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COMMENTARY

Response to Commentaries: A Socioevolutionary Approach to Self-Presentation Modification

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Introduction

We would like to thank the commentators for their thought-provoking responses to our target article on the evolution of visual appearance enhancement behavior (Davis & Arnocky, 2020). Each respected colleague agreed with the timely nature of the review, as well as the complementarity of sociocultural and evolutionary levels of analyses to encourage interdisciplinary collaboration to further elucidate the complex interactions between proximate and ultimate mechanisms. Commentators also provided constructive criticisms that will help to extend the scope of socioevolutionary research on human appearance modification practices beyond what was covered in the target article. Some proposed novel conceptual frameworks that can help to advance and test a broader array of hypotheses revolving around the visual cues/signals involved in various forms of appearance enhancement (Lewis & Buss, 2021), as well as the multimodal nature of self-presentation tactics designed to enhance, or attenuate, cues/signals (Valentova et al., 2021). Others asserted that the target article too narrowly focused on women's appearance enhancement for the purposes of mate attraction, mate retention, and intrasexual rivalry (Blake, 2021; Bradshaw & DelPriore, 2021). Some drew attention to the limited integration of sociocultural perspectives in the target article (Frederick & Reynolds, 2021). Other commentators focused on key theoretical and methodological issues contributing to ambiguities in the visual appearance enhancement literature at large (Dixson, 2021), and in relation to women's facial attractiveness (Jones et al., 2021). In this response article, we summarize areas of overlap between the responses and address central concerns raised by each commentator.

In Search of an Appropriate Conceptual Definition

Although not explicitly stated, Valentova et al. (2021) suggested that the target article did not include an explicit definition of visual appearance enhancement behavior. Operational definitions are critical for psychological scientists to develop means of observing and assessing phenomena in a reliable and valid fashion (Ginsberg, 1955; Mandler & Kessen, 1959), and we thank Valentova et al. for taking this initiative in their response. Valentova et al. defined appearance enhancement as "Active bodily modification using extracorporeal materials, tools, or specific bodily efforts (e.g., exercise) in order to positively influence others' visual-based impression of oneself." Lewis and Buss (2021) also offered a helpful conceptual definition of appearance enhancement: "Physical appearance enhancement behavior refers to the manipulation of specific visual cues to which humans' attractiveness-assessment mechanisms attend." The definition by Valentova et al. focuses more on how people may augment their appearance, whereas the definition by Lewis and Buss places emphasis on the specific visual cues being modified. This "behavior" versus "cue" debate is central to the response by Lewis and Buss and is discussed in detail in the section entitled "A Cue-Based Approach to Visual Appearance Enhancement."

Varying Forms of Self-Presentation Enhancement

The focus of the target article was on modes of visual appearance enhancement because this modality has received the most theoretical and empirical attention, and for the sake of providing a more coherent discussion of the topic.

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Nonetheless, Valentova et al. (2021) correctly pointed out that people endeavor to enhance their attractiveness through various means that target different sensory modalities in stating that "different components of self-presentation, such as visual, vocal, or behavioral, can be altered during impression management in order to obtain the general proximate goal of receiving social approval or disapproval." For example, there is interesting research on the use of perfumes to augment attractiveness, which qualifies as a form of olfactory enhancement. Lenochová et al. (2012) found that perfumes enhanced perceptions of people's body odor and that they did so by interacting with a person's natural scent. Randomly selected perfumes did not enhance perceptions of body odor, whereas participants' preferred perfumes did augment perceptions of odor pleasantness. Therefore, people appear to strategically select perfumes that will result in a more appealing "individually specific odor mixture." Consequently, Valentova et al. (2021) proposed that "To increase ecological validity, highlight the multimodal complexity of interpersonal perception and communication, and to broaden the scope of what has been traditionally conceptualized as appearance enhancement, we suggest a more perceptually neutral process: self-presentation enhancement." We also see the utility of this terminological shift.

Under this broad umbrella of self-presentation enhancement, it will be important for researchers to explicitly distinguish the main sensory and perceptual systems targeted by the enhancement behavior. The use of perfumes and colognes, as well as scented deodorants, shampoos, and body lotions (i.e., fragranced cosmetics; Sorokowska et al., 2016) are all salient examples of olfactory enhancements. Nonetheless, cleaving lines between different modes of self-presentation enhancement is not always straightforward or possible. For example, Valentova et al. (2021) described how hairstyling and depilation practices involve not only appearance-based, but also tactile-based features, such as the feeling of smooth skin (Toerien & Wilkinson, 2004). A similar argument might be provided for women's lingerie, which evidently involves visual aspects, but may also encompass tactile enhancements in relation to the fabrics that make up these garments (e.g., lace, silk, and satin; De Klerk & Lubbe, 2008; Moule & Fisher, 2015). Some cosmetic products also embody a complexity of visual, olfactory, and gustatory components, such as food-flavored lip glosses and lip balms, and there is limited research on whether (and how) these products may augment attractiveness in a sex-differentiated manner (Kościński, 2013). Indeed, as Valentova et al. point out, there is comparatively less research on non-visual forms of self-presentation enhancement in general, which has been mentioned by others (see Groyecka et al., 2017). However, there is an increasing amount of research regarding the modulation of olfactory signals via certain fragranced cosmetics (e.g., perfumes; Allen et al., 2019; Roberts et al., 2020). Different kinds of self-presentation enhancement that target olfactory, vocal, tactile, gustatory, and/or behavioral components are fruitful areas for future investigators to pursue. From this perspective, both the behavior (e.g., wearing sexy lingerie) and the targeted sensory and perceptual system(s) involved (e.g., the visual system) are paramount when formulating and testing hypotheses. Lewis and Buss (2021), in slight contrast, argued that investigators should focus more on the specific visual cue(s) within the visual sensory system that are being modified by the self-presentation enhancement behavior.

A Cue-Based Approach to Visual Appearance Enhancement

Lewis and Buss (2021) proposed that a visual cue-based approach can help to attend to some of the shortcomings of focusing on specific behavioral categories of visual appearance modification (e.g., use of facial cosmetics) delineated in the target article. With a cue-based approach, Lewis and Buss argued that we "…can (1) identify distinct cues manipulated by different behaviors within a single behavioral category, (2) unify behaviors that fall under different behavioral categories but which manipulate the same cue, and (3) guide researchers toward new hypotheses about these behaviors." This cue-based approach is appealing because it offers a greater degree of specificity, which helps to avoid creating ambiguous research hypotheses and, in turn, increases hypothesis validity (Kite & Whitley, 2018; Wampold et al., 1990). It also facilitates studying how selection has shaped what humans have evolved to find desirable and attractive, in that "selection shaped these attractiveness-assessment mechanisms to attend to cues in a potential mate that were ancestrally predictive of the probabilistic fitness consequences of mating with that individual" (Lewis & Buss, 2021).

To illustrate their framework, Lewis and Buss (2021) provided the example of the limbal ring as a visual cue to youth that can be accentuated with dark eyeliners and contact lenses. The prominence of the limbal ring may embody fitness-relevant information that is sex-differentiated in terms of its appeal, given men's preference for youth in women (Buss, 1989; Kenrick & Keefe, 1992). By focusing solely on the mode of visual appearance enhancement (eyeliner or eyewear) researchers might miss the cue being emphasized or how different kinds of visual appearance enhancement work to accentuate the same visual cue (the limbal ring). A similar example that has recently received empirical attention is eyelash length. Eyelash length may be a visual cue to health, with males expressing a stronger preference for longer lashes on females (Pazhoohi & Kingstone, 2020). Eyelash vigor and length can be modified with eyelash conditioners and serums (e.g., RevitaLash®), curling, extensions, and with mascara. Using Lewis and Buss' visual cue-based approach,

different modes of visual appearance enhancement can be studied as means to draw attention to the same visual cue (eyelash length), which might be missed if focusing on one kind of behavior in isolation.

The power of the visual cue-based approach is evident when studying how different visual cues might be emphasized by the same mode of visual appearance enhancement behavior. However, when using this framework, it is paramount that researchers be explicit about the specific visual cues that are purportedly contributing to heightened attractiveness, and exactly what fitness-enhancing qualities, if any, those visual cues are carrying. Women's use of eyeliner demonstrates how complicated the picture can become with only one form of visual appearance enhancement behavior under examination. Eyeliner can help in defining limbal rings and may heighten women's attractiveness (particularly in short-term contexts) via signaling youth and/or health (Brown & Sacco, 2018). But eyeliner can also make the eyes appear larger (Matsushita et al., 2015), which may increase women's attractiveness by signaling youth via neoteny (Jones et al., 1995). Moreover, eyeliner can create the appearance of a whiter sclera, which can augment attractiveness by enhancing perceptions of youth and/or health (Provine et al., 2013). Similarly, eyeliner can increase perceptions of bilateral symmetry (Russell, 2011), which may also augment attractiveness by signaling developmental stability (Jones et al., 2001). In addition, eyeliner styles can influence social perceptions and signal personal qualities irrespective of cues to youth, health, and genetic quality. For instance, in comparison with digital female faces with no makeup and light makeup, faces with heavy makeup that prominently feature heavy eyeliner were rated as higher in sociosexuality and attractiveness (Aguinaldo & Peissig, 2021). The example above highlights the power of a visual cue-based approach, but how challenging it can be to know exactly what evolved attractiveness-assessment mechanisms are at play, the specific cue(s) being attended to, and what information those cues are conveying. When using this approach, it is also important for scholars to be aware of what differentiates a "cue" from a "signal."

