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‘Selfie’-objectification: The role of selfies in self-objectification and disordered eating in young women

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ABSTRACT

Existing research demonstrates a relationship between social networking site (SNS) use and body-related concerns and disordered eating amongst females. Preliminary evidence indicates that SNS photo activities (e.g., taking and sharing ‘selfies’) may play a particularly important role. The present study aimed to use self-objectification as a framework to examine the relationship between SNS photo activities and body-related and eating concerns in a population of young women. Participants were 259 young women (age 18–29; $M = 22.97$, $SD = 3.25$) who completed self-report questionnaires of SNS use and body-related and disordered eating concerns. Results showed that SNS ‘selfie’ activities, rather than general SNS usage, were associated with body-related and eating concerns. Specifically, greater investment in ‘selfie’ activities was associated with increased body dissatisfaction and bulimia symptomatology, even after accounting for known risk factors such as thin-ideal internalisation and body mass index (BMI). Moreover, self-objectification was found to moderate the relationship between photo investment and bulimia symptomatology. These findings indicate that active engagement with SNS photo activities, rather than general SNS use, shows an association with body-related and eating concerns. Interventions targeting specific SNS photo activities may be an effective avenue for the prevention and management of body-related concerns and disordered eating in young women.

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1. ‘Selfie’-objectification: the role of selfies in self-objectification and eating disturbances in young women

Social networking sites (SNS), such as Facebook and Instagram, are internet-based sites that enable users to create personal profiles and share, view, comment and ‘like’ peer-generated content (Perloff, 2014). Importantly, SNS have become more popular than traditional media formats (i.e., television, magazines) among young women (Bair, Kelly, Serdar, & Mazzeo, 2012) with 90% of young adults (ages 18–29) reported to be active SNS users (Perrin et al., 2015). The unique combination of peer influences and media depictions of idealised female bodies inherent to the SNS environment provide ample opportunity for women to internalize the “thin-ideal” (i.e., thin-ideal internalisation) and scrutinise their own appearance based on these perceived norms. Such processes typically lead to body dissatisfaction and disordered eating (Rodgers, Chabrol, & Paxton, 2011). In support, recent research has

found a significant relationship between SNS use and thin-ideal internalisation, self-objectification, body dissatisfaction and eating disorder behaviours in teenage girls (Tiggemann & Miller, 2010; Tiggemann & Slater, 2013; Vandenbosch & Eggermont, 2012) and undergraduate women (Cohen & Blaszczynski, 2015; Fardouly & Vartanian, 2015; Fardouly, Diedrichs, Vartanian, & Halliwell, 2015; Mabe, Forney, & Keel, 2014). However, most research to date has focused on SNS usage in general, operationalised by time spent using SNS. Unlike traditional media consumers, SNS users are both passive recipients of content as well as ‘active’ content creators (Perloff, 2014). Therefore, further research is needed to investigate the impacts of active user-generated engagement and the specific SNS activities that are most relevant for body image and eating concerns (Prieler & Choi, 2014).

Specifically, SNS ‘selfie’ behaviours may play an important role in body image issues and disordered eating. According to Objectification Theory (Fredrickson & Roberts, 1997), women’s daily encounters with sexually objectifying experiences, for example exposure to media depictions of female bodies and interpersonal

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encounters, socialise women to internalize an observer's view of their own bodies as objects to be evaluated. This *self-objectification* manifests behaviourally as body surveillance (McKinley & Hyde, 1996), the habitual monitoring of the body's appearance, and contributes to women's risk for eating disorders (Moradi & Huang, 2008). Over one million selfies (self-images) are taken globally each day, with Australians reported to take the most selfies worldwide (Šuk, 2014). Moreover, two-thirds of Australian women aged 18–35 years report taking selfies (Šuk, 2014). Importantly, SNS users have been found to carefully pose for, select, and even edit selfies as per thin-ideal norms before posting them online to be evaluated by their peers (Chae, 2017; Chua & Chang, 2016; Fox & Vendemia, 2016; Haferkamp & Kramer, 2011).

In accordance with Objectification Theory (Fredrickson & Roberts, 1997), these selfie behaviours may foster self-objectification by positioning women to scrutinise their own image from an observers perspective, which is then further reinforced by instant feedback on their appearance through the form of comments and 'likes' (de Vries & Peter, 2013). Accordingly, SNS selfie activities may provide a novel medium through which women engage in self-objectification, thus contributing to body image and eating disturbances and indicating an important area for future research.

Lending preliminary support, Meier and Gray (2014) found that engagement in photo activities on Facebook, rather than general Facebook usage, was associated with body image disturbances and self-objectification in adolescent girls (age 12–18 years). McLean, Paxton, Wertheim, and Masters (2015) found that selfie sharing, and in particular photo investment and photo manipulation, was associated with higher body dissatisfaction, dietary restraint, and thin-ideal internalisation in a sample of 13-year-old girls. Photo investment refers to the effort involved in selecting selfies to post on SNS, whereas photo manipulation refers to the editing of the appearance of selfies prior to posting (McLean et al., 2015).

These preliminary studies in adolescent samples implicate the importance of SNS photo activities, rather than general SNS use, in the maintenance of body image and eating concerns (McLean et al., 2015; Meier & Gray, 2014). However, whilst Meier and Gray (2014) found an association between photo activities and self-objectification, they did not differentiate between active (i.e. posting) and passive (i.e. viewing) SNS photo activities. Similarly, although McLean et al. (2015) did investigate selfie behaviours more specifically in relation to body image, the authors did not include self-objectification as a variable of interest. Given that self-objectification may be theoretically intrinsic to selfie behaviours, research that investigates the relationship between selfie behaviour and self-objectification appears warranted.

