



# Perceptions of Individuals Who Engage in Age Concealment

Michael Jeanne Childs and Alex Jones  
Department of Psychology, Swansea University

Previous literature has suggested that individuals who engage in age concealment are viewed differently depending on the type of concealment used, motivations behind engagement, and, to some extent, the age of the target individual. This study aimed to expand on the literature by integrating perceiver factors such as gender, age, and individual differences in intrasexual competition, alongside the individual target factors such as concealment type and motivation for use. Using a sample of 306 participants recruited online, a linear mixed model found main effects of the target's motivation and concealment type and perceiver's gender and intrasexual competition but not perceiver age on target evaluations. We also found that women evaluated the targets most positively when age concealment was motivated by self-esteem, followed by employment, and least positively for romantic purposes, whereas men did not differ on their evaluations based on motivation. Finally, we found that the higher the female participant intrasexual competition score trait, the less positively they rated the targets. These findings suggest that the general perception toward the type and motivations behind the engagement have not changed despite the increasing access to age concealment and that perceiver trait differences also play a role in how concealers are evaluated.

### **Public Significance Statement**

Cosmetic procedures that promise to make individuals look younger are increasingly accessible to the public. The current study tested how observers react to the use of these procedures by middle-aged women as this age group is the highest consumer of cosmetic treatments. We found that, in general, middle-aged women who aim to look younger are still viewed negatively by other women who have highly competitive traits, particularly when it is done to look for partners rather than employment or self-esteem reasons. The findings suggest that it is not the treatment themselves but the psychological responses to them by others that determine how individuals are viewed when they engage in appearance-altering treatments.

**Keywords:** intrasexual competition, motivations for age concealment, perception of concealment types, female perception of age concealment

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In society, more attractive people have better outcomes in different aspects of life, be it employment, friendship circles, or, most importantly, finding

romantic partners (Langlois et al., 2000). However, research also suggest that as people get (and look) older, the less attractive they are perceived (Samson et al., 2010). This change has been linked to older people reporting lower self-esteem and a discrepancy between how old they feel and how old they look (Hurd Clarke et al., 2007; Muise & Desmarais, 2010; Slevic & Tiggemann, 2010), which has been cited as one of the main reasons for people engaging in antiaging procedures (Muise & Desmarais, 2010; Tian et al., 2020). Conversely, studies also show

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Michael Jeanne Childs  <https://orcid.org/0000-0001-9086-8898>

Alex Jones  <https://orcid.org/0000-0003-3600-3644>

Correspondence concerning this article should be addressed to Michael Jeanne Childs. Email: michaeljeannechilds@gmail.com

that, in general, older people who engage in age concealment techniques are viewed as vain (Chasteen et al., 2011) and are generally evaluated negatively by perceivers (Harris, 1994; North & Fiske, 2013; Schoemann & Branscombe, 2011). However, these studies were conducted when antiaging procedures were considered invasive, had long recovery times, and were expensive. The current technological advances in cosmetic dermatology have paved the way for less invasive procedures, including home-use devices (Juhász et al., 2017), which now result in faster recovery time and fewer complications compared to previous invasive procedures such as Botox, dermal fillers, and face-lifts and are also more affordable to the general population. This could therefore have an impact on how individuals who choose to engage in these procedures may be viewed.

However, one thing that has not changed is that the highest consumer group has been found to be middle-aged women (American Society for Aesthetic Plastic Surgery [ASAPS], 2018). Furthermore, traditional gender roles are changing, with women opting to either not have children or postpone having children in favor of their careers, with women aged 40 years and over being the sole age group with increased conception rates (Office for National Statistics, 2018). With the shift in our societal roles and the accessibility of procedures to reduce signs of aging and maintain youthful appearance of middle-aged women, several social perceptual questions therefore arise; namely, how are middle-aged women who engage in these procedures perceived, and how might this differ as a function of the type of concealment used, their motivations, and other demographic variables?

### Target Concealment Type

Antiaging techniques have their roots in facial reconstructive surgery, a field that emerged to help disfigured soldiers integrate back to society and has since flourished as a commodity to alter individuals' appearance to reduce signs of facial aging (Chatterjee, 2007). The demand in this field has paved the way for the technology to be refined and be more accessible to consumers of all types. Previously, antiaging techniques have been associated with high cost in terms of affordability, recovery times, and complications and results that appear unnatural (Hurd Clarke & Griffin, 2007). Recently, technological advancements in the field have

allowed the development of nonablative techniques—for example, using less invasive procedures such as light therapy and chemical peels, which are more affordable, have shorter recovery periods, and have fewer contraindications (Beilin, 2011). It is relatively unknown, therefore, whether there is a change in how observers perceive middle-aged women who conceal their age using these new techniques.

Previous studies, relying on descriptions of different target individuals who engage in varying types of age concealment, have shown more negative evaluations for more extreme procedures such as face-lifts (Harris, 1994), whereas targets using mild or natural (Botox and fillers or avoiding exposure to sunlight, respectively) were rated the most positively (Chasteen et al., 2011). However, these studies were conducted when age concealment procedures were less accessible and were associated with high recovery times and complications, and with the advancement of the field, we are interested to see whether these perceptions have changed.

As Chasteen et al. (2011) found that extreme procedures received the most negative evaluations, the current study therefore aimed to compare the evaluations between *moderate* concealment types such as home-use devices that use intense pulse light technology and radiofrequency (Juhász et al., 2017) and *major* treatments such as Botox and fillers as these are still high on demand among consumers. Our first hypothesis therefore was that there would be a main effect of concealment type in the perception of middle-aged women who engage in antiaging procedures, where moderate concealment would be evaluated more positively than major concealment (Hypothesis 1a).

### Target Motivation Type

In women, signs of aging such as appearance of wrinkles, sagging skin, and uneven skin tone have been linked to lowered female mate value (Buss, 1989; Maestripieri et al., 2014) and thus being at a disadvantage to attract potential mates. It is therefore understandable that for women who want to seek romantic partners, maintaining a youthful appearance is important (Harris, 1994; Swami et al., 2013). In line with this, research has found that older women who engaged in antiaging procedures were rated as more attractive and healthier (Nellis et al., 2017; Tian et al., 2020), which therefore implies that age concealment could prove to be beneficial for older women who are seeking

partners. However, studies have shown that such motivations were not viewed positively by others.

