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# The Effects of Thinspiration and Fitspiration on Body Satisfaction and Appearance Self-Esteem Are Equivalent and Mediated by Appearance Comparisons

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THE EFFECTS OF THINSPIRATION AND FITSPIRATION ON BODY  
SATISFACTION AND APPEARANCE SELF-ESTEEM ARE  
EQUIVALENT AND MEDIATED BY APPEARANCE COMPARISONS

By

Nicole A. L. Dignard

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Appearance Self-Esteem Are Equivalent and Mediated by Appearance  
Comparisons

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July 13, 2017

### **AUTHOR'S DECLARATION OF ORIGINALITY**

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**ABSTRACT**

Use of social networking sites (SNSs) are ubiquitous among youth and are more popular among this age group than mass media sources and may act as a potent influence on women's body satisfaction. Two types of content shared on SNSs that may be particularly detrimental to women's body image are thinspiration and fitspiration. Thinspiration refers to content that aims to inspire thinness at all costs. Fitspiration promotes fitness and strength and denounces thinness, but critics have highlighted that fitspiration also features very thin women and argue that fitspiration is effectively thinspiration with added demands. Female undergraduates ( $N = 340$ ) were randomly assigned to view either thinspiration, fitspiration, or travel images from Instagram and reported on a variety of trait and state body image and mental health variables. Those who viewed fitspiration or thinspiration reported lower body satisfaction and appearance self-esteem but not greater negative affect than did those who viewed travel images. As expected, the effects of fitspiration and thinspiration on body satisfaction and of fitspiration on appearance self-esteem were mediated by appearance comparison. Although the effects on the outcome variables were equivalent, those who viewed fitspiration reported engaging in appearance comparisons to a greater extent than did those who viewed thinspiration. Appearance investment and the tendency to compare one's body to others may moderate the effects of these images, the role of each are discussed. Overall, the present findings fit within the broader social attitudes, which promote body positivity and eschew the pursuit of thinness, and highlight the need to consider social attitudes in the development of media literacy programs.

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## INTRODUCTION

Ask five female university students and at least four will report being dissatisfied with their appearance (De & Chakraborty, 2015; Neighbors & Sobal, 2007). How women feel about their body significantly contributes to their global self-esteem, or how they feel about themselves overall (Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006), and is a robust predictor of the development and maintenance of disordered eating (Polivy & Herman, 2002; Stice & Shaw, 2002) and depression (Grabe, Ward, & Hyde, 2008). Sociocultural theories propose that women's dissatisfaction with their appearance results, in part, from them comparing themselves to, and aspiring to, an appearance that is not attainable for most (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Tiggemann, 2012). These standards are transmitted and promoted through a variety of sources such as family, friends, medical professionals, and, most pervasively, mass media (Tiggemann, 2012). While body image research has historically focused on the effects of mass media and exposure to thin-ideal media on body image and related outcomes, such as negative affect and low self-esteem, within the last decade, two important shifts have occurred.

The first is a shift in appearance standards for women. In addition to the thin ideal, a more athletic or fit appearance has become a popular appearance ideal (Gruber, 2007). The fit ideal is characterized by a lean and moderately muscular woman, with muscular arms, a toned abdomen, and firm lower body (Gruber, 2007). Yet critics argue that the fit ideal is less about creating an alternative to the thin ideal and more about adding an extra layer of appearance pressures for women (Homan, McHugh, Wells, Watson, & King, 2012). Although relatively new and far less researched, evidence indicates that, for women, the effects of the fit ideal are similar to those of the thin ideal on body image, mood, self-esteem, and eating pathology.

The second shift is the notable decrease in the popularity of television among 18 to 29 year olds (MarketingCharts, 2016; Stelter, 2012). Instead they turn to interactive media sources, particularly social media (Bair, Kelly, Serdar, & Mazzeo, 2012; B. T. Bell & Dittmar, 2011; Perrin, 2015; Tiggemann & Miller, 2010). Indeed, almost 90% of young adults use at least one social networking site (SNS; Perrin, 2015). Although mass media are still present online, for example, TV streaming services and online editions of magazines, social media are more salient in the lives of young adults (Fardouly & Vartanian, 2015; Pempek, Yermolayeva, & Calvert, 2009; Pew Research Center, 2015), and are particularly popular among young women (Kimbrough, Guadagno, Muscanell, & Dill, 2013).

The overarching objective of this research is to investigate the effects of two types of appearance-oriented images from the image-based SNS Instagram on body image and related outcomes. Specifically, the current study is designed to examine the effects of the thin and fit ideal as presented on SNSs, referred to as *thinspiration* and *fitspiration*, respectively. Because not everyone who views these images reacts negatively, the study further aims to examine how and for whom these types of content predict body dissatisfaction and eating pathology. Specifically, the present study focuses on appearance investment and social comparison as factors that may contribute to the effects of, and individual differences in, the response to these types of content. Key empirical and theoretical literature regarding media effects and the proposed mechanism underlying these effects will be reviewed, followed by a description of the proposed study.

## Appearance Standards for Women

### The Thin Ideal

Extant literature consistently supports the effect of exposure to mass media and specifically media promoting the thin-ideal on body image, affect, self-esteem, and eating pathology (Grabe et al., 2008; Hausenblas et al., 2013; Tiggemann, 2012; Want, 2009). A recent study in Fiji (Becker et al., 2011) found that body dissatisfaction and eating pathology increased following the introduction of Western media to the island. Consistent with sociocultural theories of body image, this suggests that the thin ideal promoted by mass media plays a significant causal role in the development of body image disturbances and disordered eating. Furthermore, internalization of the thin ideal is associated with increased body dissatisfaction (Fitzsimmons-Craft, Harney, et al., 2012; Homan, 2010; Myers, Ridolfi, Crowther, & Ciesla, 2012; Vartanian & Dey, 2013), social comparisons (Fitzsimmons-Craft, Harney, et al., 2012; Myers et al., 2012; Vartanian & Dey, 2013), and maladaptive appearance investment (Cash, Melnyk, & Hrabosky, 2004).

### The Fit Ideal

As mentioned above, emerging research suggests that the fit ideal is associated with similar effects on body image and related variables as the thin ideal. For example, correlational studies have found that, for women, internalization of the fit ideal (H. Bell, Donovan, & Ramme, 2016) and drive for muscularity (Pritchard, Parker, & Nielsen, 2011) are positively correlated with disordered eating and compulsive exercise attitudes. Similarly, in a 7-month longitudinal study of female college students, internalization of the athletic ideal prospectively predicted increased compulsive exercise over the course of the study but did not predict changes in body satisfaction or dietary restraint (Homan, 2010). Moreover, experimental studies have revealed



that viewing images of the fit ideal is associated with increased state body dissatisfaction (Benton & Karazsia, 2015; Daniels, 2009), anxiety, and depressed mood (Garvin & Damson, 2008). However, this research highlights that exposure to the athletic ideal is problematic only when the athletes are very lean (Benton & Karazsia, 2015; Bissell, 2004; Daniels, 2009; Harrison & Fredrickson, 2003). For example, in a correlational study, women who watched sports reported greater body satisfaction when those sports emphasized leanness (e.g., running or dance) compared to when the sports did not (e.g., golf) and compared to watching men's sports (Bissell, 2004). Similarly, findings from experimental studies indicate that exposure to images of lean and fit women, but not to images of normal weight muscular women, is associated with greater body dissatisfaction (Benton & Karazsia, 2015; Homan et al., 2012). Overall, results suggest that even if the fit ideal aims to promote health and fitness over the existing thin ideal, because it is combined with elements of the thin ideal, it is associated with similar effects on body image, eating, and exercise attitudes and behaviours.

### **Social Comparison Theory**

Social comparison theory (Festinger, 1954) states that social comparison processes serve primarily self-evaluative functions and guide self-view. In the absence of objective standards, comparisons with others who are similar on key related dimensions (e.g., age, gender, life circumstances), provide information that serves as the basis for self-evaluation of one's abilities and opinions. Festinger (1954) presumed that individuals were motivated to improve, and thus would prefer comparisons with superior others, termed upward comparisons, which would guide self-improvement efforts. Threatening and irrelevant comparisons are avoided as they provide little information pertinent to self-evaluation, and may threaten self-view. Nevertheless, in instances where social desirability or the costs of deviance are high, individuals may engage in

comparisons with extremely different superior others regardless of the negative impact. In this case, goals are not perceived as achievable, resulting in feelings of failure.

Since its introduction, social comparison theory has been well supported with several key revisions (Kruglanski & Mayseless, 1990). First, social comparison often is spontaneous rather than intentional (Mussweiler, Rutter, & Epstude, 2004; Want, 2009) and individuals engage in social comparison with dissimilar others (Martin & Kennedy, 1993), even when they are aware that such comparison is inappropriate (Gilbert, Giesler, & Morris, 1995). Second, domains other than opinions and abilities (e.g., physical appearance, diet, and exercise, also serve as the basis for social comparison (Fitzsimmons-Craft, Bardone-Cone, & Harney, 2012; Wheeler & Miyake, 1992). Third, individuals compare themselves with inferior others, termed downward comparison, as a means to enhance self-view (Latané, 1996). Fourth, research indicates that social comparison also can be motivated by the desire for self-improvement (Helgeson & Mickelson, 1995; Taylor & Lobel, 1989) or by self-enhancement goals (Wills, 1981). These motives influence both the direction and effect of social comparison. Specifically, individuals who are motivated to improve on some domain may engage in upward comparison to provide guidance on how to achieve success in that domain, or to provide inspiration to persevere. Alternatively, downward comparison with inferior others may be motivated by self-enhancement such that comparison highlights one's superiority, thus enhancing self-view.

Whether an individual engages in social comparison is influenced by perceived similarity between the self and other on relevant traits (Major, Testa, & Blysm, 1991). As perceived similarity between self and the other increases, the other is viewed as a more relevant point of comparison, which then may more strongly affect self-view (Major, Testa, & Blysm, 1991). Lockwood and Kunda (1997) suggest that the effects of comparison then are influenced by the

perceived attainability of the level of excellence demonstrated by the outstanding other on the relevant domain, such that if self-relevance and perceived attainability are high, positive feelings including inspiration, may result. Alternatively, if self-relevance is high but perceived attainability is low, comparison may result in feelings of failure and defeat. Social comparison also may have behavioural consequences. If the standard or desired level of excellence is perceived to be personally attainable, individuals are more likely to initiate certain behaviours or persist at a difficult task compared to when perceived attainability is low (Huguet, Dumas, Monteil, & Genestoux, 2001; Pila, Brunet, Crocker, Kowalski, & Sabiston, 2016; Testa & Major, 1990).

### **Trait Social Comparison**

Social comparison is conceptualized as a process, and there are individual differences in the tendency to engage in social comparisons. Findings from correlational studies indicate that relative to those who are low on trait social comparison, those who are high on this dimension show a greater interest in the thoughts and feelings of others (Gibbons & Buunk, 1999; Swap & Rubin, 1983). Additionally, compared to those who are low on trait social comparison, individuals who are high on this trait have a higher degree of neuroticism, self-uncertainty, and negative affectivity (Butzer & Kuiper, 2006; Gibbons & Buunk, 1999), and report lower self-esteem (Gibbons & Buunk, 1999). Moreover, social comparison more negatively impacts those who are higher on social comparison tendency than those who are lower on this tendency (Buunk, Gibbons, & Visser, 2002).

### **Social Comparisons and Body Image**

Sociocultural models of body image and disordered eating suggest that body dissatisfaction, is partly due to excessive engagement in appearance-based social comparisons

(Keery, van den Berg, & Thompson, 2004; Vartanian & Dey, 2013). Consistent with this model, research indicates that women, especially those with high pre-existing body dissatisfaction, often evaluate their appearance through comparison with others and that this comparison is typically an upward one (Leahey, Crowther, & Mickelson, 2007). Appearance comparison in turn is associated with greater body dissatisfaction (Myers & Crowther, 2009; Tiggemann & McGill, 2004; van den Berg et al., 2007; Vartanian & Dey, 2013), disordered eating (Tylka & Sabik, 2010), and negative affect (Tiggemann & McGill, 2004), as well as decreased appearance self-esteem (Martin & Gentry, 1997). Additionally, general and appearance-based comparisons are positively correlated with body dissatisfaction (Keery et al., 2004; Rodgers, Chabrol, & Paxton, 2011; van den Berg et al., 2007).

Importantly, in a study of early adolescents over a 14-month period, internalization of the thin-ideal predicted appearance comparison tendencies at Time 2. In turn, these variables predicted increased body dissatisfaction at Time 3 (Rodgers, McLean, & Paxton, 2015). From this, the authors concluded that as appearance becomes more important, individuals seek media content against which they can compare their appearance to determine the results of their efforts to attain the ideal. This conclusion is consistent with other researchers' suggestion that social comparison might be motivated by self-improvement motives (Buunk & Gibbons, 2007; Nabi & Keblusek, 2014). However, other researchers have argued that self-improvement motivated comparison is rooted in awareness of a discrepancy between one's actual and ideal appearance, but because the aspired ideal is often unrealistic women are unable to achieve their desired appearance, which evokes feelings of failure and defeat (Myers & Biocca, 1992; Rodgers et al., 2015).

**Appearance comparison processes.** Most studies infer occurrence and direction of comparison processes based on the experimental manipulation, level of trait social comparison, or the effects on body image and related outcomes (Myers & Crowther, 2009). Specifically, lowered body dissatisfaction after exposure to images consistent with the thin ideal is attributable to an upward comparison target to a superior, relevant and unattainable other. However, such methods cannot guarantee that participants do engage in social comparison, or the direction and motives of the comparison. For example, Tiggemann and Polivy (2010) randomly assigned participants to receive instructions that promoted either intelligence or appearance processing of media images, but found no group differences. Instead, regardless of the experimental condition, after viewing images of thin women, participants who engaged in appearance-based comparisons reported greater body dissatisfaction and negative affect. Those who engaged in intelligence-based comparisons reported less body dissatisfaction and negative affect. To address this concern, some studies have included an explicit measure of state social comparison (Bessenoff, 2015; Tiggemann & McGill, 2004; Tiggemann & Slater, 2004; Tiggemann & Zaccardo, 2015). Consistent with correlational studies, findings from these studies indicate that state social comparison mediates the effect of thin media images on body image, appearance self-esteem, and negative affect. Except for Tiggemann and Zaccardo (2015), these studies investigated mass media images and no studies investigating social media effects have included an explicit measure of state social comparison.

### **Appearance Investment**

Appearance investment is defined as the cognitive-behavioural salience of appearance or cognitive schemas about the meaning and importance of appearance in life. As described by Cash (2012), individuals who are highly schematic on some dimension process information

related to that dimension differently than less schematic individuals. Accordingly, these schemas guide cognitive, behavioural, and emotional responses to schema-relevant information.

Individuals who are highly invested in their appearance are said to have well-developed appearance-related self-schemas. Dysfunctional appearance investment is characterised by excessive emphasis on appearance as a core part of identity and the self, or excessive efforts to alter or maintain appearance (Cash, 2012), and is associated with body dissatisfaction (Cash et al., 2004).

The revised edition of the Appearance Schemas Inventory (ASI-R; Cash et al., 2004), divided appearance investment into self-evaluative and motivational salience. Self-evaluative salience reflects the extent to which appearance is considered central to one's identity and worth, as well as the instrumental importance of appearance in one's social and emotional experiences (Cash et al., 2004). Motivational salience reflects efforts to maintain or achieve a certain appearance as a way of presenting oneself positively. Unlike self-evaluative salience, motivational salience lacks the emphasis on appearance as a core aspect of one's identity and self-worth (Cash et al., 2004). Additionally, high motivational salience is considered more adaptive than high self-evaluative salience, although both are associated with some degree of dysfunction when excessive (Cash et al., 2004). Accordingly, although correlations between motivational salience and various markers of body image and eating disturbances, such as body image quality of life, eating pathology, and internalization of the thin ideal, trend in the same direction as self-evaluative salience, correlations are much weaker compared to correlations between self-evaluative salience and these markers of body image disturbances (Cash, Melnyk, et al., 2004).

High appearance investment, particularly high self-evaluative salience, has been consistently linked to negative affect (Hargreaves & Tiggemann, 2002a), body image disturbances (Cash, Melnyk, et al., 2004; Hargreaves & Tiggemann, 2004; White & Halliwell, 2010), compulsive exercise (Lamarche & Gammage, 2012; White & Halliwell, 2010), and eating disturbances (Cash, Melnyk, et al., 2004; Lamarche & Gammage, 2012). Further, high self-evaluative salience, but not high motivational salience, is related to lower self-esteem (Cash et al., 2004), fluctuations in state body satisfaction (Melnyk, Cash, & Janda, 2004; Rudiger, Cash, Roehrig, & Thompson, 2007), and poorer body image quality of life (Cash, Jakatdar, & Williams, 2004). Lastly, appearance investment, but not lower self-esteem, temporally precedes body dissatisfaction in high school students, such that more schematic individuals in grade 10 reported more body dissatisfaction in Grade 12 compared to less invested peers (Hargreaves & Tiggemann, 2002b).

### **Appearance Investment and Thin-Ideal Media**

As noted by Ip and Jarry (2008) few studies to date have experimentally examined the effect of appearance investment on body image following exposure to thin-ideal media. Using the original Appearance Schemas Inventory, Hargreaves and Tiggemann (2002a) found that the effect of thin-ideal media on body dissatisfaction was moderated by appearance investment. Specifically, highly invested individuals reported more body dissatisfaction following exposure to appearance-related commercials compared to control commercials. No significant differences in body dissatisfaction between conditions were identified in individuals who were less invested. In this study, schema activation, as measured by a word-stem completion task, partly mediated the effect of the images on body dissatisfaction. These results suggested that individual differences in appearance investment may contribute to women's response to media images and

provide a mechanism for the effect of media on body image and related outcomes. Later studies using a similar design (Hargreaves & Tiggemann, 2003, 2004) and magazine images (Tiggemann & McGill, 2004) did not support these findings; but Hargreaves and Tiggemann (2004) found that highly invested individuals made more appearance-related social comparisons than did less invested individuals. As will be outlined below, this suggests that appearance investment may function in tandem with social comparison to produce body dissatisfaction.

More recently, using the Appearance Schemas Inventory-Revised (Cash, Melnyk, et al., 2004), Ip and Jarry (2008) found that both self-evaluative salience and motivational salience were associated with lower appearance self-esteem and greater importance of appearance following exposure to thin-ideal images. However, individuals high in self-evaluative salience but not in motivational salience reported significantly more body dissatisfaction and importance weighted self-ideal appearance discrepancies following exposure to the images. From these results, the authors concluded that highly invested individuals are more reactive to thin-ideal media, but individuals who define themselves by their appearance are affected across a broader array of body image dimensions compared to those who are invested for appearance management. Last, as an alternate to the traditional thin-ideal media, Boersma and Jarry (2013) examined the effect of weight-based derogatory media on body image and appearance self-esteem. In this study, individuals low in self-evaluative salience reported lower body satisfaction and appearance self-esteem following exposure to weight-based derogatory media compared to a neutral exposure condition; however, this effect was not found in individuals high in self-evaluative salience who appeared unperturbed by the weight derogatory media. The authors suggested that this paradoxical finding may reflect a defensive response to a body image threat whereby highly invested women protected themselves against a threat to a valued aspect of the



self. This explanation is consistent with an earlier study that demonstrated a similar pattern of defensive responding following a self-esteem threat, which involved participants being told that they did very well on a cognitive ability test, in the top 15%, or poorly, in the bottom 30% (Jarry & Kossert, 2007). In this study, participants who received failure feedback and were shown thin ideal media images reported being more satisfied with, and less invested in their appearance, than did women who received success feedback or who viewed product advertisements. Taken together these results suggest that appearance investment, particularly self-evaluative salience, contributes to the negative effects of thin-ideal media on body satisfaction and appearance self-esteem, although the mechanism for these effect remains incompletely understood.

### **Appearance Investment and Social Comparisons**

As described previously, according to social comparison theory, individuals engage in social comparisons with others in domains that are relevant to their self-worth (Festinger, 1954). For women who are highly invested in their appearance, particularly those high in self-evaluative salience, appearance is a highly self-relevant domain. It logically follows that women who are highly invested in their appearance, particularly for self-definition, will be more likely to engage in appearance comparisons. Indeed, Hargreaves and Tiggemann (2004) found that appearance comparison tendency and investment, as measured by the ASI, were positively correlated,  $r = 0.61$ . Because these variables were highly correlated the authors combined them as a global measure of appearance investment which was positively correlated with actual appearance comparisons as well as state body dissatisfaction and negative affect. This suggests that appearance investment and comparison tendency may explain individual differences in response to media images. Yet, as discussed above, results have not consistently supported moderation effects of either variable.

