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Appearance Enhancement Produces a Strategic Beautification Penalty Among Women

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Previous research demonstrates that women's beauty is rewarded across a myriad of social contexts, especially by men. Accordingly, from a functional perspective, another woman's attractiveness can signal competitive disadvantage—and evoke negative responses—among female observers. Further, because the benefits of beauty are rewarded based on superficial qualities rather than on merit or performance, women may perceive same-sex others who use appearance enhancement to gain advantages as being dishonest or manipulative. We examined these possibilities across four experiments testing whether college-aged women impose a strategic beautification penalty (SBP) on female targets that have enhanced their appearances with cosmetics. We found that women made more negative attributions about, and experienced diminished desire to affiliate with, female targets wearing (vs. not wearing) cosmetics. The SBP was: specific to female observers (Experiment 2); mediated by decreases in perceived trustworthiness (Experiment 3); and driven by less desirable women (Experiment 4). Importantly, the negative effects of beautification effort extended beyond the increased physical attractiveness that resulted from this effort. The results suggest that engaging in appearance enhancement can produce unintended negative consequences for relationships between women.

Keywords: strategic beautification penalty, intrasexual competition, women, physical attractiveness, appearance enhancement

This research advances the idea that women impose social penalties on same-sex others with enhanced appearances. Women were less interested in affiliating with—and made more negative attributions about–female targets wearing (vs. not wearing) cosmetics. Men reported an increased desire to interact with enhanced targets, suggesting that appearance enhancement may have unique negative effects on women's relationships with each other.

In 2012, Ukrainian model Valeria Lukyanova made headlines when photographs of her smooth face, large breasts, and unrealistically tiny waist surfaced online (see Nemtsova, 2013). Lukyanova is one of a number of women who have gone to unnatural extremes in recent years to achieve a hyperfeminine, doll-like appearance (Soldak, 2012). Though these "human dolls" have gained fame (and other benefits) through their efforts, their strategically enhanced looks also have provoked hateful comments and unfair accusations, particularly from other women, who perceive their behaviors as manipulative, deceptive, or fake.

Lukyanova and the other "human dolls" have gone much further than most would dare to enhance their appearances. However, many women regularly engage in more subtle forms of appearance enhancement. For example, women spend money on brand name cosmetics or clothing to make themselves feel—and appear to others as—physically attractive (Miller, 2009). Although female beauty is frequently

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rewarded across a variety of contexts (Langlois et al., 2000), it is possible that beautification effort may have unintended negative consequences for women's relationships with each other. That is, similar to the negative reactions of women to the obviously artificial looks of the "human dolls," might women penalize other women's subtler attractiveness enhancement efforts because they are perceived to be competitively motivated? We conducted four experiments to examine this possibility. Specifically, we tested whether women would penalize female targets that have invested effort in appearance enhancement due to the perception that they are doing so to gain social advantages (i.e., these efforts are "strategic"). By isolating the effects of appearance enhancement (independent from physical attractiveness), this research represents a novel contribution to the empirical literature on women's intrasexual competition and relationships with one another.

Benefits of Female Beauty

Is it better to be beautiful? An extensive literature suggests that the answer to this question is often a decisive "yes" (the *physical attractiveness stereotype*; for a review, see Eagly, Ashmore, Makhijani, & Longo, 1991; see also Arnocky, Bird, & Perilloux, 2014; Sugiyama, 2005). Beginning at a young age, attractive people—regardless of biological sex—receive a number of social benefits not as readily available to less attractive peers (e.g., Langlois et al., 2000). Attractive students tend to earn higher grades in school (Ritts, Patterson, & Tubbs, 1992), and attractive employees earn more money over the course of their careers (Frieze, Olson, & Russell, 1991). Beautiful people—particularly women—may even enjoy more favorable legal outcomes (Mazzella & Feingold, 1994; for an exception, see Patry, 2008).

Although attractiveness provides advantages across various social settings, there are few domains in which these benefits are more pronounced than in women's interactions with men (e.g., Buss, 1989; Li & Kenrick, 2006). A woman's physical attractiveness is directly related to her health, femininity, fertility, and reproductive potential (Arnocky et al., 2014; Puts et al., 2013; Sugiyama, 2005; Wheatley et al., 2014). As such, men across cultures rate physical attractiveness as nearly "indispensable" when selecting committed or casual romantic partners (Buss & Schmitt, 1993; Li, Bailey, Kenrick, & Linsenmeier, 2002). Attractive women are preferentially selected by the most desirable men as mates (i.e., men who are high status, able and willing to commit; Buss & Shackelford, 2008; Li et al., 2013; Waynforth & Dunbar, 1995). In fact, a woman's attractiveness may be one of the best predictors of her upward social mobility, and has been shown to be a stronger determinant of her chances of marrying a high-status man than her intelligence or class origin (Elder, 1969; Udry, & Eckland, 1984).

In addition to these fitness-relevant benefits, beautiful women can gain men's favor beyond the mating domain. Men rate attractive (vs. less attractive) women more favorably as scholarship candidates and job applicants (Agthe, Spörrle, & Maner, 2010, 2011). Men also are more likely to help attractive women by giving them directions, mailing their letters, and offering financial assistance in emergency situations (West & Brown, 1975; Wilson, 1978). In short, appearing physically attractive is an effective way for women to gain both major and minor social advantages, particularly when men are in position to confer those advantages.

Women's Strategic Beautification

Given the vast benefits available to attractive women, it is not surprising that many invest considerable time and effort into enhancing their appearances. On average, women invest greater effort than men in trying to appear physically attractive (Aune & Aune, 1994). Women also allocate larger portions of their personal budgets to purchasing goods and services that can enhance their appearances (Miller, 2009). Among the most popular products purchased by women for this purpose are cosmetics, on which the average American woman spends approximately $15,000 during her lifetime (Mychaskiw, 2013). Wearing cosmetics (e.g., eyeliner, eye shadow, and lipstick) can enhance a woman's attractiveness by increasing perceptions of her facial femininity, symmetry, youth, and health (Etcoff, Stock, Haley, Vickery, & House, 2011; Russell, 2009; Stephen & McKeegan, 2010; Thornhill & Gangestad, 1994).

Similar to natural beauty, women's beautification efforts (including cosmetics use) are frequently rewarded by men. Both men and

women rate appearance enhancement to be an effective mate attraction strategy for women (Schmitt & Buss, 1996). Women wearing (vs. not wearing) cosmetics are more likely to be approached by men in a bar (Guéguen, 2008), offered a ride from male drivers (Guéguen & Lamy, 2013), and to earn better tips from male (but not female) patrons while waitressing (Guéguen & Jacob, 2011, 2012), effects that are driven by women's increased attractiveness while wearing cosmetics (Guéguen & Jacob, 2011). Therefore, appearance enhancement can provide competitive advantages for women within everyday social contexts in which beauty is rewarded.