Using descriptions of individuals who engaged in different types of age concealment and for varying motivations, Harris (1994) found different ratings for varying motivations behind concealing one's age, with vanity and self-esteem reasons receiving the highest positive rating, followed by employment and finding a partner, and pleasing others as the lowest. Self-esteem is usually seen as a person's self-worth, often associated with feelings of adequacy. However, it has also been defined as how others value the person—in other words, one's self-esteem is a result of feedback given by other people. Leary (1999) suggested that we monitor our social relationships (sociometer theory), and thus, depending on whether our relational value increases or decreases, so does our self-esteem as a response, which motivates the individual to act on it. In turn, we could argue that as we age, we lose our relational values; that is, in general, younger perceivers judge older people more negatively (less warm and less capable) compared to younger ( $d = .24$ , Kite et al., 2005). Therefore, engaging in age concealment behavior could be seen as a response in order to increase one's relational value and thus increase one's self-esteem.

In line with this, appearance of signs of aging has been negatively correlated with well-being for women (Harris, 1994; Muise & Desmarais, 2010; Slevic & Tiggemann, 2010); therefore, an increase of self-esteem and positive body image in older age has been cited to be the underlying reason for engagement in age concealment techniques (Muise & Desmarais, 2010; Slevic & Tiggemann, 2010; Slevin, 2010). Additionally, Bennett et al. (2017) found in their interviews that older women (aged 69–94) engage in different appearance management behaviors such as makeup and antiaging creams in order to promote well-being, which may suggest that self-esteem motivations play a large part when engaging in age concealment.

Recently, Tian et al. (2020) used images of middle-aged and older-aged individuals pre- and post-antiaging procedures—for example, face-lift, eyelid surgery, and browlift—and asked undergraduates to rate them on different personality traits, employability, and attractiveness. They found that postoperative images were rated to be more hireable in comparison. As the human face is used as a cue of social status, income, and employment (Bjornsdottir & Rule, 2017; Nash et al., 2006), it is possible that current economic and labor

market conditions could threaten older workers, where signs of aging are associated with negative traits such as fragility, resistance to change, and being less productive than younger workers (Hummer et al., 1997; Perry & Finkelstein, 1999), which highlights another motivation for engaging in age concealment procedures. Our second hypothesis therefore was that there would be a main effect of motivation type on evaluations of middle-aged women who engage in age concealment (Hypothesis 2); however, we are not able to give a prediction of how the different motivation types would be evaluated due to the changing societal attitudes toward romance, employment, and self-prioritization.

### Perceiver Age

Another factor that influences how individuals who engage in age concealment are viewed is the age of perceiver. Overall, older participants are more likely to be accepting of age concealment behavior than younger participants (Chasteen et al., 2011; Harris, 1994; Schoemann & Branscombe, 2011). It has been argued that older people wanting to appear younger may threaten the social identity of younger observers, thus receiving negative evaluations (Schoemann & Branscombe, 2011). Another explanation for such evaluations could be that engaging in these behaviors may be considered atypical, and therefore older people who engage in them may be viewed negatively, for example, as being desperate and vain (Harris, 1994; Schoemann & Branscombe, 2011). We therefore hypothesized that perceiver's age would have a main effect on evaluations of middle-aged women who engage in age concealment, where older perceivers would give more positive evaluations than younger perceivers (Hypothesis 3a), and that this would interact with motivation type, where younger men and women would give negative evaluations for both romantic and employment reasons but not for self-esteem (Hypothesis 3b).

### Perceiver Gender

Recent statistics have shown that an increasing number of men are also now engaging in cosmetic procedures (ASAPS, 2018). Traditionally, use of makeup and appearance-enhancing methods have been attributed to women; therefore, we expect women to be more accepting of such behaviors

(Hurd Clarke & Griffin, 2008). Some would argue that this is due to the double standard of aging, where there is more pressure for women to look younger, as appearing older is associated with more negative evaluations, for example, fragility, incompetence, being less healthy, and being less attractive (Sontag, 1979).

Evolutionary perspectives explain such phenomena as a by-product of female reproductive function, where younger women are more favored, particularly by men, as they are more able to produce offspring (Buss, 1989; Buss & Schmitt, 1993; Harris, 1994). In support of this theory, studies have found that men judge older women to be less attractive when they were looking for potential romantic partners (Maestripieri et al., 2014; Teuscher & Teuscher, 2007). However, research has shown that women above 30 years old have diminished likelihood of childbearing and increased maternal complications compared to women between 20 and 29 years old (Salihu et al., 2003). Therefore, as women between 35 and 50 years old make up the majority of those who engage in antiaging procedures, this has implications for motivations of finding a potential mate for men; for example, how would men evaluate women who want to appear younger to find potential mates?

From here, we hypothesized that there would be a main effect of gender on evaluations of middle-aged women, where men in general would give more negative ratings than women (Hypothesis 4a), and that this would interact with motivation type, where men would give the lowest ratings for romantic motivations, compared to employment and self-esteem reasons (Hypothesis 4b). To our knowledge, this would be the first study to explore the relationship between perceiver gender and target motivation on evaluations of age concealment.

### Perceiver Intrasexual Competition

Finally, another factor that could affect how perceivers view those who engage in age concealment could be the competitiveness of the perceivers themselves. Theories of intrasexual competition posit that as there is a finite number of ideal mates, men and women would have to compete with same-sex individuals to get access to potential partners (Buss & Schmitt, 1993; Cox & Fisher, 2008; Wang et al., 2021; Wyckoff et al., 2019). As men tend to look for young, fertile partners (Buss, 1989), women who attempt to conceal their age through cosmetic means could be viewed by other

women more negatively as this would increase their possible competitors (Fink et al., 2014).

Additionally, Arnocky et al. (2019) found that women with higher intrasexual competition scores (ICS) were more aggressive toward the target when they appeared in a sexualized manner (wearing more revealing clothes and makeup applied) compared to a conventional manner (wearing long-sleeved top and no makeup applied) and that this is due to the sexualized target being perceived as lower in humanness than the conventional counterpart. These findings show that a female perceiver's competition trait influences how they would perceive targets who dress more sexually. In relation to our study, we could infer that targets who engage in antiaging procedures with the aim to find a partner (and to some extent employment) could be viewed more negatively by female perceivers with high competitiveness as they would potentially be competing for resources.

