger generations. This could be due to a phenomenon known as ingroup favoritism or ingroup bias. This bias suggested that people tend to view members of their own group more positively compared to those of other groups (40). Additionally, older immigrant generations may exhibit higher levels of racist beliefs due to factors such as cultural upbringing, exposure to discriminatory attitudes prevalent in their home countries, and resistance to assimilating into the American cultural landscape (41, 42).

We surveyed 77 participants, asking them to rate a random sample of facial images on a 9-point Likert scale for beauty perceptions. In addition, we asked them guestions to measure racist beliefs and obtain demographic information. Results indicated that of the 77 participants, average racist beliefs were fairly low, and average ratings of beauty for the images were fairly high. Regression analyses demonstrated that, overall, racist beliefs did not significantly predict perceptions of beauty, with less than 1% of variance in perceptions of beauty attributable to racist beliefs. However, differences in racist beliefs were observed between first- and secondgeneration individuals, as well as between South Asian and Caucasian participants. South Asian participants were found to have slightly higher levels of racist beliefs. Additionally, perceptions of beauty varied between ethnic groups, with South Asian participants rating their own ethnicity as more attractive. These findings suggest that while racist beliefs have a minimal impact on beauty perceptions overall, ethnic background and generational factors play a more significant

Minimum age	Maximum age	Average age	Median age		
18	89	38.5	35		
Gender		Percentage			
Male		43.9%			
Female		73.2%			
Non-binary		4.9%			
Generation		Percentage			
Gen Z		14.6%			
Millennials		46.3%			
Gen X		43.9%			
Baby Boomers		22.0%			
Silent		2.4%			
Ethnicity		Percentage			
South Asian		65.9%			
Hispanic/Latino		14.6%			
White/Caucasian	1	61.0%			
African/Black		9.8%			
Education Leve	Education Level				
High school diplo	oma	14.6%			
Some college		34.1%			
Associate's degr	ee	17.1%			
	Bachelor's degree		51.2%		
Master's degree			51.2%		
Ph.D. or higher		4.9%			
First Generation	n in the US	Percentage			
Yes		34.1%			
No		58.5%			

Table 1: Participant demographics. Age distribution and demographic information of participants, including gender, generational cohort, ethnicity, education, and immigrant generational status.

role in shaping how beauty is perceived and valued within different communities.

RESULTS

We collected data via an online questionnaire from participants 18 years of age and older (**Table 1**). To quantify participants' perceptions of beauty, participants rated a random sample of eight facial images on a 9-point Likert scale (43). These sample images included an equal number of male and female faces, as well as varying racial and ethnic backgrounds. Since a standardized measure of beauty is not readily available, researchers studying perceptions of beauty commonly develop their own measurement scale using facial images. Facial attractiveness is a commonly used measure of overall physical attractiveness and has been shown to be an equal or stronger predictor than body attractiveness or overall physical attractiveness (44).

To measure participants' racist beliefs, we used the Symbolic Racism 2000 Scale (43). This scale comprises eight items rated on a 4-point Likert scale, ranging from 1 ("Strongly Agree") to 4 ("Strongly Disagree"). A low score, close to 1, indicates fewer racist beliefs, whereas a high score, close to 4, indicates stronger racist beliefs. The questions are standard. Sample items include: "Over the past few years, minorities have gotten less than they deserve," and "It's really a matter of some people not trying hard enough; if Black individuals would only try harder, they could be just as well off as white individuals" (45). This scale proves to be reliable and internally consistent, meaning that the items within the scale consistently measure the same underlying concept. It has discriminant validity, being distinctly different from both older forms of racial attitudes and political conservatism, although it has some conceptual overlap with both (45).

