BODY IMAGE AND MOOD FOLLOWING UPWARDS COMPARISON TO INSTAGRAM

MODELS: THE ROLE OF PHYSICAL APPEARANCE PERFECTIONISM AND COGNITIVE

EMOTION REGULATION

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Abstract

The present study examined whether physical appearance perfectionism is related to mood and body image among young women following an upwards appearance-based comparison to Instagram models, and whether that relationship is mediated by various cognitive coping strategies. Female undergraduate students ($N = 142$) were randomly assigned to either 1) compare the size of their body parts to the body parts of Instagram models, or 2) an appearance-neutral control condition. All participants completed measures of trait physical appearance perfectionism, pre and post measures of state mood and body image, and cognitive coping processes. As predicted, appearance comparison to the models resulted in lowered confidence and increased appearance and weight dissatisfaction. Trait physical appearance perfectionism was found to predict lower confidence and higher depression, weight dissatisfaction, and appearance dissatisfaction, and these relationships were mediated by engagement in the coping strategies rumination and catastrophizing. Clinical implications of the findings are discussed.

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Introduction

Within the last ten years, social networking platforms such as Facebook, Instagram, and Snapchat have gained widespread popularity as a means of communication, especially among young adults (Perloff, 2014). A study by the Pew Research Centre (2018) found that as of 2018 68% of Americans were using Facebook, and 35% were using Instagram. Social media use is the most widespread in individuals aged 18-24 years—amongst this age group, 80% and 71% were using Facebook and Instagram respectively. Additionally, women were more likely to use both of those social media platforms than were men (Pew Research Centre, 2018). Despite the positive aspects of social media such as maintaining contact with physically distant friends, sharing information, and networking (Ellison, Steinfield, & Lampe, 2007), there are also adverse effects of social media use. One adverse effect that has been noted is the negative impact that social media can have on young women's body image, which represents the thoughts, feelings, attitudes, and behaviours one has towards their body's physical appearance and functionality (Cash & Pruzinsky, 2002). For example, the literature has consistently revealed that Facebook usage is associated with increased body image concerns, body dissatisfaction, and lower mood (Eckler, Kalyango, & Paasch, 2017; Fardouly, Diedrichs, Vartanian, & Halliwell, 2015; Fardouly & Vartanian, 2015; Stronge et al., 2015).

Comparatively less research has been conducted on the impact of Instagram on women's body image and mood, despite the rising popularity of the social media platform. Since Instagram is a purely photo-based platform, it can be reasoned that exposure to idealized images of thin and attractive women is more likely than what would be encountered on Facebook. The photo-based nature of Instagram allows ample opportunity for users to engage in appearance-based comparisons to photos of friends, relatives, celebrities, and models. Additionally, the

hashtag feature in Instagram makes exposure to idealized images of thin and fit women more readily available to users, who often search for images of women who represent the thin and fit ideals by searching hashtags such as #fitspiration, #thinspiration, and #thin. Currently (February, 2019), an Instagram tag search of the hashtag #fitspiration yields 17 million posts, while the hashtag #thin has 2.8 million posts. Idealized images of fit, thin, and attractive women are ubiquitous on Instagram, which also normalizes these body types and could make them appear easily attainable to other women. Research suggests that women who use social media and who are exposed to idealized body images internalize the thin ideal and strive for an unrealistic standard of beauty, which may result in feelings of shame, body dissatisfaction, and low mood when they cannot achieve the same body type (Sumter, Cingel, & Antonis, 2018; Tiggemann & Slater, 2013). Additionally, the wide availability of idealized body images on Instagram, allows ample opportunity for young women to engage in appearance-based comparison to peers, celebrities, and models. Most often women engage in upwards appearance-based comparisons, which are characterized by comparing oneself to someone deemed as more attractive or superior in some way (Morrison, Kalin, & Morrison, 2004). Social comparison theory argues that upwards comparisons to others generally results in feelings of dissatisfaction because the difference between a superior other and oneself becomes salient, making the person doing the comparing feel inferior in some way (Festinger, 1954). Emerging experimental research has supported social comparison theory and demonstrated that upwards appearance-based comparisons to more attractive others on Instagram has resulted in increased body dissatisfaction among young women (Brown & Tiggemann, 2016; Fardouly & Holland, 2018; Hogue & Mills, 2019; Sumter et al., 2018; Tiggemann & Zaccardo, 2015). While research seems to reflect that exposure to attractive others on Instagram results in changes to body image and mood in young

women, it still remains unclear *who* specifically is vulnerable to adverse effects of Instagram exposure and *why* exposure to attractive others results in changes to mood and body dissatisfaction, which are gaps that the current study will address.

A meta-analysis of over 200 studies by Ferguson (2013) revealed that the effects of exposure to media-portrayed thin ideal images on body dissatisfaction are not as widespread as previously thought, and effects sizes are negligible for the average women. The conclusion of that meta-analysis was that media effects research should focus on vulnerable *subgroups* of women, rather than the general population (Ferguson, 2013). Women who are high in perfectionism may be one such subgroup that is especially vulnerable to the adverse effects of social media, as perfectionism has been predictive of social comparison to idealized others (Pokrajac-Bulian, Ambrosi-Randic, & Kukic, 2008) on Instagram and Facebook (Padoa, Berle, & Roberts, 2018), and social comparison has consistently been found to be a risk factor for depression, anxiety, and body dissatisfaction amongst young women (Myers & Crowther, 2009; Padoa et al., 2018; Perloff, 2014). Additionally, perfectionism is associated with body dissatisfaction (Wade & Tiggemann, 2013; Welch, Miller, Ghaderi, & Vaillancourt, 2009), anxiety (Smith, Vidovic, Sherry, Stewart, & Saklofske, 2018), and depression (Rudolph, Flett, & Hewitt, 2007; Smith et al., 2018) , as well as poor cognitive coping when distressed (Rudolph et al., 2013), which is also associated with body dissatisfaction (Naumann et al., 2016; Wade, George, & Atkison, 2009), depression and anxiety (Macedo et al., 2017; Rudolph et al., 2007) . Therefore, it may be that the way in which viewers think about and cognitively process idealized images of others on social media that determines whether or not they feel worse about themselves. In other words, poor cognitive coping may be a mediating factor that could explain why exposure to attractive others on Instagram results in negative changes in body image and

mood. The existing research is clear that not all women respond to exposure to idealized body images in the same way.

Perfectionism, Body Image, and Mood

Perfectionism is a personality trait characterized by setting excessively high standards, a demand for flawless performance, excessive concern about other's approval, and self-criticalness (Frost, Marten, Lahart, & Rosenblate, 1990). Perfectionism is multidimensional and can be domain-specific (Frost et al., 1990). Frost et al. (1990) created the Frost Multidimensional Perfectionism Scale (F-MPS) and conceptualized perfectionism to consist of six different factors; the maladaptive dimensions are Concern over Mistakes (CM; perceive mistakes as failures and unacceptable), Doubts about Actions (DA; doubt one's performance), Parental Criticism (PC; parents criticize one's mistakes), and Parental Expectations (PE; parents have high expectations for perfection), while the adaptive dimensions are Personal Standards (PS; set high standards for oneself), and Organization (O; neatness and organization). Alternatively, Hewitt and Flett (1991) theorized that there are three dimensions of perfectionism in their Multidimensional Perfectionism Scale (HF-MPS): self-oriented perfectionism (*SOP)* measures setting high standards for oneself and self-criticalness for not meeting those standards, *OOP* measures having unrealistic standards for others, and *SPP* measures perceptions about others setting unrealistic standards for oneself. Sometimes, scales of the F-MPS and HF-MPS are combined to reflect a higher order factor of maladaptive perfectionism called evaluative concerns perfectionism (composed of F-MPS DA, CM, PE, PC, and HF-MPS SPP and OOP; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). Both the F-MPS and HF-MPS are measures of general perfectionism and are not specific to a single domain of life.

General measures of perfectionism have been found to be consistently associated with body dissatisfaction across various measures of perfectionism. Studies that have used the F-MPS, CM, DA, PE, and PC have consistently found perfectionism to be associated with body dissatisfaction among women (Donovan, Chew, & Penny, 2014; Wade & Tiggemann, 2013). Additionally, evaluative concerns perfectionism is consistently associated with body dissatisfaction in women (Boone, Soenens, & Braet, 2011; Boone, Soenens, & Luyten, 2014; Sweeney & Fingerhut, 2013). Furthermore, CM, DA, and evaluative concerns perfectionism were unique predictors of body dissatisfaction amongst women (Arcelus, Garcia-Dantas, Sanchez-Martin, & Del Rio, 2015; Chang, Yu, Chang, & Jilani, 2016; Wade & Tiggemann, 2013).