Moreover, young adults (ages 18–29 years) are the highest SNS users (Perrin et al., 2015), yet research into the relationship between SNS selfie activities and body image and eating disturbances in this age group is lacking. Given the high rates of body dissatisfaction amongst young women (Neighbors & Sobal, 2007) and the known popularity of SNS use within this population (Perrin et al., 2015), research into user-generated photo activities on SNS in this population is needed.

1.1. The current study

The current study aims to extend upon McLean et al.'s (2015) preliminary findings by using an objectification theory framework to examine the relationship between SNS selfie activities and body-related and eating concerns in a population of young women (age 18–29 years). In particular, we investigate how photo investment and photo manipulation, as proposed by McLean et al. (2015),

are related to self-objectification, body satisfaction, drive for thinness, and bulimia. It is hypothesized that greater SNS selfie activity (selfie-taking, selfie-posting, photo investment, photo manipulation), rather than general SNS usage, will be related to lower body satisfaction and greater disordered eating. Further, given that self-objectification has been found to act as a moderator between sexual objectification experiences and disordered eating (Fitzsimmons-Craft, 2011; Moradi & Huang, 2008), we hypothesized that self-objectification will moderate the relationship between SNS selfie activities and disordered eating.

2. Method

2.1. Participants

Participants were 259 women aged 18–29 years ($M = 22.97$, $SD = 3.25$) from various locations in Australia with an average reported body mass index (BMI) of 22.45 ($SD = 4.20$), which is within the normal weight range (WHO, 2015). Participants were recruited via several Australian University psychology departments and various social media outlets promoting the study (e.g., the University's Facebook page). Participation was voluntary and participants received no reward for participation. Sixty-eight percent of participants were currently students and 61% had completed at least an undergraduate degree. The majority of participants (77.5%) identified as Caucasian, with others reporting to be Asian (15.1%), Middle Eastern (2.7%), African (0.8%), Aboriginal/Torres Strait Islander (0.8%) and other (3.1%).

2.2. Measures

2.2.1. Demographics

Participants reported age, ethnicity, level of education, height and weight. BMI (kg/m^2) was calculated using height and weight data.

2.2.2. SNS use

Participants indicated the average amount of time they spent on SNS a day on a 12-point scale: 0–15 min, 15–30 min, 1–2 h, 2–3 h, 3–4 h, 4–5 h, 5–6 h, 6–7 h, 7–8 h, 8–9 h, 9–10 h, 10 or more hours.

2.2.3. Selfie activities

The Photo Activities measure (McLean et al., 2015) was used to assess practices of taking and sharing selfies online. Selfie-taking frequency was assessed with two items asking participants i) how frequently they take selfies with only themselves in the photo, and ii) how frequently they take selfies which include others, on an 8-point Likert scale ranging from "less than once a month" to "more than twice a day". In accordance with McLean et al. (2015), the mean of the two items was summed with higher scores indicating higher selfie-taking frequency. McLean et al. (2015), reported good internal consistency for this two-item scale ($r_s = 0.86$). For this study the scale showed good internal consistency ($r_s = 0.81$).

Selfie sharing behaviour was assessed with one item asking how often participants post photos of themselves on SNS like Facebook, Snapchat or Instagram. The item was scored on a 5-point Likert scale ranging from "never" to "very often" with higher scores reflecting more frequent photo-posting activity.

The 8-item Photo Investment scale (McLean et al., 2015) was used to assess participants' investment, effort, and concern regarding posting selfies on SNS. Items were presented using visual analogue scales ranging from 0 to 100 and were anchored by contrasting statements such as "I take a long time to choose the photo" and "I choose the photo very quickly". In accordance with McLean et al. (2015), the mean for items was summed with higher

scores reflecting higher investment in SNS photo sharing. McLean et al. (2015) reported good reliability in their female adolescent sample ($\alpha = 0.85$). For this study the scale showed good reliability ($\alpha = 0.79$).

A modified version of McLean et al.'s (2015) Photo Manipulation scale was used to assess the extent to which participants manipulated or edited photos of themselves prior to sharing on social media. The 2-items asked whether participants edited their photos in general (e.g., add a filter) and whether they edited their photos to make themselves look better (e.g., make themselves skinnier). Items were scored on a 5-point likert scale ranging from “never” to “very often”. The scale showed acceptable reliability ($r_s = 0.67$).

2.2.4. Thin-ideal internalisation

The 9-item Internalisation-General subscale of the Sociocultural Attitudes Toward Appearance Questionnaire—Version 3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) was used to measure thin-ideal internalisation. Participants rate the extent to which they agree with statements like “I would like my body to look like the models who appear in magazines” on a 5-point scale ranging from “definitely disagree” to “definitely agree”. Items are summed with higher scores indicating greater internalisation of the thin-ideal. Thompson et al. (2004) found excellent psychometric characteristics amongst non-clinical female college students. For this study the scale showed excellent reliability ($\alpha = 0.93$).

