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Editing the Self Away: The Effects of Photo Manipulation on Perceptions of the Self

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by

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Abstract

The use of editing applications to manipulate photos of one's self prior to sharing them on social media has skyrocketed over the past decade, particularly among women. However, there is little research examining the consequences of such behavior. In this research, we experimentally examined the consequences of editing a photo of one's self on self-objectification and self-concept clarity in a sample of 231 women. A correlational Pilot Study provided preliminary evidence for a relationship between self-objectification, self-concept clarity, and photo manipulation, and my Thesis was conducted to further explore this relationship. We anticipated that when women were exposed to objectifying media (compared to nature images) they would spend longer editing a photo of themselves, which would in turn increase the extent to which they objectify themselves and decrease their self-concept clarity. When controlling for baseline self-concept clarity, women edited a photo of themselves for significantly longer after being exposed to objectifying media as compared to nature images. While no effects on self-objectification emerged, our data do suggest that an increase in time spent editing a photo of the self results in decreased self-concept clarity in women.

Introduction

The use of social media and social networking sites (SNS) has increased dramatically over the past decade, with platforms such as Facebook, Snapchat, and Instagram steadily growing in popularity (Smith & Anderson, 2018). As a result of the increased use of these predominantly photo-based platforms, photo related behaviors have increased as well. In 2006, 79% of teens reported posting photos of themselves on their social media profiles; by 2012, this statistic had jumped to 91% (Smith & Anderson, 2018). Beyond taking and posting "selfies," adding filters to change the appearance of photos has grown in popularity. A recent sample of Instagram accounts showed that 25% of images posted with the hashtag "#selfie" and even 10% of selfies posted with the hashtag "#NoFilter" used a filter provided by Instagram (Pettersson, 2017). Many photos are edited using third party applications which are continuously becoming easier to use, and which make it possible to realistically edit a photo of the self to appear more in-line with societal ideals surrounding appearance (Solon, 2018). Existing studies have examined the relationship between social media use, "selfie" behavior, and feelings toward the body (Meier & Gray, 2014; McLean, Paxton, Wertheim, & Masters, 2015; Veldhuis, Alleva, Bij De Vaate, Keijer, & Konijn, 2018), but many outcomes of social media use and photo related behaviors remain untapped in the psychological literature. The current research aims to explore one particular aspect of social media behavior – editing a photo of the self – and how this behavior may alter perceptions of the self among women.

Photo manipulation has become increasingly common, particularly among millennial women (Smith & Anderson, 2018), and editing tools and pre-designed filters are readily integrated within most social networking sites. Just as airbrushed and touched-up photos of models permeate mass media, social media users are now able to edit and touch-up their own photos before sharing them with their friends and followers. Intuitively, treating one's own self-image as an object to be modified may contribute to literally associating the self with an object (i.e., objectifying the self in a literal manner; Morris, Goldenberg, & Heflick, 2014), and there is some evidence to suggest that editing and presenting edited images of the self may lead to a disconnect in one's sense of identity, and an incoherent sense of who the self truly is (Yang & Brown, 2015). This thesis examines how engaging with social media impacts women's photo editing behavior, the effects of editing one's image on self-objectification, and the impact of editing on self-concept clarity. In this way, I investigate potential psychological consequences of a component of social media of which researchers have only begun to scratch the surface.

Objectification and Social Media

When considering social media, much of the observable behavior related to photo activity can be informed by objectification theory (Fredrickson & Roberts, 1997). According to objectification theory, women, more so than men, become accustomed to living in a society that heavily emphasizes their appearance, and which views them as *objects* to be used, rather than as full people. As such, women learn to internalize the focus that is traditionally placed on them by others and heavily monitor their own appearance, a process called *self-objectification*, which Fredrickson and Roberts (1997) argue is a main source of body shame and appearance anxiety for women. One of the most common ways in which women are portrayed in an objectifying manner is through media (Fredrickson & Roberts, 1997), and currently one of the most popular

ways to share and consume media is via Instagram, a photo sharing application with over one billion monthly users (Statista, n.d.).

Instagram, along with other media platforms, is a way to communicate beauty standards and ideals. One may argue that Instagram is inherently objectifying given that the main function is to share and view photos for the purpose of receiving likes and, essentially, feedback on your appearance. It is almost painfully simple to stumble across the profile of an "Instagram Model" and endlessly scroll through their perfectly posed photos. Most of these models are tall, thin and fashionable – they embody the "ideal" and broadcast it for anyone to see. These readily available images may trigger an objectifying mindset; by being reminded of everything one *should* be living up to but *is not*, this type of media may lead women to scrutinize not only the appearance of the women they are viewing, but also their own appearance. It is no surprise that Instagram use was found to be positively associated with women's body dissatisfaction as well as desire for thinness by means of appearance comparison (Hendrickse, Arpan, Clayton, & Ridgway, 2017). Also, exposure to Instagram profiles of attractive celebrities and non-celebrities resulted in greater negative mood and body dissatisfaction than exposure to travel images (Brown & Tiggemann, 2016). Taken together, it is clear that social networking sites, specifically photo-based sites such as Instagram, propagate unrealistic standards of attractiveness, exacerbate the negative effects outlined by Objectification Theory, and lead women to become more focused on their appearance.

Literal Self-objectification

Existing research exploring the consequences of self-objectification primarily operationalizes it as a preoccupation with one's physical appearance (Kahalon, Schnabel, & Becker, 2018). Studies treating self-objectification as a dependent variable often measure the

extent to which someone is self-objectifying by asking participants to describe themselves in 20 statements and counting up the number of statements that are body related (Noll & Fredrickson, 1998), by ranking body attributes in term of the relative importance of appearance versus competence related attributes (Noll & Fredrickson, 1998), or by measuring the extent of body monitoring and preoccupation with one's appearance (McKinley & Hyde, 1996). Studies exploring the effects of objectifying primes have revealed a host of affective and behavioral outcomes including an increased likeliness to describe one's self in terms of attributes related to appearance (Calogero & Pina, 2011), increased body shame (Quinn et al., 2006), and a decreased likelihood to speak in mixed gender interactions (Register et. al., 2015).

What is missing from the literature, however, is research explaining how and when women are reduced to the status of *literal* objects (Kahalon, Schnabel, & Becker, 2018), which is a component of objectification that requires further exploration. To study this facet, researchers have begun measuring objectification in a more literal manner. Morris, Goldenberg, and Heflick (2014) relied on a terror management perspective to investigate the conditions under which women are motivated to perceive the self in terms of a literal object, which was defined as a lack of attribution of human nature qualities to the self. To further investigate the literal objectification of the self, Morris, Goldenberg, and Heflick (2014) administered an explicit measure of the perceived overlap between the self and objects whereby participants categorize qualities as either "Object" or "Human," and then categorize the same qualities as either "Self" or "Others." Their findings suggest that when women deny themselves humanness, they do so by attributing the self and objects the same qualities (Morris, Goldenberg, & Heflick, 2014). To further document literal self-objectification, Morris, Goldenberg, and Heflick (2014) relied on a modified version of an Implicit Association Test using the same categories, "Self" and "Others,"

"Object" and "Human." Together, this set of studies provides support for the argument that when women self-objectify, they do so not just by focusing on their physical appearance, but also by treating the self as an actual, literal object.

One way in which women may be treating themselves as literal objects is by editing the photos that they share on social media. By manually altering their photos, participants are not only changing their appearance, but also manipulating the self in a way that treats it as a *thing* to be fixed, made thinner, made taller, or smoothed with the click of a button. Research has identified a unique implication of viewing other women in a literally objectifying way; that is, to the extent that women are perceived as less than human, and more as objects, their perceived ability to feel pain decreases (Morris, Goldenberg, & Boyd, 2018). Viewing others as unfeeling objects may be detrimental on its own but viewing the self in a similar manner may have distinct, harmful consequences as well.

Photo Editing

To date, very little research has examined the psychological effects of editing photos of the self, despite the growing popularity of this feature in popular culture. While a link has been established between engagement with selfie photo manipulation and body dissatisfaction (McLean et. al., 2015), as well as between Facebook photo activity and weight dissatisfaction, drive for thinness, thin ideal internalization, and self-objectification (Meier & Gray, 2014), this research is correlational and does not elaborate on the mechanisms relating photo manipulation to these negative outcomes. Most relevant to the present study is research suggesting that higher body surveillance is related to more frequent selfie manipulation, which therefore leads to feelings of disingenuousness, and thus depressive symptoms (Lamp, Cugle, Silverman, Thomas, Liss & Erchull, 2019). What is interesting about this finding is that it suggests that women who

are high in self-objectification are more likely to engage in photo manipulation behavior, likely as a means of presenting oneself as the "ideal." However, it seems that this strategy has the opposite effect, leaving women feeling deceptive and depressed, perhaps due to experiencing a disparity between their true self and their online self, or between their actual and ideal body. Higgins (1987) would describe this as a discrepancy between the self-concept and self-guides. When the actual self and the ideal self are not aligned, it results in feelings of disappointment and dissatisfaction (Higgins, 1987).

Although the body of research focused on photo editing is limited, we can draw parallels from research exploring online self-presentation. Research focusing on self-presentation has suggested that for online users who engage in deliberate, intentional self-presentation, they experience lower self-concept clarity than those who do not engage in this calculated behavior (Yang & Brown, 2015). A curated online self-presentation may be closely related to the way users edit their photos to visually present the self online in a certain, premeditated type of way, and this type of behavior may impact how users view themselves.

Despite the empirical support for these links, photo editing has not yet been examined in an experimental context. Additionally, the types of photo behaviors that have been focused on concern the use of pre-set filters and the quantity of selfies taken before choosing one to post. Little to no research looks at the subtle editing used by Instagram models, celebrities, and now everyday users to alter their body in a very convincing, realistic way. Beyond the negative consequences that stem from seeing someone else present an edited version of themselves that passes as genuine, there may be psychological consequences of physically engaging in this type of editing.

