



“Exercise to be fit, not skinny”: The effect of fitspiration imagery on women’s body image



Marika Tiggemann*, Mia Zaccardo

School of Psychology, Flinders University, Adelaide, Australia

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ABSTRACT

Fitspiration is an online trend designed to inspire viewers towards a healthier lifestyle by promoting exercise and healthy food. The present study aimed to experimentally investigate the impact of fitspiration images on women's body image. Participants were 130 female undergraduate students who were randomly assigned to view either a set of Instagram fitspiration images or a control set of travel images presented on an iPad. Results showed that acute exposure to fitspiration images led to increased negative mood and body dissatisfaction and decreased state appearance self-esteem relative to travel images. Importantly, regression analyses showed that the effects of image type were mediated by state appearance comparison. Thus it was concluded that fitspiration can have negative unintended consequences for body image. The results offer support to general sociocultural models of media effects on body image, and extend these to “new” media.

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Introduction

An extensive research literature has documented widespread body dissatisfaction among women, particularly with body shape and weight. This body dissatisfaction is generally attributed to sociocultural factors, with the mass media considered the most powerful and pervasive force (e.g., Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Tiggemann, 2011). Indeed, the link between media exposure and body dissatisfaction has been supported by extensive correlational (for meta-analyses, see Grabe, Ward, & Hyde, 2008; Levine & Murnen, 2009) and experimental evidence (for meta-analyses, see Grabe et al., 2008; Groesz, Levine, & Murnen, 2002; Want, 2009). Across the studies there is a reliable small-to-moderate negative effect of thin-ideal fashion magazine or television images on body satisfaction, particularly for those women who already have significant body concerns. More recent correlational research has established a similar link between time spent on the Internet and body dissatisfaction in adult and adolescent women (Bair, Kelly, Serdar, & Mazzeo, 2012; Tiggemann & Miller, 2010; Tiggemann & Slater, 2013, 2014). As yet, however,

there has been little experimental research on the effect of newer media formats on body image (Perloff, 2014).

Social Networking Sites and Body Image

One particular form of Internet media use that has increased markedly in popularity are social networking sites, such as Facebook, Twitter and Myspace. These allow users to create public or semi-public personal profiles, to share photos and information, and to interact easily with ‘friends’ in their networks. Recent Australian statistics suggest that approximately 69% of adults use social networking sites, with 46% doing so at least daily (Sensis, 2014). A small but growing number of correlational studies have investigated the use of Facebook in particular and demonstrated links with internalization of the thin ideal and body dissatisfaction (Fardouly & Vartanian, 2015; Mabe, Forney, & Keel, 2014; Meier & Gray, 2014; Tiggemann & Miller, 2010; Tiggemann & Slater, 2013).

In a more detailed examination of the components of Facebook, Meier and Gray (2014) determined that it was not the total time spent on Facebook, but instead the amount of time spent engaging in Facebook “photo activity” (e.g., posting photos, viewing friends’ photos), that was related to body image concerns. Similarly, Mabe et al. (2014) found that placing greater importance on receiving comments on their photos and more frequent untagging of photos of themselves was associated with disturbed body image. Thus image-based social media platforms may have stronger associations than Facebook with women’s body image concerns.

* Corresponding author at: School of Psychology, Flinders University, GPO Box 2100, Adelaide, South Australia 5001, Australia. Tel.: +61 8 8201 2482; fax: +61 8 8201 3877.

E-mail address: Marika.Tiggemann@flinders.edu.au (M. Tiggemann).

The present study sought to use Instagram as the medium. Instagram is one of the most popular social networking platforms, with currently 4 million active Australian users (Murton, 2015). The site is unique in that it is purely dedicated to the posting and sharing of photos, either with friends (on a private profile) or the wider public (on a public profile). Users can post their own personally created images, as well as share other users' images, so that they appear on their profile. The website also allows users to "tag" their images with identifying words, making it easy to search for themed content.

The Role of Social Comparison

The negative effects of media exposure have generally been attributed to the process of social comparison (Levine & Murnen, 2009; Want, 2009). Social comparison theory (Festinger, 1954) argues that women evaluate their own appearance by comparing themselves with the cultural ideals of beauty and thinness presented in the media. Almost invariably this will be an upward comparison by which women fall short, resulting in dissatisfaction with their own appearance and body (Strahan, Wilson, Cressman, & Buote, 2006; Want, 2009). This reasoning is supported by experimental evidence that the observed negative effect of media exposure on body dissatisfaction is at least partially mediated by engaging in social comparison while viewing thin ideal images (Bessenoff, 2006; Tiggemann & McGill, 2004; Tiggemann, Polivy, & Hargreaves, 2009; Tiggemann & Polivy, 2010).

