Understanding Selfie Editing Behavior among Female College Students in the US and China

We now live in the age of selfies. The word "selfie" was first used in 2002, and between the year of 2012 and 2013 the usage of this the word increased by 17,000 % (Bennett, 2014). The surge in the popularity of selfies was such that it was announced as Oxford Dictionary's "Word of the Year" in 2013 ("Oxford Dictionaries," 2013). Exact numbers on the pervasiveness of selfies may vary, but they are all too large to overlook. Google revealed that 200 million users uploaded 24 billion selfies to its Google Photos (Sabharwal, 2016). Another Google report in 2014 showed that Android users sent 93 million selfies every day (Brandt, 2014). Typically, young women spend five hours a week taking and posting selfies (Matyszczyk, 2015), and it has been estimated that each person takes more than 25,000 selfies in a lifetime (Wang, 2017).

Selfies are especially popular on social media (Tifentale, 2014; 2015). In 2004, the first hashtag #selfie appeared on Flick (Bennett, 2014). Instagram's first #selfie emerged in 2011 (Woodruff, Santarossa, & Lacasse, 2018). As of December 2018, on Instagram, more than 370 million images were shared with #selfie, and 376 million photograms posted with #me. On Sina Weibo (China's Twitter), #selfie# was viewed over 360 million times. On Snapchat, about 75% of all photos are selfies (Cohen, 2016). Taking and posting selfies have already become a global culture (Fan, 2017; Sung, Lee, Kim, & Choi, 2016).

Editing selfies is a new phenomenon that can also be called retouching selfies (Mills, Musto, Williams, & Tiggemann, 2018), digitally modifying or altering selfies (Vendemia & DeAndrea, 2018), and beautifying selfies (Low, 2015). People could edit their photos on computer software like Adobe Photoshop years ago, but it wasn't until the widespread use of smartphones and easily operated photo-editing applications on them that editing selfies became

accessible to the general public (Cosslett, 2016). The act of editing selfies has become so popular that an industry emerged around it (Fan, 2017; 2018; Tifentale, 2015; De Seta & Proksell, 2015). For example, apps by Meitu Inc., a Chinese technology company that makes smartphones and selfie apps, were downloaded on over 1.1 billion devices worldwide (Williams, 2017). Faceu, a popular beauty selfie camera app launched in 2016, attracted over 250 million users in just one year and was sold for $300 million earlier in 2018 (Zhao, 2018).

Previous studies have identified the motivations behind selfie posting (Pounders, Kowalczyk, & Stowers, 2016; Sung et al., 2016), and have associated selfie related behavior (i.e., taking, posting and editing) with narcissism (Fox & Rooney, 2015; Weiser, 2015; Sorokowski et al., 2015), body image concerns (Meier & Gray, 2014; McLean, Paxton, Wertheim, & Masters, 2015), and social comparison (Lewallen & Behm-Morawitz, 2016; Chae, 2017). Few studies, however, have examined the relationship between selfie related behaviors with appearance ideal internalization. Even fewer studies, if any, have studied selfies from a cross-cultural perspective. The purposes of the current study, therefore, are twofold. First, it looks at whether body image and appearance ideal internalization predict selfie editing behavior. Second, it examines whether differences exist in selfie editing behavior among female college students from two different cultures: the US and China.

Literature Review

Selfie and Selfie Editing

A selfie is defined as a photograph of oneself taken by oneself, i.e., without the help of others, typically with a smartphone or webcam, and uploaded on social media (Qiu, Liu, Yang, Qu, & Zhu, 2015; Fox and Rooney, 2015). Selfies can be classified into three types: solo-selfies,

selfies with a romantic partner, and selfies with a group of people (Wang, Yang, & Haigh, 2017; Sorokowsk et al, 2016), but in this study selfies refer to solo-selfies only.

The first self-photo went back to 1839 by an American photographer named Robert Cornelius (Grenoble, 2013). The origin of the word selfie was attributed to an Australian named Nathan Hope who used it on a forum in 2002 ("Oxford Dictionaries," 2013). One year later, in 2003, Sony introduced a mobile phone with a front-facing camera that was designed for video-conferencing. Back then, they did not realize their invention would bring people to the selfie age. Following this trend, the groundbreaking iPhone 4 released by Apple in 2010 was also equipped with front-facing cameras. In 2015, acknowledging how many people were turning the camera to themselves, Apple dedicated a specific folder for selfies (Quito, 2017).

Editing selfies refers to the beautification of selfies by means of selfie apps on smartphones, or photo-editing tools on computers. It can occur both during and after a selfie is taken. Affordances of selfie apps include but are not limited to filters, whitening and smoothing of the skin, selfie stickers, virtual makeup, and changes in the shape, size or color of overall face, eyes, eyebrows, nose, lips, chins, cheek bones, hair, legs, and hips. According to Varagur (2016), selfie-editing became popular in Asia first, then Western users began to catch up the trend. Facetune, for example, which has fewer retouching functions than similar selfie apps popular in East Asia, is now the most popular paid iPhone application in the United States ("Top 148," 2018).

Early selfie editing apps only allow users to edit by uploading already taken photos. However, increasingly, today's selfie apps enable users to see changes in real time. In 2011, For example, Instagram released its 2.0 version that featured more filters and allowed users to modify contrast, brightness and color tones of the photos people take (Gonzalez, 2011). Another

change is augmented-reality effects, through which user can add items such as cartoon characters and robotic eyeglass that can match individual facial features (Hersey, 2017). Overall, selfies seem to get increasingly "extreme" (Leadem, 2018), and Asian women still lead and set the trends of selfie taking, sharing and editing (Fan, 2017).

McLean et al. (2015) introduced two concepts related to selfies: photo investment and photo manipulation. They defined photo investment as an individual's concern about the quality of photo and how much effort a person devotes to selecting the best photo before sharing it on social media. Photo manipulation is defined as changing a person's appearance features before positing. Based on these two definitions, and the study by Al-Kandari and Abdelaziz (2017), the current study proposed two similar constructs: selfie investment and selfie manipulation. Similarly, selfie investment is defined as the extent to which a person is concerned about how he or she is portrayed in the selfie and how much effort the person expends to selecting a selfie for posting. Selfie manipulation is defined as the effort a person expends in controlling and altering the selfie quality.

Based on discussion above, the following hypothesis is raised:

H 1: Chinese women will report higher scores than their American counterparts on (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation.