However, there is some evidence that shows that women enhance their appearance to impress other women, rather than simply attracting a mate (Mafra et al., 2020; Mileva et al., 2016; Wagstaff, 2018). Mileva et al. (2016) found that female raters judged women with makeup as more dominant than those without, implying that certain behavior could be targeted to change how other women perceive them, rather than simply attracting a partner. Similarly, Wagstaff (2018) found that how often women use makeup is predicted by their sexual strategies and is highly related to their intrasexual competitiveness. Another study by Mafra et al. (2020) demonstrated that women's intrasexual competition trait and desire to attract a mate predicted frequency of makeup use. On a similar note, Wang et al. (2021) found that women focus more on their appearance when there is a higher density of women in their environment, compared to when there are more men, suggesting that when there are more competitors, women focus more on enhancing their appearance. This could be a strategy to attract a potential mate (Buss & Schmitt, 1993), which is referred as self-promotion. Another way of competing with others is by derogating the other person's appearance (Cox & Fisher, 2008) in order to reduce their value to potential mates. It has been shown that women engage in derogatory tactics such as gossiping and labeling the competition with negative traits, for example, being vain and desperate (Kellie et al., 2020).

From here, we hypothesized that the perceiver's ICS would have a main effect on evaluations of



middle-aged targets, where the higher the ICS, the more negative the evaluations will be (Hypothesis 5a); that this would interact with participant age and gender, where younger female participants would be likely to have higher ICS (Hypothesis 5b); and that this would also interact with motivation type, where those with higher ICS would give more negative evaluations to those engaging in concealment due to romantic and job reasons, compared to self-esteem (Hypothesis 5c).

### Current Study Aims and Motivations

Previous studies have shown that various factors influence how individuals who attempt to enhance their appearance using cosmetics and antiaging techniques have been evaluated. Given the increasing popularity and easier accessibility of less invasive antiaging techniques to both genders, as well as societal shifts in terms of finding a partner, competitiveness in the labor market, and the surge of “self-care” movements, it is therefore important to explore whether perceptions of engagement in antiaging techniques have also shifted.

Following Harris (1994) and Chasteen et al.’s (2011) methods of using vignettes, the current study aimed to investigate how different perceiver factors (age, gender, and intrasexual competition), target factors (concealment type and motivation type), and their interactions would predict overall ratings of middle-aged women who engage in age concealment.

In summary, this study explored how evaluations of middle-aged women who conceal their age would be predicted by

- concealment type—particularly moderate (use of hand-held devices) and major procedures (Botox and fillers)—implying that severity of procedure could influence whether the action is acceptable;
- motivation type—whether the age concealment is motivated by self-esteem, looking for employment, or seeking romantic partners—implying that reasons behind age concealment could make the action more acceptable;
- perceiver’s age—whether younger or older raters would have differing perceptions of target individuals—implying that one’s age influences how middle-aged women are perceived for their behavior;
- perceiver’s gender—whether male or female participants would be more accepting of the

behavior—implying that gender differences would exist in evaluations of women who engage in age concealment;

- ICS—whether those with high or low ICS would influence evaluations—implying that age concealment behaviors could be viewed as a way of increasing competition; and
- the interactions between the above variables.

## Method

### Participants

Four hundred ninety-three participants accessed an anonymous link to the study on the Gorilla platform (Anwyl-Irvine et al., 2020). Data was collected between January 12 and February 10, 2021. Participants were recruited through social media platforms (Facebook and Twitter) and recruitment platforms (surveycircle.com and SONA). Three hundred six participants completed the tasks and were included in the analysis. Following data cleaning (see below), two participants were removed, leaving 304 participants (230 female, 74 male) with an age range of 18–67 ( $M = 27.50$ ,  $SD = 9.51$ ).

### Statement of Ethics

Written consent forms were acquired before participants were presented the study. Participants accessed the study using an anonymous link and were able to withdraw by not completing the study at any time. Only completed tasks were included in our analysis. All participants were given an option to be included in a raffle draw as compensation for their time, and a study credit (1) was awarded when the study was accessed through SONA. This study was approved by the Swansea University Ethics Committee and followed the Declaration of Helsinki (World Medical Association, 2015).

### Material

#### Vignettes

The vignettes followed the structure from Chasteen et al.’s (2011) study (see online Supplemental Materials A). These consist of a description of a middle-aged woman engaging in either a moderate (noninvasive, hand-held device) or major (Botox and fillers) procedure to conceal their age, for three different reasons:

looking for a job, looking for a romantic partner, or for self-esteem. For example,

Angela is a middle-aged woman who wants to maintain a more youthful appearance to look for a *romantic partner*. She regularly uses *noninvasive techniques such as light therapy* that she could use at home as part of her antiaging routine.

Each vignette follows the same format, with the motivation type and concealment type changed accordingly. The vignettes were presented on their own first in the middle of the screen with no time limit. After each vignette, participants were asked to rate each target individual on eight traits, following Harris' (1994) study: admirable, attractive, conceited, foolish, interesting, pathetic, vain, and wise.

For our vignettes, we decided to describe only middle-aged targets as they are the highest consumers of antiaging procedures (ASAPS, 2018). Furthermore, for the interest of time and contemporary changes in the market, we opted only to use moderate (noninvasive, hand-held devices) and major (Botox and fillers) in our vignettes as these are currently the most popular procedures. In addition, data from Chasteen et al. (2011) found that those who used mild procedure received the most positive evaluations and those who used extreme procedures received the most negative evaluations, and we believe that this would still be the case.

### ***Intrasexual Competition Scale***

The Intrasexual Competition Scale (Buunk & Fisher, 2009; see online Supplemental Materials B) is a 12-item questionnaire that aims to measure how competitive an individual is toward people of the same sex. Participants were presented a statement relating to their attitude toward same-sex individuals and were asked to rate on a 7-point Likert scale: 1 (*not at all applicable*) to 7 (*completely applicable*). Items include "I wouldn't hire a very attractive man/woman as a colleague" and "I cannot stand it when I meet another man/woman who is more attractive than I am." Sums for the 12 items were calculated, with a maximum score of 84. The higher the total score, the more competitive they are with same-sex individuals.

### **Procedure**

Participants accessed the anonymous study link either through student recruitment sites for course

credit or social media advertisement. After providing consent and demographic information (e.g., age, sex, and ethnicity), participants completed the Intrasexual Competition Scale.