Self-Concept Clarity

According to Baumeister (1999), the self-concept refers to the way an individual feels about themselves, what kind of attributes they possess, and who or what their self truly encompasses. Self-concept clarity (SCC) is the extent to which this understanding about the self is clear, defined, and consistent over time (Campbell et al., 1996). Decades of research exploring this aspect of the self suggest that it can undergo long-term, permanent transformations (Markus & Wurf, 1987), but is also susceptible to short-term, temporary changes (Markus & Kunda, 1986). Low levels of SCC have been related to low self-esteem, chronic self-analysis, low internal state awareness, and a ruminative form of self-focused attention (Campbell et al., 1996), as well as to increased self-reflection, specifically related to the intentional management of an online self-presentation (Yang & Brown, 2015). While self-reflection is conceptualized as a form of self-focus meant to understand the self (Trapnell & Campbell, 1999), research suggests that self-reflection predicts self-rumination (Takano &Tanno, 2008), which is a more neurotic form of self-focus with the potential to be maladaptive (Trapnell & Campbell, 1999). Together, these findings suggest that a clear self-concept is beneficial to psychological health.

Relating the self-concept to social media, Valkenburg and Peter (2011) propose the *fragmentation hypothesis* which posits that social media users are able to present different facets of themselves online which may not fully represent their true self. The possibility to present countless potential selves and self-expressions, along with the potential for feedback and responses to these different selves, has been suggested to impair the development of a consistent and temporally stable self-concept (Reid, 1998). A similar argument made by Gergen (1991) argues that modern technologies expose individuals to a multitude of different identities that they can possess, and that this in turn impairs a coherent sense of self from forming.

Research exploring the relationship between social media use and the self-concept suggests that passive SNS use is negatively associated with well-being, but that the relationship is mediated by self-concept clarity (Lin, Liu, Liu, Hui, Cortina & You, 2018). The finalized model presented by Lin et al. (2018) indicates that passive SNS use is a negative predictor of SCC, a finding which supports the previously outlined fragmentation hypothesis (Valkenburg & Peter, 2008). As a result of mindlessly browsing social media, users are consuming content that may threaten the integrity of their sense of self. The mediation model also indicates that SCC predicts subjective well-being, identifying it as a mechanism between passive SNS use and well-being.

Taken together, this suggests that for individuals who are already low in SCC, they may be at a heightened risk for experiencing the negative effects associated with social media use. In fact, research looking at a sample of adolescents found that those with lower self-concept clarity reported a preference for presenting themselves online rather than offline, experimented with online self-presentation more regularly than their peers with high SCC, and presented an idealized version of the self online (Fullwood, James, & Chen-Wilson, 2016). Adolescents from this same sample with higher SCC reported presenting an online version of themselves that was far more consistent with their true self. When considered in relation to the findings of Yang and Brown (2015), whereby a negative relationship between intentional self-presentation and self-concept clarity emerged, these behaviors suggest a spiraling effect: low SCC encourages individuals to manipulate the self prior to online presentation, but altering the presentation of the self may contribute to low SCC, which then places individuals at a higher risk for negative well-being. Taken together, it seems that social media offers a chance to try out different "versions" of the self, but that this may have detrimental effects on the self-concept. One way in which social

media users may be altering their online self-presentation is by editing their physical appearance in photos. We aim to understand if the relationships between social media use and self-concept clarity can be extended to photo editing, and if the ability to alter one's physical appearance leads to individuals losing touch with who they really are.

Overview

The current study examines the psychological effects of using a photo editing application called Facetune to alter photos of the self prior to posting on social media. Facetune is unique from other forms of photo filters and editing tools due to the user's control. Whereas platforms such as Snapchat and Instagram provide pre-made filters to overlay on top of images, Facetune allows users to manually reshape the face, smooth blemishes, and enhance features. Even more interesting, Facetune, despite the name, is not restricted to just the face. Users are able to reshape their *entire body* whether that means enhancing curves, smoothing skin, or defining specific features. In this study, I further investigate the effects of editing on perceptions of the self by examining how women are affected by interacting with social media depicting an attractive woman, in this case by browsing the Instagram profile of a model (compared to a profile of nature images), and how that influences their use of Facetune to edit a photo of their self that they believe will be posted on Instagram. The proposed Instagram paradigm is similar to others used in current research (Brown & Tiggemann, 2016), but is distinct in that participants browse one entire Instagram profile at their own pace, rather than being shown photos in a timed manner. Upon completion of the editing task, literal self-objectification and self-concept clarity are measured as a function of the photo editing behavior.

Pilot Study

Building on the findings that body surveillance, selfie manipulation, and feelings of disingenuousness are associated with one another (Lamp et al., 2019), and to specifically test for a relationship between photo related behaviors, self-objectification, and self-concept clarity, a correlational Pilot Study was conducted.

Hypothesis 1: Self-objectification and photo related behaviors will be positively correlated, such that women higher in self-objectification will report more investment in their photos and edit their photos more often.

Hypothesis 2: Self-concept clarity and photo related behaviors will be negatively correlated, such that women with lower self-concept clarity will report more investment in their photos and edit their photos more often.

Hypothesis 3: Self-objectification and self-concept clarity will be negatively correlated, such that women higher in self-objectification will be lower in self-concept clarity.

Methods

Participants

Ninety-nine female participants were recruited from a large university in the Southeastern United States and were awarded partial course credit for participating in the study. All of the participants were English speaking women over the age of 18 (M_{age}=21.27, *SD*=3.98), who identified as White (45.90%), Hispanic (22.20%), East Asian (10.20%), Black (7.10%), Biracial or Multiracial (5.10%), South Asian (4.10%), Middle Eastern (4.10%), and Other (1%), and the majority of whom identified as exclusively heterosexual (70.70%). See Table 1 for descriptive statistics.

Measures

Photo Behavior

To measure photo activity, participants responded to a modified version of a scale developed by McLean et al. (2015), which includes two items to assess the frequency of taking images of the self (e.g., *"How frequently do you take 'selfies', or photos of just yourself?"*) rated from 1 (*"less than once a month*) to 8 ("*more than twice a day"*), one item to assess self-image sharing (*"Do you post photos of yourself online or share them through services like 'Snapchat' or 'Instagram'?"*) rated from 1 (*"never"*) to 5 (*"always";* α=*.82*), 8 items to assess photo investment which are presented along a continuous scale of 1 to 100 with opposing anchors on either end *(e.g., "It's easy to choose the photo to share on social media" versus "It's hard to*

choose the photo to share on social media"; α=.77), and 9 items gauging photo manipulation (e.g., *"How often do you edit or use apps to smooth skin?";* 1=*"never"*, 5=*"always";* α=.87).

Self-objectification

Trait self-objectification was measured using the Self-Objectification Beliefs and Behaviors Scale (SOBBS; Lindner & Tantleff-Dunn, 2017). This 14 item questionnaire assesses how often, and in what ways, women engage in self-objectification (e.g., "*How I look is more important to me than how I think or feel"*) using a 5-point Likert-type scale (1=*Strongly disagree,* 5=*Strongly agree*) (α=.91).

Self-concept Clarity

Self-concept clarity was measured using the Self-concept Clarity Scale (Campbell et al., 1996), which assesses the extent to which beliefs and attitudes about the self are consistent and stable. This scale asks participants to indicate how much they agree with each of 12 items (e.g., *"I seldom experience conflict between the different aspects of my personality"*) on a 5-point Likert type scale (1 = "*strongly disagree*", 5 = "*strongly agree*";α=.90).

Demographics

A standard demographics questionnaire was administered to assess age, race, ethnicity, and sexual orientation.

Procedure

All study procedures were approved by the IRB at the researcher's institution. Only women in the university's participant pool were invited to take the survey. After giving informed

consent, all participants responded to the scales in the same order beginning with the measure of self-objectification, followed by self-concept clarity, then photo behavior, and demographics.

Results

Consistent with Hypothesis 1, self-objectification was significantly positively correlated with manipulating photos of the self (r=.35, p<.001), and with how invested women are in the photos they post online (r=.27, p<.01). Hypothesis 2 was supported, with self-concept clarity being negatively associated with photo manipulation (r= -.31, p< .01) and photo investment (r= -.28, p<.01). Lastly, the data supported Hypothesis 3, showing that self-concept clarity and self-objectification are negatively related (r=-.62, p <.001). Correlations for all variables of interest are presented in Table 2.

These results suggest that as photo editing behavior and investment increase, self-concept clarity decreases, which is consistent with previous theorizing and the hypothesis for this Thesis. In addition, photo editing behavior and investment is associated with increased self-objectification, and greater self-objectification with a less clear sense of self. In all, it seems that the more women edit their photos, the less clearly defined their sense of self, and the more they see themselves in an objectifying way. However, these results are only correlational. Therefore, this Thesis aims to identify causal links between these variables.

Thesis

To identify a causal link between photo editing, self-concept clarity, and self-objectification in women, an in-lab study was conducted whereby participants were asked to view an Instagram profile of either an attractive woman or nature images for one minute, and were then asked to edit a photo of themselves that they believed would be posted on social media. Measures of self-concept clarity and self-objectification were administered after editing was complete. This thesis was pre-registered on the Open Science Framework (Center for Open Science, n.d.).

Hypothesis 1: Women exposed to the Instagram Model profile will spend more time editing their own photo than women exposed to the Nature profile.

Hypothesis 2: The relationship between Instagram profile and literal self-objectification will be mediated by the amount of time spent editing, such that the more editing behavior, the greater the literal self-objectification.

Hypothesis 3: The relationship between Instagram profile and self-concept clarity will be mediated by the amount of time spent editing, such that the more time women spend editing their image, the lower their reported SCC will be.

Exploratory Hypothesis: Considering the findings of Fullwood et al. (2016), it is also possible that baseline SCC will moderate the hypothesized effects, such that individuals with lower baseline SCC will respond to the Instagram Model (relative to the Nature) profile with more editing relative to the individuals with higher SCC, and will respond with more literal self-objectification and less SCC as a result, compared to individuals with high SCC.

Methods

Participants

Undergraduate women were recruited online through the University's online participant pool system and received partial course credit for participating in this study. Based on a power analysis, with power set to 0.80, 175 participants were needed to determine an effect size (η^2) of 0.06. To account for the exploratory moderation as well as for participants who do not allow for their data to be used, and who decline to have their photo taken, 346 participants were recruited. Accounting for missing data, as well as for participants who did not edit their photos or who failed an attention check, 231 participants remained in the final sample (See *Analysis Strategy* section for details). All participants were English speaking women over the age of 18 (M=19.51, SD=2.07) who identified as White (70.60%), Hispanic (26.80%), Black (16.50%), Asian (11.30%), American Indian (1.30%), Pacific Islander (.90%), and Other (6.50%). The majority of participants identified as exclusively (68.40%) and mostly (19.50%) heterosexual. Full demographics information can be found in Table 1.

