

“Selfie” harm: Effects on mood and body image in young women

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ABSTRACT

“Selfies” (self-taken photos) are a common self-presentation strategy on social media. This study experimentally tested whether taking and posting selfies, with and without photo-retouching, elicits changes to mood and body image among young women. Female undergraduate students ($N = 110$) were randomly assigned to one of three experimental conditions: taking and uploading either an untouched selfie, taking and posting a preferred and retouched selfie to social media, or a control group. State mood and body image were measured pre- and post-manipulation. As predicted, there was a main effect of experimental condition on changes to mood and feelings of physical attractiveness. Women who took and posted selfies to social media reported feeling more anxious, less confident, and less physically attractive afterwards compared to those in the control group. Harmful effects of selfies were found even when participants could retake and retouch their selfies. This is the first experimental study showing that taking and posting selfies on social media causes adverse psychological effects for women.

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1. Introduction

Within the past decade, social networking has become a hugely popular form of online communication, especially among young people (Perloff, 2014). Facebook, Instagram, and Snapchat are among some of the most widely used social media platforms available and can be accessed via computer, smartphone, computer tablet, and through other forms of technology (Perloff, 2014). In comparison to conventional mass media, social media are interactive, allowing individuals to create their own personal profiles and share information and photos with users on their social network (Stefanone, Lackaff, & Rosen, 2011). A national survey by the Pew Research Center found that in the U.S., 18- to 29-year-olds who access the Internet are the most likely of any demographic group to use a social networking (i.e., social media) site, and that women are more likely than men to use these sites (Duggan & Brenner, 2013). Over 95% of college students regularly maintain and manage their social networking profiles (Perloff, 2014; Stefanone et al., 2011). Women, in particular, have been found to upload photos to social media more frequently than do men, and tend to spend more time updating, managing, and maintaining their personal profiles (Stefanone et al., 2011).

Emerging evidence provides insight into the effects that social media behaviours may have on users. On one hand, social media use may be beneficial as it allows greater connectedness with others, leading to an increased sense of well-being (Tiggemann & Miller, 2010). On the other hand, social media use may lead to a preoccupation and focus on physical appearance, such as engagement in appearance-related photo activities (Cohen, Newton-John, & Slater, 2017), which could cause appearance concerns and lowered body image and self-esteem (de Vries, Peter, Nikken, & de Graaf, 2014). As users are frequently exposed to a variety of other profiles, they can compare their own appearance to friends, relatives, and strangers (Haferkamp & Kramer, 2011). Hancock and Toma (2009) found that people select their own online dating profile photos in an attempt to look as attractive as possible without being judged to be deceptive. Cross-sectional data have revealed that for both women and men, Facebook use is associated with greater (upward) social comparison and self-objectification, which are both related to lower self-esteem, poorer mental health, and body image concerns (Hanna et al., 2017).

1.1. Social media and body image

Various studies have documented widespread body and weight dissatisfaction among girls and women, and social media has been found to be a significant catalyst for these appearance concerns (Brown & Tiggemann, 2016; Holland & Tiggemann, 2016; Tiggemann & Miller, 2010). Given that social media provide the