After assessing the data, we conducted a regression analysis to explore how racist beliefs influence perceptions of beauty. Average ratings of beauty for the images were fairly high (M = mean = 6.50 out of 9 points, SD = StandardDeviation = 1.57), and average racist beliefs were moderate (M = mean = 2 out of 4 points. SD = Standard Deviation = 0.64).Overall, racist beliefs did not significantly predict perceptions of beauty (F(1, 76) = 0.18, p = 0.67, **Table 2**), with less than 1% of variance in perceptions of beauty attributable to racist beliefs ($R^2 = 0.002$). To assess this, we performed a linear regression analysis using racist beliefs as the independent variable and perceptions of beauty as the dependent variable. The R-squared value of 0.002 indicates that only a small fraction of the variance in beauty perceptions is explained by racist beliefs, reflecting a very weak relationship between these variables.

Changes in racist beliefs and perceptions of beauty according to Immigrant Generational Status

There was no significant difference in perceptions of

Model		Sum of Squares	df	Mean Square	F	р
H1	Regression	0.4454	1	0.4454	0.1795	0.6730
	Residual	186.1159	75	2.4815		
	Total	186.5613	76			

Table 2: Analysis of Variance (ANOVA) test for the relationship between racist beliefs and first-generation participants. Participants rated various racist statements on a 4-point Likert scale. Note: The intercept model is omitted, as no meaningful information can be shown.

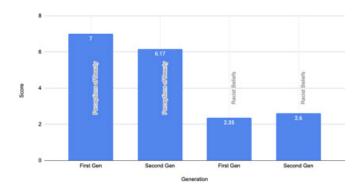


Figure 1: Average scores of perceptions of beauty and racist beliefs between first- and second-generation immigrant groups. For perceptions of beauty, the results were not significant, t(65) = 1.97, p = 0.053, suggesting no substantial differences in perceptions of beauty between the groups. For racist beliefs, there was a significant difference, t(65) = -2.51, p = 0.014, indicating that racist beliefs varied significantly between the cohorts. Participants rated eight faces on a 9-point Likert scale and various racist statements on a 4-point Likert scale, Levene's test is significant (p < .05), suggesting a violation of the assumption of equal variances.

beauty between the first-generation group (M = 7, Figure 1) and the second-generation group (M = 6.17, p = 0.053, Figure 1). However, there was a significant difference in racist beliefs between the first-generation group (M = 2.35, Figure 1) and the second-generation group (M = 2.60, p = 0.014, Figure 1). First generation participants exhibited fewer racist beliefs on average compared to Second generation participants, as indicated by a lower racist beliefs mean score of 2.35 versus 2.60.

Changes in racist beliefs and perceptions of beauty across generational cohorts

There were no significant differences in perceptions of beauty across the generational groups. The average scores for beauty perceptions were relatively consistent, with Millennials rating beauty at an average of 6.43, Gen Z at 6.20, Gen X at 7.08, and Boomers at 6.59 (F(3, 24.5) = 0.886, p = 0.462, **Figure 2A**). This suggests that perceptions of beauty did not vary significantly between the different age cohorts.

In contrast, the analysis of racist beliefs indicated marginally significant differences between the generational groups, although it did not reach the conventional threshold for significance. Millennials had an average racist belief score of 2.02, Gen Z scored 1.64, Gen X scored 2.14, and Boomers scored 2.16 (F(3, 23.3) = 2.874, p = 0.058, Figure 2B-C). The F-value indicates the ratio of the variance between the group means to the variance within the groups, while the p-value represents the probability that the observed differences occurred by chance. A p-value of 0.058 suggests that while the results are not statistically significant at the conventional alpha level of 0.05, there is a trend indicating potential differences in racist belief scores among generations. This trend implies that younger generations, particularly Gen Z, may hold slightly less racist beliefs compared to older generations (Figure 2C).