Signals are evolved actions used to convey information about the sender (or environment) to influence a response in the receiver (Freeberg et al., 2017). Signals and responses coevolve because signals often provide information that is mutually beneficial to the sender and recipient (Maynard Smith & Harper, 2003). Cues represent passive phenotypic variation in a feature possessed by the sender that benefits the recipient despite not having evolved to produce a response in the recipient: "Cues, unlike signals, have not evolved for the particular function they serve (Maynard Smith & Harper, 2003); cues benefit the receiver not the sender" (Freeberg et al., 2017, p. 6). This picture, however, becomes somewhat convoluted in relation to sexual selection and human self-presentation modification. Although cues tend to be described as "non-signaling traits," they can experience signaling selection (Biernaskie et al., 2018). Organisms vary in the extent to which they possess cues describing underlying quality and receivers are influenced by that phenotypic variation to respond in such a way that impacts the signaler's fitness. Moreover, humans actively modify the prominence of cues through their self-presentation modifications, which no longer constitute "passive" phenotypic qualities in such situations. Further compounding things is that various forms of visual appearance enhancement might constitute signals, but they often do not honestly communicate information about the sender that will benefit the recipient. Indeed, senders transmit signals to influence and manipulate behavior in the receiver for their own evolutionary gain (Freeberg et al., 2017). As stated by Freeberg et al., "…a signal that brings benefits to senders but costs to receivers in a given population should result in selection pressure for receivers to assess and discriminate signals more carefully, to ignore or avoid such costly or unreliable signals" (p. 4). Since many forms of self-presentation modification likely "work" by dishonestly signaling information about specific cues, such as with facial cosmetics, receivers should have ways of gauging the veracity of such signals. There is limited work from an evolutionary perspective on how individuals gauge the honesty of signals involved in visual appearance enhancement. In their response, Lewis and Buss (2021) considered both limbal rings and communicating sexual proceptivity to be "visual cues," which may accurately denote the former, but the latter seems to constitute a signal. For example, Elliot et al. (2013) posited that red clothing may be a sexual signal adorned by women to increase sexual attractiveness and convey sexual receptivity. Regardless, this ambiguity speaks to the importance of collectively studying what information is being conveyed by specific visual features, as well as what is being signaled by particular kinds of visual appearance enhancement behavior that emphasizes, or attenuates, the feature(s) of interest.

An additional consideration is that one kind of self-presentation enhancement behavior may not only emphasize visual cues (Lewis & Buss, 2021), but also a collection of cues spread across different sensory modalities that collectively operate to enhance attractiveness (Valentova et al., 2021). For instance, women's use of scented body lotions and creams might augment attractiveness by hydrating the skin and giving the wearer a "glowing" youthful and healthy appearance, but also through tactile enhancement via the feeling of smooth skin as well as olfactory enhancement from odor pleasantness, perhaps by signaling femininity (Barton et al., 2020; Ghodsee, 2007; Jellinek, 1997). Thus, scented body lotions and creams may embody a confluence of multimodal signals that trigger heterosexual men's attractiveness-assessment mechanisms for cues to women's youth, health, and reproductive potential through different channels. This

example makes apparent the utility of a blended multimodal cue-based approach, but also the difficulties researchers can encounter in trying to pinpoint the specific cues and attractiveness-assessment mechanisms responsible for enhancing desirability.

Visual Appearance Worsening and Decreasing the Level of a Visual Cue

A theme noted by Valentova et al. (2021) and Lewis and Buss (2021) is that humans do not solely try to enhance their appearance across domains, but, at times, they may act in specific contexts to strategically decrease their appeal. For instance, Valentova et al. argued that "Sometimes individuals may want to blend with the crowd, avoid being noticed, give the impression that they lack prestige or social appeal, or even scare off unwanted approaches from others." Similarly, Lewis and Buss noted "…the term 'enhance' could inadvertently limit researchers to thinking about only those behaviors that increase the level of a cue." Under their umbrella of self-presentation modification, Valentova et al. proposed the term "self-presentation worsening," which can help to avoid narrow conceptions of how humans systematically modify visual, olfactory, vocal, tactile, and behavioral components. The term "visual appearance worsening" was specifically delineated to encompass attempts to reduce perceptions of one's desirable physical qualities (e.g., physical attractiveness). Valentova et al. mentioned that there is a dearth of evolutionarily informed research on intentional visual appearance worsening to deviate from cultural standards of beauty and attractiveness. Nonetheless, evidence from various sociocultural literatures can help to gather insight into self-presentation strategies to either "worsen" one's appearance or reduce signals to facilitate competitive success. One such literature concerns the context-specific attitudes toward women's style of dress.

In traditionally masculine and higher status occupations in developed societies (e.g., business), women tend to garner negative appraisals if wearing more revealing and provocative clothing, such as being rated lower in intelligence, trustworthiness, and competence (Glick et al., 2005; Johnson & Gurung, 2011; Kelan, 2013; Wookey et al., 2009). Even more subtly revealing clothing on women can produce this effect. Howlett et al. (2015) found that British full-time female employees and students rated photographs of target females wearing a skirt above the knee and a blouse with two buttons undone ("provocative" condition) more harshly than the same females wearing a skirt below the knee and a blouse with one button undone (non-provocative condition). Negative judgments were more severe when the "provocatively" dressed photographed females were described as senior managers (a higher status position) in comparison with receptionists (a lower status position). Similarly, Gurung et al. (2018) found that American college students rated photographs of females at a desk with an unbuttoned blouse as significantly less intelligent and competent, but not less powerful, than the same females with a buttoned blouse. These results suggest that women may strategically reduce signals to promiscuity and sexual attractiveness by adorning less revealing attire in traditionally masculine occupations to compete for status and economic resources. Female athletes may similarly benefit from wearing more conservative garb. Gurung and Chrouser (2007) found that American female undergraduates rated photographs of three well-known female Olympians as more attractive, but less capable, intelligent, and charitable when they were wearing more provocative clothing in comparison with when they adorned more conservative attire. Using the above examples, it is challenging to say if women wearing less revealing clothing constitutes "visual appearance worsening" (Valentova et al., 2021), as it may be conceptualized as "visual appearance enhancing" if the goal is to appear more competent, intelligent, and professional. Therefore, in this circumstance, it may be more prudent to focus on the specific visual signals being manipulated, such as decreasing visual signals to promiscuity.

The strategies employed by individuals to "worsen" their appearance or reduce the level of a visual cue or signal also likely vary according to relationship context. In their response, Lewis and Buss (2021) proposed the novel hypothesis that "In long-term mating contexts, people manipulate their physical appearance to actively conceal cues to promiscuity." This strategy would likely be effective, given evidence that female adults dressed in more provocative attire are perceived as more sexually attractive, but less faithful (Cahoon & Edmonds, 1989) and less appealing as marital partners (Hill et al., 1987). As stated by Lewis and Buss, "evidence suggests that cues to sexual proceptivity increase men's perceptions of women's attractiveness in short-term, but not long-term contexts." From this perspective modifying one's appearance to lower signals to promiscuity (or perhaps to heighten signals to chastity) may qualify as a form of mate retention behavior that functions to reassure mates of commitment to the relationship (Albert & Arnocky, 2016). This form of visual appearance worsening might also help to reduce the likelihood of unwanted courtship attempts on behalf of mate poachers (Arnocky, 2020). Perhaps concealing signals to promiscuity can further help to avoid cost-inflicting mate retention behavior on behalf of jealous partners, especially from mates higher in preventive jealousy who use surveillance and controlling behavior (Davis et al., 2018). Therefore, in long-term mating contexts reducing signals to promiscuity may effectively help to maintain a valued romantic relationship. Interestingly, the exact opposite hypothesis might be advanced if those in long-term relationships are considering committing sexual infidelity. Raising visual

signals to promiscuity would likely be more effective for partnered heterosexual women than men in pursuing extra-pair sexual opportunities given men's relatively greater desire for short-term sex (see Davis et al., in press).

Regardless of the relationship context, people, particularly women, may also strategically reduce visual signals to promiscuity to elude derogation from peers and intrasexual competitors. A growing body of research shows how promiscuous same-sex others are a potent trigger for women's aggression and competitor derogation (Arnocky & Vaillancourt, 2017; Davis et al., 2020; Vaillancourt & Sharma, 2011). For instance, Arnocky et al. (2019) showed how women readily aggressed against a same-sex other dressed in sexualized garb, which was predicted by attributing less humanness (i.e., dehumanizing) to her. However, this effect only manifested among women higher in intrasexual competitiveness. Furthermore, evidence indicates that both women and men may dehumanize sexually provocative women via different processes. Vaes et al. (2011) found that photographs of women, but not men, adorning more revealing clothing in sexually provocative positions were dehumanized to a greater extent in comparison with more personalized photographs of individuals from the waist up immersed in commonplace day-to-day activities. Whereas men's dehumanization was accompanied by feelings of sexual attraction, women's dehumanization occurred alongside perceiving the provocative female targets as vulgar and superficial. Bernard et al. (2020) also recently showed how heavy makeup usage was associated with dehumanization by both women and men, which was likely driven by perceptions of sexualization. Therefore, women may reduce signals to promiscuity within and beyond the realm of mate competition to avoid being attacked by intra- and inter-sexual rivals.

Visual Appearance Enhancement Outside of Mate Attraction, Retention, and Rivalry

Several of the commentators encouraged a broader and more holistic analysis of visual appearance modification practices outside of the domains of mate attraction, mate retention, and intrasexual rivalry. For example, Valentova et al. (2021) stated "The Target Article mentions some advertised qualities, such as youth, health, wealth, power, status, and mostly focused on the romantic domain. Hence, other domains should also be explored in future research." Similarly, Bradshaw and DelPriore (2021) stated that "Abundant research conducted by psychologists, sociologists, and economists has firmly established that the benefits of an attractive appearance extend beyond interactions directly relevant to human mating." Likewise, Blake (2021) proposed that women's visual appearance enhancement "…also provides opportunities for status attainment and competition in domains that are unrelated to mate attraction." These commentators provide an important reminder that humans compete not only to be preferentially desired as mates (i.e., intersexual selection) and with rivals for mating opportunities (i.e., intrasexual competition), but also socially for material resources (e.g., food and money), status, prestige, dominance, friends, allies, and co-parents that can augment survival and/or reproductive success (i.e., social selection; West-Eberhard, 1983). One caveat is that when studying social competition, the influence of different sources of selection is often not easy to differentiate (Lyon & Montgomerie, 2012). For example, female competition for particular social resources (e.g., status) can impact survival, male value, intrasexual rivalry, and fecundity (Rucas et al., 2006; Vaillancourt & Krems, 2018). Nonetheless, it is important for evolutionary scientists to advance and test hypotheses about the antecedents and impacts of visual appearance enhancement, or worsening, in social contexts for limited valued resources not directly tied to mate competition.