2.2.5. Body satisfaction

The 7-item Appearance Evaluation subscale of the Multidimensional Body-Self Relations Questionnaire-Appearance Scales (Cash, 2000) was used to measure body satisfaction. Participants rate the extent to which they agree with statements like “My body is sexually appealing” on a 5-point likert scale ranging from “definitely disagree” to “definitely agree”. Items are summed with lower scores indicating lower body satisfaction. The scale has shown good internal consistency in a female undergraduate sample (Ata, Thompson, & Small, 2013). For this study the scale showed excellent reliability ($\alpha = 0.90$).

2.2.6. Self-objectification

The 8-item Body Surveillance subscale of the Objectified Body Consciousness Scale (McKinley & Hyde, 1996) was used to measure self-objectification. Participants rate the extent to which they agree with statements like “During the day, I think about how I look many times” on a 7-point Likert scale ranging from “strongly disagree” to “strongly agree”. Items are summed and averaged, with higher scores indicating higher levels of body surveillance. McKinley and Hyde (1996) showed good construct and discriminant validity in their undergraduate female sample. For this study the scale showed good reliability ($\alpha = 0.83$).

2.2.7. Disordered eating

The 7-item Drive for Thinness and 8-item Bulimia subscales of the Eating Disorder Inventory-3 (Garner, 2004) were used to measure disordered eating symptomatology. An example item from the Drive for Thinness subscale includes, “I think about dieting” and from the Bulimia subscale, “I have thought of trying to vomit in order to lose weight”. Both scales are scored on a 6-point Likert scale ranging from “never” to “always” (using the 0–4 scoring format, Clausen, Rosenvinge, Friberg, & Rokkedal, 2011; Garner, 2004). Items are summed with higher scores indicating higher levels of eating disorder symptoms. Both scales showed good reliability and validity in a non-clinical sample of women aged 18–30 years (Clausen et al., 2011). For this study the scales showed good-excellent reliability ($\alpha = 0.89$ drive for thinness, 0.93 bulimia).

2.3. Procedure

The University's ethics committee granted approval for the study to proceed. Participants were given a URL to access the participant information statement, consent form and questionnaires online using Qualtrics software. After providing informed consent, participants completed the demographic questionnaire, followed by the SNS questions, and finally body image, and disordered eating measures. The survey took approximately 10–15 min to complete.

2.4. Data analyses

Correlational analyses were used to examine associations between all main variables. Separate hierarchical linear regressions were conducted to take into account covariates, and determine the relative contributions of SNS usage and selfie activities on each outcome variable: body satisfaction, drive for thinness, and bulimia. The objectification literature highlights the intrinsic link between thin-ideal internalisation and self-objectification, whereby the conceptualisation of self-objectification assumes a prior internalisation of beauty standards (Fitzsimmons-Craft, 2011; Vandenbosch & Eggermont, 2012). Accordingly, thin-ideal internalisation was conceptualised as important covariate and entered at step 1 along with age and BMI. Overall SNS usage was entered at step 2, followed by selfie-taking, selfie-posting, photo-investment and photo-manipulation (step 3). Multicollinearity was not indicated for the independent variables with the highest correlation between variables being $r = 0.45$, ($VIF < 10$). Finally, moderation analyses were conducted using the SPSS PROCESS macro (Hayes, 2013) to explore whether self-objectification moderated the relationships between the selfie activities and disordered eating outcomes (drive for thinness and bulimia symptomatology).

3. Results

3.1. Preliminary analyses

For all regression analyses, the assumptions of linearity, independence of errors, homoscedasticity and normality of residuals were examined and found to be satisfactory. Overall there were minimal missing values, ranging from <1% on various subscales to 5% on the self-objectification subscale. Missing data were handled with pairwise deletion. All statistical analyses used an alpha level of 0.05 for significance with obtained p values reported.

3.2. SNS use and selfie activities

In terms of frequency of SNS use, the majority of participants (64%) reported using SNS around 2 h per day ($M = 3.81$, $SD = 1.44$, range = 1–12). Almost half of the participants (48.7%) reported taking selfies at least once per fortnight and just over half of participants (53%) reported posting selfies “sometimes” to “very often”. Over half of the participants (62.2%) reported editing their photos (e.g., adding a filter) “sometimes” to “very often”, but most participants (80.7%) reported “rarely” or “never” editing photos to make themselves look better (e.g., remove blemishes, make yourself skinnier). Only 19.3% of participants reported editing in this way “sometimes” to “very often”. Descriptive statistics for selfie activities, body image, and eating concerns are presented in Table 1, and are comparable with data reported in previous samples (Ata et al., 2013; Clausen et al., 2011; Greenleaf & McGreer, 2006).

Table 1

Range, Means and Standard Deviations for Selfie activities, Body image and Disordered Eating Variables (N = 259).

	Scale Range	M	SD
<i>Selfie Activities</i>			
Selfie-taking frequency	1–8 ^a	2.76	1.53
Selfie-posting	1–5 ^b	2.60	0.90
Photo Investment	0–100	55.36	17.80
Photo Manipulation	1–5 ^b	2.33	1.05
<i>Body Image</i>			
Thin-ideal internalisation	9–45	26.37	8.75
Appearance comparison	5–25	14.56	3.54
Body satisfaction	1–5	3.21	0.87
Self-objectification	1–7	4.47	1.00
<i>Disordered Eating</i>			
Drive for thinness	0–28	9.01	8.08
Bulimia	0–32	4.97	5.71

^a 1 = less than once a month, 8 = more than twice a day.^b 1 = never, 5 = very often.