In terms of research on the various facets of perfectionism, studies using the HF-MPS have also found that both SOP and SPP were significantly associated with body dissatisfaction (Downey & Chang, 2007; Tissot & Crowther, 2008) and were both unique predictors of body dissatisfaction, but OOP was not (Welch et al., 2009). Similarly, studies using the Eating Disorders Inventory-Perfectionism subscale (EDI-P) have found that both SOP and SPP were associated with (Donovan et al., 2014) and uniquely predictive of (Welch et al., 2009) body dissatisfaction. Additionally, EDI-P total scores were also associated with (Vohs et al., 2001) and predictive of body dissatisfaction (Welch et al., 2009). Therefore, it appears that regardless of if one sets high standards for oneself, or feels pressure from others to meet high standards, general perfectionism is associated with body dissatisfaction.

In addition to body dissatisfaction, general perfectionism is also associated with negative affect, depression, and anxiety among women. Studies using the maladaptive subscales of the F-MPS have been found to be strongly associated with or predictive of anxiety and depression

(Arcelus et al., 2015; Kawamura, Hunt, Frost, & BiBartolo, 2001; Naragon-Gainey & Watson, 2018). Additionally, socially prescribed perfectionism has also been found to predict negative affect amongst those who were moderate-high in body dissatisfaction (Downey & Chang, 2007).

Research has highlighted how perfectionism can be domain specific to areas such as sports (Dunn, Craft, Causgrove Dunn, & Gotwals, 2011), parenting (Snell, Overbey, & Brewer, 2005), and academics (Malik & Ghayas, 2016), and that domain specific measures of perfectionism may be better predictors of domain specific processes than measures of general perfectionism. Appearance is another domain in which individuals can be perfectionistic. Within a university student sample, 40% of respondents reported they were perfectionistic about their appearance, indicating that perfectionism surrounding appearance is a common domain of life about which many people are perfectionistic (Stoeber & Stoeber, 2009). Like general perfectionism, physical appearance perfectionism is associated with a host of negative body-related variables. For example, Stoeber and Yang (2015) found that physical appearance perfectionism explained additional variance in eating disorder symptoms, over and above general perfectionism in both British and Chinese university student samples, supporting the notion that domain specific perfectionism is a good predictor of domain specific processes. Physical appearance perfectionism is also positively associated with social anxiety related to appearance, appearance disturbance, body shape disturbance, body image concerns, body weight control behaviours, and negatively associated with appearance self-esteem and body area satisfaction (Yang & Stoeber, 2012). Similarly, among cosmetic surgery patients, physical appearance perfectionism was negatively associated with body satisfaction, appearance self-esteem, and positively associated with social anxiety around appearance, and appearance stress (Shang & Yang, 2014; as cited in Yang et al., 2017). Physical appearance perfectionism was also found to

positively predict body dissatisfaction and the desire to lose weight amongst Chinese students aged 9-18 years (Yang et al., 2017). In sum, physical appearance perfectionism is a reliable predictor of body image disturbance.

Cognitive Coping and Body Image and Mood

Cognitive coping, or cognitive emotional regulation, can be defined as the cognitions or thoughts that manage and regulate one's emotions, and represent the mental processes used by an individual to cope with stressful events (Rudolph et al., 2007). Garnefski, Kraaij, and Spinhoven (2001) developed the Cognitive Emotion Regulation Questionnaire to measure nine cognitive coping strategies that may be used to regulate emotion. Four of these strategies represent maladaptive cognitive coping (rumination, catastrophizing, self-blame, and other-blame), and five represent adaptive cognitive coping (acceptance, putting it in perspective, refocus on planning, positive refocusing, and positive reappraisal).

The relationship between cognitive coping and depression and anxiety has been widely studied in the literature and some consistent trends have emerged over time. Among the maladaptive subscales of the CERQ, self-blame, catastrophizing, and rumination have consistently and positively predicted both depression and anxiety, while among the adaptive subscales, positive reappraisal has been the only subscale that was consistently negatively predictive of depression and anxiety, and this was true within both adolescent (Garnefski, & Kraaij, 2018; Stikkelbroek, Bodden, Kleinjan, Reijnders, & van Baar, 2016) and adult samples (Garnefksi & Kraaij, 2007; Garnefski & Kraaij, 2005; Garnefski, Teerds, Kraaij, Legerstee, & van den Kommer, 2004; Martin & Dahlen, 2005). A cross-cultural study of depression, anxiety, and cognitive coping in six European countries found that self-blame and catastrophizing were the most consistent predictors of higher depression, and that catastrophizing and rumination were

the most consistent predictors of higher anxiety (Potthoff et al., 2016). However, the majority of the research on cognitive coping and anxiety and depression has been correlational in nature, and has failed to measure how cognitive coping strategies used in the moment immediately affect mood, making it difficult to determine causal relationships between specific cognitive coping strategies and state feelings of depression and anxiety.

Little research has been conducted on how cognitive coping is related to body image. Rumination and acceptance are two cognitive coping strategies that have begun to be studied in relation to body dissatisfaction. Naumann et al. (2016) experimentally induced women with eating disorders to feel body dissatisfied after comparing themselves to thin fashion models, and then instructed participants to engage in acceptance or rumination to cope with those feelings. The researchers found that engaging in rumination increased body dissatisfaction, while acceptance decreased body dissatisfaction. Wade et al. (2009) conducted a similar study with female undergraduate students and found that engaging in acceptance reduced both weight and appearance dissatisfaction more than did engagement in rumination. Atkinson and Wade (2012) also examined the effect of acceptance on body dissatisfaction after comparison to fashion models and found that relative to the control condition, those who engaged in acceptance had improved weight and appearance satisfaction. In a similar study, Margolis and Orsillo (2016) also found that relative to the control condition, those in the acceptance condition reported less distress about their bodies and did not experience an increase in body dissatisfaction. In sum, results from the few studies conducted to date suggest that after comparison to idealized body images in the media, engagement in rumination is associated with increased body dissatisfaction, while acceptance is associated with reduced body dissatisfaction.

Perfectionism and Cognitive Coping

Perfectionism has been found to be consistently associated with a tendency toward certain cognitive coping strategies. Rumination (i.e. worry) has been the most researched coping strategy. The following types of perfectionism have been found to be consistently associated with rumination: CM, DA, evaluative concerns perfectionism (Castro, Soares, Pereira, & Macedo, 2017; Harris, Pepper, & Maack, 2008), perfectionistic striving (Castro et al., 2017); SPP (Castro et al., 2017; Flett, Coulter, Hewitt, & Nepon, 2011; Flett, Madorsky, Hewitt, & Heisel, 2002; Rudolph et al., 2007; Senra, Merino, & Ferreiro, 2017), SOP (Flett et al., 2011; Flett et al., 2002; Senra et al., 2017; Short & Mazmanian, 2013), and perfectionistic cognitions (Flett et al., 2011; Flett et al., 2002; Rudolph et al., 2007).

The other eight cognitive coping strategies have been much less researched in relation to perfectionism. Based on our review of the published literature, only two studies have examined how the remaining eight cognitive coping strategies are related to perfectionism. The following types of perfectionism were all found to be associated with catastrophizing, self-blame, and other-blame: CM, DA, PE, PC, PS, evaluative concerns perfectionism, perfectionistic strivings (Castro et al., 2017) and SPP (Castro et al., 2017; Rudolph et al., 2007). SOP was found to be related to catastrophizing and self-blame, but not other-blame, OOP was not related to catastrophizing, self- or other-blame (Rudolph et al., 2007), and O was negatively related to self-blame (Castro et al., 2017).

In terms of cognitive coping processes seen as more helpful, the following types of perfectionism were all negatively associated with positive reappraisal, putting it in perspective, and positive refocusing: CM, DA, PC, O, evaluative concerns perfectionism (Castro et al., 2017), and SPP (Rudolph et al., 2007). CM was also negatively related to acceptance. Adaptive forms

of perfectionism (SOP, PS, perfectionistic strivings) were unrelated to any type of adaptive cognitive coping (Castro et al., 2017). Therefore, it seems that maladaptive dimensions of perfectionism were not only associated with high levels of negative cognitive coping strategies, but also lower levels of positive coping strategies. Conversely, adaptive dimensions of perfectionism were positively related to negative coping strategies, and unrelated to positive ones. However, these results are generalizable only to general perfectionism, and no study to date has examined how domain specific perfectionism is related to cognitive coping. The current study will address this gap by examining how physical appearance perfectionism is associated with the nine cognitive coping strategies from the CERQ.