Online Self-Presentation

Self-presentation is the modification of the self in social interactions to form a desired image to others (Walther, 2007; Toma and Hancock, 2010). It happens in both face-to-face (FtF) communication and compute-mediated communication (CMC) (Ellison, Heino & Gibbs, 2006), but CMC can facilitate forming more extreme impressions than FtF communication (Hancock &

Dunham, 2001). According to hyperpersonal model of CMC (Walther 1996), it's easier for people to present the self *selectively* in asynchronous text-based CMC as they can take their time to select and edit what to respond and present. Hancock and Toma (2009) showed that selective self-presentation also applies to online photos since people can enhance their physical attractiveness using technology. It has been found that people engage in selective self-presentation on social media (Gonzales & Hancock, 2011) and online dating websites (Ellison et al., 2006; Toma, Hancock, & Ellison, 2009).

Taking, sharing and editing selfies constitute a unique channel of self-presentation (Kearney, 2018; Diefenbach & Christoforakos, 2017; Sung et al., 2016; Pounders et a., 2016; Dinhopl & Gretzel, 2016; Fox & Vandemia, 2016; Chua & Chang, 2015; Qiu et al., 2015; Rettberg, 2014). More often than not, self-presentation through selfies is highly selective: people take more than one selfie before selecting the best ones to post ("#bodypositive,"; Wagner, Aguirre, & Sumner, 2016); people choose the best background, design their pose in advance, and choose the right angle (McLean et at., 2015); and people turn to filter cameras and photo-editing applications, tweaking their selfies before posting ("#bodypositive," 2018).

Motivation for and Personality Predictors of Selfie-Related Behavior

Motivation. Bazarova and Choi (2014) identified seven motivations for self-disclosure on social media, among which (a) to seek approval and likings; and (b) to express oneself and seek relief are the most important ones. Other goals include clarifying identify, developing relationships, sharing information, etc. Another study found that affection seeking, attention seeking, disclosure, habit, information sharing, and social influence are what motivate people to share photos on Facebook (Malik, Dhir, & Nieminen, 2016).

In terms of selfies, Pounder et al. (2016) showed that the purpose of selfie sharing is to manipulate the impression of happiness and physical attractiveness, and to boost self-esteem. Similarly, Holiday, Lewis, Nielsen, Anderson and Elinzano (2016) revealed that people take and share selfies to communicate their updates, to control their self-images, and to record memories. A study done in Korea showed that people post selfies to seek attention, to maintain social ties with friends, to document personal activities, and to simply entertain (Sung et al., 2016). A study in Taiwan demonstrated that perceived usefulness and playfulness lead to habitual use, and selfie-posing satisfaction, both of which motivate people to continue posing selfies (Huang, 2018). Of special note is a study done in Kuwait that matched different motives with three distinct selfie related activities: documentation is the major goal for taking selfies, status-upgrading for posting selfies, and appraisal-seeking for editing selfies (Al-Kandari & Abdelaziz, 2017).

Personality predictors. ***Narcissism.*** The personality trait that has attracted the most attention among selfie scholars is narcissism. Narcissism was found to predict addictive social media use (Andreassen, Pallesen, & Griffiths, 2017), and photo-related activities on Facebook (Alloway, Runac, Qureshi, & Kemp, 2014). Although Bergman, Fearrington, Davenport, and Bergman (2011) revealed that narcissism does not predict social media activities, they showed that narcissism predicted motivations for social media use.

In terms of selfies, most studies found a positive relationship between selfie-taking (McCain et al., 2016), selfie-posing (Sorokowski et al., 2015; Weiser, 2015; Fox & Rooney, 2015), selfie-posing intention (Kim, Lee, Sung, & Choi, 2016), and selfie-editing (Kim & Chock, 2017; Fox & Rooney, 2015). More specifically, Lee and Sung (2016) revealed that narcissism is positively associated with involvement in other people's feedback on selfies, how observant one

is of other people's selfies, and how favorably will one evaluate selfie posting behavior. Importantly, Halpern, Valenzuela, and Katz (2016) found a reciprocal process: people with higher narcissism levels take and share more selfies, and in turn, they become more narcissistic. Although Barry, Doucette, Loflin, Rivera-Hudson, and Herrington (2017) did not find significant relationship between narcissism and all types of selfies, they did show that vulnerable narcissism was positively related to the frequency of posting selfies that stress appearance.

H 2: Narcissism is positively related to (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation.

Self-Esteem. Self-esteem refers to the degree to which one regards the self as competent and worthwhile (Vogel, Rose, Roberts, & Kckles, 2014). Research findings on the relationship between self-esteem and social media use are mixed. According to Hyperpersonal Model (Walther, 1996), selective self-presentation on social media will increase users' self-esteem and this hypothesis was confirmed by Gonzales and Hancock (2011), and Toma (2013). However, self-esteem was found negatively correlated with self-promotion activities on Facebook (Mehdizadeh, 2010).

Findings on the relationship between self-esteem and selfie related behavior are mixed. A study among Chinese college students by Wang et al. (2018) revealed that self-esteem is positively related to selfie-posing. Similarly, Pounder et al. (2016) showed that self-esteem is both a reason for and a result of selfie sharing. However, Sorokowska et al. (2016) found no relationship between selfie-posting and self-esteem among women; the relationship is only weak for men. Similar results were found by Wang et al. (2017) and Barry et al. (2017). An experiment by Shin, Kim, Im, and Chong (2017) showed that posting selfies negatively impacted people's self-esteem.

Since the above findings are inconsistent, the following research question is raised:

RQ1: Is self-esteem positively related to (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation?

Perfectionism. Perfectionism is a personality trait marked by "striving for flawlessness and exceedingly high personal standards" accompanied by critical self-assessment and concerns over others' evaluations (Yang & Stoeber, 2012). So far, the extant scholarship has not analyzed the selfie editing behavior from the perspective of perfectionism. According to Yang and Stoeber (2012), physical appearance perfectionism is specific type of perfectionism which has two dimensions: Worry about Imperfection and Hope for Perfection. It is reasonable to guess that young women will edit selfies when they worry about their physical imperfection and when they desire for a more attractive version of themselves.

RQ 2: Is physical appearance perfectionism positively related to (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation?

Body Image

Body image and social media use. According to Grogan (2016), body image is a multidimensional construct defined as "a person's perceptions, thoughts, and feelings about his or her body" (p.4). Body dissatisfaction arises when these body-related thoughts and feelings are negative.