Perhaps because of this effectiveness, appearance enhancement is a strategy employed by women within competitive contexts (Buss, 1988). In fact, enhancing one's physical attractiveness is the most common intrasexual competition strategy reported by women (Fisher & Cox, 2011). Experimental research suggests a causal relationship between women's competition and their appearance enhancement efforts. Primed competition cues, including exposure to attractive women, lead women to report an increased interest in risky beautification strategies, such as skin tanning and taking diet pills (Arnocky, Perilloux, Cloud, Bird, & Thomas, 2016; Hill & Durante, 2011). Further, information suggesting that good jobs are scarce leads women to report a heightened desire to purchase and use beauty products (Hill, Rodeheffer, Griskevicius, Durante, & White, 2012; Netchaeva & Rees, 2016). In fact, women report using appearance enhancement as a way to "get ahead" more generally (Kyl-Heku & Buss, 1996). In addition to these situational relationships, women's appearance enhancement motivation is associated with dispositional characteristics indicative of frequent rivalry. For example, higher trait competitiveness predicts an increased desire to spend money on extreme forms of beautification (e.g., cosmetic surgery; Arnocky & Piché, 2014). Further, women who report interest in extreme forms of beautification have been shown to base their self-worth more on their physical appearance and less on being a virtuous person (Nicolas & Welling, 2017), a psychological pattern that may promote intrasexual competitive success.

In sum, there is evidence that artificially enhanced attractiveness may suggest something about women's competitive motivations that natural beauty does not. In this context, appearance enhancement efforts may serve as an implicit signal of women's intrasexual competition, producing unintended negative consequences for their social relationships with each other.

The Dark Side of Female Beauty

Even when not artificially enhanced for competitive reasons, a woman's attractiveness can evoke negativity from members of their same sex. Other women's physical attractiveness is frequently met with envy and jealousy (Arnocky, Sunderani, Miller, & Vaillancourt, 2012; Buunk, aan't Goor, & Solano, 2011; DelPriore, Hill, & Buss, 2012), and highly attractive women may be viewed as a threat to one's own mating goals (Fink, Klappauf, Brewer, & Shackelford, 2014). Perhaps for this reason, attractive females are more likely to be the targets—and less attractive females the perpetrators—of indirect aggression (Arnocky et al., 2012; Leenaars, Dane, & Marini, 2008). Differential levels of attractiveness can even promote discord within close female friendships, with the less attractive friend perceiving more mating rivalry within the dyad (Bleske-Rechek & Lighthall, 2010).

Although a woman's beauty can evoke negative responses from other women, these women may respond especially negatively to same-sex others who have put forth visible effort to enhance their attractiveness due to the competitive connotations of such behavior (Arnocky & Piché, 2014; Nicolas & Welling, 2017). Though beautification effort has been established as an effective tactic for securing social benefits from men (e.g., Guéguen & Jacob, 2011, 2012; Guéguen & Lamy, 2013), less is known about the impact of such efforts on women's relationships with each other. If women perceive other women's beautification (e.g., wearing cosmetics) as arising from a desire to gain a competitive advantage, they may also perceive these women as deceptive and untrustworthy. This idea is consistent with research conducted from a sexual economics perspective (Baumeister & Twenge, 2002). For example, Vaillancourt and Sharma (2011) found that women reacted more negatively toward an attractive female when she was wearing revealing clothing compared to when she was

conservatively dressed. Grabe and colleagues (2012) obtained similar results regarding women's derogation of a female news anchor with an overtly sexualized appearance. A study by Mileva and colleagues (2016) found that female targets wearing cosmetics not only elicited greater jealousy from other women; these targets were also rated as more promiscuous and dominant. Finally, Borau and Bonnefon (2017) recently showed that women's aggression toward idealized female models was driven by perceptions of the models' sexually provocative attitudes.

Together, this work suggests that women may aggress against (or socially penalize) overtly sexualized women for increasing the availability, and thus decreasing the value, of sexual access. Further, women have also been shown to aggress against physically attractive women when they are seen as potential threats in the mating domain (e.g., Fink et al., 2014). However, this body of research has not yet fully disentangled the extent to which women's appearance enhancement efforts, per se, affect how they are perceived by other women beyond the negative responses evoked by their increased attractiveness.

The Current Experiments

We conducted four experiments to examine whether women impose a strategic beautification penalty (SBP) on female targets that have enhanced their physical attractiveness with cosmetics (vs. those with more natural appearances). Because an attractive appearance has been shown to affect how individuals are both perceived and treated by others (e.g., Langlois et al., 2000), we predicted that women would perceive same-sex others who enhanced their appearances as: possessing more socially undesirable attributes (Experiment 1) and being less trustworthy (Experiment 3). We also expected women to report a decreased desire to affiliate with (Experiments 2 through 4) and behave prosocially toward (Experiment 4) these female targets. Further, consistent with past research on women's indirect aggression (e.g., Arnocky et al., 2012), we predicted that the SBP would be driven by women who are relatively disadvantaged when it comes to their own attractiveness (Experiment 4). Importantly, we expected that the SBP would be driven by the targets' beautification efforts, and not merely a byproduct of the increased attractiveness that results from wearing cosmetics.

Experiment 1: Establishing the SBP

Experiment 1 provides an initial test of whether women evaluate female targets less favorably when they are described as having enhanced their appearances. We used text descriptions to isolate the independent contribution of appearance enhancement effort versus physical attractiveness in producing the SBP. We predicted that women would make more negative attributions regarding female targets described as wearing (vs. not wearing) cosmetics in a setting in which beauty may be rewarded (a job interview with a male manager).

Method

Participants were 117 heterosexual female undergraduates (M_{age} = 19.32 years, SD = 1.47) recruited from a midsized private university in the southern United States. This sample consisted largely of White women (79%).[1] Participants were excluded prior to analysis for failing to self-identify as heterosexual (n = 2) or for failing attention checks presented within the online questionnaire (n = 17). No participants reported discussing the details of the study with other students prior to participating.

Procedure and materials. This study utilized a 2 (target attractiveness: attractive vs. unattractive, between-subjects) × 2 (cosmetics use: yes vs. no, within-subjects) mixed factorial design. Instructions and stimuli were presented online via Qualtrics survey software (Provo, UT). Participants were informed that the study was designed to explore sex differences in perceptual accuracy. They were instructed to make character assessments of the described targets as accurately as possible, relying on their gut-level responses. Participants were randomly assigned to read descriptions about a physically attractive (n = 56) or unattractive (n = 61) female target. Within each of these conditions (target attractiveness: attractive, unattractive), participants read two descriptions of the target: one in which she was described as enhancing her appearance

[1] This university's institutional review board reviewed and approved all studies.

for a job interview by wearing cosmetics, and one in which she was not. Presentation order of the target descriptions (cosmetics use: yes, no) was randomized by Qualtrics within conditions (target attractiveness). Following each description, participants responded to items assessing their negative attributions of the target and manipulation check items regarding the targets' appearance enhancement efforts. Participants then completed attention checks and a demographic questionnaire (e.g., age, race, sexual orientation). To ensure that participants were naïve to our manipulation and research hypothesis, participants also were asked whether they had discussed the details of the research with other students prior to completing the survey. In an attempt to minimize demand characteristics, we did not reveal the purpose of the study until the online debriefing presented at the end of the survey.

