



The effects of active social media engagement with peers on body image in young women

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ARTICLE INFO

Article history:

Received 25 December 2017
Received in revised form 3 November 2018
Accepted 3 November 2018
Available online 12 November 2018

Keywords:

Body image
Social media
Social comparison
Young adult women
Peer
Family member

ABSTRACT

This experimental study examined the effects of engaging on social media with attractive female peers on young adult women's body image. Participants were 118 female undergraduate students randomly assigned to one of two experimental conditions. Participants first completed a visual analogue scale measure of state body image and then either browsed and left a comment on the social media site of an attractive female peer ($n = 56$) or did the same with a family member ($n = 62$) and then completed a post-manipulation visual analogue scale measure of state body image. A 2×2 mixed analysis of variance showed a significant interaction between condition and time. Follow-up t -tests revealed that young adult women who engaged with an attractive peer on social media subsequently experienced an increase in negative body image (dependence-corrected $d = 0.13$), whereas those who engaged with a family member did not (dependence-corrected $d = 0.02$). The findings suggest that upward appearance comparisons on social media may promote increased body image concerns in young adult women.

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1. Introduction

Social media's relation to body image is often examined using social comparison theory, which purports people self-evaluate based on comparisons with similar others. In upward social comparisons, people compare themselves to superior individuals (Festinger, 1954). Among women, making upward appearance comparisons is moderately related to negative body image (Myers & Crowther, 2009). On social media, young adult women most frequently make upward appearance comparisons to peers and rarely compare their appearance to family (Fardouly & Vartanian, 2015; Fardouly, Diedrichs, Vartanian, & Halliwell, 2015).

Cross-sectional research shows negative associations between body image and active social media engagement (ASME), particularly photo-based ASME (Cohen, Newton-John, & Slater, 2017; Holland & Tiggemann, 2016; Kim & Chock, 2015; Meier & Gray, 2014). We consider ASME behaviours of viewing and commenting on friends' social media. ASME requires content engagement and may have a greater impact on psychology than passive social media consumption. Among young adult women, ASME has a small, significant positive correlation with drive for thinness (Kim & Chock, 2015). Facebook photo activity has small-to-moderate positive cor-

relations with thin ideal internalization, self-objectification, and drive for thinness, and a small negative correlation with weight satisfaction (Meier & Gray, 2014). Cross-sectional research suggests upward social comparisons to young adult women's peers on social media weakly mediates the relationship between social media use and drive for thinness and body dissatisfaction, and that these comparisons have a stronger effect on body image concerns than do celebrity and model upward social comparisons (Fardouly & Vartanian, 2015). Frequency of appearance comparison to family is uncorrelated with social media use and body image (Fardouly & Vartanian, 2015). No published studies have shown causal effects of ASME with peers on body image.

Women are more likely than men to use social media to view others' photos, and ASME is how they typically use social media (Smith, 2014). They engage with social media specifically to compare themselves with others (Haferkamp, Eimler, Papadakis, & Kruck, 2012). Men are more likely to use social media to find friends (Haferkamp et al., 2012). Women feel worse about how they look than men (Engeln, 2017). On social media, young adult women present idealized images of themselves. Consequently, women on social media likely see idealized images of their peers and compare themselves with these idealized images (Manago, Graham, Greenfield, & Salimkhan, 2008); men are less likely to use social media like this. Thus, there is a need for research on potential causal effects of photo-based ASME on young adult women's body image.

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This study investigated the effect of photo-based ASME with peers (as compared to family) on young adult women's body image. Because women are more likely to struggle with body dissatisfaction (Mills, Roosen, & Vella-Zarb, 2011) and use image-based social media than are men (Greenwood, Perrin, & Duggan, 2016), we focused on young adult women. We hypothesized ASME with a female peer whom young adult women perceive as more attractive than themselves (upward social comparison) would result in more negative body image, whereas engaging with a woman unlikely to be an appearance comparison target (a non-peer family member not perceived as more attractive than themselves) would not affect body image.