Ethnic variation in perceptions of beauty and racist beliefs

We compared how participants of different ethnicities

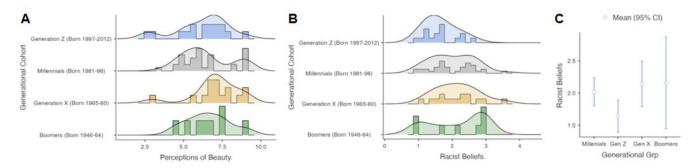


Figure 2: Average scores of racist believes and perceptions of beauty across generational cohorts. Data were collected via an online survey where participants (N = 75) rated their agreement with statements from the Symbolic Racism 2000 Scale. Participants rated eight faces on a 9-point Likert scale for perceptions of beauty and various racist statements on a 4-point Likert scale for racist beliefs. Levene's test for equality of variances indicated significant heterogeneity of variances for racist beliefs (p < .05), suggesting that the assumption of equal variances may be violated. A) Average scores of perceptions of beauty across generational cohorts (F(3, 24.5) = 0.886, p = 0.462). B) Average scores of racist beliefs across generational cohorts (F(3, 23.3) = 2.874, p = 0.058). C) Average scores of racist beliefs across generational cohorts. Mean scores of racist beliefs on a 4-point Likert scale, where lower scores indicate fewer racist beliefs, across four generational cohorts: Generation Z, Millennials, Generation X, and Baby Boomers. While the trend suggests that younger generations, particularly Generation Z, hold less racist beliefs, the differences between generations were not statistically significant (p = 0.058).

perceived the beauty of the images in the survey. We found that different ethnic groups had significantly different ratings of the beauty of the images in our survey (F(3, 67) = 3.16, p = 0.030, **Figure 3**), indicating the impact of cultural influences. Furthermore, the analysis reveals that ethnicity explains approximately 24.19% of the variability observed in perceptions of beauty, suggesting that ethnicity plays a notable role in shaping these perceptions.

The post hoc analysis revealed that while South Asian participants had significantly different beauty perceptions compared to White/Caucasian participants (p = 0.027, **Table 3**), the other group comparisons did not show significant differences. This suggests that cultural factors may play a role in shaping beauty perceptions, particularly between South Asians and White/Caucasians. However, there were no significant differences observed between the other ethnic groups, indicating potential similarities in how beauty is perceived across these populations: South Asian and Hispanic/Latinx, South Asian and African/Black, Hispanic/Latinx and White/Caucasian, Hispanic/Latinx and African/Black, White/Caucasian and African/Black.

We also compared how racist beliefs are influenced by participants of different ethnicities. We found that there was a significant effect of ethnicity on racist beliefs (F(3, 67) = 7.27, p < 0.001, **Figure 3**). This underscores the influence of cultural factors on attitudes towards race. The analysis shows that ethnicity accounts for 5.23% of the variance in racist beliefs, highlighting its impact on the differences observed in the levels of racist beliefs among the various ethnic groups.

We did a post hoc test to measure differences in racist beliefs between ethnic groups. South Asian participants exhibited significantly higher levels of racist beliefs compared to Hispanic/Latinx participants (p = 0.012, **Table 3, Figure 4A-B**), White/Caucasian participants (p = 0.003, **Table 3, Figure 4A-B**), and African/Black participants (p = 0.004, **Table 3, Figure 4A-B**). Hispanic/Latinx participants did not significantly differ in racist beliefs compared to White/Caucasian participants (p = 0.787, **Table 3, Figure 4A-B**) or African/Black participants (p = 0.968, **Table 3, Figure 4A-B**). Similarly, there was no significant difference in racist beliefs between White/Caucasian and African/Black participants (p =

0.473, Table 3, Figure 4A-B).

Comparative prejudices among ethnic groups

We then investigated differences in racist beliefs and perceptions of beauty among participants of specific ethnicities. Specifically, the White/Caucasian group had an average beauty perception score of 6.08 (SD = 1.486, **Figure 5A**), while the South Asian group had a higher average score of 7.23 (SD = 1.322, **Figure 5A**). This difference, with a p-value of 0.005, indicates that the South Asian group rated beauty perceptions higher than the White/Caucasian group (t(56) = 2.96, p=0.005, **Figure 5A**). There was also a significant difference in racist beliefs between the two groups. The South Asian group had a higher mean score for racist beliefs (M = 2.30, SD = 0.409, **Figure 5B**), compared to the White/Caucasian group, which had a lower mean score (M = 1.80, SD = 0.558, t(56) = 3.64, p < 0.001. **Figure 5B**). This suggests that the South Asian group exhibits higher levels

