



Girls Tolerate Girls, men condemn men: Gender differences in the impact of beautification strategies on trustworthiness and morality evaluation

Xianyou He^{a,b,c,d,e}, Fuqun Liang^{b,c,d,e,*}, Xingang Wang^{b,c,d,e}, Yanfei Liu^{b,c,d,e}, Jun Zhang^{b,c,d,e}, Jiahao Luo^{b,c,d,e}

^a School of Education, Kashi University, PR China

^b Key Laboratory of Brain, Cognition and Education Sciences (South China Normal University), Ministry of Education, Guangzhou, China

^c Guangdong Key Laboratory of Mental Health and Cognitive Science, South China Normal University, Guangzhou, China

^d Center for Studies of Psychological Application, South China Normal University, Guangzhou, 510631 China

^e School of Psychology, South China Normal University, Guangzhou, 510631 China

ARTICLE INFO

Keywords:

Beautification strategies
morality and trustworthiness evaluation
gender
cosmetic surgery

ABSTRACT

It's not just women who aspire to enhance their appearance; it's a universal human desire. An increasing number of men are gradually embracing beautification strategies as well. The impact of gender on perceptions of strategies users remains uncertain. This study focuses on the role of gender in beautification strategies and their influence on trustworthiness and morality evaluations. It aims to analyze the role played by both the gender of evaluators and the gender of targets, while also comparing the differences between the two most popular beautification strategies, makeup and cosmetic surgery, in shaping trustworthiness and morality evaluations. The results revealed male participants demonstrated a stronger negative bias towards these users, particularly male users. On the other hand, the research revealed that females exhibited greater tolerance when evaluating same-sex makeup users. Conversely, males gave more negative evaluations to same-sex strategies users. Furthermore, the results showed morality and trustworthiness evaluation for beautification targets was predicted by evaluators' acceptance of cosmetic surgery. This study not only contributes to the existing literature on gender differences in beautification strategies but also offers a gender-based perspective to help reduce the stigma associated with these strategies.

1. Introduction

Imagine a scenario where you are about to meet a male individual in a café, contemplating a potential collaboration. As he enters and approaches, you notice that he is wearing makeup. At that moment, how trustworthy do you perceive him to be? Now, imagine meeting a woman who is also wearing makeup. How would you assess her trustworthiness? Do your judgments differ based on the gender of the person you are evaluating? Research indicates that during initial encounters, individuals rapidly evaluate trustworthiness, particularly in the context of potential cooperative endeavors [1]. This rapid trustworthiness judgment is often influenced by

* Corresponding author. School of Psychology South China Normal University No.55, West of Zhongshan Avenue, Tianhe District Guangzhou, 510631 China.

E-mail address: liangfuqun523@163.com (F. Liang).

<https://doi.org/10.1016/j.heliyon.2023.e20365>

Received 16 March 2023; Received in revised form 6 September 2023; Accepted 20 September 2023

Available online 22 September 2023

2405-8440/© 2023 Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

facial appearance and other physical cues [2].

Moreover, recent research indicates that using makeup and cosmetic surgery to enhance physical attractiveness has been subjected to moralization. Individuals tend to make moral judgments about the targets based on their engagement in these beautification strategies [3,4]. While previous studies have examined the impact of beautification strategies on trustworthiness and morality evaluation, the majority of research has focused on female applicants, with limited attention to gender differences in the influence of beautification strategies on these evaluations. How do people evaluate male individuals who employ beautification strategies? How do men and women differ in assessing the trustworthiness and morality of same-sex and opposite-sex individuals using beautification strategies? This study aims to explore the gender differences in the influence of beautification strategies on trustworthiness and morality judgments, contributing to a better understanding of gender biases and stereotypes in society. Furthermore, it seeks to uncover potential gender biases that individuals may encounter in social interactions and promote the development of fair and equitable evaluation standards.

1.1. The impact of beautification strategies on male users were overlooked

It is not only a woman's desire to look better, but also a human nature. In an era valuing physical attractiveness, both women and an increasing number of men are using beautification strategies, such as makeup and cosmetic surgery, to enhance their attractiveness. According to the report, there was a significant surge in the total number of cosmetic procedures performed on male patients, which increased by more than 325% from 1997 to 2015 [5]. Annual data from the International Society for Aesthetic Surgery (ISAPS) indicated that approximately 3.44 million men underwent cosmetic surgery in 2020, representing an 18% increase compared to 2018 [6]. Moreover, a separate report predicts that the global market for men's cosmetics alone reached \$57.7 billion in 2017, with a projected growth to reach \$78.6 billion in 2023 [7].

These findings demonstrated the substantial and consistent expansion of the male cosmetic industry in recent years. Additionally, the data reveals that the market size of China's male skin care products reached 9.90 billion RMB in 2021, marking a remarkable 23.8% year-on-year growth, indicative of an overall rapid developmental trend. It is further projected to surpass 16 billion RMB by 2023 [8]. The 2019 annual Report released by Tmall indicated a remarkable 278% growth rate in lipstick consumption among male consumers. Furthermore, there is a rising trend in men's adoption of male cosmetics, including lipstick, eyebrow pencil, sunscreen, and masks. For these reasons, several media promoted that the "His economy" of the consumer market is coming, which may become the next economic growth windfall. However, this growing group is routinely overlooked by researchers. Previous study showed the male audience is not the focus of most cosmetic surgery websites. Many cosmetic surgeons elect to ignore or minimize male patients in their marketing efforts [9].

The increasing presence of beauty-conscious men in our society raises important questions about the effects of beautification strategies on men and how society perceives them. Some scholars suggest that male recipients of cosmetic surgery may face more criticism due to the perception of cosmetic procedures as traditionally feminine activities [10,11]. However, existing empirical studies yield contradictory findings. For instance, Parsa et al. [12] found that post-facial cosmetic surgery male patients were perceived as more trustworthy, while Bonell et al. [3] revealed that both men and women planning facelifts were perceived as immoral and less warmth, without gender-based disparities. Based on these literatures, the current study aims to comprehensively investigate the differential effects of beautification strategies on male and female individuals. Due to the perception that makeup and cosmetic surgery are typically associated with femininity, men using these beautification strategies may be considered weird or lacking in masculinity [10,11]. Therefore, we propose the hypothesis that compared to women, men who engage in beautification strategies may be subject to more negative evaluations.