The relationship between mass media exposure and body image concerns was well documented (see Grabe, Ward, & Hyde, 2008, and Holmstrom, 2004 for meta-analyses). In terms of social media, most correlational studies demonstrated a positive correlation with social media use and body image concerns (Stronge et al., 2015; Tiggemann & Slater, 2013).

Specifically, previous works found that only specific types of activities are predictors. For example, exposure to appearance-related contents on the Internet, but not on magazine nor on TV, is positively related to weight dissatisfaction (Tiggemann & Miller, 2010); the amount of time spent on photo activities (e.g., viewing, sharing and commenting on photographs) on Facebook, not time spent on Facebook overall, predicted body dissatisfaction (Meier & Gray, 2014). However, a study done in Singapore among children aged 10 to13 showed that social media use did not correlate with body dissatisfaction (Lwin & Malik, 2012). Other studies found that social comparison mediated the positive correlations between social media use and body dissatisfaction (Fardouly & Vartanian, 2015).

Most longitudinal studies supported the positive relationships between social media use and body image concerns (Smith, Hames, & Joiner, 2013), although one study, in which over 94% of the participants were Latino, found that this positive relationship exists only when peer comparisons serve as a mediator (Ferguson, Munoz, Garza, & Galindo, 2014). Similarly, de Vries, Peter, Nikken and Graaf (2014) revealed that social media use, indirectly through an increase in appearance investment, boosted adolescents' intention to undergo plastic procedures. Importantly, de Vries, Peter, Graaf, and Nikken (2016) demonstrated that social media use increased body dissatisfaction 18 months later, but body dissatisfaction did not lead to an increase in social media consumption.

The majority of experimental studies supported direct causal relationship between social media use and body dissatisfaction (Tiggemann & Zaccardo, 2015; Mabe, Forney, & Keel, 2014; Lee, Taniguchi, Modica, & Park, 2013; Haferkamp & Kramer, 2011), except for one study by Fardouly, Diedrichs, Vartanian, and Halliwell (2015). Nonetheless, Fardouly et al. (2015)

showed that the tendency to compare appearance with others mediated the relationship between social media use and face, hair, and skin-related concerns.

While literature abounds on the correlations between body image and social media use in general, few studies focused on selfie-related behavior specifically. An experiment by Mills et al. (2018) showed that posting edited selfies significantly decreased women participants' feelings of physical attractiveness. McLean et al. (2015) found that those dissatisfied with their body and those over-evaluating the importance of weight and shape are more likely to edit their selfies before posting. However, some researchers found opposite results. Ridgway and Clayton (2016) revealed that the number of selfies posted on Instagram was negatively related to body dissatisfaction. A longitudinal study in Korea by Chae (2017) showed that people edit their selfies not because of dissatisfaction with their overall facial appearance, but due to upward social comparison with their peers.

A research question is raised because of mixed results on the relationship between body image concerns and selfie related activities:

RQ 3: Is body dissatisfaction positively related to (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation?

Appearance ideals across cultures. Western beauty standards are influential in East Asia. For example, although modest fatness in Asia, was historically regarded as wealthy, healthy, higher social status, and fertility (Han, 2003), there has been a well-documented trend that Asian women are incorporating Western beauty standards, for example, to be thin (Jung & Lee, 2006; Luo, Parish, Laumann, 2005; Han, 2003; Leung, Lam, & Sze, 2001).

Desiring thinness as much as Western women do (Frederick, Kelly, Latner, Sandhu, Tsong, 2016), Asian women still have own unique beauty standards (Yan & Bissell, 2014). For

example, while Western women emphasize weight and shape, Asian women are more sensitive to their face, hair and skin features (Frederick et al., 2016; Kawamura, 2012; Staley & Zhan, 2011; Firth, Shaw & Cheng, 2005). In today's East Asia, at least in China, a tall woman who has big, round and alert eyes with double-fold eyelids, long, straight and dark hair, a narrow face with white and flawless skin, a tall nose, a small mouth, a V-line chin, and large breasts are narrowly defined and widely accepted physical appearance ideals (Liu, 2018; Jackson, Jiang, & Chen, 2016; Kawamura, 2012; Johansson, 1998). Some of these beauty ideals were indigenous to Asia, while others are adopted from Western world (Yan & Bissell, 2014; Leung et al., 2001).

In contrast to these idealized beauty standards, East Asian women are shorter with darker skin tones than their Western counterparts, and fewer Asian women have double-fold eyelids (Kawamura, 2012). That is why blepharoplasty (eyelid surgery) and rhinoplasty (nose surgery) are among the most popular plastic surgery procedures in East Asia (Lam, 2017). That is also why skin-whitening is a $7.5 billion market in Asia out of the $13.3 billion global market (Liu, 2018).

In general, Asian women tend to report higher scores on (a) overall body dissatisfaction, (b) dissatisfaction with body parts, (c) weight/shape concerns, (d) face-hair-skin related concerns than Caucasian women (Frederick et al., 2016; Mellor et al., 2013; Jung & Lee, 2006; Evans & McConnell, 2003).

Body image across body parts, culture and medium. So far, most scholarship examining body image concerns, drive for thinness and thin ideal internalization focus merely on weight/body shape concerns. This responded to the finding discussed above that Western women are more sensitive to their weight and shape. However, (dis) satisfaction with body parts and (dis) satisfaction with face are two categorically different constructs (Petrie, Tripp, & Harvey,

2002). Frederick et al. (2016) even proposed a new concept "Face Image." Although Cash (2015) and Frederick, Hatfield, Bohrnstedt, and Berscheid (2014) did not regard *satisfaction with face* as parallel with *satisfaction with body*, they both establish *satisfaction with facial features* as a distinct factor, along with other factors like *upper torso factor* and *lower torso factor*.

Body image is racially/culturally salient. Many scholars have pointed out the shortcomings of only addressing weight and shape concerns, especially when examining (a) ethnic groups (Frederick et al., 2016; Jackson and Chen, 2015; Mellor et al., 2013), and (b) body image concerns associated with social media use (Fardouly et al., 2015). For example, Frederick et al. (2016) showed that face satisfaction partially explains differences in appearance evaluation between White women and Asian American women. Jackson and Chen (2015) revealed that for Chinese young women, fatness and facial appearance concerns, but not overall body dissatisfaction, is positively correlate with plastic procedure considerations.