Ip and Jarry (2008) suggest that appearance-related schemas are more readily activated in individuals who are more invested in their appearance. They suggest that this prompts thoughts of one's physical appearance and attractiveness, which may lead to appearance-based social comparison with models shown in advertisements. This inevitably upward comparison then leads to lower body satisfaction and appearance self-esteem. Relatedly, as described above, Rodgers and colleagues (2015) argued that internalization of the thin ideal, which is conceptually and empirically similar to appearance investment (Cash, Melnyk, et al., 2004), prompts individuals to seek opportunities to assess their success in achieving the thin-ideal. They contend that the resulting body dissatisfaction motivates women and increases their willingness to engage in behaviours necessary to achieve the appearance to which they aspire. This argument is consistent with Tiggemann and Zaccardo's (2015) finding that women who viewed fitspiration images were inspired to increase their fitness but also dissatisfied with their appearance. Combined, these arguments provide a cohesive explanation for both who is most likely to be negatively affected by fitspiration and thinspiration as well as the underlying mechanism for these effects.

### **Social Networking Sites and Body Image**

SNS use is positively correlated with body dissatisfaction (Fardouly & Vartanian, 2015; Meier & Gray, 2014; Santarossa & Woodruff, 2017; Tiggemann & Slater, 2013), dieting (Tiggemann & Slater, 2014) and eating disturbances (Fardouly & Vartanian, 2015; Mabe, Forney, & Keel, 2014; McLean, Paxton, & Wertheim, 2016; Santarossa & Woodruff, 2017), depression (Lup, Trub, & Rosenthal, 2015), negative affect (Fardouly, Diedrichs, Vartanian, & Halliwell, 2015), and is negatively correlated with self-esteem (Mehdizadeh, 2010; Santarossa & Woodruff, 2017). Further, Facebook users report more body image disturbances than non-users (Stronge et al., 2015; Tiggemann & Slater, 2013). Importantly, a pair of studies that followed a

single group of female adolescents over an 18-month period, found that higher SNS use at baseline predicted increased body dissatisfaction (de Vries, Peter, de Graaf, & Nikken, 2016) and desire to have cosmetic surgery at follow-up (de Vries, Peter, Nikken, & de Graaf, 2014). In female college students maladaptive Facebook use, defined by the authors as engaging in frequent social comparisons and posting negative self-evaluations, predicted increased appearance dissatisfaction and eating disturbances four weeks later (Hummel & Smith, 2015; Smith, Hames, & Joiner, 2013).

SNSs are an interesting venue to study the effect of appearance-based media and social comparisons for several reasons. First, unlike mass media, SNSs are designed to be more interactive, making users both content creators and consumers. In fact, Moreno (2011) describes SNSs as a media “super peer” that establishes and promotes norms of behaviour (p.61). Users connect with other users by “friending” on Facebook or “following” on Instagram and Twitter, and receive feedback on their posts in the form of “likes”, “shares”, and comments (refer to Figure 1). These “likes” and comments provide social cues about what is desirable (Borzekowski, Schenk, Wilson, & Peebles, 2010; Ghaznavi & Taylor, 2015; Perloff, 2014). Additionally, users may share content from other users, fan pages, or websites on their own profile, thus sharing it with all their friends or followers, or they can share the content with specific users by tagging them, sharing on their profile, or sending it to them as a private message. This means that a user may view the same photo, or some variant of it, repeatedly, from various sources, which further emphasizes that the appearance or behaviour is socially desirable. Thus, SNSs may serve to reinforce appearance ideals, and promote potentially unhealthy eating and exercise attitudes and behaviours.

Second, it is always available and unlike traditional media, it is produced continuously. Smartphones are owned by 85% of individuals aged 18-29 years old, of which 91% use SNS applications on their phones (Pew Research Center, 2015); 78% own a laptop, and studies of college students suggest approximately 90% own laptops (Dahlstrom & Bichsel, 2014; Pearson Education, 2014) and 92% own multiple Internet-capable devices (e.g. laptops, smartphones, tablets; Dahlstrom, Eden; Bichsel, 2014). The ubiquity of technology makes SNSs almost always available and affords users virtually limitless opportunities to engage in social comparisons. Indeed, women report engaging in social comparison on SNSs (Kim & Chock, 2015) and rate social comparison as a primary motive for viewing others' profiles (Haferkamp, Eimler, Papadakis, & Kruck, 2012). As with mass media, social comparison mediates the effect of SNS use on body dissatisfaction (Fardouly et al., 2015; Fardouly & Vartanian, 2015; McLean, Paxton, Wertheim, & Masters, 2015), disordered eating (Kim & Chock, 2015; McLean et al., 2015; Walker et al., 2015), self-esteem (Fardouly et al., 2015; Stefanone, Lackaff, & Rosen, 2011; Vogel, Rose, Okdie, Eckles, & Franz, 2015), and mood (Fardouly et al., 2015; Vogel et al., 2015).

Lastly, because SNSs are a media of one's peers, images shared on SNSs may be seen as more realistic and less edited (Kleemans, Daalmans, Carbaat, & Anschutz, 2016; McLean et al., 2015). Therefore, appearance ideals transmitted via social media may be perceived to be more attainable than those presented in traditional media and thus may have a stronger effect on women's body satisfaction. Further, given that users selectively post photos to present themselves more positively (Chou & Edge, 2012), social comparisons based on this biased information should involve mostly upward comparisons (Haferkamp & Krämer, 2011; Lee, 2014; Vogel, Rose, Roberts, & Eckles, 2014). Accordingly, researchers have argued that the

effects of SNS mediated social comparison may be intensified relative to offline or media-based social comparison (Manago, Graham, Greenfield, & Salimkhan, 2008; Meier & Gray, 2014). Indeed, results from an Ecological Momentary Assessment study indicated that appearance comparison via social media is associated with more negative effects on women's body satisfaction and mood, and predicted greater thoughts of exercise and dieting relative to comparisons with others in person or shown in traditional media (Fardouly, Pinkus, & Vartanian, 2017).

### **Instagram and Body Image**

Although much of the research to date has been based on other SNSs, most often Facebook, Instagram is particularly well-suited for studying the effect of appearance-oriented social media for several reasons. First, what individuals are doing while on SNSs is more predictive of outcomes than is duration of use. Specifically, photo activity and social grooming behaviours, including posting photos, and viewing, liking, and commenting on other users' photos, has been linked to greater body dissatisfaction (McLean et al., 2015; Meier & Gray, 2014), drive for thinness (Kim & Chock, 2015; Meier & Gray, 2014), overvaluation of shape and weight, and dietary restraint (McLean et al., 2015). Accordingly, as an image-based SNS, effects on body image may be particularly potent among Instagram users. Second, as described on the Instagram website, the core function of Instagram is to use filters to "transform your [mediocre] photos into professional-looking snapshots" (Instagram, 2016). Theoretically, the selective presentation of the best and most interesting aspects of one's life, filtered and enhanced, as is the promoted norm on Instagram, may bias views of the success of others and exacerbate users' body image concerns (Perloff, 2014; Tiggemann & Slater, 2014). Third, unlike Facebook, Instagram allows for asymmetric relationships between users, such that users do not have to

mutually subscribe to each other's content, and users do not have to "follow" other users to view, like, and comment on their photos. As will be discussed below, if the other user is not known personally (i.e., there is no offline relationship), users are unable to correct potentially biased perceptions of others (Blease, 2015; Lup et al., 2015; Manago et al., 2008) which may promote the perception that others are living better and more exciting lives (Chou & Edge, 2012).

Lastly, Instagram communities are based on "hashtags," labels preceded by the "#" symbol. Hashtags function to allow users to search for content that matches their interest. When posting a photo, users may add any number of hashtags so that other users could search this hashtag and find their photo and all other images with the same hashtag (e.g., #fitspiration). Combined with the asymmetrical relationships, this means that users have virtually limitless access to content that interests them. This unprecedented access to enhanced photos of potential peers and celebrities, may serve to increase the pressure to achieve a specific standard for appearance, as well as the perceived feasibility of attaining that appearance ideal.

### **Online Representations of Appearance Standards for Women**

**Thinspiration.** Thinspiration refers to online content that promotes weight loss, dietary restriction, and excessive exercise behaviours, and often glorifies eating disorders, portraying them as a lifestyle rather than a mental disorder (Lewis & Arbutnott, 2012; National Eating Disorders Association, 2013). A recent meta-analysis examined four correlational and five randomized controlled experimental studies of the effects of exposure to pro-ED websites. The results showed moderate-to-large effect sizes of exposure on body dissatisfaction ( $d = .41$ ), dieting ( $d = .68$ ), and negative affect ( $d = 1.00$ ; Rodgers, Lowy, Halperin, & Franko, 2016). The authors attribute these findings to the emphasis on the centrality of appearance, especially the pursuit of thinness, on these websites (see also Bardone-Cone & Cass, 2007). In their study,

Bardone-Cone and Cass (2007) found that exposure to a prototypical pro-anorexia website resulted in greater negative affect, thoughts about one's weight, and appearance comparisons, as well as lower appearance self-efficacy relative to viewing either fashion or home décor websites. Remarkably, these effects were observed after just 25 minutes of exposure suggesting that even brief exposure is associated with adverse effects on body image and related variables.

*Thinspiration on SNSs.* In 2012, when thinspiration spread to SNSs, public outrage prompted Facebook and Instagram, among other SNSs, to amend user policies to prohibit thinspiration and content that promotes self-harm and eating disorders (see Chancellor, Lin, & De Choudhury, 2016, for a review). As part of this policy, Instagram banned 8 terms (probulimia, promia, proana, proanorexia, thighgap, thinspiration, and thinspo) issued advisories on 9 others (ana, anorexia, anorexianervosa, bonespo, bulimia, eatingdisorder, mia, secretsociety, skinny, thin; Chancellor, Pater, Clear, Gilbert, & De Choudhury, 2016). Yet, not all content that is tagged with one of the banned terms was, or is, taken down; instead, Instagram has made these hashtags unsearchable. For example, searching “#Anorexic” will not yield any results, however, using a lexical variant, such as thinspoooo yields photos tagged #anorexic. Clicking on the hashtag, which normally would bring users to other photos with the same hashtag, brings up no results. Following these bans, one study identified a total of 672 lexical variants (Chancellor, Pater, et al., 2016). This study found that although there was a 70% overall reduction in content associated with the banned terms, in some cases (e.g., “thighgap” and “thinspo”), the lexical variants (e.g. “thygap” and “thlnspo”, respectively) have more posts than the originally banned terms. Furthermore, on average, posts tagged with lexical variants have 30% more likes and 15% more comments than the terms from which they were derived. Combined, this suggests that the ban has had some success in limiting this content, but the pro-eating disorder (pro-ED; also

referred to as pro-anorexia/pro-ana and pro-bulimia/pro-mia) community continues to thrive on Instagram. In fact, analyses of the content of these lexical variants to the root hashtags suggest that photos tagged with the lexical variants are more graphic and reflect more self-harm (Chancellor, Lin, et al., 2016; Chancellor, Pater, et al., 2016). The authors suggest that this content may therefore be more triggering for individuals who are at risk of developing an eating disorder. Similar findings have been reported with other SNSs including Twitter<sup>1</sup> (Arseniev-Koehler, Lee, McCormick, & Moreno, 2016; Ghaznavi & Taylor, 2015) and Pinterest<sup>2</sup> (Lewallen & Behm-morawitz, 2016).

**Fitspiration.** Apparently contrasting thinspiration, fitspiration is designed to promote fitness and to emphasises strength over thinness (Tiggemann & Zaccardo, 2015). Yet, Tiggemann and Zaccardo (2015) highlight that many fitspiration images on Instagram feature thin and toned women engaging in exercise or dressed in exercise clothes. They argue that this portrait suggests that only thin and toned women are fit and healthy. Indeed, content analyses of healthy living blogs (Boepple & Thompson, 2014), fitspiration blogs (Boepple, Ata, Rum, & Thompson, 2016), and comparisons of thinspiration and fitspiration blogs (Boepple & Thompson, 2016) suggest that fitspiration presents many of the same messages as thinspiration blogs. First, examination of 21 healthy living blogs indicated that many of their messages emphasize appearance, thin appearance ideals, and disordered eating and nutrition (Boepple & Thompson, 2014). In a follow-up study examining fitspiration blogs specifically, nearly all (97.82%) fitspiration blogs contained images of thin women, but less than a quarter featured images of muscular, normal weight women (Boepple et al., 2016). This analysis also found that

<sup>1</sup> Microblogging service; users share 140 character or less messages, videos, photos and links to websites (commonly an abbreviated link or “short link”)

<sup>2</sup> SNS that allows users to create virtual cork boards by “pinning” images with website links to virtual “boards”;



most, 92.85%, had messages that emphasized exercise for appearance; almost half had weight-stigmatizing messages; a quarter had negative or guilt inducing messages about food; and a fifth endorsed dieting or restraint messages. Comparison of fitspiration and thinspiration blogs indicated that they did not differ on the presence of messages intended to induce guilt or shame about one's body or weight, stigmatize being overweight, objectify women, or promote dieting and restraint (Boepple & Thompson, 2016). Indeed, though thinspiration blogs contained more of these messages, 80% of the fitspiration blogs contained such messages compared to 88% of thinspiration blogs. Given the ongoing promotion of thinness as an element of the ideal body and the similarity of the messages, fitspiration may have many of the same effects as thin ideal media. However, more research is needed to verify the effects of fitspiration independently and relative to thinspiration.

In the first study to date to focus exclusively on the effect of fitspiration, Tiggemann and Zaccardo (2015) found that participants who viewed fitspiration images reported being inspired by the images to improve their fitness and to eat healthily, but they also reported lower mood, appearance satisfaction, and appearance self-esteem. They also found that the effect of fitspiration on negative affect, appearance satisfaction, and appearance self-esteem was mediated by engagement in social comparisons. Taken together, these results support the contention that “fitspo is thinspo in a sports bra” (Anderson, 2012) and highlight that fitspiration may have both positive and negative effects, and that more research is needed to understand the mechanisms underlying these effects.

### **Media, Body Image, and Health Behaviour**

Beyond detrimental effects on body image, SNS use can influence health behaviours. Indeed, a growing body of literature suggests that SNS use is associated with higher eating

pathology (see Holland & Tiggemann, 2016 for review), and that these effects are mediated by social comparison processes (Fardouly & Vartanian, 2015; Kim & Chock, 2015; Smith et al., 2013). As discussed above, Rodgers and colleagues (2015) argue that upward appearance comparison inevitably results in negative appearance evaluations which then may motivate behaviours necessary to achieve the ideal appearance. This hypothesis has not been formally tested and the effect of appearance- and health-related inspirational SNS media (e.g., healthy living blogs, fitspiration, and thinspiration) on long term behaviours remains largely unstudied. To this author's knowledge, only one study to date included a measure of actual behavioural changes associated with exposure to these types of content. Specifically, Jett and colleagues (2010) assessed change in dietary intake but did not evaluate changes in exercise behaviours, nor short- or long-term body image effects, so it is unclear what effects these media may have on these variables long-term. Given the ubiquity of SNSs in the lives of youth it is important to understand the global effects of fitspiration and thinspiration.

### **Theory of Planned Behaviour**

According to the theory of planned behaviour (Ajzen, 1991), future behaviour can be predicted from intentions which are predicted by attitudes towards the behaviour, subjective norms, and perceived behavioural control. Attitudes are determined by the evaluation of the importance of, and expected outcomes, of a behaviour. They also are determined by the expected consequences of not engaging in the behaviour. Subjective norms capture social pressures for or against a specific behaviour and includes injunctive and descriptive norms. Specifically, injunctive norms refer to the perceived attitudes of important others towards a behaviour and descriptive norms are the perceptions of others' actual engagement in that behaviour (Rivis & Sheeran, 2003). For example, a woman might believe that her friends think

physical fitness is important or might see that many of her friends post photos of themselves exercising and infer that she should start exercising more. These examples reflect injunctive and descriptive norms, respectively. Lastly, perceived behavioural control refers to perceived capability and practical constraints impacting the ability to effect the desired behavioural change. High perceived behavioural control is characterized by low external constraints, such as lack of access to necessary resources. It also includes high self-efficacy related beliefs such as the belief that one is physically capable of engaging in the behaviour and that they could sustain the behavioural change over time (Ajzen, 1991; Povey et al., 2000).

The theory of planned behaviour is well supported by research. Indeed, the combination of attitudes, norms, and perceived behavioural control accounts for 40 to 49% of variance in intentions and 19 to 36% of variance in behaviours. The theory of planned behaviour offers a useful framework for understanding the potential long-term behavioural consequences of exposure to fitspiration and thinspiration. Specifically, as described above, researchers argue that SNSs establish and promote norms for behaviour and a culture for what is acceptable. Moreover, research suggests that descriptive norms are more predictive of individual attitudes and behaviour than are injunctive norms (Ajzen & Fishbein, 2005; Armitage & Conner, 2001), perhaps because the former is more readily observable (Paxton, Schutz, Wertheim, & Muir, 1999). Through the photos they choose to post, as well as through the photos that they like and on which they comment, peers model the desired behaviours (i.e., descriptive norms) and promote the current cultural standards for appearance (i.e., injunctive norms).

Additionally, as described above, social comparison can motivate efforts to alter appearance to match the appearance ideal. Although photo editing is the norm on Instagram, users may be unaware of the extent of editing and may perceive the images to be a truer

representation of reality than are the images shown on mass media. Thus, the thin and fit appearance ideal shown on Instagram may be judged more attainable than the ideal shown in mass media. Combined, these characteristics imply that female Instagram users have a positive attitude towards the thin and fit appearance ideal, believe that they can achieve this desired appearance, and feel that those who matter to them would approve of their efforts to attain this appearance. This suggests that these users may be more likely to engage in behaviours required to attain the desired appearance. However, they also may perceive several key barriers to exercising or eating healthily, such as lack of time, money, or access to necessary resources such as a gym or an affordable grocery store. In this scenario, perceived behavioural control may be low, thus reducing the likelihood that the individual will engage in the target behaviours.

### **The Present Research**

The present study was designed to expand on past literature on the association between appearance-related media and women's body image. Specifically, the effect of thin- and fit-ideal media as it is shared on social networking sites on women's body satisfaction, appearance self-esteem, and affect. Although overtly the message of fitspiration is one that promotes strength over thinness, researchers have highlighted several similarities with thin-ideal media and preliminary evidence indicates that like thin-ideal media and thinspiration, viewing fitspiration results in increased body dissatisfaction and negative affect, as well as reduced appearance self-esteem. Though past studies have examined the effect of these media independently and using traditional media images, this study represented the first attempt to compare the effects of these types of images as shared on SNSs, on these variables in women. This research also was designed to elucidate how and for whom these types of images will be most problematic and is

the first to examine self-evaluative salience as a potential moderator of the effect of fitspiration and thinspiration on state appearance comparison.

### **Research Aims & Hypotheses**

Accordingly, the overarching purpose of the present research was to examine the effects of viewing fitspiration and thinspiration images as found on Instagram, both independently and comparatively, on women's body satisfaction, appearance self-esteem, and negative affect. Related to this, the present research aimed to examine how and for whom fitspiration and thinspiration are associated with these outcomes. Specific aims and associated hypotheses are outlined below.

**Aim 1.** The first aim of the proposed research is to compare the effects of viewing fitspiration and thinspiration on the above noted outcome variables. As previously discussed, research suggests a number of thematic similarities between fitspiration and thinspiration. Thus, I expected that individuals who were shown either fitspiration or thinspiration would report reduced appearance satisfaction and self-esteem, as well as greater negative affect, compared to those who were shown neutral images (i.e., travel images). Moreover, given the aforementioned similarities between fitspiration and thinspiration messages, I predicted that the effects on these variables would be comparable.

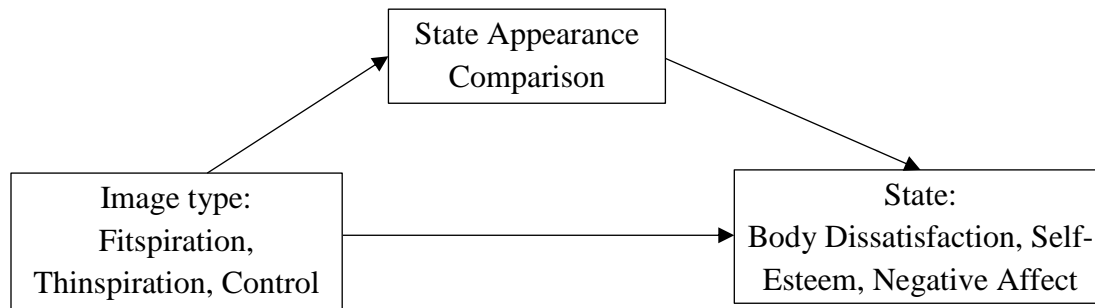
**Hypothesis 1a.** Relative to the control group, individuals in the fitspiration and thinspiration conditions will report lower state appearance self-esteem and body satisfaction, as well as greater negative affect.

**Hypothesis 1b.** Fitspiration and thinspiration will have statistically equivalent effects on body satisfaction, appearance self-esteem, and negative affect.

**Aim 2.** The second overarching research aim was to examine how and for whom viewing fitspiration and thinspiration was associated with body dissatisfaction, low appearance self-esteem, and negative affect. Specifically, social comparison is proposed as a mediator of the effect of fitspiration and thinspiration images on these variables. Further, the effect of these images on state appearance comparison is expected to be moderated by trait social comparison and self-evaluative salience.