Target descriptions. The four target descriptions (target attractiveness: attractive, unattractive; cosmetics use: yes, no) were written to provide neutral information about each target, and all descriptions were identical except for varying the target's physical attractiveness and cosmetics use. To illustrate, the "physically attractive—wearing cosmetics" target was described as follows (with modifications for the "physically unattractive" and "not wearing cosmetics" targets in parentheses):

> Melissa is in her last semester at her university. For the past two years, she has worked part-time as a student office worker. She enjoys watching movies and attending outdoor festivals. People who know Melissa consider her to be opinionated and somewhat lucky. Everyone agrees she is [not] very attractive.
>
> Melissa is currently looking for a full-time job related to her major. She has been invited for her first interview: she will be meeting with Josh McManus, a company manager who would be her immediate supervisor. In preparation for the interview, Melissa sets aside her best outfit. The morning of the interview, she decides to pull her hair back and [does not wear any makeup] takes some time to apply foundation, blush, eye makeup, and lipstick. She leaves for the interview feeling confident that she will make a good first impression.

Target ratings. Following each description, participants rated the degree to which the target was (a) deceptive, (b) fake, (c) manipulative, (d) selfish, and (e) trying to get ahead at all costs. These ratings were used for hypothesis-testing. As a manipulation check, we presented two questions to ensure that the targets were perceived to engage in greater appearance enhancement when described as wearing (vs. not wearing) cosmetics: (1) How much effort does she put into her appearance? and (2) How hard is she trying to get others to find her attractive? All responses were made on scales ranging from 1 (*not at all*) to 7 (*very much*).

Attention checks. Because participants completed the survey outside of a controlled laboratory setting (online) and the experimental manipulation was subtle (and text-based), it was critical to ensure that participants carefully read the instructions and target descriptions. To this end, after viewing the target descriptions, participants were presented with two attention check items. The first item included an instruction stem that prompted participants to select "never" as their response from a set of 12 different options. Participants were also asked to identify the male interviewer named in the target descriptions out of four possible options. Participants who failed either attention check were excluded prior to analysis (see above).

Results

To ensure that participants rated the target as engaging in more appearance enhancement effort when she was described as wearing (vs. not wearing) cosmetics, we performed repeated-measures analyses of variance (ANOVAs) assessing within-subjects differences in appearance enhancement ratings given to the targets. As intended, participants rated the target described as wearing (vs. not wearing) cosmetics as investing more effort in her appearance (cosmetics: $M = 4.99$, $SD = 1.50$; no cosmetics: $M = 3.22$, $SD = 1.61$; $F[1, 113] = 136.50$, $p < .001$, $d = 1.14$) and trying harder to get others to find her attractive (cosmetics: $M = 4.86$, $SD = 1.57$; no cosmetics: $M = 3.05$, $SD = 1.56$; $F[1, 112] = 111.32$, $p < .001$, $d = 1.16$). These analyses confirmed the effectiveness of our text-based manipulation.

For the purpose of hypothesis-testing, we created composite indices of perceived social undesirability by averaging the items within this measure for the target when she was described as wearing ($\alpha = .79$) and not wearing ($\alpha = .86$) cosmetics. Differences in these ratings were analyzed using a 2 (target attractiveness, between-subjects factor) $\times$ 2 (cosmetics use, within-

subjects factor) mixed-model ANOVA. This analysis did not reveal a main effect of target attractiveness ($p = .27$) or an interaction between target attractiveness and cosmetics use ($p = .62$). However, there was a significant main effect of cosmetics use, such that the target was rated as possessing more socially undesirable traits when she was described as wearing cosmetics ($M = 3.12$, $SD = 1.09$) relative to when she was described as not wearing cosmetics ($M = 2.89$, $SD = 1.18$), $F(1, 115) = 5.60$, $p = .020$, $d = .20$ (see Figure 1).

Discussion

Experiment 1 provided initial evidence of a strategic beautification penalty (SBP) among women. Specifically, women rated a female target described as wearing cosmetics to a job interview with a male manager as possessing more socially undesirable traits relative to when the same female target was described as not wearing cosmetics to the interview. The results did not depend on baseline target attractiveness (that is, there was no interaction between described target attractiveness and cosmetics use). Further, the main effect of cosmetics use was found within-conditions (target attractiveness), effectively controlling for target attractiveness. These experimental results provide initial evidence that women's efforts to enhance their appearances may prompt negative responses from same-sex others, independent of their attractiveness.

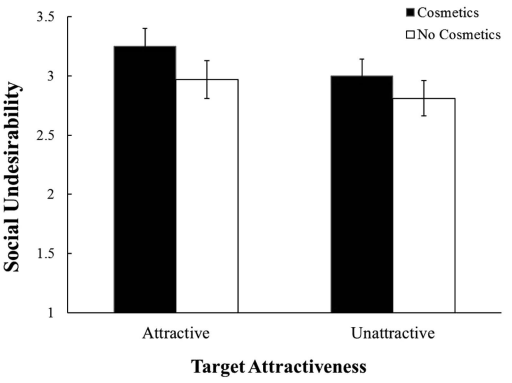

Figure 1. The effects of target cosmetics use on women's perceptions of female targets' social undesirability (Experiment 1). Error bars reflect the standard error.

Experiment 2: Sex Differences in the SBP

Research on the physical attractiveness stereotype (e.g., Langlois et al., 2000) suggests that individuals' attractiveness not only has implications for how they are perceived by others (i.e., their social desirability), but also for how people behave toward them. Experiment 2 was thus designed to extend the results of the previous experiment by examining the effects of appearance enhancement on women's desire to affiliate with female targets, an outcome linked with (but distinct from) perceptions of socially desirable traits (e.g., Lemay, Clark, & Greenberg, 2010). The text-based manipulation used in Experiment 1 was subtle, and perhaps as a result, the obtained effect was small. Therefore, in the current study, we used photographs (instead of text descriptions) to produce a stronger manipulation with greater external validity. Experiment 2 also sought to examine men's responses to female targets that have enhanced their appearances. Because research indicates that men tend to reward beauty (both natural and enhanced) across a variety of domains (e.g., Buss & Schmitt, 1993; Försterling, Preikschas, & Agthe, 2007; Guéguen & Jacob, 2011, 2012), we predicted that men would report an increased desire to affiliate with female targets shown wearing cosmetics (vs. bare-faced targets). We predicted that women, on the other hand, would report a decreased desire to affiliate with these targets, conceptually replicating the SBP effect found in Experiment 1. Finally, we obtained ratings of target physical attractiveness to test for the effects of appearance enhancement effort, per se, on the SBP while statistically controlling for the effects of target attractiveness.

Method

Participants were 97 heterosexual undergraduates ($n = 45$ women; $M_{age} = 19.78$ years, $SD = 1.53$) from a midsized private university in the southern United States. This sample consisted largely of White women and men (77%). Participants were excluded prior to analysis for: reporting a nonexclusively heterosexual orientation ($n = 4$); failing the attention check ($n = 2$); or indicating that they recognized one of the female targets ($n = 4$).

Procedure and materials. The study utilized a 2 (participant sex: men vs. women, between subjects) × 2 (cosmetics use: yes vs. no, within subjects) mixed factorial design. Instructions and stimuli were presented online, and the cover story and instructions were similar to Experiment 1. However, instead of reading text descriptions, each participant viewed eight photographs of different female targets (four pictured wearing cosmetics, four pictured not wearing cosmetics). Participants responded to items assessing their desire to affiliate with each target as well as manipulation check items assessing the perceived effort each target put into enhancing her appearance. The manipulation check items were the same as in Experiment 1. We also asked participants to rate the physical attractiveness of each target on a 7-point scale (1 = *not at all*, 7 = *very much*). Finally, participants answered demographic questions and were debriefed before submitting their survey responses.