Body image also has salience in medium. Mills et al. (2018) demonstrated that posting selfies, either retouched or not, elicit decrease in women's feelings of attractiveness, but no changes in their feelings of weight and body size concerns were observed. They explained that his might be because they instructed the participants to take a headshot. Similarly, the experiment by Fardouly et al. (2015) demonstrated that Facebook exposure did not lead to women's dissatisfaction with overall body, or a desire to change their body weight and shape. However, this exposure, mediated by body comparison, did result in their desire to change face, hair, and skin features. This study justifies the necessity to distinguish between body satisfaction and face-skin-hair satisfaction when social media is in question, even if White women are the main subjects.

This study involves ethnic groups (Chinese women, and probably Black and Hispanic American women); it also entails the use of social media, as selfies are primarily for posting on social-networking websites. Therefore, two independent representation of body image concerns, i.e., body dissatisfaction (BD), and face-hair-skin satisfaction (FHSS) are utilized.

Based on above discussions, the following hypotheses are raised in which selfie-related behavior refers to (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation.

H 3: (a) Chinese women will report higher levels of BD and lower levels of FHSS than American women; (b) the differences between FHSS will be greater than those between BD.

H 4: For both cultural groups, (a) both FHSS and BD predict selfie-related behavior, but (b) FHSS is a stronger predictor than BD.

H 5: FHSS is a stronger predictor of selfie-related behavior for Chinese women than for American women.

Internalization of Appearance Ideal

Defining internalization of appearance ideal. Internalization of appearance ideal refers to the extent to which an individual cognitively "incorporates current social standards of appearance and attractiveness into one's own approach to managing and thinking about one's appearance" (Thompson, Schaefer, & Menzel, 2012, p 499). These idealized standards are oftentimes unattainable for most men and women (Thompson & Stice, 2001).

Studies showed that media use is a significant predictor of internalization of appearance ideal. For example, a longitudinal study by Tiggemann (2006) among adolescent girls demonstrated that media exposure led to appearance ideal internalization. When it comes to Internet and social media use, Tiggemann and Slater (2013) found that Internet exposure in

general, and the amount of time spent on Facebook and MySpace in particular are positively related to higher levels of thin-ideal internalization. Similar results were found by Tiggemann and Miller (2010) who showed that exposure to appearance-related contents on magazine and the Internet, but not on TV, is positively related to drive for thinness and thin-ideal internalization.

Studies also found that internalization of appearance ideal correlated significantly with body dissatisfaction and eating disorder (Thomson & Stice, 2001). According to the Tripartite Influence Model (Keery, van den Berg, & Thompson, 2004), pressure from family, peers and the media will exert an impact on people's dissatisfaction via two mediators: appearance comparison and internalization. Body dissatisfaction then leads to bulimia (Keery et al., 2004). Similarly, dual-pathway model (Stice, 2001) predicted that two factors—perceived pressure (from family, friends, romantic partner and the media) to be thin, and thin ideal internalization—would lead to body dissatisfaction, which then cause bulimic symptoms via two mediators, i.e., dieting and negative affect.

So far, no study has examined selfie related behavior from the perspective of Internalization of appearance ideal. A relevant study is done by Henderson-King and Brooks (2009). They found that internalization of appearance ideal predicted acceptance of and desire for cosmetic surgery procedures. Similar results were found among young Chinese women. Jackson and Chen (2015) showed that cosmetic surgery considerations among Chinese women were significantly related to internalization of appearance ideals promoted on media. However, the relationship between internalized appearance ideal was found to be indirect, mediated by body dissatisfaction (Menzel et al., 2011) or facial appearance concerns (Ching and Xu, 2019).

Since selfie-editing can be seen as a "virtual" cosmetic surgery, it is a reasonable guess that internalized appearance ideals will correlate with selfie related behaviors. Based on this assumption, the following research question is raised:

RQ 4: Is internalization of appearance ideal positively related to (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation?

Internalization of appearance ideal and plastic surgery considerations. It is not uncommon that people produce an idealized version of the self through photo-retouching, and at the time they are exposed to other people's beautified selfies ("Women admit," 2015). This has increased women's tendency to get plastic surgery (Rees, 2014). Reports showed that women undergo cosmetic procedures so as to look better in their selfies (AAFPRS, 2018), to look like selfies of celebrities' ("The aging face," 2016), and, increasingly, to look like their own retouched selfies (Davies, 2018; Yang, 2018; Rajanala, Maymone, Vashi, 2018; Hosie, 2018). This new trend has been called as "Snapchat Dysmorphia" (Hosie, 2018). As Edward Farrior, President of American Academy of Facial Plastic and Reconstructive Surgery, observed, "social platforms …, force patients to hold a microscope up to their own image and often look at it with a more self-critical eye than ever before" (as cited in AAFPRS, 2014, para. 3).

Selfie editing provides offers a unique way for women to make their idealized selves come true. People post their beautified selfies on their social media where other people can view, share and hopefully comment on. At the same time, they are fed with others' edited selfies as well. Thus, a vicious cycle is created where beauty standards generated by beauty selfies apps get popular among, and internalized by these young women. When they get accustomed to their enhanced physical appearance in cyberspace, they want to make the idealized self made possible

by photo retouching applications come true. For them, cosmetic procedures are the easy way to go. Based on this logic, the following research question is raised:

RQ 5: Is plastic surgery considerations positively related to (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation?

Above hypotheses and research questions are as follows (See Figure 1):