Social comparison can also be conceptualized as a trait. There exist relatively stable individual differences in the general tendency to engage in social comparison. This has been found to be a strong predictor of body dissatisfaction in its own right (for a meta-analysis, see Myers & Crowther, 2009), as well as a moderator of the effect of thin-ideal images on body-focused anxiety in an experimental study (Dittmar & Howard, 2004).

There are a number of reasons that social comparison may be particularly pertinent to social networking sites. First, the speed and ease with which individuals can connect to their peers gives rise to the opportunity for ready and multiple comparisons (Tiggemann & Miller, 2010). Further, these comparisons are likely to be made with at least somewhat idealized images, in that users generally post only photographs in which they look good or are doing something 'cool', and even these can be digitally altered (Krämer & Winter, 2008). Instagram, for example, offers the selection of a number of possible filters to enhance the appearance of the photo. Second, according to social comparison theory (Festinger, 1954), the drive for self-evaluation causes people to seek out comparisons with others who are similar rather than dissimilar to themselves. Thus peers provide more important appearance-comparison targets than models or celebrities (Heinberg & Thompson, 1995). In support, Cash, Cash, and Butters (1983) found that women exposed to photos of attractive peers had lower self-ratings of attractiveness than women exposed to the same photos presented as professional models. Third, social networking sites like Facebook and Instagram allow users to "like" and make comments on the photos. Thus social networking sites may provide a pervasive and intense form of "appearance conversations" that have been shown to be associated with poorer body image (Clark & Tiggemann, 2006; Jones, Vigfusdottir, & Lee, 2004).

A few correlational studies have explicitly examined social comparison and Facebook use. For example, Meier and Gray (2014) found that Facebook users scored higher on trait appearance comparison than non-users. Further, Fardouly and Vartanian (2015) showed that trait appearance comparison mediated the relationship between frequency of Facebook use and body image concerns.

Fitspiration

A recent trend offered by the Internet is "fitspiration". Fitspiration (the amalgamation of the words *fitness* and *inspiration*) consists of images that are, as described by one website, designed to motivate people to exercise and pursue a healthier lifestyle (Abena, 2013). Thus fitspiration has been put forward as a healthy antidote to another Internet-based trend known as "thinspiration" (amalgamation of *thin* and *inspiration*). Thinspiration consists of images of emaciated women and accompanying text designed to inspire viewers to lose weight and promote an eating disorder lifestyle (Borzekowski, Schenk, Wilson, & Peebles, 2010; Ghaznavi & Taylor, 2015). Exposure to such material has been found to be damaging to body image in correlational (Harper, Sperry, & Thompson, 2008) and experimental studies (Bardone-Cone & Cass, 2007), but fortunately is largely limited to a small number of pro-eating disorder websites.

In contrast, fitspiration is designed to inspire people to achieve an empowered body image through exercise and healthy eating ("What is Fitspiration", 2013). It is widely promulgated on a range of websites, most notably the social networking site of Instagram. To illustrate, a search of the "fitspiration" hashtag on Instagram returned over 3.3 million images. Further, when a user posts a picture to Instagram, it also appears on all of their friends' feeds. In addition, as many people link their Instagram accounts with their Facebook accounts, any content posted on Instagram is automatically also posted to Facebook. Thus, while users can actively seek out or 'follow' fitspiration imagery on Instagram by searching the "fitspiration" hashtag, they are also likely to experience some inadvertent exposure.

A perusal of Instagram images tagged with the "fitspiration" hashtag indicates that photos are mainly of women, typically engaging in exercise or dressed in exercise gear, or of healthy food. Sometimes these are overlain with inspirational quotes, either general in nature (e.g., "We don't grow when things are easy; we grow when we face challenges") or fitness-related (e.g., "Exercise to be fit, not skinny"). Overall health and well-being are strongly endorsed through the promotion of healthy eating, exercise and self-care. The general philosophy is one which emphasises strength and empowerment. For example, a common slogan amongst fitspiration advocates is "Strong is the new skinny". Thus fitspiration has the potential for considerable positive social influence on physical and mental health.