The participants were then presented with a total of six individuals who engage in different age concealment techniques for varying reasons. Each trial consisted of the description first—there was no time limit to the presentation of the vignette—before the participant continued to the evaluation component. The vignette was kept on the left side of the screen, with the traits to be measured presented on the right side. Each trait was followed by a sliding scale with values of 0 (*not at all*) to 100 (*extremely*). The traits to be evaluated were presented on two screens. The trials were presented randomly to the participant to avoid order effects. The study took approximately 8–10 min to complete.

### **Data Cleaning**

One hundred eighty-seven participants did not complete the tasks and therefore were removed from the data set. In addition, we calculated the standard deviation within each participant's responses and removed those who had a standard deviation of zero as this meant the participant consistently gave the same answers in the study. From this procedure, one participant was removed. Furthermore, as we were looking at gender differences and we only had one participant who identified as other, we decided to only include participants who identified as male or female. This yielded a final sample of 304.

### **Design and Analytic Strategy**

We fitted a linear mixed-effects model in R (R Core Team, 2013) using lme4 (Bates et al., 2015) with a mean rating (averaging all variables together after reverse scoring conceited, foolish, pathetic, and vain) as the outcome variable, with fixed effects of participant age (scaled), participant gender, participant ICS (scaled), concealment type, motivation type, and their interactions. Participants were used as random effects, reflecting that the ratings come from different individuals. This statistical model allows us to investigate the differences in evaluations of people who engage in different age concealment types (moderate or major) for different motivations

(romantic, job, or self-esteem) between men and women across the age and ICS distribution.

The model was as follows: Mean Rating =  $P_{\text{Age(scaled)}} \times P_{\text{Gender}} \times \text{Motivation} \times \text{Concealment} \times P_{\text{ICS(scaled)}} + (1 | P)$ . P stands for participant, where the age, gender, and ICS values were collected from the participants rather than the target vignettes.

## Results

### Descriptive Statistics

Table 1 presents the means and standard deviations of the averaged ratings given by the participants to each target vignette. Overall, female participants gave higher ratings for the targets ( $M = 56.80$ ,  $SD = 17.00$ ) than men ( $M = 52.88$ ,  $SD = 15.90$ ), moderate concealment procedures were given higher evaluations ( $M = 60.93$ ,  $SD = 14.38$ ) than major concealment procedures ( $M = 50.75$ ,  $SD = 17.54$ ), and self-esteem motivations received the most positive evaluations ( $M = 58.75$ ,  $SD = 16.25$ ), followed by looking for job ( $M = 55.42$ ,  $SD = 16.76$ ), and looking for romantic partner received the lowest evaluations ( $M = 53.36$ ,  $SD = 17.03$ ). Our raw data and code can be seen at <https://osf.io/pj6h8/>.

### Perceptions Model

The complete estimated coefficients for our model are shown in the online supplemental materials. We found several significant predictors: gender,  $b = -4.47$ ,  $t(643.9303) = -2.128$ ,  $p = .033$ ; concealment type,  $b = 8.92$ ,  $t(1480) = 9.642$ ,  $p < .001$ ; and ICS,  $b = -4.33$ ,  $t(643.9303) = -4.15$ ,  $p < .001$ . We also found significant interactions between age and romantic motivation,  $b = -1.999$ ,

$t(1840.001) = -2.166$ ,  $p = .030$ ; age and self-esteem motivation,  $b = -2.394$ ,  $t(1480.001) = -2.594$ ,  $p = .009$ ; and gender and ICS,  $b = 4.901$ ,  $t(643.930) = 2.336$ ,  $p = .02$ . Other interactions were not significant,  $p > .05$ .

### Main Effects

To further investigate the significance of our model, we conducted an analysis of variance (using Type III sums of squares) on the fitted linear mixed model in R (R Core Team, 2013). Here we found a significant main effect of gender,  $F(1, 296) = 4.57$ ,  $p < .001$ ,  $\eta_p^2 = .02$ , where women gave higher ratings ( $M = 56.80$ ,  $SD = 17.002$ ) than men ( $M = 52.88$ ,  $SD = 15.90$ ). There was also a significant main effect of motivation type,  $F(2, 1480) = 17.786$ ,  $p < .001$ ,  $\eta_p^2 = .02$ , where concealments due to romantic pursuits were rated the lowest ( $M = 53.36$ ,  $SD = 17.03$ ), followed by employment ( $M = 55.42$ ,  $SD = 16.76$ ) and self-esteem reasons ( $M = 58.75$ ,  $SD = 16.25$ ). We also observed a significant main effect of concealment type,  $F(1, 1480) = 364.05$ ,  $p < .001$ ,  $\eta_p^2 = .20$ , where moderate treatments were rated higher ( $M = 60.93$ ,  $SD = 14.38$ ) than major treatments ( $M = 50.75$ ,  $SD = 17.54$ ), as well as a significant main effect of ICS,  $F(1, 296) = 5.115$ ,  $p < .024$ ,  $\eta_p^2 = .02$ , where the higher the participant's ICS, the lower the mean rating they provided.

### Interactions

Figure 1 demonstrates the two-way interaction found between gender and motivation,  $F(2, 1480) = 9.02$ ,  $p < .001$ ,  $\eta_p^2 = .01$ . Pairwise comparisons using the emmeans package (Russel et al., 2017) showed no evidence that that male and female participants

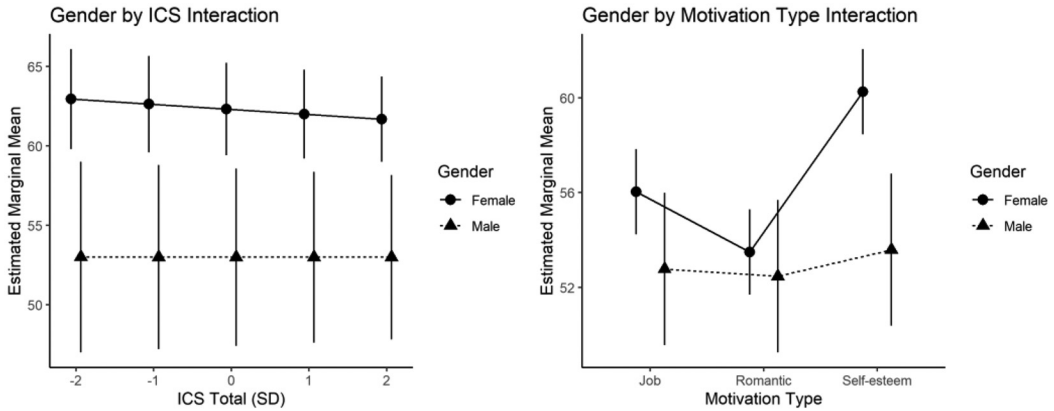
**Table 1**

*Means and Standard Deviations of the Mean Rating for Each Vignette From Female and Male Participants*