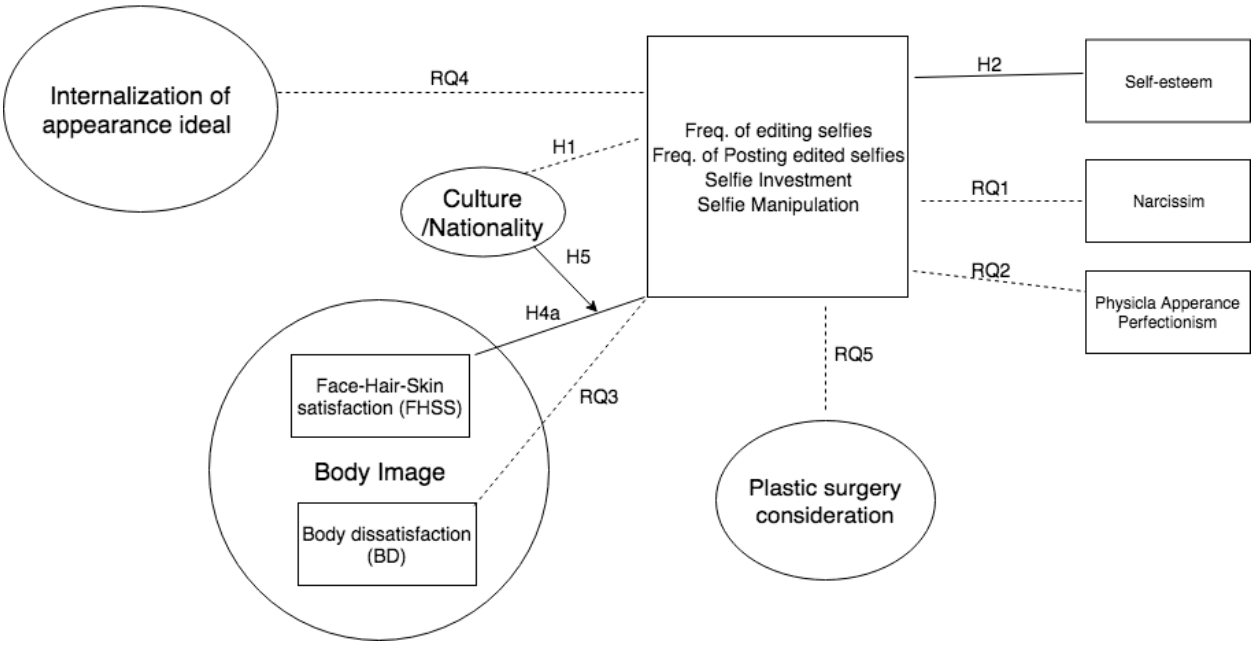

Figure 1 Hypotheses and research questions. H and RQ are proposed as above.

Method

Participants and Procedure

The study was approved by the IRB at the author(s)' university. A sample of 400 female college students aged 18-30 (half from a Midwestern university in the United States, and the other half from a university in Northern China) obtained through Qualtrics completed a 20-minute online survey. Since one of the focuses of the current study is on cultural difference, only Chinese citizens whose country of origin and country of residence are both China will be

recruited. The requirement was the same for participants in the United States. Also, as adolescents (aged 12 to 19) and young adults (20-30) are most active in selfie related behaviors (Dhir, Pallesen, Torsheim, & Andreassen, 2016), participants aged 18 to 30 thus will cover these two groups.

Before doing the survey, each participant was told that the study was designed to examine "the impact of social media on people's self-image." Participants were also given the requirement for nationality in the current study, and were provided informed consent. Qualified and consenting participants were then given the definition of a selfie: a photograph of oneself taken by oneself, i.e., without the help of others, typically with a smartphone or webcam, and uploaded on social media. They were explained that only solo selfies will be studied; selfies with another person (e.g., a friend, a romantic partner) or a group of people were not identified as selfies in this study. Then, each participant was shown 10 photos and was asked to click on those that were selfies. Participants providing any single wrong answer were shown the definition and the task again until he or she provided correct responses to all the ten photos. The purpose of this check was to make sure each participant read the definition and understand clearly what counted as a selfie for the current study.

Measures

Demographics. Participants reported their gender, nationality, country of origin and country of residence, race and age. Weight and height were also reported, by which BMI was calculated.

Body dissatisfaction. The Body Parts Satisfaction Scale—Revised (BPSS-R) by Petrie et al. (2002) is a two-factor 11-item scale measuring people's satisfaction with the various body parts and face. For this study, only the first factor which measures satisfaction with weight and

body parts other than face, hair and skin, was used. Factor 1 has been shown to have high internal consistency among U.S. citizens in the study by Ridgway and Clayton (2016) with a Cronbach's alpha of .93. No reports on its internal consistency among Chinese women were found. The reason why the current study does not use the second factors is that (a) both Petrie et al. (2002), and Ridgeway and Clayton (2016) reported a lower internal consistency (around .75) for this factor; (b) it only contains four items, i.e., hair, complexion, overall face, and breasts, which could reflect neither the affordances of today's selfie-editing apps nor Chinese women's standards of facial beauty as discussed above.

Participants rated their satisfaction with their weight, arms, stomach, buttocks, hips, upper thighs, and general muscle tone, with a scale anchored by 1=*very dissatisfied* to 4=*very satisfied*.

Face-Hair-Skin Satisfaction (FHSS). Based on face satisfaction in the BBSS-R (Petrie et al., 2002) and the scale of Face Dissatisfaction Frequency by Frederick et al. (2016), the current study constructed the scale of Face-Hair-Skin Satisfaction (FHSS). FHSS measures participants satisfaction with (a) overall face, (b) face size and shape, appearance of the (c) eyebrows, (d) eyes, (e) nose, (f) lips, (g) chin, (h) cheek bones, (i) color and texture of the skin, and the (j) length, color, thickness, and moisture of the hair. Participants rated their satisfaction with these face-hair-skin related features with a scale anchored by 1=*very satisfied* to 4 *very dissatisfied*.

Time spent on social networking sites. Participants were asked how much time they spent on each of the five most used social networking sites, i.e., Facebook, Snapchat, Instagram, WeChat, and Sina Weibo (Thai, 2018; Smith and Anderson, 2018). One open question was also

offered where participants could add a site that was not listed above. Total time will be summed and higher scores indicate more time devoted to social media use.

Frequency of editing selfies. Participants were asked how often they take selfies with a filter camera or edit selfies with photo-editing apps on phones and software on computers. They responded to a 7-point scale (1=*never*; 7=*once an hour*).

Frequency of posing edited selfies. Participants were asked how often they post retouched selfies on social media. Similarly, they responded to a 7-point scale (1=*never*; 7=*once an hour*).

Internalization of Appearance Ideal. The Internalization-General Attractiveness subscale, and the Internalization-Thin/Low Body Fat subscale, of the Sociocultural Attitudes Towards Appearance Questionnaire-4-Revised-Female (SATAQ-4R-female; Schaefer, Harriger, Heinberg, Soderberg, & Thompson, 2017). These two subscale measure the extent to which participants cognitively incorporate socially defined standards of beauty (thinness and attractiveness) into their beliefs. Sample items are "It is important for me to look good in the clothes I wear", "I don't think much about how I look", and "I think about about looking thin". Items were rated on a 5-point Likert scale (1=*definitely disagree*; 5=*definitely agree*). Both subscales were reported to have an internal consistency of .86 by Schaefer et al. (2017).