1.2. The effect of beautification strategies on trustworthiness and morality evaluation

Through techniques such as cosmetics and cosmetic surgery, individuals can to some extent alter their facial features. Research indicates that people often rapidly form judgments of trustworthiness based on facial features, and this process can occur rapidly and even without conscious awareness. Trustworthiness, as a crucial dimension of first impressions, significantly influences subsequent social interactions, such as cooperation [2]. Furthermore, some researchers have suggested that the use of cosmetic surgery and other beautification strategies has become moralized, meaning that people make moral judgments based on the application of such strategies to achieve beauty goals [3,4]. Previous research has indeed demonstrated that moral characteristics exert a significant influence on an individual's overall impression, even to the extent of being regarded as the most critical dependent variable in studies of personal perception [13].

Given the importance of trustworthiness and morality, prior studies investigating the impact of beautification strategies have placed particular emphasis on these two evaluative dimensions [14,15]. However, the findings of these studies have yielded inconsistent results. For instance, a portion of the research suggests that women who utilize beautification strategies receive favorable evaluations. Recent studies have indicated that men perceive women who have undergone rhinoplasty as more trustworthy after the procedure [16]. Additionally, it has been demonstrated that women who use beautification strategies are perceived as more trustworthy [17–19]. Furthermore, recent studies have shown that makeup significantly enhances facial attractiveness and leads to the perception of individuals possessing more positive personality traits [20], as well as being more trustworthy in social interactions, such as in trust games [21].

However, another segment of the research has presented contrasting findings, revealing negative evaluations of women who employ beautification strategies [14,22]. Qualitative studies, for instance, have reported that women who undergo cosmetic surgery

may be subject to adverse perceptions, including psychological instability and mental unwellness [3,23], being perceived as vain and lazy [23], and experiencing heightened self-consciousness [24]. Moreover, some studies have indicated that women wearing makeup are viewed as more promiscuous, untrustworthy, and morally questionable [18,25,26]. In a cross-cultural context, a study showed that individuals from Hong Kong, Japan, and the United States tended to associate negative traits with cosmetic surgery recipients and were less inclined to establish social connections with them [27]. Additionally, research indicated that both male and female salespersons are perceived as less trustworthy as they wear more makeup [28].

Upon reviewing these studies, it becomes evident that they primarily focus on women as recipients of beautification strategies, while the evaluators may comprise both male and female individuals or only females. However, the majority of these studies did not compare the gender differences of the evaluators, thus making it difficult to discern whether the contradictory results are influenced by the gender of the evaluators themselves. For instance, a recent study found that male observers perceived women who underwent rhinoplasty as more trustworthy than their pre-surgery selves, whereas female observers did not exhibit the same perception [16]. Nonetheless, this study did not conduct further comparisons between men and women evaluators. Therefore, this current study aims to investigate gender differences among evaluators concerning the impact of beautification strategies on judgments of morality and trustworthiness.

1.3. Intra-sexual jealousy or in-group preference? Social trait evaluation for same-sex beautification strategy users

Whether people are more positive or negative in their evaluation of same-sex target using beautification strategies? Based on intra-sexual competition theory, beautification strategies such as the use of cosmetics may be more likely to lead to intra-sexual competition [29,30], and the jealousy generated by intra-sexual competition is likely to cause negative trait evaluation. A recent study supported this view, with women making more negative attributions to women who wore makeup (as opposed to no makeup), and their desire to affiliate with them decreased. In contrast, men expressed a stronger desire to affiliate with women who wore makeup [25].

However, the in-group preference hypothesis also stated that when out-groups exist, people identify with the in-group and therefore give more positive evaluations. Those outside the group are evaluated more negatively [31,32]. Gender, in turn, is one of the most commonly used indicators to classify in- and out-groups [33,34]. In this respect, it is also possible that people may positively evaluate traits of the same-sex (as opposed to the opposite-sex) using beautification strategies. Therefore, this study proposed two competing hypotheses for this issue and hoped to test them in the results. The *intra-sexual envy hypothesis*, in which people evaluated social traits of same-sex targets (as opposed to opposite-sex) using beautification strategies more negatively. The *in-group preference hypothesis*, in which people evaluated social traits of same-sex targets (as opposed to opposite-sex) using beautification strategies more positively.

1.4. Makeup versus cosmetic surgery in impacting social trait evaluations

In addition, if beautification strategies influence trustworthiness and morality evaluations, how do the two beautification strategies of cosmetic surgery and makeup differ in their effects on evaluations? Thought studies suggested that the reason why people who wear makeup and cosmetic surgery are considered immoral and untrustworthy may be due to the covert nature of the beautification strategy, which makes people inauthentic [3,18,22]. Drawing upon self-presentation theory, it is posited that physical appearance serves as a means through which individuals express their sense of self [35]. Consequently, altering one's physical attributes through the use of makeup or cosmetic surgery may lead people to perceive the individual as misrepresenting their true self, thereby deeming them less trustworthy [36]. Furthermore, research indicates that the more effort an individual invests in beautification, the greater the perceived misrepresentation of their true self, consequently diminishing their perceived trustworthiness [14]. Obviously, cosmetic surgery is more covert and invests more effort and money than makeup [29,37], so we hypothesize that recipients of cosmetic surgery may be perceived as less trustworthy and moral than those who wear makeup.

