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Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways

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Abstract

This study examined the relationship between Instagram use (overall, as well as specifically viewing fitspiration images) and body image concerns and self-objectification among women between the ages of 18 and 25 from the United States ($n = 203$) and from Australia ($n = 73$). Furthermore, this study tested whether internalization of the societal beauty ideal, appearance comparison tendency in general, or appearance comparisons to specific target groups on Instagram mediated any relationships between Instagram use and the appearance-related variables. Greater overall Instagram use was associated with greater self-objectification, and that relationship was mediated both by internalization and by appearance comparisons to celebrities. More frequently viewing fitspiration images on Instagram was associated with greater body image concerns, and that relationship was mediated by internalization, appearance comparison tendency in general, and appearance comparisons to women in fitspiration images. Together, these results suggest that Instagram usage may negatively influence women's appearance-related concerns and beliefs.

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Social media has become an integral part of the lives of young people around the world (Australian Communications and Media Authority, 2014; Pew Research, 2015a), and researchers have recently become concerned with the potential negative impact of social media use. Previous research has found a link between Facebook usage and young women's self-objectification (i.e. viewing one's body as an object to be gazed upon; Fredrickson and Roberts, 1997) and body image concerns (Fardouly et al., 2015b; Fardouly and Vartanian, 2015; Meier and Gray, 2014; Tiggemann and Slater, 2013, 2014), which is concerning because both self-objectification and body dissatisfaction are important predictors of disordered eating and depression among young women (Paxton et al., 2006; Peat and Muehlenkamp, 2011; Stice, 2002; Tylka and Hill, 2004). There is very little research, however, examining the association between the use of other social media platforms and women's appearance concerns. Instagram is one of the most popular and fastest growing social media platforms (Smart Insights, 2016), with over 400 million monthly active users (Instagram, 2016). Instagram is particularly popular among young women (Pew Research, 2015a), who report spending around 30 minutes per day on the site (Tiggemann and Zaccardo, 2015). Given that Instagram's primary use is for posting and sharing images, researchers have suggested that Instagram may be more detrimental to women's appearance concerns than other social media platforms (such as Facebook) that contain more varied content (e.g. Fardouly and Vartanian, 2016; Holland and Tiggemann, 2016). Therefore, it is important to examine the association between Instagram usage and women's appearance-related concerns and beliefs.

Sociocultural models of body image suggest that media usage may lead to body dissatisfaction through two pathways: internalization of the societal beauty ideals and a tendency to compare one's appearance to the appearance of others (Thompson et al., 1999; Van den Berg et al., 2002). Internalization refers to the extent to which individuals endorse societally defined beauty ideals as personally meaningful beliefs and goals (Thompson and Stice, 2001). A key premise in this literature is that although most people are aware of societal standards of beauty, not everyone internalizes those standards to the same degree, and it is those who do internalize the societal standards who are at greatest risk of body dissatisfaction and eating disorders (Stice, 2002). Regarding the second pathway, social comparison theory suggests that people have an innate drive to compare themselves with others in order to determine their progress and standing on various aspects of their lives (which can include their physical attractiveness), and that these comparisons can be made with others deemed to be better off (upward comparisons) or worse off (downward comparisons) than oneself (Festinger, 1954). Although upward comparisons can lead to negative consequences (e.g. higher body dissatisfaction) and downward comparisons can lead to positive consequence (e.g. lower body dissatisfaction; Leahey and Crowther, 2008), research suggests that having a greater tendency to compare one's appearance to others in general (regardless of the direction of comparison) can also be associated with negative outcomes (Fardouly et al., 2015b; Halliwell and Harvey, 2006; Keery et al., 2004).