Selfie Investment. An adapted form of Self Photo Investment Scale (McLean et al., 2015) was used to measure selfie investment. This scale reflects concerns about how selfies portray the individual, and the efforts expended in choosing the best selfies before posting. It is a 8-item scale anchored by 1=*completely disagree* to 4=*completely agree*. Total scores, ranging from 8 to 32, were calculated from the sum of the responses. Higher scores indicate higher investment in selfie taking and posting. McLean et al (2015) used the original scale among

Australians and reported a Cronbach's alpha of .85. Example items include "It's easy to choose the photo," and "I feel anxious or worried about the photos I share/post."

Selfie Manipulation. Selfie Manipulation was assessed with the 10-item Self Photo Manipulation Scale (McLean et al., 2015). Participants responded on a seven-point Likert scale (1= *never*; 5= *always*). Example items are "Make yourself look larger" and "Edit to hide blemishes like pimples". Total scores were calculated from the sum of the responses, ranging from 10 to 50. Higher scores mean more manipulation over photo quality, and physical features in the selfie. This scale was reported to have a Cronbach's alpha of .85 among Australian adolescent girls (McLean et al., 2015).

Cosmetic surgery consideration. Following Jackson and Chen (2015), the five-item ACSS consideration subscale was employed. This scale measures participants willingness to consider cosmetic procedures when considering the associated cost, pain and side effects. Participants responded on a seven-item Likert scale (0=*disagree strongly*; 6=*agree strongly*). Example items are "In the future, I could end up having some kind of cosmetic surgery," and "If I could have a surgical procedure done for free, I would consider trying cosmetic surgery." Jackson and Chen (2015) reported a Cronbach's alpha of .86 among Chinese women.

Narcissism. To avoid survey fatigue in the respondents, the Single Item Narcissism Scale (SINS; Konrath, Meier, & Bushman, 2014) was used to measure participants' level of narcissism. SINS is a one-item seven-point Likert scale (1=*not very true of me*; 7=*very true of me*). The scale was validated in a Turkish sample (Özsoy, Rauthmann, & Jonason, 2017).

Self-esteem. Self-esteem is measured with the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965). Participants will respond on a four-point Likert scale (1= *strongly agree* to 4= *strongly disagree*). Example items include "On the whole, I am satisfied with myself" and

"All in all, I am inclined to feel that I am a failure". The scale was reported to have a Cronbach's alpha of 0.86 among Americans (Wang et al., 2017). This scale was shown to be problematic among Chinese (Wu, 2008), especially due to the eighth item: I wish I could have more respect for myself. Thus, this item was deleted in the Chinese version of the scale.

Physical appearance perfectionism. The Physical Appearance Perfectionism Scale (PAPS; Yang and Stoeber, 2012) was employed. This scale measures participants level of physical appearance perfectionism. It has two dimensions: Worry About Imperfection (WAI) and Hope For Perfection (HFP). This scale was validated among Chinese. Both English and Chinese versions of the scale were provided by Yang and Stoeber (2012). Example items are "I am not satisfied with my appearance," and "I wish I could completely change my appearance."

Scale translation. Except for PAPS, all other scales were translated into Chinese and back-translated into English by two English majors in China. Minor differences were discussed among the two translator and the author of the current study. Final Chinese versions were agreed upon by the two translators.

Topics Related to the Choice of the Method and the Instruments

Is the study ethical? Any privacy concerns or harm to participants? Firstly of all, the study should be approved by the IRB before the author can proceed. Also, participation in the study will be completely voluntary. Since the survey will be done on Qualtrics, people can leave it at any time, if they wish to do so. On Qualtrics, participants are anonymous. No personal information other than age, race, country of origin and residence, and body weight and height will be revealed. The author is not sure whether other questions relating to body image, self-esteem, narcissism, and internalization of appearance ideals will be beneficial for the

participants. (They might well be, as these questions might guide participants to reflect on their attitudes and behavior.) He is sure, however, that these questions do little harm.

Why choosing survey as the method? The current study is a cross-sectional one. As can be seen from the above hypotheses and research questions, this study is interested in correlations, for example, whether the frequency of editing selfies correlates with body dissatisfaction or cosmetic procedures consideration. Answers to these questions depend on participants' self-reports. The current study does not examine causal relationships between the above listed variables. Also, units of analysis in this study are individuals (female college students), not the selfies that they have posted. Because of all these, the author chose survey research as the method.

That said, survey and content analysis are very important in the author's future research on selfies. For example, he noticed that (a) American women are more likely to post selfies of their whole body or selfies taken in front of a mirror; Chinese women are more likely to post headshots; (b) Chinese women are more likely than their American counterparts to attach cute selfie stickers. Questions like these should be answered through conducting content analysis. Also, the author is interested in whether posting edited selfies lead to dissatisfaction with body and face. This question has to be answered through longitudinal study or experiments.

Why females only? In the study, only female college students are identified as units of analysis. This is for two reasons. First, selfies are more popular among women than men. Data show that around that in China, U.S., and Russia, women account for 60%-80% of selfies takers (Gaskin, 2018; Wright, 2017). Second, and most importantly, men and women have different body image concerns (Franzoi & Shields, 1984), and they internalize different appearance ideals (Schaefer et al., 2017). The author is already addressing cultural differences in body image

concerns. If gender differences are also included, the current study will have unnecessarily too many focuses and eventually will become too long. Therefore, they author decided to forgo analyzing gender differences and only focus on cultural differences among women instead.

Generalizability. Due to lack of funding, the current study does apply probability sampling. Population for the study consists of about 20 million female college students in the US and China. The author does not have financial capability to collect data on nationally representative. (If he does, there might be better ways to spend the money.) Undergraduate students will be used as convenience samples. Therefore, the generalizability of this study is limited.

If it is not generalizable, then why wasting time and money on the project? The current study suffers from low generalizability. However, this does not mean that it is totally useless. As stated in the sections of introduction and literature review, so far, extent scholarship failed to answer the following questions:

(a) Is internalization of appearance ideals related to selfie editing?

(b) Do Chinese and American young females differ in their frequency of editing selfies and posting them on their social media?

(c) Is face-hair-skin related dissatisfaction more significantly related to selfie editing behavior than body dissatisfaction?

(d) Is selfie editing behavior related to plastic surgery considerations?

Some reports revealed the differences in popularity and selfie market between the U.S. and China. There is also news coverage that an increasing number people undergoing plastic procedures report higher frequency of selfie taking and sharing. However, little empirical data on either differences in popularity or the relationships between selfie editing behavior and plastic

surgery intentions exists. Differences between selfie related behavior between young females in the US and China might be just fun fact to know, but the correlation between selfie editing behavior and plastic procedure considerations, *if supported in the study*, will be of social significance. As a cross-sectional study, it does not inform us causality. However, the study will at least show that the correlation exists. This finding can encourage, if not guide, future experimental studies that can support or refute the causality between the two variables.