1.5. Current study

To summarize, the present study examines the role of gender in influencing the trustworthiness and moral evaluation of beautification strategies. Utilizing vignettes to manipulate target gender and the application of beautification strategies, a comparative analysis will be conducted to explore the evaluation discrepancies between two popular beautification strategies. The aim is to reveal biases in individuals' evaluations of users of beautification strategies and uncover underlying gender biases. In addition, this study also sought to explore the psychological mechanisms by which beautification strategies influence trustworthiness and morality evaluation. Attitudes are an antecedent factor of evaluation [38], and we proposed that people's attitudes toward beautification strategies are likely to be an important predictor of evaluation of social traits of strategy applicators. Therefore, this study would also measure participants' attitudes toward cosmetic surgery using the Acceptance of Cosmetic Surgery Scale (ACSS) [39,40]. This study has been pre-registered on the Open Science Framework (<https://osf.io/kxp5q>).

2. Methods

Participants. One hundred and fourteen Chinese adult participants were recruited to participate in this experiment. Among them, 61 were men and 53 were women, all heterosexual, with a mean age of 22.03 ± 2.61 . According to sensitivity power analysis, a minimal effect size of $f = 0.12$ can be detected under standard criteria ($\alpha = 0.05$, 95% power). All participants completed an informed

consent form and received 8 RMB at the end of the experiment. This study was approved by the Ethics Review Committee of South China Normal University (Reference No.: SCNU-PSY-2022-357).

Design. A 2 (evaluator gender: male/female; between) * 2 (target gender: male/female; within) * 3 (beautification strategy: natural/makeup/cosmetic surgery; within) mixed design was used. The dependent variables were trustworthiness evaluation (how trustworthy do you think this person is?), moral evaluation (how moral do you think this person is?), which were rated on a 7-point Likert scale [41]. In addition, we also asked the participants to fill out the Acceptance of Cosmetic Surgery Scale (ACSS), which was used to examine the predictive role of the participants' cosmetic surgery acceptance on evaluation of trustworthiness and morality.

Materials. Vignettes were employed to manipulate beautification strategies and target gender (More details see Supplement). Natural condition was “‘S’ is a woman/man. She/He often wears no makeup, showing her/his natural appearance to everyone”. Makeup condition was “‘R’ is a woman/man. She/He often wears make-up and shows her/his make-up appearance to everyone”. Cosmetic surgery condition : “‘X’ is a woman/man. She/he had a cosmetic surgery and show her/his cosmetic face to everyone”.

Acceptance of cosmetic surgery scales (ACSS). The ACSS [39] has 15 items with three subscales. The intrapersonal subscale (5 items) measures self-oriented benefits of cosmetic surgery (e.g., “It makes sense to have minor cosmetic surgery rather than spending years feeling bad about the way you look”). The social subscale (5 items) measures social motivations for taking cosmetic surgery (e.g., “I would seriously consider having cosmetic surgery if my partner thought it was a good idea”). The consider subscale (5 items) measures one’s likelihood to consider undergoing cosmetic surgery (e.g., “In the future, I could end up having some kind of cosmetic surgery”). The ACSS scale is a 7-point response scale, ranging from 1 (I completely disagree) to 7 (I completely agree). The overall score was computed by summing the items. The α coefficient of this scale in the present study was 0.89.

Procedure. This study was produced using Sojump (Chinese Qualtrics) and participants were recruited by the host on the Internet. To ensure the validity of data, the host was first given a guidance statement and an electronic version of the informed consent, and the study link was sent to participant only after they clearly expressed their informed and understanding of the guidance statement.

Each participant was first presented with a vignette. Subsequently, participants were asked to judge the person’s trustworthiness and morality. During this time participants were also required to complete two attention testing questions (Please select the number 7 for this item./Please choose the number 1 for this item.). If a participant selects a number that does not match the requirements for these two items, it is considered invalid data. After all the vignettes were evaluated, they were also asked to complete the Acceptance of Cosmetic Surgery Scale (ACSS). Finally, the host reviewed the quality of data after they completed the task and confirmed the validity of the data before issuing the fees.

3. Data analysis

R studio was used to pre-process and analyze the data. In order to ensure the confidentiality of the participants, the personal information of the participants will be excluded from the analysis, and only the age and sex of the participants will be retained. Multi-factor mixed analysis of variance (ANOVA), pairwise comparisons and interaction analysis were done using *BruceR* package [42]. Results graphs were plotted using the *ggpubr* package [43]. To present the results more clearly, we referred to previous analyses [14] and construct multi-factor ANOVA models with morality and trustworthiness evaluation as dependent variables, respectively. reverse scoring and reliability tests for ACSS were done using SPSS 27.0, and regression prediction model construction and analysis of ACSS scores on social trait evaluation were done in R studio.

4. Results

4.1. Trustworthiness

A 2 (evaluator gender: male/female; between) * 2 (target gender: male/female; within) * 3 (beautification strategy: natural/makeup/cosmetic surgery; within) ANOVA model was conducted on trustworthiness evaluation. The results revealed that all main effects were significant (See Table 1). Specifically, the main effect of evaluator gender is significant, $F(1,112) = 9.05, p = .003, \eta^2_p = .07$.

Further analysis showed the evaluation of female participants significantly more positive than male participants ($t(112) = 3.01, p$

Table 1
Results of the ANOVA test on trustworthiness evaluations.

Varialbes	df1	df2	F	p	η^2_p	[90% CI of η^2_p]
A(Evaluator gender)	1	112	9.055	0.003***	0.075	[.015, .164]
B(Target gender)	1	112	6.222	0.014*	0.053	[.006, .134]
A * B	1	112	0.002	0.961	0.000	[.000, .000]
C(Beautification strategies)	1.74	194.872	54.66	<.001***	0.328	[.241, .406]
A * C	1.74	194.872	8.987	<.001***	0.074	[.023, .136]
B * C	1.965	220.067	3.52	0.032*	0.03	[.001, .072]
A * B * C	1.965	220.067	5.23	0.006***	0.045	[.008, .093]

●For the purpose of facilitating the presentation of interactions between variables, we use A to refer to Evaluator gender, B to refer to Target gender, and C to refer to Beautification strategy. In the table, df represents degrees of freedom, F stands for the value of the analysis of variance F-test, and η^2_p denotes the significance level, with * indicating $p < .05$, and *** representing $p < .001$. η^2_p is the effect size.