Target photographs. Sixteen total photographs (two each for the eight individual females; each target was wearing cosmetics in one of her photographs and was not wearing cosmetics in her other photograph) were obtained from a web page presenting photographs of women with and without makeup (Hanson, 2013). All photographs were of the "upper body" region and presented in color. The female targets were relatively attractive and appeared to be in their early or mid-20s; seven of the targets were White and one was multiracial. The target photographs were presented such that all participants viewed each of the eight females, but we counterbalanced whether each individual female was wearing cosmetics or not across two randomized sets of stimuli. (That is, the four individuals shown wearing cosmetics in Set 1 were not wearing cosmetics in Set 2, and vice versa.) Because the women in the photographs were potentially recognizable, we asked participants to indicate whether they recognized any of the female targets presented within the survey (see above).

Desire to affiliate. Participants were asked to imagine working with each target and to rate the likelihood they would (a) share personal information with her, (b) want to get to know her on a personal level, (c) want to hang out with her outside of the workplace, and (d) invite her to lunch and pay for her meal. Each item was presented on a rating scale ranging from 1 (*not at all likely*) to 7 (*very likely*).

Results

To confirm the effectiveness of our photograph-based manipulation (i.e., as a manipulation check), we performed mixed-model ANOVAs on the physical appearance (effort and attractiveness) ratings made for the targets. Participant sex served as the between-subjects factor and target cosmetics use as the within-subjects factor. The analyses revealed significant main effects of cosmetics use such that participants rated the targets wearing (vs. not wearing) cosmetics as investing more effort into their appearances (cosmetics: $M = 5.93$, $SD = .72$; no cosmetics: $M = 3.40$, $SD = .92$; $F[1, 95] = 508.26$, $p < .001$, $d = 3.06$) and trying harder to get others to find them attractive (cosmetics: $M = 5.82$, $SD = .79$; no cosmetics: $M = 3.29$, $SD = .97$; $F[1, 95] = 510.80$, $p < .001$, $d = 2.86$). These results confirmed the effectiveness of our manipulation. As expected, participants also rated targets wearing cosmetics as more physically attractive ($M = 5.49$, $SD = .83$) than targets not wearing cosmetics ($M = 4.00$, $SD = .81$, $F[1, 95] = 254.54$, $p < .001$, $d = 1.82$). This main effect was not moderated by participant sex ($p = .08$). Statistically controlling for the increased attractiveness of targets wearing cosmetics permits a test of the unique effects of appearance enhancement effort in producing the SBP.

To test our hypothesis, we first created variables assessing participants' self-reported desire to affiliate with the female targets. We created two composite scores by averaging participant ratings on these four items for targets wearing ($\alpha = .92$) and not wearing ($\alpha = .93$) cosmetics. We analyzed differences in these ratings using a 2 (participant sex, between-subjects) × 2 (cosmetics use, within-subjects) mixed-model ANOVA. This analysis revealed a significant two-way interaction between participant sex and target cosmetics use, $F(1, 95) = 22.75$, $p < .001$. Women expressed a decreased desire to affiliate with targets wearing cosmetics ($M = 4.04$, $SD = .83$) compared with the barefaced targets ($M = 4.36$, $SD = 1.02$), $F(1, 95) = 7.22$, $p = .008$, $d = .34$. In contrast, men expressed an increased desire to interact with the female targets wearing cosmetics ($M = 4.73$, $SD = 1.04$) relative to the more natural-looking tar-

gets ($M = 4.28$, $SD = .97$), $F(1, 95) = 16.92$, $p < .001$, $d = .45$.

Finally, it is relevant to our hypothesis to isolate the effects of appearance enhancement effort, beyond the effects of increased attractiveness that results from this effort, on the desire to affiliate with female targets. Specifically, we wanted to test whether the pattern of results could be accounted for by the increased physical attractiveness of targets shown wearing (vs. not wearing) cosmetics. To this end, we tested a multilevel model using the lme function in the nlme package in R 3.1.1. In this model, target ratings (cosmetics vs. no cosmetics) were nested within individual participants. We tested a model identical in form to the mixed-model ANOVA above, except that participants' physical attractiveness ratings for the target groups (cosmetics use: yes, no) were entered as covariates. The two-way interaction between participant sex and cosmetics use, $F(1, 94) = 16.48$, $p < .001$, and the simple main effect of cosmetics use on women's desire to affiliate with the targets, $F(1, 94) = 40.21$, $p < .001$, remained significant while controlling for target attractiveness ratings. However, the effect of cosmetics use on men's desire to interact with the female targets was no longer conventionally significant after controlling for the enhanced physical attractiveness of the made-up targets, $F(1, 94) = 3.49$, $p = .065$. These findings suggest that some of men's increased desire to interact with targets wearing cosmetics could be accounted for by their increased physical attractiveness, whereas women's decreased desire to affiliate with the enhanced targets was not.

Discussion

Experiment 2 provided further support for the SBP hypothesis by demonstrating that women may impose social penalties on same-sex others who put forth effort to enhance their appearances. That is, women reported less interest in affiliating with female targets wearing cosmetics relative to those not wearing cosmetics. This finding was not accounted for by the female targets' increased attractiveness while wearing cosmetics. Men, however, demonstrated the opposite tendency. Specifically, men reported an increased desire to affiliate with female targets whose appearances had been enhanced via cosmetics. This finding is consistent with research showing that men behave more favorably toward women with enhanced (vs. natural) appearances (e.g., Guéguen, 2008; Guéguen & Jacob, 2011, 2012; Guéguen & Lamy, 2013). Similar to this past research, at least some of this effect was driven by the made-up targets' enhanced attractiveness. Taken together, the current results suggest important differences in how women and men may behave toward females with enhanced versus natural appearances.

Experiment 3: Mediators of the SBP

Experiment 3 had two main goals. First, we wanted to test a proposed mediator of the SBP: perceptions of target trustworthiness. Because appearance enhancement is a frequently utilized strategy in female intrasexual competition, women may perceive other women's appearance enhancement efforts as providing a cue to their motivation to gain a competitive advantage via their appearance. Indeed, previous research suggests that women's cosmetics use can negatively impact perceptions of their trustworthiness (Etcoff et al., 2011). Further, from an evolutionary perspective, taking steps to gain a competitive advantage can compromise trust among in-group members (here, women), with this behavior evoking avoidance and social exclusion (Neuberg, Smith, & Asher, 2000). Accordingly, Experiment 3 tested whether women's diminished desire to affiliate with made-up (compared to bare-faced) targets is mediated by women's belief that the made-up targets are competitively motivated and cannot be trusted.

The second goal of Experiment 3 was to further test whether the SBP demonstrated in the previous experiments could be accounted for by the increased physical attractiveness of female targets wearing cosmetics. Ruling out this alternative hypothesis is important as previous research finds that women may evaluate physically attractive members of their own sex more negatively than their less attractive counterparts (Agthe et al., 2010, 2011). Accordingly, it is possible that women may respond negatively to made-up targets simply due to the targets' heightened attractiveness and not, as hypothesized, their beautification efforts. We accounted for this possibility in two ways. First, we tested the role of women's perceptions of the targets' appearance enhancement *effort* in driv-

ing the SBP. Second, similar to Experiment 2, we statistically controlled for target attractiveness ratings in our main model.