Is the work feasible and workable? This study is feasible for me. In terms of budget, there will not any funding. However, if each participant receives 2 dollars, the total expenditure will be about $800, which is acceptable. Also, Professor Nicole Martins is an expert in the body image research. I took her class and she said she would be happy to offer assist and guidance for this study.

The politics of this study. At first, the author wanted to focus on race: only White/Caucasian females in the U.S., and Han/Chinese females in China would participate in the study. Although it won't be a problem to specify this requirement in China (after all, few Westerns are living in China and much fewer of them can read fluently in Chinese), this, however, will potentially be considered as "politically incorrect" in the United States as Black and Hispanic females are excluded. The author later decided to focus on culture instead, which will not be considered as racist or prejudicial.

Questionnaires on social media use. The author could have asked a general question: how many hours do you spend on social media each day. This is not the best way to obtain reliable answer because the majority of young people use any forms of social media (Smith & Anderson, 2018). People might not be able to come up with the total number of hours they spent. (In fact, this might be easier for respondents, but the results won't be accurate.) When asked to

specify how many hours they spend on specific social media platform, participants will, hopefully, try to think about it. The sum of hours devoted to each platform will be more reliable. Also, an open-ended question is asked because some respondents might use a not-so-popular platform.

Will participants be willing to answer, and honestly? In general, the questions asked (as can be seen in Appendix section) are not sensitive. If observed by others, participants might not provide honest answers to questions about how they are satisfied or dissatisfied with their body or face since they want to appear confident. However, since the survey will be done online through Qualtrics, such pressure will not appear.

The ordering of the questions. The author has three considerations when deciding the orders of questions to be asked: (a) participants won't know the exact purpose of this study, at least not at the start of survey; (b) the first few questions are easy to answer, i.e., without too much thinking or calculation; (c) the first few questions are interesting, at least not boring enough to discourage the participants from finishing the survey; (d) a block of questions won't be very irrelevant to the earlier block.

Among all the blocks of questions, the author thinks that satisfaction with body and face is the most interesting one and they are not very hard, so he puts these two blocks at start of the survey, right after demographics. Questions about personality are not as engaging, and thus are place at the end.

Why choosing online surveys rather than mail (post), telephone, in-home interviews, and street intercept surveys?

a. Internet surveys save both the author's and the respondents' time. The author saves his time because he can collect responses from 400 people relatively quickly and these responses

are digital. The author is supposed to analyze data produced by over 400 people. If each person answers 100 questions, the author will have 4,000 pieces of data. If the author conducts the survey through mail, telephone, or interviews, he has to digitalize these pieces of information before running them on SPSS. This process alone will take so much time. Also, one hundred questions might take more than half an hour if asked through phone or in interview. If the author interviews 2 people each day, he needs more than one year to collect the data. If he intercepts people on street, it probably takes a long time too.

From the perspective of participants, they can complete the survey in 20 minutes by just clicking on computers or phones. Answering questions in interviews will take much time. In mail surveys, participants have to complete the questionnaires by pen or pencil. This takes a lot time.

b. Internet surveys save money. The author is a poor graduate student. Suppose he conducts the survey through mailing people, he probably has to put one dollar in the envelop. Considering that the respondence rate won't be 100%, he will waste a lot of money. If the survey is done by phone, he probably will pay some money for all the international calls to China.

c. Participants are more willing to answer and more likely to answer honestly in online surveys. Most of respondents will be charming ladies from China and the U.S.. By contrast, the author is a plain-looking Chinese male, and he wants to study these charming ladies' weight, height, and their body image. The ladies, interviewed by the plain-looking, if not homely, author, must feel wired. They are unlikely to tell the author their real thoughts, feelings and attitudes. If the survey is conducted online through Qualtrics, participants feel more comfortable about answering these questions.

d. It is safer. Both knocking on strangers' doors and intercepting people on the street might pose some danger to the author.

Data Analysis Approach

First, demographic information for both Chinese and American samples was looked at (See Table 1). Abnormal data was excluded from analysis.

Table 1 Demographic information on two samples

Demographic information	Chinese sample	American sample
N		
Age mean (SD)		
Age range		
BMI mean (SD)		
Race (%)		
Chinese		
White/Caucasian		
African American/Black		
Asian		
Other		

Second, other variables for both Chinese and American samples were also looked at (See Table 2). Abnormal data were examined.

Table 2 Mean and standard deviation for BD, FHSS, SNS use, editing frequency, posting frequency, internalization of appearance ideal, selfie investment, selfie manipulation, cosmetic surgery consideration, SINS, self-esteem, and PAPS

	Chinese sample	American sample
Variables	Mean (SD)	Mean (SD)
BD		
FHSS		
SNS use		
Editing freq.		
Posting freq.		
Internalization		
Selfie investment		
Selfie manipulation		
Cosmetic surgery consdr.		
SINS		
Self-esteem		
PAPS		

Third, to test the relationship between age, gender and selfie-related behavior, correlational analyses were run (see Table 2).

Table 3 Correlations between variables

	Variables	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Age													
2	Race													
3	BD													
4	FHSS													
5	SNS use													
6	Editing freq.													
7	Posting freq.													
8	Internalization													
9	Selfie investment													
10	Selfie manipulation													
11	Cosmetic surgery consdr.													
12	SINS													
13	Self-esteem													
14	PAPS													

The aim of this test was to test whether age and gender should be viewed as covariates. Kim and Chock (2017) reported that age influenced selfie posting. If the relationship between age and selfie-related behavior was significant, then age would be controlled in the following analyses. The same was for race.

To test H 1, independent sample t test was employed. If $p<.05$, it means that the case in the current study is very unlikely to occur if there is no differences in (a) the frequency of editing selfies; (b) the frequency of posting edited selfies; (c) selfie investment; and (d) selfie manipulation between Chinese and American women. Thus, if $p<.05$, H 1 will be supported.

To test H 2, and to answer RQ1, RQ2, and RQ5, multiple linear regression were employed.

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Appendices

Appendix A
(Demographic info)

Directions: Please answer the following questions carefully and honestly. Your responses will be kept confidential and won't be shared with others.