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opportunity for social comparison, as well as exposure to unrealistic beauty expectations, body dissatisfaction is likely to result from frequent use (Fardouly, Pinkus, & Vartanian, 2017; Tiggemann & Slater, 2013; Want & Saiphoo, 2017). Social media present innumerable idealized images of thin, lean/tone, beautiful, photo-shopped women, and the “thin ideal” and “athletic ideal” are displayed as a normal, desirable, and attainable body type for every woman (Kim & Chock, 2015; Meier & Gray, 2014; Robinson et al., 2017). Furthermore, the Internet and social media have been found to promote thinness, dieting behavior, and weight loss through idealized images of “perfect” women (Perloff, 2014). Women who use social media often internalize the “thin ideal,” causing them to strive for an unrealistic, unnatural standard of beauty and to feel ashamed when they are unable to achieve it (Kim & Chock, 2015; Meier & Gray, 2014; Tiggemann & Slater, 2013). Studies have found that frequent exposure to the Internet and social networking websites results in high levels of weight dissatisfaction, drive for thinness, and body surveillance in young women (Tiggemann & Miller, 2010; Tiggemann & Slater, 2013), regardless of race (Howard, Heron, MacIntyre, Myers, & Everhart, 2017). Additionally, Perloff (2014) suggests that women who have relatively higher levels of thin ideal internalization, perfectionism, and/or low self-esteem would be especially likely to spend time on appearance-focused online comparisons and that they probably do not use ‘self-protective’ downward appearance comparisons (i.e., comparing their appearance to less attractive friends). These predictions are concerning, since high body dissatisfaction among women is a primary risk factor for the development of eating disorders and is correlated with low self-esteem and depression (Meier & Gray, 2014; Tiggemann & Miller, 2010). Therefore, it is important for researchers to understand the causal effects that social media and self-presentation strategies have on young women by using experimental research methods.

1.2. Self-presentation and impression management

Past research on the psychological effects of social media has mainly focused on the implications of social media use for body satisfaction in general. However, there is a lack of empirical research that evaluates the effects of the specific self-presentation strategies that social media users rely on. According to Toma and Hancock (2010), self-presentation involves “adjusting and editing the self during social interactions to create a desired impression on the audience.” The motivation to selectively self-present also relates to impression management, whereby individuals carefully present themselves in order to make specific impressions on their viewers (Pounders, Kowalczyk, & Stowers, 2016). As a result, social media users are driven to present the most attractive versions of themselves to others in order to make a favorable impression (Toma & Hancock, 2010). These photos, however, often do not portray an accurate depiction of one’s true physical appearance (Toma & Hancock, 2010). The most common way that users selectively self-present on social media is through the taking and uploading of “selfies” (photos taken by and of oneself). Users tend to capture selfies from flattering angles and using bright lighting, and may also edit their photos using colour correction, skin-retouching, and even photo-shopping to make body parts appear thinner (Anderson, Fagan, Woodnutt, & Chamorro-Premuzic, 2012). In this way, social media users are able to manage the impressions they have on others by presenting only the most flattering images of themselves and minimizing perceived flaws or imperfections (Anderson et al., 2012; Bell, Cassarly, & Dunbar, 2018; Pounders et al., 2016). It has also been found that individuals who desire to boost their self-esteem upload selfies more frequently, and that women of 16–25 years of age spend up to 5 h per week taking selfies and sharing them on social media (Pounders et al., 2016). Research on

gender differences in Internet activities has found that, compared to men, women tend to be more motivated to create a positive self-presentation on their social media profiles, and as a result, they engage in more photo-enhancement behaviours (Haferkamp, Eimler, Papadakis, & Kruck, 2012; Toma & Hancock, 2010). Overall, research has suggested that the taking and retouching of selfies may be a particularly risky behaviour in terms of its potential to negatively impact the body image and self-esteem of young girls and women.

1.3. The current study

In summary, previous research demonstrates that social media use is positively correlated with appearance concern. Furthermore, the literature suggests that selfie-taking and photo-retouching, which are very common social media behaviours, are associated with poorer self-esteem and body image among young women. It has been suggested that editing and uploading selfies may worsen appearance concerns (de Vries et al., 2014), but it is not yet known whether a causal relationship exists.

To fill this gap in the literature, the current study tested the effects of selfie taking on body image and mood in women. It was hypothesized that updating one’s social media profile with a selfie photo would result in lowered mood and increased body concerns as compared to a control group. To answer a secondary research question, we also tested the effects of having control over self-presentation on social media, by retaking and retouching a selfie photo, on women’s body image and mood. It was hypothesized that participants who were allowed to retake and retouch their selfie would experience better mood and body image compared to women who were not allowed to modify their selfie before posting it on social media. This is because women typically react to seeing a photo of themselves by feeling dissatisfied with their appearance (Mills, Shikatani, Tiggemann, & Hollitt, 2014) and photo modification allows a person to present an idealized version of themselves to others (Tiggemann & Miller, 2010).