Past literature demonstrates that social comparison mediates the effects of media images and of SNS use on the outcome variables. Tiggemann and Zaccardo (2015) have conducted the only study testing this model using Instagram, and the first SNS-based study to explicitly measure state social comparison. Thus, this study aimed to confirm Tiggemann and Zaccardo's (2015) findings that state social comparison mediates the effect of fitspiration, and, in the present research, of thinspiration, on each of the outcome variables.

**Hypothesis 2.** The effect of fitspiration and thinspiration images on body satisfaction, appearance self-esteem, and negative affect will be mediated by state appearance comparison behaviour. Specifically, viewing fitspiration and thinspiration images will prompt greater engagement in appearance comparisons that in turn will result in higher negative affect and lower appearance self-esteem and body satisfaction (Refer to Figure 1, below).

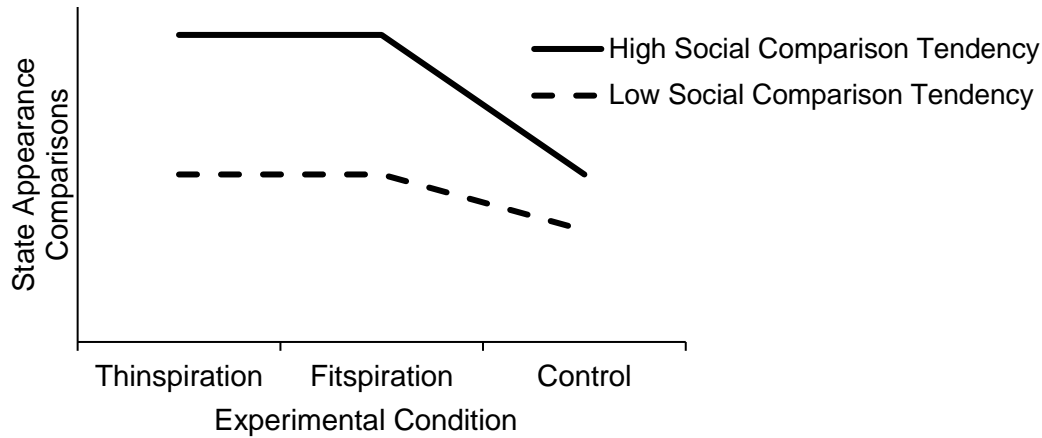


*Figure 1.* Proposed mediation model for effects of fitspiration and thinspiration on body dissatisfaction, appearance self-esteem, and negative affect.

As previously discussed, Hargreaves and Tiggemann (2004) combined appearance investment and trait social comparison and found that this composite variable moderated the relation between image condition and state appearance comparison. Specifically, those who scored higher on the composite variable engaged in social comparison to a greater extent, particularly those in the ideal appearance condition, than did those who scored lower on the composite variable. Similarly, Tiggemann and McGill (2004) found that trait social comparison predicted state appearance comparison. Consistent with these findings, in this study trait social comparison was expected to moderate the effect of fitspiration and thinspiration images on state social comparison such that individuals high in trait social comparison would engage in appearance comparisons to a greater extent when viewing the fitspiration and thinspiration than would those who were low on trait social comparison (see Figure 2).

***Hypothesis 3a.*** Women who are high in trait social comparison will engage in appearance comparisons to a greater extent than will those who are lower in trait social comparison regardless of the images to which they are exposed.

***Hypothesis 3b.*** For women who are high in trait social comparison, viewing fitspiration or thinspiration images will result in greater engagement in appearance comparison than it will for women who are low on trait social comparison or who view travel images (refer to Figure 2).



*Figure 2.* Hypothesized effect of fitspiration and thinspiration on state social comparisons for women high and low in trait social comparison.

*Note:* Graph is intended to demonstrate the pattern of results expected.

Self-evaluative salience was tested as a separate moderator of the relation between image type and state social comparisons. As outlined above, self-evaluative salience reflects the importance of appearance for self-worth or identity (self-evaluative salience) and of the engagement in appearance management behaviour (motivational salience). According to social comparison theory, individuals are more likely to engage in social comparisons in domains that are highly self-relevant. Therefore, women who are highly invested in their appearance for self-definition (i.e., high self-evaluative salience) were expected to engage in social comparisons to a greater extent when presented with fitspiration or thinspiration images compared to those who were less invested or who viewed travel-related images.

**Hypothesis 4a.** Women who are highly invested in their appearance for self-definition will engage in appearance comparisons to a greater extent than will women who are less invested in their appearance regardless of the images to which they are exposed.

**Hypothesis 4b.** For women who are highly invested in their appearance for self-definition, viewing fitspiration and thinspiration images will be associated with higher state



appearance comparison compared to women who are less invested in their appearance or for either group when viewing travel images (refer to Figure 3).

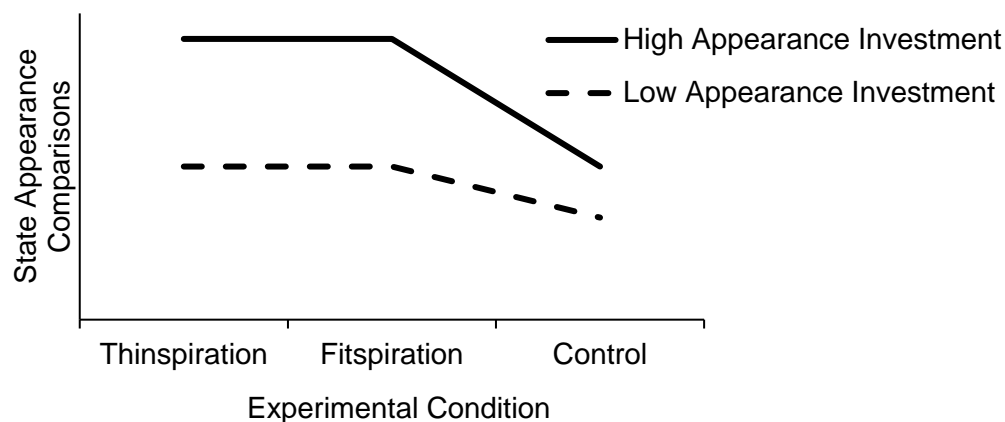


Figure 3. Hypothesized moderation effect of fitspiration and thinspiration on social comparisons for women high and low on appearance investment.

Note: graph is intended to show the pattern of results expected.

**Aim 3.** The third aim of the present research was to assess the potential short- and long-term effect of viewing fitspiration and thinspiration images. Tiggemann and Zaccardo (2015) found that compared to women who viewed travel images, women who viewed fitspiration images reported being more inspired to increase their fitness and eat healthily. It is important to determine whether this inspiration may translate to changes in behaviour. Using the above described theory of planned behaviour, it can be assumed that positive attitudes and norms combined with high perceived behaviour control will promote behaviour change, in this case healthier eating and more frequent exercise. As an intermediary to this change, the present research included measures of intention to eat healthily, exercise more frequently, and attempt to lose weight, as well as measures of attitudes, norms, and perceived behavioural control for each of these health behaviours.

Jett and colleagues (2010) found that individuals in the health/fitness condition intended to use the recommendations from the websites, but did not reduce their caloric intake over the

week. The messages associated with fitspiration do not promote weight loss explicitly, but promotes regular exercise and a healthy diet. Given that fitspiration and the behaviours that it promotes are socially approved, it was expected that participants who viewed fitspiration would report greater intentions to eat healthily and exercise more frequently but might not report greater intention to attempt to lose weight. However, if fitspiration is indeed similar in influence to thinspiration, as suggested by critics, then there should be no differences in intentions for these behaviours between the two experimental groups, and both should report greater intent to eat healthily, exercise more frequently, and attempt to lose weight than those in the control group.

***Hypothesis 5.*** Compared to those in the travel condition, women in the fitspiration and thinspiration conditions will report greater intention to eat healthily, exercise more frequently, and attempt lose weight.

## METHOD

These research aims were addressed using an experimental design and a combination of analysis of variance (ANOVA), tests of equivalence, and moderated-mediation multiple linear regression analyses. In each analysis, the type of image shown (i.e., thinspiration, fitspiration, or travel) was the independent variable. To test the first four hypotheses, the dependent variables were state body satisfaction, appearance self-esteem, and negative affect. To test the fifth hypothesis, the dependent variables were intent to eat healthily, exercise more frequently, and attempt to lose weight. In each of the regression analyses, state appearance comparison was included as a mediator and self-evaluative salience and trait social comparison were tested as moderators. Prior to analyses, SNS use, trait self-esteem, and depression were compared between conditions to ensure there were no pre-existing differences on these variables, which have been shown to relate to the dependent variables.

### Participants

Female undergraduates from the University of Windsor without a past or present eating disorder and who currently use either Facebook or Instagram at least once per week were recruited for the study and were awarded course credit for participation. This research focused on female students because body dissatisfaction presents differently in men and women (Neighbors & Sobal, 2007) which may impact the effectiveness of the experimental manipulation. Specifically, the appearance ideal for men is characterised by muscularity, broad shoulders, and a narrow waist, also referred to as a mesomorphic body type. Although muscle definition and strength are part of the fit ideal for women, both the thin and fit appearance ideals emphasize slimness. Participants were screened for past or present eating disorders for two reasons. First, statistically speaking, responses to the images may be more extreme in those with

a past or present eating disorder. These extreme scores may bias the data and are not representative of the target population (i.e., non-clinical, female students). Second, from an ethical standpoint, thinspiration images may also be triggering for individuals with a past or present eating disorder. Therefore, to minimize risk of extreme psychological effects, they were not eligible to participate. Participants ( $N = 340$ ) were recruited through the University of Windsor Psychology Participant Pool using an online ad and were awarded course credit for participation. This study received ethics approval from the University of Windsor Research Ethics Board.

The mean age of participants was 20.61 ( $SD = 2.64$ ). Based on self-reported height and weight, the average body mass index (BMI) of participants was 23.35  $\text{kg/m}^2$  ( $SD = 4.34$ ), which is within the normal range. Participants' self-identified race and ethnicity were as follows: 77.7% Caucasian/European, 9.3% Arab, 6.3% African, 5.4% South Asian, 2.7% East Asian, 2.7% First Nations, 1.5% Hispanic, 0.6% Caribbean, and 2.1% mixed race. The majority of participants were full-time students (96.1%) majoring in psychology (55.1%). Participants had completed an average of 7.64 psychology courses prior to completing the study. In terms of their years of university education, 18.4% were in their first year, 24.4% were in their second year, 25.3% were in their third year, 23.8% were in their fourth year, and 8.1% had attended university for more than 4 years.

In terms of social networking site usage, 90.7% of participants used Facebook at least several times per week, including 73.2% who used it several times per day, and 89.2% used Instagram at least several times per week, 80.4% of whom used it several times daily. In terms of which SNS was reported as the most often used, Instagram (35.6%) was most commonly selected, followed by Facebook (28.1%), or SnapChat (22.4%). On average, participants

followed 349 people on Instagram and had 489 friends on Facebook. Of those they followed or friended, approximately 40% were not well known outside of social networking sites. Although only 2.7% of participants reported posting photos of themselves in exercise clothing, either before or after a workout, 60.2% followed health and fitness accounts on Instagram.

## Materials

### Stimuli

In each condition participants viewed twenty screenshots taken from the Instagram website. Each image included the caption and number of likes, but usernames were blurred and self-harm and explicitly pro-ED hashtags were removed as they may evoke responses from participants independent of the content of the image, and thus introduce statistical noise.

Although comments were sometimes in another language, the captions of all images were in English. Three of the images in each condition included text overlaid on the images. In the thinspiration condition, an example of this is “*Because everything looks good on skinny.*” In the fitspiration condition, an example of a quote used is, “*Sweat more, bitch less.*” Lastly, in the travel condition, an example is “*Say yes to new adventures.*”

**Image selection.** As in past research (Tiggemann & Zaccardo, 2015), travel images were used in the control condition, hereafter referred to as the travel condition. To protect internal validity, so that the only difference between the control and experimental conditions was the presence or absence of appearance-related content, none of the photos used in the travel condition included women, food, or other appearance related content. Given the number of questionnaires not focused on appearance, the absence of appearance-related stimuli in this condition was not expected to rouse suspicion. Consistent with ratios of experimental and control images used in prior research in the Studies in the Psychology of Appearance Lab (e.g.,

Ip & Jarry, 2008), twelve of the twenty images in the fitspiration and thinspiration conditions were images related to the thin or fit ideal respectively. The remaining eight photos were taken from the travel condition so that the experimental conditions were as similar as possible and the effects of fitspiration and thinspiration can be isolated (i.e., protection of internal validity).

All fitspiration images were sourced using ‘#fitspiration’; related hashtags such as ‘#igfit’, ‘#fitspo’, and ‘#fitchick’ often accompanied ‘#fitspiration’ and were used to access a broader variety of content<sup>3</sup>. Images were selected for possible inclusion based on the following criteria: (a) a single woman was shown in the image, (b) the woman in the image appeared to have a BMI above 18.5 with visible muscular definition, and (c) the individual was either engaged in physical activity or dressed in exercise attire.

Thinspiration images were accessed using variants as guided by previous content analyses (Chancellor, Lin, et al., 2016; Chancellor, Pater, et al., 2016), for example ‘#skinnygoals’, ‘#thinpo’ ‘#thinpiration’, as well as searching hashtags used in these images. The following criteria were used to guide selection of potential images: (a) a single woman was shown in the image, (b) the BMI of the woman shown in the image appeared to be less than 18.5, and (c) the woman was not engaged in physical activity or wearing exercise attire.

For this study, images in which the woman shown was posed in a highly sexual manner or in which the primary focus was food were omitted. Although these features are somewhat common (Santarossa, Coyne, Lisinski, & Woodruff, 2016), inclusion would introduce statistical noise. Thus, to ensure that the only differences between the experimental conditions was directly related to the differences between the thin and fit ideal these images were omitted. Lastly, in

<sup>3</sup> Although all images included ‘#fitspiration’ and/or the dominant shorthand, ‘#fitspo’ search algorithms appeared to function based on the order of the hashtags such that if #fitspiration appeared after #igfit, the latter search would return the image as a top result while the former did not.

both conditions, care was given to ensure images of non-Caucasian women were included to minimize the risk that participants would not engage in social comparisons because the women in the images were of a different race.

Travel images were identified using ‘#travel’, ‘#wanderlust’, ‘#travelgoals’, and ‘#traveldreams’ and by searching for users that posted travel images, such as “ExploreCanada,” an account that posts pictures from around Canada. As mentioned above, images in this condition did not feature any appearance- or food-related content. Images included a variety of settings, beaches, igloos, waterfalls, streets, parks, and buildings, to ensure that they would appeal to as many participants as possible.

From the initial pool of images selected, the final images were selected using an iterative selection process based on feedback from members of the Studies of the Psychology of Appearance lab. First, 35 images were selected from a pool of approximately 50 images based on lab member consensus as to whether the image fit the definition for the relevant experimental condition. Specifically, images were included if at least 5 out of 7 members indicated they felt the image matched the relevant criteria, as outlined above, and were excluded if anyone felt the image matched neither fitspiration or thinspiration exclusively (i.e., if an image in the thinspiration condition shared characteristics of fitspiration or vice versa). Lab members then were asked to rate each of these 35 images for quality and degree of fit with the definition for each condition, for example, how well the image matched the definition of fitspiration. Items were rated on each of these dimensions using two bipolar 7-point Likert scales, where higher scores indicated better quality or fit respectively.

Photos for each condition were ranked based on quality and degree of fit, however, because rankings on these dimensions were not always concordant, degree of fit was emphasized

over quality when selecting the final images. As outlined above, in the experimental conditions the top 12 photos were selected and added to 8 of the top 20 travel images with the same travel images used in both experimental conditions.

So that three photos in each condition had a quote, quotes were added to two images in the travel and fitspiration conditions and one image in the thinspiration condition. After these quotes were added and photos were edited as described above, the photos were rated again for quality and degree of fit with the target characteristics for each condition.

**Analyses and results of image selection.** Mean ratings for the final photos indicated good quality and fit overall (refer to *Table 1*). Quality and fit also were compared between conditions using two repeated-measures ANOVAs. Specifically effect of condition on quality and degree of fit was compared between the thinspiration, fitspiration, and travel photos. Results indicated that the images did not differ in terms of degree of fit with the respective definitions ( $F(2, 8) = 2.88, p > .05$ ) but that the quality of the photos differed statistically between conditions ( $F(2, 8) = 16.59, p < .05$ ). Specifically, post-hoc analyses indicated that photos in the thinspiration condition ( $M = 5.54, SD = .18$ ) were of lower quality than those in the fitspiration ( $M = 6.26, SD = .16, p < .05$ ) and travel ( $M = 6.46, SD = .28, p < .05$ ) conditions but the travel and fitspiration photos did not differ statistically from each other ( $p > .05$ ). Although preferable that photos be of equal quality, as a fringe group of users, lower quality photos are somewhat typical for thinspiration photos and thus, somewhat unavoidable. Therefore, this discrepancy is considered acceptable for the purpose of ecological validity. Additionally, in the current study, mean photo rating was unrelated to any of the outcome variables (refer to Results, *Table 2*).



Table 1

*Means and Standard Deviations for Ratings of Image Quality and Fit by Experimental Condition*

Condition	Photo Quality (Lab) <i>M (SD)</i>	Fit with Definition <i>M (SD)</i>	Photo Quality (Study) <i>M (SD)</i>
Thinspiration	5.55 (.41)	6.08 (.42)	3.90 (1.80)
Fitspiration	6.26 (.36)	6.13 (.20)	4.28 (2.33)
Control	6.46 (.63)	6.46 (.28)	5.28 (2.08)

*Note.* Ratings based on final ratings from 5 lab members.

### Measures

#### Mediator

**State appearance comparisons.** As used by Tiggemann and colleagues (Tiggemann & McGill, 2004; Tiggemann & Zaccardo, 2015), state appearance comparisons was assessed using three items assessed on 7-point Likert scales. The first item assesses the extent to which participants thought about their appearance when viewing the images (1 = *no thought*, 7 = *a lot of thought*). The second and third items ask participants to indicate how much they compared their general appearance and specific body parts, such as buttocks, legs, arms, or abdomen, with the women in the images (1 = *no comparison*, 7 = *a lot of comparison*). A total score is calculated by averaging the three items with higher scores indicating more state social comparison. This measure has been shown to be sensitive to changes that occur as a result of exposure to both thin-ideal images from magazines (Tiggemann & McGill, 2004) and fitspiration images from Instagram (Tiggemann & Zaccardo, 2015).

Research supports excellent internal consistency with, Chronbach's alpha = .91 in female university students (Tiggemann & Zaccardo, 2015). Research by Tiggemann and McGill (2004) indicated that scores on this measure are correlated with trait appearance comparison as measured by the Physical Appearance Comparison Scale,  $r = .42$  (Thompson, Heinberg, &

Tantleff-Dunn, 1991). In the current study, these items demonstrated excellent internal consistency,  $\alpha = .93$ .

### Moderators

**Trait social comparison.** General social comparison tendency was assessed using the 11-item Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999). Items are rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and summed with higher scores indicative of a greater tendency to engage in social comparisons. In college students, the INCOM has demonstrated good internal consistency, Chronbach's alpha ranging between .75 and .82 (Gibbons & Buunk, 1999). In a more recent study of college students' use of Facebook, Chronbach's  $\alpha = .77 - .80$  (Vogel et al., 2015). Scores on the INCOM correlate with other theoretically relevant measures (Gibbons & Buunk, 1999) including Self-Esteem ( $r = -.32$ ; Rosenberg, 1965; 1979), Negative Affect ( $r = .21$ ; Watson, Clark, & Tellegen, 1988), and Neuroticism ( $r = .33$ ; Eysenck & Eysenck, 1975). In the current study, the INCOM demonstrated good internal consistency,  $\alpha = .83$ .

The Body, Eating, and Exercise Comparison Orientation measure (BEECOM; Fitzsimmons-Craft, Bardone-Cone, & Harney, 2012) also was used to more precisely assess the tendency to make appearance-related comparisons. The BEECOM is an 18-item measure with 6 items in each of three scales. The first scale assesses body and appearance-related comparison and includes items such as, "*I pay attention to whether or not I am as thin as, or thinner, than my peers*". The second subscale assesses the tendency to compare diet with others and includes items such as, "*During meals, I compare what I am eating to what others are eating*". The third subscale addresses exercise-related comparison tendency includes items such as, "*I pay close attention when I hear peers talking about exercise (in order to determine if I am exercising as*

*much as they are*)". Items are rated on a 7-point Likert scale from 1 (*never*) to 7 (*always*) and summed to create subscale and total scores. Higher scores represent a greater tendency to engage in comparisons. Internal consistency is excellent for the BEECOM as a whole ( $\alpha = .95 - .96$ ), as well as for the body ( $\alpha = .94 - .95$ ), eating ( $\alpha = .94$ ), and exercise ( $\alpha = .93 - .95$ ) comparison subscales (Fitzsimmons-Craft, Bardone-Cone, et al., 2012; Tylka & Iannantuono, 2016). Scores on the BEECOM are positively correlated with general trait social comparison ( $r = .42 - .58$ ; Gibbons & Buunk, 1999), trait appearance comparison ( $r = .53 - .76$ ; Thompson, Heinberg, & Tantleff, 1991), body and weight dissatisfaction ( $r = .60 - .70$ ; Garner, Olmstead, Bohr, & Garfinkel, 1982), and weight and shape concerns ( $r = .61 - .75$ ; Fairburn & Beglin, 2008) suggesting good convergent validity. In the current study, the BEECOM demonstrated excellent internal consistency for total scores ( $\alpha = .97$ ), as well as for the body ( $\alpha = .95$ ), eating ( $\alpha = .93$ ), and exercise ( $\alpha = .94$ ) subscales.