In their responses, Blake (2021) and Bradshaw and DelPriore (2021) highlighted that across cultures more physically attractive children and adults are perceived, judged, and treated more positively (Langlois et al., 2000). In the labor market, attractive adults are often the recipients of financial (e.g., hiring decisions, wages, and promotions) and prosocial biases, particularly women in the context of opposite-sex interactions, whereby both mating and non-mating motives appear to drive effects (Maestripieri et al., 2017). Across cultures, people also wish to affiliate and establish friendships with attractive others, attributing positive personal qualities (e.g., generosity, kindness, and warmth) to them in the process (Anderson, 2019; Lemay et al., 2010). Among adolescents, being attractive is a peer-valued characteristic associated with perceptions of power and popularity (Vaillancourt & Hymel, 2006), which can buffer against being targeted for peer victimization (Knack et al., 2012). A large sociocultural literature has been devoted to studying how people derive exaggerated positive attributions across a range of personal qualities from being perceived as physically attractive, known as the "what is beautiful is good" bias (Dion et al., 1972). For instance, physically attractive individuals are often perceived as more intelligent, conscientious, and competent (Talamas et al., 2016). Therefore, beyond mate attraction, mate retention, and intrasexual rivalry, physical attractiveness confers important evolutionary benefits in the domain of social competition. If so, then various modes of self-presentation enhancement that augment physical attractiveness could be useful strategies to compete for valued social resources, such as social status.

Blake (2021) and Bradshaw and DelPriore (2021) emphasized that evolutionarily informed research on social competition, particularly for status, dominance, and prestige, has tended to center on men, and women's competition for

social resources has not received the same theoretical and empirical attention (Benenson, 2013; Burch, 2020; Fisher & Moule, 2013; Geary et al., 2014; Reynolds, 2021). Blake voiced how female status competition has been documented in various mammalian species, and how heightened status and dominance can provide a range of benefits that facilitate survival and reproduction, including food, nesting sites, allomothers, alliances, protection, and producing more offspring (Stockley & Bro-Jørgensen, 2011). For example, dominant and high-status female meerkats (*Suricata suricatta*) produce more surviving pups in comparison with their lower status same-sex counterparts, as well as relative to dominant males (Clutton-Brock & Huchard, 2013). In one of our closest living phylogenetic relatives, bonobos (*Pan paniscus*), dominant females occupy the highest social rank, and the status of sons is greatly dependent upon the dominance and status of mothers who acquire indirect fitness benefits via extended maternal investment (Surbeck et al., 2011). Dominant female bonobos, although more tolerant and equitable than males, also gain disproportionate access to non-mating resources, including highly prized food (Vervaecke et al., 2000).

Likewise, girls and women evidently strive for and benefit from social status, dominance, and prestige for both mating and non-mating resources that can impact their survival and reproductive success (Benenson et al., 2013; Cheng et al., 2013; Hrdy, 2009; Lee et al., 2018; Vaillancourt & Hymel, 2006; Vaillancourt & Krems, 2018). For example, alongside being rated as more attractive, images of women wearing cosmetics are rated by same-sex others as higher in dominance, whereas men rated these women as higher in prestige (Mileva et al., 2016). Furthermore, wearing stylish clothing can augment the attractiveness in addition to the popularity and power of adolescent girls in the eyes of peers (Vaillancourt & Hymel, 2006). Across cultures, women's capacity to accrue and maintain status appears to be intimately tied to their levels of physical attractiveness (Buss et al., 2020). For instance, among the Tsimane in Bolivia, women perceived same-sex others who were powerful, articulate, hardworking, and good mothers to be higher in attractiveness (Rucas et al., 2006). Vaillancourt and Krems proposed that girl's and women's physical attractiveness initiates a cascade to higher social status, which promotes the use of indirect aggression (e.g., malicious gossip and social exclusion) to maintain social standing and to vie for valued mating opportunities.

The status benefits conferred by physical attractiveness can also be used by women to obtain allies for alloparental care, emotional support, and protection, as well as material resources for themselves and/or their children (Benenson et al., 2013). Status and physical attractiveness are likely important aspects of women's cooperative mothering to gain allomothers, as well as their competitive mothering to retain long-term partners, display the ability to both look beautiful and take care of children, and to procure resources for oneself and one's offspring (Fisher & Moule, 2013; Fisher et al., 2017). Consequently, as summarized by Blake (2021), "By delivering these benefits [e.g., status], attractiveness enhancement provides a fruitful strategy for women to maximize their social position and thus their opportunity for reproductive success." Bradshaw and DelPriore (2021) similarly noted that evidence of non-mating benefits conferred to beautiful women suggests that "…enhancing one's appearance should be an effective strategy for women to increase their access to social support, cooperation, professional success, and other culturally relevant resources."

Nonetheless, physical attractiveness in women does not produce unequivocally beneficial outcomes. Attractiveness discrepancies, but not differences in ambition and athleticism, in female same-sex friendships predict heightened perceptions of mating rivalry (Bleske-Rechek & Lighthall, 2010). In the sociological literature, researchers have also documented evidence of the "beauty is beastly" effect (Heilman & Saruwatari, 1979), that physically attractive women applying for high-status stereotypically masculine jobs may be viewed less favorably in comparison with relatively unattractive women applying for the same job (Johnson et al., 2010; Paustian-Underdahl & Walker, 2016). When applying for work, attractive women may also face discrimination from jealous and envious same-sex evaluators and recruitment officers (Ruffle & Shtudiner, 2015). This makes sense given that women readily identify attractive same-sex others as potential rivals who are targeted for indirect aggression (Arnocky & Vaillancourt, 2017; Davis et al., 2020; Vaillancourt, 2013). However, Blake (2021) provided a pertinent reminder that "it is important to acknowledge the difference between physical attractiveness and sexual attractiveness."

Visual signals to sexual attractiveness may increase women's success in the context of short-term mating (discussed by Lewis & Buss, 2021), but adorning more revealing attire and signaling sexuality can harm women's capacity to compete for valued economic resources in many professional contexts (Glick et al., 2005; Johnson & Gurung, 2011; Wookey et al., 2009). Wearing more sexually provocative clothing can be a strong trigger for women's intrasexual rivalry and might also detract from women's ability to form friendships to build social capital (Vaillancourt & Sharma, 2011). Therefore, visual cues to sexual attractiveness are more likely to harm various aspects of women's social competition than physical attractiveness. This nuance is relevant to the point made by Valentova et al. (2021) that particular modes of self-presentation modification are perceived, responded to, and rewarded differently across professional, civil, personal, familial, friendship, romantic, and sexual contexts. The visual appearance modification strategies that facilitate success in one domain may be relatively ineffective, or perhaps even detrimental, to success in another.

Blake (2021) further proposed that "If, as society progresses toward gender equity, women's ability to independently hold reproductively relevant resources reduces the incentive for attractiveness enhancement, then that will tell us the extent to which mating competition affects attractiveness enhancement." Wang et al. (2021) recently showed how women living in conditions of competitor abundance (i.e., a female-biased operational sex ratio [OSR]) and income inequality were more interested in cosmetic surgery and had greater access to a larger number of surgeons in the U.S. These researchers also showed that Chinese female students from colleges with female-biased OSRs (i.e., high intrasexual competition) expressed a stronger proclivity toward beautification. Being primed with competitor abundance in a hypothetical speed dating scenario was related to women focusing more on their physical appearance. When imagining competing with several same-sex others for a desirable mate, women focused more on their bodies and showed a greater preference for appearance-oriented beauty products, which was mediated by self-sexual objectification (i.e., perceiving oneself as primarily a sexual object). Therefore, as emphasized by Blake, degree of income inequality is likely an important moderator of women's effort and interest in beautification practices. Blake stressed that "In my own work so far, we have found that general mechanisms for status seeking, and not mating competition, drive attractiveness enhancement strategies among women in resource unequal contexts." More research will be needed to bear this hypothesis out. Nevertheless, there appears to be considerable support for the importance of mating motives and a desire to compete with same-sex others for mating opportunities and resources in promoting women's visual appearance enhancement in cultures relatively high in gender parity with lower levels of income inequity (Abed et al., 2012; Arnocky & Locke, 2020; Arnocky & Piché, 2014; Maestripieri et al., 2017; Mafra et al., 2020). The significance of women's sexual self-objectification in female-biased OSR contexts in the study by Wang et al. (2021) also points to the interdependence of sociocultural and evolutionary processes when studying human self-presentation modification.

Limited Integration of Sociocultural Perspectives

Frederick and Reynolds (2021) pointed out that there was insufficient integration of sociocultural perspectives in the target article. These researchers highlighted several key intersections across the body image literature that help to elucidate the power of a unified socioevolutionary lens for studying human visual appearance modification behavior. For example, Frederick and Reynolds drew attention to sociocultural literature on inter-individual variability in internalizing the thin, slender ideal that is prevalent in many Western cultures, which can arise from social comparisons and contribute to self-objectification (i.e., appearance becoming a central part of someone's identity and sense of self-esteem). In the target article, we covered research on social comparisons using an evolutionary perspective (e.g., Arnocky & Piché, 2014; Arnocky et al., 2016; Mafra et al., 2020), but missed the opportunity to underscore the complementarity of sociocultural viewpoints on the topic.

Ancestrally, physical appearance comparisons would likely have facilitated gauging one's own mate value relative to intrasexual rivals to encourage appearance modification to augment reproductive success (Hill & Buss, 2008). Taking heed of the constructive criticisms provided by Blake (2021) and Bradshaw and Delpriore (2021), these appearance-based comparisons might also be advantageous when competing against intra- and inter-sexual rivals in social and occupational spheres to accrue status and resources. Despite its adaptive utility, individuals who frequently compare their appearance to others express heightened envy, which can lead them to engage in risky and dangerous forms of appearance enhancement behavior, such as willingness to use diet pills with potential negative health side effects (Arnocky et al., 2016). The selection of physical appearance comparisons occurred in an ancestral circumstance devoid of persistent and extreme (e.g., photoshopped) highly attractive comparators featured today across television, magazines, websites, and social media. For example, frequency of Facebook usage can initiate a deleterious cascade to greater social comparisons and self-objectification, resulting in poorer self-esteem and mental health, and heightened body shame (Hanna et al., 2017). Therefore, both sociocultural and evolutionary researchers agree that higher levels of appearance-based comparisons can lead to personally damaging appearance-based concerns, and that it is prudent to study countervailing socialization mechanisms. To this end, Frederick and Reynolds (2021) discussed the potential utility of representing diverse body types in the media that can help to reduce weight-based stigma (Selensky & Carels, 2021).