Method

Participants were 107 heterosexual female undergraduates (M_{age} = 19.50 years, SD = 1.36) from a private university in the United States. This sample consisted largely of White women (77%). Participants were excluded prior to analysis for failing the attention check (n = 1), indicating that they recognized one of the female targets (n = 1), or discussing the experiment with another student prior to participating (n = 1).

Procedure and materials. The overall design of this study was a one-way between subjects (cosmetics use: yes vs. no) ANOVA. Participants were randomly assigned to view either four targets wearing cosmetics (n = 53) or the same four targets not wearing cosmetics (n = 54). The four individual targets were selected from the full set of eight female targets used in Experiment 2,[2] and women rated their desire to affiliate with each target using the same items as in the previous study. Participants also rated their perceptions of each target's appearance enhancement effort, trustworthiness, and physical attractiveness.

Appearance enhancement effort. Upon viewing each target, participants were asked six questions to rate the amount of effort she invests in her physical appearance: (a) How much effort does this woman put into enhancing her appearance?, (b) How much effort does she put into looking better than other women?, (c) How much time does she spend on her appearance relative to her peers?, (d) How much of this woman's beauty is natural versus artificial?; (e) How hard is she trying to appear prettier than she actually is?, and (f) How hard is she trying to make herself more attractive to the opposite sex? We presented each question on a 7-point rating scale, with higher values corresponding to greater appearance enhancement effort.

Perceptions of target trustworthiness. Participants also rated the perceived trustworthiness/fairness of each target on 7-point scales. Some of these items were modified from Singh et al.'s (2009) measure of partner trust. In the current experiment, participants were asked to respond to the following eight items: (a) How much would you trust this woman's advice or opinion?; (b) If we were competing for something, I would expect her to play fair; (c) I would feel secure around this person; (d) If I were to meet this woman, she would act benevolently (or kindly) toward me; (e) If given the opportunity, this woman would probably exploit those around her to get what she wants; (f) She would take advantage of me or others to get ahead; (g) This woman would do anything to get what she wants; and (h) If I were to meet this woman, I would think that she is after something. Items (e) through (h) were reverse-coded, and higher values corresponded to greater perceptions of target trustworthiness.

Target attractiveness. Participants rated each target's physical attractiveness by responding to the following item: How physically attractive is this person? The response scale ranged from 1 (*not at all*) to 7 (*very much*).

Results

We created composite scores for appearance enhancement effort (α = .97), perceived target trustworthiness (α = .87), and desire to affiliate with the targets (α = .86) by averaging the items on each of these measures. (See Table 1 for descriptive statistics.) Similar to the previous study, we first wanted to establish that women perceived the targets pictured wearing (vs. not wearing) cosmetics as investing greater effort to enhance their appearances. To this end, we tested the between-subjects effect of condition (cosmetics use: yes vs. no) on these ratings. Indeed, participants who viewed targets wearing (vs. not wearing) cosmetics rated these targets as putting forth greater appearance enhancement effort, $F(1, 105) = 223.25$, $p < .001$, $d = 2.88$. Participants also rated the targets wearing (vs. not wearing) cosmetics as more physically attractive, $F(1, 105) = 22.93$, $p < .001$, $d = .93$.

We then analyzed the effects of priming condition on our dependent measures using a one-way between-subjects (cosmetics use) multivariate analysis of variance. Consistent with our hypothesis, participants who viewed targets

[2] We selected and presented the four individual targets that were most closely matched across their two photos (cosmetics vs. no cosmetics) outside of their cosmetics use (e.g., their attire, facial expressions, photo angle).

Table 1
Descriptive Statistics (Experiment 3)

Characteristic	Cosmetics		No cosmetics	
	M	*SD*	*M*	*SD*
Appearance enhancement effort	5.58	.57	3.82	.65
Target trustworthiness	3.62	.60	4.40	.52
Desire to affiliate	3.64	.83	4.13	.86
Target attractiveness	4.89	.78	4.19	.73

wearing cosmetics rated these targets as less trustworthy than women who viewed targets that were not wearing cosmetics, $F(1, 105) = 51.46$, $p < .001$, $d = 1.39$. Further, participants who viewed targets wearing cosmetics reported decreased desire to affiliate with these targets than did participants who viewed targets not wearing cosmetics, $F(1, 105) = 8.80$, $p = .004$, $d = .58$, replicating the results of Experiment 2. Importantly, the results persisted when target attractiveness ratings were included in the model as a covariate (all ps $< .001$).

Next, we examined the role of target trustworthiness as a potential intervening mechanism in the SBP. Further, we wanted to more rigorously test the contribution of appearance enhancement effort (above and beyond the effects of enhanced physical attractiveness) in producing this effect. To this end, we tested a serial mediation model to examine whether the impact of cosmetics use on women's diminished desire to affiliate with same-sex others is driven by changes in the targets' perceived appearance enhancement effort (Mediator 1) and trustworthiness (Mediator 2).[3] We used Hayes' (2013) PROCESS SPSS macro (Model 6) to determine whether the indirect effects of cosmetics use on affiliation desire through the proposed mediators were significantly different from zero (Preacher & Hayes, 2008). Following recommendations outlined by Preacher and Hayes (2004), analyses were run on 10,000 bootstrapped samples to generate bias-corrected 95% confidence intervals for each indirect effect (the paths through the mediators). The mediators (target appearance enhancement effort, perceived target trustworthiness) were ordered to reflect the hypothesized causal sequence of the variables, with increased appearance enhancement effort leading to decreased perceptions of target trustworthiness.

This analysis provided support for the hypothesized mediation pathway: cosmetics use (0: yes; 1: no) → perceived appearance enhancement effort → target trustworthiness → desire to affiliate (see Figure 2), $b = .35$ ($SE = .13$), 95% CI [.13, .65]. Relative to women in the "no cosmetics" condition, women who viewed targets wearing cosmetics rated the targets as trying harder to enhance their appearances ($\beta = -.83$ [$b = -1.76$, $SE = .12$], $t = -14.94$, $p < .001$), which in turn was associated with decreased perceptions of the targets' trustworthiness ($\beta = -.38$ [$b = -.24$, $SE = .09$], $t = -2.74$, $p = .007$). Finally, this decreased trust predicted a decreased desire to affiliate with the made-up targets ($\beta = .65$ [$b = .83$, $SE = .13$], $t = 6.47$, $p < .001$). This pattern of results persisted when physical attractiveness ratings were included in the model as a covariate ($b = .35$ [$SE = .12$], 95% CI [.14, .63]), providing further evidence that the SBP effect arises from the targets' appearance enhancement efforts rather than their increased attractiveness.

Discussion

The results of Experiment 3 conceptually replicated the SBP effect found in the previous studies, with women reporting lowered affiliative desire toward female targets with artificially enhanced appearances. This study also indicated that women's diminished desire to affiliate with made-up targets was driven by their appearance enhancement effort, per se, and not merely a byproduct of the increased attractiveness that results from the use of cosmetics. This conclusion was supported by the results of the serial mediation model, which included appearance enhancement effort as a mediating variable, as well as the results obtained while statistically controlling for perceptions of target attractiveness.