Materials

Self-concept Clarity

Self-concept clarity data for all participants was collected through the University's mass testing questionnaire at the beginning of the semester, as well as twice throughout the experiment as a pre and post-test measure. The Self-concept Clarity Scale (Campbell et al., 1996) asks participants to indicate how much they agree with each of 12 items (e.g., *"I seldom experience*

conflict between the different aspects of my personality") on an eight-point sliding scale scored from 0 ("*strongly disagree*") to 7 ("*strongly agree*";α=. 82; α=.87). These items assess the extent to which feelings and perceptions about the self are consistent and stable.

Social Media Cover Questionnaire

Participants answered 13 questions detailing their social media use and behavior on social networking sites (SNSs) (e.g., "*How frequently do you use SNSs?"*) using a 7-point Likert type scale (Shi, Luo, Yang, Liu, & Cai, 2014; α=.71). This measure was not used for any analyses, but rather to bolster the cover story about social media use.

Instagram Profiles

Participants were instructed to browse either the Instagram page of a popular model, or the Instagram page of nature scenes for one minute on an iPad provided to them by the researcher with screen recording turned on. The images on the Model profile draw explicit attention to her physical appearance, physique, and beauty, whereas the Nature profile should not lead to any sort of thought associated with the body. The Model's profile contained 970 photos, the majority of which portray her face and body, while the Nature profile contained 850 photos of the Pacific Northwest region of the United States. Participants were allowed to scroll through as many photos as they wanted, mimicking how users typically engage with Instagram. The amount of time spent viewing each profile was recorded based on the screen recordings.

Instagram Feedback Questionnaire

Participants responded to 8 questions concerning perceptions of the Instagram profile (e.g., *"Did you find the photos on this page visually pleasing?"; "Did you think there was a good variety of photos on this Instagram profile?"*) with responses on a 5-point Likert type scale.

Responses from this measure were not used for any analyses, but to ensure that participants engaged with and reflected upon the Instagram profile that they viewed.

Implicit Association Test

To measure literal objectification of the self, participants completed a Self-Object IAT task modified from a task developed by Morris, Goldenberg, and Heflick (2014) using the Inquisit software. Throughout seven blocks, participants were asked to sort 16 stimuli words (*object, tool, device, thing, human, individual, person, citizen, me, self, my, myself, others, they, them,* and *theirs*) within the categories "Object," "Human," "Me," and "Others." Participants were instructed to sort the presented stimuli into the correct category using a designated key and are told to do so as quickly as possible. Blocks 1 and 2 included a single target category ("Me"; "Others"). Blocks 3 and 4 combined categories (e.g., "Me OR Object"; "Others OR Human"), and in Block 5 the categories "Me" and "Others" switched sides for another single category task. Blocks 6 and 7 reversed the pairings from Blocks 3 and 4 (e.g., "Others OR Object"; "Me OR Human"). This task takes about five minutes to complete. Responses were analyzed using the D-score algorithm (Greenwald, Nosek, & Binaji, 2003) which uses log-transformations of mean differences in reaction times to assess the differences in response latencies between trials that associate "Me" with "Object" in relation to "Me" with "Human," where higher scores show a stronger association between the self and objects.

Body Image Scales

Measures of self-objectification and body esteem were administered in the mass testing questionnaire completed prior to the study so as be analyzed as potential covariates.

Self-objectification. Trait self-objectification was measured in mass testing using the

Self-Objectification Beliefs and Behaviors Scale and then matched to participants' responses (SOBBS; Lindner & Tantleff-Dunn, 2017). This 14-item questionnaire was described in the Pilot Study and is a measure of trait self-objectification (α=.92).

Body Esteem. Body esteem was assessed in mass testing using the Body-esteem Scale (Franzoi & Shields, 1984). This scale asks participants to indicate how they feel about specific parts or functions of their body and consists of three factors measuring sexual attractiveness (e.g., *"body scent"*; α=.82), weight concern (e.g., *"appetite";* α=.91), and physical condition (e.g., *"physical stamina"*; α=.85). This measure uses a 5-point response scale (1=have strong negative feelings, 5=have strong positive feelings) to assess participants' feelings.

Photo Behavior

To measure photo activity, participants again responded to the photo behavior scale described in the Pilot Study (McLean et al., 2015), which asks how often participants take photos of themselves (α =.72), how often participants share images of themselves, photo investment (α=.77), and engagement with photo manipulation (α=.85). This scale was used to control for differences related to photo behavior among participants and was administered after completing the IAT and the Self-concept Clarity Scale and before demographics information.

Demographics

A standard demographics questionnaire was administered assessing age, race, ethnicity, and sexual orientation.

Procedure

Participants were recruited for a study that they were told pertains to social media trends and the use of social media among college students. Upon arriving to the lab, participants gave

their consent to participate and were informed by a female experimenter that the lab is building their Instagram presence, and that the researchers wanted to include photos of students who participate in studies on the lab's Instagram "story" (a post that automatically removes itself after 24 hours). The experimenter asked for consent to take a full body photo and told the participant that they could opt out of posting it at the end of the study if they did not want it included. Following this, participants were brought to a cubicle where they responded to the Self-concept Clarity Scale (Campbell et al., 1996) and completed a cover questionnaire (modified from Shi et al., 2014) detailing their social media use. After completing the questionnaires, participants were asked to give feedback about a randomly selected social media profile that they had been assigned to view. Participants were either asked to browse the Instagram page of a model, or the Instagram page of nature scenes for one minute on an iPad that was provided to them by the research assistant, and which was screen recording their browsing behavior. After viewing the profile, they answered eight questions about the profiles.

Following this manipulation, participants were told that the researchers were studying behaviors related to photo-editing and that we would like feedback on a new popular photo editing application. Participants watched a video tutorial designed by the researchers which explained all of the editing features available on Facetune so that every participant was familiar with how to use it. The experimenter then opened their photo in the Facetune application and instructed the participant to edit their photo as much or as little as they liked before it is posted to the account. The experimenter left the room while the participant edited their photo and instructed them to let her know when they had finished. The iPad was set to a feature that recorded the screen while edits were made so that the amount of time spent editing and other editing behaviors could be coded.

Once participants finished editing their photo, participants completed the Self-Object Implicit Association Test (IAT) to assess implicit literal objectification of the self, which took approximately five minutes. Lastly, the post-test measure of self-concept clarity was administered, followed by a photo behavior questionnaire and standard demographic items. As part of the cover story, participants were asked to give permission to post their photo to Instagram, which they could choose to decline. Upon completion, participants were debriefed and thanked for their time.

Coding

To code for the amount of time participants spent editing, as well as the content of the changes made, the researcher as well as two undergraduate research assistants independently coded each participant's video. First, as a variable to control for, the amount of time spent viewing the Instagram profile was calculated by each of the three coders. Then, the amount of time spent editing was recorded. This was operationalized as beginning at the time participants select the first editing tool to use and ending when the final edit was made. Additionally, videos were coded for whether or not participants edited their body, face, or the background of the image, and for the amount of change between the original and final photo on a scale of 1 to 4 (*1=no change, 2= barely noticeable, 3=some change 4= extreme change)*. We decided prior to data collection (and specified in our pre-registration) to only include participants who edited their body or face in some way, and therefore exclude participants who strictly edited the background of the photo, as that is not anticipated to effect self-concept clarity. We also specified that we would not include data should a participant decline to have their photo taken, but no participants declined to have their photo taken.

Inter-rater reliability was assessed using a series of two-way mixed effects, absolute agreement reliability analyses. Intra-class correlation coefficient (ICC) estimates and their 95% confident intervals were calculated using a series of mean-rating (k = 3), two-way mixed effects, absolute agreement reliability analyses. All analyses were conducted using SPSS statistical package version 25 (SPSS Inc, Chicago, IL). The ICC for inter-rater reliability was excellent for the amount of time spent viewing the profile (.988, 95% CI [.985, .990]), as well as for the amount of time spent editing the photo (.997, 95% CI [.994, .998]). The ICC for inter-rater reliability was excellent or very good for the types of edits made as well: .933 (95%CI [.917, .946]) for body edits; .910 (95%CI [.889, .927]) for face edits; and .944 (95%CI [.932, .953]) for background edits. The ICC for inter-rater reliability was good for the amount of change between participants' original and final photos (.886, 95% [.824, .923]). Additionally, The ICC for inter-rater reliability for whether or not the data should be used based on whether they edited more than just the background was .912, 95% CI [.894, 928], which is very good. Average profile viewing time scores and average editing time scores were computed to be used in all subsequent analyses. Descriptive statistics of editing behaviors can be found in Table 3 as well as correlations between editing behaviors and descriptive statistics in Table 4.

Data analytics

Analysis strategy

Due to an unforeseen issue with the response scale of the self-concept clarity measure, the analyses were approached in multiple ways. Using the Qualtrics online survey platform for this study, we decided to measure self-concept clarity with a sliding scale to decrease the motivation to appear consistent (by picking the same number) with the measure of self-concept clarity included in the beginning of the study. As a result of a slider scale response, whereby the

slider starting point was positioned at the farthest left *"Strongly disagree"* choice, many responses were coded as un-answered by Qualtrics if the participant did not move the slider from its original position. We cannot be sure whether this missing data was due to participants intentionally leaving the slider at *"Strongly disagree,"* or due to intentionally not answering this question. Therefore, analyses were conducted in multiple ways. That is, we conducted all analyses using the most conservative approach where mean scores of pre and post-test self-concept clarity were created only for participants who had all 12 items in both tests, and then only those participants were selected for the analyses. This limitation of the data reduced the sample size to 231 participants (out of the 346 originally collected). We then repeated the analyses using a series of less conservative approaches whereby mean scores were created for participants who had 7 of the 12 pre and post-test self-concept clarity items and limited the sample to only them, repeating this process for individuals with 8, 9, 10, and 11 of the items.