3.3. Correlations

Table 2 displays the correlations between all variables. As predicted, overall SNS usage did not demonstrate a significant relationship with any of the outcome variables, whereas the SNS selfie activities did. Specifically, selfie posting was significantly correlated with body satisfaction; photo investment was significantly associated with thin-ideal internalisation, body satisfaction (negatively), self-objectification, drive for thinness, and bulimia; and photo manipulation was significantly correlated with thin-ideal internalisation and self-objectification. Since selfie taking was not significantly correlated with any of the outcome variables, it was not explored further in the regression analyses.

3.4. Hierarchical multiple regression

Table 3 displays the summary statistics for the regression models for the three dependent variables. For all three dependent variables, when controlling for age, BMI and thin-ideal internalisation (step 1), the addition of SNS usage (step 2) did not explain additional variance. The addition of selfie posting (step 3) explained significant additional variance for body satisfaction, such that higher levels of selfie posting were associated with higher body satisfaction. Photo investment also explained additional variance for body satisfaction and bulimia, but not drive for thinness, such that higher levels of photo investment were associated with lower levels of body satisfaction and higher levels of bulimia symptomology.

Table 2

Correlations between study variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1.Age	1											
2.Body Mass Index	0.004	1										
3.Thin Ideal Internalisation	−0.02	−0.08	1									
4.Body Satisfaction	0.15 ^a	−0.24 ^c	−0.40 ^c	1								
5.Self-Objectification	−0.16 ^b	0.003	0.59 ^c	−0.45 ^c	1							
6.Drive for Thinness	−0.04	0.08	0.50 ^c	−0.55 ^c	0.59 ^c	1						
7.Bulimia	−0.008	0.18 ^b	0.26 ^c	−0.45 ^c	0.36 ^c	0.53 ^c	1					
8.SNS Usage	−0.15 ^b	0.13 ^a	−0.06	0.03	−0.03	−0.06	−0.04	1				
9.Selfie-taking	−0.33 ^c	0.11	0.14 ^a	0.04	0.11	0.03	−0.02	0.25 ^c	1			
10.Selfie-posting	−0.10	0.12	0.09	0.14 ^a	0.09	0.03	0.03	0.247 ^c	0.45 ^c	1		
11.Photo Investment	−0.14 ^a	0.002	0.38 ^c	−0.30 ^c	0.50 ^c	0.28 ^c	0.27 ^c	0.07	0.08	0.04	1	
12.Photo Manipulation	−0.07	0.03	0.14 ^a	0.02	0.23 ^c	0.12	0.04	0.18 ^b	0.29 ^c	0.44 ^c	0.19 ^b	1

Note. ^a $p < 0.05$, ^b $p < 0.01$, ^c $p < 0.001$.**Table 3**

Summary of hierarchical regression analyses predicting body satisfaction, drive for thinness and bulimia.

	R^2	ΔR^2	F	β	t	p
<i>DV: Body Satisfaction</i>						
Step 1	0.27	0.27	30.54 ^c			
Age				0.15 ^b	2.77	0.006
BMI				−0.28 ^c	−5.11	<0.001
Thin-ideal Internalisation				−0.43 ^c	−7.93	<0.001
Step 2	0.28	0.004	1.49			
SNS Usage				0.07	1.22	0.224
Step 3	0.35	0.07	8.69 ^c			
Selfie Posting				0.22 ^c	3.75	<0.001
Photo Investment				−0.13 ^a	−2.23	0.026
Photo Manipulation				0.06	0.93	0.351
<i>DV: Drive for Thinness</i>						
Step 1	0.29	0.29	33.37 ^c			
Age				−0.04	−0.65	0.518
BMI				0.14 ^b	2.63	0.009
Thin-ideal Internalisation				0.53 ^c	9.80	<0.001
Step 2	0.30	0.005	1.68			
SNS Usage				−0.07	−1.29	0.197
Step 3	0.31	0.008	0.90			
Selfie Posting				−0.05	−0.85	0.397
Photo Investment				0.07	1.18	0.240
Photo Manipulation				0.05	0.74	0.458
<i>DV: Bulimia</i>						
Step 1	0.11	0.11	10.14 ^c			
Age				−0.002	−0.03	0.978
BMI				0.21 ^c	3.39	0.001
Thin-ideal Internalisation				0.28 ^c	4.59	<0.001
Step 2	0.11	0.002	0.46			
SNS Usage				−0.04	−0.68	0.499
Step 3	0.15	0.04	3.54 ^a			
Selfie Posting				0.002	0.03	0.980
Photo Investment				0.22 ^c	3.25	0.001
Photo Manipulation				−0.03	−0.37	0.710

Note. ^a $p < 0.05$, ^b $p < 0.01$, ^c $p < 0.001$; β = standardised regression coefficient.