**Appearance investment.** Appearance investment was assessed using the Appearance Schemas Inventory-Revised (ASI-R; Cash et al., 2004). The ASI-R is a 20-item scale with two subscales – a 12-item self-evaluative salience (self-evaluative salience) and an 8-item motivational salience (motivational salience) subscale. Items are assessed on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Item scores are averaged to create composite and subscale scores with high scores indicative of higher levels of investment in appearance.

Research with the ASI-R indicates excellent internal consistency for the 20-item composite ( $\alpha = .88$ ; Cash et al., 2004), as well as the self-evaluative salience ( $\alpha = .82 - .86$ ) and motivational salience ( $\alpha = .77 - .90$ ) subscales (Cash et al., 2004; Giovannelli, Cash, Henson, & Engle, 2008; Lamarche & Gammage, 2012). The authors reported that ASI-R composite and

subscale scores are positively correlated with various measures of cognitive, affective, and behavioural aspects of body image including internalization of the thin ideal ( $r = .44 - .64$ ), self-ideal appearance discrepancies ( $r = .25 - .60$ ), and appearance dissatisfaction ( $r = .32 - .67$ ).

Consistent with self-evaluative salience being more dysfunctional than motivational salience, these correlations are stronger for self-evaluative salience than for motivational salience. In the current study, the ASI-R demonstrated good internal consistency for the total scale ( $\alpha = .87$ ), as well as the self-evaluative ( $\alpha = .82$ ) and motivational ( $\alpha = .83$ ) salience subscales.

### **Dependent Variables**

**State body satisfaction.** State body satisfaction was assessed using the 6-item Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002). Items assess appearance satisfaction and judgements of attractiveness relative to how they normally feel and compared to other people. Items are scored on 9-point Likert scales and averaged with lower scores indicative of greater dissatisfaction with one's appearance. Research by Cash and colleagues (2002) indicates that the BISS is sensitive to effects of an experimental manipulation designed to evoke body dissatisfaction.

The authors of the scale report good internal consistency with Chronbach's  $\alpha$  ranging from .77 to .90 (Cash et al., 2002). The authors also reported good convergent validity, as indicated by the positive correlation,  $r = .77$ , between scores on the BISS and a trait measure of body dissatisfaction - the Body Areas Satisfaction Subscale of the Multidimensional Body-Self Relations Questionnaire (Brown, Cash, & Mikulka, 1990). In the current study, the BISS demonstrated excellent internal consistency,  $\alpha = .87$ .

**State self esteem.** State self-esteem was assessed using the 20-item State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991). The SSES includes three subscales assessing

performance, social, and appearance self-esteem. Items are scored on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*extremely*) and summed to create a total composite and subscale scores, with higher scores indicating better self-esteem. Research in undergraduate populations indicates that it is sensitive to changes in self-esteem resulting from experimental manipulations (Bardone-Cone & Cass, 2007; Heatherton & Polivy, 1991; Ridolfi et al., 2011; Tiggemann & Zaccardo, 2015). Only the appearance self-esteem scale was analyzed in the current study.

Research supports excellent internal consistency in undergraduate populations with Chronbach's  $\alpha$  ranging from .82 to .91 (Bardone-Cone & Cass, 2007; Heatherton & Polivy, 1991; Ridolfi et al., 2011; Tiggemann & Zaccardo, 2015). The authors also reported good convergent validity as indicated by a strong correlation between SSES scores and trait self-esteem, as measured by the RSES ( $r = .72$ ). The appearance subscale also correlates positively with body dissatisfaction as measured by an ideal figure selection task ( $r = .72$ ). In the current study, the appearance subscale demonstrated excellent internal consistency,  $\alpha = .87$ .

**State affect.** State affect was assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item measure with two 10-items scales reflecting positive and negative affect, respectively. When used as a state measure, participants are asked to indicate how much they are feeling each of the listed emotions "*right now, in this moment.*" Each item is rated on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*very much*). The ten items from each scale are summed to create two total scores with higher scores indicative of more positive or negative affect. Research demonstrates that that PANAS is sensitive to experimental manipulations and is reliable as a measure of acute changes in affect (Watson et al., 1988).

When used as a state measure, the authors report excellent internal consistency, with Chronbach's  $\alpha = .89$  for the PA scale and  $\alpha = .85$  for the NA scale (Watson et al., 1988). Results from later studies of the effect of media exposure have supported similar, if not higher levels of internal consistency (Bardone-Cone & Cass, 2007; Ip & Jarry, 2008). Watson and colleagues (1988) also found support for convergent validity. Scores on the NA scale correlate with measures of depressive symptoms, ranging from  $r = .56$  to  $r = .58$ ; state anxiety,  $r = .51$ ; and general psychological distress, ranging from  $r = .65$  to  $r = .74$ . As would be expected, scores on the PA subscale negatively correlate with each of these measures of psychological well-being. In the current study, the positive ( $\alpha = .91$ ) and negative ( $\alpha = .90$ ) affect scales demonstrated excellent internal consistency.

**Theory of planned behaviour.** No standardized measures of the theory of planned behaviour are consistently used in the literature. Measures developed by Conner, Norman, and Bell (2002) and Povey and colleagues (2000) were used to develop the measure to be used in the proposed research. Adaptations were made to these scales as necessary to assess the behaviours of interest. Both of these previous measures have shown generally good to excellent internal consistency (Chronbach's  $\alpha = .73$  -.95).

For the purpose of the present research, all aspects of the theory of planned behaviour were assessed for eating healthily, exercising more frequently, attempting to lose weight, and travelling but only responses related to the first three behaviours will be analysed. Healthy eating was not defined so that participants could respond based on their personal definition, accounting for any dietary needs and preferences (e.g., vegetarianism, celiac/gluten-free). Scores for each subscale and behaviour were averaged separately. Analyses of between-group

differences were conducted only for the effect of condition on the intention subscale for each of the three health behaviours.

**Intention.** Intent was assessed by a series of four items per behaviour modified from Conner and colleagues (2002). For each behaviour, items will be rated on 7-point bipolar scales ranging from low to absent intentions (-3) to very strong intentions (+3). For example, “*I intend to eat a healthy diet in the future*” was rated on a scale from -3 (*definitely do not*) to +3 (*definitely do*). In the current study, Chronbach’s alpha was .86 for intent to eat healthily, .87 for intent to exercise more frequently, and .96 for intent to attempt to lose weight.

**Attitude.** Attitudes towards each of the behaviours was assessed using a series of six semantic differentials. Items were rated on a 7-point bipolar scale from negative (-3) to positive attitudes (+3). For example, “*For me, exercising more frequently would be/is...*” was rated on each of the following dimensions: *unpleasant-pleasant*, *unenjoyable-enjoyable*, *bad-good*, and *unnecessary-necessary*. More negative scores indicate less favourable attitudes towards the given behaviour. In the current study, Chronbach’s alpha was .74 for attitudes towards eating healthily, .80 for attitudes towards exercising more frequently, and .91 for attitudes towards attempting to lose weight.

**Norms.** Descriptive norms were scored on a 7-point Likert scale ranging from 1 (*Never*) to 7 (*Always*). Injunctive norms were rated on a 7-point bipolar scale ranging from -3 (*Strongly Disapprove*) to +3 (*Strongly Approve*). These groups are romantic partner, parents, close friends, peers and acquaintances, health experts, and online friends/people I follow. These groups are based on the work of Povey and colleagues (2000) with three modifications. First, since Povey and colleagues studied adults, ‘children’ was replaced with ‘parents’ and ‘peers and acquaintances’ replaced ‘colleagues’. Second, online friends/people I follow was added to assess

SNSs as a source of norms. Third, “*people who are important to me*” and “*my doctor*” were removed for the sake of parsimony. Povey and colleagues (2002) found good internal consistency ( $\alpha = .80$ ). In the current study, Chronbach’s alpha for descriptive norms was between .70 for eating healthily and .85 for attempting to lose weight. For injunctive norms, Chronbach’s alpha was .81 for both eating healthily and exercising more frequently and was .92 for attempting to lose weight.

***Perceived behavioural control (PBC).*** PBC was assessed using 5 items rated on a 7-point unipolar scale (1 = *low PBC*, 7 = *high PBC*). For example, “*how confident are you that you could eat a healthy diet if you wanted to?*” was scored from ‘*not at all confident*’ (1) to ‘*extremely confident*’ (7). In the current study, Chronbach’s alpha was .68 for attempting to lose weight, .76 for exercising more frequently, and .78 for eating healthily.

### **Group Equivalence Variables**

Several variables were measured to ensure there were no pre-existing differences between the experimental groups that may account for experimental effects. These variables were SNS use, depressive symptoms, body mass index, and trait self-esteem.

**Demographics.** Basic demographic information, including age, ethnicity, and educational background was gathered using a demographics questionnaire.

**SNS use.** As discussed previously, SNS use is correlated with body dissatisfaction, negative affect, and self-esteem. To distinguish the effect of everyday SNS use and past exposure to fitspiration and thinspiration from the effect of the experimental manipulation, a detailed SNS use questionnaire was developed for the proposed research. First, participants were asked to indicate how often they use a variety of SNSs, the approximate duration of use per day of each of these SNSs, and how they typically access SNSs. Second, participants were asked to



indicate how often they engage in a variety of activities on SNSs using a 5-point Likert scale ranging from 1 = *Never* to 5 = *Often*. Third, participants were asked to indicate the type of content they follow or would follow on Instagram, for example, *health and fitness* or *celebrities and models*, and how often they and other people they know post a variety of types of content, including fitness and food-related photos.

**Body Mass Index (BMI).** Body mass index is a scaled measure of body weight according to height. BMI is calculated by dividing body mass, in kilograms, by height, in metres squared. Although less precise than laboratory measures, online self-reported and objectively measured height and weight are highly correlated,  $r = .98$  in young adults (Pursey, Burrows, Stanwell, & Collins, 2014). Moreover, participants were asked to report their height and weight before viewing the images and were randomly assigned to a condition, which should have reduced the risk for systematic biases in reporting.

**Beck Depression Inventory-Second Edition (BDI-II).** The BDI-II (Beck, Steer, Ball, & Ranieri, 1996) is a 21-item self-report measure of the severity of depressive symptoms. Specifically, items are designed to evaluate the intensity of affective, cognitive, and neuro-vegetative symptoms of depression in adults. Items are rated on a 4-point Likert scale, with 0 indicating an absence of symptoms and 3 indicating a high degree of symptom intensity. Item scores are summed to obtain a total score, where a higher total score is indicative of a higher level of depressive symptoms.

Among undergraduate samples, the BDI-II has shown excellent internal consistency in both psychiatric outpatients, Chronbach's  $\alpha = .93$  (Beck et al., 1996) and college undergraduates, Chronbach's  $\alpha = .91$  (Dozois, Dobson, & Ahnberg, 1998). Convergent validity also has been demonstrated, indicating that scores on the BDI-II were positively correlated,  $r = .93$ , with scores

on the original BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the Hamilton Rating Scale for Depression,  $r = .71$  (HAM-D; Dozois et al., 1998; Hamilton, 1960). In the current study, the BDI demonstrated excellent internal consistency,  $\alpha = .93$ .

**Rosenberg Self-Esteem Scale (RSES).** Global trait self-esteem was measured using the 10-item RSES (Rosenberg, 1965; 1979). Items are scored on a 4-point Likert scale (1 = *strongly agree*, 4 = *stronger disagree*) and summed to create a total score with higher scores indicating better self-esteem.

Research by Rosenberg (1965) indicated excellent internal consistency, Chronbach's  $\alpha = .92$ . Research by Demo (1985) supports convergent validity, indicating that scores on the RSES were positively correlated,  $r = .66$ , with scores on the Coopersmith Self-Esteem Inventory (Coppersmith, 1967). In the current study, the RSES demonstrated excellent internal consistency,  $\alpha = .91$ .

### Supplemental Data

**Inspirational effects.** To ensure that the images had the desired effect, participants were asked to rate their level of inspiration to exercise to increase their fitness, exercise to improve their muscle tone, eat healthily, attempt to lose weight, and travel using a 7-point Likert scale ranging from “*not at all inspired*” (1) to “*very much inspired*” (7). These questions were adapted from those used by Tiggemann and Zaccardo (2015). Specifically, inspiration to attempt to lose weight and to exercise to increase muscle tone were added and inspiration to increase fitness was modified to read “*exercise to increase fitness.*”

**Validity checks.** A total of four validity checks were used to screen for careless responding. As discussed above, two images in each condition asked a specific question, for example, “*what is the colour of the sports bra that this person is wearing?*” To ensure

participants were reading the questionnaire items, the ASI-R and CTS each had an added item that instructed participants to select a particular response. For example, “*If you have read this statement, please select ‘Mostly Disagree’.*”

### Procedure

Participants were invited to complete an online study on recreational Instagram use and mental health. They were instructed to complete the study in a quiet room at a time that they may focus on the study and complete it in a single sitting. To control for order effects, after providing informed consent, participants completed the questionnaires in randomized order within the following four blocks (refer to Figure 4). In the first block, participants completed the BDI-II, RSES, SNS Use Questionnaire, and demographics questionnaire. In the second block, participants were randomly directed to one of three series of photos, as outlined above. Photos were embedded in the survey and presented in randomized order for a minimum of 5 seconds each. They were asked to rate the quality of each photo to encourage them to pay attention to the photos. In the third block, participants completed the BISS, SSES, PANAS as well as the state appearance comparison measures and the inspiration questions. In the fourth block, participants completed measures of trait social comparison, appearance investment, and theory of planned behaviour variables.

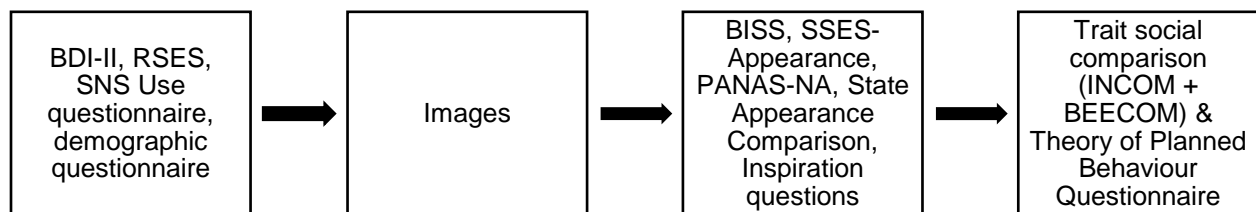


Figure 4. Flow of questionnaire administration by blocks.

Note: Questionnaires were administered in computer-randomized order within each block.

## RESULTS

### Approach to Data Analysis

All analyses were conducted using Statistical Package for Social Science (SPSS) version 22.0 for Windows. After screening the data for missing values, the data were screened to ensure the assumptions of ANOVA and regression analyses were satisfied. Next, to ensure that random assignment was effective, the data were checked for significant differences between conditions on BMI, depressive symptoms, trait self-esteem, and demographic variables (see “Effectiveness of Random Assignment”). Per Wilkinson and American Psychological Association Task Force on Statistical Inference (1999) recommendations, significance testing relied primarily on confidence intervals (CIs) where possible. Specifically, results were considered significant if the confidence interval did not contain 0 (Hayes, 2013).

A series of one-way three-level analysis of variance (ANOVA) with planned contrasts were used to evaluate whether those who viewed fitspiration and thinspiration reported lower state appearance self-esteem, state body satisfaction, and state negative affect relative to those who viewed travel images (Hypothesis 1a). Tests of equivalence, as outlined by Rodgers and colleagues (1993), were used to test the hypothesis that fitspiration and thinspiration would have similar effects on these variables (Hypothesis 1b). Hayes’ (2013) PROCESS macro for SPSS version 2.16.3 then was used to test the moderated-mediation models for each of the outcome variables, where the effect of condition on the relevant dependent variable was significant (i.e., Hypotheses 2-4). Lastly, a series of one-way three-level ANOVAs were used to test the hypothesis that viewing fitspiration and thinspiration would prompt greater intent to eat healthily, exercise more frequently, and attempt to lose weight (Hypothesis 5).

## Data Inspection

### Missing and Invalid Data

Data for 8 participants were removed from analyses because these participants failed more than two validity checks ( $n = 4$ ), viewed photos from multiple experimental conditions ( $n = 3$ ; i.e., restarted the survey after viewing the photos), or, due to technical error, did not view a complete set of photos ( $n = 1$ ). One participant did not complete the BEECOM, and was removed from relevant regression analyses. Sixty-three participants declined reporting their height and/or weight for BMI calculations, but the number of participants who declined reporting was approximately equal across conditions and BMI was used only to confirm equivalence between groups. Missing values analyses indicated no other missing data.

### Data Cleaning

**Assumptions of multiple regression analysis (MRA).** Prior to main analyses, the data were screened to ensure the assumptions of multiple regression were tenable. First, the assumption of adequate sample size was addressed. Simulation studies suggest 75-100 participants per condition is sufficient to attain 80% power, with regression coefficients greater than .30, and  $\alpha = .05$  (Preacher, Rucker, & Hayes, 2007). This is similar to the value obtained using Green's (1991) rule of thumb for MRA, which indicated 84 participants per condition were necessary. Thus, with at least 104 participants in each condition, the sample size was deemed adequate.

As outliers may bias the regression equation (Tabachnik & Fidell, 2007), the data were screened for univariate outliers using scatterplots and z-scores. Cases with z-scores exceeding  $\pm 3$  standard deviations of the distribution mean for a given variable were Winsorized, such that raw scores for outliers were reduced to one unit larger or smaller than the next most extreme

score in the distribution of the respective variable (Tabachnik & Fidell, 2007). Outliers were identified and Winsorized for the PANAS negative affect subscale ( $n = 3$ ), ASI-R self-evaluative salience subscale ( $n = 2$ ), INCOM ( $n = 2$ ), BDI-II ( $n = 2$ ), RSES ( $n = 1$ ), and BMI ( $n = 7$ ). The data were subsequently screened for multivariate outliers and influential cases for each regression separately. Mahalanobis scores were calculated to detect multivariate outliers, as indicated by values greater than 18.47<sup>4</sup>. To reduce data loss, these cases were examined individually and were removed from analyses only if they also were identified as influential observations, as indicated by a Cook's D value greater than 1 (Cohen, Cohen, West, & Aiken, 2003). No such cases were identified.

Examination of bivariate scatterplots for all pairs of standardized residuals and standardized predicted values indicated that the assumptions of linearity and homoscedasticity of errors were satisfied. Errors also should be independent and normally distributed. Durbin Watson statistics should be approximately 2 to confirm independence of errors (Cohen et al., 2003). Durbin-Watson statistics in the current study ranged from 1.84 to 2.02, indicating this assumption has been satisfied. Inspection of Q-Q plots and histograms suggested that errors were approximately normally distributed.

MRA also assumes the absence of multicollinearity and singularity between the predictor variables. Correlations between predictor variables were all below the recommended threshold of  $|\ .90|$  (refer to Table 2; Cohen et al., 2003), suggesting the absence of multicollinearity. Additionally, variance inflation factor values were less than 10 and tolerance values were greater than  $\ .10$  in all analyses, confirming the absence of multicollinearity and singularity (Cohen et al., 2003).

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<sup>4</sup> based on 4 degrees of freedom and  $\alpha = .001$

Table 2

*Zero-Order Correlations (Pearson) for Variables Used in Regression Analyses and Data Screening*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. State Appearance Comparison	-	-.40**	.27**	-.39**	.08	.39**	.22**	-.21**	.29**	.35**	.37**	.37**	.03	.17**
2. State Body Satisfaction		-	-.40**	.84**	-.42**	-.41**	-.47**	.58**	-.29**	-.51**	-.54**	-.51**	.01	-.12*
3. State Negative Affect			-	-.45**	.10	.23**	.53**	-.46**	.15**	.24**	.22**	.28**	.05	.17**
4. State Appearance Self-Esteem				-	-.39**	-.47**	-.59**	.69**	-.36**	-.53**	-.57**	-.50**	-.02	-.11*
5. Body Mass Index					-	.10	.05	-.14*	-.07	.24**	.20**	.20**	-.14*	-.03
6. Self-Evaluative Salience						-	.43**	-.38**	.58**	.48**	.63**	.47**	.02	.04
7. Depressive Symptoms							-	-.69**	.36**	.29**	.35**	.29**	.00	.09
8. Trait Self-Esteem								-	-.29**	-.31**	-.35**	-.30**	.02	-.02
9. Trait Social Comparison - Global									-	.42**	.58**	.39**	.02	.06
10. Trait Social Comparison - Eating										-	.82**	.81**	-.02	.13*
11. Trait Social Comparison – Body											-	.77**	.01	.13*
12. Trait Social Comparison - Exercise												-	-.02	.12*
13. Photo Rating													-	.05
14. SNS use														-

\* $p < .05$ \*\* $p < .01$

Lastly, it is assumed that all variables are measured without error; thus, only measures with high reliability were selected for the proposed study. To further ensure this assumption has been met Cronbach's alpha was calculated for all measures used in the proposed research (refer to "Measures" section for details).