However, there are several aspects of fitspiration which may raise some concern. First, the great majority of women in the images exhibit one particular body shape: a relatively thin and toned figure. While this figure is less thin and more muscular than that of the models typically found in fashion magazines, it is still unattainable for most women (Krane, Stiles-Shipley, Waldron, & Michalenok, 2001). Further, the repeated promotion of only this one body shape carries the implication that only thin and toned bodies can be fit and healthy. In addition, the images are of everyday women rather than fashion models, and hence likely to give rise to greater social comparison. Second, many of fitspiration's attempts to inspire women towards health and fitness focus on the appearance-related benefits of such a lifestyle. Example quotations include "Do it for looking in the mirror and feeling good about what you see" and "Suck it up now and you won't have to suck it in later". Research has demonstrated that exercise motivated by appearance reasons rather than health or enjoyment is associated with negative body image (e.g., Strelan, Mehaffey, & Tiggemann, 2003). Third, a number of the images have objectifying features, such as particular poses or a focus on particular body parts (e.g., washboard abs). Exposure to objectified images has been associated with self-objectification and body dissatisfaction (Fredrickson & Roberts, 1997; Harper & Tiggemann, 2008). Indeed, the medium of Instagram might be seen

as inherently self-objectifying, in that users post photos, often of themselves, explicitly for viewing by others.

The Present Study

Thus the overall aim of the present study was to investigate the effect of exposure to fitspiration images on women's body image from within a social comparison framework. While fitspiration is designed to have an inspirational and positive effect on intentions to exercise and to eat healthily, we postulated that it may have a negative effect on body image. Specifically, we predicted that exposure to fitspiration images would result in greater body dissatisfaction and lower state appearance self-esteem than exposure to a set of control images. Travel images were chosen as the control, as they are also a common form of content on Instagram and largely inspirational in nature. The effect was predicted to be mediated by amount of (state) appearance comparison processing engaged in. The effect was also predicted to be greater for individuals high on general (trait) appearance comparison tendency.

Method

Participants

Participants were 130 female undergraduate students at Flinders University in South Australia. They were aged between 17 and 30 years, with a mean age of 19.91 years ($SD = 2.80$).

Design

The experiment employed a between-subjects design with two levels of the independent variable of image type (fitspiration, travel). The major dependent variables were negative mood and body dissatisfaction (after controlling for baseline scores), state appearance self-esteem, and state appearance comparison. The latter was tested as a mediating variable. Trait tendency for appearance comparison was also tested as a potential moderating variable.

Materials

Experimental manipulation: Image type. Two sets of stimulus materials were constructed for the study, each containing 18 Instagram images. The fitspiration image set contained 16 fitspiration pictures containing women (posing in fitness clothing or engaging in exercise) plus two travel-related images (to make sense of subsequent travel-related questions). The travel image set contained 18 pictures of various travel destinations, and included natural landscapes, monuments, and buildings. Of these, 11 also contained people (to justify subsequent social comparison questions). General inspirational quotations (e.g., "If your dreams don't scare you, they aren't big enough") were overlain on four images of each set. Images were presented on an Apple iPad via a slideshow on the Photos application and were 14.5 cm $\times$ 14.5 cm in size.

All images were sourced from public Instagram profiles: the fitspiration images from the "fitspiration" hashtag and the travel images from the "travel" hashtag. The specific images were selected from an initial pool of 40 fitspiration and 40 travel images to provide a reasonable coverage of currently disseminated images in the designated categories. These were rated by a small panel of three women from the target age range for 'quality' and 'visual appeal' of the photograph on 5-point Likert scales (1 = *very poor*, 5 = *excellent*). The final sets of images were well-matched on both perceived quality (fitspiration $M = 3.11$, $SD = 0.65$; travel $M = 3.33$, $SD = 0.64$), $t(34) = 1.05$, $p = .302$, and visual appeal (fitspiration $M = 3.15$, $SD = 0.57$; travel $M = 3.07$, $SD = 0.72$), $t(34) = 0.34$,

$p = .735$. The four quotations were also sourced from existing fitspiration images on Instagram.