Consistent with sociocultural models, research on more traditional forms of media (e.g. magazines and television) has found that both internalization of the beauty ideal and appearance comparisons (in general) mediate the relationship between media

usage and women's body image concerns (Halliwell and Harvey, 2006; Keery et al., 2004). Furthermore, research on social media has showed that appearance comparison tendency plays a role in the relationship between Facebook usage and women's appearance concerns and self-objectification (Fardouly et al., 2015a, 2015b; Fardouly and Vartanian, 2015; Kim and Chock, 2015). Instagram may also influence body image and self-objectification through these two pathways. First, Instagram is an image-based social media platform, with over 80 million images uploaded to Instagram every day (Instagram, 2016), providing users with regular opportunities to compare their appearance to others. Second, because users often edit and enhance images through filters provided by Instagram (and other apps) before posting them on their profiles, the images on Instagram may promote the societal beauty ideals and also result in users judging themselves to be less attractive than people in the images on Instagram (i.e. upward comparisons), both of which contribute to greater body dissatisfaction and self-objectification (Myers and Crowther, 2009; Vandenbosch and Eggermont, 2012).

Unlike traditional media that primarily features images of models or celebrities, social media platforms, such as Instagram, often contain images of a variety of different comparison targets that vary in relational closeness to the user (e.g. friends, family, acquaintances, strangers, celebrities, or even themselves). Research shows that appearance comparisons to different target groups on Facebook are differentially associated with women's appearance concerns and self-objectification (Fardouly et al., 2015b; Fardouly and Vartanian, 2015). Women typically report comparing their appearance more often to images of their previous selves (known as temporal comparisons; Albert, 1977), friends, and acquaintances than to celebrities on Facebook (Fardouly et al., 2015b; Fardouly and Vartanian, 2015). Furthermore, appearance comparisons to peers on Facebook (but not comparisons to family, celebrities, or themselves) mediated the relationship between Facebook usage and women's body image concerns (Fardouly and Vartanian, 2015) and self-objectification (Fardouly et al., 2015b). It is perhaps not surprising that comparisons to peers featured prominently in the association between Facebook usage and body image concerns, given that Facebook is primarily used for interacting with peers (Hew, 2011). However, on platforms such as Instagram, it is much more common for people to follow and view images of celebrities and models (*The Telegraph*, 2016). Thus, comparisons to celebrities might be more prominent on Instagram than had been documented in previous research on Facebook.

Another unique feature of Instagram is the prominence of "fitspiration" images (the term fitspiration is a combination of the words fitness and inspiration), which are images designed to motivate people to exercise and eat healthily. Young women are the largest consumers of fitspiration images (Carrotte et al., 2015), and although these images may motivate people toward a healthier lifestyle (Tiggemann and Zaccardo, 2015), they are also largely appearance-focused and primarily contain women with thin and toned bodies (Boepple et al., 2016; Simpson and Mazzeo, 2017; Tiggemann and Zaccardo, 2016). These images can also be sexually objectifying, containing sexually objectifying phrases or poses (Boepple et al., 2016), or only containing specific body parts (e.g. only abs or legs; Tiggemann and Zaccardo, 2016). Women in fitspiration images largely match the current societal beauty ideals (i.e. thin and toned; Krane et al., 2001), which are

unattainable for most women, often resulting in upward appearance comparisons and greater body dissatisfaction (Myers and Crowther, 2009). Indeed, one experimental study found that exposure to fitspiration images taken from Instagram led to greater body dissatisfaction and negative mood among young women, and this relationship was mediated by how frequently women compared their appearance to others in those images during exposure (Tiggemann and Zaccardo, 2015). Thus, regularly viewing fitspiration images might also be associated with body dissatisfaction and self-objectification.

The present study

Previous research has shown a link between Facebook usage and women's body image concerns and self-objectification (e.g. Fardouly et al., 2015b; Fardouly and Vartanian, 2015; Mabe et al., 2014; Tiggemann and Slater, 2013), but very little work has been done relating Instagram use to these variables. Thus, the primary aim of this study was to determine whether Instagram usage was associated with young women's body image concerns (i.e. body dissatisfaction and drive for thinness) and self-objectification. We also tested whether internalization of the beauty ideal, appearance comparison tendency in general, and/or appearance comparisons to specific target groups on Instagram mediated any relationship between Instagram usage and women's body image concerns/self-objectification. Finally, we examined the relationship between viewing fitspiration images on Instagram and women's body image concerns and self-objectification and tested whether appearance comparisons to women in fitspiration images mediated any relationship. The study was conducted with young women because they are the largest users of Instagram (Pew Research, 2015b) and because body dissatisfaction is prevalent in this population (Neighbors and Sobal, 2007). In order to examine the generalizability of the findings, this study was conducted with young women (18- to 25-year-olds) from both Australia and the United States.