Experiment 3 also provided insight into a potential mechanism underlying the SBP. Specifically, we found that women perceived female targets wearing cosmetics as having engaged in more strategic appearance enhancement than female targets not wearing cosmetics, an effect that

[3] The emphasis of this analysis is on statistical mediation, as it is based on ratings collected at a single time-point and thus cannot establish temporal mediation.

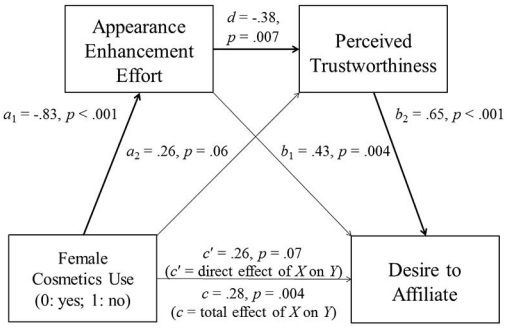

Figure 2. Serial mediation pathway (in bold) wherein target cosmetics use exerts an indirect effect on women's desire to affiliate with female targets through perceived appearance enhancement effort and trustworthiness (Experiment 3). The displayed coefficients are standardized, and all paths were retained in this model.

led participants to view these targets as being less trustworthy/more manipulative. This decreased trust, in turn, was associated with a reduced desire to affiliate with these females. Taken together, the results are consistent with research indicating that appearance enhancement is a cue to intrasexual competition among women (Fisher & Cox, 2011), and that such enhancement can decrease perceptions of women's trustworthiness (Etcoff et al., 2011). These findings are also consistent with the idea that individuals respond with vigilance and avoidance when confronted with in-group members who they deem untrustworthy (e.g., Neuberg et al., 2000). Together, the current results suggest that women may perceive appearance enhancement by same-sex competitors as a strategic and deceptive act.

Experiment 4: Individual Differences in the SBP

The main goal of Experiment 4 was to examine whether the SBP is moderated by individual differences in the likelihood that another woman's enhanced appearance would put female perceivers at a competitive disadvantage. As noted earlier, less attractive females are more likely to be the perpetrators of indirect aggression than attractive females (e.g., Arnocky et al., 2012). If, as we have hypothesized, the SBP stems from women perceiving attractiveness enhancement as a competitive strategy aimed at gaining social favors (particularly from men), the tendency to object to this practice may be strongest among women who are relatively disadvantaged in terms of their own appearances—that is, women who are less desirable to men.

Method

Participants were 95 heterosexual female undergraduate students (M_{age} = 19.26 years, SD = 2.14; n = 48 in the cosmetics condition) from the United States. This sample consisted primarily of White women (90%). Participants were excluded prior to analysis for failing the attention check (n = 1), indicating that they recognized one of the female targets (n = 1), or discussing the experiment with another student prior to participating (n = 1).

Procedure and materials. The design, procedure, and materials were similar to Experiment 3. That is, we presented the same four targets using a between-subjects design, and we assessed participants' desire to affiliate with the targets and target attractiveness ratings using the same items as in the previous study. However, in the current experiment, we included an additional dependent measure intended to assess participants' likelihood of behaving in ways that benefit the female targets. Further, we measured individual differences in participants' views of their own physical desirability.

Likelihood of pro-social behavior. To measure women's self-reported willingness to engage in behaviors that benefit each female target in the workplace, we asked participants to rate the likelihood they would (1) speak highly about her to your superiors (e.g., your boss), (2) give her inside information that would help her get a promotion, (3) speak highly about her to your colleagues, and (4) nominate her for an award. The response scale ranged from 1 (*not at all likely*) to 7 (*very likely*).

Participant desirability. We measured differences in participants' physical desirability using the Self-Perceived Mating Success Scale (Landolt, Lalumière, & Quinsey, 1995). This scale includes eight items assessing women's perceptions of their own desirability to men (e.g., I receive many compliments from members of the opposite sex; Members of the opposite sex are attracted to me). Participants responded to these items on a 7-point scale, and scores were coded such that higher values correspond to higher self-perceived desirability (α = .91).

Results

Descriptive statistics are presented in Table 2. To ensure that the experimental manipulation did not influence participants' perceptions of their own desirability, we first conducted a one-way between subjects (cosmetics use: yes vs. no) ANOVA on participants' self-perceived desirability scores. The results revealed no effect of condition on participants' self-perceived desirability ($p = .59$).

Desire to affiliate. We created a composite score for women's reported desire to affiliate with the female targets by averaging women's responses on these four items ($\alpha = .85$). To test for the effects of condition and participants' self-perceived desirability on this measure, we conducted a multiple regression analysis in which desire for affiliation was regressed on condition (dummy-coded: cosmetics = 0; no cosmetics = 1), women's desirability scores (centered), and the interaction between these two factors.

This analysis revealed a significant interaction between condition and women's self-perceived desirability on the dependent measure, ($\beta = -.30$ [$SE = .15$], $t = -2.05$, $p = .044$, semipartial $r^2 = .04$). Simple slopes tests revealed a positive relationship between women's desirability and their desire to affiliate with the female targets wearing cosmetics, with less (vs. more) desirable women expressing a decreased desire to affiliate with the made-up targets ($\beta = .47$ [$SE = .11$], $t = 3.20$, $p = .002$, semipartial $r^2 = .10$). No such relationship was observed among women who viewed the barefaced targets ($p = .62$). Additionally, examining the effect of target cosmetics use on women relatively high and low (1 standard deviation above and below the mean, respectively) in desirability revealed that this interaction was driven by women relatively low in desirability: less desirable women were less interested in affiliating with the made-up targets compared to the barefaced targets ($\beta = .41$ [$SE = .23$], $t = 2.98$, $p = .004$, semipartial $r^2 = .08$; see Figure 3). No between-conditions difference was found for women relatively high in desirability ($p = .94$). We repeated these analyses controlling for target physical attractiveness ratings. Although the two-way interaction was no longer conventionally significant in this model ($t = -1.57$, $p = .12$), the overall pattern of results persisted. Specifically, both the positive simple slope for women in the cosmetics condition and the between-conditions difference among less desirable women (-1 *SD*) remained significant ($ps \leq .01$).

Table 2
Descriptive Statistics (Experiment 4)

	Cosmetics		No cosmetics	
Characteristic	*M*	*SD*	*M*	*SD*
Participant desirability	4.42	1.03	4.30	1.16
Desire to affiliate	3.88	.89	4.21	.74
Likelihood of prosocial behavior	3.75	.97	4.08	.77
Target attractiveness	5.01	.82	4.18	.74

Likelihood of pro-social behavior. We created a composite score for women's reported likelihood of performing behaviors that benefit the targets by averaging these four items ($\alpha = .91$). To test for the effects of condition and participants' self-perceived desirability on this measure, we conducted a multiple regression analysis similar in form to the one conducted for affiliation desire. This analysis also revealed a significant two-way interaction between condition and women's self-perceived desirability ($\beta = -.47$ [$SE = .16$], $t = -3.29$, $p = .001$, semipartial $r^2 = .10$). There was a positive relationship between women's desirability and their willingness to benefit the female targets wearing cosmetics, with less (vs. more) desirable women reporting a lower likelihood of behaving prosocially toward the made-up targets ($\beta = .55$ [$SE = .12$], $t = 3.85$, $p < .001$, semipartial $r^2 = .13$). No such relationship was observed among women who viewed the barefaced targets ($p = .53$). Additionally, less desirable women (-1 *SD*) reported being less likely to benefit the made-up targets compared with the barefaced targets ($\beta = .52$ [$SE = .24$], $t = 3.79$, $p < .001$, semipartial $r^2 = .13$; see Figure 4). No effect of target cosmetics use was found for women relatively high ($+1$ *SD*) in desirability ($p = .39$). We repeated these analyses controlling for target physical attractiveness ratings, and the overall pattern of results persisted. Specifically, the two-way interaction, simple slope for participants in the cosmetics condition, and between-conditions difference among less desirable women (-1 *SD*) remained significant in this model ($ps \leq .004$).