2. Method

2.1. Participants

Participants were 113 psychology undergraduate students recruited through an online experiment management system at York University in Toronto, Canada. Inclusion criteria included being female, being between 16 and 29 years old ($M = 19.00$, $SD = 1.66$), and having an active account on Facebook or Instagram. In exchange for their participation in a single, hour-long lab session, participants received partial course credit toward their Introduction to Psychology course. The self-reported ethnic distribution of the sample was 24.8% South Asian, 20.2% European/Caucasian, 12.8% Black/African-American, 10.1% Middle Eastern, 9.2% Caribbean, 6.4% Pacific Islands American, 5.5% East Asian, 2.8% Latino/Hispanic, and 8.2% other ethnic identification. Body mass index ($BMI = kg/m^2$) scores ranged from 15.84 to 36.23 ($M = 23.71$, $SD = 4.03$) across the sample, with the mode, median, and mean all falling within the “normal” weight range ($18.5 < BMI < 24.9$) (Centers for Disease Control & Prevention, 2015). One participant who mistakenly signed up for the study was excluded because he self-identified as male. Two participants declined to participate after reading the informed consent form because they were uncomfortable taking a photo of themselves for religious reasons.

2.2. Apparatus

2.2.1. iPad

Participants used the Internet browser, camera, and photo modification app (“You-Cam Now”), if applicable, installed on an iPad.

2.3. Measures

2.3.1. Mood and body image

A series of visual analogue scales (VAS) was used to measure mood and body image at baseline as well as after the experimental manipulation (described below). This commonly used set of scales was designed to assess pre-post fluctuations in psychological states, typically in experimental research designs (Heinberg & Thompson, 1995). The measure consisted of six VAS, each with a 10-centimeter horizontal line labeled with a specific attitude or emotional state. Participants are asked to place an X on the point on the line that most accurately depicts the degree to which they were experiencing that feeling at the moment, from *Not at all* to *Very much*. The mood items included anxiety, depression, and confidence. The body image items included feelings of fatness, physical attractiveness, and body size satisfaction. Rather than collapsing scores into global affect or appearance concerns, we separated the items so that we could examine specific affective changes among participants. VAS format is recommended over Likert scales for pre-post research designs since it reduces recall bias (i.e., participants cannot recall their previous response), can be completed quickly, is sensitive to emotional changes (Hargreaves & Tiggemann, 2003). The measure used in the current study is the same one used in other published studies.

2.3.2. Demographics

Age and race/ethnicity demographics were collected from each participant. Filler items not of interest to the study were included on the questionnaire (e.g., living arrangements, year of study, university program, and media consumption).

2.4. Procedure

Ethics approval was received from York University’s Human Participants Review Committee. Female undergraduate students volunteered for an advertised study examining “the relationship between personality and social media use.” Participants were tested individually behind a partition wall from the experimenter and were asked to leave their bags and any personal electronic devices (including phones) outside of the testing area. Participants were randomly assigned to one of three experimental conditions prior to arriving at the lab. Upon arrival to the lab, participants read and signed a written informed consent form, were given a baseline VAS, and then the demographics questionnaire with additional filler items to distract from the purpose of the study. For ethical reasons, the informed consent form contained the information that participants may be asked to post a selfie to their own social media profile. For the experimental task, participants in the Untouched Selfie condition were asked to take a single photo (a headshot) on the lab’s iPad and upload it to their preferred social media profile (Facebook or Instagram). Participants in the Retouched Selfie condition were asked to take one or more photos of themselves on the lab’s iPad and were told that they could use the photo editing app installed on the iPad to retouch the photo to their satisfaction before uploading it to their social media profile. Participants in the Control condition were also given the lab’s iPad but were asked to read a short article from a social media news website chosen for neutral, non-appearance related content (i.e., popular travel ideas for university students) and to answer questions about the article. This task was chosen to maintain the cover study of social media

use and to control for using an iPad, and for the amount of time elapsed between pre-post measures. It was intentional that Control condition participants not engage on Facebook or Instagram (theirs or other people’s profiles, since we could not be certain that they were not exposed to appearance-related content, which could affect mood and/or body image).