Method

Participants

Participants (N=276) were young women residing in the United States who were recruited through Amazon's Mechanical Turk (MTurk; n=203) and female undergraduate students at a large Australian University (n=73). The majority of undergraduate students in Australia are under the age of 25 (Australian Bureau of Statistics, 2013). Thus, to maintain consistency between the two samples (US and Australian), only 18- to 25-year-old women were eligible for the study. Participants from the combined sample had a mean age of 22.83 years (standard deviation [SD]=3.57) and their mean body mass index (BMI; kg/m^2) was 24.37 (SD=6.52). In the US sample, the majority of participants identified as Caucasian (n=145, 71.4%), 26 as African American (12.8%), 17 as Asian (8.4%), 12 as Hispanic American (5.9%), and 3 as American Indian (1.5%). In the Australian sample, 40 identified as Caucasian (54.8%), 20 as Asian (27.4%), 2 as Aboriginal/Pacific Islander (2.7%), and 11 identified as "Other ethnicities" (15.1%). All participants had an Instagram account.

Materials

Instagram usage. In keeping with research on other forms of social media (Fardouly et al., 2015b; Fardouly and Vartanian, 2015), two questions were used to assess participants' Instagram usage: "How often do you check Instagram (even if you are logged on all day)?" (1=*not at all*, 2=*every few days*, 3=*once a day*, 4=*every few hours*, 5=*every hour*, 6=*every 30 minutes*, 7=*every 10 minutes*, 8=*every 5 minutes*), and "Overall, how long do you spend on Instagram on a typical day?" (1=*5 minutes or less*, 2=*15 minutes*, 3=*30 minutes*, 4=*1 hour*, 5=*2 hours*, 6=*3 hours*, 7=*4 hours*, 8=*5 hours*, 9=*6 hours*, 10=*7 hours*, 11=*8 hours*, 12=*9 hours*, 13=*10 hours or more*). Because these indicators were highly correlated, $r=.64$, $p<.001$, responses on these two questions were standardized by creating z scores and then averaged to form a single measure of Instagram usage (range=−1.79 to 2.97).

Viewing fitspiration images on Instagram. Participants were asked to report how often they viewed fitspiration images on Instagram (1=*never*, 5=*every time I use Instagram*; range=1–5). Based on the content analysis by Tiggemann and Zaccardo (2016), fitspiration images were described as photos of fit people, people in the gym, photos of healthy foods, and inspirational quotes relating to fitness and diet.

Comparisons to specific target groups/images on Instagram. Similar to measures used in previous research (Fardouly et al., 2015b; Fardouly and Vartanian, 2015), participants reported on the frequency with which they compare their appearance to specific female target groups on Instagram. In each case, participants were instructed that the question "refers to people of the same sex as you." Participants were asked on a 5-point scale, "When looking at photos of the following people on Instagram, how often do you compare your appearance to theirs?" (1=*never*, 5=*very often*). The target groups included *family*, *friends*, *acquaintances* (i.e. people that they do not know personally but know of), *strangers*, *celebrities* (i.e. models, actors, athletes, comedians), and *themselves* (i.e. "photographs of yourself on Instagram"). On the same 5-point scale, participants were also asked to report how often they compare their appearance to other females in *fitspiration*-type images on Instagram. Scores on each of the target-comparison items were positively correlated with scores on the measure of appearance comparison tendency described below (see Table 2), providing support for the validity of these target-comparison items.