Sex	Romantic			Job			Self-esteem		
	Moderate	Major	Overall romantic	Moderate	Major	Overall job	Moderate	Major	Overall self-esteem
Women ( $n = 230$ )									
<i>M</i>	58.83	48.52	53.68	60.73	51.76	56.25	65.71	55.22	60.46
<i>SD</i>	14.9	18.14	17.36	14.41	17.72	16.75	13.83	16.75	16.22
Men ( $n = 74$ )									
<i>M</i>	58.26	46.47	52.36	58.54	47.13	52.83	58.34	48.54	53.44
<i>SD</i>	11.81	17.46	15.99	14.81	16.39	16.59	12.95	15.76	15.19

*Note.* The maximum rating for each vignette is 100.

**Figure 1**  
Illustrations of Interactions Between Variables



Note. Panel on the left depicts the interaction between participant gender and participant intrasexual competition scores (ICS). Panel on the right depicts the interaction between participant gender and target motivation type.

were similar in their evaluations of romantic ( $p = .59$ ) and job motivations ( $p = .08$ ), but they were significantly different in their evaluations for self-esteem reasons ( $p < .001$ ), where female participants gave higher ratings for ( $M = 60.46$ ,  $SD = 16.22$ ) than male participants ( $M = 53.44$ ,  $SD = 15.19$ ),  $p < .001$ . Furthermore, we found that within genders, male participants did not differ in their ratings across the three motivation types (all comparisons  $p > .05$ ), whereas female participants gave significantly different ratings across the three motivations ( $p < .001$ ), where they rated romantic reasons the lowest ( $M = 53.68$ ,  $SD = 17.36$ ), followed by employment ( $M = 56.25$ ,  $SD = 16.75$ ), and self-esteem received the highest evaluations ( $M = 60.46$ ,  $SD = 16.22$ ).

We also found a significant two-way interaction between gender and ICS (see Figure 1),  $F(1, 296) = 4.95$ ,  $p = .03$ ,  $\eta_p^2 = .02$ . We conducted an estimated marginal means analysis (emmeans package in R; Russel et al., 2017) on the ICS scaled to their standardized scores ( $-2$ ,  $-1$ ,  $0$ ,  $1$ ,  $2$ ) between each gender. The pairwise comparisons yielded significant differences between male and female participants for each level of ICS, where female participants consistently gave higher ratings than male participants (all comparisons  $p < .001$ ) regardless of ICS.

## Discussion

The current study investigated how target factors (motivation and concealment type) and participant

factors (age, gender, and intrasexual competition scores) would predict how the target individuals who engage in antiaging behavior would be evaluated. We presented participants with six hypothetical middle-aged women who varied on their concealment type used and motivation behind the use of antiaging procedures. To address our hypotheses, we ran a linear mixed model that allowed us to integrate the between and repeated-measures variables in a single analysis.

We found a number of main effects and two-way interactions. First, our findings support Hypothesis 1a that there would be a main effect of concealment type, where, as expected, targets who engaged in moderate concealment received more positive evaluations than those who engaged in major concealment. This supports findings from previous studies, where it was found that more invasive procedures were rated negatively than milder ones (Chasteen et al., 2011; Harris, 1994). This implies that the general attitude toward more invasive procedures has not changed. It is worth remembering that although Botox (classed as major procedure in this study) is less invasive than extreme measures such as face-lift in Chasteen et al.'s (2011) study, this could be appraised as more invasive than home-use products. It is also important to point out that although the moderate procedure in this study is relatively new to the market, the premise of achieving professional results at home could be viewed as less invasive and more natural (Juhász et al., 2017). We understand that there are other



appearance-enhancing procedures that are currently gaining in popularity, such as dermal fillers, which provide instant changes in appearance; however, this is outside the scope of our rationale as we wanted to compare the relatively new domain of home-use devices to those of established antiaging procedures such as Botox (Chasteen et al., 2011). This will be a good avenue for future research, however. In general, therefore, our findings first demonstrate that the overall perception of antiaging procedures remains the same—that is, the less extreme, the more acceptable it is perceived to be.

Our data also support our Hypothesis 2 that there would be a main effect of motivation type on evaluations of individuals who engage in age concealment. However, we predicted that the three motivations would significantly differ with each other; instead, we found that romantic and employment motivations were rated similarly, and self-esteem reasons were significantly rated higher than the other two motivations. Self-esteem motivations receiving the highest evaluations supports previous studies that found that the primary goal of most women wanting to engage in antiaging procedures is to increase their confidence and body image (Hurd Clarke & Griffin, 2008; Muise & Desmarais, 2010; Slevic & Tiggemann, 2010). Overall, this finding highlights the idea that personal well-being as motivation for appearance enhancement is more accepted than other motivations. This could also be viewed as women wanting to increase their relational value as they get older (Leary, 1999) as the appearance of youth is perceived to be more positive compared to appearing old (Schoemann & Branscombe, 2011).

That employment motivations were not rated significantly different from romantic reasons, however, was not expected as previous studies have shown that middle-aged and older-aged individuals who have engaged in appearance enhancement procedures are deemed as more hireable than their counterparts (Tian et al., 2020), and therefore, it could be argued that appearing younger to gain or progress in one's career would be more acceptable than finding a partner. However, a study by North and Fiske (2013) showed that older target individuals were disliked by younger raters when they did not share their wealth compared to those who were more generous. In relation to employment, we could infer that our middle-aged targets are viewed negatively due to them taking up resources (income) that would otherwise be taken up by others, that is, the younger group. Unlike North and Fiske's (2013)

study, however, we did not find an interaction of age and motivation type—although this could be due to the majority of our participants being in a younger age range, and with our current labor market being saturated, the idea that middle-aged targets are further competing may have influenced the negative evaluations.