**Assumptions of ANOVA.** Specific to ANOVA, variances between groups should be approximately equal, as indicated by a non-significant ( $p > 0.05$ ) Levene's test. Levene's test was significant for state social comparison, self-evaluative salience, general social comparison tendency, and exercise-based social comparison tendency ( $p < .05$ ). However, Cohen and colleagues (2003) note that given approximately equal group sizes, ANOVA is generally robust to violations of the assumption of homogeneity of variance.

Second, outcome variables should be normally distributed within groups. Kolmogorov-Smirnov tests indicated that scores on the PANAS, State Appearance Comparison Scale, RSES, BDI-II, and BEECOM-Exercise were not normally distributed,  $KS$  values ranged from .09 to .23,  $p < .05$ . However, skewness and kurtosis values were within acceptable limits of  $\pm 2$  and  $\pm 3$  (Tabachnik & Fidell, 2007), respectively, and histograms and Q-Q plots did not suggest significant non-normality.

Lastly, it is assumed that outcome variables are measured on at least an interval scale. Although, the scales used in the proposed research are strictly speaking ordinal scales, it is common practice to treat these scales as continuous (Tabachnik & Fidell, 2007).

### **Descriptive Statistics**

Descriptive statistics for all study variables by experimental condition are presented in Table 3.



Table 3

*Summary of Means and Standard Deviations for Scores on Study Variables as a Function of Experimental Condition*

Measure	Travel (n = 104)		Thinspiration (n = 111)		Fitspiration (n = 116)	
	Mean	SD	Mean	SD	Mean	SD
<i>Equivalence Variables</i>						
Depressive Symptoms (BDI-II)	12.58	10.26	13.94	10.98	13.63	10.26
Trait global self-esteem (RSES)	19.59	5.57	18.72	5.70	18.82	5.60
Body Mass Index (BMI)	22.81 <sup>b</sup>	3.66 <sup>b</sup>	23.39 <sup>c</sup>	4.23 <sup>c</sup>	23.74 <sup>d</sup>	4.93 <sup>d</sup>
Rating of photo quality <sup>a</sup>	5.28	2.08	3.90	1.80	4.28	2.33
<i>Moderator Variables</i>						
Trait Social Comparison – Global (INCOM)	3.43	.64	3.60	.52	3.56	.47
Trait Body Comparison - (BEECOM- Body)	24.19	9.43	25.80 <sup>e</sup>	9.35	25.48	7.77
Trait Social Comparison - Exercise (BEECOM-Exercise)	17.67	8.25	20.71 <sup>e</sup>	10.35	19.93	8.53
Trait Social Comparison - Eating (BEECOM-Eating)	21.34	8.51	22.34 <sup>e</sup>	9.81	21.69	8.54
Self-Evaluative Saliency (ASI-R SES)	3.87	.66	4.03	.76	3.98	.56
<i>Mediator Variables</i>						
State Appearance Comparison	3.34	2.33	4.16	2.17	4.80	1.94
<i>Outcome Variables</i>						
State Appearance Self-Esteem (SSES- Appearance)	19.59	5.02	18.31	5.54	17.50	5.02
State Body Satisfaction (BISS)	5.33	1.60	4.71	1.78	4.46	1.60
State Negative Affect (PANAS-NA)	16.47	6.43	17.39	7.69	17.99	7.21

<sup>a</sup> Ratings of photo quality (e.g., focus, colouring, and layout) are based on ratings for all photos participants viewed in that condition; thus, in the fitspiration and thinspiration conditions this included ratings of the 8 travel images

<sup>b</sup> n = 80. <sup>c</sup> n = 92. <sup>d</sup> n = 95. <sup>e</sup> n = 110, as noted, one participant did not complete the BEECOM

### **Effectiveness of Random Assignment**

Given that depressive symptoms, global trait self-esteem, and BMI have been shown to be associated with body satisfaction, a series of ANOVAs were used prior to hypothesis testing to confirm that there were no pre-existing differences between participants in each condition. Groups also were compared to ensure they did not differ in terms of SNS use or demographic characteristics including age, ethnicity, number of psychology courses completed, and the number of years of university education completed. Results indicated no significant differences between conditions on any of these variables ( $p > .10$ ). Thus, random assignment was considered effective.

### **Photo Ratings**

As a final check, the mean rating for the quality of the photos used in each condition was compared using a one-way three-level ANOVA. Results indicated significant differences between conditions on ratings of photo quality ( $F(2, 326) = 12.55, p < .01, \eta^2 = .07$ ). Examination of post-hoc comparisons, indicated that travel photos were rated more positively (i.e., higher quality) than fitspiration and thinspiration photos,  $p < .001$ , which were not statistically different,  $p = .46$ . However, as shown in Table 2, ratings were not correlated with any of the outcome variables ( $ps > .05$ ). Thus, it is unlikely that the effect of the images is attributable to these differences in ratings of image quality.

## **Main Analyses**

### **Effect of Fitspiration and Thinspiration vs. Control**

As mentioned, Hypothesis 1a was tested using a series of one-way three-level ANOVAs with image condition as the independent variable and state body satisfaction, appearance self-esteem, and negative affect as the dependent variables. For each ANOVA, two linear contrasts

were planned to test the specific hypothesis that viewing fitspiration and thinspiration would result in lower body satisfaction and appearance self-esteem, as well as higher negative affect. When conducting linear contrasts, a contrast coefficient of 0 indicates that the condition should not be included in the contrast. Therefore, the conditions that are to be compared are coded as a combination of negative and positive integers that sum to zero. Thus, the relevant experimental condition, fitspiration or thinspiration, was assigned a contrast coefficient of 1, the travel condition -1, and the remaining experimental condition 0. Given that these contrasts were planned a priori, no adjustment was made to correct familywise error.

**Body satisfaction.** As predicted, there was a significant effect of condition on body satisfaction,  $F(2, 328) = 7.77, p = .01, \eta_p^2 = .04$  (see Figure 5). Examination of the planned contrasts confirmed that participants in the fitspiration ( $t(218) = -4.01, p < .01, d = .54, 95\% CI_d [.27, .81]$ ) and thinspiration ( $t(213) = -2.65, p = .01, d = .36, 95\% CI_d [.09, .63]$ ) conditions reported significantly lower appearance satisfaction than did participants in the travel condition.

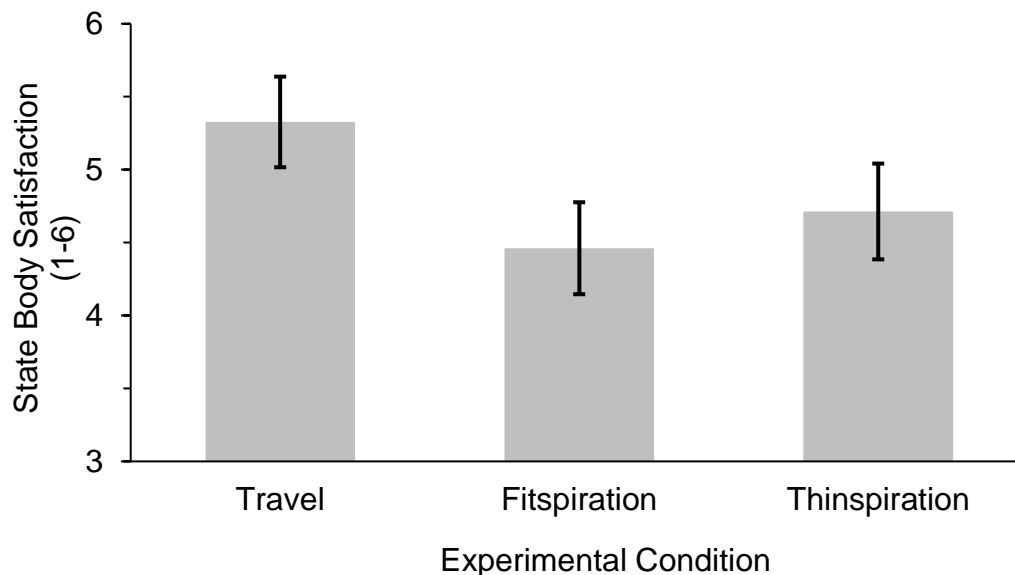


Figure 5. State body satisfaction by experimental condition. Error bars represent the 95% CI for each mean

**Appearance self-esteem.** As with body satisfaction, there was a significant effect of condition on appearance self-esteem,  $F(2, 328) = 4.46, p = .01, \eta_p^2 = .03$  (see Figure 6).

Participants in the fitspiration condition reported lower appearance self-esteem relative to those in the travel condition ( $t(218) = -3.08, p < .01, d = .42, 95\%CI_d [.15, .68]$ ). Although participants in the thinspiration condition also reported lower appearance self-esteem than did participants in the travel condition, this difference was not statistically significant ( $t(213) = -1.77, p = .08, d = .24, 95\%CI_d [-.03, .51]$ ).

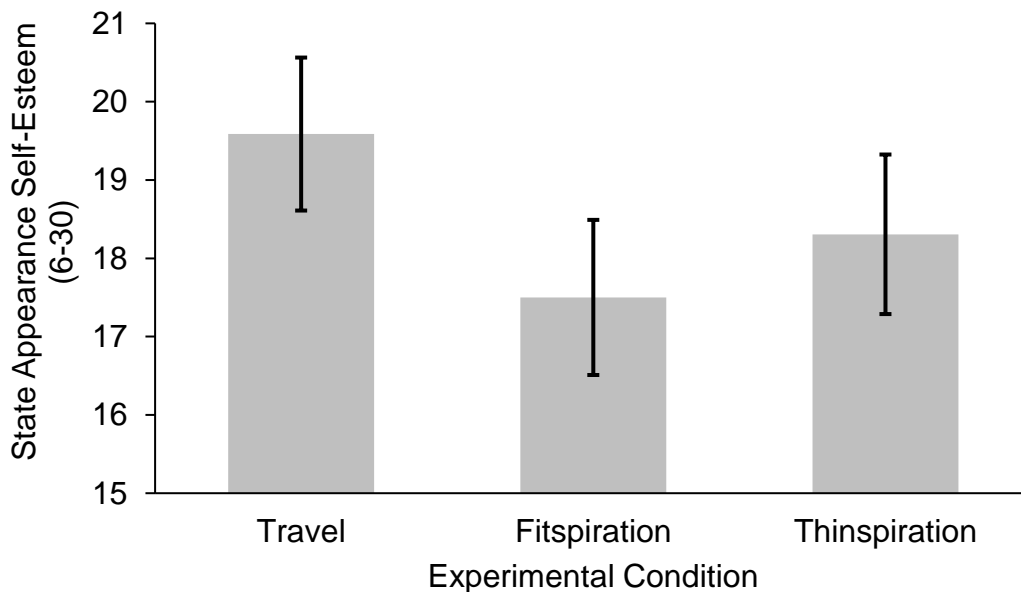


Figure 6. State appearance self-esteem by experimental condition. Error bars represent the 95% CI for each mean.

**Negative affect.** Contrary to the hypothesis, there was no significant effect of condition on negative affect ( $F(2, 328) = 1.25, p = .29, \eta_p^2 = .01$ ; Refer to Figure 7). Examination of results from the planned contrasts confirmed that compared to those who viewed travel images, neither those who viewed fitspiration ( $t(218) = 1.64, p = .10, d = .22, 95\%CI_d [-.04, .49]$ ) nor those who viewed thinspiration ( $t(213) = .94, p = .35, d = .13, 95\%CI_d [-.14, .40]$ ) reported significantly lower negative affect.

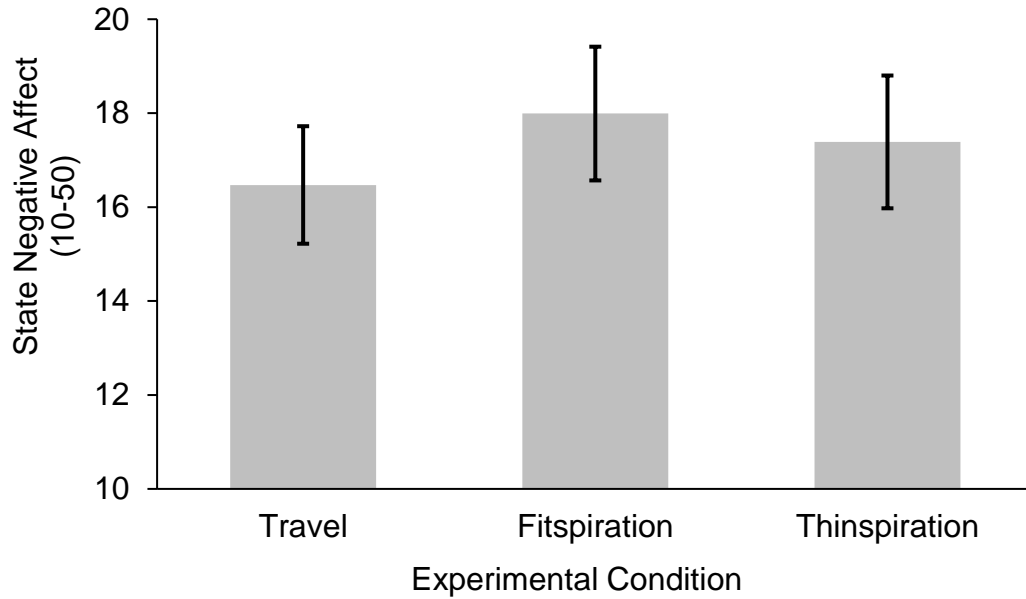


Figure 7. State negative affect by experimental condition. Error bars represent the 95% CI for each mean.

### Tests of Equivalence

To test Hypothesis 1b, that the effects of fitspiration and thinspiration on state body satisfaction, appearance self-esteem, and negative affect would be comparable, tests of equivalence, as outlined by Tryon (2001) and Rodgers and colleagues (1993), were conducted. Specifically, a difference of  $\pm 20\%$  was set as the minimum significant difference,  $\Delta$ . A 90% confidence interval for the mean difference between the effect of thinspiration and fitspiration on each of the outcome variables,  $\delta$ , was constructed using a pair of one-sided  $t$ -tests, each with  $\alpha$  set at .05. If the confidence interval for  $\delta$  does not contain  $\Delta$ , the effect of fitspiration and thinspiration on the relevant outcome is said to be equivalent. This approach was selected because the absence of a significant difference, does not necessarily indicate equivalence (Tryon, 2001). Therefore, a non-significant  $t$ -test is insufficient, and a formal test of equivalence is more appropriate.

Results of the initial  $t$ -tests were not significant, as indicated by the fact that the confidence interval includes 0. Moreover, for each of the outcome variables, the 90% confidence interval for  $\delta$  did not include  $\Delta$ . Thus, as hypothesized, the effects of fitspiration and thinspiration on the outcome variables were statistically equivalent (see Table 4).

Table 4

*Tests of equivalence for the effect of fitspiration and thinspiration on body satisfaction, appearance self-esteem, and negative affect*

Variable	$\Delta$	90% CI $_{\delta}$		$t$	$d$
State appearance self-esteem (SSES-Appearance)	$\pm 3.50$	-1.96	.35	-1.15	.08
State body satisfaction (BISS)	$\pm .89$	-.62	.12	-1.12	.15
State negative affect (PANAS-NA)	$\pm 3.60$	-1.03	2.24	.61	.15

### Regression Analyses

To address how and for whom viewing fitspiration and thinspiration were associated with reduced body satisfaction and appearance self-esteem, a series of mediation and moderated-mediation models were tested using Hayes' (2013) PROCESS macro version 2.16.3 for SPSS. PROCESS is a regression-based bootstrap analysis that is considered more accurate than traditional hierarchical methods such as the Baron and Kenny (1985) approach. As outlined by Preacher and colleagues (2007), bootstrapping with the PROCESS macro offers two key advantages. First, the assumptions of MRA, except for linearity of relationships and independence of observations, are rendered largely unimportant because confidence intervals are empirically derived rather than based on the assumption of a normal distribution. The second key advantage of the macro is that it yields more stable estimates of regression coefficients relative to standard multiple regression analyses, which are based on the assumption that data for all variables are normally distributed. Indeed, research demonstrates that regression coefficients

and standard errors generated by PROCESS are almost identical to those derived from more sophisticated statistical approaches, such as structural equation modelling (Hayes, Montoya, & Rockwood, 2017).

In the present study, reported regression coefficients and standard errors are based on analyses of 10 000 bias-corrected bootstrapped samples. As discussed above, variables are considered significant predictors of the criterion variable if the bootstrap estimated confidence interval for the regression coefficient does not include 0.

Given that PROCESS does not allow simultaneous testing of multiple criterion variables, a separate set of analyses was conducted for each criterion variable. Because there was no significant effect of condition on state negative affect, regression analyses were not conducted for this criterion variable. Similarly, regression analyses for the effect of thinspiration on appearance self-esteem were not conducted given that, as discussed, the effect of viewing thinspiration on appearance self-esteem did not differ significantly from the effect of viewing travel images. In all analyses, condition was dummy coded such that the relevant experimental condition, fitspiration or thinspiration, was coded 1 and the travel condition was coded 0. Thus, a negative regression coefficient indicates that viewing fitspiration or thinspiration resulted in a lower score on the criterion variable, and a positive coefficient indicates an increase in the values of the criterion variable. Mediation analyses were conducted first, followed by analyses of moderated-mediation for each proposed moderator, as described below.

**Mediation by state appearance comparison.** To test the hypothesis that state appearance comparison would mediate the effect of fitspiration and thinspiration on body satisfaction and appearance self-esteem, separate regression analyses were conducted for each criterion and condition, where relevant. Rather than computing the effect of condition before

and after adding the mediator to the regression model, all predictors are added simultaneously and PROCESS computes estimates of the direct, indirect, and total effects with bootstrapped confidence intervals and standard errors for each. Prior to analyses, the data was split into separate files containing data from either the fitspiration and travel conditions, or from the thinspiration and travel conditions, and dummy coded as described above.

***Fitspiration vs. Control.*** Regression coefficients, standard errors, and tests of significance are summarized in Table 5.

Table 5

*Effect of Fitspiration on State Body Satisfaction and State Appearance Self-Esteem as Mediated by State Appearance Comparison*

	<i>b</i>	<i>SE</i>	<i>t</i>	<i>95% CI</i>
<i>Outcome: State Appearance Comparison (M; 1-7)</i>				
Condition (a)	1.46**	.29	5.07	.89, 2.03
<i>Outcome: State Body Satisfaction (1-9)</i>				
State Appearance Comparison (b)	-.20**	.05	-4.12	-.30, -.10
Condition (c')	-.57*	.22	-2.60	-1.00, -.14
Total Effect (c)	-.87**	.22	-4.01	-1.29, -.44
Indirect Effect (ab)	-.29	.09	-	-.52, -.15
<i>Outcome: State Appearance Self-Esteem (6-30)</i>				
State Appearance Comparison (b)	-.65**	.15	-4.27	-.96, -.35
Condition (c')	-1.13	.69	-1.64	-2.49, .23
Total Effect (c)	-2.08**	.68	-3.08	-3.42, -.75
Indirect Effect (ab)	-.96	.29	-	-1.64, -.48

\*  $p < .05$

\*\*  $p < .01$

*State body satisfaction.* Results of the regression analysis partially support the hypothesis that state appearance comparison mediates the effect of viewing fitspiration on state body satisfaction. As shown in Figure 8, participants who viewed fitspiration engaged in more



appearance comparisons ( $a$  path,  $R^2 = .10$ ) and reported lower body satisfaction ( $c/c'$  paths) than those who viewed travel images. Greater state appearance comparison in turn resulted in reduced body satisfaction ( $b$  path). The direct effect of fitspiration on body satisfaction was significant after accounting for the indirect effect ( $ab$ ), which also was significant and accounted for one third (34%) of the total effect ( $c$ ,  $R^2 = .15$ ) on body satisfaction. The direct effect ( $c'$ ) remained significant after accounting for the indirect effect, indicating that the indirect effect accounted for some but not all the effect of fitspiration on body satisfaction.

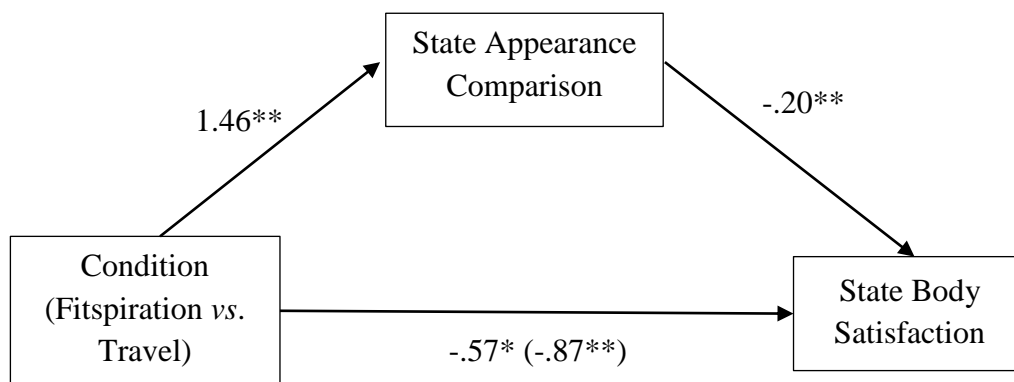


Figure 8. Mediation model for the effect of fitspiration on state body satisfaction via state appearance comparison.