= .003, $d = 0.35$). Meanwhile, the main effect of target gender is also significant, $F(1,112) = 6.22, p = .014, \eta^2p = .05$. Female targets also were evaluated more trustworthy than male target ($t(112) = 2.49, p = .014, d = 0.13$). Furthermore, the main effect of beautification strategy is also significant, $F(1.74,194.87) = 54.66, p < .001, \eta^2p = .32$. Further analysis showed that natural targets were evaluated more trustworthy than makeup targets ($t(112) = 7.89, p < .001, d = 0.61$) and cosmetic targets ($t(112) = 8.56, p < .001, d = 0.78$), and makeup targets more trustworthy than cosmetic targets ($t(112) = 2.62, p = .017, d = 0.17$). All of main effect and double-interaction effect could be checked in Supplement.

More importantly, we found a triple-interaction effect on trustworthiness evaluation, $F(1.97, 220) = 5.23, p = .006, \eta^2p = .05$ (See Fig. 1). Further analysis showed when target was women, male participants evaluated natural target more trustworthy than makeup target ($t(112) = 5.30, p < .001, d = 0.69$) and cosmetic target ($t(112) = 7.67, p < .001, d = 1.12$), and makeup targets more trustworthy than cosmetic targets ($t(112) = 3.75, p = .004, d = 0.42$). However, female participants evaluated trustworthiness of the three targets were not difference.

On the other hand, when target was men, male participants still evaluated natural target were more trustworthy than makeup target ($t(112) = 8.79, p < .001, d = 1.15$) and cosmetic target ($t(112) = 7.11, p < .001, d = 0.99$), but trustworthiness of makeup target and cosmetic target was not significant($t(112) = 1.31, p = 1.00, d = 0.15$).

Nevertheless, female participants evaluated trustworthiness of natural target and makeup target was not difference ($t(112) = 2.38, p = .028, d = 0.33$), and makeup target compared to cosmetic target was also not difference ($t(112) = 2.05, p = .043, d = 0.26$). But female participants evaluated natural target more trustworthy than cosmetic target ($t(112) = 4.00, p < .002, d = 0.60$).

4.2. Morality

A 2 (evaluator gender: male/female; between) * 2 (target gender: male/female; within) * 3 (beautification strategy: natural/makeup/cosmetic surgery; within) ANOVA model was conducted on morality evaluation (See Table 2). The results revealed that the main effect of beautification strategy was significant, $F(1.69,189.27) = 24.79, p < .001, \eta^2p = .18$. Further analysis showed that natural targets were evaluated higher morality than makeup targets and cosmetic targets, and makeup targets more trustworthy than cosmetic targets.

The interaction between evaluator gender and beautification strategy was also significant, $F(1.69,189.27) = 3.47, p = .04, \eta^2p = .03$ (See Fig. 2). Simple effects analysis [44] found that men perceived higher moral levels for natural targets than for makeup target ($t(112) = 5.40, p < .001, d = 0.55$) and cosmetic targets ($t(112) = 5.35, p < .001, d = 0.66$), but the difference between makeup and cosmetic targets was not significant ($t(112) = 1.31, p = .187, d = 0.11$).

In contrast, female participants did not perceive a difference in morality between makeup target and natural target ($t(112) = 1.39, p = .164, d = 0.15$), but cosmetic target had significantly lower moral scores than natural target ($t(112) = -3.02, p = .003, d = 0.40$) and makeup target ($t(112) = -2.73, p = .008, d = .25$). Other non-significant main effects and interactions are shown in Table 2.

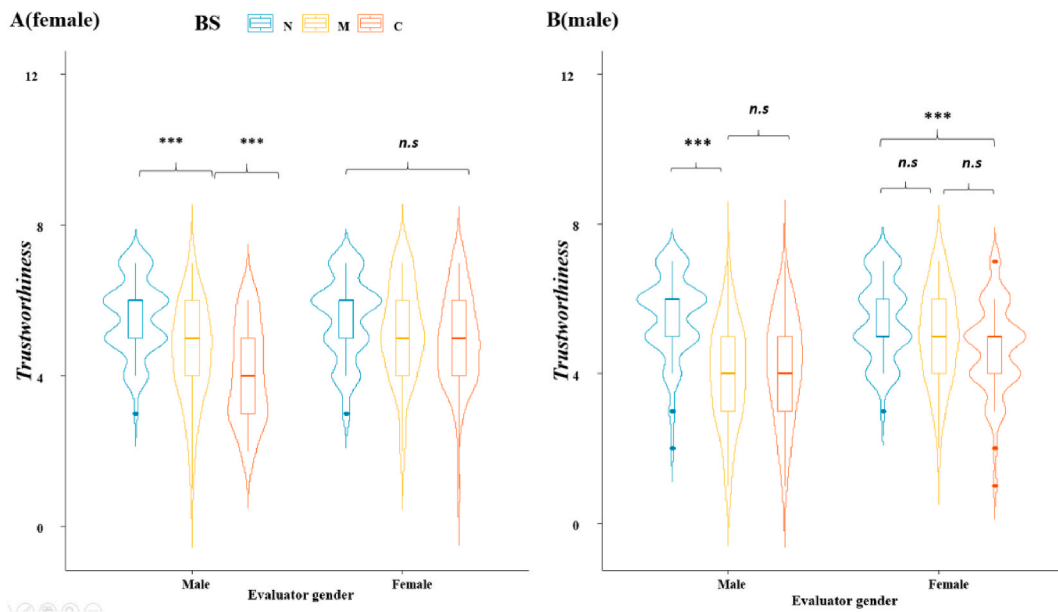


Fig. 1. The triple-interaction effect on trustworthiness
 ** Panel A is female target; Panel B is male target. horizontal coordinates are evaluator gender, vertical coordinates are trustworthiness evaluation. BS is beautification strategy (N = natural/M = makeup/C = cosmetic surgery).n.s means non-significance, *** means $p < .001$.

Table 2
Results of the ANOVA Test on morality.