2. Method

2.1. Participants

The initial sample consisted of 143 female York University undergraduate students enrolled in an Introduction to Psychology course recruited through an online experiment management system for a study on "social media and relationships." Eighteen participants were unable to adhere to experimental instructions and were excluded from all analyses, leaving a final sample of 125. Participants ranged in age from 17 to 27 years ($M = 19.59$, $SD = 2.00$) and in body mass index (BMI) from 15.43 to 42.26 kg/m² ($M = 24.31$, $SD = 5.00$). The self-reported ethnicity of the sample was: 25.6% South Asian; 16.0% European; 14.4% Middle Eastern; 8.0% Caribbean; 4.0% Pacific Islander; 7.2% African; 4.8% Latin, Central, and South American; 4.8% East Asian; 1.6% African-American; 1.6% Indigenous; and 7.2% other. A few participants (4.8%) did not report their ethnicity.

2.2. Materials

2.2.1. Demographics

Participants reported their age, ethnicity, whether English was their first language, and years of post-secondary education in an online questionnaire 1.5 months before the experiment. Level of post-secondary education was self-reported by answering, "How many years have you been a university student?" English as a first language was self-reported by answering, "Is English your first language?" and, if not, by answering, "Do you consider yourself fluent in English?"

2.2.2. State body image dissatisfaction

Visual analogue scales (VAS) measured state overall appearance (VAS-OAD) and body dissatisfaction (VAS-BD) before and after ASME. Participants rated how dissatisfied they felt about their overall appearance and body by placing a vertical line on a 10-cm horizontal line. Responses were scored to the nearest millimeter, producing a 100-point scale. The range of responses was *none* to *very much*. Higher scores indicated greater state body or overall appearance dissatisfaction. Heinberg and Thompson (1995) constructed the VAS-BD and VAS-OAD measures, averaging them to form one body dissatisfaction measure. We refer to this averaged measure as the State Body Image Scale (SBIS). The pre-manipulation SBIS Spearman-Brown coefficient was .86 and the inter-item correlation was .79. The post-manipulation SBIS Spearman-Brown coefficient was .88 and the inter-item correlation was .78. Heinberg and Thompson (1995) demonstrated convergent validity of the VAS-BD and VAS-OAD with the Eating Disorder Inventory–Body Dissatisfaction subscale (Garner, Olmsted, & Polivy, 1983), $r = .66$, $p < .01$, $r = .76$, $p < .01$, respectively.

2.2.3. Height and weight

Participants were weighed and measured on a balance beam scale at the study's end.

2.3. Social media engagement manipulation

2.3.1. ASME with a peer manipulation

Participants in this condition (the Peer Condition) completed the pre-manipulation SBIS and then identified a female peer within five years of their own age whom she followed on social media and explicitly considered more attractive than herself (see Appendix A for full Peer Condition identification instructions). Participants reported the peer's relationship to them and her initials. Next, participants viewed and commented on this peer's social media pages for 5 min on Facebook and then 5 min on Instagram.

Participants looked at only their identified peer's social media, found a photo of her on Facebook, and left an online comment on this photo. Participants could engage with the peer's other Facebook content during the 5-min task. After participants received instructions, the experimenter loaded www.facebook.com and left. The experimenter came back after 5 min and gave the participant similar instructions, asking her to do the same thing on Instagram. The experimenter then loaded www.instagram.com and left. Participants commented on photos of the same peer across Facebook and Instagram. Once the next 5 min were over, the experimenter came back into the room, confirmed the instructions had been followed, and asked the participant to complete a social media interaction questionnaire and the post-manipulation SBIS.

2.3.2. ASME with family manipulation

The procedure and instructions in this condition (the Family Condition) were identical to the Peer Condition, except participants engaged with a female family member's social media. They looked at and commented on a non-peer, not-more-attractive family member's social media posts for 5 min. per social media platform (i.e., Facebook and Instagram). Non-peer was defined as someone at least five years younger or older than the participant (see Appendix B).

2.3.3. Social media interaction questionnaire

Participants were asked whether they found a photo of the person they identified earlier on Facebook and Instagram and to write the comments they had left on her social media.

2.3.4. Manipulation checks

Participants confirmed their and their social media contact's age, and their relationship to her. Participants were asked again during the debriefing if they followed the instructions. Browser history was checked after each participant completed the experiment. The social media interaction questionnaire also served as a manipulation check, as all participants wrote down the comments they left. As noted above, 18 participants could not identify a suitable contact and were excluded from the analyses.