Internalization of the beauty ideal. The Internalization-General subscale of the Sociocultural Attitudes Towards Appearance Questionnaire–3 (SATAQ-3; Thompson et al., 2004) was used to measure the extent to which participants have internalized the beauty ideal portrayed within their society. Participants rated the extent to which they agreed (1=*definitely disagree*, 5=*definitely agree*) with statements regarding their desire to look like people in the media (e.g. "I would like my body to look like the models who appear in magazines") and the extent to which they compare their body to people in the media (e.g. "I compare my body to the bodies of people who are on TV"). The nine items were summed, with higher scores indicating a greater internalization of the beauty ideal ($\alpha=.95$; range=9–45).

General appearance comparison tendency. The Upward and Downward Appearance Comparison Scale (O'Brien et al., 2009) was used to measure participants' general tendency to compare their appearance to others. Participants reported on their tendency to compare their appearance to others whom they perceive to be better looking (e.g. "When I see good-looking people I wonder how I compare to them") or worse looking (e.g. "I compare myself to people less good looking than me") than themselves. The 18 items are rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Items were averaged, with higher scores reflecting a greater tendency to compare one's appearance to others, regardless of direction ($\alpha = .95$; range $= 1–5$).

Body image concerns. Two subscales of the Eating Disorder Inventory (EDI; Garner et al., 1983) were used to assess participants' concerns with body weight and shape: the Body Dissatisfaction subscale (BD; nine items, for example, "I think my stomach is too big") and the Drive for Thinness subscale (DFT; seven items, for example, "I am terrified of gaining weight"). Following the suggestion of Schoemaker et al. (1994) for non-clinical samples, all items were rated on a 6-point scale (1 = *never*, 6 = *always*). Items for each subscale were averaged (after reverse-coding relevant items), with higher scores indicating greater body dissatisfaction/drive for thinness. Internal consistency reliability was high for both subscales (αs $= .90$; range $= 1–6$).

Self-objectification. The Self-Objectification Questionnaire (SOQ; Noll and Fredrickson, 1998) was used to measure the extent to which participants view their body in terms of its appearance (objectified) or competence (non-objectified). Participants were asked to rank how important 10 attributes are to their physical self-concept, from 1 (*most important*) to 10 (*least important*). Half the attributes were appearance related (weight, sex appeal, firm/sculpted muscles, physical attractiveness, measurements) and the other half were competency related (physical coordination, health, strength, physical fitness, energy level). The sum of the competency items was subtracted from the sum of the appearance items to obtain a total score (ranging from −25 to +25), with higher scores indicating greater self-objectification. The SOQ has good construct validity (Noll and Fredrickson, 1998).

Procedure

Participants signed up for an online study on social media use. Only females between the ages of 18 and 25 who had an Instagram account were eligible for the study. After providing informed consent, participants completed the online survey, which included the aforementioned measures as well as filler questionnaires related to the self that were not part of the current investigation. The questions on Instagram usage were presented first, and the remaining questionnaires were then presented in a random order. Participants were also asked to report their age, ethnicity, and height and weight (used to calculate BMI). Data checks were placed throughout the questionnaire to ensure that participants paid attention to the questions and that their responses were valid. Participants were debriefed online. This study was approved by the university's ethics committee.

Results

Preliminary analyses

Because participants were recruited from two different sources, we first compared MTurk participants to student participants on each of the variables using independent-samples *t* tests (see Table 1). Compared to student participants, MTurk participants were older; had a higher BMI; checked their Instagram accounts less frequently; were less likely to view fitspiration images on Instagram; were less likely to compare themselves to celebrities, acquaintances, and fitspiration images on Instagram; and were less dissatisfied with their bodies. Despite these between-sample differences, moderated mediation analyses indicated that the pattern of associations described below did not vary as a function of the sample. Thus, all the analyses reported below are based on the combined sample.

Instagram usage

Participants reported checking their Instagram account between "once a day" and "once every few hours" ($M=3.65$, $SD=1.25$, range$=1–7$) and reported spending approximately "30 minutes" per day on Instagram ($M=3.16$, $SD=1.84$, range$=1–11$). The combined Instagram usage measure was positively correlated with self-objectification, but not with body dissatisfaction or drive for thinness (see Table 2).