To preserve the power of the original large sample, we also examined the data using structural equation modeling (SEM), relying on the full information maximum likelihood (FIML) approach which estimates missing values based on the variables that are present. Results from the SEM approach, as well as the less conservative mean score approaches are all consistent with the most conservative approach that we took. Therefore, all subsequent analyses are reported using the full self-concept clarity data approach (n=231). In addition, we report the results from the less conservative approach (7 of the 12 items) as well as the results from the SEM analysis using the entire sample in Table 5 and Table 6.

Results

Preliminary Analyses

Prior to conducting our primary analyses, descriptive statistics and correlations were examined to replicate the correlations presented in the pilot data, and to observe patterns in the data. Consistent with the pilot study, pre-test levels of self-concept clarity were negatively associated with photo investment, r=-.34, p<.001 and negatively associated with trait self-objectification, r=-.39, p<.001. Additionally, trait self-objectification was positively associated with photo manipulation, r=.16, p<.05, and with photo investment, r=.41, p<.001. These patterns hold with the self-concept clarity data collected in mass-testing, which is strongly associated with pre-test self-concept clarity scores collected in the lab, r=.64, p<.001. Contrary to the pilot study, however, we did not see the anticipated negative relationship between photo manipulation behaviors and mass testing levels of self- concept clarity, r= -.11, p=.11, or between photo manipulation behaviors and pre-test levels of self- concept clarity collected in the lab, r= -.07, p=.31.

The amount of time that participants spent editing their photo in the lab was not associated with general photo manipulation behaviors, r=.03, p=.61, but was negatively associated with pre-test levels of self-concept clarity, r= -.15, p<.05, and with post-test levels of self-concept clarity, r=-.17, p<.001. This finding is consistent with the theorizing that individuals with lower self-concept clarity engage in more photo manipulation behaviors. Additionally, trait measures of self-objectification, as measured by the SOBBS (Lindner & Tantleff-Dunn, 2017) were not associated with Implicit Association Test scores, r=.08, p=.27, thus supporting our

argument that these two measures assess different components of self-objectification. Lastly, the amount of time that participants spent editing their photo in the lab was not associated with Implicit Association Test scores, $r = .10$, $p = .15$, or with trait self-objectification $r = .12$, $p = .10$. Correlations for all variables can be found in Table 7, along with descriptive statistics in Table 8.

Outlier Detection

To screen for outliers in our primary analyses, Mahalanobis distance scores were computed based on the guidelines offered by Tabachnik and Fidell (2013). Values were determined based on the primary mediation analyses which each have three predictor variables (independent variable, mediator, and one covariate) and one dependent variable, and cutoff scores were determined accordingly. Based on three predictors, Mahalanobis distance indicates a cutoff score of 16.27 to conservatively estimate the probability of a case being an outlier.

Based on this cutoff criterion, outliers were identified for each of the two primary mediation models of interest (testing hypotheses 2 and 3). Due to having two primary dependent variables of interest, different outliers were identified for each primary analysis. For Hypothesis 2, treating condition, amount of time spent editing, and amount of time spent viewing the Instagram profile as predictors, and IAT scores as the outcome, 6 additional outliers were detecting, bringing the sample for that primary analysis to 225. For Hypothesis 3, treating condition, amount of time spent editing, and amount of time spent viewing the Instagram profile as predictors, and self-concept clarity scores as the outcome, the same 6 outliers were identified. Therefore, all further analyses exclude the 6 outliers and rely on a sample size of 225.

Primary Analyses

To check that our sample was randomized and that there were not baseline differences in self-concept clarity between groups, a t-test was conducted treating Instagram profile as the

group and the pre-measure of self-concept clarity as the outcome variable. The results showed that the means of the Instagram Model group (*M*=4.91) and the Instagram Nature group (*M*=4.77) were not significantly different, *t*(223)= -0.89, *p*=.38.

To test whether amount of time spent editing their photo varied as a function of Instagram condition (Hypothesis 1), a second t-test was conducted treating Instagram profile as the group and editing time as the outcome variable. While the average editing time for participants in the Instagram Model condition (*M*=238.38 seconds; 3.97 minutes) was higher than the average editing time for participants in the Instagram Nature condition (*M*=204.64 seconds; 3.41 minutes), the difference was not significant, *t*(223)=-1.85, *p*=.07.

To test whether the relationship between Instagram profile and literal self-objectification was mediated by the amount of time spent editing (Hypothesis 2), I used PROCESS Model 4 (Hayes, 2013) and controlled for the amount of time viewing the profile. The *a* path, whereby condition predicts editing time, was marginally significant, β= 0.58, *SE*=0.30, *t*(222)= 1.90, *p*=.06. Despite not reaching significance, this pattern does indicate that participants in the Instagram Model condition spent more time on average editing their photo than participants in the Instagram Nature condition. Average time spent viewing the profile was not a significant predictor of editing time, β= .66, *SE*=0.56, *t*(222)= 1.20, *p*=.23[1].

As anticipated, the *c'* path, whereby condition directly predicts self-objectification was not significant β= .002, *SE*=.05, *t*(221)=0.05, *p*=.96, and the *b* path, whereby editing time influences self-objectification, was also not significant β= .01, *SE*=0.01, *t*(221)= 1.09, *p*=.29. The

[1] In all mediation analyses, the Instagram model condition is coded as 0 and the Instagram nature condition is coded as 1. All analyses were conducted using 20,000 bootstrap estimates.

overall model, which accounts for 1.7% of the total variance, (R^2=.017) was not significant, p=.29. The indirect effect of editing time on self-objectification was tested using a percentile bootstrap estimation approach using 20,000 samples, and indicated that the indirect effect was not significant, β = .01, *SE*=.01, 95% CI [-0.01, 0.02]. These path coefficients are shown in Figure 1. In all, it does not seem that there is a relationship between Instagram condition, editing time, and self-objectification.

Hypothesis 3 was also tested using PROCESS Model 4 (Hayes, 2013) to determine the indirect effect of Instagram condition on self-concept clarity, mediated by time spent editing. Again, this model controlled for the amount of time spent viewing the profile. As seen in the previous mediation model, the *a* path, whereby condition predicts editing time, was marginally significant, β= 0.58, *SE*=0.30, *t*(222)= 1.90, *p*=.06. Again, average time spent viewing the profile was not a significant predictor of editing time, β= 0.66, *SE*=0.56, *t*(222)= 1.20, *p*=.23.

The *c'* path, which shows the direct effect of Instagram condition on self-concept clarity, was also not significant, β= .19, *SE*=0.17, *t*(221)= 1.13, *p*=.26. However, the *b* path, which shows time spent editing predicting self-concept clarity, was significant β= -.10, *SE*=0.04, *t*(221)= -2.87, *p*<.01. The overall model accounts for 4.1% of the total variance, (R^2)= .041, *p*=.03, and the overall indirect effect was not significant β=-.06, *SE*=0.03, 95% CI [-0.13, 0.001]. These path coefficients are shown in Figure 2. Although there is no evidence for a significant effect of condition on editing time, there is evidence to suggest that as time spent editing a photo of one's self increases, self-concept clarity decreases.

To understand how baseline self-concept clarity relates to editing behaviors, the two previous mediation analyses were re-analyzed, treating baseline self-concept clarity as a covariate. Re-testing Hypothesis 2, whereby literal self-objectification is the outcome variable,

Instagram condition becomes a significant predictor of editing time, β= 0.62, *SE*=0.30, *t*(221)= 2.05, *p*=.04, which indicates that individuals who browse the Instagram profile of a model are editing for a longer duration of time than participants exposed to the Instagram profile of nature images. Additionally, baseline self-concept clarity was a significant predictor of time spent editing, β=- 0.30, *SE*=0.13, *t*(221)= -2.30, *p*=.02, indicating that individuals with lower self-concept clarity edited their photos for significantly more time than individuals with higher self-concept clarity. Amount of time spent viewing the profile remained a non-significant predictor of time spent editing, β= 0.63, *SE*=0.55, *t*(221)= 1.14, *p*=.25. As seen in the original analysis, editing time did not significantly predict literal self-objectification, β= 0.01 *SE*=0.01, *t*(220)= 0.79, *p*=.43, but baseline self-concept clarity was a marginally significant predictor of literal self-objectification, β= -0.04 *SE*=0.02, *t*(220)= -1.87, *p*=.06. The indirect effect was not significant, β= 0.01 *SE*=0.01, 95% CI [-.01, .02].

Revisiting our mediation analyses testing Hypothesis 3, whereby post-test self-concept clarity is the outcome variable, and treating baseline self-concept clarity as a covariate, Instagram condition remains a significant predictor of editing time, β= 0.62 *SE*=0.30 *t*(221)= 2.05, *p*=.04, whereby participants who browse the Instagram profile of a model are editing their photo for longer than participants who browse the Instagram profile of nature images. Baseline levels of self-concept clarity significantly predict editing time, β= -0.30 *SE*=0.13 *t*(221)= -2.20, *p*=.02, whereby participants lower in self-concept clarity are spending more time editing their photo, and editing time is a significant predictor of post-test self-concept clarity, β= -0.03 *SE*=0.01 *t*(220)= -2.06, *p*=.04, whereby increased time spent editing is leading to lower self-concept clarity. The model accounts for 88.9% of the variance, (R^2=.889), *p*<.001, but despite all

individual paths being significant, the indirect effect is not, β= -0.02 *SE*=0.01, 95% CI [-.04, .002].

Exploratory Analyses

It could be that the anticipation of others viewing a photo influences the extent to which someone will edit their appearance. Participants were told at the beginning of the study that if they were unhappy with their photo or did not want it to be shared, they could opt out of posting it at the end of the study. Looking at participants' responses to this question, we examined whether allowing their photo to be posted affected our results. The majority of participants indicated that we could post their photo to the lab Instagram story (*n*=163), but 63 participants indicated that they did not want their image shared. Repeating the primary analyses with this question as a covariate, the effect of condition on editing time remained marginally significant, β= 0.57, *SE*=0.31, *t*(221)= 1.85, *p*=.07, and the effect of editing time on self-objectification remained non-significant, β= .01, *SE*=0.01, *t*(220)= 1.04, *p*=.30. However, the amount of time spent editing remained a significant predictor of post-test levels of self-concept clarity, β= -0.10, *SE*=0.04, *t*(220)= -2.84, *p*<.01.