In sum, cognitive coping seems to be associated with both general perfectionism and body image and mood. Past research has also found that cognitive coping strategies have mediated the relationship between general perfectionism and eating disorder symptoms (Riviere & Douilliez, 2017), anxiety (Macedo et al., 2017), depression (Flett et al., 2011; Senra et al., 2017), and negative affect (Castro et al., 2017; Short & Mazmanian, 2013). However, no study to date has examined whether a reliance on certain cognitive coping strategies explains the relationship between perfectionism and body dissatisfaction. This is important, since it could suggest ways to prevent or reduce body dissatisfaction.

The Current Study

As reviewed above, social media sites have a significant impact on how young women feel about themselves and social media use has been identified as a risk factor for negative body image and mood, particularly for certain types of women. Previous research highlights the role of upward appearance-based comparisons on how people feel about themselves after viewing idealized images, but it is not yet know what individuals are most vulnerable and why. The

purpose of the current study was to examine how physical appearance perfectionism as a personality trait is related to body image and mood in a social media environment. This study will address gaps in past research, which have not yet examined links between perfectionism and body distress and mood following exposure to idealized body types on Instagram. Additionally, the current study was interested in assessing how physical appearance perfectionism and body image and mood (and the relationship between them) are related to cognitive coping strategies, which has yet to be investigated. It was also a goal of the current research to investigate whether cognitive coping following upward appearance-based comparisons to idealized images mediates the relationship between physical appearance perfectionism and resulting body image and mood. At a practical level, the aim of the study was to inform the treatment and prevention of eating disorders and body dissatisfaction.

An experimental design was used in order to attempt to isolate the causal effects of upward appearance comparisons through social media on the variables of interest. Cognitive coping was assessed in response to participants being instructed to compare themselves to idealized body images on social media. Based on past research, the following hypotheses were proposed: 1) among young women, comparing themselves to idealized body images on Instagram would result in increased weight and appearance dissatisfaction, increased depression and anxiety, and lower confidence over time and in relation to a neutral control condition; 2) trait physical appearance perfectionism would be directly and positively related to state weight dissatisfaction, appearance dissatisfaction, depression, and anxiety, and directly and negatively related to confidence; 3) trait physical appearance perfectionism would be indirectly related to state weight dissatisfaction, appearance dissatisfaction, and confidence through the effects of rumination, catastrophizing, and acceptance; 4) trait physical appearance perfectionism would be

indirectly related to state anxiety and depression through the effects of rumination, catastrophizing, and positive reappraisal.

Method

Participants

Participants were 142 psychology undergraduate students recruited through the undergraduate research participant pool at York University in Toronto, Canada. Inclusion criteria included being female and being between the ages of 18-25 years inclusive; this age range of women was chosen not only for convenience, but because women in this age range are the heaviest users of Instagram (Pew Research Centre, 2018). Participant ages ranged from 18-24 years ($M = 19.06$, $SD = 1.34$). The self-reported ethnic distribution of the sample was 26.8% Caucasian, 22.5% South-Asian, 15.5% East-Asian, 13.4% Middle Eastern, 7% Black/African-Canadian, 6.3% Other, 4.2% Caribbean, 1.4% Pacific Islander, .7% Native, .7% West Asian, and .7% Hispanic/Latino. Participants' objective body mass index (BMI = kg/m^2) scores ranged from 12.3-46.5 ($M = 21.83$, $SD = 4.97$). The mean, median, and mode for BMI scores all fell within the "normal" weight range (18.5-24.9) according to World Health Organization guidelines (World Health Organization, 2019).

Measures

Perfectionism. The Physical Appearance Perfectionism Scale (PAPS; Yang & Stoeber, 2012) was used to measure trait physical appearance perfectionism. The PAPS is composed of two subscales: worry about imperfection (7 items; e.g., "I worry that my appearance is not good enough") and hope for perfection (5 items; e.g., "I hope my body shape is perfect"). Participants respond to each item on a five-point scale from *1-strongly disagree* to *5-strongly agree*, with higher scores indicating more perfectionism. A total score that combines both subscales can be

computed, as well as an individual score for each subscale. We used the total score in this study ($\alpha =. 87$) since we did not have hypotheses specific to either subscale.

State mood and body image. To measure state mood and body image we adapted the procedure by Tiggemann and McGill (2004), and used several visual analogue scales (VAS) to measure state mood and body image both immediately before and immediately after viewing the Instagram images. Each scale consisted of a 100 mm horizontal line with endpoints that were labelled as '*none*' and '*very much*'. Participants were asked to report how they feel "right now" in regard to feelings of depression, anxiety, confidence, and appearance and weight dissatisfaction by placing a vertical tick mark at the point on the line that best depicts how they are feeling in that moment. Responses to the scales were measured with a ruler from the '*none*' endpoint to the closest millimeter, and therefore responses could range from 0 to 100, with higher scores indicating stronger feelings. Scales of this type have long been used in experimental research to reliably assess pre- and post- fluctuations in psychological states (Heinberg &Thompson, 1995). Visual analogue scales are advantageous because they can be filled out quickly and previous responses are difficult to remember since the line is not numbered, which improves sensitivity to small changes.

Cognitive emotion regulation. The Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001) is a 36 item self-report questionnaire that assesses the types of thoughts participants use to regulate their emotions following a stressful event. The questionnaire has nine subscales, which are composed of four items each, which represent nine different cognitive emotion regulation strategies. A modified version of the CERQ that specifically measured thoughts and feelings following engagement in comparison to Instagram models was used in the current study to examine active engagement in the following coping strategies:

rumination (e.g., *I am dwelling upon the feelings comparing my body to the models has evoked in me;* α =. 83), catastrophizing (e.g., *I am thinking that how I feel about my body after comparison to the models is much worse than what others have experienced;* α =. 71), self-blame (e.g.,. *I feel that I am the one to blame for the level of satisfaction with my bodyt,* α =. 70), other-blame (e.g. *I feel that others/the models are responsible for my level of body satisfaction;* α =. 75), acceptance (e.g., *I think that I have to accept my body the way it is;* α =. 63), positive refocusing (e.g., *I think about pleasant experience that have nothing to do with my bodys;* α =. 73), refocus on planning (e.g., *I think of what I can do best instead of thinking about my body;* α =. 68), positive reappraisal (e.g., *I think I can learn something from the situation;* α =. 81), and putting into perspective (e.g., *I tell myself that there are worse things in life than the feelings I feel after comparing my body to the models;* α =. 70). The ends of each sentence in the CERQ was modified by making the statement specific to the context of the study (i.e. feelings about the body in relation to the comparison to the models), rather than leaving each statement in the generic format, which is applicable to any specified situation. In the current study, participants were asked to indicate how often they actually experienced each type of thought while looking at the Instagram images, rather than indicating how often they usually experience these types of thoughts, which is how the questionnaire is typically administered. Higher scores indicate greater usage of that cognitive coping strategy.

Procedure

Ethics approval was granted by the York University Human Participants Review Committee. Eligible students could see and sign up for the study through an online experiment management system. Interested participants volunteered to take part in an advertised study on "personality and social media" for partial course credit. For Part 1 of the study participants

completed online questionnaires up to seven days prior to the date they were scheduled to participate in Part 2. The online questionnaire assessed trait physical appearance perfectionism, as well as demographic information such as age and ethnicity. This questionnaire was completed seven days prior to Part 2 to reduce the likelihood of biased responding in the second part of the study.