The assigned tasks in the Untouched Selfie and Control conditions were timed (5 min each). The Retouched Selfie condition was not timed so that participants could retake and retouch their selfie to their satisfaction. However, time to completion was recorded by the experimenter and participants in the Retouched Selfie condition took a similar amount of time to complete their task (mean time to completion = 4.5 min). Instructions and set up in all three conditions took approximately 1–2 min.

As manipulation checks, Control condition participants were asked to answer written questions about their article to ensure that they read the article. Selfie condition participants were asked verbally by the experimenter whether they completed the tasks as instructed. In addition, at the end of the study the experimenter checked the photo and browser histories, and any deleted files on the iPad to ensure that participants in all conditions adhered to the instructions and did not open any other websites or social media profiles. All participants confirmed that they followed the instructions and there was no evidence of non-adherence.

Upon completion of the experimental tasks, all participants completed the post-manipulation VAS. Participants were asked to complete the scales based on how they were feeling at that particular moment. The elapsed time between the baseline and post-manipulation VAS measure was approximately 10 min. Furthermore, the format of the VAS scale is such that participants cannot recall their previous answer; thus, recall bias is minimized. Participants were then debriefed and probed as to what they believed to be the purpose of the study. Lastly, height and weight were measured by the experimenter on a balance beam scale.

2.5. Data analysis

Statistical analyses were conducted using SPSS version 24. An alpha level of .05 was used for significance testing. A power analysis was conducted using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007); an alpha of .05, medium effect size, and power estimate of .80 resulted in a recommended sample size of 110, which was obtained. Repeated measures analysis (Time 1 – Time 2) was chosen to analyze the effects of experimental condition instead of VAS change scores to maximize power and use within-subject error estimates. To control for Type I error, an initial repeated measures multivariate analysis of variance (RM-MANOVA) was performed with time (Time 1 – Time 2) and test (VAS item) as the within-subject factors, and experimental condition (Untouched Selfie, Retouched Selfie, and Control) as the between-subjects factor. Any significant multivariate 3-way interaction (time × test × condition) on the combined dependent measures was followed by univariate repeated measures ANOVAs, with time (Time 1 – Time 2) as the within-subject factor and experimental condition as the between-subjects factor. Any significant within-subjects contrasts (time × condition) were followed by post-hoc *t*-tests to examine which conditions differed. For ease of interpretation, change scores (Time 1 – Time 2) were used only for these post hoc *t*-tests to examine the direction and magnitude of change to psychological states as a function of condition.

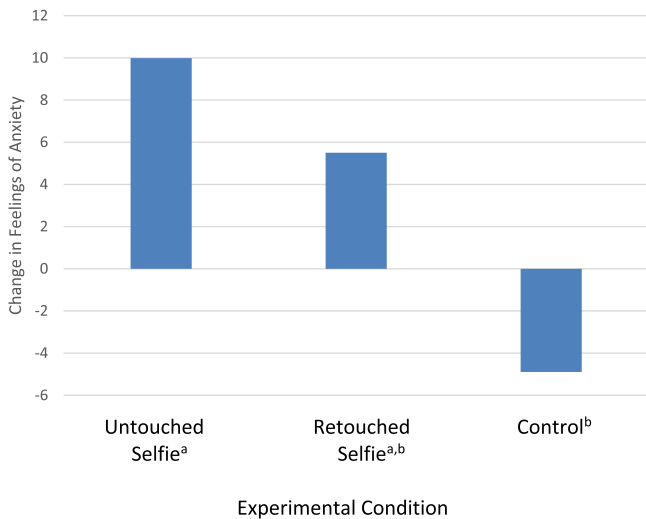


Fig. 1. Mean change in anxiety as a function of condition. Means with different superscripts are significantly different from one another at $p < .05$.