Social networking use. Participants were asked general questions about their use of social networking sites. More specifically, they were asked whether or not they had an Instagram and/or Facebook account, how much time they spend there per day (*less than 10 min*, *10–30 min*, *31–60 min*, *over 1 h*), and whether or not they see Instagram images on other social networking sites. Participants also indicated how much importance they placed on the quality of the photograph (e.g., blurriness, composition) when posted by others and by themselves on two 7-point Likert scales (1 = *not important at all*, 7 = *extremely important*).

Mood and body dissatisfaction. Following Heinberg and Thompson (1995), visual analogue scales (VAS) were used to measure mood and body dissatisfaction before and after viewing the Instagram images. Each scale consisted of a 95-mm horizontal line, with endpoints labelled *none* and *very much*. Participants were instructed to indicate how they felt "right now" by placing a small mark on the line, which was subsequently measured to the nearest millimetre. There were eight VAS. The first was 'inspiration' (the avowed aim of fitspiration imagery), followed by five mood dimensions ('anxiety', 'depression', 'happiness', 'anger', and 'confidence') and two body dissatisfaction dimensions ('weight dissatisfaction' and 'appearance dissatisfaction'). An overall score for (negative) mood was calculated by averaging the five mood items (positive mood items reverse coded), and for body dissatisfaction by averaging the weight and appearance dissatisfaction measures. Such VAS carry the advantage that they can be completed quickly, are difficult to recall and are sensitive to small changes. They have also been shown to correlate with longer and more complex measures of mood and body image disturbance (Heinberg & Thompson, 1995). In the current study, internal reliability for both mood ($\alpha = .75$) and body dissatisfaction ($\alpha = .86$) were acceptable.

State self-esteem. State self-esteem was measured by the State Self-Esteem Scale (SSES) of Heatheron and Polivy (1991). The SSES was designed to be sensitive to short-lived changes in self-esteem and contains three subscales addressing different facets of self-esteem: performance, social, and appearance (of most interest here). Participants are asked to indicate how true each of twenty different statements is of them 'right now' on a 5-point scale (1 = *not at all*, 5 = *extremely*). The items for each subscale are averaged (negative items reverse coded) to produce a score ranging from 1 to 5, with higher scores indicating greater state self-esteem. The SSES (and its subscales) have been demonstrated to be sensitive to experimental manipulations of self-esteem, and to have a high level of internal consistency, as well as discriminant and construct validity (Heatheron & Polivy, 1991). In the present sample, all subscales had good internal reliability (Performance, $\alpha = .82$; Social, $\alpha = .85$; Appearance, $\alpha = .87$).

Inspirational goals. As fitspiration images are designed to have inspirational effects on health and well-being, three items were constructed to assess the potentially motivational effect of the images. Participants were asked to use 7-point Likert scales to rate how inspired they felt when viewing the images (1 = *not at all inspired*, 7 = *very inspired*) to improve their fitness, to eat healthily, and to go travelling. These items also served as a manipulation check, in that fitspiration images should inspire people to improve their fitness and eating, and travel images to go travelling.

State appearance comparison. The amount of appearance comparison processing participants engaged was assessed by Tiggemann and McGill's (2004) State Appearance Comparison Scale. The scale asks participants to use three 7-point Likert scales to rate the extent to which they thought about their appearance when viewing the Instagram images (1 = *no thought about appearance*, 7 = *a lot of thought*), and the extent to which they compared their overall appearance and specific body parts with those of the

people they saw in the images they viewed (1 = *no comparison*, 7 = *a lot of comparison*). A total score for state appearance comparison was calculated by averaging the three items, producing a scale ranging from 1 to 7, with higher scores indicating greater appearance comparison processing. Items in this scale have been shown to be highly inter-correlated ($r = .71-.82$) (Tiggemann & McGill, 2004). In the current study, the scale had excellent internal reliability ($\alpha = .91$).

Trait appearance comparison. The tendency to make global social comparisons on the basis of appearance was measured by the Physical Appearance Comparison Scale (PACS) of Thompson, Heinberg, and Tantleff-Dunn (1991). Participants rate how frequently (1 = *never*, 5 = *always*) they make physical appearance comparisons with others in different situations. Scores on the five items are averaged (with one negative item reverse coded) to produce a final score ranging from 1 to 5, with higher scores indicating a greater tendency to engage in appearance comparison. The PACS has established convergent and divergent validity and test-retest reliability ($r = .72$) (Thompson et al., 1991). In the present sample, internal consistency was acceptable ($\alpha = .72$).