\*  $p < .05$  \*\*  $p < .01$

*State appearance self-esteem.* As predicted, the effect of viewing fitspiration on state appearance self-esteem was mediated by state appearance comparison. Viewing fitspiration evoked greater appearance comparison ( $R^2 = .10$ ), which in turn resulted in lower appearance self-esteem (see Figure 9). The indirect effect was significant, and accounted for nearly half (46%) of the total effect ( $R^2 = .12$ ). In this model, the direct effect was no longer significant after accounting for the indirect effect ( $p = .10$ ). This indicates that the effect of fitspiration on appearance self-esteem is largely explained by the effect on state appearance comparison.

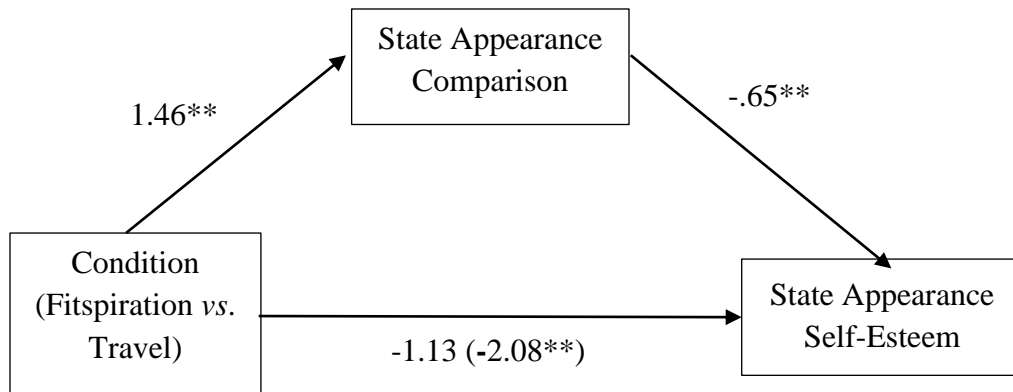


Figure 9. Mediation model for the effect of fitspiration on state appearance self-esteem via state appearance comparison.

\*\*  $p < .01$ .

#### ***Thinspiration vs. control.***

*State body satisfaction.* As shown in Table 6 and Figure 10, results support the hypothesis that the effect of thinspiration on state body satisfaction would be mediated by state appearance comparison. Participants in the thinspiration condition engaged in more appearance comparisons relative to those in the travel condition ( $R^2 = .20$ ). In turn, appearance comparisons resulted in reduced body satisfaction. Combined, condition and state appearance comparison accounted for 23% of the variance in state body satisfaction. The indirect effect via state appearance comparison was significant and accounted for 39% of the total effect.

Table 6

*Effect of Thinspiration on State Body Satisfaction as Mediated by State Appearance Comparison*

	<i>b</i>	<i>SE</i>	<i>t</i>	<i>95% CI</i>
<i>Outcome: State Appearance Comparison (1-7)</i>				
Condition (a)	.82**	.31	2.68	.22, 1.43
<i>Outcome: State Body Satisfaction (1-9)</i>				
State Appearance Comparison (b)	-.29**	.05	-6.09	-.39, -.20
Condition (c')	-.37	.22	-1.72	-.80, .05
<i>Total Effect (c)</i>	-.61**	.23	-2.65	-1.07, -.16
<i>Indirect Effect (ab)</i>	-.24	.10	-	-.46, -.07

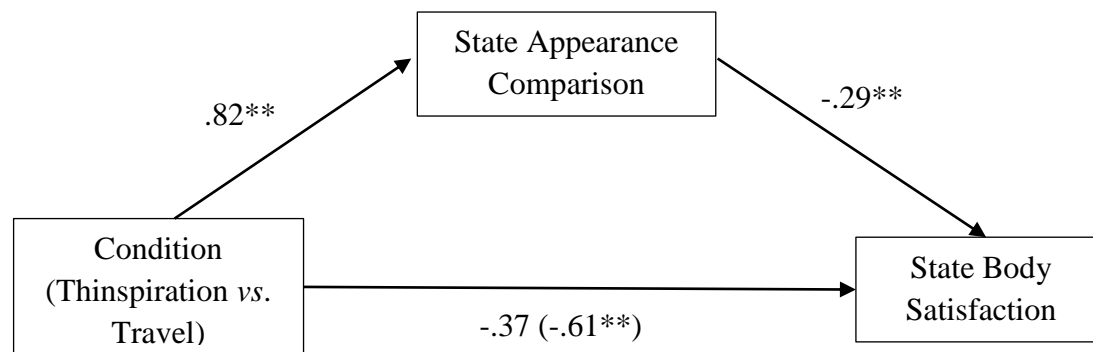
\*\*  $p < .01$ 

Figure 10. Mediation model for indirect effect of thinspiration on state body satisfaction via state appearance comparison.

\*\*  $p < .01$ .

**Moderated-mediation models.** Before reporting the results of the moderated-mediation analyses, a brief outline of how PROCESS performs moderated-mediation follows. First, it should be noted that unlike the stepwise method proposed by Baron and Kenny (1986), consistent with SEM methods, PROCESS effectively omits the first two steps and adds the predictor, moderator, and interaction terms into the model simultaneously.

Also unlike stepwise methods, PROCESS allows for the simultaneous testing of more complex models, such as moderated-mediation. For example, in the present research, the  $a$  path is moderated by a trait social comparison ( $W$ ). However, if the strength of the  $a$  path is contingent on the level of  $W$ , then so too is the indirect effect ( $ab$  path). PROCESS generates an index of moderated-mediation, which is an estimate of how the strength or direction of the indirect effect is contingent on the level of the moderator, as well as the associated bootstrap standard errors and confidence intervals for this estimate. Like moderation analyses in which the effect of the independent variable on the dependent variable is estimated at different values of the moderator, PROCESS estimates the  $ab$  path at values of the mean  $\pm 1$  standard deviation of the moderator. Thus, PROCESS provides a more complex understanding of how each moderator affects not only the mediator, but the entire model.

Recall that trait social comparison and appearance investment for self-definition (self-evaluative salience) were proposed as potential moderators of the effect of fitspiration or thinspiration on state appearance comparison. Additionally, as discussed above, trait social comparison was assessed using both a general measure of trait social comparison (INCOM) and a measure of trait social comparison related to body-, eating-, and exercise (BEECOM). Separate moderated-mediation models were tested for the INCOM and for each of the three subscales of the BEECOM as moderators. Thus, for each criterion, where relevant, five separate moderated-mediation regression analyses were conducted. The basic template for each of these analyses is presented in Figure 11. For each model, the mediator was as follows: Model 1: general trait social comparison, Model 2: trait body comparison, Model 3: trait exercise comparison, Model 4: trait eating comparison, and Model 5: self-evaluative salience. As

recommended by Hayes (2013), given that the predictor (i.e., condition) does not have a meaningful 0, each moderator was mean centred prior to analysis to aid with interpretation.

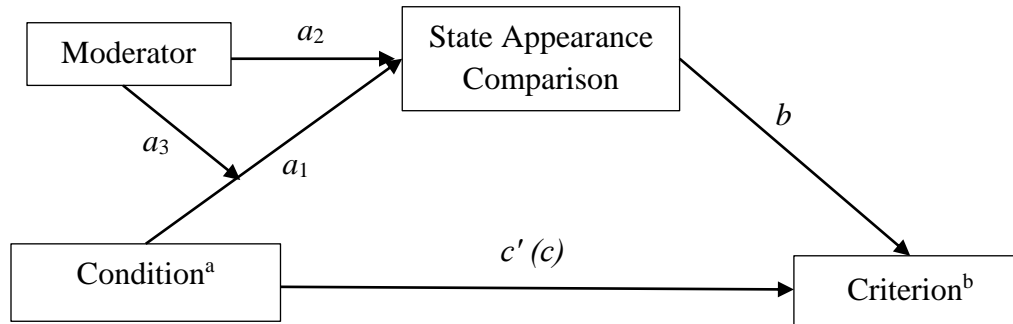


Figure 11. General conceptual model for moderated-mediation models.

Note: Statistically, path  $a_3$  represents the path between the interaction term (Condition  $\times$  Moderator) and state appearance comparison.

<sup>a</sup> Condition is based on the dummy coding scheme described for mediation analyses.

<sup>b</sup> For fitspiration effects models, criterion are state body satisfaction and appearance self-esteem; for thinspiration the only criterion tested was state body satisfaction.

Results are summarized below by condition and moderator. Because the primary question being addressed is whether the strength or direction of the relation between condition and state appearance comparison is dependent on the level of the moderator, results are presented only for the moderation of the  $a$  path. Conditional indirect effects are reported when moderation was significant, as indicated by a significant interaction term and index of moderated-mediation.

***Fitspiration vs. Control.*** Results for all proposed moderators are summarized in Table 7.

Table 7

*Moderation of the Effect of Fitspiration on State Appearance Comparison*

	<i>b</i>	<i>SE</i>	<i>t</i>	<i>95% CI</i>
<i>Model 1</i>				
<i>Moderator: General Trait Social Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	1.35**	.28	4.73	.78, 1.91
INCOM ( <i>a</i> <sub>2</sub> )	.40	.32	1.24	-.23, 1.03
INCOM × Condition ( <i>a</i> <sub>3</sub> )	.88	.52	1.69	-.14, 1.91
<i>Model 2</i>				
<i>Moderator: Trait Body Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	1.36**	.28	4.95	.82, 1.91
BEECOM-Body ( <i>a</i> <sub>2</sub> )	.04	.02	1.94	.00, .08
BEECOM-Body × Condition ( <i>a</i> <sub>3</sub> )	.07*	.03	2.08	.01, .13
<i>Model 3</i>				
<i>Moderator: Trait Exercise Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	1.26**	.28	4.57	.72, 1.80
BEECOM-Exercise ( <i>a</i> <sub>2</sub> )	.08**	.02	3.30	.03, .13
BEECOM-Exercise × Condition ( <i>a</i> <sub>3</sub> )	.01	.03	.25	-.06, .07
<i>Model 4</i>				
<i>Moderator: Trait Eating Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	1.43**	.28	5.20	.89, 1.98
BEECOM-Eating ( <i>a</i> <sub>2</sub> )	.07**	.02	2.98	.03, .12
BEECOM-Eating × Condition ( <i>a</i> <sub>3</sub> )	.01	.03	.33	-.05, .07
<i>Model 5: Self-Evaluative Saliency</i>				
Condition ( <i>a</i> <sub>1</sub> )	1.34**	.27	4.94	.80, 1.87
Self-Evaluative Saliency ( <i>a</i> <sub>2</sub> )	.94**	.30	3.17	.36, 1.53
Self-Evaluative Saliency × Condition ( <i>a</i> <sub>3</sub> )	.66	.44	1.49	-.21, 1.53

Note. INCOM = Iowa-Netherlands Comparison Orientation Measure, general social comparison tendency; BEECOM = Body, Eating, and Exercise Comparison Orientation Measure, measure of body, eating, and exercise specific social comparison tendency; ASI-R SES = Appearance Schemas Inventory Revised, Self-Evaluative Saliency subscale.

\*  $p < .05$ ; \*\*  $p < .01$ ;  $n = 220$

*General trait social comparison (Model 1).* Contrary to hypotheses, general trait social comparison neither predicted ( $p = .21$ ) nor moderated ( $p = .09$ ) the effect of fitspiration on state appearance comparison.

*Trait body comparison (Model 2).* Body comparison tendency did not predict state appearance comparison, but did moderate the effect of fitspiration on state appearance comparison. As expected, individuals who were high on trait body comparison engaged in more appearance comparisons when shown fitspiration than did individuals either lower on trait body comparison or who were shown travel images (see Figure 12). The index of moderated mediation was significant for both state body satisfaction ( $b = -.014$ ,  $SE = .007$ , 95% CI [-.030, -.002]) and state appearance self-esteem ( $b = -.04$ ,  $SE = .02$ , 95% CI [-.009, -.006]). Examination of the indirect effect at each level of trait body comparison indicated that the indirect effect of fitspiration on both state body satisfaction and appearance self-esteem was significant at all levels of trait body comparison, but was stronger at higher levels of trait body comparison.

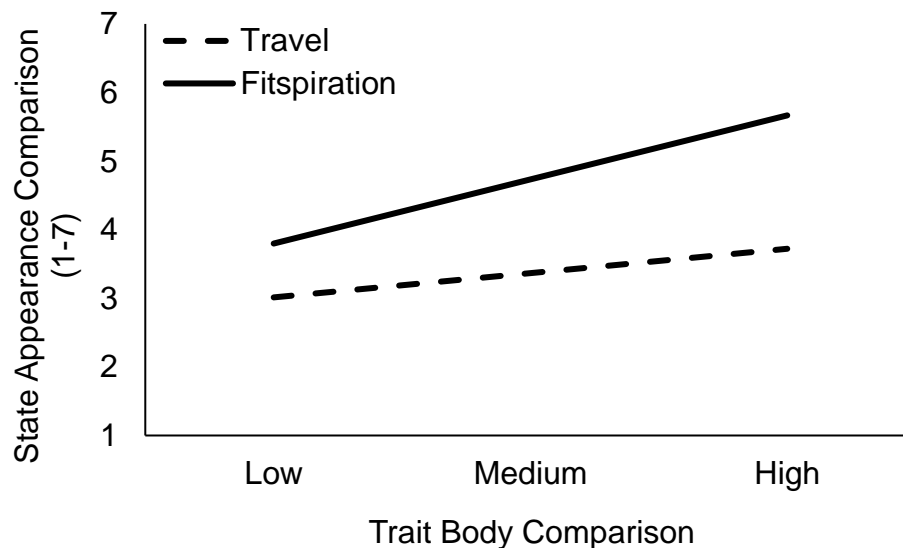


Figure 12. Effect of trait body comparison on state appearance comparison by experimental condition (fitspiration vs. travel).

*Trait exercise comparison (Model 3).* Trait exercise comparison significantly predicted state appearance comparison, indeed condition no longer predicted state appearance comparison when the moderator was included in the model. However, contrary to hypotheses, the interaction between condition and trait exercise comparison was not significant, indicating that trait exercise comparison was not a significant moderator.

*Trait eating comparison (Model 4).* As with Model 3, trait eating comparison predicted greater state appearance comparison, but did not moderate the effect of fitspiration on state appearance comparison.

*Self-evaluative salience (Model 5).* As expected, women who were more highly invested in their appearance for self-definition, as indicated by high scores on the self-evaluative salience subscale of the ASI-R, engaged in more appearance comparisons than their less invested counterparts. However, results did not support self-evaluative salience as a moderator of the effect of fitspiration on state appearance comparison, as indicated by a non-significant interaction between condition and self-evaluative salience.

***Thinspiration vs. Control.*** Results for proposed moderators are summarized in Table 8. Recall that moderated-mediation analyses were conducted for the effect of thinspiration on state body satisfaction only, and that five separate models testing each of the proposed moderators were performed, as described above.



Table 8

*Moderation of the Effect of Thinspiration on State Appearance Comparison*

	<i>b</i>	<i>SE</i>	<i>t</i>	<i>95% CI</i>
<i>Moderator: General Trait Social Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	.63*	.30	2.13	.05, 1.21
INCOM ( <i>a</i> <sub>2</sub> )	.40	.33	1.21	-.25, 1.05
INCOM × Condition ( <i>a</i> <sub>3</sub> )	1.39**	.51	2.72	.38, 2.40
<i>Moderator: Trait Body Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	.67*	.29	2.34	.11, 1.23
BEECOM-Body ( <i>a</i> <sub>2</sub> )	.04	.02	1.90	0, .08
BEECOM-Body × Condition ( <i>a</i> <sub>3</sub> )	.08**	.03	2.69	.02, .14
<i>Moderator: Trait Exercise Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	.54	.29	1.84	-.04, 1.12
BEECOM-Exercise ( <i>a</i> <sub>2</sub> )	.08**	.02	3.15	.03, .13
BEECOM-Exercise × Condition ( <i>a</i> <sub>3</sub> )	.01	.03	.18	-.06, .07
<i>Moderator: Trait Eating Comparison</i>				
Condition ( <i>a</i> <sub>1</sub> )	.71*	.29	2.49	.15, 1.28
BEECOM-Eating ( <i>a</i> <sub>2</sub> )	.07**	.02	2.90	.02, .12
BEECOM-Eating × Condition ( <i>a</i> <sub>3</sub> )	.03	.03	1.06	-.03, .10
<i>Moderator: Self-Evaluative Salience</i>				
Condition ( <i>a</i> <sub>1</sub> )	.65*	.29	2.25	.08, 1.22
Self-Evaluative Salience ( <i>a</i> <sub>2</sub> )	.94**	.31	3.00	.32, 1.57
Self-Evaluative Salience × Condition ( <i>a</i> <sub>3</sub> )	.32	.41	.77	-.50, 1.13

\*  $p < .05$ ; \*\*  $p < .01$  $n = 215$ 

*General Trait Social Comparison.* In the first model, general trait social comparison moderated the effect of thinspiration on state appearance comparison but did not directly predict state appearance comparison. The index of moderated-mediation also was significant ( $b = -.41$ ,  $SE = .16$ , 95% CI [-.76, -.14]). As expected, participants who were high on general trait social comparison engaged in more appearance comparisons when shown thinspiration compared to those who were lower on general trait social comparison or who were shown travel images.

Examination of estimates of the indirect effect at values of the mean  $\pm 1$  SD indicated that the indirect effect was not significant at low levels of general trait social comparison, but was significant at values greater than or equal to the mean of general trait social comparison (refer to Figure 13).

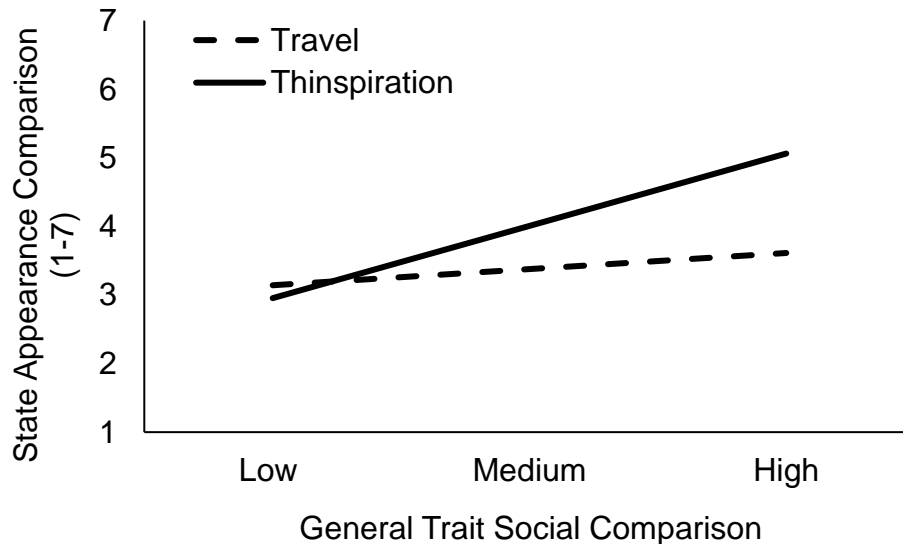


Figure 13. Effect of general trait social comparison on state appearance comparison by experimental condition (thinspiration vs. travel).

*Trait body comparison (Model 2).* An similar pattern of results was observed for the second model, assessing trait body comparison as a moderator of the effect of thinspiration on state body satisfaction. That is participants prone to comparing their appearance to others engaged in more comparisons when shown thinspiration images than did participants who do not routinely engage in appearance-comparisons or who were shown travel images. As with general trait social comparison, the indirect effect was significant only at values greater than or equal to the mean for trait body comparison (see Figure 14).

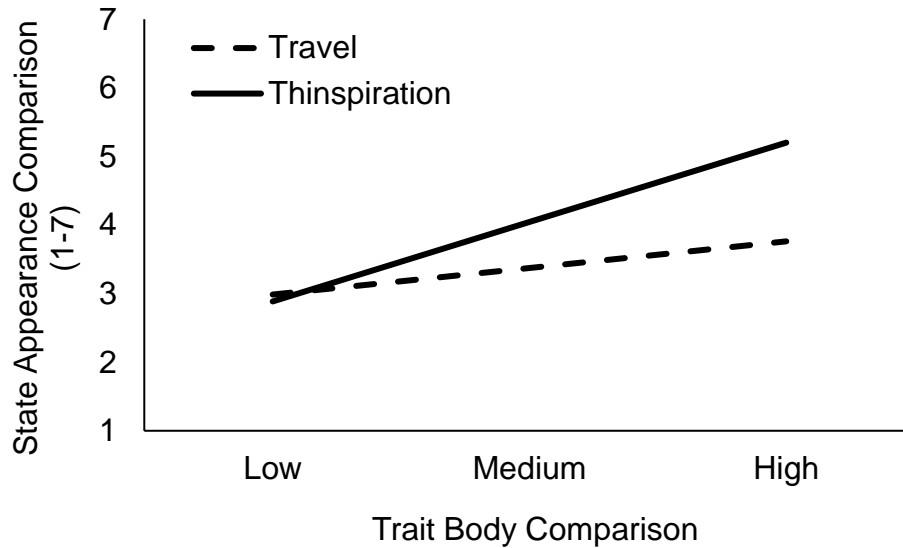


Figure 14. Effect of trait body comparison on state appearance comparison by experimental condition (thinspiration vs. travel).