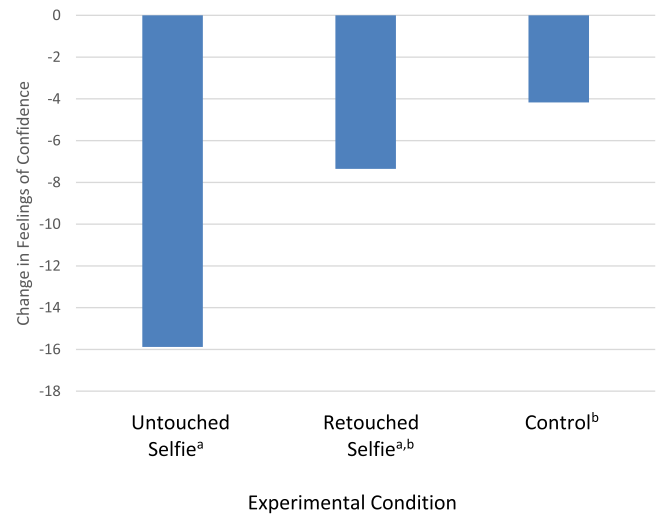


Fig. 2. Mean change in confidence as a function of condition. Means with different superscripts are significantly different from one another at $p < .05$.

3. Results

3.1. Preliminary analyses

Inspection of histograms, skewness, and kurtosis suggested that all of the variables were normally distributed. There were no statistical outliers ($\pm 3.0 SD$) among the dependent variables; therefore, no adjustments were made. Groups did not differ significantly on baseline levels of any variable, suggesting that randomization resulted in equivalent groups.

3.2. Multivariate effects of experimental condition

Means and standard deviations for all dependent variables of interest (pre- and post-manipulation) as a function of the experimental condition are shown in Table 1. For ease of interpretation, Table 1 also shows the change in participants' self-ratings across the psychological states.

A significant 3-way (test \times time \times condition) multivariate effect on the combined dependent variables was found, Hotelling's Trace = .21, $F(10, 201) = 2.14$, $p = .02$, partial $\eta^2 = .10$, meaning that the experimental groups differed with respect to how mood and body image ratings changed between Time 1 and Time 2.

Significant 2-way (time \times condition) interactions were found for anxiety, Hotelling's Trace = .06, $F(2, 107) = 3.32$, $p = .04$, partial $\eta^2 = .06$, confidence, Hotelling's Trace = .07, $F(2, 107) = 3.69$, $p = .03$, partial $\eta^2 = .07$, and physical attractiveness, Hotelling's Trace = .07, $F(2, 107) = 3.59$, $p = .03$, partial $\eta^2 = .06$, meaning that the experimental groups were not equal with respect to changes on those items from Time 1 to Time 2. Interactions were not significant for depression, Hotelling's Trace = .01, $F(2, 107) = 0.48$, $p = .62$, feelings of fatness, Hotelling's Trace = .02, $F(2, 107) = 0.97$, $p = .38$, or satisfaction with body size, Hotelling's Trace = .01, $F(2, 107) = 0.75$, $p = .47$.

3.3. Changes to psychological states as a function of condition

The significant 2-way interactions reported above were followed up with t -tests to compare changes to psychological states across experimental groups.

As can be seen in Fig. 1, participants in the Untouched Selfie condition experienced an increase in anxiety and this was significantly greater than the Control condition $t(71) = 2.35$, $p = .02$. The Retouched Selfie condition also experienced an increase in

anxiety but was not significantly different from the Control condition, $t(71) = 1.80$, $p = .08$. The Untouched and the Retouched Selfie conditions did not differ with respect to changes in anxiety, $t(71) = 0.79$, $p = .43$.