Procedure

Participants were recruited for a study on “recreational Instagram use”. They were randomly allocated to one of two experimental conditions (fitspiration, travel), subject to equal *N*s. They first completed the measure of social networking use and pre-exposure VAS for inspiration, mood and body dissatisfaction. Participants were then provided with an iPad and told that they would be watching a slideshow of images from a particular Instagram profile and rating the quality of the photos as they appeared. In both conditions participants viewed 18 images for 20 s each and rated the quality of each photograph using a 5-point scale (1 = *very poor quality*, 5 = *very good quality*). This ensured that they attended to the images as well as providing a credible rationale for the study. Following exposure to the Instagram images, participants completed post-exposure VAS, as well as measures of state self-esteem, state appearance comparison, inspirational goals, and finally, trait appearance comparison. As a trait measure, the latter should not be reactive to experimental manipulations. Height and weight were then measured (with participants’ explicit permission). Testing sessions lasted approximately 25 min and participants received course credit for their participation.

Results

Characteristics of the Sample

The women in the sample had a mean age of 19.91 years ($SD = 2.80$). Mean Body Mass Index (BMI) was 23.15 ($SD = 4.86$), which falls within the normal weight range as defined by Garrow and Webster (1984). The great majority of participants reported that they had an account on Instagram (78.5%), as well as on Facebook (95.4%). Modal use of Instagram was 10–30 min per day and Facebook 1 h or more per day. Almost all participants (94.6%) reported having seen Instagram images on other social networking sites such as Facebook. Participants placed considerable importance on the quality of the photographs posted on Instagram or Facebook by others ($M = 4.78$, $SD = 1.31$) and especially by themselves ($M = 6.01$, $SD = 1.11$).

Preliminary analyses indicated that the two experimental groups did not differ in age, $t(128) = 0.00$, $p = 1.00$, $d = 0.00$, or BMI, $t(128) = 0.04$, $p = .965$, $d = 0.01$. More importantly, the groups also did not differ significantly on initial negative mood, $t(128) = 1.36$, $p = .178$, $d = 0.24$, or body dissatisfaction, $t(128) = 1.28$, $p = .203$,

Table 1

Means (*SD*) and adjusted means (*SE*) for inspiration, negative mood and body dissatisfaction by image type.

	Pre	Post	
	<i>M (SD)</i>	<i>M (SD)</i>	Adj. <i>M (SE)</i>
Inspiration			
Fitspiration	35.98 (21.00)	47.35 (22.70)	51.05 (1.94)
Travel	45.71 (19.75)	52.22 (20.89)	48.52 (1.94)
Negative mood			
Fitspiration	26.24 (11.96)	29.22 (11.87)	28.01 (0.69)
Travel	23.40 (11.88)	21.14 (11.38)	22.36 (0.69)**
Body dissatisfaction			
Fitspiration	50.39 (21.50)	54.03 (22.98)	51.76 (1.72)
Travel	45.13 (25.20)	41.65 (25.91)	43.93 (1.72)**

** $p < .001$.

$d = 0.22$. Nor did they differ on trait appearance comparison, $t(128) = 0.00$, $p = 1.00$, $d = 0.00$, indicating that this had not been reactive to the experimental manipulation.

Effect of Image Type on Inspiration, Negative Mood and Body Dissatisfaction

The means and adjusted means (controlling for pre-exposure scores) for the VAS measures (inspiration, negative mood and body dissatisfaction) for both conditions before and after image exposure are presented in Table 1. It can be seen that for inspiration, participants in both conditions experienced an increase from pre- to post-exposure. An ANCOVA, with pre-exposure inspiration scores entered as a covariate to control for individual differences, confirmed that there was no significant effect of image type on inspiration after viewing the images, $F(1, 127) = 0.82$, $p = .366$, $\eta_p^2 = .006$ (see adjusted means).

In contrast, for both negative mood and body dissatisfaction, it can be seen from the means in Table 1 that participants who viewed fitspiration images showed an increase from pre- to post-exposure, while those who viewed travel images showed a slight decrease. The ANCOVA for negative mood found a significant effect of image type, $F(1, 127) = 32.86$, $p < .001$, $\eta_p^2 = .206$. Likewise, the effect of image type on body dissatisfaction was also significant, $F(1, 127) = 10.32$, $p < .001$, $\eta_p^2 = .075$. The adjusted means in Table 1 show that, as predicted, participants who viewed fitspiration images had significantly greater negative mood and body dissatisfaction after exposure than those who viewed travel images.