To test for an interaction between baseline self-concept clarity and Instagram condition, two moderated mediation analyses were conducted using PROCESS Model 7 (Hayes, 2013). First, we tested if baseline self-concept clarity moderated the relationship between Instagram condition and editing time. The *a* path (condition predicting editing time) was not significant, β= 0.88, *SE*=1.32, *t*(220)= 0.67, *p*=.51; the *b* path (editing time predicting self-objectification) was not significant, β= .01, *SE*=0.01, *t*(221)= 1.09, *p*=.28; the *c'* path (condition affecting self-objectification) was not significant β=.00, *SE*=0.05, *t*(221)=0.05, *p*=.96; and the interaction of self-concept clarity and Instagram condition on editing time was also not significant, β= -0.05,

SE=0.27, *t*(220)=-0.20, *p*=.84. The index of moderation mediation included zero in the confidence interval range, β=-.001, *SE*=0.004, 95% CI [-0.01, 0.01], indicating no moderated mediation.

The same analysis was conducting, this time treating post-test self-concept clarity scores as the outcome variable. Again, the *a* path (condition predicting editing time) was not significant, β= 0.88, *SE*=1.32, *t*(220)= 0.67, *p*=.51; the *b* path (editing time predicting self-concept clarity) was significant β= -0.10, *SE*=0.04, *t*(221)= -2.87, *p*<.01; the *c'* path (condition predicting self-concept clarity) was not significant, β= 0.19, *SE*=0.17, *t*(221)= 1.13, *p*=.26; and the interaction of self-concept clarity and Instagram condition on editing time was not significant, β=-0.05, *SE*=0.27, *t*(220)= -0.20, *p*=.84. Again, the index of moderation mediation included zero in the confidence interval range, β=0.01, *SE*=0.03, 95% CI [-0.04, 0.06], indicating no moderated mediation. Despite the individual significant paths of condition on editing time and of baseline self-concept clarity on editing time seen in the previous analyses, these exploratory analyses suggest that baseline self-concept clarity is not moderating the extent to which participants edit their photos, and subsequently affecting literal objectification or self-concept clarity.

Discussion

Social media use has been continuously rising over the past decade, particularly on photo-based platforms such as Snapchat and Instagram (Smith & Anderson, 2018). As a consequence, methods to alter one's physical appearance in photos have increased in popularity as well, and users are encouraged to change their appearance regularly. For individuals with a stable sense of who they are this may have little psychological impact, but for those with a less clear sense of self, altering their appearance may create a dangerous cycle, causing them to have an even less defined sense of self. It has been previously established that women in particular are constantly pressured to appear and present themselves in a specific manner (Fredrickson & Roberts, 1997), whether that means wearing makeup to hide blemishes, wearing a "waist-trainer" to cinch the waist, or going to a tanning salon to appear sun-kissed. Popular photo-based platforms such as Instagram act as means of reinforcing and highlighting the standards expected of women, and engagement with such platforms may force women to be hyper-aware of their own appearance, especially in comparison to others. While this may result in negative feelings due to social comparison or body shame, photo editing applications allow women the opportunity to easily and realistically change their appearance in photos, whether it means smoothing their blemishes, making their waist appear narrower, or changing the complexion of their skin. However, this potential to "fix" the body may have negative consequences for the self- concept.

In this study, I examined the effects of manipulating the body's appearance on perceptions of the self. Research investigating the self-concept has outlined a multitude of

negative consequences that come with reduced self-concept clarity, such as a reduced sense of meaning in life, decreased relationship commitment, and more frequent social anxiety and aggression compared to individuals with higher self-concept clarity (Bigler, Neimeyer, & Brown 2001; Lewandowski, Nardone, & Raines, 2010; Valkenburg & Peter, 2008; von Collani & Werner, 2005). Specifically, selecting specific aspects of the self to highlight and present in virtual spaces has been theorized to result in a fragmented perception of the self (Valkenburg & Peter, 2011). In addition, research investigating the objectification of women has outlined a multitude of negative consequences that come with perceiving the self in an objectifying manner (disrupted flow of consciousness, body shame, feelings of anxiety, and decreased awareness of bodily states; Fredrickson & Roberts, 1997) as well as from viewing other women in an objectifying manner. These consequences include increased aggression towards an objectified woman (Vasquez, Ball, Loughnan, & Pina, 2017), lessened perceived suffering of an objectified target in a sexual assault scenario (Loughnan, Pina, Vasquez, & Puvia, 2013), decreased perception of agency (Gray, Knobe, Sheskin, Bloom, & Barrett, 2011), and denial of certain human qualities (Morris, Goldenberg, & Boyd, 2018). While there is ample research documenting the effects of viewing the self and others in an objectifying way, less is known about the consequences of viewing the self as a *literal* object, and if photo editing can contribute to seeing the self as more object-like than human-like. However, research has identified a unique consequence associate with viewing women as a literal object, that is, the more a woman is seen as a literal object, the less she is perceived as able to feel pain (Morris, Goldenberg, & Boyd, 2018).

In this research I anticipated a relationship between the type of Instagram media that women were exposed to and how much they edited a photo of themselves, along with an effect

of time spent editing on both self-objectification and self-concept clarity. While at first condition was only a marginally significant predictor of editing time, controlling for baseline self-concept clarity revealed that women who are exposed to objectifying media of an attractive model spend significantly more time editing their photo than women who see nature images. It is possible that had participants been exposed to the Instagram profile for a long enough amount of time, this result would have emerged in the whole sample.

Contrary to our theorizing, the results did not show an effect of editing a photo of one's self on self-objectification, as had been predicted. This may have been a result of the measure used; the Self-Object IAT may not reflect the type of self-objectification that women engage in as a result of editing a photo of themselves. Perhaps women become more focused on their appearance, but do not perceive themselves as more object-like, as a result of editing. Supporting the interpretation that women did not engage in literal self-objectification, the computed IAT *D* score means for participants both in the Instagram Model condition (*M*=-.57) and the Instagram Nature condition (*M*=-.57) are much closer to the *D* score means reported by Morris et al. (2014) for their participants who were not expected to self-objectify (*M*=-.56), compared to their participants who did engage in literal self-objectification (*M*=-.24). It is possible that had we included a more traditional appearance-focused measure of self-objectification the anticipated results would have emerged.

Another main goal of this research was to examine the effect of photo editing on the stability of an individual's self-concept, and we hypothesized that the visual manipulation of one's physical appearance would disrupt an individual's sense of identity and create a disconnected sense of who the self truly is. Although the total indirect effect of the mediation model was not significant, the results do suggest that the more time women spend editing a photo

of themselves, the less clear their self-concept. Additionally, when including baseline self-concept clarity, we see a spiraling effect, whereby lower self-concept clarity predicts longer editing time, which then predicts reduced self-concept clarity. This finding is important because a disruption to the integrity of one's self-concept may exacerbate the negative effects associated with social media use and photo editing behaviors and may harm psychological well-being. Given the established correlates of low self-concept clarity (low self-esteem, chronic self-analysis, low internal state awareness, and a ruminative form of self-focused attention; Campbell et al., 1996), this has the potential to be maladaptive. Despite these findings, we found no interaction of baseline self-concept clarity with Instagram condition on editing behaviors.

To build on and improve this research, I intend to modify the present study such that participants will view their assigned Instagram profile for a longer duration of time, the Self-concept Clarity scale will not use a slider response scale, and an additional measure of state self-objectification will be included in addition to the IAT. Additionally, I plan to further investigate the relationship between editing and self-concept clarity, building on the results that increased editing reduces self-concept clarity. A follow-up study will experimentally manipulate state self-concept clarity and then implement the same editing paradigm, followed by a post-test measure of self-concept clarity. This will allow us to more clearly parse the relationship between editing a photo of the self, and beliefs about the self-concept.

More and more, women are regularly using Facetune and other types of editing applications in anticipation of sharing photos on their social media platforms, to the point where it appears to have become a routine part of the photo sharing process. Step 1: take photo of self; Step 2: edit photo of self; Step 3: share photo of "the self." However, when the photo posted

online is not a true reflection of the self, there may be unintended consequences, and a lack of understanding of who the self really is.

References

Baumeister, R. F. (1999). The nature and structure of the self: An overview. In R. Baumeister (Ed.), *The self in social psychology* (pp. 1-20). Philadelphia, PA, US: Psychology Press (Taylor & Francis). Retrieved from https://psycnet.apa.org/record/2000-07436-000

Bigler, M., Neimeyer, G. J., & Brown, E. (2001). The divided self revisited: Effects of self-concept clarity and self-concept differentiation on psychological adjustment. *Journal of Social and Clinical Psychology, 20*(3), 396–415. https://doi.org/10.1521/jscp.20.3.396.22302

Brown, Z., & Tiggemann, M. (2016). Attractive celebrity and peer images on Instagram: Effect on women's mood and body image. *Body Image, 19*, 37-43. doi:10.1016/j.bodyim.2016.08.007

Calogero, R. M., and Pina, A. (2011). Body guilt: Preliminary evidence for a further subjective experience of self-objectification. *Psychology of Women Quarterly, 35,* 428–440. doi: 10.1177/0361684311408564

Campbell J.D., Trapnell P.D., Heine S.J., Katz I.M., Lavallee L.F., & Lehman D.R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology, 70,*141–156. doi: 10.1037/0022-3514.70.6.1114.

Center for Open Science. (n.d.) *OSF*. https://cos.io/our-products/osf/.

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

Fullwood, C., James, B.M., & Chen-Wilson, C.J. (2016). Self-concept clarity and online self-presentation in adolescents. *CyberPsychology, Behavior & Social Networking,19,* 716-720. doi**:** 10.1089/cyber.2015.0623

Gergen, K. J. (1991). *The saturated self: Dilemmas of identity in contemporary life*. New York, NY: Basic Books. Retrieved from https://psycnet.apa.org/record/1991-97621-000

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: An improved scoring algorithm. *Journal of Personality and Social Psychology, 85,* 197–216. doi: 10.1037/0022-3514.85.2.197

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

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*, 319–340. http://dx.doi.org/10.1037/0033-295X.94.3.319

Kahalon R., Shnabel N., & Becker J.C. (2018) Experimental studies on state self-objectification: A review and an integrative process model. *Frontiers in Psychology,9.* https://doi.org/10.3389/fpsyg.2018.01268.