Table 1. Mean (*SD*) ratings for MTurk participants and student participants.

	MTurk	Student	*p*-value	Cohen's *d*
Age	24.26 (2.99)	18.85 (1.29)	<.001	2.13
BMI	25.33 (7.08)	21.64 (3.35)	<.001	0.61
Check Instagram	3.53 (1.06)	3.84 (1.34)	.05	−0.27
Daily Instagram use	3.26 (1.88)	2.88 (1.71)	.13	0.21
Compare—family	2.01 (1.07)	2.10 (1.04)	.58	−0.08
Compare—friends	3.01 (1.18)	3.30 (1.04)	.07	−0.25
Compare—celebrities	2.82 (1.25)	3.41 (1.13)	<.001	−0.48
Compare—acquaintances	2.48 (1.16)	2.86 (1.27)	.02	−0.32
Compare—strangers	2.25 (1.12)	2.38 (1.10)	.38	−0.12
Compare—self	2.59 (1.37)	2.42 (1.25)	.36	0.13
View fitspiration images	2.62 (1.04)	2.89 (1.30)	.03	0.23
Compare—fitspiration	2.98 (1.27)	3.34 (1.22)	.03	−0.29
Internalization	27.76 (10.59)	28.75 (8.18)	.41	−0.10
Comparison tendency	3.01 (0.91)	3.18 (0.71)	.10	−0.20
Body dissatisfaction	3.33 (1.23)	3.70 (1.05)	.02	−0.31
Drive for thinness	3.18 (1.31)	3.23 (1.30)	.76	−0.04
Self-objectification	−2.61 (13.64)	−5.67 (12.15)	.10	0.23

SD: standard deviation; MTurk: Amazon's Mechanical Turk; BMI: body mass index.

Table 2. Correlations among all study variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Instagram use	—												
2. Fitspiration view	.19**	—											
3. Internalization	.22***	.22***	—										
4. Comparison tendency	.06	.17**	.69***	—									
Comparison target													
5. Family	.04	.15*	.21***	.31***	—								
6. Friend	.06	.07	.45***	.55***	.51***	—							
7. Acquaintance	.19**	.12	.42***	.48***	.25***	.53***	—						
8. Stranger	.20**	.14*	.39***	.35***	.19**	.37***	.64***	—					
9. Celebrity	.22***	.14*	.59***	.53***	.18**	.52***	.51***	.43***	—				
10. Themselves	.01	.09	.21**	.29***	.27***	.36***	.27***	.23***	.25***	—			
11. Comparison to fitspiration images	.11	.50***	.44***	.43***	.25***	.42***	.33***	.30***	.44***	.25***	—		
12. Body dissatisfaction	-.02	.19**	.47***	.45***	.13*	.25***	.18**	.18**	.30***	.14*	.25***	—	
13. Drive for thinness	.10	.23***	.61***	.54***	.16**	.34***	.26***	.25***	.39***	.14*	.35***	.71***	—
14. Self-objectification	.28***	.06	.52***	.42***	.11	.33***	.23***	.20**	.34***	.08	.18**	.30***	.42***

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Mean (*SD*) ratings of the frequency of appearance comparisons to specific target groups on Instagram.

	Family	Friends	Acquaintances	Strangers	Celebrities	Themselves
Comparison frequencies	2.65 (1.48)[d]	3.97 (1.39)[a]	3.34 (1.55)[b]	2.97 (1.51)[c,d]	3.81 (1.52)[a]	3.23 (1.73)[b,c]

SD: standard deviation.
Comparison frequency ratings ranged from 1 = *never* to 5 = *very often*. Means within a row with different superscripts are significantly different at *p* < .05.