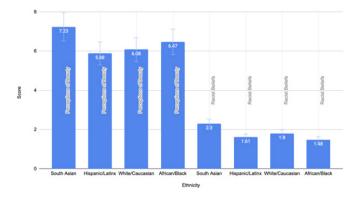


Figure 3: Average scores of perceptions of beauty and racist beliefs across ethnic groups. One-way ANOVA yielded a significant result, F(3, 67) = 3.16, p = 0.030, indicating differences between ethnic groups. For racist beliefs, the ANOVA also revealed significant differences, F(3, 67) = 7.27, p < 0.001. Participants rated beauty using a 9-point Likert scale, where lower scores indicate lower ratings of beauty, and various racist statements using a 4-point Likert scale, where lower scores indicate fewer racist beliefs. Levene's test is significant (p < .05), suggesting a violation of the assumption of equal variances.

Perceptions of Beauty		South Asian	Hispanic/Latinx	White/Caucasian	African/Black
South Asian	Mean difference	-	1.35	1.142	0.752
	p-value	-	0.157	0.027	0.683
Hispanic/Latinx	Mean difference		-	-0.208	-0.598
	p-value		-	0.986	0.884
White/Caucasian	Mean difference			-	-0.390
	p-value			-	0.931
African/Black	Mean difference				-
	p-value				-
Racist Beliefs		South Asian	Hispanic/Latinx	White/Caucasian	African/Black
Racist Beliefs South Asian	Mean difference	South Asian	Hispanic/Latinx 0.694	White/Caucasian 0.500	African/Black 0.822
			•		
	difference	-	0.694	0.500	0.822
South Asian	p-value Mean	-	0.694	0.500	0.822
South Asian	p-value Mean difference	-	0.694	0.500 0.003 -0.194	0.822 0.004 0.128
South Asian Hispanic/Latinx	p-value Mean difference p-value Mean Mean	-	0.694	0.500 0.003 -0.194 0.787	0.822 0.004 0.128 0.968
South Asian Hispanic/Latinx	difference p-value Mean difference p-value Mean difference	-	0.694	0.500 0.003 -0.194 0.787	0.822 0.004 0.128 0.968 0.322

Table 3: Post hoc Tukey HSD test comparing perceptions of beauty and racist beliefs between ethnic groups. Participants rated beauty using a 9-point Likert scale and various racist statements using a 4-point Likert scale. Mean differences and corresponding p-values are provided to indicate the significance of differences in perceptions of beauty between each pair of ethnic groups. Significant differences (p < 0.05) are denoted with bolded p-values. Levene's test is significant (p < .05), suggesting a violation of the assumption of equal variances.

of racist beliefs compared to the White/Caucasian group (Figure 5B).

DISCUSSION

While overall racist beliefs did not predict perceptions of beauty in our study, we did identify statistically significant differences in racist beliefs between first-generation and second-generation participants. First-generation participants exhibited fewer racist beliefs on average compared to second-generation participants, as indicated by a lower mean score of 2.35 versus 2.60, which was inconsistent with our hypothesis. This may be because first-generation immigrants often retain strong connections to their culture of origin, which may emphasize communal values and collective identity over individualism (46, 47). This cultural retention can foster greater tolerance and acceptance of diversity within their own communities and beyond (46, 47). Studies have shown that first-generation immigrants are likely to maintain cultural practices and values from their home countries, which can promote inclusivity and solidarity among diverse groups (48). Further, having experienced marginalization and discrimination themselves, first-generation immigrants may develop a heightened awareness of the impacts of racism and prejudice (48, 49). This empathetic understanding can lead to more inclusive attitudes. Research indicates that personal experiences of discrimination can foster empathy towards other marginalized groups, reducing racist beliefs (49). First-generation immigrants also often exhibit high levels of resilience and adaptability, traits that are associated with openness to new experiences and acceptance of others

(50). This resilience, developed through the challenges of migration and adaptation, can mitigate prejudiced attitudes (50).