For Part 2 of the study, participants were randomly assigned to either the control ($n = 70$) or experimental ($n = 72$) condition prior to arriving to the research lab. Participants were individually tested in a private room and were asked to leave their bags and any electronic devices outside of the testing area so that they did not look at them during the experiment. All participants read and signed an informed consent form and completed a baseline VAS for mood and body image. Following completion of the VAS, participants in the experimental condition were instructed to browse unaltered Instagram images of two preselected Instagram models on a desktop computer. Instagram models were selected by four members of the experimenter's research lab based on how closely they represented the thin and fit ideal (see Figures 1 and 2). Both of the specific models were chosen because they had a large following on Instagram (each had over 11 million followers), and therefore we reasoned that these photos were representative of the types of models that young women are following and routinely exposed to on Instagram. Specific photographs were selected based on which photos had the most likes on the models' Instagram accounts, and which also clearly showed the bodies and faces of the models. Participants viewed each model for ten minutes and were instructed to complete a short comparison task that required participants to compare the size of various parts of their bodies to the size of the Instagram model's body parts. For example, participants were instructed to indicate if their thighs, arms, butt, waist, hips, biceps, breasts, legs, and stomach were *much*

smaller, *smaller*, *about the same size*, *larger*, or *much larger* than the corresponding body parts in the Instagram model. They were also asked to indicate if their face and overall physical appearance was *much more attractive*, *slightly more attractive*, *about the same level of attractiveness*, *less attractive*, or *much less attractive* than the Instagram models'. Participants completed this task for both Instagram models they viewed. This task was given to participants to ensure they were engaging in an active appearance-based comparison to the Instagram models. Immediately after viewing the Instagram models and engaging in the comparison task, participants completed another VAS to assess what effect comparison to Instagram models had on mood and body image. Participants then completed the CERQ, and were instructed to report what thoughts they had actually experienced when dealing with feelings evoked from comparing themselves to the Instagram models. A period of approximately twenty minutes had passed between participants' first viewing the images and completing the CERQ, and therefore the CERQ would be measuring any coping thoughts that participants had experienced within that twenty minute window.

Those in the control condition viewed preselected images of landscape paintings on Instagram (see Figure 3). Landscape paintings were chosen as a control stimulus because they are not body-related in nature and therefore we reasoned that these types of images would have no significant impact on body image. Participants browsed the images for ten minutes and completed an art critique task that required participants to compare the images of the paintings on various artistic aspects. This control condition was included to control for time spent interacting with the images across conditions, as well as being online. Control participants then also completed another VAS to assess state mood and body image after viewing the paintings on

Instagram. Control participants also completed the CERQ and were asked to indicate what thoughts they usually had when they had a conflict with a family member.

Upon completing the questionnaires all participants were thanked for their time and debriefed. All participants had their height and weight measured backwards by the experimenter on a balance beam scale prior to leaving the lab; this information was used to calculate participants' BMI. The experimental condition participants also completed a ten-minute positive body induction task where they wrote a short paragraph about positive traits or qualities they liked about themselves, to try to counteract any feelings of body dissatisfaction they may have experienced.

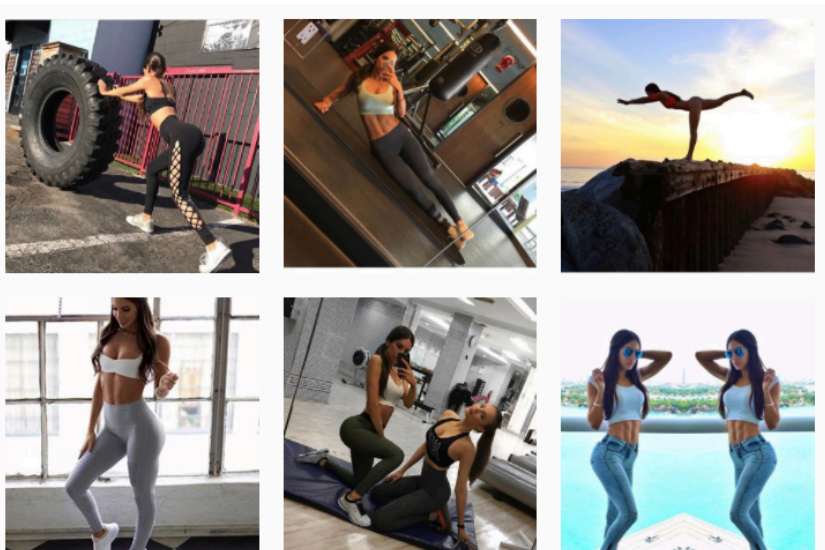*Figure 1*. "Fit ideal" model used for experimental condition stimuli.
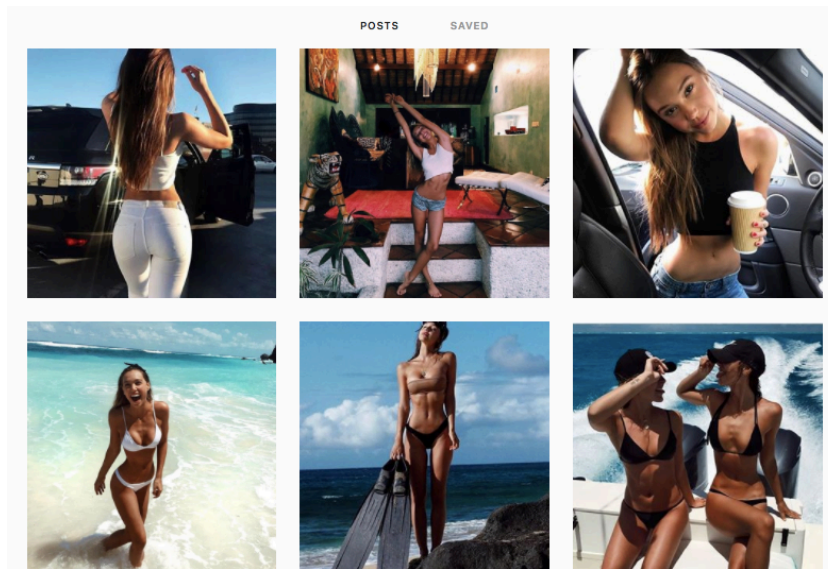
Figure 2. "Thin ideal" model used for experimental condition stimuli.
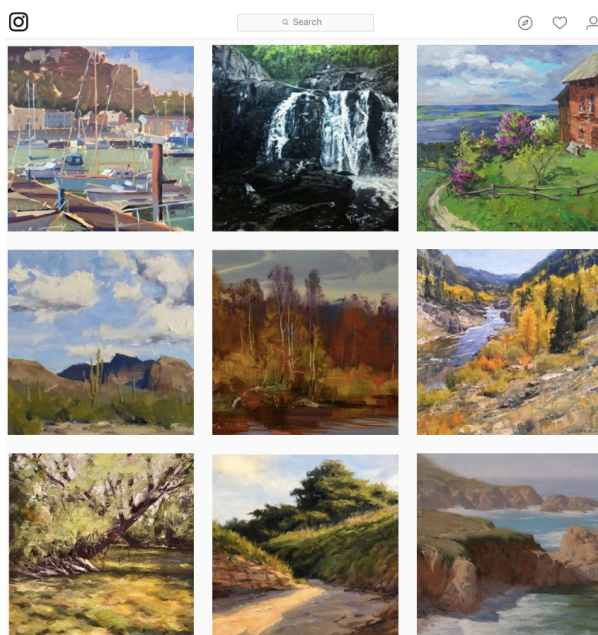
Figure 3. Landscape paintings used for stimuli in control condition.

Results

Data Analysis

Statistical analyses were conducted using SPSS version 25. To examine the effects of the experimental manipulation, a mixed univariate analysis of variance (ANOVA) was used to test

whether pre and post scores for weight dissatisfaction, appearance dissatisfaction, confidence, anxiety, and depression were dependent upon experimental condition. Time (Time 1- Time 2) was the within-subject factor, and experimental condition (experimental or control group) was the between-subjects factor. Any statistically significant interactions between time and condition were followed up with paired samples *t*-tests.