Effect of Image Type on State Self-Esteem

Table 2 provides the means for the fitspiration and travel conditions on the three forms of state self-esteem, collected only

Table 2

Means (*SD*) for state self-esteem subscales, inspirational goals, state appearance comparison and trait appearance comparison.

	Image type	
	Fitspiration	Travel
State self-esteem		
Performance	3.58 (0.67)	3.51 (0.73)
Social	3.34 (0.58)	3.41 (0.61)
Appearance	2.71 (0.77)	2.99 (0.79)*
Inspiration		
Improve fitness	4.57 (1.33)	2.69 (1.40)**
Eat healthily	4.45 (1.44)	2.57 (1.46)**
Travel	3.38 (2.04)	5.58 (1.61)**
State appearance comparison	4.84 (1.58)	3.04 (1.63)**
Trait appearance comparison	3.27 (0.68)	3.27 (0.61)

* $p < .05$.

** $p < .001$.

after exposure to the images. Independent samples *t*-tests established that there was no significant difference between groups on performance self-esteem $t(128)=0.56$, $p=.579$, $d=0.10$, or social self-esteem, $t(128)=0.73$, $p=.465$, $d=0.13$. However, there was a significant difference on appearance self-esteem, $t(128)=2.08$, $p=.04$, $d=0.36$. As can be seen from the means, as predicted, exposure to fitspiration images led to lower state appearance self-esteem than travel images.

Effect of Image Type on Inspirational Goals

Table 2 displays the means for the fitspiration and travel conditions on reported inspiration to improve fitness, eat healthily, and go travelling. It can be seen that participants who viewed fitspiration images felt significantly greater inspiration to improve their fitness $t(128)=7.82$, $p<.001$, $d=1.38$, and to eat healthily, $t(128)=7.40$, $p<.001$, $d=1.45$, than those who viewed travel images. On the other hand, those who viewed travel images felt greater inspiration to go travelling than those who viewed fitspiration images, $t(128)=6.83$, $p<.001$, $d=1.20$.

Effect of Image Type on State Appearance Comparison

The means for the fitspiration and travel conditions on state appearance comparison after image exposure are also shown in Table 2. It can be seen that participants exposed to fitspiration images showed greater state appearance comparison than those exposed to travel images. An independent samples *t*-test confirmed that the effect of image type on state appearance comparison was significant, $t(128)=6.42$, $p<.001$, $d=1.61$.

In addition, Pearson correlations showed that state appearance comparison processing was significantly related to post-exposure negative mood, $r=.36$, $p<.001$, post-exposure body dissatisfaction, $r=.58$, $p<.001$, and state appearance self-esteem, $r=-.52$, $p<.001$. It was not significantly correlated with post-exposure inspiration, $r=.12$, $p=.191$.

Mediation by State Appearance Comparison

A series of regression analyses was conducted to examine whether the observed effects of image type on negative mood, body dissatisfaction, and state appearance self-esteem were mediated by increased state social comparison. Mediation is established when the effect of the predictor variable (here image type) on the outcome variable (here negative mood, body dissatisfaction, state appearance self-esteem) is less when the mediator variable (here state appearance comparison) is entered in the regression equation than when the predictor variable is entered on its own (Baron & Kenny, 1986). In order to assess change, pre-exposure scores were controlled for in the first step of the analyses predicting negative mood and body dissatisfaction.

The regression analyses to predict change in negative mood indicated that the initial relationship with image type ($\beta=.23$, $p<.001$) was reduced (but still remained significant) when state appearance comparison was included in the regression equation ($\beta=.19$, $p<.001$). For change in body dissatisfaction, the initial relationship with image type ($\beta=.16$, $p=.002$) was reduced to non-significance ($\beta=.08$, $p=.155$). Likewise, the relationship between state appearance self-esteem and image type ($\beta=-.18$, $p=.040$) was reduced to non-significance ($\beta=.10$, $p=.255$) with the inclusion of state appearance comparison. The bootstrapping protocol of Preacher and Hayes (2008) was then used to estimate the indirect effects of image type through appearance comparison. In this approach, mediation is significant if the 95% bias-corrected confidence interval (CI) of the indirect path does not contain zero. Results, based on 10,000 bootstrapped samples, indicated that

there was a significant indirect effect through appearance comparison on all of post-exposure negative mood, $b=.127$, CI [.043, .241], body dissatisfaction, $b=.296$, CI [.184, .433], and appearance self-esteem, $b=-.280$, CI [-.410, -.174].