Varialbes	df1	df2	F	p	η^2p	[90% CI of η^2p]
A(Evaluator gender)	1	112	0.256	0.614	0.075	[.015, .164]
B(Target gender)	1	112	2.092	0.151	0.053	[.006, .134]
A * B	1	112	0.796	0.374	0.000	[.000, .000]
C(Beautification strategies)	1.69	189.275	24.793	<.001***	0.328	[.241, .406]
A * C	1.69	189.275	3.47	0.041*	0.074	[.023, .136]
B * C	1.961	219.688	1.008	0.365	0.03	[.001, .072]
A * B *C	1.961	219.688	1.954	0.145	0.045	[.008, .093]

●For the purpose of facilitating the presentation of interactions between variables, we use A to refer to Evaluator gender, B to refer to Target gender, and C to refer to Beautification strategy. In the table, df represents degrees of freedom, F stands for the value of the analysis of variance F-test, and p denotes the significance level, with * indicating $p < .05$, and *** representing $p < .001$. η^2p is the effect size.

5. ACSS analysis

First, we used a Welch two sample *t*-test to detect gender differences in the acceptance of cosmetic surgery. The results showed the differences in acceptance of cosmetic surgery between men ($M = 57.15$) and women ($M = 64.15$) were not significant, $t(105.77) = -1.97, p = .051$. Further, general linear regression models (12 models in total) were constructed using the scores on the Acceptance of Cosmetic Surgery Scale as independent variables, trustworthiness evaluation scores and morality evaluation scores for different targets as dependent variables, and age and gender of participants as covariates (See detail in Supplement).

Results revealed that the acceptance of cosmetic surgery only predicted their evaluation of trustworthiness ($p = .03$) and morality ($p = .02$) for cosmetic women. However, the acceptance of cosmetic surgery of participants could predicted evaluation of trustworthiness ($p = .03$) and morality ($p = .02$) for makeup and cosmetic men.

6. General discussion

The present study examined the important role of gender in beautification strategies affecting trustworthiness and morality evaluation. Specifically, in comparison to male participants, females tend to perceive strategies users as more trustworthy. Moreover, female users of beautification strategies are perceived to be more trustworthiness than their male counterparts.

Of particular significance, this study also uncovered interactive effects of participants' gender, target gender, and beautification strategies on trustworthiness evaluations. Specifically, females exhibited more positive evaluations towards same-gender strategies users, aligning with the in-group favoritism hypothesis.

Conversely, male participants displayed more negative evaluations towards same-gender strategies users, in line with the same-sex rivalry hypothesis. In addition, we found that evaluators' acceptance of cosmetic surgery predicted their evaluations of cosmetic surgery targets, and makeup men. Next, we will delve into a more detailed discussion of these findings.

6.1. Beautification strategies lead to negative evaluations, with male users facing a higher degree of stigmatization

This study reveals that the application of makeup and cosmetic surgery (compared to natural appearance) is perceived as less trustworthy and less moral. These findings align with the results of some previous research. It may validate the conclusions drawn by Bonell et al. [4] that the act of using beautification strategies has been moralized by people. By employing Eastern participants, we further validate this conclusion, indicating that this phenomenon could be cross-cultural. According to the naturalistic fallacy

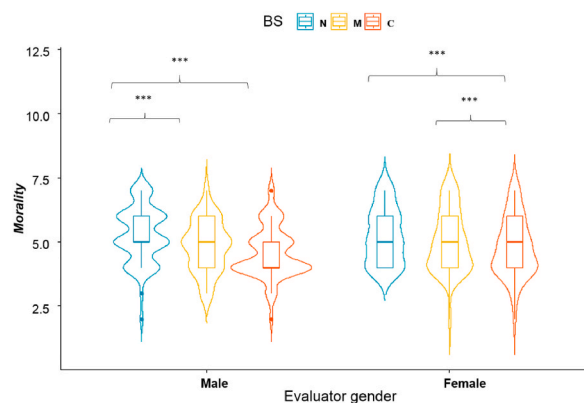


Fig. 2. The interaction of subject gender and appearance enhancement strategy on morality *BS is beautification strategy (N = natural/M = makeup/C = cosmetic surgery). n.s means non-significance, *** means $p < .001$.

hypothesis, individuals might perceive the act of applying beautification strategies as undermining the naturalness of one's appearance, thereby deeming it immoral [45].

Furthermore, based on the beauty-as-currency hypothesis [46], individuals might perceive the use of beautification strategies as a means of cheating to obtain unearned currency. Consequently, it could be considered a behavior that undermines fairness and is therefore deemed immoral. Recent research has also revealed that the application of beautification strategies may be perceived as misrepresenting one's true self and potentially reducing the estimability of one's genes, leading to less trustworthy [36]. The present study found that people's attitudes towards cosmetic surgery directly predict their trustworthiness and moral evaluations for users. This provides a potential direction for mitigating the stigmatization of beautification strategies users in the future, namely, by gradually improving attitudes towards cosmetic surgery and similar strategies to reduce this stigmatization.

Moreover, when comparing the effects of the target gender, we found that, after using beautification strategies, males are perceived as less trustworthy by females. This indicates that compared to female users, male users may experience more biases. This could be attributed to the fact that makeup and cosmetic surgery are often perceived as tools associated with femininity, which tend to enhance the user's feminine [10,11]. Therefore, when males use beautification strategies, they might be seen as deviating from traditional masculinity and social norms, resulting in more negative evaluations.

While it is common for men in today's society to use makeup and undergo cosmetic procedures, there still appears to be resistance to accepting men who apply beautification strategies. This research finding serves as a warning to pay attention to potential biases and stigmatization towards this group, as such stigmatization could lead to subsequent harmful behaviors or discriminatory treatment [47].

6.2. Men have more biases towards beautification users

This study not only reveals that male users of beautification strategies may encounter more stigmatization and biases but also demonstrates that males are more likely to be the perpetrators of such discrimination and stigmatization (compared to females). In other words, male participants are more inclined to perceive users as less moral and less trustworthy compared to female participants.