Discussion

Experiment 4 demonstrated that women are less willing to affiliate with and perform prosocial behaviors to benefit females with enhanced appearances relative to females who have not put forth such effort. These effects were driven by female observers who themselves are relatively low in desirability (and likely more threatened by the appearance enhancement efforts of female competitors). Indeed, past research has shown that negative evaluations given to attractive same-sex others in organizational contexts are driven by women who themselves are relatively less attractive (Agthe et al., 2010), and that less attractive females are more likely to indirectly aggress against attractive females than the reverse (e.g., Arnocky et al., 2012). Importantly, this experiment extends previous work by isolating the effects of appearance enhancement, over and above the effects of physical attractiveness, in driving these responses. Taken together, the current work suggests that appearance enhancement effort may be received especially negatively by women already at a disadvantage in contexts where beauty is rewarded.

Internal Meta-Analysis

Given the limited sample sizes of the individual experiments, it is important to examine the reliability of the documented "strategic beautification penalty" across experiments (as recommended by Maner, 2014). Following procedures outlined by Goh, Hall, and Rosenthal (2016), we performed an internal meta-analysis of the effects of female appearance enhancement on women's negative evaluations obtained across the four experiments ($N = 364$ women).[4] To this end, a fixed effects test was conducted in which the mean effect size (i.e., mean correlation) was weighted by sample size. Pearson's correlation coefficients were calculated for each analysis. For studies with multiple relevant dependent measures (i.e., Experiments 3 and 4), correlation coefficients were averaged to obtain a single effect size for each study (Experiment 1 [$N = 117$]: $r = .10$; Experiment 2 [$N = 45$]: $r = .17$; Experiment 3 [$N = 107$]: $r = .43$; Experiment 4 [$N = 95$]: $r = .19$). Study correlations were Fisher's z transformed for analysis. Overall, the effect across studies was significant ($M_r = .24$, $Z = 4.26$, $p < .01$), with female appearance enhancement predicting negative responses (e.g., more negative evaluations, decreased desire for affiliation) among women. The aggregate effect size ($r = .24$, $d = .49$) corresponds approximately to a medium-sized effect.

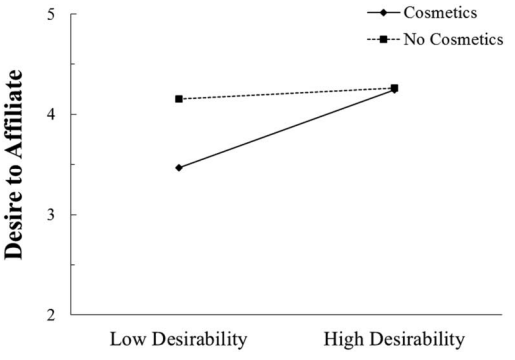

Figure 3. The effects of target cosmetics use and women's self-perceived desirability on their desire to affiliate with female targets (Experiment 4).

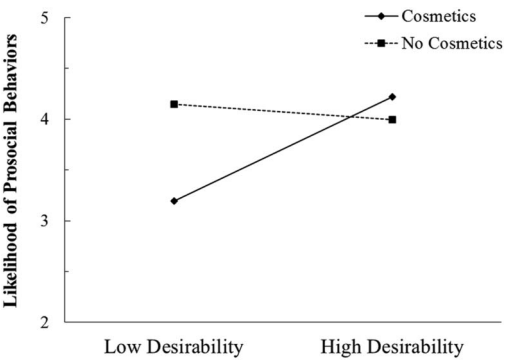

Figure 4. The effects of target cosmetics use and women's self-perceived desirability on their likelihood of performing prosocial behaviors directed toward the female targets (Experiment 4).

[4] The internal meta-analysis was restricted to dependent measures included for the purpose of hypothesis-testing. That is, we did not include manipulation check items (i.e., items assessing target appearance enhancement effort) or physical attractiveness ratings when determining average study effect sizes.

General Discussion

Researchers have found widespread evidence for the "beauty is good" effect, with attractive individuals—particularly attractive women—being rewarded across social contexts (Arnocky et al., 2014; Langlois et al., 2000). However, because appearance enhancement is a common and effective strategy women use to gain social advantages (e.g., Fisher & Cox, 2011; Schmitt & Buss, 1996), artificial beauty may suggest something about women's competitive motivations (and associated attributes) that natural beauty does not. Accordingly, we hypothesized that women would experience heightened negativity toward other women who have invested effort into enhancing their appearances (vs. those who have not).

We found support for the hypothesized SBP effect across four experiments and an internal meta-analysis aggregating the results. Specifically, female targets shown (or described) as having enhanced their appearances with cosmetics were perceived to (a) possess more negative traits (Experiment 1) and (b) be less desirable interaction partners (Experiments 2 through 4). Moreover, the SBP was specific to female observers (Experiment 2) and driven by women who perceived themselves to be relatively undesirable to men (Experiment 4). Finally, the effects were mediated by decreases in perceived trustworthiness in response to females' appearance enhancement effort (Experiment 3) and, importantly, were not merely a byproduct of the increased physical attractiveness of female targets wearing cosmetics (Experiments 2 through 4). In addition to demonstrating an important limitation of the "beauty is good" effect, the current work suggests that utilizing artificial means to augment one's appearance may imply a competitive motivation and thus produce a "strategic beautification penalty" enforced by other women.

Taken together, the results of this research provide experimental support for the potentially detrimental effects of strategic appearance enhancement, in general, and cosmetics use, more specifically, on women's relationships with one another. As shown in the current studies, these negative evaluations and perceptions may taint interactions among women in organizational settings. In addition, this work has potential implications for marketing and consumer behavior. For instance, agencies may benefit by considering how to best present female models in advertisements intended to appeal to young women (e.g., females whose appearances have been noticeably enhanced may be perceived as less trustworthy—and less effective at selling products or services—than those with more natural appearances). This work may also have important implications for relationships among female acquaintances and friends. Among adolescents, for example, it is possible that beautification efforts enacted by females may increase their likelihood of being excluded by same-sex peers or targeted by female bullies. Indeed, research suggests that as teenagers, attractive females are more likely to become the victims of indirect aggression than less attractive females (Leenaars et al., 2008). The current work suggests that this social problem may be exacerbated among girls who take noticeable steps to enhance their appearances.