When using a socioevolutionary lens, it is integral that researchers be mindful that, although intertwined with one another, explanations regarding socialization and evolution operate at different levels of analysis. It is not a matter of "either/or" and competing explanations for the "true" source(s) of variability (Lewis et al., 2017). Women's adornment of provocative lingerie can help to elucidate this point. At a sociocultural level of analysis, women may self-report that they wear lingerie to feel confident, feminine, and sexy, or because they feel pressured by influences from peers, media, and men, which can lead to conflicting attitudes and beliefs about notions of sexual empowerment and subjugation (Karimova et al., 2017). At an evolutionary level of analysis, researchers might assert that lingerie increases one's

attractiveness to her partner, signals sexual receptivity and/or that feeling sexy may encourage women to be more sexually proceptive (Davis & Arnocky, 2020; Moule & Fisher, 2015). This example makes salient the overlap between the cognitive behavioral model (e.g., personal thoughts and feelings associated with physical appearance) and the sociocultural theory of body image (e.g., media encouraging specific kinds of feminine dress; discussed by Frederick & Reynolds, 2021), with sexual strategies theory (i.e., evolved contextually based sex-differentiated mating strategies; Buss & Schmitt, 2016).

Heterosexual men's evolved propensity to attend to these sexualized signals may contribute to ethically problematic cultural phenomena whereby women are persuaded to adorn scantily clad garb in non-mating contexts. For example, Weaving (2014) examined the Lingerie Football League (recently rebranded the X-League) and argued that the lingerie-style uniforms female athletes must wear creates a sexist caricature of women in sport. Although operating at different levels of analysis, many sociocultural and evolutionary researchers would likely agree that women should have the power to choose what uniforms they wear to compete in.

Another example demonstrating the utility of a socioevolutionary lens relates to the grooming, styling, and depilation of men's facial hair. In his response, Dixson (2021) drew attention to how male beardedness could be a sexually selected trait in stating "…beards may be an ornamental feature that communicates men's age, masculinity, and aspects of social dominance that, in turn, may be perceived as sexually attractive for long-term and co-parenting relationships rather than short-term relationships." Sociocultural theory of body image (Thompson et al., 1999) can enrich an understanding of how media promotes certain styling and depilation practices for men's facial hair. In Western culture, companies like The Beard Struggle® advertise an array of beard-care products, including shampoos, conditioners, sprays, tonic oils, balms, and volumizing brushes, that are paired with images of tough, musclebound Viking men. This example spotlights the interwoven nature of evolutionary and sociocultural processes regarding men's facial hair practices denoted by Dixson and capitalized on by The Beard Struggle®. Men may be encouraged, or feel pressured, to use these products to augment perceptions of masculinity and dominance, which they may perceive as providing them with more bargaining power on the mating market in Western society (see Frederick & Reynolds, 2021). Beard care and grooming may also augment perceptions of men's cleanliness, which can be important within occupational contexts in developed societies where proper hygiene is seen as a crucial part of "professional appearance," such as in the hospitality (Tesone & Ricci, 2006) and food service industries (Fournier & Ineson, 2010).

Clarifying Theoretical and Methodological Inconsistencies

In their responses, Dixson (2021) and Jones et al. (2021) elaborated on many important theoretical and methodological considerations that future researchers studying attractiveness and visual self-presentation modification should take heed of. Dixson emphasized the mixed findings that characterize the literature of women's preferences for facial masculinity, with some studies suggesting a heightened preference in short-term mating contexts (e.g., DeBruine, 2014), others in long-term mating circumstances (e.g., Clarkson et al., 2020), and still others finding no significant differences across mating contexts (e.g., Stower et al., 2020). Dixson further spoke about the inconsistent cross-cultural findings in the mate preference literature regarding the role of pathogen stress and degree of economic development. For instance, some studies have supported that woman prefer facial masculinity in lower-income nations with higher pathogen stress (e.g., DeBruine et al., 2012), whereas others report that women living in more urban environments with lower pathogen stress prefer more masculinized faces (e.g., Marcinkowska et al., 2019). In relation to cross-cultural preferences for women's body size and waist-to-hip ratios, Dixson offered an important reminder that "…a particular size, shape or distribution of secondary sexual fat deposits as the optimally healthy and preferred female physique is inaccurate and fails to capture mate preferences around the world." Dixson further encouraged future researchers to consider how Western makeup applications might be viewed differently across the globe, and the need for more empirical work on how intrasexual competition has shaped men's hairstyling, depilation, and grooming practices.

Like the ambiguity in the literature on women's preferences for facial masculinity, there are ongoing debates in the literature on women's facial attractiveness, such as the utility of data- and theory-driven models and whether multivariate techniques are superior to univariate analyses (Holzleitner et al., 2019). In their response, Jones et al. (2021) focused on inconsistent findings, important nuance, and avenues in need of future empirical inquiry regarding "…four aspects of underlying physical condition typically emphasized and considered by evolutionary theories of facial attractiveness." These components of physical condition concern: (1) susceptibility to infectious illnesses, (2) the role of sex hormones (e.g., estrogen), (3) menstrual cycle phase position, and (4) youth. Jones et al. pointed out that researchers have not consistently supported correlations between indicators of physical health (e.g., greater immunocompetence) and women's facial attractiveness (e.g., Żelaźniewicz et al., 2020). Yet, there is a somewhat pervasive belief in evolutionary psychology that women's facial attractiveness is a

reliable cue to health status. Jones et al. further noted that "…very few have directly investigated the effects of current infections on facial attractiveness." Therefore, it would be fruitful for future researchers to examine how visual appearance shifts with infection status (e.g., a pallid appearance; Axelsson et al., 2018) and how this influences perceptions of attractiveness. Jones et al. posited that certain forms of visual appearance enhancement, such as wearing cosmetics, might "…function to obscure facial cues of current illness (e.g., pallor and fatigue cues), rather than enhance signals of good long-term health."

Mixed findings also typify research regarding the links between women's sex hormones and their facial attractiveness. A review by Lephart (2018) indicated that estrogens are related to perceptions of age, attractiveness, and skin health. Nonetheless, regarding estrogen and progesterone, Jones et al. (2021) asserted that "…empirical evidence for the proposal that women with more attractive faces tend to have higher levels of these hormones is mixed." They pointed to research by Law Smith et al. (2006) who suggested that the use of cosmetics might obscure, rather than amplify, the links between facial attractiveness and hormone-linked facial characteristics. Thus, far more research is needed regarding the specific visual cues that facial cosmetic products enhance, whether these products increase attractiveness by accentuating hormonally mediated facial features, and if these facial features are reliably linked to markers of biological condition.

Jones et al. (2021) further asserted that, although many evolutionary scholars believe that women's facial attractiveness varies predictably across the phases of the menstrual cycle, this evidence is quite mixed. Evidence is also inconsistent regarding whether morphological facial features purported to connote biological condition and facial attractiveness differ significantly across the menstrual cycle. For example, Marcinkowska and Holzleitner (2020) did not find evidence for cycle-dependent shifts in facial symmetry, averageness, and sexual dimorphism during high and low fertile phases of women's menstrual cycles. Consequently, Jones et al. argued "Thus, it seems unlikely that appearance-enhancement behaviors target facial characteristics linked to cyclic changes in fertility, particularly given appearance-enhancement behaviors do not reliably track changes in fertility during the menstrual cycle." Dixson (2021) advanced a similar criticism regarding purported cycle-dependent shifts in women's mate preferences, which "…may be less robust than the foundational research reported." Although evidence supporting cycle-dependent shifts in facial attractiveness and mate preferences are equivocal, shifts in appearance enhancement behavior across the menstrual cycle appear to be somewhat consistent (Durante et al., 2008; Eisenburch et al., 2015; Guéguen, 2012; Haselton et al., 2007; Kim & Hiromi, 1995; Röder et al., 2009; Saad & Stenstrom, 2012; Schwarz & Hassebrauck, 2008). Several of these studies have salient methodological limitations (see Jones et al., 2019), but so do studies reporting null results or small effects (e.g., the use of backward counting methods to pinpoint cycle phase position; Arslan et al., 2018; Schleifenbaum et al., 2021). Therefore, more research on cycle-dependent shifts in women's visual appearance modification is needed.

An interesting area of empirical inquiry that intersects with women's visual appearance modification and purported cycle-dependent shifts concerns the so-called red-attractiveness effect, which was not touched on in our target article. In previous work, women have been shown to wear red clothing more often when intending to meet attractive singletons (Prokop & Hromada, 2013) and in the context of real-world first dates (Kramer & Mulgrew, 2018). These women are viewed as more attractive, as well as more sexually receptive and proceptive (Elliot et al., 2013). Therefore, red clothing may be used by women to communicate sexual interest. From the perspective of color-in-context theory (Elliot & Maier, 2014 see for review), red is linked to sexual arousal and fertility in human and non-human primates, and thus influences behavior in a mating context. Nonetheless, some studies have failed to support the "red-attractiveness" effect among men viewing women (e.g., Lehmann & Calin-Jageman, 2017). Pazda et al. (2021) argued that "…this effect is absent under certain conditions, such as when women have masculine, unattractive, or older features." Across three experiments, these researchers showed that men rated images of highly desirable female models as significantly more attractive when they were wearing red in comparison with when they were wearing green lingerie. Pazda et al. further showed that the red-attractiveness effect was significantly mediated by perceptions of sexual receptivity.

Some researchers have supported that women are more likely to wear red or pink clothing during more fertile phases of the menstrual cycle relative to when they are less fertile (i.e., the "red-dress effect"; Beall & Tracy, 2013). In an attempted replication of their earlier study, Tracy and Beall (2014) found that current weather was an important moderator of this relation: the red-dress effect was absent during warmer days when data were collected and present during colder days of data collection. These researchers reasoned that "If the red-dress effect is driven by a desire to increase one's sexual appeal, then it should emerge most reliably when peak-fertility women have few alternative options for accomplishing this goal (e.g., wearing minimal clothing)." Nonetheless, a recent study considering outside temperature did not find compelling evidence that women were more likely to wear red or pink during peak fertility on colder days (Hone & McCullough, 2020). Therefore, like much of the research on women's cycle-dependent shifts (Jones et al., 2019), results appear relatively mixed regarding the red-dress effect during times of peak fertility. Along with omitting a discussion of the purported red-attractiveness effect, our target article also

did not provide an adequate discussion of how developmental parameters might impact visual appearance enhancement behavior.