Internalization and appearance comparison tendency as potential mediators. Overall, Instagram usage was positively correlated with internalization of the beauty ideal but not with appearance comparison tendency (see Table 2). Because internalization of the beauty ideal was also correlated with self-objectification, we tested internalization as a mediator of the association between Instagram usage and self-objectification. The mediation analysis was conducted using the PROCESS macro (Hayes, 2013), which uses a non-parametric bootstrapping procedure involving resampling and replacement (in this case, 5000 resamples) to generate an approximation of the sampling distribution for the indirect effect. The indirect path is considered significant when the confidence interval does not include zero. In this case, the indirect path from Instagram usage to self-objectification through internalization of the beauty ideal was significant (point estimate = 1.46, *SE* = 0.48, 95% confidence interval [CI] = [0.58, 2.44], completely standardized indirect effect [CSIE] = 0.10).

Comparison to specific targets as potential mediators. We next examined comparisons to specific target groups on Instagram. A repeated-measures analysis of variance (ANOVA) showed that the frequency of appearance comparison varied as a function of the specific target group, $F(5, 1375) = 45.60$, $p < .001$. As seen in Table 3, participants reported comparing their appearance most often to *friends* and *celebrities*, then to *acquaintances* and *themselves*, and least often to *strangers* and *family members* on Instagram. However, of the specific targets of comparison, only comparisons to *celebrities*, *acquaintances*, and *strangers* were correlated with both overall Instagram usage and self-objectification (Table 2), and thus, only those target groups were included in the multiple mediation analysis. When all three comparison targets were entered simultaneously as potential mediators in a multiple mediation analysis, comparisons to *celebrities* emerged as a significant mediator of the association between Instagram usage and self-objectification (point estimate = 0.74, standard error [*SE*] = 0.32, 95% CI = [0.30, 1.64], CSIE = .05), but comparisons to *acquaintances* (point estimate = 0.15, *SE* = 0.19, 95% CI = [−0.15, 0.65], CSIE = .01) and comparisons to *strangers* (point estimate = 0.02, *SE* = 0.21, 95% CI = [−0.42, 0.46], CSIE = .002) did not.

Fitspiration images

On average, participants reported that they "rarely" to "sometimes" viewed fitspiration images on Instagram (*M* = 2.69, *SD* = 1.12, range = 1–5). In contrast to overall Instagram usage, viewing fitspiration images on Instagram was positively correlated with body

dissatisfaction and drive for thinness, but was not correlated with self-objectification (see Table 2).

Internalization and appearance comparison tendency as potential mediators. Frequency of viewing fitspiration images was positively correlated with both internalization of the beauty ideal and appearance comparison tendency (see Table 2). Furthermore, internalization and appearance comparison tendency were positively correlated with body dissatisfaction and drive for thinness. Multiple mediation analysis indicated that both internalization (point estimate=0.06, SE=0.03, 95% CI=[0.02, 0.13], CSIE=.06) and appearance comparison tendency (point estimate=0.04, SE=0.02, 95% CI=[0.01, 0.10], CSIE=.04) mediated the association between viewing fitspiration images and body dissatisfaction, and there was no difference in the strength of those indirect effects (contrast 95% CI=[−0.04, 0.09]). The same pattern was observed for drive for thinness: both internalization (point estimate=0.11, SE=0.04, 95% CI=[0.04, 0.19], CSIE=.10) and appearance comparison tendency (point estimate=0.04, SE=0.02, 95% CI=[0.1, 0.09], CSIE=.04) mediated the association between viewing fitspiration images and drive for thinness; however, the contrast analysis indicated that internalization of the beauty ideal was the stronger mediator (contrast 95% CI=[0.01, 0.15]).[1]

Comparison to fitspiration images as a potential mediator. Frequency of comparison to fitspiration images was positively correlated with frequency of viewing fitspiration images and with both body dissatisfaction and drive for thinness. Furthermore, frequency of comparison to fitspiration images was a significant mediator of the association between frequency of viewing fitspiration images and body dissatisfaction (point estimate=0.11, SE=0.04, 95% CI=[0.03, 0.20], CSIE=.10) and between frequency of viewing fitspiration images and drive for thinness (point estimate=0.19, SE=0.04, 95% CI=[0.10, 0.28], CSIE=.16).