In examining the generational cohort (distinct from immigrant generational status), our data revealed no significant difference in racist beliefs or perceptions of beauty across the generations. However, as shown in Figure 4. Generation Z exhibited marginally lower racist beliefs compared to other generations, aligning with broader societal trends. Younger generations, such as Gen Z, are generally more diverse and inclusive, often embracing diversity and inclusivity more than older generations (51). This trend is reflected in our data, where Gen Z participants demonstrated slightly lower levels of racist beliefs, potentially due to their greater exposure to social justice causes and advocacy for equality. Their active engagement with issues like systemic racism and unconscious bias, amplified by their access to social media, may contribute to this generational shift (52, 53). On the other hand, Generation X participants, who grew up during significant civil rights movements, displayed a moderate level of racist beliefs. This aligns with their historical context, as they are often more attuned to racial issues due to their upbringing during a time of profound social change (54). The Baby Boomer cohort, with its diverse views shaped by varied life experiences, showed a wider range of beliefs, which is consistent with our findings that they did not significantly differ from other generations in terms of racist beliefs or perceptions of beauty (55). These generational differences, while not statistically significant in our study, suggest a nuanced landscape where social and historical

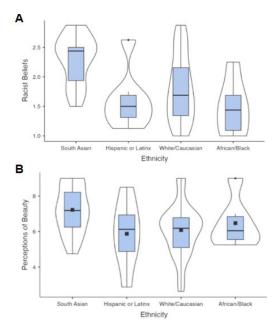


Figure 4: Mean differences in racist beliefs and perceptions of beauty between ethnic groups. A) Mean differences in racist beliefs between ethnic groups B) Mean differences in perceptions of beauty between ethnic groups. Mean differences among South Asian, Hispanic/Latinx, White/Caucasian, and African/Black participants. Participants rated racist statements on a 4-point Likert scale. Post hoc Tukey HSD tests were conducted to compare mean differences between groups. Significant differences are indicated by asterisks: * p < 0.05, ** p < 0.01, *** p < 0.001. Results are averaged across three replicates for each ethnic group comparison.

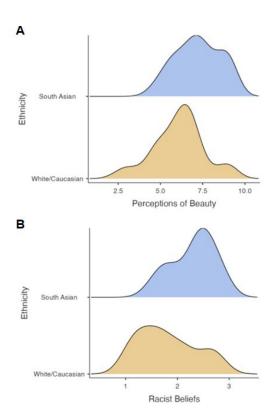


Figure 5: Comparing perceptions of beauty and racist beliefs between South Asian and White/Caucasian groups. A) Perceptions of beauty comparison between South Asian and White/ Caucasian groups. B) Racist beliefs comparison between South Asian and White/Caucasian groups. Mean scores of racist beliefs on a 4-point Likert scale, where lower scores indicate fewer racist beliefs. Mean scores of perceptions of beauty on a 9-point Likert scale, where lower scores indicate lower ratings of beauty. Data were collected via an online survey where participants (N = 75) rated their agreement with statements from the Symbolic Racism 2000 Scale. Independent Samples t-test was conducted to measure differences. South Asian participants (n = 22) had higher ratings of beauty (M = 7.23, SD = 1.322) than White/Caucasian participants (n = 36, M = 6.08, SD = 1.486), t(56) = 2.96, p = 0.005. However, South Asian participants (M = 2.30, SD = 0.409) also reported higher levels of racist beliefs compared to White/Caucasian participants (M = 1.80, SD = 0.558), t(56) = 3.64a, p < 0.001. Levene's test is significant (p < .05), suggesting a violation of the assumption of equal variances.

context plays a crucial role in shaping attitudes toward race and beauty.