Lamp, S. J., Cugle, A., Silverman, A. L., Thomas, M. T., Liss, M., & Erchull, M. J. (2019).

Picture perfect: The relationship between selfie behaviors, self-objectification, and depressive symptoms. *Sex Roles: A Journal of Research*. https://doi.org/10.1007/s11199-019-01025-z.

Lewandowski, G., Nardone, N., & Raines, A. J. (2010). The role of self-concept clarity in relationship quality. *Self and Identity, 9*(4), 416-433.

Lin, S., Liu, D., Liu, W., Hui Q., Cortina K.S., & You X. (2018). Mediating effects of self-concept clarity on the relationship between passive social network sites use and subjective well-being. *Current Psychology* ,1-8. doi: 10.1007/s12144-018-0066-6

Markus, H., & Kunda, Z. (1986). Stability and malleability of the self-concept. *Journal of personality and social psychology (51),* 858-66. https://doi.org/10.1037//0022-3514.51.4.858.

Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology,38,* 299-337. https://doi.org/10.1146/annurev.ps.38.020187.001503

McKinley, N. M., and Hyde, J. S. (1996). The objectified body consciousness scale development and validation. Psychology of Women Quarterly,20, 181–215. https://doi.org/10.1111/j.1471-6402.1996.tb00467.

McLean, S.A., Paxton, S.J., Wertheim, E. H., & Masters, J. (2015). Photoshopping the selfie: Self photo editing and photo investment are associated with body dissatisfaction in adolescent girls. *International Journal of Eating Disorders, 48*, 1132-1140. doi:10.1002/eat.22449

Meier, E. P., & Gray, J. (2014). Facebook photo activity associated with body image disturbance in adolescent girls. *Cyberpsychology, Behavior, and Social Networking, 17*, 199-206. doi: 10.1089/cyber.2013.0305

Morris, K. L., Goldenberg, J., & Boyd, P. (2018). Women as animals, women as objects: Evidence for two forms of objectification. *Personality and Social Psychology Bulletin, 44*, 1302-1314. https://doi.org/10.1177/0146167218765739

Morris, K., Goldenberg, J., & Heflick, N. (2014). Trio of terror (pregnancy, menstruation, and breastfeeding): An existential function of literal self-objectification among women. *Journal of personality and social psychology*, *107*, 181-198. doi:10.1037/a0036493.

Noll, S. M., and Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly, 22*, 623–636. doi: 10.1111/j.1471-6402.1998.tb00181.

Pettersson, S. (2017). Statistics: How filters are used by Instagram's most successful users. Retrieved from https://medium.com/@stpe/statistics-how-filters-are-used-by-instagrams-most-successful-users-d44935f87fa9.

Quinn, D. M., Kallen, R. W., Twenge, J. M., and Fredrickson, B. L. (2006b). The disruptive effect of self-objectification on performance. *Psychology of Women Quarterly, 30*, 59–64. doi: 10.1111/j.1471-6402.2006.00262.x

Reid, E. (1998). The self and the Internet: Variations on the illusion of one self. In J. Gackenbach (Ed.), Psychology and the Internet: Intrapersonal, interpersonal, and transpersonal implications (pp. 29–41). San Diego, CA: Academic Press. Retrieved from: https://www.sciencedirect.com/book/9780123694256/psychology-and-the-internet

Register, J. D., Katrevich, A. V., Aruguete, M. S., and Edman, J. L. (2015). Effects of self-

objectification on self-reported eating pathology and depression. *American Journal of Psychology, 128*, 107–113. doi:10.5406/amerjpsyc.128.1.0107

Renfrew Center Foundation (2014) Afraid to be your selfie? Survey reveals most people Photoshop their images. http://tinyurl.com/orsj9zc (Accessed 2 June, 2019).

Shi Y., Luo Y.L.L., Yang Z., Liu Y., Cai H. (2014) The Development and Validation of the Social Network Sites (SNSs) Usage Questionnaire. In: Meiselwitz G. (eds) Social Computing and Social Media. SCSM 2014. Lecture Notes in Computer Science, vol 8531. Springer, Cham. https://doi.org/10.1007/978-3-319-07632-4_11

Smith, A., & Anderson, M. (2018). Social media use in 2018. Retrieved from https://www.pewinternet.org/2018/03/01/social-media-use-in-2018/.

Solon, O. (2018). Facetune is conquering Instagram- but does it take airbrushing too far? *The Guardian.* Retrieved from https://www.theguardian.com/media/2018/mar/09/Facetune-photoshopping-app-instagram-body-image-debate

Statista (n.d.) Number of monthly active Instagram users from January 2013 to June 2018 (in millions). Retrieved from https://www.statista.com/statistics/253577/number-of-monthly-active-instagram-users/.

Takano, K., & Tanno, Y. (2008). Self-rumination, self-reflection, and depression: Self-rumination counteracts the adaptive effect of self-reflection. *Behavior Research and Therapy,47*, 260-264. doi:10.1016/j.brat.2008.12.008

Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the Five-Factor Model of personality: distinguishing rumination from reflection. *Journal of Personality and Social Psychology, 76*, 284–304. http://dx.doi.org/10.1037/0022-3514.76.2.284

Valkenburg, P. M., & Peter, J. (2008). Adolescents' identity experiments on the Internet. Consequences for social competence and self-concept unity. *Communication Research, 35*, 208–231. doi: 10.1177/0093650207313164

Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: An integrated model of its attraction, opportunities, and risks. *Journal of adolescent health*, *48*(2), 121-127.

Veldhuis, J., Alleva, J. M., Bij de Vaate, A. J. D., Keijer, M. G., & Konijn, E. A. (2018). Me, my selfie, and I: the relations between selfie behaviors, body image, self-objectification, and self-esteem in young women. *Psychology of Popular Media Culture*, 1-17. https://doi.org/10.1037/ppm0000206

von Collani, G., & Werner, R. (2005). Self-related and motivational constructs as determinants of aggression. An analysis and validation of a German version of the Buss-Perry Aggression Questionnaire. *Personality and Individual Differences, 38*(7), 1631–1643. https://doi.org/10.1016/j.paid.2004.09.027

Yang, C., & Brown, B.B. (2015). Online self-presentation on Facebook and self development during the college transition. *Journal of Youth Adolescence, 45*,402-416. doi: 10.1007/s10964-015-0385-y

Appendices

Appendix A: Tables and Figures

Table A1. *Demographic Statistics from Studies 1 and 2.*

Study	*N*	Median Age	Mean age	White	Hispanic	Black	Exclusively Heterosexual
1	99	20.00	21.27	45.90%	22.40%	7.10%	72.20%
2	231	19.00	19.51	70.60%	26.80%	16.50%	68.40%

Table A2. *Study 1 Correlations and Descriptive Statistics.*

Variable	1	2	3	4
1. Photo Manipulation	-			
2. Photo Investment	.23*	-		
3. Self-concept Clarity	-.31*	-.28**	-	
4. Self-objectification	.35***	.27**	-.62***	-
Mean	2.13	55.68	3.01	2.09
SD	0.89	14.80	0.87	0.79
Skew	.68	-.09	.12	-.33
Kurtosis	-.40	1.99	-.53	.16

Note. *$p < .05$, **$p < .01$, ***$p < .001$. N=99 for all variables except for photo investment for which N=98.

Table A3. *Percentages of participants who engaged in specific editing behaviors.*

	Edited face	Edited body	Edited background	No change in final photo	Barely noticeable change in final photo	Some change in final photo	Extreme change in final photo	Reverted photo to the original
N	198	177	97	42	113	55	22	26
Percent	85.70%	76.60%	42.0%	18.20%	48.90%	23.40%	9.50%	11.30%

Table A4. *Correlations and descriptive statistics of editing behaviors.*

Variable	1	2	3	4	5	6	7	8	9
1. Editing time	-								
2. Revert	-.07	-							
3.Background	.25***	.09	-						
4. Face	.28***	-.13†	-.03	-					
5. Body	.23***	-.10	-.28***	.13†	-				
6. Change	.31***	-.52***	-.19**	.29***	.41***	-			
7. Permission	.02	.02	-.08	-.02	-.02	.06	-		
8. BMI	.03	-.10	-.01	-.06	.17*	.23***	.09	-	
9. SOBBS	.12	-.04	-.04	.10	.07	.03	.10	.13†	-
10. IAT D score	.10	-.06	.11	.06	.003	-.04	.12†	-.01	.08

Note. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. N=231 for all variables except BMI for which N=229, and SOBBS for which N=193. "Revert" refers to reverting their photo to the original after editing; "Background", "Face", and "Body" refers to editing those specific aspects of their photo; "Change" refers to the amount of change between the original and final photo; "Permission" refers to giving permission to post their photo on the lab Instagram account; "BMI" refers to body-mass index; "SOBBS MT" refers to trait self-objectification scores collected from mass-testing data; and "IAT D score" refers to scores of literal self-objectification.