Fig. 2 shows that participants in the Untouched Selfie condition experienced a decrease in confidence and this was significantly greater than the Control condition, $t(71) = 2.48$, $p = .01$, and marginally greater than that experienced in the Retouched Selfie conditions $t(72) = 1.92$, $p = .06$. There was no difference in changes to feelings of confidence between the Retouched Selfie and Control conditions, $t(71) = 0.60$, $p = .55$.

Fig. 3 shows that participants experienced decreases in feelings of physical attractiveness that were significantly greater than in the Control condition in both the Untouched Selfie condition, $t(71) = 2.43$, $p = .02$, and the Retouched Selfie condition, $t(71) = 2.32$, $p = .02$. These decreases were equivalent between the two selfie conditions $t(72) = 0.12$, $p = .90$.

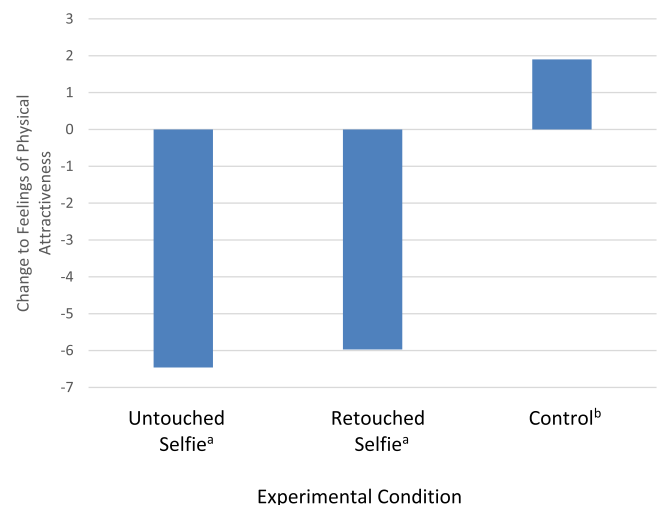


Fig. 3. Mean change in feelings of physical attractiveness as a function of condition. Means with different superscripts are significantly different from one another at $p < .05$.

Table 1
Dependent Variables of Interest (Pre and Post) as a Function of Experimental Condition.

	Experimental Condition		
	Untouched Selfie (n = 37) M (SD)	Retouched Selfie (n = 37) M (SD)	Control (n = 36) M (SD)
Anxiety - Pre	27.15 (26.91)	26.92 (24.82)	32.11 (27.48)
Anxiety - Post	37.14 (30.17)	32.97 (26.74)	27.22 (28.35)
Change	9.99 (26.87)	5.50 (21.26)	-4.89 (27.29)
Depression - Pre	13.61 (20.79)	19.81 (20.97)	18.56 (19.96)
Depression - Post	16.30 (21.63)	19.24 (24.02)	20.00 (22.96)
Change	2.69 (15.76)	-0.57 (14.54)	2.00 (14.90)
Confidence - Pre	54.93 (24.37)	55.86 (23.77)	60.17 (23.14)
Confidence - Post	39.05 (27.83)	48.51 (22.44)	55.89 (23.84)
Change	-15.88 (21.38)	-7.35 (16.61)	-5.11 (15.06)
Feelings of Fatness - Pre	34.78 (28.11)	36.81 (27.37)	37.63 (30.44)
Feelings of Fatness - Post	35.58 (29.23)	34.95 (28.17)	31.92 (28.32)
Change	-0.17 (19.83)	-1.86 (17.15)	-6.26 (20.93)
Physical Attractiveness - Pre	48.35 (22.58)	49.57 (19.81)	51.63 (22.11)
Physical Attractiveness - Post	41.89 (25.10)	43.59 (21.45)	53.53 (22.67)
Change	-6.46 (17.07)	-5.97 (16.66)	1.90 (11.85)
Satisfaction Body Size - Pre	47.89 (32.11)	46.89 (25.75)	50.49 (29.34)
Satisfaction Body Size - Post	46.51 (28.99)	46.14 (24.06)	53.56 (28.58)
Change	-1.38 (13.21)	-0.76 (21.15)	3.07 (14.81)

4. Discussion

This is the first experimental study of the causal effects of posting selfies to social media on young women. The findings generally supported our hypothesis that taking and posting a selfie on social media would result in lowered mood and worsened self-image. We also found that women who had the opportunity to retake and modify their selfie before posting it to social media still experienced decreases to mood and anxiety that were similar to the reactions of those who could not retouch their photo.