Further, one's ethnic group is likely to rate their own group higher in beauty as we predicted (40). Our data indicate that different ethnic groups had significantly different ratings of beauty images, with South Asian participants rating their own ethnicity higher than other groups, suggesting a preference for their own ethnic characteristics (Table 3). Further data support this trend, showing that South Asian participants rated perceptions of beauty higher compared to White/ Caucasian participants (Figure 5A-B). This tendency can be attributed to a strong sense of commitment to one's ethnic identity, which provides a buffer against the negative effects of discrimination (56). High levels of identity exploration, however, may lead to increased vulnerability (56). The importance of ethnicity and race in one's identity can both protect against and heighten susceptibility to discrimination, potentially influencing how beauty is perceived within and

across different ethnic groups (56). Cultural norms and standards of beauty vary widely across different societies and regions. People tend to be influenced by the beauty ideals of their own culture (28-30). This can lead individuals to perceive features commonly associated with their ethnicity as attractive (40). This can also function as a familiarity bias (38). Positive reinforcement and personal experiences from loved ones can influence how someone perceives their own ethnic features (40). These experiences may include cultural celebrations, community support, and a sense of belonging (40, 57).

Perceptions of beauty significantly differed between South Asian and Caucasian participants, with South Asian participants giving higher average beauty ratings across all images. Overall, South Asians consistently rated the presented images as more beautiful than Caucasians did. This focus on South Asian versus Caucasian participants was chosen due to the distinct cultural and societal norms that influence beauty standards in these groups. The differences in ratings suggest that South Asian participants may either perceive a greater degree of beauty in the images or are more expressive in their ratings. These findings could be influenced by cultural biases, differing standards of beauty, or the specific ways these groups internalize and express aesthetic preferences. While comparing how participants perceived the beauty of the images in the survey, it is important to consider the residual variance, which represents the unexplained variability in perceptions of beauty after accounting for the effects of ethnicity. In this case, the residual variance is 140.63, indicating that there are other factors beyond ethnicity that contribute to the variability in perceptions of beauty among the participants. These factors could include individual differences, cultural influences, or other unmeasured variables that were not included in the analysis.

South Asian and Caucasian cultures may have different ideals regarding skin tone, facial features, and other aspects of facial appearance (29). Interestingly, South Asian participants also exhibited slightly higher levels of racist beliefs. In comparing how racist beliefs are influenced by participants of different ethnicities, however, the residual variance of 17.27 indicates that a substantial portion of the variability in racist beliefs remains unexplained by ethnicity alone. This suggests that other factors, potentially including socio-economic background, cultural influences, individual experiences, and education levels, also contribute to differences in racist beliefs among participants. South Asian communities in Western contexts often experience distinct forms of racialization and discrimination, which can shape their perceptions of race and ethnicity (58). Historical and contemporary experiences of marginalization or stereotyping may contribute to heightened sensitivity or defensive attitudes towards racial issues among South Asians (59). Secondly, cultural values and norms within South Asian communities, such as hierarchical social structures or notions of purity and pollution, may influence attitudes towards other racial or ethnic groups (58). Personal experiences, upbringing, and exposure to diverse beauty ideals can all shape an individual's perception of what is beautiful (1).

It is crucial to note that interpretations of racist beliefs can vary widely across different cultural groups. What may be perceived as racist by one group might not be similarly

interpreted by another due to differing cultural norms and historical experiences (61, 63). Therefore, understanding these nuances is essential for developing effective strategies to address racial inequalities and promote intercultural understanding in multicultural societies.

To ensure the robustness of our findings amidst multiple comparisons, we applied Bonferroni corrections to control for Type I errors in our statistical analyses. Specifically, in Tables 6 and 7, which present results from Tukey's Honestly Significant Difference (HSD) tests comparing perceptions of beauty and racist beliefs among South Asian, Hispanic/Latinx, White/ Caucasian, and African/Black ethnic groups, a corrected significance level of $\alpha = 0.0083$ (i.e., 0.05/[6 comparisons]) was used to determine statistical significance. This correction was applied to maintain an overall alpha level of 0.05 across multiple pairwise comparisons within each table. The results in Table 3, which originally showed a p-value of 0.027, may need to be interpreted with caution, suggesting that the difference in perceptions of beauty between South Asian and White/Caucasian groups might not be as significant as initially thought. However, a further t-test did indicate significant differences (Figure 5). In Table 3, the comparison between South Asian and Hispanic/Latinx groups showed a p-value of 0.12, which may not be considered significant after Bonferroni correction, even though South Asians were generally perceived as having higher levels of racist beliefs. In contrast, Figure 5 presents results from independent samples t-tests comparing perceptions of beauty and racist beliefs specifically between South Asian and White/Caucasian groups. These tests did not require Bonferroni correction for individual tests but were interpreted in the context of the total number of tests conducted.