*Trait exercise comparison (Model 3).* Results for Model 3 indicate that trait exercise comparison predicted lower engagement in appearance comparison but did not moderate the effect of thinspiration on state appearance comparison.

*Trait eating comparison (Model 4).* Results for Model 4 indicate that eating comparison predicted lower engagement in appearance comparison but did not moderate the effect of thinspiration on state appearance comparison.

*Self-evaluative salience (Model 5).* As predicted, self-evaluative salience predicted lower state appearance comparison. However, contrary to Hypothesis 4b, self-evaluative salience did not moderate the effect of thinspiration on state appearance comparison.

**Supplemental Analyses.** Given that findings from previous studies have demonstrated that appearance investment moderates the effect of thin ideal media on body satisfaction (e.g., Boersma & Jarry, 2013; Ip & Jarry, 2008; Jarry & Kossert, 2007) supplemental analyses were conducted to examine self-evaluative salience as a moderator of the effect of fitspiration and thinspiration on state body satisfaction and state appearance self-esteem. That is, whether self-

evaluative salience moderated the  $c$  path. As with the above tests of moderated-mediation, state appearance comparison was retained as a mediator (i.e., conditional and indirect effects tested simultaneously; refer to Figure 15 for the general model used in these analyses).

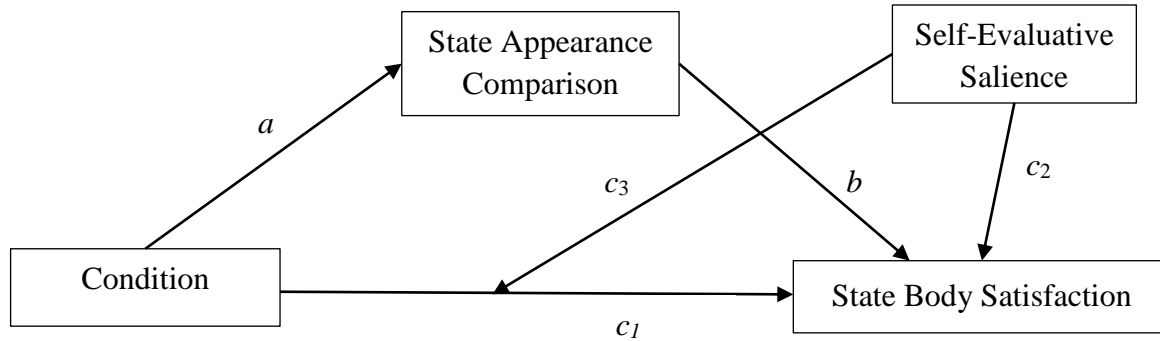


Figure 15. General model for the moderated-mediation model involving moderation of the direct effect of condition on state body satisfaction by self-evaluative salience.

*Fitspiration vs. Control.* Results of the moderated-mediation analysis indicate that condition, self-evaluative salience, and the interaction between condition and self-evaluative salience significantly predicted body satisfaction (see Table 9). Individuals highly invested in their appearance for self-definition reported being less satisfied with their appearance after viewing fitspiration images than did less invested individuals or those who viewed travel images (see Figure 16). Thus, as expected, self-evaluative salience moderated the effect of fitspiration on body satisfaction.

Table 9

*Effect of Fitspiration on State Body Satisfaction as Moderated by Self-Evaluative Salience*

	$b$	$SE$	$t$	95% CI
State Appearance Comparison	-.10*	.05	-2.01	-.20, -.001
Condition	-.64**	.21	-3.08	-1.04, -.23
Self-Evaluative Salience	-.61**	.22	-2.77	-1.05, -.18
Interaction	-.67*	.32	-2.09	-1.31, -.04

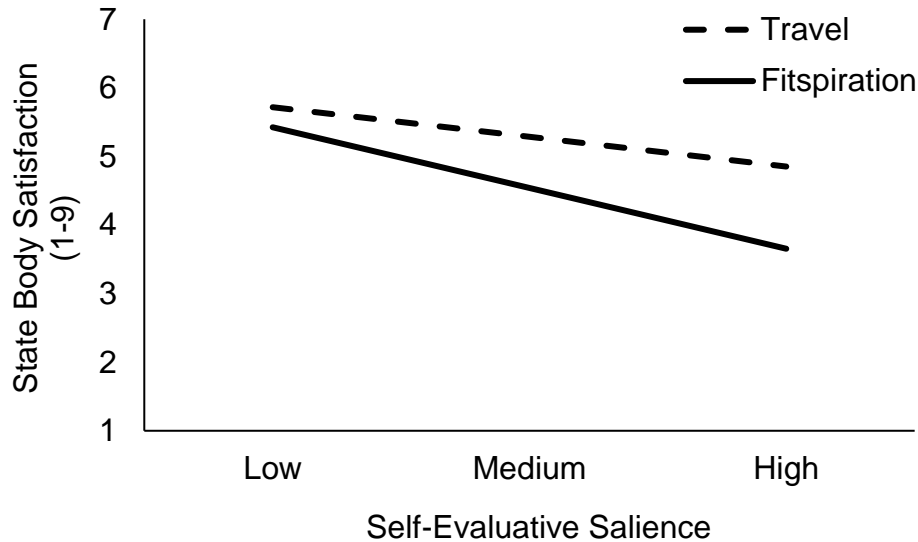


Figure 16. Effect of self-evaluative salience on state body satisfaction by experimental condition (fitspiration vs. travel)

*Thinspiration vs. Control.* Contrary to expectations, as indicated by the non-significant interaction between self-evaluative salience and condition, self-evaluative salience did not moderate the effect of condition on body satisfaction ( $p > .05$ ).

### **Effect on Intent to Eat Healthily, Exercise More Frequently, and Attempt to Lose Weight**

To test the final hypothesis that viewing fitspiration and thinspiration would result in stronger intentions to eat healthily, exercise more frequently, and attempt to lose weight a series of ANOVA were conducted using the total sample with condition as the independent variable and intention to engage in regular physical activity, eat healthily, or attempt to lose weight as dependent variables. For each ANOVA, contrasts were planned in which fitspiration or thinspiration were coded 1 and the travel condition coded -1. Given that these contrasts were planned a priori, no adjustment was made to correct familywise error. Results indicated no significant differences between conditions on intent to engage in regular physical activity, eat healthily, or attempt to lose weight ( $ps > .05$ ).

*Supplemental analyses.*

*Effect on inspiration.* As a follow-up to these analyses ANOVAs were conducted in a similar fashion to the tests of the effect on intention described above, but with level of inspiration to exercise to increase fitness, exercise to improve muscle tone, eat healthily, and attempt to lose weight as the dependent variables. Compared to the travel condition, participants in the fitspiration reported being more inspired to exercise to increase their fitness ( $t(327) = 3.12, p < .01, d = .42$ ) and improve their muscle tone ( $t(327) = 2.48, p < .05, d = .33$ ), eat healthily ( $t(327) = 2.16, p < .05, d = .29$ ), and lose weight ( $t(327) = 2.92, p < .01, d = .40$ ). Compared to the travel condition, there was a significant effect of thinspiration on inspiration to exercise to increase fitness ( $t(327) = 2.08, p = .04, d = .14$ ) but there was no effect on inspiration to exercise to improve muscle tone ( $t(327) = .88, p = .38$ ), eat healthily ( $t(327) = 1.05, p = .29$ ), or lose weight ( $t(327) = 1.84, p = .07$ ). Compared to the fitspiration group, participants in the thinspiration condition were less inspired to exercise to increase their fitness ( $t(327) = 2.08, p < .05, d = .29$ ).

*Prediction of intention from theory of planned behaviour variables.* No hypotheses were developed about how attitudes, descriptive and injunctive norms, and perceived behaviour control would predict intention to engage in each of the above noted health behaviour. Nevertheless, exploratory analyses were conducted in the form of multiple regression analyses to test these variables as potential predictors of each of the health behaviours. Analyses were conducted separately for each of the three health behaviours: eating healthily, exercising more frequently, and attempting to lose weight. In each analysis injunctive and descriptive norms, perceived behavioural control, and attitudes were entered simultaneously as predictors of intention. Results of the final models for each criterion are summarized in Table 10.

The final model for intent to eat healthily was significant,  $F(3, 326) = 22.15, p < .001$ . Combined, attitudes, descriptive norms, and perceived behavioural control accounted for 17% of the variance in intention. Injunctive norms was not a significant predictor and was not included in the final model.

Similarly, intent to engage in exercise more frequently was predicted by attitudes, descriptive norms, and perceived behaviour control. Injunctive norms was not a significant predictor and was omitted from the final model, which was significant,  $F(3, 326) = 37.64, p < .001$ , and accounted for 28% of the variance in intention to engage in routine physical activity.

Lastly, only attitudes and injunctive norms significantly predicted intention to attempt to lose weight. The final model, which excluded descriptive norms and perceived behavioural control was significant,  $F(2, 327) = 207.90, p < .01$ , and accounted for 56% of the variance in intent to attempt to lose weight.

Table 10

*Prediction of Intent to Eat Healthily, Exercise More Frequently, and Attempt to Lose Weight from Theory of Planned Behaviour Variables*

Predictor	Eat Healthily				Exercise More Frequently				Attempt to Lose Weight			
	<i>b</i>	<i>SE</i>	<i>t</i>	95% CI	<i>B</i>	<i>SE</i>	<i>t</i>	95% CI	<i>b</i>	<i>SE</i>	<i>t</i>	95% CI
Attitudes	.20	.06	3.60	[.09, .31]	.36	.06	5.78	[.23, .47]	.74	.05	15.19	[.65, .84]
Descriptive Norms	.14	.06	2.49	[.03, .26]	.16	.06	2.75	[.05, .28]	-	-	-	-
Injunctive Norms	-	-	-	-	-	-	-	-	.18	.04	4.02	[.09, .27]
Perceived Behaviour Control	.23	.06	3.60	[.10, .36]	.26	.07	3.44	[.11, .40]	-	-	-	-

*- indicates variable was not a significant predictor and was removed from the final model.*



## DISCUSSION

Thinspiration is either banned or moderated on most SNSs because it promotes self-harm and dangerously restrictive diets, and presents eating disorders as a lifestyle choice (see Chancellor et al., 2016, for a review). At the same time fitspiration, which includes many of the same themes as does thinspiration, has flourished (Boepple et al., 2016; Boepple & Thompson, 2014, 2016). However, given that the messages are similar, the effects of fitspiration and thinspiration also may be similar. A small but growing body of empirical evidence suggests that fitspiration and thinspiration are detrimental to women's body satisfaction (Rodgers et al., 2016; Tiggemann & Zaccardo, 2015) and are associated with increased eating pathology (Holland & Tiggemann, 2016b; Rodgers et al., 2016). However, the effects of fitspiration and thinspiration had not yet been compared. The overarching purpose of the present research was therefore to examine the effects of fitspiration on women's body satisfaction, appearance self-esteem, and negative affect and to compare the effects of fitspiration and thinspiration on these same variables. The second overarching purpose of this research was to test a model of how and for whom viewing fitspiration and thinspiration is detrimental. It was hypothesized that state appearance comparison would mediate the effect on state body satisfaction, appearance self-esteem, and negative affect (Hypothesis 2), and that the effect of fitspiration and thinspiration on state appearance comparison would be moderated by trait social comparison (Hypothesis 3a/b) and self-evaluative salience (Hypothesis 4a/b). As discussed, mediation and moderated-mediation models only were conducted for dependent variables on which a significant effect of condition was observed. Thus, for fitspiration, models were tested for the effect of condition (fitspiration vs. control) on both state body satisfaction and appearance self-esteem but for

thinspiration, only models for the effect of condition (thinspiration vs. fitspiration) on state body satisfaction were tested.

Given the number and complexity of predictions in the present research, a summary of results is provided in Table 11. Rather than elaborating on each hypothesis individually, for the sake of clarity and parsimony, an overview of noteworthy findings is offered below, followed by a discussion of the pattern of findings, strengths and limitations of the present study, and implications and future directions.

Table 11

*Summary of Hypotheses, Statistical Procedures, and Results*

Statistical Analyses – ANOVA with Planned Linear Contrasts		
Hypothesis	Sample	Results
<b>Hypothesis 1a.</b> Relative to the control group, individuals in the fitspiration and thinspiration conditions will report lower state appearance self-esteem and body satisfaction, as well as greater negative affect.	Full Sample	<i>Partially Supported:</i> Participants in the fitspiration condition reported lower state body satisfaction and appearance self-esteem than did participants in the travel image travel condition. Participants in the thinspiration condition reported lower state body satisfaction than did participants in the travel image travel condition. The effect of neither the thinspiration nor the fitspiration conditions differed significantly from the travel image travel condition on state negative affect.
Statistical Analyses – Tests of Equivalence		
Hypothesis	Sample	Results
<b>Hypothesis 1b.</b> Fitspiration and thinspiration will have statistically equivalent effect on body satisfaction, appearance self-esteem, and negative affect.	Thinspiration & Fitspiration	<i>Supported:</i> The effects of fitspiration and thinspiration on state body satisfaction, appearance self-esteem, and negative affect were statistically equivalent.
Statistical Analyses – Linear Regression (PROCESS Model 4)		
Hypothesis	Sample	Results
<b>Hypothesis 2.</b> The effect of fitspiration and thinspiration images on body satisfaction, appearance self-esteem, and negative affect will be mediated by state appearance comparison behaviour. Specifically, viewing fitspiration and thinspiration images will prompt greater engagement in	Fitspiration vs. Travel	<i>Supported:</i> The effect of fitspiration on state body satisfaction and appearance self-esteem was mediated by state appearance comparison. Viewing fitspiration resulted in more state appearance comparison than did viewing travel images. Greater appearance comparison in

appearance comparisons that in turn will result in higher negative affect\* and lower appearance self-esteem and body satisfaction.

turn resulted in lower body satisfaction and appearance self-esteem.

Thinspiration  
vs. Travel

Supported: The effect of thinspiration on state body satisfaction was mediated by state appearance comparison.

Viewing thinspiration resulted in more state appearance comparison than did viewing travel images. Greater appearance comparison in turn resulted in lower body satisfaction.

Statistical Analyses – Linear Regression (Moderation of the *a* path; PROCESS Model 7)<sup>1</sup>

Hypothesis

Sample

Results

**Hypothesis 3a.** Women who are high in trait social comparison will engage in appearance comparisons to a greater extent than will those who are lower in trait social comparison regardless of the images to which they are exposed.

Fitspiration  
vs. Travel

*Partially Supported:*

Only trait exercise and eating comparison predicted greater state appearance comparison. Trait body comparison and general trait social comparison were not significant predictors of state appearance comparison.

Thinspiration  
vs. Travel

*Partially Supported:*

Trait body, exercise, and eating comparison predicted greater state appearance comparison. General trait social comparison did not significantly predict state appearance comparison.

**Hypothesis 3b.** For women who are high in trait social comparison, viewing fitspiration or thinspiration images will result in greater engagement in appearance comparison than it will for women who are low on trait social comparison or who view travel images.

Fitspiration  
vs. Travel

*Partially Supported:*

Only trait body comparison moderated the effect of fitspiration on state appearance comparison. The indirect effect of fitspiration on state body satisfaction and appearance self-esteem was stronger for women who were higher on trait body comparison than

		for women who were lower on trait body comparison or who viewed travel images. The following did not moderate the effect of fitspiration on state appearance comparison: general trait social comparison, trait exercise comparison, and trait eating comparison.
	Thinspiration vs. Travel	<i>Partially Supported:</i> General trait social comparison and trait body comparison moderated the effect of thinspiration on state appearance comparison. The indirect effect of fitspiration on state body satisfaction was stronger for women who were high on general trait social comparison and trait body comparison than for women who were lower on either trait or who viewed travel images. Trait exercise and eating comparison did not moderate the effect of thinspiration on state appearance comparison.
<b>Hypothesis 4a.</b> Women who are highly invested in their appearance for self-definition will engage in appearance comparisons to a greater extent than will women who are less invested in their appearance regardless of the images to which they are exposed.	Fitspiration vs. Travel	<i>Supported:</i> High self-evaluative salience predicted greater engagement in appearance comparison
	Thinspiration vs. Travel	<i>Supported:</i> High self-evaluative salience predicted greater engagement in appearance comparison
<b>Hypothesis 4b.</b> For women who are highly invested in their appearance for self-definition, viewing fitspiration and thinspiration images will be associated with higher state appearance comparison compared to women who are less invested in their appearance or for either group when viewing travel images.	Fitspiration vs. Travel	<i>Not Supported</i>
	Thinspiration vs. Travel	<i>Not Supported</i>

## Statistical Analyses – ANOVA

Hypothesis	Sample	Results
<b>Hypothesis 5.</b> Compared to those in the travel condition, women in the fitspiration and thinspiration conditions will report greater intention to engage in regular physical activity, eat healthily, and attempt lose weight.		<i>Not Supported</i>

Supplemental Analyses – Linear Regression Analysis (Moderation of the *c* path, PROCESS Model 5)

Hypothesis	Sample	Results
Self-evaluative salience will moderate the effect of fitspiration and thinspiration on state body satisfaction	Fitspiration vs. Travel	<i>Supported:</i> Women in the fitspiration condition who were high on self-evaluative salience were less satisfied with their appearance than women who were less invested or who viewed travel images.
	Thinspiration vs. Travel	<i>Not Supported</i>

## Supplemental Analyses – Multiple Regression

Hypothesis	Sample	Results
Intentions to eat healthily, exercise more frequently, and attempt to lose weight will be predicted by attitudes, descriptive and injunctive norms, and perceived behavioural control	Full Sample	<i>Partially supported:</i> Intentions to eat healthily and exercise more frequently were predicted by attitudes, descriptive norms and perceived behavioural control. Intention to attempt to lose weight was predicted by attitudes and injunctive norms.

*Note:* Analyses for Hypotheses 2-4 were conducted only where a significant effect of fitspiration or thinspiration on the given dependent variable was observed. Thus, mediation and moderated-mediation analyses were not conducted for the effect of either fitspiration or thinspiration on state negative affect, nor were analyses conducted for the effect of thinspiration on state appearance self-esteem.

<sup>1</sup> Main effect in moderation models were tested within the moderated-mediation model, and therefore is presented separately for models of the effect of fitspiration and of thinspiration.

### Summary of Findings

As expected, results showed that compared to viewing travel images, viewing fitspiration and thinspiration resulted in lower body satisfaction and appearance self-esteem. Unexpectedly, there was no effect of condition on negative affect. It is possible that the lack of a significant effect of condition on negative affect is because images in all three conditions evoked similar levels of negative affect, albeit for different reasons. That is, among those in the thinspiration and fitspiration conditions negative affect was related to body dissatisfaction, but among those in the travel condition, it was related to disappointment that they had not or could not go travelling. However, given that scores are consistent with population norms (Crawford & Henry, 2004; Watson et al., 1988), it also is possible that there was no effect of the manipulation on state affect. Importantly, results showed that the effects of viewing fitspiration on state body satisfaction, appearance self-esteem, and negative affect were statistically equivalent to, if not slightly worse than the effects of viewing thinspiration on these variables.

Neither those in the fitspiration or thinspiration conditions reported increased intent to eat healthily, exercise more frequently, or attempt to lose weight compared to those in the travel condition. Thus, Hypothesis 5 was not supported. However, supplemental analyses of responses to the inspiration questions revealed that participants who viewed fitspiration reported being more inspired to exercise to increase muscle tone and improve physical fitness, eat healthily, and attempt to lose weight, compared to those who viewed travel images. Viewing thinspiration did not inspire participants to eat healthily, exercise more frequently, or attempt to lose weight more than did viewing travel images.

Consistent with past research (e.g., Fardouly & Vartanian, 2015; Tiggemann & Slater, 2004; Tiggemann & Zaccardo, 2015) and hypotheses, the present findings indicated that the

effects of fitspiration and thinspiration on state body satisfaction and appearance self-esteem are mediated by state appearance comparison. Interestingly, although the effects of fitspiration and thinspiration on body satisfaction and appearance self-esteem were the same, participants in the fitspiration condition engaged in more appearance comparison than did participants in the thinspiration condition. The possible reasons for this finding are discussed in detail following this summary of results.