However, there were no significant differences between male and female participants in terms of acceptance of cosmetic surgery, indicating that acceptance might not be the underlying cause of this gender difference. According to the perspective of evolutionary psychology, we speculate that this gender difference may be due to men's greater concern about loyalty issues compared to women [48]. Individuals who use beautification strategies are often perceived to have stronger short-term mating preferences, more sexual partners, and a tendency for promiscuity [18,26]. Consequently, men might view strategies users as less trustworthy and less moral. Recent research also indicates that male participants tend to perceive women who use beautification strategies as less loyalty, making them less inclined to establish long-term mating relationships with such individuals [36].

Therefore, this finding that men may be more prone to bias against beautification strategies users holds significant implications. It suggests that the effects of beauty products may not always live up to the perfect image portrayed in advertisements, and individuals using beautification strategies need to be cautious of potential biases from others, especially when facing men.

6.3. Triple interaction: girls tolerate girls, men condemn men

Are people more positive or more negative about same-sex beautification strategy applicators? The study results revealed that the triple interaction of evaluator gender, target gender, and beautification strategy influenced trustworthiness evaluation, but not in the morality evaluation. When female participants evaluated female goals, they did not believe that using beautification strategies would affect same-sex trustworthiness, yet evaluated male cosmetic goals to be less trustworthy than natural targets. It appears, then, that female participants seem to be more tolerant of same-sex and did not stigmatize or prejudice toward the same sex, which supported the theory of in-group preference [32]. This finding may contradict some previous research results. Many past studies have indicated that women's use of beautification strategies could lead to jealousy among same-sex peers, resulting in more negative evaluations.

However, we believe that this discrepancy may be attributed to the presence of gender as a variable that makes it easier to distinguish between ingroup and outgroup members in our experimental conditions. Specifically, the presence of male individuals might have caused female participants to perceive female users as ingroup members, leading to a preference for the ingroup.

Conversely, male evaluators seemed to be more critical of the same-sex using beautification strategies. Specifically, they all evaluated cosmetic targets as the least trustworthy, and considered men who wore makeup to be less trustworthy than women who wore makeup. This indicates that men wearing makeup are viewed as more unacceptable by other men, which may be a result of intra-sexual competition [49]. Because makeup can enhance the attractiveness of the wearer, this enhancement may be perceived as a form of cheating, leading to an increased likelihood of arousing jealousy and a desire for competition among same-sex peers. Of course, this perception may also stem from the association of makeup with a more feminine behavior, leading to more negative evaluations and stigmatization for men displaying higher femininity traits.

These intriguing research findings on people's potential biases towards makeup users and gender differences also contribute to a deeper understanding of gender disparities. Such discoveries can be utilized to promote gender equality and challenge gender stereotypes, thus advancing the progress of the Affirmative Action [50]. Furthermore, gender can interactively influence individuals' evaluations of those who employ beautification strategies, and to some extent, elucidate the potential reasons for the contradictory findings in previous research. This also serves as a cautionary note for future researchers, highlighting the imperative of adequately considering the role of gender when examining the impact of beautification strategies.

Finally, we would like to discuss the difference between morality and trustworthiness. In this study, two common social traits were

analyzed independently. It was found that the using beautification strategies significantly influenced the evaluation of both traits. Meanwhile, we also found that trustworthiness is more susceptible to gender variables than morality. In contrast, moral evaluation was neither influenced by gender of evaluators nor gender of targets, and rarely interacted with other variables. It indicated that morality evaluation may be more cross-gender consistent than trustworthiness evaluation.

7. Limitation

This study also has the following limitations. First, A majority of the participants in this study came from college or graduate students aged around 22 years old in China, where the motto of the traditional culture is "the body, hair and skin are received by the parents, and dare not be destroyed". Using beautification strategies to change one's appearance may be a bit difficult for Chinese people to accept, so the results need to be more conservative when extending the results. Due to the inadequate representation in the sample, more caution is needed in inferring the results.

Secondly, this study only explored the two social traits of high concern, morality and trustworthiness, and does not answer the gender differences in other social traits such as warmth and competence. In addition, we used only one question item for the morality and trustworthiness evaluation, which lacked some measurement stability and could be used in future research conducted with a more classical and stable measure [13].

Third, this study used vignettes to operationalize the beautification strategy but did not take into account the possible enhancement of face attractiveness that may result from the beautification strategy, and face attractiveness may also affect trait judgments. Future research could also examine the effects of beautification strategies more comprehensively.

8. Conclusion

The study revealed an important role of gender in evaluating morality and trustworthiness of strategies users. Firstly, the study showed biases towards users in terms of trustworthiness and moral dimensions, and these biases were particularly pronounced among male participants. Additionally, male users were more susceptible to moral and trustworthy stigmatization compared to female counterparts.

Moreover, the research also revealed that women exhibited greater tolerance and stronger ingroup preference when evaluating same-sex users. Conversely, males tended to give more negative evaluations to same-sex users, perceiving them as less moral and trustworthy compared to their natural state. Furthermore, the results showed morality and trustworthiness evaluation for strategies users was predicted by evaluators' acceptance of cosmetic surgery. This study sheds light on people's potential biases and gender differences towards beauty enhancer, contributing to a deeper understanding of gender issues. These findings hold the potential to advance gender equality and challenge gender stereotypes, thus fostering the progress of the Affirmative Action.

Author contribution statement

Xianyou He; Fuqun Liang: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Xingang Wang; Yanfei Liu: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Jun Zhang: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Jiahao Luo: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Data availability statement

Data associated with this study has been deposited at <https://osf.io/kxp5q>.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

This work was supported by the Natural Science Foundation of China (Grant Number: 31970984) and The MOE Project of Key Research Institute of Humanities and Social Sciences in Universities (Grant Number: 22JJD19 0005).

References

- [1] A. Todorov, M. Pakrashi, N.N. Oosterhof, Evaluating faces on trustworthiness after minimal time exposure, *Soc. Cognit.* 27 (6) (2009) 813–833.
- [2] A. Todorov, C.Y. Olivola, R. Dotsch, P. Mende-Siedlecki, Social attributions from faces: Determinants, consequences, accuracy, and functional significance, *Annu. Rev. Psychol.* 66 (1) (2015) 519–545.