To test whether cognitive coping mediated the effects of appearance comparison to Instagram models, mediation regression analyses were conducted on experimental condition data only (*n* = 72), using the PROCESS SPSS macro version 3.2 (Hayes, 2018). We tested model 4, which includes one outcome variable, one predictor, one mediator, and room for covariates. As shown in Figure 4, we used physical appearance perfectionism as the predictor, one of the nine CERQ subscales as a mediator, and weight dissatisfaction, appearance dissatisfaction, anxiety, depression, or confidence as the outcome variable. We included BMI as a covariate, to statistically control for any variance attributable to objective body size. An *a priori* power analysis was conducted using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to estimate the sample size needed for the mediation analyses (conducted within the experimental group). Using an alpha level of .05, a medium effect size, and power estimate of .80, the recommended sample size was 68 participants. We ran a few extra participants to allow for possible missing data and an equivalent number of participants in the control condition to test the effects of the experimental manipulation.
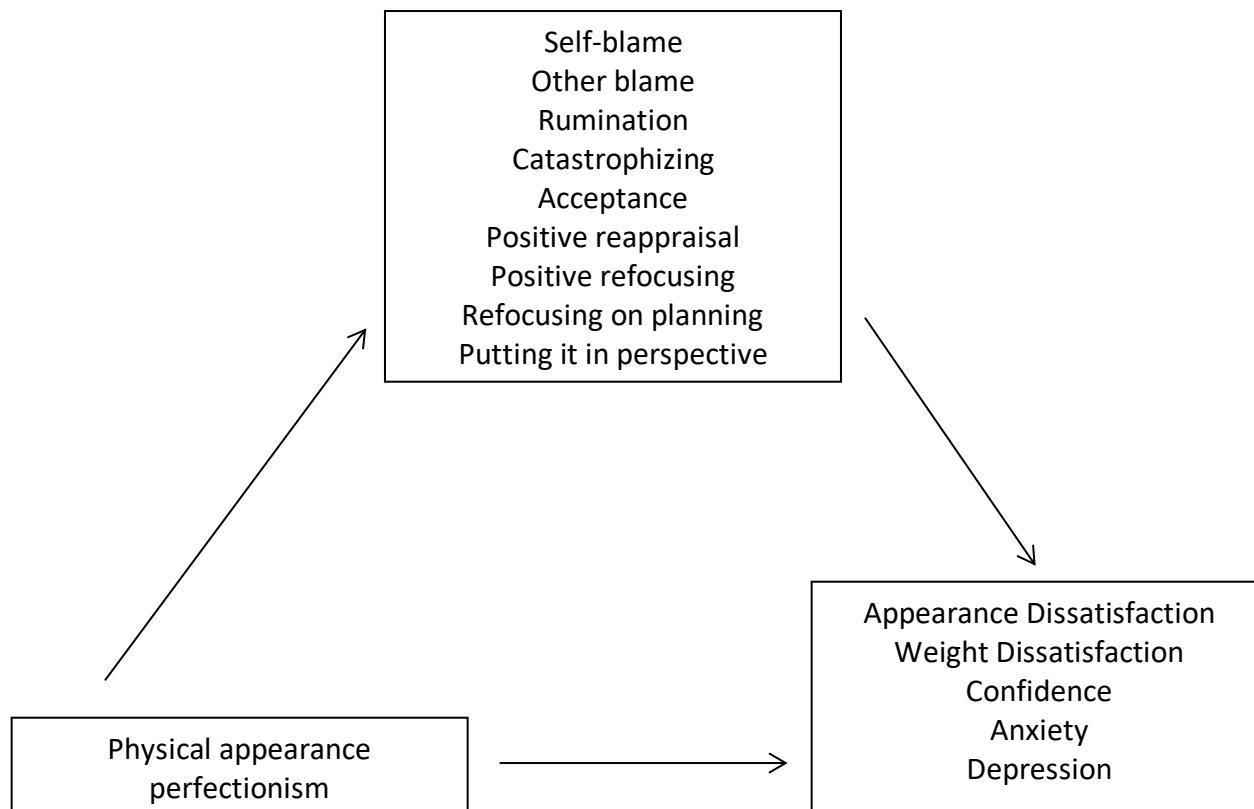
Figure 4. Proposed relationships between physical appearance perfectionism, CERQ subscales, and mood and body image outcome variables.

Preliminary Analyses

Inspection of histograms, skewness, and kurtosis suggested that all of the variables were normally distributed. There were no statistically significant outliers (± 3 *SD*) among the predictor, mediator, or outcome variables.

A series of one-way ANOVAs showed that the experimental and control conditions did not differ in regard to age, $F(1,140) = .89$, $p = .35$, BMI, $F(1,138) = .69$, $p = .41$, or baseline measures of anxiety, $F(1,140) = .19$, $p = .66$, depression, $F(1,140) = .10$, $p = .75$, confidence, $F(1,140) = .09$, $p = .77$, or weight dissatisfaction, $F(1,140) = 2.55$, $p = .11$. They did however differ in baseline levels of appearance dissatisfaction, $F(1,140) = 5.04$, $p = .03$, with the control condition reporting higher appearance dissatisfaction than the experimental condition. Together,

these results suggest that randomization to condition resulted in reasonably equivalent groups on all but one of the participant characteristics and baseline states. However, the control group started the experiment feeling slightly worse about their appearance than did the experimental group. No adjustment to the subsequent ANOVAs involving appearance dissatisfaction were deemed necessary, since the relevant analyses were on repeated measures that incorporated scores at Time 1. No adjustments were made to the mediation analyses involving appearance dissatisfaction since they involved only the experimental group at post-manipulation. Visual inspection of the means and distribution of the baseline scores did not suggest that we had an atypical sample in the experimental group or a potential ceiling effect on appearance dissatisfaction.

Bivariate correlations, means, and standard deviations were computed between physical appearance perfectionism scores, CERQ subscales, and post-induction measures of the VAS outcomes for the experimental group, and can be found in Table 1. In sum, the variables were related to each other in the expected directions and in theoretically meaningful ways.

Changes to Mood and Body Image as a Function of Condition

As predicted, significant 2-way interactions (condition x time) were found for depression, $F(1) = 14.48$, $p<.001$, $\eta_p^2 = .094$, confidence, $F(1) = 11.96$, $p =.001$, $\eta_p^2 = .079$, weight dissatisfaction, $F(1) = 28.11$, $p<.001$, $\eta_p^2 = .167$, and appearance dissatisfaction, $F(1) = 31.50$, $p<.001$, $\eta_p^2 = .184$, meaning that the two experimental conditions were not equal with respect to changes in those outcome variables from Time 1 to Time 2. No significant interaction was found for anxiety (see Figure 5).

Significant interactions were followed up with paired samples *t*-tests. Contrary to hypotheses, paired samples *t*-tests revealed that the control condition experienced decreased

depression, t (69) = 4.33, p<.001 (mean difference of 5.3) from Time 1 to Time 2, while the

experimental condition experienced no statistically significant changes in depression (see Figure

6). The control condition also experienced decreases in weight dissatisfaction, t (69) = 2.77,

p=.007 (mean difference of 4.62), and appearance dissatisfaction, t (69) = 3.67, p<.001 (mean

difference of 5.00), whereas, as predicted, the experimental condition experienced increases in

both weight dissatisfaction, t (71) = 4.56, p<.001 (mean difference of -11.46), and appearance

dissatisfaction, t (71) = 4.39, p<.001 (mean difference of -9.98) from Time 1 to Time 2 (see

Figures 7 and 8). The control condition experienced no statistically significant changes in

confidence, while the experimental condition experienced significant decreases in confidence, t

(71) = 4.30, p<.001 (mean difference of -8.83) from Time 1 to Time 2, as predicted (see Figure

9).

Table 1

Intercorrelations for Physical Appearance Perfectionism, CERQ Strategy, and Mood and Body Image Outcomes

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	M	SD
1. PAPS-T	---															39.56	7.76
2. Anxiety	.144	---														27.06	25.24
3. Depression	.371**	.579**	---													21.51	23.16
4. Weight dissatisfaction	.415**	.104	.293**	---												47.03	30.12
5. Appearance Dissatisfaction	.454**	.103	.427**	.686**	---											46.62	25.35
6. Confidence	-.239*	-.322**	-.421**	-.346**	-.455**	---										45.67	23.22
7. Rumination	.496**	.170	.450**	.424**	.486**	-.510**	---									11.04	3.13
8. Catastrophizing	.407**	.162	.396**	.509**	.528**	-.518**	.701**	---								8.05	2.64
9. Self-blame	.242*	-.030	.093	.412**	.251*	-.115	.356**	.177	---							14.75	2.51
10. Other-blame	.221	.263**	.232*	.090	.130	-.362**	.429**	.500**	-.060	---						8.33	2.80
11. Acceptance	-.067	-.027	-.170	-.281*	-.134	.077	.007	-.242*	.066	.206	---					13.96	2.64
12. Positive reappraisal	-.018	-.226	-.325**	.099	-.040	.241*	-.046	-.204	.202	-.163	.193	---				13.75	2.93
13. Positive refocusing	-.086	-.145	-.311**	-.251*	-.319**	.478**	-.482**	-.406**	-.048	-.224	.257*	.377**	---			11.14	2.77
14. Refocus on planning	.250*	-.117	-.043	.392**	.308**	-.030	.449**	.404**	.501**	.180	.029	.467**	.101	---		12.17	2.82
15. Putting in perspective	-.050	-.137	-.314**	-.187	-.130	.183	-.074	-.352**	.045	-.014	.285*	.336**	.095	.083	---	14.82	2.71