Whereas women reliably applied the posited SBP to enhanced female targets, men in Experiment 2 showed the opposite tendency (consistent with past research: Guéguen et al., 2011, 2012, 2013). It is worth noting that this sex difference was found when participants evaluated targets in a relatively low-cost context (that is, their likelihood of interacting as coworkers). It is possible that men might not respond to artificially enhanced women with equal favor across domains characterized by variable investment costs. For instance, given established links between natural beauty and women's health and fertility (e.g., Arnocky et al., 2014; Sugiyama, 2005), it could be that men prefer natural (vs. artificial) beauty among women they are evaluating as potential long-term relationship partners. Although the current research was not designed to test the boundary conditions of men's responses to female targets' appearance enhancement efforts, future research could examine how these responses might vary across social contexts.

Though the current research found that women imposed a strategic beautification penalty on same-sex others who enhanced their attractiveness through artificial means, it did not test predictions that could be used to discriminate between this perspective and what would be predicted based on sexual economics theory (e.g., Baumeister & Twenge, 2002). Sexual economics theory posits that women are motivated

to punish and aggress against same-sex others who they perceive as making sex too readily available. In this vein, several studies show that women dislike and aggress against same-sex others who dress or behave in an overtly sexual manner (Borau & Bonnefon, 2017; Grabe et al., 2012; Vaillancourt & Sharma, 2011). Because cosmetics can contribute to women's perceptions of same-sex others' promiscuity (Batres, Russell, Simpson, Campbell, Hansen, & Cronk, 2018; Mileva et al., 2016), women's motives for disliking and aggressing against these women could be driven by a desire to punish same-sex others who they believe make sex too readily available.[5] However, it is important to note that sexual economics theory and the current conceptualization of women's SBP may not be mutually exclusive. That is, sexual economics focuses on a proximal factor that contributes to intrasexual competition (i.e., perceptions of target promiscuity and devaluing of sexual access), whereas our hypothesis is a more ultimate explanation rooted in the competitive advantages that attractive appearances have historically provided human females. It is possible (and likely) that women are less interested in affiliating with enhanced targets both because of sexual economics and as a response to the competitive advantages that an attractive appearance can provide.

In all, this research highlights a potential dilemma that women may experience in everyday settings. Although using cosmetics to enhance one's appearance may lead to more favorable responses and greater cooperation from men (as seen in Experiment 2 and research by Guéguen, 2008 and Guéguen & Jacob, 2011, 2012, 2013), women who invest time and effort into enhancing their appearances may unintentionally evoke hostile responses from same-sex peers.

Limitations and Future Directions

Future experiments are necessary to more fully examine the effects of women's appearance enhancement efforts. An important next step would be to test behavioral responses to females who have enhanced their appearances with cosmetics. Though our results demonstrated unfavorable shifts in women's perceptions and behavioral intentions directed toward female targets using cosmetics, research will be needed to determine whether these psychological shifts produce corresponding behavioral shifts (e.g., decreased willingness to help, poorer customer service) in everyday settings. Such effects may differ based on whether women perceive themselves to be in competition with the enhanced target, consistent with research showing that undergraduate students evaluate comparably aged targets (potential competitors) shown wearing cosmetics more negatively than older targets shown wearing cosmetics (Huguet, Croizet, & Richetin, 2004). Further, it is possible that other women's cosmetics use might prompt women to engage in greater appearance enhancement themselves in an attempt to level the competitive playing field.

In each experiment, we demonstrated that women respond more negatively to females shown (or described as) wearing cosmetics versus those not wearing cosmetics. Although we chose to focus on cosmetics use as our primary metric of appearance enhancement, some of the pictured females differed across their photographs in ways outside of their use of cosmetics (e.g., wearing different hair styles or clothing across photos). Although we attempted to minimize these differences, it is possible that some of them could have contributed to our effects. Regardless, the consistency of the effects across experiments as well as the inclusion of measures assessing targets' appearance enhancement effort increases our confidence that the demonstrated SBP was driven by perceptions of female targets' efforts to enhance their appearances. However, future studies should replicate these effects using targets that more rigorously isolate the presence or absence of various dimensions of female appearance enhancement (e.g., cosmetics use) to determine their relative impact.

It is important to note that the current research used samples of heterosexual college students, and that the generalizability of the results is inherently limited by the restricted demographics of the participants. Support for the hypothesized SBP was found among young women for whom levels of intrasexual competition are likely relatively high. (That is, many college-aged women are still fiercely competing for access to the highest-quality mates and jobs

[5] We thank an anonymous reviewer for noting this possibility.

available.) It is possible that older women—who are less intrasexually competitive (Fernandez, Muñoz-Reyes, & Dufey, 2014)—may be more forgiving of other women's use of cosmetics, leading to diminution of the SBP effect. Alternatively, because women's perceptions of their desirability decrease with age (Brase & Guy, 2004), older women may experience a more pronounced negative response when a female competitor uses appearance enhancement to her advantage. Though age differences in the obtained effects were not explicitly tested, we expect that when women find themselves competing against females with enhanced appearances for access to scarce fitness-relevant resources, the SBP effect is likely to emerge across ages. Further, to isolate the effects of cosmetics use on women's intrasexual competitive processes, we restricted our participants to those who reported a heterosexual orientation. However, the nature of the SBP—as well as the "beauty is good" effect—may vary systematically among women of different sexual orientations. For instance, it is possible that lesbian women would report an increased desire to affiliate with females wearing (vs. not wearing) cosmetics. Future research should examine whether females who put forth effort to enhance their appearances are rewarded or penalized by women who do not self-identify as heterosexual and under what conditions.

In addition to these limitations regarding the participants' ages and sexual orientations, a majority of our participants—and the targets presented—across experiments were White. Although Etcoff and colleagues (2011) found that race does not moderate the effects of cosmetics use on perceptions of facial attractiveness, it is possible that women perceive their heaviest competition to be with same-sex others who are most similar to themselves (e.g., women from similar racial/ethnic backgrounds). Future research should therefore examine whether the effects of cosmetics use demonstrated herein are comparable for female targets and perceivers from different racial/ethnic backgrounds.

Finally, Experiments 2 through 4 tested the hypothesized effects using a relatively small and uniform set of photographs as target stimuli. The target females were relatively attractive, restricted in terms of their age range (the women were relatively young), and appeared sexually appealing in their enhanced photos. Although the selected targets were effective in capturing the SBP effect among our college-aged participants, responses to these targets may be magnified compared to how women may respond to other women they encounter in their everyday lives (e.g., women who appear less attractive/sexy). Future research will be needed to determine how the magnitude of the SBP effect changes across target stimuli, including stimuli that are more representative of women in the general population.

Conclusion

Considerable research supports the idea that physical attractiveness—especially when possessed by women—is generally rewarded across domains. Because these rewards are preferentially conferred upon beautiful women (often by men), other women may respond with hostility and resentment when exposed to women who are more beautiful than themselves. This hostility may be magnified when women take noticeable steps to artificially enhance their attractiveness, as evidenced by the hateful comments posted online attacking the contemporary phenomenon of "human dolls." Our experiments demonstrate that the SBP effect can also manifest in response to more ordinary forms of appearance enhancement, including female cosmetics use. As a result, appearance enhancement effort may be an important consideration for women looking to put their best foot forward in commonly encountered social settings.

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