- [3] S. Bonell, S.C. Murphy, S. Griffiths, Under the knife: unfavorable perceptions of women who seek plastic surgery, *PLoS One* 16 (9) (2021), e0257145, <https://doi.org/10.1371/journal.pone.0257145>.
- [4] S. Bonell, F.K. Barlow, S. Griffiths, The cosmetic surgery paradox: toward a contemporary understanding of cosmetic surgery popularization and attitudes, *Body Image* 38 (2021) 230–240, <https://doi.org/10.1016/j.bodyim.2021.04.010>.
- [5] American Society for Aesthetic Plastic Surgery, Cosmetic surgery national data bank statistics, *Aesthetic Surg. J.* 36 (Suppl. 1) (2016) 1–29. <https://www.plasticsurgery.org/documents/News/Statistics/2016/plastic-surgery-statistics-full-report-2016.pdf>.
- [6] International Society of Aesthetic Plastic Surgery, ISAPS Global Survey Results, 2020. <https://www.isaps.org/wp-content/uploads/2022/01/ISAPS-Global-Survey-2020.pdf>.
- [7] Male Grooming Products Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2018-2023, IMARC, 2018. <https://www.researchandmarkets.com/reports/4617656/>. male-grooming-products-market-global-industry).
- [8] Qianzhan, REPORT OF PRODUCE & SALE DEMAND AND INVESTMENT FORECASTANALYSIS ON CHINA SKIN CARE PRODUCTS INDUSTRY, 2021, pp. 2022–2027. <https://bg.qianzhan.com/trends/detail/506/210719-67101e8c.html>.
- [9] S. Sinno, G. Lam, N.D. Brownstone, D.S. Steinbrech, An assessment of gender differences in plastic surgery patient education and information in the United States: are we neglecting our male patients? *Aesthetic Surg. J.* 36 (1) (2016) 107–110, <https://doi.org/10.1093/asj/sjv100>.
- [10] K. Davis, A dubious equality?: Men, women and cosmetic surgery. *Body & Society* 8 (1) (2002) 49–65, <https://doi.org/10.1177/1357034X02008001003>.
- [11] N. Guéguen, Makeup and menstrual cycle: near ovulation, women use more cosmetics, *Psychol. Rec.* 62 (3) (2012) 541–548, <https://doi.org/10.1007/BF03395819>.
- [12] K.M. Parsa, W. Gao, J. Lally, S.P. Davison, M.J. Reilly, Evaluation of personality perception in men before and after facial cosmetic surgery, *JAMA facial plastic surgery* (2019), <https://doi.org/10.1001/jamafacial.2019.0463>.
- [13] G.P. Goodwin, J. Piazza, P. Rozin, Moral character predominates in person perception and evaluation, *J. Pers. Soc. Psychol.* 106 (1) (2014) 148.
- [14] A. Samper, L.W. Yang, M.E. Daniels, Beauty, effort, and misrepresentation: how beauty work affects judgments of moral character and consumer preferences, *J. Consum. Res.* 45 (1) (2018) 126–147, <https://doi.org/10.1093/jcr/ucx116>.
- [15] S. Bonell, S.C. Murphy, E. Austen, S. Griffiths, When (fake) beauty turns ugly: plastic surgery as a moral violation, *Curr. Psychol.* (2020) 1–14.
- [16] K.M. Parsa, K. Charipova, K. Coerd, C.M. Clark, H. Wang, E. Chu, M.J. Reilly, The role of age and gender on perception of women after plastic rhinoplasty, *Aesthetic Plast. Surg.* 45 (3) (2021) 1184–1190, <https://doi.org/10.1007/s00266-020-02030-4>.
- [17] C. Batres, R. Russell, J.A. Simpson, L. Campbell, A.M. Hansen, L. Cronk, Evidence that makeup is a false signal of sociosexuality, *Pers. Individ. Differ.* 122 (2018) 148–154, <https://doi.org/10.1016/j.paid.2017.10.023>.
- [18] V.R. Mileva, A.L. Jones, R. Russell, A.C. Little, Sex differences in the perceived dominance and prestige of women with and without cosmetics, *Perception* 45 (10) (2016) 1166–1183, <https://doi.org/10.1177/03010066166652053>.
- [19] R. Mulhern, G. Fieldman, T. Hussey, J.L. Leveque, P. Pineau, Do cosmetics enhance female Caucasian facial attractiveness, *Int. J. Cosmet. Sci.* 25 (4) (2003) 199–205, <https://doi.org/10.1046/j.1467-2494.2003.00188.x>.
- [20] L. Carrillo, B. Coleman, T. Hack, What's in a face?: perceptions of women wearing cosmetics, *Journal of Psychological Inquiry* 19 (2) (2014) 13–22.
- [21] A.C.S. Póvoa, W. Pech, E. Woiciekovi, Trust and social preferences: a cross-cultural experiment, *Journal of Behavioral and Experimental Economics* 86 (2020), 101526, <https://doi.org/10.1016/j.socec.2020.101526>.
- [22] D.J. Kellie, K.R. Blake, R.C. Brooks, Behind the makeup: the effects of cosmetics on women's self-objectification, and their objectification by others, *Eur. J. Soc. Psychol.* 51 (4–5) (2021) 703–721, <https://doi.org/10.1002/ejsp.2767>.
- [23] R. Ricciardelli, K. Clow, Men, appearance, and cosmetic surgery: the role of self-esteem and comfort with the body, *Can. J. Sociol.* 34 (1) (2009) 105–135, <https://doi.org/10.29173/cjs882>.
- [24] S.S. Delinsky, Cosmetic surgery: a common and accepted form of self-improvement? *J. Appl. Soc. Psychol.* 35 (10) (2005) 2012–2028, <https://doi.org/10.1111/j.1559-1816.2005.tb02207.x>.
- [25] D.J. DelPriore, H.K. Bradshaw, S.E. Hill, Appearance enhancement produces a strategic beautification penalty among women, *Evolutionary Behavioral Sciences* 12 (4) (2018) 348, <https://doi.org/10.1037/ebc0000118>.