4. Moderation analyses

No selfie behaviours were found to significantly predict drive for thinness in the regression analyses and therefore moderation analyses were conducted with bulimia as the only disordered eating outcome variable. Controlling for age, BMI, and thin-ideal internalisation, self-objectification was found to moderate the relationship between photo investment and bulimia $\Delta R^2 = 0.23$, $F(6, 230) = 6.83$, $p < 0.001$. Simple slopes for the association between photo investment and bulimia symptomology were tested for low (−1 SD below mean), medium (mean), and high (+1 SD above mean) self-objectification. As depicted in Fig. 1, among women high in self-objectification, there was a significant positive relationship between photo investment and bulimia symptomology, $b = 0.11$,

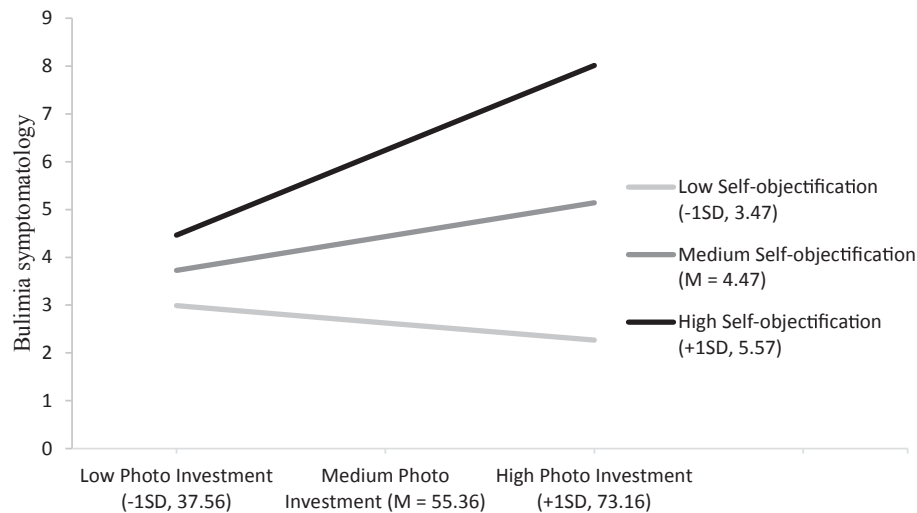


Fig. 1. Simple slopes for the relationship between photo investment and bulimia symptomatology for different levels of self-objectification.

$t(230) = 2.89$, $p = 0.004$, however this relationship was not significant among women with low, $b = -0.03$, $t(230) = -1.08$, $p = 0.28$, or medium self-objectification, $b = 0.04$, $t(230) = 1.74$, $p = 0.09$. Thus, for women who are high in self-objectification, greater investment in their selfies is associated with increased bulimia symptomatology.

5. Discussion

The primary aim of this study was to use objectification theory as a framework to explore the relationship between SNS selfie activities and body-related and disordered eating outcomes in a sample of young adult women. Consistent with previous research in adolescent samples (McLean et al., 2015; Meier & Gray, 2014), the results of this study supported the hypothesis whereby SNS selfie activities, rather than SNS usage per se, were associated with body-related concerns and disordered eating in young women. The current findings may help to clarify previous inconsistencies in the literature, with several studies finding a positive association between time spent on SNS and poorer body image outcomes (Fardouly & Vartanian, 2015; Mabe et al., 2014; Tiggemann & Slater, 2013) and others finding no association (Ferguson, Munoz, Garza, & Galindo, 2013), or even a negative association (Rutledge, Gillmor, & Gillen, 2013). Importantly, however, these studies did not assess how users spent their time on SNS and thus contradictory findings may be explained by the homogenous conceptualisation of SNS usage (Kim & Chock, 2015). By contrast, as demonstrated by the current findings, a more nuanced approach to specific SNS user activity may more accurately relate to body-related effects.

5.1. Selfie activities and body satisfaction

Interestingly, in the current sample, greater selfie-posting was associated with greater body satisfaction. Whilst this positive association was not found in McLean et al.'s (2015) adolescent sample, it was consistent with Ridgway and Clayton's (2016) finding that higher body satisfaction was associated with greater Instagram selfie-posting in an adult sample. This finding might be understood in a number of ways. Firstly, research shows that appearance-focused images like selfies receive more positive reinforcement in the forms of 'likes' and comments in comparison with neutral images (Bakhshi, Shamma, & Gilbert, 2014). Accordingly, those who post more selfies are likely to get more positive reinforcement

about their appearance, thus leading to an increase in body satisfaction. Alternatively, those who have greater body satisfaction to begin with are more likely to post more selfies (Ridgway & Clayton, 2016). The disparate findings may also point to the potential for different relationships between selfie-posting and body satisfaction in adolescent and young adult samples. Experimental research is needed to further understand the direction and causation of such effects.

By contrast, greater photo investment was associated with decreased body satisfaction. It may be that whilst those higher in body satisfaction tend to post selfies more frequently, those lower in body satisfaction tend to invest more in the selection and presentation of their photos before posting online. This is plausible given that those women lower in body satisfaction also endorsed photo investment items like "I worry about what others will think about how I look" and "I carefully select the best photo to share/post" more strongly than those more satisfied with their appearance. Alternatively, it is possible that the process of engaging with one's selfies in such a self-conscious way fosters dissatisfaction in one's appearance.

Either way, these divergent findings highlight a difference in the relationship between the quantity versus quality of selfie activities with body satisfaction. Posting selfies online may not be negatively impacting body image, in fact, as this study found, frequency of selfie posting may be positively associated with body satisfaction. However, the way in which one interacts with their selfies prior to posting online may be more important for body image outcomes, and as this study found, photo investment is negatively related to body satisfaction.

5.2. Selfie activities and disordered eating

Greater photo investment was also associated with increases in bulimia symptomatology, even after controlling for other risk factors. This finding may indicate that those higher in disordered eating are more invested in their selfies and how they may be received by peers. This is consistent with Mabe et al.'s (2014) finding that participants with greater disordered eating endorsed greater importance of receiving comments on their photos. Alternatively, higher photo investment, as indicated by greater endorsement of items like "I feel anxious about the photos I post", may involve negative affect, which is a known trigger of binge eating behaviour (Engelberg, Steiger, Gauvin, & Wonderlich, 2007).