Romantic motivations receiving the most negative evaluations supports findings from Chasteen et al. (2011) and Harris (1994). One explanation for this could be that as a target's sex and age interact in terms of how the perceivers view them (Sng et al., 2020), our participants may have viewed our target as atypical for their sex *and* age, that is, younger women are typically viewed to be more invested in finding a partner and starting a family; therefore, a middle-aged woman trying to find a romantic partner may not fit the stereotype. Further research looking at how male middle-aged targets would be viewed could be beneficial to the literature.

In contrast to our Hypothesis 3a, we did not find a main effect of participant age. This contradicts previous studies that found that younger perceivers rated older targets more negatively (Chasteen et al., 2011; Harris, 1994; North & Fiske, 2013; Schoemann & Branscombe, 2011). However, although we tried to recruit a wider age range of participants, our sample is relatively young ( $M$  age = 27.50), and therefore the effect may not have been as salient as expected. It is therefore useful to recruit more older adults for future studies.

On the other hand, our findings support our Hypothesis 4a that there would be a main effect of participant gender on target evaluations, where male participants in general would give harsher ratings than female participants. This supports previous findings by Teuscher and Teuscher (2007) where male participants rated older female targets more negatively, as well as findings from Harris (1994) where female participants gave higher ratings to targets overall. Additionally, as women are the main consumers of cosmetic products and procedures (ASAPS, 2018), it could be that female raters viewed engaging in age concealment behavior as more typical and therefore had more positive assessments (Harris, 1994). However, as our study only included female targets, we are not able to explore how male targets would be evaluated. This could be a useful avenue for future research.

Additionally, our results support our Hypothesis 4b that gender would have an interaction with motivation type. However, the trend we originally predicted was not observed. Instead of male

participants giving the lowest ratings for romantic motivations and their evaluations increasing for employment and self-esteem motivations, our data show that male evaluations did not significantly differ across the motivation types, whereas female evaluations did. In other words, male participants in general gave lower evaluations overall, regardless of the motivation. This is of particular interest as such findings contradict the evolutionary perspective, where we expect men to view women who want to look younger to gain a partner negatively as this potentially conceals their reproductive value, a trait suggested to be sought after by men (Buss, 1989; Buss & Schmitt, 1993). It could be that with middle-aged women wanting to appear younger (and if they want to attract a mate), the pool for potential mates would increase and could therefore be beneficial for men. This, however, still poses an issue in terms of reproductive value as women face more pregnancy complications and risks as they get older (Maestripieri et al., 2014).

Furthermore, although female participants were more generous in their evaluations overall, they gave harsher evaluations when the target was looking for a romantic partner, followed by employment, and gave the highest evaluations for self-esteem. This supports previous findings by Harris (1994), where it was found that vanity and self-esteem reasons received the highest ratings compared to looking for a partner and employment. This also implies that female participants, rather than male participants, pay more attention to *how* other women consume cosmetic products and the motivation that influences such behavior. Previous studies have shown a similar trend; for example, Mileva et al. (2016) found that female observers perceived women who wore more makeup as threats to themselves. This therefore questions the concept of double standards theory, which claims that women engage in appearance enhancement for men (Sontag, 1979)—if this is the case, we would expect men to also have significant differences in their evaluations between motivation types. However, as we did not explore our participants' attitudes and behaviors regarding antiaging procedures, we cannot fully make assumptions as to their personal motivations.

Finally, our data also support our Hypothesis 5a that the perceiver's ICS would have a main effect on evaluations, and, as expected, we found that the higher the ICS, the less positive the evaluations were. This is in support of previous studies that

showed that female participants would engage in derogatory tactics in order to compete with rivals (Cox & Fisher, 2008; Wyckoff et al., 2019)—in this study's case, more negative evaluations toward an individual who is aiming to appear younger.

Our results did not yield a two-way interaction between motivation type and ICS, however, contradicting Hypothesis 5b. This implies that those with high competitiveness view others as competitors regardless of the reason behind their appearance enhancement. This supports findings from Arnocky et al. (2019), where participants with high competitiveness trait were more aggressive toward our targets. We could infer that as all our targets were engaging in appearance enhancement; this on its own could be reason enough to be viewed negatively. However, unlike Arnocky et al.'s (2019) study, we did not ask our participants to rate our targets on their humanness, and therefore we cannot assume that the same psychological mechanism is at work here.

We also did not find a three-way interaction for age, gender, and ICS (Hypothesis 5c), implying that there are similar levels of ICS across the population and that evaluations toward the targets are similar across the age range. We did, however, find a significant two-way interaction between participant gender and participant ICS, where men had similar ratings across all levels of ICS and women's mean ratings were significantly different for each level of ICS, where those with higher ICS gave higher evaluations. It could be that as our target individuals were female, intrasexual competition toward the targets is therefore more relevant to the female participants. This supports the general idea that women who are more competitive would view others as threats and therefore would engage in tactics to reduce their rival's potential (Wyckoff et al., 2019).

One limitation of the current study is that we only investigated how male and female perceivers would evaluate *female* targets. This therefore did not allow us to fully investigate the double standards of aging as we cannot make conclusions as to how male age concealers would be evaluated. To overcome this, future research could include both male and female targets and compare the evaluations between the two. We could expect that male perceivers' ICS would have an influence on male, but not female, targets, and vice-versa. However, as mating strategies of men do not depend on them looking younger (Buss, 1989; Buss & Schmitt, 1993), we do not anticipate changes in the

evaluations of male targets as a function of perceiver age and target motivation type.

Another limitation of our study is the sole use of vignettes to describe the targets. A recent study by Tian et al. (2020) showed that participants who were shown pre- and posttreatment photos of age concealers rated the target more positively on their posttreatment appearance. They argued that seeing the results of age concealment would negate the underlying stigma about age concealment. However, as the moderate treatment in the current study aims to be less invasive while aiming to deliver similar results to professional procedures, it could be that those who engage in more extreme procedures would be rated more negatively when participants are able to compare the results side by side. Such studies therefore would need to consider using independent samples to reduce carry-on effects.

Another limitation of the current study is that we did not provide an explicit definition of “middle age.” It was previously shown that the perception of onset of “middle-age-ness” differs between younger and older people, where older participants tend to attribute middle-age onset as later than younger participants (Chopik et al., 2018; Drevenstedt, 1976). It could therefore be that the subjective views of our participants affected how they would evaluate our target. This could also explain why we did not find a significant main effect of age but previous studies did (Chasteen et al., 2011). For future studies, therefore, it would be important to explicitly define the target’s age as this could affect evaluations.