Note. Intercorrelations, means and standard deviations reflect post experimental induction scores for the experimental condition only. $N = 71$. PAPS-T = Physical appearance perfectionism scale-total score. * $p<0.05$; **$p<0.01$
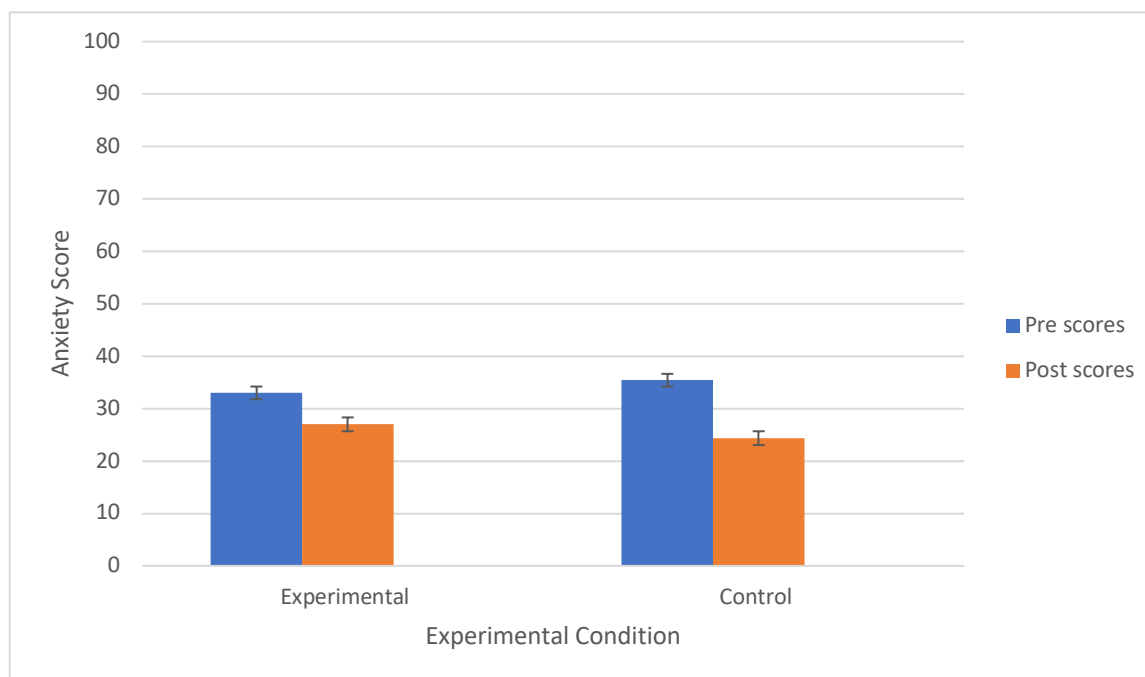
Figure 5. Anxiety scores prior to and following exposure to Instagram images.

Note. *** *p*<.001; ***p*<.01

Figure 6. Depression scores prior to and following exposure to Instagram images.
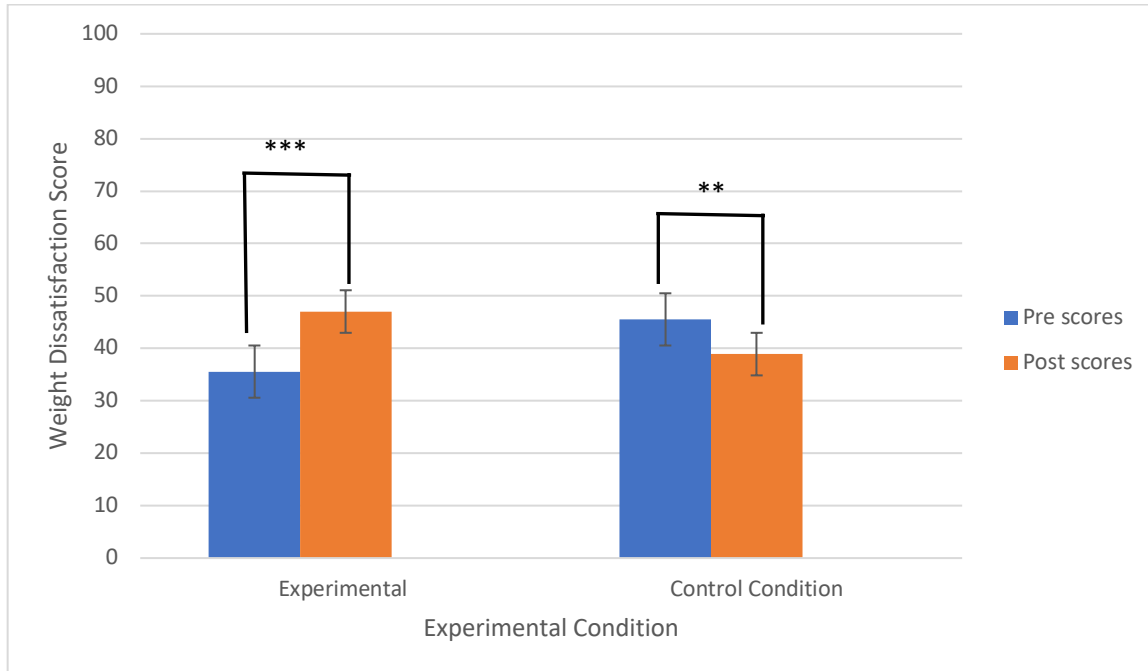
Note. *** *p*<.001; ***p*<.01

Figure 7. Weight dissatisfaction scores prior to and following exposure to Instagram images.
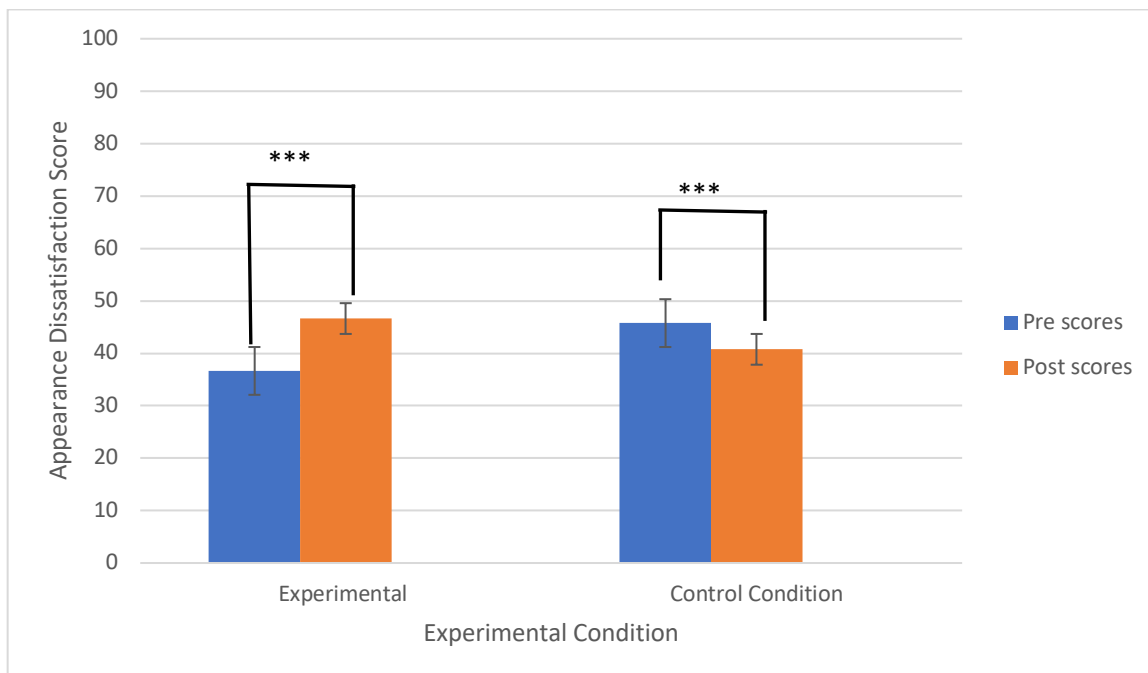
Note. *** *p*<.001; **p*<.01