Regarding the proposed moderation of the  $a$  path (the effect of either fitspiration or thinspiration vs travel, see Figure 9) by trait social comparison, results indicate that general trait social comparison moderated the effect of thinspiration but not of fitspiration on state appearance comparison. That is, women high in general trait social comparison engaged in appearance comparisons, particularly when shown thinspiration. Trait body comparison moderated the effect of fitspiration and thinspiration on state appearance comparison. Again, women who were high on trait body comparison engaged in more appearance comparisons while viewing fitspiration and thinspiration than did women who were low on trait body comparison or who viewed travel images. Lastly, trait exercise and eating comparison positively predicted state appearance comparison but did not moderate the effect of either fitspiration or thinspiration on state appearance comparison. Combined, results suggest that fitspiration and thinspiration are particularly detrimental to women's body satisfaction and appearance self-esteem in women who tend to engage in appearance comparisons because these individuals engage in more appearance comparisons when shown thinspiration or fitspiration. Results showed that self-evaluative salience positively predicted state appearance comparison but did not moderate the effect of either thinspiration or of fitspiration on state appearance comparison. Results from supplemental



analyses indicated that the effect of fitspiration but not of thinspiration on state body satisfaction was moderated by self-evaluative salience.

### **The Sociocultural Context of Fitspiration and Thinspiration**

According to social comparison theory, in the absence of objective standards individuals evaluate their standing relative to others on domains that are relevant to their self-worth. For many women, appearance is one such domain (Neighbors & Sobal, 2007). According to sociocultural theories, body dissatisfaction is partly due to excessive engagement in appearance comparisons (Thompson et al., 1999; Tiggemann, 2012). Indeed, appearance comparison is a well documented mediator of the effect of thin-idea media on body dissatisfaction (e.g., Hargreaves & Tiggemann, 2002a; Tiggemann & Slater, 2004). As mentioned, participants in the fitspiration condition engaged in appearance comparisons to a greater extent than did those in the thinspiration condition but the effects of each on state body satisfaction and appearance self-esteem did not differ. This finding suggests that compared to those who viewed fitspiration, women who viewed thinspiration images either were more affected by appearance comparisons, or they under-reported the extent to which they engaged in appearance comparisons. The latter explanation fits well with the existing literature, particularly when considered within the larger sociocultural context.

Within the last decade there has been a notable shift in sociocultural pressures as the body acceptance movement, which is primarily aimed at women and girls, has become more ubiquitous (Karazsia, Murnen, & Tylka, 2017). A recent meta-analysis of 326 non-clinical samples ( $N = 100\ 228$ ) between 1981 and 2012, suggests that with this shift towards body acceptance, there has been a decrease in reported thinness-oriented body dissatisfaction over the last three decades (Karazsia et al., 2017). Body dissatisfaction is the single strongest predictor of

the development of eating pathology (Smolak & Levine, 2015) and so incidence of eating disorder also should have decreased during this time frame. However, prevalence rates have remained largely stable (Crowther, Arney, Luce, Dalton, & Leahey, 2008; Smink, van Hoeken, & Hoek, 2012).

One possible explanation for these contradictory findings is that the nature of sociocultural pressures related to appearance standards for women has shifted towards a “sexualized curvaceous” and/or “strong, lean, and fit ideal” (Karazsia et al., 2017). This shift in the nature of standards is reflected in the finding that muscularity-based body dissatisfaction has remained stable over the last three decades (Karazsia et al., 2017). Thus, despite a decrease in reported thinness-oriented body dissatisfaction, because muscularity has become a more prominent element in appearance standards for women, the extent to which women are dissatisfied with their appearance has not changed, it simply has shifted focus. Consequently, the prevalence of eating disorders, has not decreased.

Another possible explanation is that the body acceptance movement has created a prescriptive norm to be outwardly satisfied with one’s appearance, prompting women to be more secretive about their dissatisfaction (Chang, 2014). Chang (2014) had participants complete measures of body dissatisfaction online and again in lab, where they were told either that their responses would be kept private or that they would be publicly discussed with peers. Larger decreases in reported body dissatisfaction were observed among participants who were told that their responses would be discussed publicly compared to those who were told that their responses would be kept private. In focus groups of feminist women, participants reported beliefs that they should reject the thin ideal and accept their bodies but felt guilty for continuing to struggle to do so (Rubin, Nemeroff, & Russo, 2004). This suggests that social attitudes

towards the pursuit of thinness have caused women to become more secretive about their body dissatisfaction rather than less dissatisfied.

Within the broader sociocultural context, large scale media campaigns like Dove's "Choose Beauty" campaign, released in 2014, and Kellogg's Special K "#OwnIt" campaign, released in 2016, recognize women's dissatisfaction with their appearance but presents their body dissatisfaction as the result of a choice. For example, Dove's "Choose Beauty" campaign positions body satisfaction as "a choice just like any other you make about yourself, a personal power we all have the right to embrace" (Unilever, 2017). Similarly, Special K's "#OwnIt" campaign slogan states, "It's time to silence that voice inside your head that says you're not good enough. It's time to start making positive, healthy choices and focus on the things we can change instead of the things we can't" (Kellogg, 2016). These campaigns and the associated public discourse have created a social imperative for women to love their body, regardless of whether they perceive it to be flawed. Yet this necessarily implies that there is still a standard that women are not meeting. Thus, consistent with Chang's (2014) suggestion, while women may be equally dissatisfied with their appearance, and may still aspire to the thin ideal, new social norms promotes secretiveness about their dissatisfaction and pursuit of thinness.

In the present study, ratings of the quality of images suggest that participants had a strong, negative reaction to the thinspiration images, particularly those with quotes overlaid on the images. This same negative response was not observed for ratings of the quality of fitspiration images. Thus, participants at least claimed to reject the messages associated with thinspiration. This outward rejection of thinspiration also is evident in the finding that participants in the thinspiration condition reported engaging in less appearance comparison than

did participants in the fitspiration condition. However, it is unclear whether participants consciously under-reported and how this relates to the effects of thinspiration.

The issue is that fitspiration is erroneously viewed as diametrically opposed to the pursuit of thinness. On the surface, fitspiration echoes messages from public health agencies – eat healthily and exercise regularly. Yet, while fitspiration messages promote strength and empowerment they also present a female figure that closely resembles the thin ideal (Boepple et al., 2016; Tiggemann & Zaccardo, 2015). To appear muscular, as in the fit ideal, one must necessarily have a low body fat percentage. Combined, this presents the message that the fit ideal is synonymous with both health and thinness; therefore, to be healthy, one must also be thin. Thus the health messages are conflated with appearance messages (Boepple & Thompson, 2014). Messages like the one in Kellogg's #OwnIt campaign and those associated with fitspiration images imply that by changing your behaviour, i.e., engaging in more health behaviours, you can change how you feel about your body. As one feminist blog eloquently stated, “Instagrams [that attach photos of progress or low-fat/low-calorie foods to body positivity messages] feed into a major myth diet culture teaches us: that you can love your body and change it – or even love it *by changing it*” (Weiss, 2017; italics in original). Given that social attitudes now eschew the pursuit of thinness in favour of radical acceptance of one's appearance regardless of shape or size, fitspiration affords users a way to pursue the thin ideal and rationalize dietary restriction and excessive exercise without overtly challenging these social attitudes (Holland & Tiggemann, 2016a). Several large-scale media campaigns urge women to reject the thin ideal, but none acknowledge that the fit ideal, which also emphasizes thinness, is a problem as well. Thus, the current social climate is one that allows fitspiration to have an unchecked influence on women's body satisfaction and appearance self-esteem.

### **Anticipated Behavioural Effects of Fitspiration and Thinspiration**

Combined, results of the present study indicate that fitspiration is associated with both positive and negative effects. Specifically, women who viewed fitspiration reported being inspired to engage in a variety of health behaviours, but also reported being less satisfied with their appearance and reported lower appearance-self-esteem. Although engaging in exercise regularly and eating a healthy diet are generally positive health behaviours, engaging in exercise for appearance-based reasons has been shown to predict increased eating disorder symptoms and depressive symptoms, as well as decreased self-esteem (DiBartolo, Lin, Montoya, Neal, & Shaffer, 2007; Mond, Hay, Rodgers, & Owen, 2006). Additionally, promoting appearance-based motives for exercise results in lower persistence and effort than does promoting health-based motives for exercise (Vansteenkiste, Simons, Soenens, & Lens, 2004). This may be because appearance-based motives are inherently extrinsic whereas health-based motives foster intrinsic motives (Sebire, Standage, & Vansteenkiste, 2009). Given that many of the messages associated with fitspiration and thinspiration relate to the benefits for one's appearance (Boepple et al., 2016; Boepple & Thompson, 2016; Santarossa et al., 2016) it can be assumed that fitspiration is likely to promote extrinsic motivation. Thus, the benefits of fitspiration vis-à-vis lasting engagement in health behaviours may not come to fruition, or would not be of any real benefit when compared to the potentially detrimental psychological effects.

Neither participants in the fitspiration condition nor those in the thinspiration condition reported greater *intentions* to eat healthily, exercise more frequently, or attempt to lose weight. Yet, participants in the fitspiration condition reported being more *inspired* to engage in these behaviours. This suggests that perhaps viewing fitspiration resulted in participants being in what is referred to as the precontemplation stage of behaviour change (Webb & Sheeran, 2006). That

is, participants wanted to attain the fit ideal but were not sufficiently motivated to make plans and initiate the necessary behaviours. Another possible explanation is that a combination of methodological and sociocultural factors contributed to the null findings. The questions related to exercise ask about exercising *more frequently*, but participants may have been exercising regularly and were satisfied with their existing level of physical activity. Regarding the other two behaviours, social desirability may have impacted responses. Specifically, diet was not referenced in the fitspiration images used in the present study, and therefore may not have activated thoughts related to eating healthily. In the thinspiration condition, although two of the three messages related to eating, messages clearly were related to the pursuit of the thin ideal. Thus, participants may have been less willing to disclose intentions to alter their diet after viewing thinspiration images. Similarly, participants in both conditions may not have been comfortable disclosing intentions to attempt to lose weight.

Lastly, consistent with the above discussed sociocultural attitudes against the pursuit of thinness, injunctive norms but not descriptive norms or perceived behavioural control predicted intentions to attempt to lose weight. That is, individuals' perceptions of others' approval of their intent to attempt to lose weight, but not of other's engagement in attempts to lose weight predicted whether they intended to attempt to lose weight. On the other hand, injunctive norms did not predict intentions to eat healthily or to exercise more frequently. In these models, participants' intentions were based on whether they felt it was a good idea, that they have the ability to engage in these behaviours, and that others also were engaging in these behaviours. This highlights the potential risks of fitspiration images which could create a skewed perception of others' dieting and exercise behaviours and impact intentions to pursue a healthy lifestyle, which, as noted, is likely to be driven by appearance-based motives that would ultimately lead to

body dissatisfaction, discontinuation of efforts to eat healthily and exercise regularly, and disordered eating and compulsive exercise.

### **Supplemental Analyses**

As described above, per social comparison theory, individuals engage in social comparisons in domains that are highly self-relevant (Festinger, 1954). Because appearance is highly self-relevant for women who are invested in their appearance for self-definition, it was expected that they would engage in more appearance comparison when shown fitspiration and thinspiration than would women who were less invested, or who viewed travel images. This hypothesis was not supported, although self-evaluative salience was positively correlated with state appearance comparison. Supplemental analyses revealed that women who are more invested in their appearance for self-definition are less satisfied with their appearance after viewing fitspiration images relative to those who are less invested or who viewed travel images. That is self-evaluative salience moderated the effect of fitspiration but not of thinspiration on state body satisfaction.

Appearance investment is defined as the cognitive salience of appearance, thus, individuals who are highly schematic are more attentive to appearance related information, including what is considered to be the most desirable appearance. Currently, as discussed, the socially approved ideal is one that is lean and muscular. Accordingly, highly schematic individuals would be more attentive to the fitspiration images than travel images but they would not have been more attentive to the thinspiration images. Because they are paying more attention to fitspiration, they are more dissatisfied with their appearance. At the same time, because socially, thinspiration portrays a less desirable appearance, highly schematic individuals do not pay as much attention to it and therefore they are no more dissatisfied than less schematic

individuals who were shown thinspiration images or than those who were similarly invested for self-definition, but viewed travel images. Thus, although those high on self-evaluative salience are more strongly affected by fitspiration than less invested individuals or those who viewed travel images, regardless of their level of investment, it appears that the mechanism for these effects was not via social comparison.

### **Strengths and Limitations of the Present Research**

#### **Research Strengths**

Overall, the present study had several notable strengths. First, the study included both fitspiration and thinspiration images and is the first to directly compare the effects of these images. Second, the inclusion of a control condition strengthens the internal validity of the present findings by isolating the effects of fitspiration and thinspiration images from the effect of factors related to their presentation (i.e., from Instagram; online presentation). Third, participants completed the study online, which may be a closer approximation to their real-world experiences of fitspiration relative to in-lab studies. However, it is necessary to note that this decision is not without drawbacks. Specifically, it is possible that participants were not paying attention to the study as much as they might in a lab setting. This may contribute to the smaller effect sizes observed in the present study relative to those observed in Tiggemann and Zaccardo's (2015) study of the effect of fitspiration, in which participants viewed images on an iPad in a lab. Nevertheless, everyday browsing of SNSs often is characterized by divided attention and so from an ecological validity perspective, potentially lower attention may be considered a strength. The fourth and final strength of note is that analytically, the use of PROCESS allowed for the testing of more sophisticated models of the effects of fitspiration compared to older analytical approaches (i.e., Barron & Kenny, 1986).



### Research Limitations

The present findings also must be interpreted in light of several limitations. First, the images used in the present study were fairly homogeneous, and did not include all features or types of content associated with fitspiration and thinspiration. For example, fitspiration and thinspiration often include images of food, images that are simply a quote (i.e., no women shown), and highly-sexualized images of women (e.g., in a bra and underwear, laying on a bed). In the present study, such features were exclusion criteria in the image selection process. It is possible that some of these features relate to the effects on state body satisfaction, appearance self-esteem, and appearance comparison. The low variety therefore may contribute to why effect sizes were smaller in the present study than in Tiggemann and Zaccardo's (2015) study. Albeit because it is unclear what criteria these authors used in selecting the images it cannot be concluded that differences in the variety of features between the current study and Tiggemann and Zaccardo's (2015) affected the magnitude of the effects observed in each study.

Related to this, because comparatively few images with the relevant hashtags featured women who were not Caucasian, the majority of the women shown in the thinspiration and fitspiration images in this study were Caucasian. Bruns and Carter (2015) found that neither Caucasian nor African American women reported greater self-ideal appearance discrepancy after viewing advertisements with ethnically similar models than they did after viewing advertisements with ethnically different models. This suggests that ethnic dissimilarity between participants and the women shown in the Instagram images should not have impacted results, but it would be useful to examine this in future research.

Second, the characteristics of the sample limit the generalizability of the present findings. More precisely, only female undergraduates were eligible to take part in this study and the

majority of participants were Caucasian and majored in psychology. Thus, results may not be replicated in community samples or in all cultural/ethnic groups. However, it is important to note that SNSs are most popular among female youth aged 16 to 25, thus the sample used in the present study was drawn from a population that is more likely to be exposed to fitspiration. Nevertheless, it would be prudent to repeat the study in a community sample of university-aged women and in adolescent samples. Males were excluded from the present study because the presentation of fitspiration differs for men and women, as do experiences of body dissatisfaction (Karazsia et al., 2017; Neighbors & Sobal, 2007). Therefore, it is more appropriate to study the effects of fitspiration and thinspiration on males and females separately. As in much of the body image literature, the decision was made to focus first on the effects for women first, but future research should examine the effects of fitspiration on body image in men.

Regarding the method of data collection, the study relied entirely on self-report measures, which assumes that participants are aware of their cognitive processes and reactions to the images, and that they are willing to report their experiences accurately. Additionally, as the majority of the sample were psychology majors, it is possible that participants had additional information about psychological processes that they could have leveraged, consciously or unconsciously, to manage their responses. Thus, as with all online and self-report based research, results may not reflect real-world responses to the experimental manipulation.

### **Implications and Future Directions**

Combined, the present findings suggest that women are rejecting the thin ideal and instead buying into the fit ideal. Presently, thinspiration is banned or moderated on most SNSs, but fitspiration is widely spread and socially acceptable and appears to evoke greater appearance comparison, and thus is potentially highly damaging. Future research should consider

incorporating implicit measures of body satisfaction and appearance comparison to better capture the effect of fitspiration and thinspiration. Because, on most SNSs, users connect to other users and subscribe to their content, for example by *friending* or *following*, it is unlikely that users will *accidentally* view thinspiration images through routine use. However, friends and other users to whom individuals subscribe are likely to post fitness- or health-related images. Indeed, 60% of participants in this study followed health and fitness accounts on social networking sites. Thus, although the effects are similar, the likelihood of exposure to fitspiration is much higher.

The present findings highlight the need to better understand the effect of fitspiration, including what features about the media and how it is shared impact the relation between exposure to fitspiration and body satisfaction. It is neither feasible nor practical to attempt to ban fitspiration, but the present findings highlight the complexities associated with developing programs that might mitigate the risks associated with viewing fitspiration. That is, in developing programs to protect women against the effect of fitspiration, it is important to be mindful that the structure and content of these programs do not inadvertently encourage secrecy related to body dissatisfaction and the pursuit of thinness.

To extend the present findings, it is important that the effects of dose, self-selection of appearance-related social media, and the specific characteristics of fitspiration are better understood. This includes comparing the effects of the medium through which it is shared. As discussed, characteristics associated with social networking sites may allow appearance-related content that is shared via social networking sites to have a more potent effect than the same content that is shared via traditional media sources. However, additional research is needed comparing the effects of identical images shared through traditional and social media.

This area of research also would benefit greatly from the use of eye-tracking technology. For example, future research may examine attention to specific features of fitspiration images, such as specific body parts, and of social media in general, such as the comments, captions, and number of likes, predict body dissatisfaction. Researchers, such as Moreno (2011) and Perloff (2014), have noted that social media informs users of what is socially desirable, and suggest that it may shape new ideals and reinforce existing ones. However, it is unclear what features of SNSs most strongly communicate these ideals. Similarly, it may be that the message accompanying fitspiration images may modify their impact (Lewallen, 2016). Specifically, researchers may wish to examine whether body-positive messages and messages promoting exercise solely for health and mental well-being have a different effect than images accompanied by messages promoting exercise for the sake of appearance and sexual desirability.

Eye-tracking also would help to identify who is most likely to self-select fitspiration images when provided a choice among several types of images. It also would clarify how preferential attention to fitspiration and other appearance-oriented social media impact body satisfaction and mental well-being. This could be extended to allow for monitoring of what content users seek when given autonomy. By monitoring what content they seek and the features that they attend to, the effect of SNS use and state appearance comparison on body satisfaction in the real world (i.e., outside of a lab) could be better understood.

The effect sizes observed in the present study were smaller than those observed in previous studies. This may be due, in part, to the number of images or the ratio of fitspiration/thinspiration images to travel images used in the present study. Tiggemann and Zaccardo used 16 fitspiration and 2 travel-based images, compared to the present study, which used 12 fitspiration images and 8 travel images. The ratio of images used in the present study is

similar to the ratio used in past studies in our lab (e.g., Ip & Jarry, 2008) and it was expected that this would be sufficient to induce an effect without causing participants to guess the purpose of the study. However, it is possible that having nearly half of the images in the thinspiration and fitspiration conditions being related to travelling may have reduced the effects of the fitspiration and thinspiration images. Accordingly, future research should consider the effect of dose, including whether the effects on body satisfaction and appearance self-esteem are related to the number of images used and whether repeated exposure impacts the magnitude or duration of the effects on body satisfaction.

Lastly, as noted above, the majority of the sample was Caucasian and only female students were eligible to participate. Given that past research suggests that ethnicity may affect responses to thin-ideal media (Bruns & Carter, 2015), the role of ethnicity in the effects of fitspiration and thinspiration on body image also should be examined. Similarly, given that appearance ideals and experiences of body dissatisfaction differ for men and women (Neighbors & Sobal, 2007) research should examine the effect of fitspiration in male samples.

## CONCLUSIONS

The overarching purpose of this study was to examine the effect of fitspiration and thinspiration, how each affects body satisfaction, appearance self-esteem, and mood as well as who is at greater risk for these effects. Building on previous research, the present study was the first to examine self-evaluative salience as a moderator of the effects of fitspiration and thinspiration on state appearance comparison, satisfaction, and self-esteem. Backed by what appears to be scientific evidence from public health agencies, fitspiration allows women to pursue the thin ideal in a socially sanctioned manner under the guise that they are trying to be healthy and seeking strength and empowerment rather than thinness. The social desirability of the fit ideal is reflected in the finding that those in the fitspiration condition engaged in more appearance comparison than did those in the thinspiration condition. Of course, this does not necessarily indicate that women actually engaged in less appearance comparison. In fact, as discussed, the effects of fitspiration and thinspiration on state body satisfaction, appearance self-esteem, and negative affect equivalent. As outlined above, this suggests that women either were more affected by comparisons with thinspiration than by comparisons with fitspiration, or they engaged in appearance comparisons more than they reported. Combined these findings highlight the complexity of the effects of fitspiration. That is, it is not only the percent fat or muscularity that is problematic; it is the messages that accompany the images, the medium through which they are shared, and the sociocultural context which combine to create a potent threat to women's body satisfaction.

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