In sum, the current study aimed to investigate whether the perceptions of people who engaged in age concealment have changed given the current societal shift to increasing use of concealment techniques and personal priorities. We found that, in general, the less extreme procedure is still regarded more positively, and male participants did not differ in their evaluations regardless of why the target engaged in age concealment. Such findings have implications for how we interpret previous theories that have suggested that women primarily engage in such behaviors to attract mates, while the evidence here suggests it may be to compete with other women.

## References

American Society for Aesthetic Plastic Surgery. (2018). *Statistics*. [https://www.surgery.org/sites/default/files/ASAPS-Stats2018\\_0.pdf](https://www.surgery.org/sites/default/files/ASAPS-Stats2018_0.pdf)

- Anwyl-Irvine, A., Massonnié, J., Flitton, A., Kirkham, N., & Evershed, J. (2020). Gorillas in our midst: An online behavioral experiment builder. *Behavior Research Methods*, *52*, 388–407. <https://doi.org/10.3758/s13428-019-01237-x>
- 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>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. <https://doi.org/10.18637/jss.v067.i01>
- Beilin, G. (2011). Home-use TriPollar RF device for facial skin tightening: Clinical study results. *Journal of Cosmetic and Laser Therapy*, *13*(2), 69–76. <https://doi.org/10.3109/14764172.2011.552607>
- Bennett, E. V., Hurd Clarke, L., Kowalski, K. C., & Crocker, P. R. E. (2017). “I’ll do anything to maintain my health”: How women aged 65-94 perceive, experience, and cope with their aging bodies. *Body Image*, *21*, 71–80. <https://doi.org/10.1016/j.bodyim.2017.03.002>
- Bjornsdottir, R. T., & Rule, N. O. (2017). The visibility of social class from facial cues. *Journal of Personality and Social Psychology*, *113*(4), 530–546. <https://doi.org/10.1037/pspa0000091>
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, *12*(1), 1–14. <https://doi.org/10.1017/S0140525X00023992>
- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, *100*(2), 204–232. <https://doi.org/10.1037/0033-295X.100.2.204>
- Buunk, A. P., & Fisher, M. (2009). Individual differences in intrasexual competition. *Journal of Evolutionary Psychology*, *7*(1), 37–48. <https://doi.org/10.1556/JEP.7.2009.1.5>
- Chasteen, A. L., Bashir, N. Y., Gallucci, C., & Visekruna, A. (2011). Age and antiaging technique influence reactions to age concealment. *The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences*, *66*(6), 719–724. <https://doi.org/10.1093/geronb/gbr063>
- Chatterjee, A. (2007). Cosmetic neurology and cosmetic surgery: Parallels, predictions, and challenges. *Cambridge Quarterly of Healthcare Ethics*, *16*(2), 129–137. <https://doi.org/10.1017/S0963180107070156>
- Chopik, W. J., Bremner, R. H., Johnson, D. J., & Giasson, H. L. (2018). Age differences in age perceptions and developmental transitions. *Frontiers in Psychology*, *9*, Article 67. <https://doi.org/10.3389/fpsyg.2018.00067>

- Cox, A., & Fisher, M. (2008). A framework for exploring intrasexual competition. *Journal of Social, Evolutionary, and Cultural Psychology*, 2(4), 144–155. <https://doi.org/10.1037/h0099348>
- Drevenstedt, J. (1976). Perceptions of onsets of young adulthood, middle age, and old age. *Journal of Gerontology*, 31(1), 53–57. <https://doi.org/10.1093/geronj/31.1.53>
- Fink, B., Klappauf, D., Brewer, G., & Shackelford, T. K. (2014). Female physical characteristics and intra-sexual competition in women. *Personality and Individual Differences*, 58, 138–141. <https://doi.org/10.1016/j.paid.2013.10.015>
- Harris, M. B. (1994). Growing old gracefully: Age concealment and gender. *Journal of Gerontology*, 49(4), 149–158. <https://doi.org/10.1093/geronj/49.4.P149>
- Hummert, M. L., Garstka, T. A., & Shaner, J. L. (1997). Stereotyping of older adults: The role of target facial cues and perceiver characteristics. *Psychology and Aging*, 12(1), 107–114. <https://doi.org/10.1037/0882-7974.12.1.107>
- Hurd Clarke, L., & Griffin, M. (2007). The body natural and the body unnatural: Beauty work and aging. *Journal of Aging Studies*, 21(3), 187–201. <https://doi.org/10.1016/j.jaging.2006.11.001>
- Hurd Clarke, L., & Griffin, M. (2008). Visible and invisible ageing: Beauty work as a response to ageism. *Ageing & Society*, 28(5), 653–674. <https://doi.org/10.1017/S0144686X07007003>
- Hurd Clarke, L., Repta, R., & Griffin, M. (2007). Non-surgical cosmetic procedures: Older women's perceptions and experiences. *Journal of Women & Aging*, 19(3–4), 69–87. [https://doi.org/10.1300/J074v19n03\\_06](https://doi.org/10.1300/J074v19n03_06)
- Juhász, M. L., Levin, M. K., & Marmur, E. S. (2017). A review of available laser and intense light source home devices: A dermatologist's perspective. *Journal of Cosmetic Dermatology*, 16(4), 438–443. <https://doi.org/10.1111/jocd.12371>
- Kellie, D. J., Blake, K. R., & Brooks, R. C. (2020). Behind the makeup: The effects of cosmetics on women's self-objectification, and their objectification by others. *European Journal of Social Psychology*, 51(4–5), 703–721. <https://doi.org/10.1002/ejsp.2767>
- Kite, M. E., Stockdale, G. D., Whitley, B. E., Jr., & Johnson, B. T. (2005). Attitudes toward younger and older adults: An updated meta-analytic review. *Journal of Social Issues*, 61(2), 241–266. <https://doi.org/10.1111/j.1540-4560.2005.00404.x>
- 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>
- Leary, M. R. (1999). Making sense of self-esteem. *Current Directions in Psychological Science*, 8(1), 32–35. <https://doi.org/10.1111/1467-8721.00008>
- Maestriperi, D., Klimczuk, A. C., Traficante, D. M., & Wilson, M. C. (2014). A greater decline in female facial attractiveness during middle age reflects women's loss of reproductive value. *Frontiers in Psychology*, 5, Article 179. <https://doi.org/10.3389/fpsyg.2014.00179>
- Mañra, A. L., Varela, 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, Article 110042. <https://doi.org/10.1016/j.paid.2020.110042>
- 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>
- Muise, A., & Desmarais, S. (2010). Women's perceptions and use of "anti-aging" products. *Sex Roles*, 63(1–2), 126–137. <https://doi.org/10.1007/s11199-010-9791-5>
- Nash, R., Fieldman, G., Hussey, T., Lévesque, J. L., & Pineau, P. (2006). Cosmetics: They influence more than Caucasian female facial attractiveness. *Journal of Applied Social Psychology*, 36(2), 493–504. <https://doi.org/10.1111/j.0021-9029.2006.00016.x>
- Nellis, J. C., Ishii, M., Papel, I. D., Kontis, T. C., Byrne, P. J., Boahene, K. D. O., Bater, K. L., & Ishii, L. E. (2017). Association of face-lift surgery with social perception, age, attractiveness, health, and success. *JAMA Facial Plastic Surgery*, 19(4), 311–317. <https://doi.org/10.1001/jamafacial.2016.2206>
- North, M. S., & Fiske, S. T. (2013). Act your (old) age: Prescriptive, ageist biases over succession, consumption, and identity. *Personality and Social Psychology Bulletin*, 39(6), 720–734. <https://doi.org/10.1177/0146167213480043>
- Office for National Statistics. (2018). *Conceptions in England and Wales: 2018*. <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/conceptionstatistics/2018>
- Perry, E. L., & Finkelstein, L. M. (1999). Toward a broader view of age discrimination in employment-related decisions: A joint consideration of organizational factors and cognitive processes. *Human Resource Management Review*, 9(1), 21–49. [https://doi.org/10.1016/S1053-4822\(99\)00010-8](https://doi.org/10.1016/S1053-4822(99)00010-8)
- R Core Team. (2013). R: A language and environment for statistical computing [Computer software]. R Foundation for Statistical Computing. <http://www.R-Project.org/>
- Russel, V. L., Buerkner, P., Herve, M., Love, J., Riebl, H., & Singman, H. (2017). Estimated