Importance of Developmental Period

In their response, Lewis and Buss (2021) mentioned the importance of inputs during development regarding attractiveness-assessment mechanisms. Bradshaw and DelPriore (2021) also commented on the salience of developmental period: "…it may be useful to examine the functions that appearance enhancement serves across the lifespan, as benefits (and thus motives) are likely to vary at different ages." Bradshaw and DelPriore suggested that younger women might enhance their appearance in service of mating-relevant goals, whereas older women might enhance their appearance primarily for status-related benefits, such as in service of augmenting inclusive fitness through investing in grandchildren. Dixson (2021) also spoke of the relevance of studying age differences in women's proclivity to undergo cosmetic surgeries such as mammoplasty. Young nulliparous women may opt for breast enlargement for the purpose of mate attraction and intrasexual rivalry, whereas older parous and multiparous women might opt for surgeries, such as mastopexy, to increase the firmness and shape of their breasts to augment perceptions of reproductive value. In their response, Jones et al. (2021) discussed an example that lends itself to a consideration of developmental period. Referring to research by Russell et al. (2019), these commentators noted that "…although women between 40 and 50 years of age were judged to be younger when wearing makeup than when not wearing makeup, women around 20 years of age were judged to be older when wearing makeup than when not wearing makeup." Therefore, women's use of cosmetics does not appear to unequivocally enhance perceptions of youthfulness, and age is likely an important demographic consideration in this research.

From Traditional to Digital Visual Appearance Enhancements

Some of the commentators touched on how individuals not only strive to modify their appearance for face-to-face social, romantic, and sexual interactions, but also online via social media and applications mediated by different digital technologies. For example, Jones et al. (2021) stated that "Whether the motivations behind the application of digital methods for appearance enhancement are broadly the same or qualitatively different to those implicated in real-world interactions is an exciting avenue for research in this area." Valentova et al. (2021) noted that virtual self-presentation modification provides important opportunities for self-promotion through "…specific selfie angles, photo editing applications, filters, virtual backgrounds, and creation of avatars with the addition of features and 'skins' in virtual games." Studying forms of digital visual appearance enhancement offers another avenue through which to illustrate the complementarity of sociocultural and evolutionary approaches, and several insightful studies have been published on the topic.

Sedgewick et al. (2017) found that the angles of dating profile self-portraits (i.e., selfies) on Tinder (an online dating application) differed in sex-specific ways in line with evolutionary thinking: men more often took photographs from below, perhaps to create the appearance of being taller, whereas women more often had photographs angled downward, perhaps to appear shorter. Hendrickse et al. (2017) showed that female university students' frequency of Instagram usage (a photograph-based social media application) predicted a drive for thinness and body dissatisfaction, both of which were mediated through physical appearance comparisons. These researchers also supported a positive relation between intrasexual competitiveness and frequency of appearance comparisons when using Instagram. Tifferet and Vilnai-Yavetz (2018) studied profile portraits on LinkedIn (an employment-oriented networking website) and noted many similarities across portraits that help to communicate professionalism (e.g., professional workwear), but that people varied in the degree to which they smiled. Smiling may increase perceptions of warmth and likeability, but larger smiles can reduce perceptions of competence. Women were also found to be more emotionally expressive in their LinkedIn portraits, whereas men more often wore formal business attire, perhaps to signal status.

Miller (2020) showed that androphilic men often showed their faces in their online dating profile photographs, and that about 20% included photographs of their unclothed torsos. Expressing a drive for a muscular physique and higher self-rated masculinity predicted having a shirtless photograph among these men. Naezer (2020) reported that adolescent girls' sexualized self-portraits (i.e., "sexy selfies") can be shared to embrace and promote one's sexuality, as well as to attract potential partners. However, girls who shared sexy selfies also risked being targeted for objectification, harassment, and bullying. Collectively, these findings suggest that digital visual appearance enhancement involves culturally unique modern technologies, applications, and websites that appear to be governed by motivations, dynamics, and outcomes that are similar to those observed with traditional face-to-face visual self-presentation modification. It will be fruitful for future researchers to study the motivations and effectiveness of using digital means to augment various aspects of physical appearance often regarded as attractive, such as using virtual makeup apps (e.g., Perfect365©) to increase the prominence of limbal rings (Lewis & Buss,

2021), eyelash length (Pazhoohi & Kingstone, 2020), and youthfulness (Jones et al., 2021).

Conclusion

Since the writing of the target article, research on the diverse ways in which humans alter and modify their appearance from an evolutionary perspective has continued to grow (e.g., Jach & Moroń, 2020; Kellie et al., 2021; Pazhoohi & Kingstone, 2020; Wang et al., 2021). This demonstrates the timely nature of a comprehensive review of human visual self-presentation modification to provide scholars with insight into the complementarity of sociocultural and evolutionary approaches (i.e., a socioevolutionary framework), pertinent theoretical and methodological considerations, and avenues in need of future empirical attention. Many of these evolutionary scholars are already employing socioevolutionary approaches in their research on visual appearance enhancement. For example, Kellie et al. drew on insights from objectification theory (Fredrickson & Roberts, 1997) in their study of women's cosmetic usage across mating (e.g., romantic date) and non-mating contexts (e.g., job interview), and the sex-specific attributions made of women's mental capacities and moral status by level of makeup usage.

The commentators responding to the target article raised many salient points that will help to guide future research on the topic. Underneath the broad umbrella of self-presentation modification fall strategies that can be used to either enhance (i.e., self-presentation enhancement) or worsen (i.e., self-presentation worsening) one's appeal across various sensory modalities (e.g., visual, olfactory, and tactile; Valentova et al., 2021). Studying the levels of specific visual cues and signals emphasized, or attenuated, by certain forms of visual appearance modification will help to advance novel hypotheses about how selection has shaped attractiveness-assessment mechanisms (Lewis & Buss, 2021). This approach will also permit a finer-grained examination of how some forms of visual appearance enhancement draw on multiple visual cues to augment attractiveness, as well as how varying forms of visual self-presentation target the same visual cue in context-specific ways.

Humans have historically and continue to engage in appearance modification practices for direct mating benefits, but also in the broader service of social competition to acquire status, friends, allies, economic resources, and co-parents that impact survival and reproductive success (Blake, 2021; Bradshaw & DelPriore, 2021). Women's visual appearance enhancements can augment physical attractiveness and be a powerful means through which to compete for social status.

Blending sociocultural and evolutionary perspectives requires explicitly attending to key theoretical and methodological insights in both communities of researchers to comprehensively study the proximate and ultimate mechanisms underpinning visual appearance enhancement behavior (Frederick & Reynolds, 2021). Inconsistent and mixed findings characterize much of the research on heterosexual women's preferences for masculine features and men's grooming patterns across mating contexts, social-ecological parameters (e.g., level of pathogen stress), and menstrual cycle phase position (Dixson, 2021). Likewise, whether women's facial attractiveness reliably signals physical condition in relation to health, sex hormones, menstrual cyclicity, and youth remains to be confirmed, despite longstanding assumptions in the evolutionary literature regarding the robustness of this evidence (Jones et al., 2021). Thus, it is prudent that future investigators inquire further into how various modes of visual appearance enhancement influence specific visual cues in sex- and context-specific ways to augment attractiveness, and whether these attractive qualities connote aspects of underlying physical condition.

References

Abed, R., Mehta, S., Figueredo, A. J., Aldridge, S., Balson, H., Meyer, C., & Palmer, R. (2012). Eating disorders and intrasexual competition: Testing an evolutionary hypothesis among young women. *The Scientific World Journal*. https://doi.org/10.1100/2012/290813

Aguinaldo, E. R., & Peissig, J. J. (2021). Who's behind the makeup? The effects of varying levels of cosmetics application on perceptions of facial attractiveness, competence, and sociosexuality. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2021.661006

Albert, G., & Arnocky, S. (2016). Use of mate retention strategies. In T. K. Shackelford & V. A. Weekes-Shackelford (Eds.), *Encyclopedia of evolutionary psychological science*. Springer. https://doi.org/10.1007/978-3-319-16999-6_151-1

Allen, C., Havlíček, J., & Roberts, S. C. (2019). The effects of artificial fragrances on human olfactory communication. In C. D. Buesching (Ed.), *Chemical signals in vertebrates 14* (pp. 107–117). Springer.

Anderson, S. L. (2019). The importance of attractiveness across cultures. In K. D. Keith (Ed.), *Cross-Cultural psychology: Contemporary themes and perspectives* (pp. 598–613). Wiley.

Arnocky, S. (2020). Mate-value moderates the relationship between intrasexual competitiveness and successful mate poaching. *Evolutionary Psychological Science, 6*, 346–353. https://doi.org/10.1007/s40806-020-00242-0

Arnocky, S., & Locke, A. (2020). Jealousy mediates the link between women's upward physical appearance comparison and mate retention behavior. *Evolutionary Psychology, 18*(4), 1–9. https://doi.org/10.1177/1474704920973990

Arnocky, S., Perilloux, C., Cloud, J. M., Bird, B. M., & Thomas, K. (2016). Envy mediates the link between social comparison and appearance enhancement in women. *Evolutionary Psychological Science, 2*(2), 71–83. https://doi.org/10.1007/s40806-015-0037-1

Arnocky, S., & Piché, T. (2014). Cosmetic surgery as intrasexual competition: The mediating role of social comparison. *Psychology, 5*, 1197–1205. https://doi.org/10.4236/psych.2014.510132

Arnocky, S., Proietti, V., Ruddick, E. L., Côté, T. R., Ortiz, T. L., Hodson, G., & Carré, J. M. (2019). Aggression toward sexualized women is mediated by decreased perceptions of humanness. *Psychological Science, 30*(5), 748–756. https://doi.org/10.1177/0956797619836106

Arnocky, S., & Vaillancourt, T. (2017). Sexual competition among women: A review of the theory and supporting evidence. In M. L. Fisher (Ed.), *The Oxford handbook of women and competition* (pp. 25–39). Oxford University Press.

Arslan, R. C., Schilling, K. M., Gerlach, T. M., & Penke, L. (2018). Using 26,000 diary entries to show ovulatory changes in sexual desire and behavior. *Journal of Personality and Social Psychology*, *121*, 410–431. https://doi.org/10.1037/pspp0000208

Axelsson, J., Sundelin, T., Olsson, M. J., Sorjonen, K., Axelsson, C., Lasselin, J., & Lekander, M. (2018). Identification of acutely sick people and facial cues of sickness. *Proceedings of the Royal Society B: Biological Sciences, 285*(1870), 20172430. https://doi.org/10.1098/rspb.2017.2430

Barton, S., Eastham, A., Isom, A., McIaverty, D., & Soong, Y. L. (Eds.). (2020). *Discovering cosmetic science*. Croydon: Royal Society of Chemistry.