Either way, further experimental research is necessary to determine causality and the direction of effects.

Interestingly, photo investment was related to bulimia symptomatology but not to drive for thinness. Whereas the drive for thinness subscale captures an attitudinal construct of eating disorders, the bulimia subscale more directly taps into behaviours associated with eating disorders. While previous research has demonstrated relationships between SNS use and drive for thinness (Fardouly & Vartanian, 2015; Tiggemann & Miller, 2010; Tiggemann & Slater, 2013), these studies have measured SNS use in terms of overall exposure time, possibly capturing 'passive' SNS use. It may be that the current study's measure of photo investment captures 'active' SNS use, and that this active engagement relates more to the behavioural manifestations of disordered eating (bulimia symptomatology) than attitudinal indications (drive for thinness).

5.3. The moderating role of self-objectification

Importantly, the current study found that self-objectification moderated the relationship between photo investment and bulimia symptomatology. This finding is consistent with the Objectification Theory literature suggesting that self-objectification, or body surveillance, may intensify the link between sexual objectification experiences and eating disorder symptoms (Moradi & Huang, 2008; Noll & Fredrickson, 1998; Tiggemann & Kuring, 2004). Moreover, this finding extends upon previous research showing an association between general SNS use and self-objectification (Fardouly et al., 2015; Tiggemann & Slater, 2013), by identifying the moderating role of self-objectification in the relationship between specific SNS activities and body image outcomes in young women.

The constant monitoring of one's outward appearance, inherent in self-objectification, has been likened to the concept of body-checking (Tiggemann, 2013), an established maintaining factor for disordered eating (Shafran, Fairburn, Robinson, & Lask, 2004). SNS photo investment may similarly serve to reinforce a preoccupation with appearance, especially for women with a higher tendency to self-objectify, and thus may contribute to core features of eating disorders such as an over-evaluation of weight and shape (McLean et al., 2015). Indeed, investment in one's self-presentation in photos to be shared and evaluated online might be conceptually similar to self-objectification and related body surveillance, which in turn may relate to the use of unhealthy weight loss strategies and eating patterns consistent with bulimia symptomatology (Fitzsimmons-Craft, 2011).

5.4. Limitations and future directions

The present study has various limitations to consider. Firstly, the cross-sectional nature of the results precludes causal inference. More experimental and longitudinal research is required to ascertain the nature and direction of the relationship between selfie activities and body-related concerns. Secondly, all measures were self-report and therefore may have been subject to social desirability and retrospective bias. Future research could employ diary methodology to provide more ecologically valid data on participants' SNS usage. An unavoidable limitation of the present study was the lack of well-validated measures of selfie behaviour. SNS use and selfie posting behaviour were based upon single items with no established reliability or validity and therefore results for these measures should be interpreted with caution. Further measurement development and validation is necessary to improve future research in this field. Additionally, since selfies predominantly include portrait photos rather than full-bodied photos (Haferkamp,

Eimler, Papadakis, & Kruck, 2012), future research into SNS-based photos may benefit from measuring appearance or facial features satisfaction rather than general body satisfaction. The current sample was relatively homogenous in terms of ethnicity and level of education and therefore caution should be taken when generalising the current findings to more culturally diverse samples or the general population. Future research with clinically diagnosed eating disorder samples may also be more informative in exploring the role of SNS selfie activities in the development and maintenance of eating disorders specifically.

5.5. Implications

The current findings have various theoretical implications for the body image and disordered eating literature as well as practical implications for the management and prevention of eating disorders. Firstly, the current study adds to the existing literature (McLean et al., 2015; Meier & Gray, 2014) in demonstrating the utility of investigating specific SNS activities, rather than overall SNS usage, in understanding the relationship between SNS use and body image concerns. In order to truly understand the effect of SNS use on body image and eating disturbances, future research must first delineate between the various kinds of SNS engagement (Prieler & Choi, 2014). Moreover, the finding that self-objectification moderated the relationship between photo investment and bulimia symptomatology lends further support to Objectification Theory (Fredrickson & Roberts, 1997; Moradi & Huang, 2008) and demonstrates how high levels of self-objectification may intensify the relationship between specific SNS selfie activities and disordered eating in young women. Future studies should investigate whether limiting selfie investment may protect young women from increased self-objectification and eating disorder risk.

The present study's more nuanced analysis of SNS activities indicates that general SNS use may not be inherently negative for body and eating concerns, but rather active engagement with SNS photo activities may be more relevant. Accordingly, rather than limiting the quantity of SNS usage as earlier studies may suggest, it may be more practical and effective to target the quality of engagement with specific SNS photo activities in the prevention and management of body-related concerns and disordered eating in young adult women. Perhaps media literacy programs, which have been found to improve body-related concerns (Halliwell, Easun, & Harcourt, 2011; Posovac, Posovac, & Weigel, 2001), may benefit from including a critical analysis of selfie activities and the self-objectification processes associated with them. Moreover, the finding of an association between photo investment and bulimia symptomatology indicates it may be beneficial to consider and monitor specific SNS activities in the treatment of those with eating disorders.