Participants who took and uploaded a selfie onto social media, without the option to retouch or take multiple photos, felt more anxious, less confident, and less physically attractive afterward, and these differences were significantly greater than the control condition (i.e., reading a neutral news article online). These results all yielded medium effect sizes. These findings are consistent with the previous suggestion that appearance concerns are heightened when women interact with and construct their social media profiles, manifesting in poorer body image and mood (e.g., [de Vries et al., 2014](#)). However, we did not find significant effects of selfie-taking on all of the dependent variables of interest in the current study; we found null effects on state feelings of fatness, satisfaction with one's body, and depression. We interpret these findings to suggest that the psychological states affected by taking and posting selfies to social media are specifically related to feelings of self-consciousness and/or fear of negative evaluation by others. This interpretation seems likely given that participants in the study were sharing their selfie photos on their own social media profiles and for other people they know to see.

It is interesting that feelings of physical attractiveness were negatively affected by selfie taking and posting, but not feelings of fatness or satisfaction with one's body size. However, it is important to note that the current study involved taking a photo only of one's head and face. In other words, it may not be surprising that effects of taking a selfie on body-related constructs were not found, since the current study looked only at the effects of taking selfies of one's face. If the current study had examined the effect of taking and posting photos that showed the participant's body the results might have been different. Celebrities, but probably many social media users, often post body-conscious selfies on their social media (e.g., wearing bathing suits, lingerie, or no clothing at all). Posting selfies of

one's body (and not just the face), even when clothed, could trigger body-specific appearance concerns but we did not capture those effects in the current study. This is an area for future research.

We had a secondary research question related to whether being able to retake, select, and modify one's selfie (as is commonly done by many social media users) might, in fact, improve subsequent mood or body image. As suggested by [Kim and Chock \(2015\)](#), women are motivated to present perfected images and idealized versions of themselves on their social media profiles in order to make a favorable impression on their viewers. Photo-retouching behaviours allow women to present the most attractive versions of themselves and minimize perceived imperfections ([Toma & Hancock, 2010](#)). In the current study, women in the retouched selfie condition were able to take multiple photos, delete unwanted photos, and could retouch their photos to their satisfaction using a photo editing application. However, we found little evidence of any psychological benefit of being able to modify the photo women posted to their social media. In terms of state anxiety, women who posted an untouched selfie to social media felt significantly more anxious than those who did not post a selfie at all. But women who were able to retouch their selfie before posting it also felt marginally more anxious than those in the control condition and equally anxious to those in the untouched selfie group. In other words, having the ability to retake and retouch their selfie to their satisfaction before posting it did not mitigate women's anxiety significantly. This lack of difference between the effects of the two experimental selfie tasks on anxiety was unexpected. A similar result was found regarding feelings of physical attractiveness. Participants who could retouch their selfie felt significantly less attractive after posting it online (as did those who were asked to post an untouched selfie), and there was no significant difference between the retouched and untouched selfie groups on changes to feelings of physical attractiveness. In terms of feelings of confidence, women who could retouch their selfie did feel more confident afterward than those in the untouched selfie group, but they felt just as confident as those who did not post a selfie at all. In other words, posting a retouched selfie did not improve women's confidence, as compared to engaging in an appearance-neutral task.