2.4. Procedure

The authors' institutional human participants ethics review board approved this study. Testing was conducted from June 6, 2016 to June 13, 2017. Only female students with Facebook and Instagram accounts were eligible and received partial course credit for participating. Participants provided informed consent in the online questionnaire and then again right before the experiment. Participants were randomly assigned to condition using a coin toss. Each participant was seated alone in a private room; the experimenter only entered the room to explain instructions.

Questionnaires were anonymous. Participants were weighed and debriefed in writing and verbally after the study.

2.5. Statistical analyses

The data were examined for normality, with no notable violations. Missing data accounted for 0.8% of the total values in the dataset. Both pre- and post-SBIS were missing 0.8% of data. Missing data were missing completely at random (MCAR), as determined by using Little (1988) MCAR analysis, $\chi^2(2) = 1.35$, $p = .509$. We inputted missing values using the multiple imputation expectation maximization technique, generating five imputations. Using G*Power for an *a priori* power analysis, for an analysis of variance (ANOVA) repeated measures within-between interaction, a Cohen (1988) f of 0.15 (i.e., a small-to-medium effect size), and a power estimate of 90%, the recommended sample size was 120. Additional participants were run to allow for any necessary exclusions. A 2×2 mixed ANOVA was conducted to compare the effect of ASME condition on SBIS scores pre- and post-manipulation. The independent variable was condition. Following Finch (2016) approach to address missing data, using the R base package (R Core Team, 2018), we pooled p -values. Results were considered significant at the $\alpha = .05$ level, unless otherwise specified below. Analyses were performed using SPSS v. 24 and R.

3. Results

3.1. Randomization check

Preliminary analyses found no between-group differences in the distribution of ethnic groups, Fisher's exact test $p = .120$; English as a first language, $\chi^2(1) = 2.30$, $p = .129$; number of years of post-secondary education, $t(123) = 0.75$, $p = .409$, $d = 0.14$; mean age, $t(123) = 0.23$, $p = .819$, $d = 0.04$; and mean BMI, $t(123) = 1.06$, $p = .293$, $d = 0.19$. Of those who reported English was not their first language ($n = 31$), the number of participants who considered themselves fluent in English did not differ by condition, $\chi^2(1) = 1.35$, $p = .245$. Thus, randomization resulted in equivalent groups on these variables.

3.2. Manipulation checks

If a participant viewed a social media contact's profile, the history tab showed an address including the contact's username. History tab checks confirmed participants followed the instructions. After excluding the aforementioned 18 participants, all remaining participants ($N = 125$) indicated they found a photo of their contact on Facebook and Instagram on which to comment.

Generally, social media "friends" are peers (West, Lewis, & Currie, 2009). To maximize ecological validity, we included participants who identified a best, close, or just "friend" ($n = 32$). The most commonly reported relationship in the Peer Condition was "friend" ($n = 22$). "Cousin" ($n = 38$) was the most commonly reported relationship in the Family Condition.

3.3. Effects of experimental condition on state body image

Despite randomization to condition and no observed pre-manipulation differences on sociodemographic variables or BMI, a t -test revealed an unexpected difference in pre-SBIS scores between conditions, $t(123) = 2.74$, $p = .006$, $d = 0.49$. We inspected the distribution of pre-SBIS scores to explain the pre-existing group difference and noted some visual outliers. We then omitted cases where the pre-SBIS was greater than or less than 2 SD above or below the mean. That resulted in excluding seven Peer Condition participants with very high pre-SBIS scores, and a sample of 118

for the main analyses. The difference in pre-SBIS scores between conditions was no longer significant, $t(116) = 1.83$, $p = .070$, $d = 0.30$.