Beall, A. T., & Tracy, J. L. (2013). Women are more likely to wear red or pink at peak fertility. *Psychological Science, 24*(9), 1837–1841. https://doi.org/10.1177/0956797613476045

Benenson, J. F. (2013). The development of human female competition: Allies and adversaries. *Philosophical Transactions of the Royal Society b: Biological Sciences, 368*(1631), 20130079. https://doi.org/10.1098/rstb.2013.0079

Bernard, P., Servais, L., Wollast, R., & Gervais, S. (2020). An initial test of the cosmetics dehumanization hypothesis: Heavy makeup diminishes attributions of humanness-related traits to women. *Sex Roles, 83*(5), 315–327. https://doi.org/10.1007/s11199-019-01115-y

Biernaskie, J. M., Perry, J. C., & Grafen, A. (2018). A general model of biological signals, from cues to handicaps. *Evolution Letters, 2*(3), 201–209. https://doi.org/10.1002/evl3.57

Blake, K. R. (2021). Attractiveness helps women secure mates, but also status and reproductively relevant resources [Commentary]. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-021-01949-2

Bleske-Rechek, A., & Lighthall, M. (2010). Attractiveness and rivalry in women's friendships with women. *Human Nature, 21*(1), 82–97. https://doi.org/10.1007/s12110-010-9081-5

Bradshaw, H. K., & DelPriore, D. J. (2021). Beautification is more than mere mate attraction: Extending evolutionary perspectives on female appearance enhancement [Commentary]. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-021-01952-7

Brown, M., & Sacco, D. F. (2018). Put a (limbal) ring on it: Women perceive men's limbal rings as a health cue in short-term mating domains. *Personality and Social Psychology Bulletin, 44*(1), 80–91. https://doi.org/10.1177/0146167217733072

Burch, R. L. (2020). More than just a pretty face: The overlooked contributions of women in evolutionary psychology textbooks. *Evolutionary Behavioral Sciences, 14*(1), 100–114. https://doi.org/10.1037/ebs0000166

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*(1), 1–49. https://doi.org/10.1017/S0140525X00023992

Buss, D. M., Durkee, P. K., Shackelford, T. K., Bowdle, B. F., Schmitt, D. P., Brase, G. L., Choe, J. C., & Trofimova, I. (2020). Human status criteria: Sex differences and similarities across 14 nations. *Journal of Personality and Social Psychology, 119*(5), 979–998. https://doi.org/10.1037/pspa0000206

Buss, D. M., & Schmitt, D. P. (2016). Sexual strategies theory. In T. K. Shackelford & V. A. Weekes-Shackelford (Eds.), *Encyclopedia of evolutionary psychological science*. Springer. https://doi.org/10.1007/978-3-319-16999-6_1861-1

Cahoon, D. D., & Edmonds, E. M. (1989). Male-female estimates of opposite-sex first impressions concerning females' clothing styles. *Bulletin of the Psychonomic Society, 27*(3), 280–281. https://doi.org/10.1016/0162-3095(87)90037-9

Cheng, J. T., Tracy, J. L., Foulsham, T., Kingstone, A., & Henrich, J. (2013). Two ways to the top: Evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. *Journal of Personality and Social Psychology, 104*(1), 103–125. https://doi.org/10.1037/a0030398

Clarkson, T. R., Sidari, M. J., Sains, R., Alexander, M., Harrison, M., Mefodeva, V., & Dixson, B. J. W. (2020). A multivariate analysis of women's mating strategies and sexual selection on men's facial morphology. *Royal Society Open Science, 7*, 191209. https://doi.org/10.1098/rsos.191209

Clutton-Brock, T., & Huchard, E. (2013). Social competition and its consequences in female mammals. *Journal of Zoology, 289*(3), 151–171. https://doi.org/10.1111/jzo.12023

Davis, A. C., & Arnocky, S. (2020). An evolutionary perspective on appearance enhancement behavior. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-020-01745-4

Davis, A. C, Arnocky, S., Mackinnon, M., A., & McKelvie, L. (in press). Men's extra-pair sexual interest. In T. K. Shackelford (Ed.). *The Cambridge handbook of evolutionary perspectives on sexual psychology*. Cambridge: Cambridge University Press

Davis, A. C., Desrochers, J., DiFilippo, A., Vaillancourt, T., & Arnocky, S. (2018). Type of jealousy differentially predicts cost-inflicting and benefit-provisioning mate retention. *Personal Relationships*, *25*(4), 596–610. https://doi.org/10.1111/pere.12262

Davis, A. C., Vaillancourt, T., & Archer, J. (2020). Evolutionary roots of women's aggression: Causes, contexts, and consequences. In F. M. Cheung & D. F. Halpern (Eds.), *The Cambridge handbook of the international psychology of women* (pp. 258–272). Cambridge University Press.

DeBruine, L. M. (2014). Women's preferences for male facial features. In V. Weekes-Shackelford & T. K. Shackelford (Eds.), *Evolutionary perspectives on human sexual psychology and behavior* (pp. 261–275). Springer.

DeBruine, L. M., Little, A., & Jones, B. C. (2012). Extending parasite stress theory to variation in human mate preferences. *Behavioral and Brain Sciences, 35*, 86–87. https://doi.org/10.1017/S0140525X11000987

De Klerk, H. M., & Lubbe, S. (2008). Female consumers' evaluation of apparel quality: Exploring the importance of aesthetics. *Journal of Fashion Marketing and Management, 12*(1), 36–50. https://doi.org/10.1108/13612020810857934

Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology, 24*(3), 285–290. https://doi.org/10.1037/h0033731

Dixson, B. J. (2021). Sexual selection and the evolution of human appearance enhancements [Commentary]. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-021-01946-5

Durante, K. M., Li, N. P., & Haselton, M. G. (2008). Changes in women's choice of dress across the ovulatory cycle: Naturalistic and laboratory task-based evidence. *Personality and Social Psychology Bulletin, 34*(11), 1451–1460. https://doi.org/10.1177/0146167208323103

Eisenburch, S., Simmons, Z. L., & Roney, J. R. (2015). Lady in red: Hormonal predictors of women's clothing choices. *Psychological Science, 26*(8), 1332–1338. https://doi.org/10.1177/0956797615586403

Elliot, A. J., Greitemeyer, T., & Pazda, A. D. (2013). Women's use of red clothing as a sexual signal in intersexual interaction. *Journal of Experimental Social Psychology, 49*(3), 599–602. https://doi.org/10.1016/j.jesp.2012.10.001

Elliot, A. J., & Maier, M. A. (2014). Color psychology: Effects of perceiving color on psychological functioning in humans. *Annual Review of Psychology, 65*, 95–120. https://doi.org/10.1146/annurev-psych-010213-115035

Fisher, M. L., & Moule, K. R. (2013). A new direction for intrasexual competition research: Cooperative versus competitive motherhood. *Journal of Social, Evolutionary, and Cultural Psychology, 7*(4), 318–325. https://doi.org/10.1037/h0099187

Fisher, M. L., Burch, B., & Sokol-Chang, R. (2017). A theoretical proposal for examining the integration of cooperative and competitive mothering behavior. *Human Ethology Bulletin, 32*(1), 6–16. https://doi.org/10.22330/heb/321/006-016

Fournier, H., & Ineson, E. M. (2010). Closing the gap between education and industry: Skills' and competencies' requirements for food service internships in Switzerland. *Journal of Hospitality & Tourism Education, 22*(4), 33–42. https://doi.org/10.1080/10963758.2010.10696990

Frederick, D. A., & Reynolds, T. A. (2021). The value of integrating evolutionary and sociocultural perspectives on body image. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-021-01947-4

Fredrickson, B. L., & Roberts, T. A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly, 21*, 173–206. https://doi.org/10.1111/j.1471-6402.1997.tb00108.x

Freeberg, T. M., Book, D. L., Jung, H., & Kyle, S. C. (2017). Communication cues and signals. In T. Shackelford & V. Weekes-Shackelford (Eds.), *Encyclopedia of evolutionary psychological science.* Springer. https://doi.org/10.1007/978-3-319-16999-6_2728-1

Geary, D. C., Winegard, B., & Winegard, B. (2014). Reflections on the evolution of human sex differences: Social selection and the evolution of competition among women. In V. A. Weekes-Shackelford & T. K. Shackelford (Eds.), *Evolutionary perspectives on human sexual psychology and behavior* (pp. 393–412). Springer.

Ghodsee, K. (2007). Potions, lotions and lipstick: The gendered consumption of cosmetics and perfumery in socialist and post-socialist urban Bulgaria. *Women's Studies International Forum, 30*(1), 26–39. https://doi.org/10.1016/j.wsif.2006.12.003

Ginsberg, A. (1955). Operational definitions and theories. *Journal of General Psychology, 52*(2), 223–245. https://doi.org/10.1080/00221309.1955.9920241

Glick, P., Larsen, S., Johnson, C., & Branstiter, H. (2005). Evaluations of sexy women in low-and high-status jobs. *Psychology of Women Quarterly, 29*(4), 389–395.

Groyecka, A., Pisanski, K., Sorokowska, A., Havlíček, J., Karwowski, M., Puts, D., & Sorokowski, P. (2017). Attractiveness is multimodal: Beauty is also in the nose and ear of the beholder. *Frontiers in Psychology, 8*, 778. https://doi.org/10.3389/fpsyg.2017.00778

Guéguen, N. (2012). Makeup and menstrual cycle: Near ovulation, women use more cosmetics. *Psychological Record, 62*(3), 541–548. https://doi.org/10.1007/BF03395819

Gurung, R. A. R., & Chrouser, C. (2007). Predicting objectification: Do provocative clothing and observer characteristics matter? *Sex Roles, 57*, 91–99. https://doi.org/10.1007/s11199-007-9219-z

Gurung, R. A., Punke, E., Brickner, M., & Badalamenti, V. (2018). Power and provocativeness: The effects of subtle changes in clothing on perceptions of working women. *Journal of Social Psychology, 158*(2), 252–255. https://doi.org/10.1080/00224545.2017.1331991

Hanna, E., Ward, L. M., Seabrook, R. C., Jerald, M., Reed, L., Giaccardi, S., & Lippman, J. R. (2017). Contributions of social comparison and self-objectification in mediating associations between Facebook use and emergent adults' psychological well-being. *Cyberpsychology, Behavior, and Social Networking, 20*(3), 172–179. https://doi.org/10.1089/cyber.2016.0247

Haselton, M. G., Mortezaie, M., Pillsworth, E. G., Bleske-Rechek, A., & Frederick, D. A. (2007). Ovulatory shifts in human female ornamentation: Near ovulation, women dress to impress. *Hormones and Behavior, 51*(1), 40–45. https://doi.org/10.1016/j.yhbeh.2006.07.007

Heilman, M. E., & Saruwatari, L. R. (1979). When beauty is beastly: The effects of appearance and sex on evaluations of job applicants for managerial and nonmanagerial jobs. *Organizational Behavior & Human Performance, 23*, 360–372. https://doi.org/10.1016/0030-5073(79)90003-5

Hendrickse, J., Arpan, L. M., Clayton, R. B., & Ridgway, J. L. (2017). Instagram and college women's body image: Investigating the roles of appearance-related comparisons and intrasexual competition. *Computers in Human Behavior, 74*, 92–100. https://doi.org/10.1016/j.chb.2017.04.027

Hill, E. M., Nocks, E. S., & Gardner, L. (1987). Physical attractiveness: Manipulation by physique and status displays. *Ethology and Sociobiology, 8*(2), 143–154. https://doi.org/10.1016/0162-3095(87)90037-9

Hill, S. E., & Buss, D. M. (2008). The evolutionary psychology of envy. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 60–70). Oxford University Press.