The study has limitations that should be considered when interpreting the results. Firstly, the small sample size of firstgeneration participants (n = 17) may not adequately represent the diversity of perspectives within this group, limiting the generalizability of the results. Additionally, the imbalanced group sizes, with a larger number of South Asian participants, could skew the overall results. This imbalance may have influenced the study's outcomes, particularly in the context of higher racist beliefs among South Asian participants. Future studies should aim to include a more comprehensive range of ethnic backgrounds to improve the accuracy of the results. The study's measure for assessing racist beliefs should also be critically examined. Validation of the Symbolic Racism 2000 Scale involves assessing its reliability and applicability across diverse cultural contexts, ensuring that it accurately measures racist beliefs. Potential biases and nuances, such as cultural insensitivity in item content and response biases influenced by social desirability, may affect the scale's validity and reliability.

Future research could aim to increase the sample size and ensure greater diversity within each demographic category, including ethnicity, age, and generation status. This would provide a more comprehensive understanding of how these factors intersect with racist beliefs and perceptions of beauty. Furthermore, exploring the underlying reasons for the observed link between higher racist beliefs among specific ethnicities and varied beauty perceptions could benefit from qualitative research, such as interviews, or follow-up studies. Finally, the study should consider potential confounding variables, such as socio-economic status and personal

experiences with racism, that may have influenced the results but were not accounted for in the analysis.

The results of this study suggest that generational differences and cultural backgrounds play a role in shaping attitudes towards race and beauty, highlighting the importance of understanding these factors in addressing racism and promoting inclusivity, including understanding the complex interplay between generational differences, cultural backgrounds, and perceptions of beauty. By exploring these factors, this research contributes to a broader conversation about the social and psychological impacts of racial and ethnic identities. The insights gained can inform initiatives aimed at fostering inclusivity, enhancing cultural awareness, and reducing bias in various social settings. Moreover, this study provides a foundation for future research to delve deeper into how societal perceptions influence self-image and identity, ultimately supporting efforts to promote diversity and equality across different communities.

MATERIALS AND METHODS

To recruit participants for this study, we utilized a combination of convenience sampling and snowball sampling methods. Participants were primarily recruited through personal networks, including the professional contacts of the lead researcher (a Caucasian professor) and the personal contacts of the co-researcher (a South Asian student). The lead researcher primarily contacted colleagues within academic circles, while the co-researcher enlisted the participation of friends and family members residing in the United States and India. This approach aimed to capture a diverse range of perspectives and demographics within the participant pool.

The survey was distributed to potential participants via email and social media platforms. Participants were informed about the study and invited to participate without prior knowledge of its specific objectives. The survey link was shared with individuals who met the inclusion criteria of being 18 years of age or older. Participants were provided with a brief overview of the study's purpose and procedures at the beginning of the survey. They were informed that their participation was voluntary, and they had the option to withdraw at any time without consequences. Informed consent was obtained from all participants before proceeding with the survey.

We collected via an online questionnaire from 77 participants. We had participants with ages ranging from 18 to 89 years, an average age of 38.5 years, and a median age of 35 years (**Table 1**). Regarding gender, there were 34 male participants, 56 female participants, and 4 non-binary participants. Generation-wise, 11 participants were Gen Z, 36 were Millennials, 34 were from Gen X, 17 were Baby Boomers, and 2 were from the Silent Generation (**Table 1**). 26 participants were first-generation individuals in the U.S., while 45 were not (**Table 1**). Ethnically, 65.9% of the participants identified as South Asian, 14.6% as Hispanic/Latino, 61.0% as White/Caucasian, and 9.8% as African/Black (**Table 1**). IRB approval was obtained from the Collin College Institutional Review Board (IRB) with the approval number 2022-10102.