To explain these findings, it could be that scrutinizing and modifying images of themselves makes women think more about their flaws or imperfections. Retouching could activate feelings of

self-objectification. Even though self-presentation strategies like photo-editing provide a sense of control over physical appearance (Tiggemann & Miller, 2010), they do not actually appear to improve mood or self-image. The current study found no evidence that posting retouched photos to social media makes women feel better than usual and found some evidence that it makes them feel worse than usual. Although women might feel less anxious about posting a selfie if they have the chance to retouch it and make it more flattering, the process of taking and editing the photo still draws their attention to feeling dissatisfied about aspects of their appearance.

4.1. Clinical implications

These findings have clinical implications for the prevention and treatment of mental health difficulties. Women who took a selfie and posted it to their social media profile had increased levels of anxiety, decreased confidence, and lowered perceived physical attractiveness compared to those who did not take a selfie. Given that women between 16–25 years of age spend up to 5 h per week taking selfies and uploading them to their personal profiles (Pounders et al., 2016), these findings raise significant concern about social media use and well-being. Posting selfies to one's social media has adverse causal effects on the self-image and mood of young women, and could make them more vulnerable to clinical eating, mood, and/or anxiety disorders. Frequently taking selfies could be considered a body checking behavior, such as repeated weighing and recurrent checking of one's reflection in mirrors (Mills et al., 2014). As a result, frequently taking and posting selfies should be considered a risky online health-related behavior for young women in terms of mental health, especially if they trigger weight and shape dissatisfaction. High body dissatisfaction is the primary risk factor for the development of eating disorders and is correlated with low self-esteem and depression (Meier & Gray, 2014; Tiggemann & Miller, 2010). Interventions that aim to diminish or eliminate the harmful effects of social media engagement on psychological functioning should be validated and implemented.

4.2. Limitations and future directions

A unidirectional causal relationship between posting selfies to social media and worsened mood and body image was demonstrated in the current study. The reverse relationship – the effect of low mood or body dissatisfaction on posting selfies – is a future research question of importance. There could be a bidirectional and self-perpetuating cycle between appearance-based social media engagement and negative mood and/or body image. Because the current sample included only young women who regularly use social media, these results may not generalize to older women or women who do not use social media. We did not include men since the existing literature on social media and body image has focused on women. Future studies should include men and relevant appearance-related psychological constructs (e.g., drive for muscularity; Mills & D'Alfonso, 2007). For ethical reasons, participants were informed on the consent form that they may be asked to take a photograph of themselves and post it to social media. We attempted to minimize demand characteristics by including filler questions between repeated measures, by using the visual analogue scale format, by stating the purpose of the study in only vague terms, and by probing what participants thought to be the true purpose of the study. There was no evidence that demand characteristics were a threat to the validity of the study. Nevertheless, it is possible that participants might have had implicit assumptions about the effects of the experimental tasks on how they felt. We did not examine personality moderators in the current study; future research should investigate individual differences and whether certain types of women (e.g., those who are high on

perfectionism, those who frequently post selfies in their everyday lives) are more or less vulnerable to the adverse effects of posting selfies to social media than others. Future research should also study the specific modifications that participants make to their photos using retouching. We did not include this outcome variable in the current study, but future studies could explore ways of assessing selfie modification behaviours surreptitiously. Participants in the control condition of the current study did not interact on social media to avoid any possible exposure to appearance-related online content and to make the control condition entirely appearance neutral. However, a different control task (e.g., uploading a neutral, non-selfie photo to social media) might produce different results. Therefore, an important next step is to dismantle what aspects of posting selfies to social media produce the observed effects (e.g., taking selfies without posting them on social media). Finally, future research should examine the longer term and/or cumulative effects of posting selfies to social media using prospective, longitudinal research designs.

5. Conclusions

This is the first study to show experimentally that selfie posting on social media is harmful in terms of young women's mood and self-image. Being able to retouch or modify their photo did not result in women feeling better about themselves after posting a selfie to social media. Future research should look at the longer-term effects of posting photos of oneself on social media, which is an increasingly common aspect of contemporary media use.

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