Holzleitner, I. J., Lee, A. J., Hahn, A. C., Kandrik, M., Bovet, J., Renoult, J. P., Simmons, D., Garrod, O., DeBruine, L. M., & Jones, B. C. (2019). Comparing theory-driven and data-driven attractiveness models using images of real women's faces. *Journal of Experimental Psychology: Human Perception and Performance, 45*(12), 1589–1595. https://doi.org/10.1037/xhp0000685

Hone, L. S., & McCullough, M. E. (2020). Are women more likely to wear red and pink at peak fertility? What about on cold days? Conceptual, close, and extended replications with novel clothing colour measures. *British Journal of Social Psychology, 59*(4), 945–964. https://doi.org/10.1111/bjso.12371

Howlett, N., Pine, K. J., Cahill, N., Orakçıoğlu, İ, & Fletcher, B. C. (2015). Unbuttoned: The interaction between provocativeness of female work attire and occupational status. *Sex Roles, 72*(3), 105–116. https://doi.org/10.1007/s11199-015-0450-8

Hrdy, S. B. (2009). *The woman that never evolved*. Harvard University Press.

Jach, Ł, & Moroń, M. (2020). I can wear a beard, but you should shave Preferences for men's facial hair from the perspective of both sexes. *Evolutionary Psychology, 18*(4), 1–9. https://doi.org/10.1177/1474704920961728

Jellinek, P. (1997). Fragrance in cosmetic products. In J. S. Jellinek (Ed.), *The psychological basis of perfumery* (pp. 131–137). Springer.

Johnson, S. K., Podratz, K. E., Dipboye, R. L., & Gibbons, E. (2010). Physical attractiveness biases in ratings of employment suitability: Tracking down the "beauty is beastly" effect. *Journal of Social Psychology, 150*, 301–318. https://doi.org/10.1080/00224540903365414

Johnson, V., & Gurung, R. A. R. (2011). Defusing the objectification of women by other women: The role of competence. *Sex Roles, 65*, 177–188. https://doi.org/10.1007/s11199-011-0006-5

Jones, B. C., Hahn, A. C., & DeBruine, L. M. (2019). Ovulation, sex hormones, and women's mating psychology. *Trends in Cognitive Sciences, 23*, 51–62. https://doi.org/10.1016/j.tics.2018.10.008

Jones, B. C., Jones, A. L., Shiramizu, V., & Anderson, C. (2021). What does women's facial attractiveness signal? Implications for an evolutionary perspective on appearance enhancement [Commentary]. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-021-01955-4

Jones, B. C., Little, A. C., Penton-Voak, I. S., Tiddeman, B. P., Burt, D. M., & Perrett, D. I. (2001). Facial symmetry and judgements of apparent health: Support for a "good genes" explanation of the attractiveness–symmetry relationship. *Evolution and Human Behavior, 22*(6), 417–429. https://doi.org/10.1016/S1090-5138(01)00083-6

Jones, D., Brace, C. L., Jankowiak, W., Laland, K. N., Musselman, L. E., Langlois, J. H., & Symons, D. (1995). Sexual selection, physical attractiveness, and facial neoteny: Cross-cultural evidence and implications [and comments and reply]. *Current Anthropology, 36*(5), 723–748. https://doi.org/10.1086/204427

Karimova, G. Z., Rassilbay, A., & Sauers, D. A. (2017). Lingerie and morality Generation Y Kazakhstani women's attitude toward lingerie. *Journal of Eastern European and Central Asian Research*, *4*. https://doi.org/10.15549/jeecar.v4i1.149

Kelan, E. K. (2013). The becoming of business bodies: Gender, appearance, and leadership development. *Management Learning, 44*(1), 45–61. https://doi.org/10.1177/1350507612469009

Kellie, D. J., Blake, K. R., & Brooks, R. C. (2021). Behind the makeup: The effects of cosmetics on women's self-objectification, and their objectification by others. *European Journal of Social Psychology*. https://doi.org/10.1002/ejsp.2767

Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in human reproductive strategies. *Behavioral and Brain Sciences, 15*(1), 75–91. https://doi.org/10.1017/S0140525X00067595

Kim, H. E., & Hiromi, T. (1995). Effects of the menstrual cycle on dressing behavior in the cold. *Physiology & Behavior, 58*(4), 699–703. https://doi.org/10.1016/0031-9384(95)00118-3

Kite, M. E., & Whitley, B. E. (2018). *Principles of research in behavioral science*. Routledge.

Knack, J. M., Tsar, V., Vaillancourt, T., Hymel, S., & McDougall, P. (2012). What protects rejected adolescents from also being bullied by their peers? The moderating role of peer-valued characteristics. *Journal of Research on Adolescence, 22*(3), 467–479. https://doi.org/10.1111/j.1532-7795.2012.00792.x

Kościński, K. (2013). Perception of facial attractiveness from static and dynamic stimuli. *Perception, 42*(2), 163–175.

Kramer, R. S., & Mulgrew, J. (2018). Displaying red and black on a first date: A field study using the "first dates" television series. *Evolutionary Psychology, 16*(2), 1–7. https://doi.org/10.1177/1474704918769417

Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin, 126*(3), 390–423. https://doi.org/10.1037/0033-2909.126.3.390

Law Smith, M. J., Perrett, D. I., Jones, B. C., Cornwell, R. E., Moore, F. R., Feinberg, D. R., & Hillier, S. G. (2006). Facial appearance is a cue to oestrogen levels in women. *Proceedings of the Royal Society b: Biological Sciences, 273*(1583), 135–140. https://doi.org/10.1098/rspb.2005.3296

Lee, K. S., Brittain, H., & Vaillancourt, T. (2018). Predicting dating behavior from aggression and self-perceived social status in adolescence. *Aggressive Behavior, 44*(4), 372–381. https://doi.org/10.1002/ab.21758

Lehmann, G. K., & Calin-Jageman, R. J. (2017). Is red really romantic? *Social Psychology, 48*(3), 174–183. https://doi.org/10.1027/1864-9335/a000296

Lemay, E. P., Jr., Clark, M. S., & Greenberg, A. (2010). What is beautiful is good because what is beautiful is desired: Physical attractiveness stereotyping as projection of interpersonal goals. *Personality and Social Psychology Bulletin, 36*(3), 339–353. https://doi.org/10.1177/0146167209359700

Lenochová, P., Vohnoutova, P., Roberts, S. C., Oberzaucher, E., Grammer, K., & Havlíček, J. (2012). Psychology of fragrance use: Perception of individual odor and perfume blends reveals a mechanism for idiosyncratic effects on fragrance choice. *PLoS ONE, 7*(3), e33810. https://doi.org/10.1371/journal.pone.0033810

Lephart, E. D. (2018). A review of the role of estrogen in dermal aging and facial attractiveness in women. *Journal of Cosmetic Dermatology, 17*(3), 282–288. https://doi.org/10.1111/jocd.12508

Lewis, D. M. G., Al-Shawaf, L., Conroy-Beam, D., Asao, K., & Buss, D. M. (2017). Evolutionary psychology: A how-to guide. *American Psychologist, 72*(4), 353–373. https://doi.org/10.1037/a0040409

Lewis, D. M. G., & Buss, D. M. (2021). Appearance enhancement: A cue-based approach [Commentary]. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-021-01957-2

Lyon, B. E., & Montgomerie, R. (2012). Sexual selection is a form of social selection. *Philosophical Transactions of the Royal Society b: Biological Sciences, 367*(1600), 2266–2273. https://doi.org/10.1098/rstb.2012.0012

Maestripieri, D., Henry, A., & Nickels, N. (2017). Explaining financial and prosocial biases in favor of attractive people: Interdisciplinary perspectives from economics, social psychology, and evolutionary psychology. *Behavioral and Brain Sciences, 40*, 1–56. https://doi.org/10.1017/S0140525X16000340

Mafra, A. L., Varella, M. A. C., Defelipe, R. P., Anchieta, N. M., de Almeida, C. A. G., & Valentova, J. V. (2020). Makeup usage in women as a tactic to attract mates and compete with rivals. *Personality and Individual Differences*, *163*, 1100042. https://doi.org/10.1016/j.paid.2020.110042

Mandler, G., & Kessen, W. (1959). *The language of psychology*. John Wiley.

Marcinkowska, U. M., & Holzleitner, I. J. (2020). Stability of women's facial shape throughout the menstrual cycle. *Proceedings of the Royal Society B, 287*(1924), 20192910. https://doi.org/10.1098/rspb.2019.2910

Marcinkowska, U. M., Rantala, M. J., Lee, A. J., Kozlov, M. V., Aavik, T., Cai, H., & Dixson, B. J. W. (2019). Women's preferences for men's facial masculinity are strongest under favorable ecological conditions. *Scientific Reports*. https://doi.org/10.1038/s41598-019-39350-8

Matsushita, S., Morikawa, K., & Yamanami, H. (2015). Measurement of eye size illusion caused by eyeliner, mascara, and eye shadow. *Journal of Cosmetic Science, 66*(3), 161–174.

Maynard Smith, J., & Harper, D. (2003). *Animal signals*. Oxford University Press.