Moderation by Trait Appearance Comparison

A series of hierarchical multiple regression analyses was conducted to test trait appearance comparison as a potential moderator of the effect of image type on negative mood, body dissatisfaction, and state appearance self-esteem. Following Aiken and West's (1991) recommendation, trait appearance comparison scores were centred to reduce multi-collinearity. Where relevant, pre-exposure measures were entered on the first step, then image type (dichotomous variable) and centred trait appearance comparison, with the two-way product term entered on the final step of the analysis. A significant interaction is established when the product term offers significant additional variance beyond that provided by the individual variables (main effects). Here, the inclusion of the product term did not explain significant additional variance in any of negative mood, $R^2_{\text{change}}=.000$, $F_{\text{change}}(1, 125)=0.00$, $p=.976$, body dissatisfaction, $R^2_{\text{change}}=.002$, $F_{\text{change}}(1, 125)=0.93$, $p=.337$, or appearance self-esteem, $R^2_{\text{change}}=.012$, $F_{\text{change}}(1, 126)=1.86$, $p=.175$.

Discussion

The present study aimed to determine the effect of exposure to fitspiration imagery on women's body image. The major finding is clear. Despite fitspiration being inspirational in a number of ways, exposure to fitspiration images resulted in greater body dissatisfaction and lower state appearance self-esteem than did exposure to control (travel) images. Further, this effect was fully mediated by appearance comparison processing. To our knowledge, this represents the first experimental investigation of the effects of fitspiration in particular, and of Instagram-based media more generally, on body image.

The finding that exposure to fitspiration images led to greater negative mood, body dissatisfaction and lower appearance self-esteem relative to travel images is consistent with a large body of previous experimental research demonstrating the negative effects of viewing ideal images (mostly drawn from fashion magazines) on women's body image (Grabe et al., 2008; Groesz et al., 2002; Want, 2009). Although fitspiration images tend to feature women whose bodies are less thin than those of models, they are still relatively thin, in addition to being toned and strong. It is not possible here to disentangle whether effects are a function of the thinness of the women in the images, or their fitness and strength, or most likely both. Nevertheless, both aspects are unlikely to be attainable by the average woman, so comparisons on both are likely to be upward, resulting in the observed negative effects.

Relatedly, it is interesting to note that the effect sizes found in the present study (moderate-to-large) were greater than those (small) effects typically reported in the previous literature. This may be a function of fitspiration imagery being more potent in some way than thin-ideal imagery. Perhaps women do not process fitspiration images as critically as they do thin-ideal images, or perhaps adding tone and strength to thinness cumulates to provide women with more ways in which to feel inadequate. Future research might usefully directly compare fitspiration and thin-ideal imagery. Alternately, the size of effect may be a function of the imagery being presented via Instagram. As an Internet-based photo platform, this may provide a most potent form of transmission, as suggested by Meier and Gray (2014). In addition, the presentation

by iPad, a contemporary and ecologically valid medium, may have added immediacy.

The results also delineate a clear role for social comparison on the basis of appearance. The effect of image type on body image was fully mediated by state appearance comparison. This finding extends previous experimental research highlighting social comparison as a mediator of the effects of idealized images on negative body image outcomes (Bessenoff, 2006; Tiggemann & McGill, 2004; Tiggemann & Polivy, 2010; Tiggemann et al., 2009) to a new form of image (fitspiration) presented in a new format (Instagram). This confirms that most of the comparisons made with the fitspiration images were indeed upward. Further, these comparisons were made with everyday women or peers, rather than models, potentially leading to more deleterious effects (Cash et al., 1983), which might have further contributed to the larger effect sizes observed.