The time \times condition interaction on SBIS was significant, $F(1, 116) = 9.98$, Wilks' $\Lambda = 0.92$, $p = .002$, $\eta_p^2 = .08$. Follow-up t -tests revealed there was no difference between pre-SBIS ($M = 35.89$, $SD = 23.62$) and post-SBIS ($M = 35.14$, $SD = 22.99$) in the Family Condition, $t(61) = 0.77$, $p = .438$, dependence-corrected $d = 0.02$. However, there was a significant difference between pre-SBIS and post-SBIS in the Peer Condition, $t(55) = 3.33$, $p = .002$, dependence-corrected $d = 0.13$. As predicted, in the Peer Condition only, participants reported worse state body image after the experimental manipulation ($M = 48.70$, $SD = 22.11$) than before the manipulation ($M = 43.46$, $SD = 21.06$). There was a significant difference in post-SBIS scores between conditions, $t(116) = 2.83$, $p = .005$, $d = 0.59$. The results revealed a significant main effect of time, $F(1, 116) = 4.89$, Wilks' $\Lambda = 0.96$, $p = .029$, $\eta_p^2 = .04$, and condition on SBIS, $F(1, 116) = 6.09$, $p = .015$, $\eta_p^2 = .05$, but they were qualified by the interaction.

4. Discussion

We hypothesized that young adult women who actively engaged with the image-based social media of attractive peers (upward social comparison targets) would have more negative body image than before doing so, whereas young adult women who engaged with the image-based social media of family (unlikely social comparison targets) would not. Results showed ASME with attractive peers' appearance-based social media resulted in worsened body image in young adult women, whereas interacting with that of family had no effect on state body image, supporting our hypothesis. Our findings align with the recommendation that body image media literacy programs should highlight social media use, especially pressures associated with viewing images of others (Holland & Tiggemann, 2016), and peers in particular. However, similar to other social media and body image research findings, our effect size was small, and possibly negligible in real-world terms. Thus, these results should not be overstated.

This study adds to literature showing young adult women's body image is negatively affected by viewing attractive women's photos on social media (Fardouly, Pinkus, & Vartanian, 2017; Haferkamp & Krämer, 2011; Kim & Park, 2016; Tamplin, McLean, & Paxton, 2018). It extends prior research by showing ASME with known, attractive female peers causes adverse effects on body image, but the same type of interaction with family does not have this effect. Our results were found across a racially heterogeneous sample. Allowing our participants to identify their own known contact may have allowed them to identify personal (e.g., racial) attractiveness concepts.

4.1. Limitations and future directions

Focusing on short-term effects limited our study. Our female-only sample was drawn from one university. Our results are not generalizable to all young adult women and cannot generalize to men. Despite effective randomization in terms of sociodemographic variables and BMI, participants in the Peer Condition unexpectedly had more negative baseline body image scores than those in the Family Condition. Therefore, a degree of response bias was inadvertently introduced. Cautious interpretation of our findings is warranted. Future work should investigate whether ASME with peers affects young men's body image and if certain individuals are more affected by ASME with peers.

4.2. Conclusions

This is the first study showing actively engaging with attractive peers' social media causes worsened body image in young adult

women. ASME with family not more attractive than oneself does not cause body image changes. It is common for young adult women to engage with peers' image-based social media; this study shows this activity can cause a small increase in negative state body image.

Author note

We thank Anastasia Buchvostov and Dina Nikseresht for their assistance with data collection and entry, and Dr. Rob Cribbie for his assistance with data analysis. This research was supported by a SSHRC Insight Grant awarded to the second author.

Appendix A. Acquaintance Condition Identification Instructions

Acquaintance

In order for us to understand different ways people use social media in various relationships, please write down the initials of a female acquaintance who:

- You consider more attractive than yourself
and
- Who has both Facebook and Instagram accounts
and
- Who is between 5 years younger or older than you. (This means she could even be your age.)

This person could be a classmate, a friend of a friend, or any other peer who is NOT a close friend or family member. Please make sure this acquaintance fits a), b), & c) above.

Your Acquaintance's Initials: _____

Your Relationship with this Acquaintance: _____

Appendix B. Family Condition Identification Instructions

Family

In order for us to understand different ways people use social media in various relationships, please write down the initials of a female family member who:

- You do NOT consider *more* attractive than yourself. (Pick someone whose appearance you don't compare to your own.)
and
- Who has both Facebook and Instagram accounts
and
- Who is at least 5 years older or younger than you.

This person could be your mother, an aunt, a sister (as long as she is at least 5 years older or younger than you), a cousin (as long as she is at least 5 years older or younger than you), a grandmother, or any other female family member who fits a), b) & c).

Your Family Member's Initials: _____

Your Relationship with this Family Member: _____

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