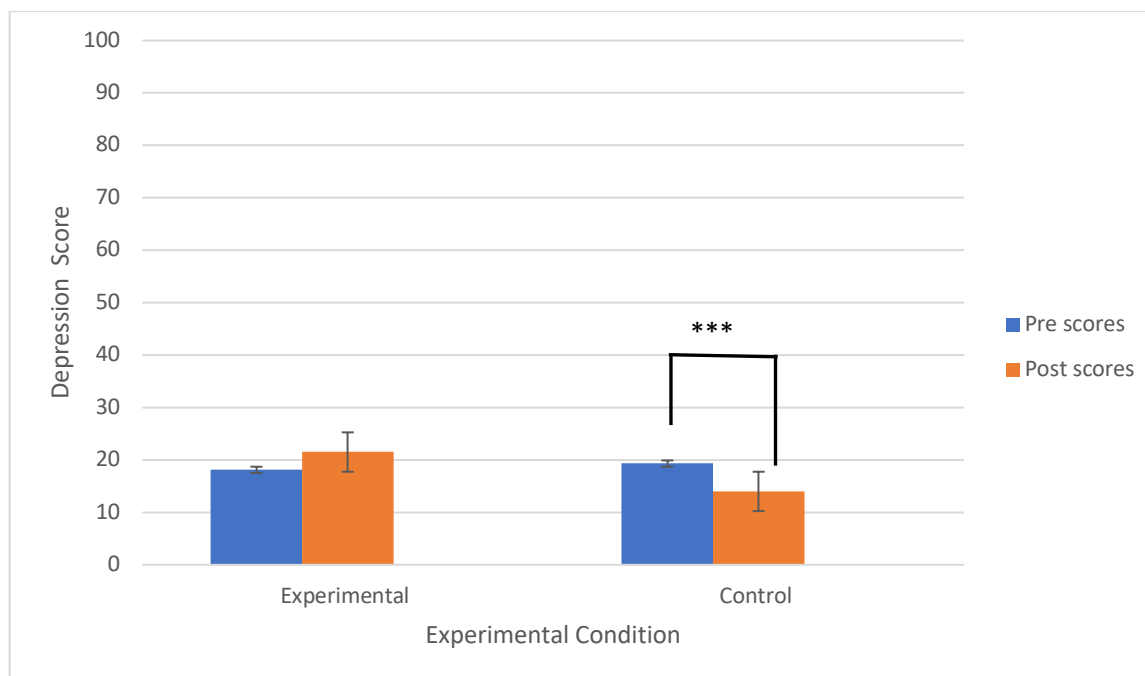*Figure 8.* Appearance dissatisfaction scores prior to and following exposure to Instagram images.
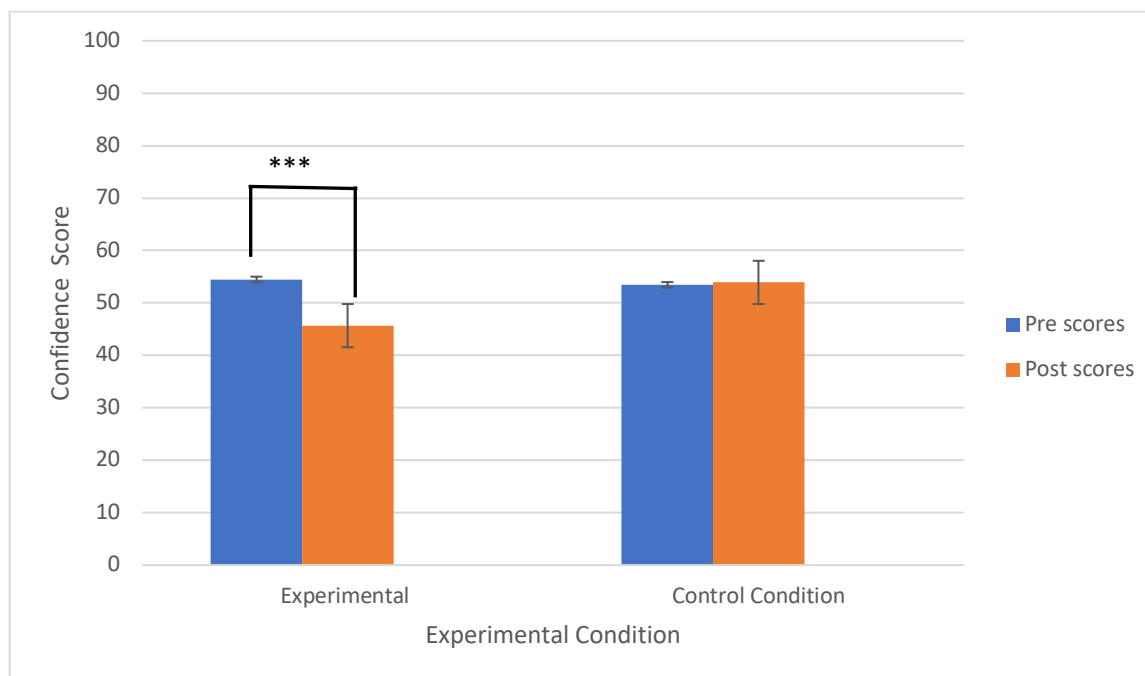
Note. *** *p*<.001; **p*<.01

Figure 9. Confidence scores prior to and following exposure to Instagram images.

Note. *** *p*<.001; **p*<.01

Mediation Analyses[1]

Physical appearance perfectionism, CERQ dimensions, and weight dissatisfaction.

As shown in Table 2, we tested whether physical appearance perfectionism was directly related to weight dissatisfaction, and also indirectly related through the effect of the nine cognitive emotion regulation strategies from the CERQ.

As hypothesized, physical appearance perfectionism was directly and positively related to weight dissatisfaction in all nine models that were tested[2]. Also as predicted, physical appearance

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[1] Linear regression was also used to examine whether general perfectionism (as measured by Total scores on the Frost Multidimensional Perfectionism Scale, FMPS-T scores) was directly and indirectly related to weight dissatisfaction, appearance dissatisfaction, confidence, anxiety, and depression through any of the nine CERQ coping strategies. Results revealed significant b paths between several CERQ coping strategies and body image and mood, but no significant a paths between FMPS-T scores and CERQ strategies. Direct effects were only found between FMPS-T scores and anxiety and depression. No indirect effects were found for any outcome variable. These results provide further support that domain specific measures of perfectionism are better predictors of domain specific processes, as has been found in past research.

[2] 2 Linear regression was also used to examine whether physical appearance perfectionism directly predicted post-manipulation anxiety, depression, confidence, weight and appearance dissatisfaction scores in the control condition

perfectionism was indirectly associated with weight dissatisfaction through the effect of rumination. Physical appearance perfectionism was also indirectly associated with weight dissatisfaction through the effect of catastrophizing. Contrary to hypotheses, physical appearance perfectionism was not indirectly associated with weight dissatisfaction through the effect of acceptance. No indirect effects were found for any of the other six cognitive emotion regulation strategies either. Additionally, physical appearance perfectionism was found to significantly and positively predict rumination, catastrophizing, and self-blame, but did not significantly predict the adaptive coping strategies, except for refocus on planning. Furthermore, rumination, catastrophizing, self-blame, and refocus on planning all positively predicted weight dissatisfaction, while acceptance and positive refocusing both negatively predicted weight dissatisfaction.

Physical appearance perfectionism, CERQ dimensions, and appearance dissatisfaction.

As shown in Table 3, we tested whether physical appearance perfectionism was directly related to appearance dissatisfaction, and also indirectly related through the effect of the nine cognitive emotion regulation strategies on the CERQ.

As hypothesized, physical appearance perfectionism was directly and positively related to appearance dissatisfaction in all nine models that were tested. Also as predicted, physical appearance perfectionism was indirectly associated with appearance dissatisfaction through the effect of rumination. Physical appearance perfectionism was also indirectly associated with appearance dissatisfaction through the effect of catastrophizing. Contrary to hypotheses, physical

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as well. This was done to assess whether trait physical appearance perfectionism is predictive of these outcome variables in general, even when women are not exposed to stimuli that would be expected to cause changes in these outcomes. Linear regressions revealed that, for the control group, physical appearance perfectionism did directly predict post-induction confidence, weight and appearance dissatisfaction scores, but not depression or anxiety. Therefore, physical appearance perfectionism seems to be predictive of body image dissatisfaction when women are exposed to thin ideal images, but also when they are not.

appearance perfectionism was not indirectly associated with appearance dissatisfaction through the effect of acceptance. No indirect effects were found for any of the other six cognitive emotion regulation strategies. Additionally, physical appearance perfectionism was found to significantly and positively predict rumination, catastrophizing, and self-blame, but did not significantly predict the adaptive coping strategies, except for refocus on planning. Furthermore, rumination and catastrophizing both positively predicted appearance dissatisfaction, while positive refocusing negatively predicted appearance dissatisfaction.

Physical appearance perfectionism, CERQ dimensions, and confidence.

As shown in Table 4, we tested whether physical appearance perfectionism was directly related to confidence, and also indirectly related through the effect of the nine cognitive emotion regulation strategies assessed by the CERQ.