Measures

Demographic Information: Demographic information was obtained from the participants to better understand the sample

used in the research. The parameters that were included were ethnicity, age, gender, education level, generational cohort, and immigrant generational status. the option "prefer not to answer" was provided to participants. The gender options provided were male, female, transgender, and non-binary. Participants were asked to state their age and to select their generational cohort from the following categories: Generation Z (born 1997-2012), Millennials (born 1981-1996), Generation X (born 1965-1980), Boomers (born 1946-1964), and the Silent Generation (born 1928-1945). They were also asked whether they were first-generation immigrants, secondgeneration immigrants, or neither. For ethnicity, the options were: White/Caucasian; East Asian (Chinese, Japanese, or other); South Asian (Indian, Pakistani, Bangladeshi, Sri Lankan, etc.); Hispanic or Latino; African/Black; Native American; Native Hawaiian or Pacific Islander; and Unknown. The education levels listed were: some high school, high school diploma, some college, associate's degree, bachelor's degree, master's degree, and Ph.D. or higher.

Perceptions of beauty (43): For the purposes of this study, a random sample of facial images was used, representing an equal number of male and female faces, as well as varying racial and ethnic backgrounds. Participants rated these images on a 9-point Likert scale. While the facial depository from which we collected our images no longer functions (43), these images and a variation of the rating scale were used in a previously published study (63). The 8 faces featured in the survey included one female and one male each of African, Caucasian, East Asian, and West Asian descent.

The Symbolic Racism 2000 Scale (45): This survey consists of eight items on a 4-point Likert scale (ranging from 1, "Strongly agree" to 4, "Strongly Disagree"). Sample items included "It's really a matter of some people not trying hard enough; if Blacks would only try harder, they could be just as well off as Whites" and "Irish, Italian, Jewish, and many other minorities overcame prejudice and worked their way up. Hispanics should do the same." A low score, close to 1, indicates fewer racist beliefs, whereas a high score, close to 4, indicates stronger racist beliefs. We changed some of the "Blacks" to other ethnicities for the present study.

Methods

The primary dependent variable in our analysis was the participants' perceptions of beauty. This was measured by having participants rate eight randomly selected facial images on a 9-point Likert scale, where 1 indicated 'Not at all attractive' and 9 indicated 'Extremely attractive' (43). The primary independent variable was the level of racist beliefs among participants, measured using the Symbolic Racism 2000 Scale (45). Control variables were various demographic variables such as ethnicity, gender, age, education level, generational cohort, and immigrant generational status.

Several statistical techniques were employed to analyze the data using Jamovi (64, 65). Linear regression was conducted to explore the relationship between racist beliefs (independent variable) and perceptions of beauty (dependent variable), while controlling for demographic factors. The analysis and F-statistics aimed to determine whether racist beliefs significantly predicted perceptions of beauty. Independent sample t-tests were performed using Jamovi to compare perceptions of beauty and levels of racist beliefs between various groups, such as first-generation

and second-generation participants, as well as South Asian and Caucasian participants. ANOVA was utilized to examine differences in perceptions of beauty and levels of racist beliefs across different ethnic groups and generational cohorts. Post hoc Tukey HSD tests were also conducted to measure further differences among specific ethnicities.

The statistical output generated by Jamovi provided information such as the t-value, degrees of freedom (df), and p-value for each comparison. A significance level (α) of 0.05 was used to determine whether the differences observed were statistically significant. In the present study, multiple comparisons were conducted to examine differences in perceptions of beauty and racist beliefs across different ethnic groups. To account for the increased risk of Type I errors due to conducting multiple tests, Bonferroni correction was applied where appropriate.

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