6. Conclusions

The present study adds to the extant literature by showing that SNS photo activities, rather than general SNS usage, may be important in body-related and eating concerns in young women. This study highlights that it is the active investment in selfies that are particularly pertinent to body dissatisfaction and bulimia symptomatology and that self-objectification moderates this relationship. These findings point to the potential value of focusing on selfie activities in the prevention and treatment of body image issues and disordered eating.

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References

- Ata, R. N., Thompson, J. K., & Small, B. J. (2013). Effects of exposure to thin-ideal media images on body dissatisfaction: Testing the inclusion of a disclaimer versus warning label. *Body Image*, 10, 472–480. <https://doi.org/10.1016/j.bodyim.2013.04.004>.
- Bair, C. E., Kelly, N. R., Serdar, K. L., & Mazzeo, S. E. (2012). Does the Internet function like magazines? An exploration of image-focused media, eating pathology, and body dissatisfaction. *Eating Behaviors*, 13, 398–401. <https://doi.org/10.1016/j.eatbeh.2012.06.003>.
- Bakhshi, S., Shamma, D. A., & Gilbert, E. (2014). Faces engage us: Photos with faces attract more likes and comments on Instagram. In *Paper presented at the proceedings of the SIGCHI conference on human factors in computing systems*.
- Cash, T. F. (2000). *Multidimensional Body-Self Relations Questionnaire (MBSRQ)*. User's Manual. Retrieved from <http://www.body-images.com>.
- Chae, J. (2017). Virtual makeover: Selfie-taking and social media use increase selfie-editing frequency through social comparison. *Computers in Human Behavior*, 66, 370–376.
- Chua, T. H. H., & Chang, L. (2016). Follow me and like my beautiful selfies: Singapore teenage girls' engagement in self-presentation and peer comparison on social media. *Computers in Human Behavior*, 55, 190–197. <https://doi.org/10.1016/j.chb.2015.09.011>.
- Clausen, L., Rosenvinge, J. H., Friborg, O., & Røkkedal, K. (2011). Validating the eating disorder inventory-3 (EDI-3): A comparison between 561 female eating disorders patients and 878 females from the general population. *Journal of Psychopathology and Behavioral Assessment*, 33, 101–110. <https://doi.org/10.1007/s10862-010-9207-4>.
- Cohen, R., & Blaszczynski, A. (2015). Comparative effects of facebook and conventional media on body image dissatisfaction. *Journal of Eating Disorders*, 3, 1–11. <https://doi.org/10.1186/s40337-015-0061-3>.
- Engelberg, M. J., Steiger, H., Gauvin, L., & Wonderlich, S. A. (2007). Binge antecedents in bulimic syndromes: An examination of dissociation and negative affect. *International Journal of Eating Disorders*, 40, 531–536. <https://doi.org/10.1002/eat.20399>.
- Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). The mediating role of appearance comparisons in the relationship between media usage and self-objectification in young women. *Psychology of Women Quarterly*, 39, 1684–1688. <https://doi.org/10.1016/j.psq.2015.08.001>.
- Fardouly, J., & Vartanian, L. R. (2015). Negative comparisons about one's appearance mediate the relationship between facebook usage and body image concerns. *Body Image*, 12, 82–88. <https://doi.org/10.1016/j.bodyim.2014.10.004>.
- Ferguson, C. J., Munoz, M. E., Garza, A., & Galindo, M. (2013). Concurrent and prospective analyses of peer, television and social media influences on body dissatisfaction, eating disorder symptoms and life satisfaction in adolescent girls. *Journal of Youth and Adolescence*, 43, 1–14. <https://doi.org/10.1007/s10964-012-9898-9>.
- Fitzsimmons-Craft, E. E. (2011). Social psychological theories of disordered eating in college women: Review and integration. *Clinical Psychology Review*, 31, 1224–1237. <https://doi.org/10.1016/j.cpr.2011.07.011>.
- Fox, J., & Vendemia, M. A. (2016). Selective self-presentation and social comparison through photographs on social networking sites. *Cyberpsychology, Behavior, and Social Networking*, 19, 593–600.
- Fredrickson, B. L., & Roberts, T. A. (1997). Objectification Theory: Toward understanding Women's lived experiences and mental health risks. *Psychology of Women Quarterly*, 21, 173–206. <https://doi.org/10.1111/j.1471-6402.1997.tb00108.x>.
- Garner, D. M. (2004). *Eating disorder inventory-3 (EDI-3)*. Lutz, FL: Psychological Assessment Resources Inc.
- Greenleaf, C., & McGreer, R. (2006). Disordered eating attitudes and self-objectification among physically active and sedentary female college students. *The Journal of Psychology*, 140, 187–198. <https://doi.org/10.3200/JRPL.140.3.187-198>.
- Haferkamp, N., Eimler, S. C., Papadakis, A.-M., & Kruck, J. V. (2012). Men are from Mars, Women are from Venus? Examining gender differences in self-presentation on social networking sites. *Cyberpsychology, Behavior, and Social Networking*, 15, 91–98. <https://doi.org/10.1089/cyber.2011.0151>.
- Haferkamp, N., & Kramer, N. C. (2011). Social comparison 2.0: Examining the effects of online profiles on social-networking sites. *Cyberpsychology, Behavior, and Social Networking*, 14, 309–314. <https://doi.org/10.1089/cyber.2011.0151>.