Table A5. *Results of mediation of time spent editing on self-objectification.*

Model 1 (*n*=225)		Effect	*SE*	LLCI	ULCI	*t*	*p*
	Path						
	a: C→ET	0.58	0.30	-0.02	1.18	1.90 †	.06
	b: ET→ IAT	.01	.01	-.01	.03	1.09	.29
	c': C→ IAT	.002	0.05	-.10	0.10	0.05	.96
	Indirect effects						
	c: C→ET→ IAT	0.01	0.01	-0.01	0.02		
Model 2 (*n*=283)		Effect	*SE*	LLCI	ULCI	*t*	*p*
	Path						
	a: C→ET	0.47	0.27	-0.07	1.01	1.71†	.09
	b: ET→ IAT	0.005	0.01	-0.01	0.02	0.50	.62
	c': C→ IAT	-0.02	0.04	-0.10	0.07	-0.37	.71
	Indirect effects						
	c: C→ET→ IAT	0.002	0.01	-0.01	0.01		
Model 3 (*n*=346)		Effect	*SE*	*z*	*p*		
	Path						
	a: C→ET	-16.84	16.91	0.00	.32		
	b: ET→ IAT	.00	0.00	0.67	.50		
	c' C→ IAT	-.01	0.04	-0.24	.81		
	Indirect effects						
	c: C→ET→ IAT	-.001	0.003	-0.56	.58		

Note. Model 1 refers to the strictest analyses using only full self-concept clarity data, and are the analyses reported throughout the document. Model 2 refers to the least strict analyses using data for which at least 7 of the 12 self-concept clarity items were present in both pre and post-test measures. Model 3 refers to the Full Information Maximum Likelihood approach using structural equation modeling. In models 1 and 2, time spent editing is coded in minutes; condition is coded such that Instagram nature is 0 and Instagram model is 1. In Model 3, time spent editing is coded in seconds; condition is coded such that Instagram nature is 2 and Instagram model is 1. Despite these differences, the patterns remain the same. "C" refers to Condition, "ET" refers to editing time, "IAT" refers to Self-Object IAT score. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Table A6. *Results of mediation of time spent editing on self-concept clarity.*

Model 1 (*n*=225)		Effect	*SE*	LLCI	ULCI	*t*	*p*
	Path						
	a: C→ET	0.58	0.30	-0.02	1.18	1.90 †	.06
	b: ET→ SCC	-0.10	.04	-0.18	-.03	-2.87**	.005
	c': C→ SCC	0.19	0.17	-0.14	0.51	1.13	.26
	Indirect effects						
	c: C→ET→ SCC	-0.06	0.03	-0.13	0.001		
Model 2 (*n*=283)		Effect	*SE*	LLCI	ULCI	*t*	*p*
	Path						
	a: C→ET	0.47	0.27	-0.07	1.01	1.71†	.09
	b: ET→ SCC	-0.10	0.03	-0.17	-0.03	-2.80**	.003
	c': C→ SCC	-.04	0.16	-0.34	0.27	-0.23	.82
	Indirect effects						
	c: C→ET→ SCC	-.05	0.03	-0.11	0.01		
Model 3 (*n*=346)		Effect	*SE*	*z*	*p*		
	Path						
	a: C→ET	-16.84	16.91	0.00	.32		
	b: ET→ SCC	-.002	.001	-3.96***	.00		
	c': C→ SCC	.11	0.12	0.64	0.52		
	Indirect effects						
	c: C→ET→ SCC	.04	0.04	0.97	0.33		

Note. Model 1 refers to the strictest analyses using only full self-concept clarity data, and are the analyses reported throughout the document. Model 2 refers to the least strict analyses using data for which at least 7 of the 12 self-concept clarity items were present in both pre and post-test measures. Model 3 refers to the Full Information Maximum Likelihood approach using structural equation modeling. In models 1 and 2, time spent editing is coded in minutes; condition is coded such that Instagram nature is 0 and Instagram model is 1. In Model 3, time spent editing is coded in seconds; condition is coded such that Instagram nature is 2 and Instagram model is 1. Despite these differences, the patterns remain the same. "C" refers to Condition, "ET" refers to editing time, "SCC" refers to self-concept clarity. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Table A7. *Study 2 Correlations.*

	Variable	1	2	3	4	5	6	7	8	9	10	11
1.	Photo Manip.	-										
2.	Photo Invest.	.18**	-									
3.	SCC MT	-.11	-.32***	-								
4.	Body Esteem MT	.03	-.17*	.33***	-							
5.	SOBBS MT	.16*	.41***	-.45***	-.27***	-						
6.	SCC Pre	-.07	-.34***	.64***	.36***	-.39***	-					
7.	SCC Post	-.07	-.32***	.62***	.32***	-.40***	.94***	-				
8.	Editing Time	.03	.07	-.08	-.06	.12	-.15*	-.17**	-			
9.	IAT *D* score	-.002	.13†	-.02	.03	.08	-.12†	-.11†	.10	-		
10.	BMI	-.14*	-.04	-.04	-.32***	.13†	-.11†	-.13†	.03	-.01	-	
11.	Age	.00	.04	.08	.01	.17†	.07	.03	.02	.16*	.13*	-
12.	Sex. Orient.	.11†	.04	.14†	.12	-.05	.10	.13†	-.01	-.04	-.11	-.05

Note. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. "Photo Manip." refers to photo manipulation; "Photo Invest." refers to photo investment; "SCC MT" refers to self-concept clarity scores collected from mass-testing data; "Body Esteem MT" refers to body esteem scores collected from mass-testing data; "SOBBS MT" refers to trait self-objectification scores collected from mass-testing data; "SCC pre" refers to pre-test self-concept clarity scores; "SCC Post" refers to post-test self-concept clarity scores; "BMI" refers to body-mass index; and "Sex. Orient." refers to sexual orientation. N=231 for Photo Manip., Photo Invest., SCC Pre, SCC Post, Editing Time, IAT D score, and Sex. Orient.; N=230 for Age; N=229 for BMI; N=196 for SCC MT; N=193 for SOBBS MT; N=169 for Body Esteem MT.

Table A8. *Study 2 Descriptive Statistics.*

	Photo Manip.	Photo Invest.	SCC MT	Body Esteem MT	SOBBS MT	SCC Pre	SCC Post	Editing Time	IAT *D* score	BMI	Age
Mean	2.11	55.77	3.05	3.34	2.43	4.83	4.88	231.68	-.57	24.21	19.51
Minimum	1.00	24.00	1.50	2.11	1.07	2.00	1.58	8.67	-1.34	15.06	18.00
Maximum	4.22	86.86	5.00	5.00	4.86	7.50	7.83	1011.00	.42	50.03	34.00
SD	.82	11.69	.75	.62	.78	1.15	1.26	160.13	.37	5.53	2.07
Skew	.78	-.21	.23	.58	.46	.13	.11	1.80	.44	2.01	3.10
Kurtosis	-.32	-.17	-.45	-.17	.17	-.38	-.44	4.62	-.16	5.70	15.09

Note. "Photo Manip." refers to photo manipulation; "Photo Invest." refers to photo investment; "SCC MT" refers to self-concept clarity scores collected from mass-testing data; "Body Esteem MT" refers to body esteem scores collected from mass-testing data; "SOBBS MT" refers to trait self-objectification scores collected from mass-testing data; "SCC pre" refers to pre-test self-concept clarity scores; "SCC Post" refers to post-test self-concept clarity scores; and "BMI" refers to body-mass index. N=231 for Photo Manip., Photo Invest., SCC Pre, SCC Post, Editing Time, IAT D score; N=230 for Age; N=229 for BMI; N=196 for SCC MT; N=193 for SOBBS MT; N=169 for Body Esteem MT.

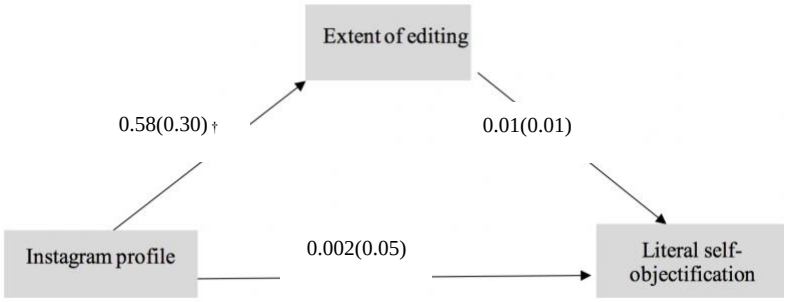


Figure A1. *Coefficients of the mediating role of editing time on literal self-objectification.*
Note. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. The Instagram nature condition is coded as 0 and the Instagram model condition is coded as 1.

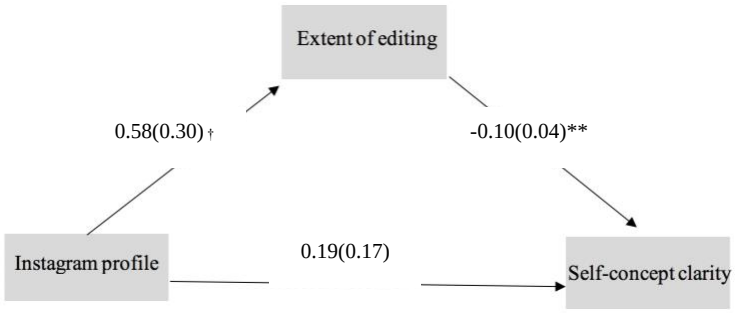
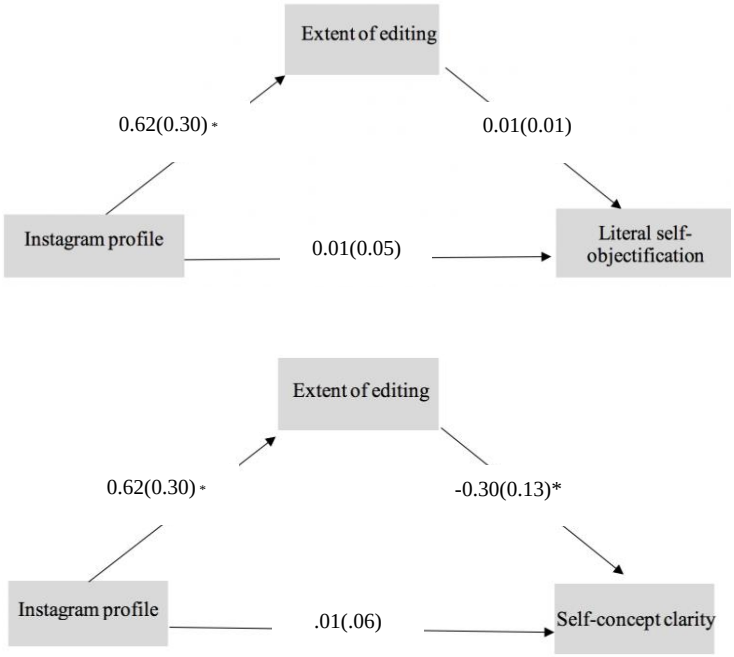


Figure A2. *Coefficients of the mediating role of editing time on self-concept clarity.*
Note. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. The Instagram nature condition is coded as 0 and the Instagram model condition is coded as 1.



Figures A3 and A4. *Mediation coefficients with baseline self-concept clarity as a covariate.*
Note. †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. The Instagram nature condition is coded as 0 and the Instagram model condition is coded as 1. Baseline self-concept clarity is a significant predictor of editing time, β=- 0.30, *SE*=0.13, *t*(221)= -2.30, *p*=.02.