Discussion

This study aimed to examine the relationship between Instagram usage and young women's body image concerns and self-objectification. Overall Instagram usage was positively correlated with self-objectification, which is consistent with other research showing that Facebook usage is associated with self-objectification (Fardouly et al., 2015b). Instagram is an image-based social media platform and users often post images of themselves and others on their profiles, which frequently receive appearance-related comments from others. In these ways, Instagram could be described as an appearance-focused media platform. Thus, spending more time on Instagram may be associated with higher self-objectification because of the salience of physical appearance (Fredrickson and Roberts, 1997). In contrast to research on other social media platforms (e.g. Facebook; Fardouly and Vartanian, 2015; Mabe et al., 2014; Tiggemann and Slater, 2013, 2014), Instagram usage in general was not associated with young women's body dissatisfaction or drive for thinness. One possible explanation for this discrepancy might be that women view more images of celebrities on Instagram than they do on Facebook. If women judge the appearance of celebrities to be less personally attainable than they

judge the appearance of their peers (e.g. because they know that the celebrity's images are often airbrushed or distorted), viewing images of celebrities may be less influential on body image than viewing images of peers. Thus, although viewing images of celebrities may heighten the salience of appearance (and thus, self-objectification), the recognition that these images are modified and thus unrealistic might mitigate the impact on body image concerns. Of course, this explanation is mere speculation and would need to be tested in future research.

In addition to examining the overall association between Instagram usage and appearance-related variables, we also examined potential mediators of those associations. At a trait level, we found that internalization of the beauty ideal mediated the association between Instagram usage and self-objectification. Images posted on Instagram can be carefully selected, edited, and enhanced and may contain idealized representations of women's physical appearance. Thus, viewing images on Instagram might enhance the salience of the societal beauty ideal ultimately, thereby increasing the extent to which women internalize that beauty ideal (Morry and Staska, 2001; Vandenbosch and Eggermont, 2012).

We also examined the relevance of appearance comparisons to specific target groups on Instagram. Participants reported comparing their appearance most frequently to both friends and celebrities, but only comparisons to celebrities on Instagram mediated the relationship between Instagram usage and self-objectification. These results differ from those found in studies of Facebook usage, in which appearance comparisons to friends and distant peers were more frequent than comparisons to celebrities, and appearance comparisons to friends and peers (but not celebrities) mediated the relationship between Facebook usage and self-objectification (Fardouly et al., 2015b). Celebrities are important appearance comparison targets on Instagram, perhaps because users follow and view more images of celebrities on this social media platform. In addition, celebrities may be more important appearance comparison targets on Instagram because Instagram only allows users to post, view, and comment on images or videos on the site, whereas Facebook might provide more of a social environment in which people can interact with peers (Hew, 2011). For example, unlike Instagram, Facebook allows users to create/organize events with friends and to create particular groups of people with whom users can share information with (rather than all their followers).

Finally, we examined participants' tendency to view fitspiration images on Instagram and found that viewing more fitspiration images was associated with higher body dissatisfaction and a greater drive for thinness among young women, but was not associated with self-objectification. One reason why fitspiration images might not have been associated with self-objectification is that fitspiration images emphasize not only appearance but also fitness and strength, and those two features might cancel each other out with respect to participants' self-objectification. Furthermore, internalization of the beauty ideal, appearance comparison tendency in general (particularly a tendency to make upward comparisons), and appearance comparisons to women in fitspiration images on Instagram mediated the relationship between viewing fitspiration images on Instagram and women's body image concerns (both body dissatisfaction and drive for thinness). These results add to those of experimental research in the area, which found that exposure to fitspiration images leads to greater body dissatisfaction and negative mood among

women and that appearance comparisons to women in those images mediated the effect (Tiggemann and Zaccardo, 2015). Together, these findings suggest that although fitspiration images may aim to motivate people toward a healthier lifestyle (Tiggemann and Zaccardo, 2015), viewing fitspiration images on Instagram may negatively impact women's body image concerns.