1. Do you identify yourself as a female?
   □ Yes
   □ No (If the answer is No, the survey ends here.)
2. Nationality_____
   □ United States of America
   □ People's Republic of China
   □ Other (If the answer is Other, the survey ends here.)
3. Country of origin (where you were born) _____
4. Country of residence (Where you have been living in the past three years) _____
   (If the answer to Q 4 is different from that to Q 3, the survey ends here.)
5. Race
   □ White/Caucasian
   □ Asian
   □ Hispanic
   □ Black
   □ Other (Please specify)
6. Age_____
7. Weight_____
8. Height _____

Appendix B
(Body Parts Satisfaction Scale—Revised, Body Dissatisfaction)

Directions: Please select the response that best describes your attitude to each of your body parts.

Very dissatisfied	Dissatisfied	Satisfied	Very satisfied
1	2	3	4

9. Weight
10. Arms
11. Stomach
12. Buttocks
13. Hips
14. Upper thighs
15. General muscle tone

Appendix C
(Face-Hair-Skin Satisfaction Scale)

Directions: Please select the response that best describes your attitude to the your body parts.

Very satisfied	satisfied	Dissatisfied	Very dissatisfied
1	2	3	4

16. Overall face
17. The size and shape of face
18. Eyebrows
19. Eyes
20. Nose
21. Lips
22. Chin
23. Cheekbones
24. Skin (color and texture)
25. Hair (length, color, thickness, moisture)

Appendix D
(Social Media Use and Selfie-Editing Behavior)

26. Please specify how many hours you spend on each of the following social media websites:
    - ❍ Facebook_____
    - ❍ Snapchat_____
    - ❍ Instagram_____
    - ❍ WeChat_____
    - ❍ Sina Weibo_____

    Other(s) (please specify the name of the platform and your time spent)_____
27. Have you ever taken a selfie?
    - □ Yes
    - □ No (If No is chosen, Q 28-21 won't appear)
28. Have you ever used a filter camera or edit your selfies with photo-editing apps? □ Yes
    - □ No (If No is chosen, Q 29 won't appear.)
29. In the past 30 days, how often did you use a filter camera or photo-editing apps?
    a. Never
    b. Once a Year
    c. Once a Month
    d. Once a Week

e. Once a Day
f. Several Times a Day
g. Once an Hour

30. Have you ever posted a selfie taken with a filter camera or edited by photo-editing apps?

□ Yes
□ No (If the answer is No, Q 31 won't appear.)

31. In the past 30 days, how often did you post such selfies on your social media?
a. Never
b. Once a Year
c. Once a Month
d. Once a Week
e. Once a Day
f. Several Times a Day
g. Once an Hour

Appendix E
(Internalization of Appearance Ideals)

Directions: Please indicate your level of agreement with the following statements.

Definitely disagree	Mostly disagree	Neither agree or disagree	Mostly agree	Definitely agree
1	2	3	4	5

32. It is important for me to look good in the clothes I wear.

33. I want my body to look very think.

34. I think a lot about my appearance.

35. I think a lot about looking thin.

36. I want to be good looking.

37. I don't really think much about my appearance.

38. I want my body to look very lean.

39. It is important to me to be attractive.

40. I think a lot about having very little body fat.

41. I don't think much about how I look.

Appendix F
(Self Photo Investment Scale)

Directions: Please think about photos of yourself that you post online or share through social media and indicate your level of agreement with the following statements.

Completely disagree	Disagree	Agree	Completely agree
1	2	3	4

42. It's easy to choose the photo
43. I take a long time to choose the photo ^
44. I feel anxious or worried about the photos I share/post ^
45. I share/post whichever photo is available
46. I don't care what others will think about how I look
47. I don't care which photos I share/post
48. I worry about whether anyone will "Like" my photos ^
49. I don't take any notice of how many "Likes" my photos get

Appendix G
(Self Photo Manipulation Scale)

Directions: Please indicate how often do you do the following to make your selfie look better.

Never	Rarely	Sometimes	Often	Always
1	2	3	4	5

50. Get rid of red eye
51. Make yourself look larger
52. Highlight facial features, e.g., cheekbones or eye color/brightness
53. Use a filter to change the overall look of the photo, e.g., making it black and white, or blurring and smoothing images
54. Make yourself look skinnier
55. Adjusting the light/darkness of the photo
56. Edit to hide blemishes like pimples
57. Whiten your teeth
58. Make specific parts of your body look larger or look smaller
59. Edit or use apps to smooth skin

Appendix H
(Cosmetic Surgery Consideration)

Directions: Please indicate your level of agreement with the following statements.

Disagree strongly	Disagree somewhat	Disagree slightly	Neither disagree nor agree	Agree slightly	Agree somewhat	Agree strongly
0	1	2	3	4	5	6

60. In the future, I could end up having some kind of cosmetic surgery.
61. I have sometimes thought about having cosmetic surgery.
62. I would never have any kind of plastic surgery.
63. If I could have a surgical procedure done for free, I would consider trying cosmetic surgery.
64. If I knew there would be no negative side effects or pain, I would like to try cosmetic surgery.

Appendix I
(Single Item Narcissism Scale, SINS)

65. To what extent do you agree with this statement: "*I am a narcissist*." (Note: The word "narcissist" means egotistical, self-focused, and vain.)

1	2	3	4	5	6	7
Not very true of me						Very true of me

Appendix J
Rosenberg Self-Esteem Scale

Directions: Below is a list of statements dealing with your general feelings about yourself. Select the response that best fits you.

Strongly agree	Agree	Disagree	Strongly disagree
1	2	3	4

66. On the whole, I am satisfied with myself.
67. At times, I think I am no good at all.
68. I feel that I have a number of good qualities.
69. I am able to do things as well as most other people.
70. I feel I do not have much to be proud of.

71. I certainly feel useless at times.
72. I feel that I'm a person of worth.
73. I wish I could have more respect for myself.
74. All in all, I am inclined to think that I am a failure.
75. I take a positive attitude toward myself.

Appendix K
(Physical Appearance Perfectionism Scale, PAPS)

Directions: Please indicate your agreement to the following statements.

Definitely disagree	Mostly disagree	Neither agree or disagree	Mostly agree	Definitely agree
1	2	3	4	5

76. I am not satisfied with my appearance.
77. I am never happy with my appearance no matter how I dress.
78. I hope my body shape is perfect.
79. I worry that my appearance is not good enough.
80. I wish I could completely change my appearance.
81. I hope that I look attractive.
82. My appearance is far from my expectations.
83. I worry about other' being critical of my appearance.
84. I often think about shortcomings of my appearance.
85. I hope others admire my appearance.
86. I hope others find me attractive.
87. I hope I am beautiful.