- Halliwell, E., Easun, A., & Harcourt, D. (2011). Body dissatisfaction: Can a short media literacy message reduce negative media exposure effects amongst adolescent girls? *British Journal of Health Psychology*, 16, 396–403. <https://doi.org/10.1348/135910710X515714>.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press.
- Kim, J. W., & Chock, T. M. (2015). Body image 2.0: Associations between social grooming on facebook and body image concerns. *Computers in Human Behavior*, 48, 331–339. <https://doi.org/10.1016/j.chb.2015.01.009>.
- Mabe, A. G., Forney, K. J., & Keel, P. K. (2014). Do you “like” my photo? Facebook use maintains eating disorder risk. *International Journal of Eating Disorders*, 47, 516–523. <https://doi.org/10.1002/eat.22254>.
- McKinley, N. M., & 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.x>.
- 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. <https://doi.org/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. <https://doi.org/10.1089/cyber.2013.0305>.
- Moradi, B., & Huang, Y. P. (2008). Objectification theory and psychology of women: A decade of advances and future directions. *Psychology of Women Quarterly*, 32, 377–398. <https://doi.org/10.1111/j.1471-6402.2008.00452.x>.
- Neighbors, L. A., & Sobal, J. (2007). Prevalence and magnitude of body weight and shape dissatisfaction among university students. *Eating Behaviors*, 8, 429–439. <https://doi.org/10.1016/j.eatbeh.2007.03.003>.
- Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly*, 22, 623–636. <https://doi.org/10.1111/j.1471-6402.1998.tb00181.x>.
- Perloff, R. M. (2014). Social media effects on young women's body image concerns: Theoretical perspectives and an agenda for research. *Sex Roles*, 71, 363–377. <https://doi.org/10.1007/s11199-014-0384-6>.
- Perrin, A., Duggan, M., Rainie, L., Smith, A., Greenwood, S., Porteus, M., et al. (2015). *Social media usage: 2005–2015*. Pew Research Center.
- Posovac, H., Posovac, S., & Weigel, R. (2001). Reducing the impact of exposure to idealized media images of female attractiveness on women's body image: An investigation of three psychoeducational interventions with a high risk sample. *Journal of Social and Clinical Psychology*, 20, 324–340.
- Prieler, M., & Choi, J. (2014). Broadening the scope of social media effect research on body image concerns. *Sex Roles*, 71, 378–388.
- Ridgway, J. L., & Clayton, R. B. (2016). Instagram Unfiltered: Exploring associations of body image satisfaction, Instagram# selfie posting, and negative romantic relationship outcomes. *Cyberpsychology, Behavior, and Social Networking*, 19, 2–7. <https://doi.org/10.1089/cyber.2015.0433>.
- Rodgers, R., Chabrol, H., & Paxton, S. (2011). An exploration of the tripartite influence model of body dissatisfaction and disordered eating among Australian and French college women. *Body Image*, 8, 208–215. <https://doi.org/10.1016/j.bodyim.2011.04.009>.
- Rutledge, C. M., Gillmor, K. L., & Gillen, M. M. (2013). Does this profile picture make me look fat? Facebook and body image in college students. *Psychology of Popular Media Culture*, 2, 251. <https://doi.org/10.1037/ppm0000011>.
- Shafraan, R., Fairburn, C. G., Robinson, P., & Lask, B. (2004). Body checking and its avoidance in eating disorders. *International Journal of Eating Disorders*, 35, 93–101. <https://doi.org/10.1002/eat.10228>.
- Šuk, T. (2014). Selfie infographic – “selfiegraphic” facts and statistics. Retrieved from <https://techinfographics.com/selfie-infographic-selfiegraphic-facts-and-statistics/>.
- Thompson, J. K., van den Berg, P., Roehrig, M., Guarda, A., & Heinberg, L. (2004). The sociocultural attitudes towards appearance scale-3 (SATAQ-3): Development and validation. *International Journal of Eating Disorders*, 35, 293–304. <https://doi.org/10.1002/eat.10257>.
- Tiggemann, M. (2013). Objectification theory: Of relevance for eating disorder researchers and clinicians? *Clinical Psychologist*, 17, 35–45. <https://doi.org/10.1111/cp.12010>.
- Tiggemann, M., & Kuring, J. K. (2004). The role of body objectification in disordered eating and depressed mood. *British Journal of Clinical Psychology*, 43, 299–311. <https://doi.org/10.1348/0144665031752925>.
- Tiggemann, M., & Miller, J. (2010). The Internet and adolescent girls' weight satisfaction and drive for thinness. *Sex Roles*, 63, 79–90. <https://doi.org/10.1007/s11199-010-9789-z>.
- Tiggemann, M., & Slater, A. (2013). NetGirls: The Internet, Facebook, and body image concern in adolescent girls. *International Journal of Eating Disorders*, 46, 630–633. <https://doi.org/10.1007/s11199-010-9789-z>.
- Vandenbosch, L., & Eggermont, S. (2012). Understanding sexual objectification: A comprehensive approach toward media exposure and girls' internalization of beauty ideals, self-objectification, and body surveillance. *Journal of Communication*, 62, 869–887. <https://doi.org/10.1111/j.1460-2466.2012.01667.x>.
- de Vries, D. A., & Peter, J. (2013). Women on display: The effect of portraying the self online on women's self-objectification. *Computers in Human Behavior*, 29, 1483–1489. <https://doi.org/10.1016/j.chb.2013.01.015>.
- World Health Organization. (2015). *Global database on body mass index: BMI classification*. 2006.