Limitations and future directions

There are several strengths and limitations to this study that should be noted. This study was conducted on samples of young women from both Australia and the United States, showing that the results are generalizable to women residing in different Western countries. However, research suggests that men too may be influenced by social media usage (Holland and Tiggemann, 2016) and that Instagram may be particularly popular among adolescents (Pew Research, 2015a). Therefore, future research could examine the association between Instagram usage and appearance-related concerns and beliefs among a younger and more varied sample.

Given that this is a correlational study, experimental research is needed to determine the direction of the relationship between Instagram usage and self-objectification among young women. Furthermore, the relationship between Instagram usage and self-objectification may be bidirectional, in that women who have higher levels of self-objectification may choose to spend more time on Instagram, which may in turn increase their levels of self-objectification. In addition, the relationship between viewing fitspiration images and women's body image concerns may also be bidirectional, in that women high in body image concerns may choose to view more fitspiration images on Instagram, which may then increase their concerns with their body. Longitudinal research would help determine the direction of these relationships over time.

The results of this study also highlight the need for future research to further explore differences across social media platforms. There were several differences noted between the present results for Instagram usage and those found in previous research on Facebook in terms of both the most relevant targets of appearance comparison and the body-related variables associated with social media use. Given the wide array of different social media platforms, it would be worth identifying the similarities and differences among them in terms of their association with body image. This study also noted differences between overall Instagram use and viewing fitspiration images on Instagram. Previous research also suggests that different activities on social media (e.g. viewing images of friends or posting images) may be more strongly associated with body image concerns than others (e.g. Meier and Gray, 2014). Thus, future research should also continue to examine the importance of different activities on social media to appearance-related concerns and beliefs.

Implications and conclusions

Overall, this study found that Instagram usage was positively associated with self-objectification among young women and that this relationship was mediated by internalization of the societal beauty ideal and appearance comparisons to celebrities on Instagram. Furthermore, viewing more fitspiration images on Instagram was associated with greater

body image concerns among women, and internalization of the beauty ideal, appearance comparison tendency in general, and appearance comparisons to women in fitspiration images on Instagram mediated this relationship. Together, the results of this study suggest that Instagram usage may negatively influence women's appearance-related concerns and beliefs, particularly if they have internalized the beauty ideal and if they make appearance comparisons to others on Instagram. Given that female Instagram users report spending around 30 minutes per day on the site (Tiggemann and Zaccardo, 2015) and given that Instagram usage is growing in popularity among female adolescents (Pew Research, 2015a), it is important to examine ways to reduce any negative effect of this image-based social media platform. Media literacy programs (McLean et al., 2016) are needed to educate young people about the idealized (and often edited) nature of images posted on social media. In addition, based on the results of this study, Instagram users could be encouraged to not follow or view images of celebrities or fitspiration images on Instagram and to follow more Instagram accounts that post nonappearance-related images (e.g. images of landscapes or animals that do not include people) to reduce the appearance focus of their Instagram newsfeed.

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Note

1. Based on the query of an anonymous reviewer, we examined these mediation analyses separately for upward and downward comparison tendencies. Those post hoc analyses indicated that the indirect path was significant for upward comparisons (body dissatisfaction: point estimate $= 0.11$, standard error $[SE] = 0.03$, 95% confidence interval $[CI] = [0.06, 0.19]$, completely standardized indirect effect $[CSIE] = .11$; drive for thinness: point estimate $= 0.15$, $SE = 0.04$, 95% $CI = [0.07, 0.23]$, $CSIE = .13$), but not for downward comparisons (body dissatisfaction: point estimate $= 0.001$, $SE = 0.01$, 95% $CI = [-0.01, 0.02]$, $CSIE = .001$; drive for thinness: point estimate $= 0.001$, $SE = 0.04$, 95% $CI = [-0.01, 0.02]$, $CSIE = .001$).

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