Although fitspiration imagery had negative effects on body image, there were some positive effects. Fitspiration is, by definition, designed to be inspirational. Here it was shown to be so. Both fitspiration and travel images led to increases in overall feelings of inspiration, indicating that the travel images provided an appropriate comparison condition. With respect to specific goals, women exposed to fitspiration images reported feeling more inspired to improve their fitness and to eat healthily, whereas women exposed to travel images felt more inspired to go travelling. In some ways, this can be seen to serve as a manipulation check for both sets of images. More importantly, the finding shows that fitspiration images do have their desired effect of inspiring viewers to engage in healthy behaviours. Whether or not such inspiration translates into any subsequent behavioural change remains a future research question. Nevertheless, fitspiration does accomplish what it sets out to do.

Taken together, the present findings indicate that fitspiration has both a positive (intended) effect on motivation and a negative (unintended) effect on body image. Thus it is difficult to come to firm conclusions regarding its overall usefulness. However, it should be noted that otherwise potentially helpful behavioural changes in diet or exercise may have adverse consequences in their own right, in terms of excessive exercise and disordered eating, when motivated by appearance-based reasons such as the desire to emulate the ideal bodies displayed in fitspiration imagery. Illustrating a similar tension, one content analysis of the text of "Healthy Living Blogs" on the Internet (Boepple & Thompson, 2014) concluded that much of the content in fact emphasized appearance and promoted thin ideals. The authors cautioned that the promotion of appearance-focused attitudes towards the body, food and exercise may serve to normalize a range of disordered behaviours.

The results of the current study have important theoretical implications. They contribute to the growing body of literature on "new" media and body image. In particular, they highlight fitspiration as a new and prolific online trend associated with body image disturbance. Importantly, the experimental design used establishes causal direction: acute exposure to fitspiration imagery leads to negative body image outcomes, at least in the short term. The results not only provide additional support to theoretical frameworks such as the sociocultural model (Thompson et al., 1999; Tiggemann, 2011) which propose social comparison as an important mechanism by which media ideals negatively impact on body image, but extend them into a new medium.

At a practical level, the findings point to recommendations for women to limit their exposure to fitspiration images. One challenge, however, is that fitspiration imagery is difficult to avoid in that it is prolific and a large number of Instagram and Facebook users may receive inadvertent exposure via their friends' postings. Thus this adds to recommendations to limit social networking time, Internet time and screen time more generally (e.g., Tiggemann & Miller, 2010). Another challenge is that it may be

particularly difficult to educate women about fitspiration imagery. Anecdotally, it is not uncommon for women to use fitspiration images as motivational material in daily life, such as by applying the images as computer or mobile phone backgrounds, or placing them on their bedroom walls. Indeed, the very fact that fitspiration imagery is inspirational probably makes its potential negative effect on body image all the more serious and insidious. In particular, women should be warned against using the women portrayed in fitspiration images as aspirational targets for social comparison. Thus media literacy programmes, which have shown some success in combating negative body image (Levine & Murnen, 2009), need to be expanded to incorporate social networking media in general, and fitspiration imagery in particular.

Like all studies, the present findings need to be interpreted in the context of a number of limitations. First, the sample was restricted to young predominantly White Australian university students, and thus results may not generalize to other groups of women. Future research could specifically investigate the effects on adolescent girls who are particularly high consumers of the Internet and social networking sites (Sensis, 2014). Second, the study took place in a laboratory setting. Although the images presented were real images sourced from the Internet and presented on an ecologically valid format (iPad), participants were asked to pay attention to the images in a way that they might not normally do in their homes or elsewhere. In addition, there was no opportunity to interact with the images, i.e., to "like" them or comment on them. It is this interactivity which distinguishes social media technologies from conventional mass media (Perloff, 2014). Future research should attempt to explicitly assess the effects of this form of interaction. Third, the results do not indicate which components of the images were responsible for observed effects. While it is a methodological strength of the study that both sets of images were chosen to represent those currently available on Instagram, thereby establishing high ecological validity, future research should attempt to disentangle the effects of the thinness, fitness, pose, and setting of the image, as well as the effect of the inspirational quotations. In addition, there are likely non-appearance components, such as perceived effort, control or willpower, that warrant further investigation.

Despite these limitations, the present study has clearly demonstrated that exposure to fitspiration leads to negative body image, and that this relationship is mediated by social comparison. In so doing, it has extended media effects on body image research into a new media format. It has also highlighted how a practice (fitspiration) avowedly designed to promote healthy eating and exercise can have (unintended) negative consequences on body image. Accordingly, the results well illustrate the complexity of the role played by the mass media in body dissatisfaction.

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