Appendix B: Scales

Social Media Cover Questionnaire

Social network sites (SNSs) are defined as web-based services that allow individuals to construct a profile and share connections with a certain list of other users. In SNSs, people can establish their own social networks, design their own homepages, post some personal news, photos, audios, and videos and so on. Some typical and popular SNSs are Instagram, Facebook, and YouTube.

1. How frequently do you use SNSs?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

2. On average, each time you visit SNS, how long would you spend on it?

15 minutes or less	15-30 minutes	0.5 to 1 hour	1 to 2 hours	2 to 3 hours	3 to 4 hours	More than 4 hours
1	2	3	4	5	6	7

3. In your favorite SNSs, how many friends do you have?

1-50	50-100	100-200	200-300	300-400	400-500	More than 500
1	2	3	4	5	6	7

4. In your favorite SNSs, the composition of your friends is…

All real-life acquaintances			Equal			All strangers
1	2	3	4	5	6	7

5. How frequently do you send private messages to others?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

6. How frequently do you update your status?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

7. How frequently do you write notes/blogs?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

8. How frequently do you update your profile photo?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

9. How frequently do you post photos?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

10. How frequently do you share things that are posted on others' profiles?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

11. How frequently do you visit your friends' profiles?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

12. How frequently do you comment on others' posts or photos?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

13. How frequently do you check the comments on your profile or photos?

Never	Yearly	Monthly	Weekly	Multiple times a week	Daily	Multiple times a day
1	2	3	4	5	6	7

Instagram Feedback Questionnaire

Please answer the following questions in response to the Instagram profile you just browsed.

1. Did you find the photos on this page visually pleasing?

Not at all appealing				Very appealing
1	2	3	4	5

2. Would you follow this Instagram account?

Definitely would not follow				Definitely would follow
1	2	3	4	5

3. Did you think this Instagram account portrayed a certain "theme"?

There was not a strong theme				There was a strong theme
1	2	3	4	5

4. Did you find the photos on this Instagram account to be staged well?

Not well staged				Very well-staged
1	2	3	4	5

5. Did you think this Instagram profile should have more followers?

Should not have more followers				Should have more followers
1	2	3	4	5

6. Did you think this Instagram profile should have less followers?

Should not have less followers				Should have less followers
1	2	3	4	5

7. Did you think this Instagram profile was unique?

Not at all unique				Very unique
1	2	3	4	5

8. Did you think there was a good variety of photos on this Instagram profile?

Not a good variety				A very good variety
1	2	3	4	5

Self-Objectification Beliefs and Behaviors Scale

1	2	3	4	5
Strongly Disagree				Strongly Agree

1. Looking attractive to others is more important to me than being happy with who I am inside.
2. I try to imagine what my body looks like to others (i.e., like I am looking at myself from the outside).
3. How I look is more important to me than how I think or feel.
4. I choose specific clothing or accessories based on how they make my body appear to others.
5. My physical appearance is more important than my personality.
6. When I look in the mirror, I notice areas of my appearance that I think others will view critically.
7. I consider how my body will look to others in the clothing I am wearing.
8. I often think about how my body must look to others.
9. My physical appearance says more about who I am than my intellect.
10. How sexually attractive others find me says something about who I am as a person.
11. My physical appearance is more important than my physical abilities.
12. I try to anticipate others' reactions to my physical appearance.
13. My body is what gives me value to other people
14. I have thoughts about how my body looks to others even when I am alone.

Body-Esteem Scale

Instructions: On this page are listed a number of body parts and functions. Please read each item and indicate how you feel about this part or function of your own body using the following scale: 1 = Have strong negative feelings 2 = Have moderate negative feelings 3 = Have no feeling one way or the other 4 = Have moderate positive feelings 5 = Have strong positive feelings

---

1. body scent _____ SA
2. appetite _____ WC
3. nose _____ SA
4. physical stamina _____ PC
5. reflexes _____ PC
6. lips _____ SA
7. muscular strength _____ PC
8. waist _____ WC
9. energy level _____ PC
10. thighs _____ WC
11. ears _____ SA
12. biceps _____ PC
13. chin _____ SA
14. body build _____ WC
15. physical coordination _____ PC
16. buttocks _____ WC
17. agility _____ PC
18. width of shoulders _____
19. arms _____
20. chest or breasts _____ SA
21. appearance of eyes _____ SA
22. cheeks/cheekbones _____ SA
23. hips _____ WC
24. legs _____ WC
25. figure or physique _____ WC
26. sex drive _____ USA
27. feet _____
28. sex organs _____ SA
29. appearance of stomach _____ WC
30. health _____ PC
31. sex activities _____ SA
32. body hair _____ SA
33. physical condition _____ PC
34. face _____ SA

35. weight _____ WC

The factors are (1) Sexual Attractiveness (SA) for females, (2)Weight Concern (WC) for females and (3) Physical Condition (PC) for both males and females.

Self- concept Clarity

1	2	3	4	5
Strongly Disagree				Strongly Agree

1. My beliefs about myself often conflict with one another. *
2. On one day I might have one opinion of myself and on another day I might have a different opinion. *
3. I spend a lot of time wondering about what kind of person I really am. *
4. Sometimes I feel that I am not really the person that I appear to be. *
5. When I think about the kind of person I have been in the past, I'm not sure what I was really like. *
6. I seldom experience conflict between the different aspects of my personality.
7. Sometimes I think I know other people better than I know myself. *
8. My beliefs about myself seem to change very frequently. *
9. If I were asked to describe my personality, my description might end up being different from one day to another day. *
10. Even if I wanted to, I don't think I could tell someone what I'm really like. *
11. In general, I have a clear sense of who I am and what I am.
12. It is often hard for me to make up my mind about things because I don't really know what I want. *

Photo Behavior

Self-image Taking

"How frequently do you take "selfies", or photos of only yourself?"

1 2 3 4 5 6 7 8

Less than More than

once a month twice a day

"How frequently do you take "usies", or photos of yourself with others?"

1 2 3 4 5 6 7 8

Less than More than

once a month twice a day

Self-image Sharing

"How often do you post photos of yourself online or share them through services like 'Snapchat' or 'Instagram'?"

1 2 3 4 5 6 7 8

Less than More than

once a month twice a day

Photo Investment

Instructions: Please think about photos of yourself that you post online or share through social media and mark your answer along the line to indicate the best response for you.
(Slider scale of 0 to 100 between anchor items)

It's easy to choose the photo	_____	It's hard to choose the photo
I take a long time to choose the photo ^	_____	I choose the photo very quickly
I feel anxious or worried about the photos I share/post ^	_____	I feel very comfortable about the photos I share/post
I share/post whichever photo is available	_____	I take photos especially for posting/sharing
I don't care what others will think about how I look	_____	I worry about what others will think about how I look
I don't care which photos I share/post	_____	I carefully select the best photo to share/post
I worry about whether anyone will "Like" my photos ^	_____	I don't care whether anyone will "Like" my photos
I don't take any notice of how many "Likes" my photos get	_____	I take notice of how many "Likes" my photos get

^, reverse scored

Self Photo Manipulation

Instructions: For photos of yourself that you post online or share via mobile, how often do you do the following to make the photos look better

	Never	Rarely	Sometimes	Often	Always
Get rid of red eye	1	2	3	4	5
Highlight facial features, e.g., cheekbones or eye color/brightness	1	2	3	4	5
Use a filter to change the overall look of the photo, e.g., making it black and white, or blurring and smoothing images	1	2	3	4	5
Make yourself look skinnier	1	2	3	4	5
Adjusting the light/darkness of the photo	1	2	3	4	5
Edit to hide blemishes like pimples	1	2	3	4	5
Whiten your teeth	1	2	3	4	5
Make specific parts of your body look larger or look smaller	1	2	3	4	5
Edit or use apps to smooth skin	1	2	3	4	5

Facetune Familiarity Questionnaire

1. How familiar are you with the Facetune application?

1	2	3	4	5
Not at all familiar				Very familiar

2. How often do you edit photos using the Facetune application?

1	2	3	4	5
Never				All the time

3. How often do you post photos of yourself that you have edited using Facetune?

1	2	3	4	5
Never				All the time

Demographics

1. What is your assigned sex at birth?
    a. Male
    b. Female
    c. Intersex
2. What is your gender identity?
    a. Male
    b. Female
    c. Non-binary
    d. Other_____
3. How do you identify your sexual orientation? Please select on best descriptor. Also, if the categories provided do not fully capture your identify, please feel free to use the "Other" category to specify further.

    a. Exclusively lesbian or gay
    b. Mostly lesbian or gay
    c. Bisexual
    d. Mostly heterosexual
    e. Exclusively heterosexual
    f. Asexual
    g. Other
4. What is your age?
5. Is English your native language yes/no
6. Are you of Hispanic or Latino origin?
7. How would you describe your race/ethnicity? Please select the one best descriptor, or use the “Biracial/Multiracial” option to specify further.
    a. African. African American/Black
    b. American Indian/Native American
    c. Arab American/Middle Eastern
    d. Asian/Asian American
    e. Hispanic/Latina/o American
    f. Pacific Islander
    g. White/European American/ Caucasian
    h. Biracial/Multiracial (please specify)
    i. Other (please specify)
8. What is your academic year?
    a. First
    b. Second
    c. Third
    d. Fourth
    e. Fifth or more
9. What is your relationship status?

- Single/Never married
- In a relationship
- Married/Domestic partnership
- Divorced

- Widowed
- Separated

10. Do you give permission for your photo to be posted on our Instagram story?
    Yes
    No

Body Mass Index

What is your height in feet and inches?
What is your weight in pounds?

Appendix C: Instagram and Facetune Information

Instagram Profile Script and Information

"We are interested in gathering some feedback about different social media profiles and you have been randomly assigned to view a specific profile. We are going to open an Instagram profile on the iPad and would like you to browse it for one minute. Please don't look at the user's story or any other pages—just look at the photos are posted to their page. We are interested in getting a variety of feedback, so make sure you are fully engaged with the profile and the types of photos that have been posted. Everything on the screen is going to be recorded for data monitoring and safety purposes. I will let you know when the minute is over."

Model: https://www.instagram.com/sophielouisesdiary/?hl=en
Nature: https://www.instagram.com/pnwisbeautiful/?hl=en

Facetune Demonstration Video

https://www.youtube.com/watch?v=Gp1-IyzKhZk&t=20s