- [26] L. Penke, J.B. Asendorpf, Beyond global sociosexual orientations: a more differentiated look at sociosexuality and its effects on courtship and romantic relationships, *J. Pers. Soc. Psychol.* 95 (5) (2008) 1113, <https://doi.org/10.1037/0022-3514.95.5.1113>.
- [27] K.P. Tam, H.K.S. Ng, Y.H. Kim, V.W.L. Yeung, F.Y.L. Cheung, Attitudes toward cosmetic surgery patients: the role of culture and social contact, *J. Soc. Psychol.* 152 (4) (2012) 458–479, <https://doi.org/10.1080/00224545.2011.637997>.
- [28] S. Mittal, D.H. Silvera, Makeup or mask: makeup's effect on salesperson trustworthiness, *J. Consum. Market.* 37 (3) (2020) 271–277, <https://doi.org/10.1108/JCM-02-2019-3101>.
- [29] S.L. Dubbs, A.J. Kelly, F.K. Barlow, Ravishing rivals: female intrasexual competition and cosmetic surgery, in: M.L. Fisher (Ed.), *The Oxford Handbook of Women and Competition*, Oxford University Press, Oxford, England, 2017, pp. 597–616, <https://doi.org/10.1093/oxfordhb/9780199376377.013.35>.
- [30] X. Wang, H. Chen, Z. Chen, Y. Yang, Women's intrasexual competition results in beautification, *Soc. Psychol. Personal. Sci.* 12 (5) (2021) 648–657, <https://doi.org/10.1177/1948550620933403>.
- [31] L. Shamoia-Nir, I. Razpurker-Apfeld, J.B. Dautel, L.K. Taylor, Out-group prosocial giving during childhood: the role of in-group preference and out-group attitudes in a divided society, *IJBD (Int. J. Behav. Dev.)* 45 (4) (2021) 337–344, <https://doi.org/10.1177/0165025420935619>.
- [32] H. Tajfel, M.G. Billig, R.P. Bundy, C. Flament, Social categorization and intergroup behavior, *Eur. J. Soc. Psychol.* 1 (2) (1971) 149–178, <https://doi.org/10.1002/ejsp.2420010202>.
- [33] L. Ma, J.D. Woolley, Young children's sensitivity to speaker gender when learning from others, *J. Cognit. Dev.* 14 (2013) 100–119, <https://doi.org/10.1080/15248372.2011.638687>.
- [34] M.G. Taylor, Gender influences on children's selective trust of adult testimony, *J. Exp. Child Psychol.* 115 (4) (2013) 672–690, <https://doi.org/10.1016/j.jecp.2013.04.003>.
- [35] R.F. Baumeister, D.G. Hutton, Self-presentation theory: self-construction and audience pleasing, in: *Theories of Group Behavior*, Springer New York, New York, NY, 1987, pp. 71–87.
- [36] F. Liang, M. Zhu, Y. Lei, S. Zhang, X. He, Untrustworthy Beauty: Beautification Strategies Cause Female Applicators to Be Perceived Untrustworthy, *Psychol. Aesthetics Creativ. Arts* (2023) (In press).
- [37] A.C. Davis, S. Arnocky, An evolutionary perspective on appearance enhancement behavior, *Arch. Sex. Behav.* (2020) 1–35.
- [38] W.A. Cunningham, P.D. Zelazo, Attitudes and evaluations: a social cognitive neuroscience perspective, *Trends Cognit. Sci.* 11 (3) (2007) 97–104, <https://doi.org/10.1016/j.tics.2006.12.005>.
- [39] D. Henderson-King, E. Henderson-King, Acceptance of cosmetic surgery: scale development and validation, *Body Image* 2 (2) (2005) 137–149, <https://doi.org/10.1016/j.bodyim.2005.03.003>.
- [40] Y. Wu, J.M. Alleva, S. Mulkens, Factor analysis and psychometric properties of the Chinese translation of the acceptance of cosmetic surgery scale, *Body Image* 33 (2020) 244–256, <https://doi.org/10.1016/j.bodyim.2020.03.009>.
- [41] Q. He, Y. Xie, The moral filter of patriotic prejudice: how Americans view Chinese in the COVID-19 era, *Proc. Natl. Acad. Sci. USA* 119 (47) (2022), e2212183119.
- [42] H.-W.-S. Bao, bruceR: broadly useful convenient and efficient R functions, R package version 0.8.x, <https://CRAN.R-project.org/package=bruceR>, 2022.
- [43] A. Kassambara, M.A. Kassambara, Package 'ggpubr', R package version 0.1 (2020) 6. <https://cran.microsoft.com/snapshot/2017-02-26/web/packages/ggpubr/ggpubr.pdf>.
- [44] R.G. O'Brien, A simple test for variance effects in experimental designs, *Psychol. Bull.* 89 (3) (1981) 570.
- [45] L. Daston, The naturalistic fallacy is modern, *Isis* 105 (3) (2014) 579–587, <https://doi.org/10.1086/678173>.

- [46] R.M. Calogero, T.L. Tylka, L.C. Donnelly, A. McGetrick, A.M. Leger, Trappings of femininity: a test of the “beauty as currency” hypothesis in shaping college women’s gender activism, *Body Image* 21 (2017) 66–70.
- [47] T. Moses, Being treated differently: stigma experiences with family, peers, and school staff among adolescents with mental health disorders, *Social science & medicine* 70 (7) (2010) 985–993.
- [48] M. Daly, M. Wilson, Evolutionary social psychology and family homicide, *Science* 242 (1988) 519–524.
- [49] B.J. Dixson, Sexual selection and the evolution of human appearance enhancements, *Arch. Sex. Behav.* 51 (1) (2022) 49–55, <https://doi.org/10.1007/s10508-021-01946-5>.
- [50] R.R. Thomas Jr., From affirmative action to affirming diversity, *Harv. Bus. Rev.* 68 (2) (1990) 107–117.