- marginal means, aka least-squares means (Version 1.7.5) [Computer software]. <https://cran.r-project.org/web/packages/emmeans/index.html>
- Salihu, H. M., Shumpert, M. N., Slay, M., Kirby, R. S., & Alexander, G. R. (2003). Childbearing beyond maternal age 50 and fetal outcomes in the United States. *Obstetrics and Gynecology*, *102*(5 Part 1), 1006–1014. [https://doi.org/10.1016/S0029-7844\(03\)00739-7](https://doi.org/10.1016/S0029-7844(03)00739-7)
- Samson, N., Fink, B., Matts, P. J., Dawes, N. C., & Weitz, S. (2010). Visible changes of female facial skin surface topography in relation to age and attractiveness perception. *Journal of Cosmetic Dermatology*, *9*(2), 79–88. <https://doi.org/10.1111/j.1473-2165.2010.00489.x>
- Schoemann, A. M., & Branscombe, N. R. (2011). Looking young for your age: Perceptions of anti-aging actions. *European Journal of Social Psychology*, *41*(1), 86–95. <https://doi.org/10.1002/ejsp.738>
- Slevec, J., & Tiggemann, M. (2010). Attitudes toward cosmetic surgery in middle-aged women: Body image, aging anxiety, and the media. *Psychology of Women Quarterly*, *34*(1), 65–74. <https://doi.org/10.1111/j.1471-6402.2009.01542.x>
- Slevin, K. F. (2010). “If I had lots of money. . . I’d have a body makeover”: Managing the aging body. *Social Forces*, *88*(3), 1003–1020. <https://doi.org/10.1353/sof.0.0302>
- Sng, O., Williams, K. E., & Neuberg, S. L. (2020). Sex-age stereotyping: Social perceivers as lay adaptationists. *Evolution and Human Behavior*, *41*(2), 136–149. <https://doi.org/10.1016/j.evolhumbehav.2019.12.001>
- Sontag, S. (1979). The double standard of aging. In J. Williams (Ed.), *Psychology of women* (pp. 462–478). Academic Press.
- Swami, V., Pietschnig, J., Stewart, N., Nader, I. W., Stieger, S., Shannon, S., & Voracek, M. (2013). Blame it on patriarchy: More sexist attitudes are associated with stronger consideration of cosmetic surgery for oneself and one’s partner. *International Journal of Psychology*, *48*(6), 1221–1229. <https://doi.org/10.1080/00207594.2012.740566>
- Teuscher, U., & Teuscher, C. (2007). Reconsidering the double standard of aging: Effects of gender and sexual orientation on facial attractiveness ratings. *Personality and Individual Differences*, *42*(4), 631–639. <https://doi.org/10.1016/j.paid.2006.08.020>
- Tian, L., Bashir, N. Y., Chasteen, A. L., & Rule, N. O. (2020). The effect of age-stigma concealment on social evaluations. *Basic and Applied Social Psychology*, *42*(4), 1–16. <https://doi.org/10.1080/01973533.2020.1741359>
- Wagstaff, D. L. (2018). Comparing mating motivations, social processes, and personality as predictors of women’s cosmetics use. *Evolutionary Behavioral Sciences*, *12*(4), 367–380. <https://doi.org/10.1037/ebs0000119>
- Wang, X., Chen, H., Chen, Z., & Yang, Y. (2021). Women’s intrasexual competition results in beautification. *Social Psychological & Personality Science*, *12*(5), 648–657. <https://doi.org/10.1177/1948550620933403>
- World Medical Association. (2015). *Medical ethics manual*. [https://www.wma.net/wp-content/uploads/2016/11/Ethics\\_manual\\_3rd\\_Nov2015\\_en\\_1x1.pdf#page=102](https://www.wma.net/wp-content/uploads/2016/11/Ethics_manual_3rd_Nov2015_en_1x1.pdf#page=102)
- Wyckoff, J. P., Asao, K., & Buss, D. M. (2019). Gossip as an intrasexual competition strategy: Predicting information sharing from potential mate versus competitor mating strategies. *Evolution and Human Behavior*, *40*(1), 96–104. <https://doi.org/10.1016/j.evolhumbehav.2018.08.006>

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