Mileva, V. R., Jones, A. L., Russell, R., & Little, A. C. (2016). Sex differences in the perceived dominance and prestige of women with and without cosmetics. *Perception, 45*(10), 1166–1183. https://doi.org/10.1177/0301006616652053

Miller, B. (2020). A picture is worth 1000 messages: Investigating face and body photos on mobile dating apps for men who have sex with men. *Journal of Homosexuality, 67*(13), 1798–1822. https://doi.org/10.1080/00918369.2019.1610630

Moule, K. R., & Fisher, M. (2015). You can look but you cannot touch: Male behaviors observed in lingerie stores. *Human Ethology Bulletin, 29*(4), 4–17.

Naezer, M. (2020). Sexy selves: Girls, selfies and the performance of intersectional identities. *European Journal of Women's Studies, 27*(1), 41–56. https://doi.org/10.1177/1350506818804845

Paustian-Underdahl, S. C., & Walker, L. S. (2016). Revisiting the beauty is beastly effect: Examining when and why sex and attractiveness impact hiring judgments. *International Journal of Human Resource Management, 27*(10), 1034–1058. https://doi.org/10.1080/09585192.2015.1053963

Pazda, A. D., Thorstenson, C. A., & Elliot, A. J. (2021). The effect of red on attractiveness for highly attractive women. *Current Psychology*. https://doi.org/10.1007/s12144-021-02045-3

Pazhoohi, F., & Kingstone, A. (2020). The effect of eyelash length on attractiveness: A previously uninvestigated indicator of beauty. *Evolutionary Behavioral Sciences*. https://doi.org/10.1037/ebs0000243

Prokop, P., & Hromada, M. (2013). Women use red in order to attract mates. *Ethology, 119*(7), 605–613. https://doi.org/10.1111/eth.12102

Provine, R. R., Cabrera, M. O., & Nave-Blodgett, J. (2013). Red, yellow, and super-white sclera. *Human Nature, 24*(2), 126–136. https://doi.org/10.1007/s12110-013-9168-x

Talamas, S. N., Mavor, K. I., & Perrett, D. I. (2016). Blinded by beauty: Attractiveness bias and accurate perceptions of academic performance. *PLoS ONE, 11*(2), e0148284. https://doi.org/10.1371/journal.pone.0148284

Tesone, D. V., & Ricci, P. (2006). Toward a definition of entry-level job competencies: Hospitality manager perspectives. *International Journal of Hospitality & Tourism Administration, 7*(4), 65–80. https://doi.org/10.1300/J149v07n04_04

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. American Psychological Association.

Tifferet, S., & Vilnai-Yavetz, I. (2018). Self-presentation in LinkedIn portraits: Common features, gender, and occupational differences. *Computers in Human Behavior, 80*, 33–48. https://doi.org/10.1016/j.chb.2017.10.013

Toerien, M., & Wilkinson, S. (2004). Exploring the depilation norm: A qualitative questionnaire study of women's body hair removal. *Qualitative Research in Psychology, 1*(1), 69–92. https://doi.org/10.1191/1478088704qp006oa

Tracy, J. L., & Beall, A. T. (2014). The impact of weather on women's tendency to wear red or pink when at high risk for conception. *PLoS ONE, 9*(2), e88852. https://doi.org/10.1371/journal.pone.0088852

Reynolds, T. A. (2021). Our grandmothers' legacy: Challenges faced by female ancestors leave traces in modern women's same-sex relationships. *Archives of Sexual Behavior.* https://doi.org/10.1007/s10508-020-01768-x

Roberts, S. C., Havlíček, J., & Schaal, B. (2020). Human olfactory communication: Current challenges and future prospects. *Philosophical Transactions of the Royal Society B: Biological Sciences, 375*(1800), 20190258. https://doi.org/10.1098/rstb.2019.0258

Röder, S., Brewer, G., & Fink, B. (2009). Menstrual cycle shifts in women's self-perception and motivation: A daily report method. *Personality and Individual Differences, 47*(6), 616–619. https://doi.org/10.1016/j.paid.2009.05.019

Rucas, S. L., Gurven, M., Kaplan, H., Winking, J., Gangestad, S., & Crespo, M. (2006). Female intrasexual competition and reputational effects on attractiveness among the Tsimane of Bolivia. *Evolution and Human Behavior, 27*(1), 40–52. https://doi.org/10.1016/j.evolhumbehav.2005.07.001

Ruffle, B. J., & Shtudiner, Z. E. (2015). Are good-looking people more employable? *Management Science, 61*(8), 1760–1776. https://doi.org/10.1287/mnsc.2014.1927

Russell, R. (2011). Why cosmetics work. In R. B. Adams, N. Ambady, K. Nakayama, & S. Shimojo (Eds.), *The science of social vision* (pp. 186–204). Oxford University Press.

Russell, R., Batres, C., Courrèges, S., Kaminski, G., Soppelsa, F., Morizot, F., & Porcheron, A. (2019). Differential effects of makeup on perceived age. *British Journal of Psychology, 110*(1), 87–100. https://doi.org/10.1111/bjop.12337

Saad, G., & Stenstrom, E. (2012). Calories, beauty, and ovulation: The effects of the menstrual cycle on food and appearance-related consumption. *Journal of Consumer Psychology, 22*(1), 102–113. https://doi.org/10.1016/j.jcps.2011.10.001

Schleifenbaum, L., Driebe, J., Penke, L., & Arslan, R. (2021). Women feel more attractive before ovulation: Evidence from a large-scale online diary study. *Evolutionary Human Sciences*. https://doi.org/10.1017/ehs.2021.44

Schwarz, S., & Hassebrauck, M. (2008). Self-perceived and observed variations in women's attractiveness throughout the menstrual cycle—a diary study. *Evolution and Human Behavior, 29*(4), 282–288. https://doi.org/10.1016/j.evolhumbehav.2008.02.003

Sedgewick, J. R., Flath, M. E., & Elias, L. J. (2017). Presenting your best self (ie): The influence of gender on vertical orientation of selfies on Tinder. *Frontiers in Psychology, 8*, 604. https://doi.org/10.3389/fpsyg.2017.00604

Selensky, J. C., & Carels, R. A. (2021). Weight stigma and media: An examination of the effect of advertising campaigns on weight bias, internalized weight bias, self-esteem, body image, and affect. *Body Image, 36*, 95–106. https://doi.org/10.1016/j.bodyim.2020.10.008

Sorokowska, A., Sorokowski, P., & Havlíček, J. (2016). Body odor based personality judgments: the effect of fragranced cosmetics. *Frontiers in Psychology, 7*, 530. https://doi.org/10.3389/fpsyg.2016.00530

Stockley, P., & Bro-Jørgensen, J. (2011). Female competition and its evolutionary consequences in mammals. *Biological Reviews, 86*(2), 341–366. https://doi.org/10.1111/j.1469-185X.2010.00149.x

Stower, R. E., Lee, A. J., McIntosh, T. L., Sidari, M. J., Sherlock, J. M., & Dixson, B. J. (2020). Mating strategies and the masculinity paradox: How relationship context, relationship status, and sociosexuality shape women's preferences for facial masculinity and beardedness. *Archives of Sexual Behavior, 49*, 809–820. https://doi.org/10.1007/s10508-019-1437-2

Surbeck, M., Mundry, R., & Hohmann, G. (2011). Mothers matter! Maternal support, dominance status and mating success in male bonobos (Pan paniscus). *Proceedings of the Royal Society b: Biological Sciences, 278*(1705), 590–598. https://doi.org/10.1098/rspb.2010.1572

Vaes, J., Paladino, P., & Puvia, E. (2011). Are sexualized women complete human beings? Why men and women dehumanize sexually objectified women. *European Journal of Social Psychology, 41*, 774–785. https://doi.org/10.1002/ejsp.824

Vaillancourt, T. (2013). Do human females use indirect aggression as an intrasexual competition strategy? *Philosophical Transactions of the Royal Society b: Biological Sciences, 368*(1631), 20130080. https://doi.org/10.1098/rstb.2013.0080

Vaillancourt, T., & Hymel, S. (2006). Aggression and social status: The moderating roles of sex and peer-valued characteristics. *Aggressive Behavior, 32*(4), 396–408. https://doi.org/10.1002/ab.20138

Vaillancourt, T., & Krems, J. A. (2018). An evolutionary psychological perspective of indirect aggression in girls and women. In S. M. Coyne & J. M. Ostrov (Eds.), *The development of relational aggression* (pp. 111–126). Oxford University Press.

Vaillancourt, T., & Sharma, A. (2011). Intolerance of sexy peers: Intrasexual competition among women. *Aggressive Behavior, 37*(6), 569–577. https://doi.org/10.1002/ab.20413

Valentova, J. V., Mafra, A. L., & Varella, M. A. C. (2021). Enhancing the evolutionary science of self-presentation modification [Commentary]. *Archives of Sexual Behavior*. https://doi.org/10.1007/s10508-021-01975-0

Vervaecke, H., De Vries, H. A. N., & Van Elsacker, L. (2000). Dominance and its behavioral measures in a captive group of bonobos (Pan paniscus). *International Journal of Primatology, 21*(1), 47–68. https://doi.org/10.1023/A:1005471512788

Wampold, B. E., Davis, B., & Good, R. H. I. I. I. (1990). Hypothesis validity of clinical research. *Journal of Consulting and Clinical Psychology, 58*(3), 360–367. https://doi.org/10.1037/0022-006X.58.3.360

Wang, X., Chen, H., Chen, Z., & Yang, Y. (2021). Women's intrasexual competition results in beautification. *Social Psychological and*

Personality Science, 12(5), 648–657. https://doi.org/10.1177/1948550620933403

Weaving, C. (2014). It is okay to play as long as you wear lingerie (or skimpy bikinis): A moral evaluation of the Lingerie Football League and its rebranding. *Sport in Society, 17*(6), 757–772. https://doi.org/10.1080/17430437.2014.882905

West-Eberhard, M. J. (1983). Sexual selection, social competition, and speciation. *Quarterly Review of Biology, 58*(2), 155–183. https://doi.org/10.1086/413215

Wookey, M. L., Graves, N. A., & Butler, J. C. (2009). Effects of a sexy appearance on perceived competence of women. *Journal of Social Psychology, 149*(1), 116–118. https://doi.org/10.3200/socp.149.1.116-118

Żelaźniewicz, A., Nowak, J., Łącka, P., & Pawłowski, B. (2020). Facial appearance and metabolic health biomarkers in women. *Scientific Reports, 10*(1), 13067. https://doi.org/10.1038/s41598-020-70119-6