Contrary to hypotheses, physical appearance perfectionism was, for the most part, not found to be directly and negatively related to confidence; it was only directly and negatively related to confidence in two of the nine models tested. However, as predicted, physical appearance perfectionism was indirectly associated with confidence through the effect of rumination. Physical appearance perfectionism was also indirectly associated with confidence through the effect of catastrophizing. Contrary to hypotheses, physical appearance perfectionism was not indirectly associated with confidence through the effect of acceptance. No indirect effects were found for any of the other six cognitive emotion regulation strategies. Additionally, physical appearance perfectionism was found to significantly and positively predict rumination, catastrophizing, and self-blame, but did not significantly predict the adaptive coping strategies except for refocus on planning. Furthermore, rumination, catastrophizing, and other-blame all negatively predicted confidence, while positive refocusing positively predicted confidence.

Physical appearance perfectionism, CERQ dimensions, and depression.

As shown in Table 5, we tested whether physical appearance perfectionism was directly related to depression, and also indirectly related through the effect of the nine cognitive emotion regulation strategies assessed by the CERQ.

As hypothesized, physical appearance perfectionism was directly and positively related to depression. Also as predicted, physical appearance perfectionism was indirectly associated with depression through the effect of rumination. Physical appearance perfectionism was also indirectly associated with depression through the effect of catastrophizing. Contrary to hypotheses, physical appearance perfectionism was not indirectly associated with depression through the effect of positive reappraisal. No indirect effects were found for any of the other six cognitive emotion regulation strategies. Additionally, physical appearance perfectionism was found to significantly and positively predict rumination, catastrophizing, and self-blame, but did not significantly predict the adaptive coping strategies except for refocus on planning. Furthermore, rumination and catastrophizing both positively predicted depression, while positive reappraisal, positive refocusing, and putting it in perspective negatively predicted depression.

Physical appearance perfectionism, CERQ dimensions, and anxiety.

As shown in Table 6, we tested nine models to examine whether physical appearance perfectionism was directly related to anxiety, and also indirectly related through the effect of the nine cognitive emotion regulation strategies listed in the CERQ.

Contrary to hypotheses, physical appearance perfectionism did not directly or indirectly predict anxiety; no direct or indirect effects were found in any of the nine models in Table 6. However, physical appearance perfectionism was found to significantly and positively predict rumination, catastrophizing, and self-blame, but did not significantly predict any of the adaptive

coping strategies, except for refocus on planning. Only other-blame positively predicted anxiety,

and positive reappraisal negatively predicted anxiety.

Table 2

Direct and Indirect Effects of CERQ Dimensions on the Relationship between Physical

Appearance Perfectionism and Weight Dissatisfaction

Regression paths	*b*	95% CI
Rumination		
Mediation *a* path (PAPS-T on rumination)	.20***	[.11, .28]
Mediation *b* path (Rumination on weight dissatisfaction)	3.20**	[1.01, 5.38]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.00*	[.13, 1.88]
Indirect effect with 95% CI	.63	[.15, 1.19]
Catastrophizing		
Mediation *a* path (PAPS-T on catastrophizing)	.14***	[.06, .21]
Mediation *b* path (Catastrophizing on weight dissatisfaction)	4.64***	[2.30, 6.99]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.00*	[.20, 1.80]
Indirect effect with 95% CI	.64	[.17, 1.23]
Self-blame		
Mediation *a* path (PAPS-T on self-blame)	.08*	[.01,.15]
Mediation *b* path (Self-blame on weight dissatisfaction)	3.13*	[.57, 5.70]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.39**	[.58, 2.19]
Indirect effect with 95% CI	.25	[-.06,.61]
Other-blame		
Mediation *a* path (PAPS-T on other-blame)	.08	[-.01, .16]
Mediation *b* path (Other-blame on weight dissatisfaction)	.31	[-2.00, 2.62]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.61***	[.79, 2.44]
Indirect effect with 95% CI	.02	[-.19, .30]
Acceptance		
Mediation *a* path (PAPS-T on acceptance)	-.02	[-.11, .06]
Mediation *b* path (Acceptance on weight dissatisfaction)	-3.21**	[-5.47, -.96]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.56***	[.80, 2.33]
Indirect effect with 95% CI	.08	[-.20, .38]
Positive reappraisal		
Mediation *a* path (PAPS-T on positive reappraisal)	-.01	[-.09, .08]
Mediation *b* path (Positive reappraisal on weight dissatisfaction)	.17	[-2.07, 2.41]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.64***	[.83, 2.45]
Indirect effect with 95% CI	-.00	[-.14, .12]
Positive refocusing		
Mediation *a* path (PAPS-T on positive refocusing)	-.03	[-.12, .05]
Mediation *b* path (Positive refocusing on weight dissatisfaction)	-.29*	[-5.10, -.71]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.54***	[.77, 2.32]
Indirect effect with 95% CI	.09	[-.11, .39]
Refocus on planning		
Mediation *a* path (PAPS-T on refocus on planning)	.09*	[.01, .17]
Mediation *b* path (Refocus on planning on weight dissatisfaction)	2.79*	[.55, 5.04]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.39***	[.59, 2.19]
Indirect effect with 95% CI	.25	[-.01, .66]
Putting it in perspective		
Mediation *a* path (PAPS-T on putting in perspective)	-.02	[-.10, .07]

Mediation *b* path (Putting in perspective on weight dissatisfaction)	-1.53	[-3.83, .76]
Direct effect, *c'* (PAPS-T on weight dissatisfaction)	1.61***	[.81, 2.41]
Indirect effect with 95% CI	.03	[-.16, .24]

Note. PAPS-T = physical appearance perfectionism scale-total score. *p < .05. **p < .01. ***p < .001.

Table 3

Direct and Indirect Effects of CERQ Dimensions on the Relationship between Physical

Appearance Perfectionism and Appearance Dissatisfaction

Regression paths	*b*	95% CI
Rumination		
Mediation *a* path (PAPS-T on rumination)	.20***	[.11, .28]
Mediation *b* path (Rumination on appearance dissatisfaction)	2.95**	[1.05, 4.84]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	.91*	[.15, 1,67]
Indirect effect with 95% CI	.58	[.14, 1.10]
Catastrophizing		
Mediation *a* path (PAPS-T on catastrophizing)	.14***	[.06, .21]
Mediation *b* path (Catastrophizing on appearance dissatisfaction)	3.96***	[1.90, 6.02]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	.95**	[.25, 1.65]
Indirect effect with 95% CI	.55	[.16, 1.09]
Self-blame		
Mediation *a* path (PAPS-T on self-blame)	.08*	[.01, .15]
Mediation *b* path (Self-blame on appearance dissatisfaction)	1.33	[-.98, 3.64]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	1.39***	[.67, 2.12]
Indirect effect with 95% CI	.11	[-.20, .33]
Other-blame		
Mediation *a* path (PAPS-T on other-blame)	.08	[-.01, .16]
Mediation *b* path (Other-blame on appearance dissatisfaction)	.40	[-1.61, 2.42]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	1.47**	[.74, 2.19]
Indirect effect with 95% CI	.03	[-.13,.30]
Acceptance		
Mediation *a* path (PAPS-T on acceptance)	-.02	[-.11, .06]
Mediation *b* path (Acceptance on appearance dissatisfaction)	-1.07	[-3.14, 1.00]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	1.47***	[.77, 2.18]
Indirect effect with 95% CI	.03	[-.11, .19]
Positive reappraisal		
Mediation *a* path (PAPS-T on positive reappraisal)	-.01	[-.09, .08]
Mediation *b* path (Positive reappraisal on appearance dissatisfaction)	-.54	[-2.49, 1.41]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	1.49***	[.79, 2.20]
Indirect effect with 95% CI	.004	[-.12, .13]
Positive refocusing		
Mediation *a* path (PAPS-T on positive refocusing)	-.03	[-.12, .05]
Mediation *b* path (Positive refocusing on appearance dissatisfaction)	-2.76**	[-4.65, -.86]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	1.41***	[.74, 2.08]
Indirect effect with 95% CI	.09	[-.14, .32]
Refocus on planning		
Mediation *a* path (PAPS-T on refocus on planning)	.09*	[.01, .17]
Mediation *b* path (Refocus on planning on appearance dissatisfaction)	1.81	[-.19, 3.81]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	1.34***	[.62, 2.05]
Indirect effect with 95% CI	.16	[-04, .47]

Putting it in perspective		
Mediation *a* path (PAPS-T on putting in perspective)	-.02	[-.10, .07]
Mediation *b* path (Putting in perspective on appearance dissatisfaction)	.-.94	[-2.96, 1.08]
Direct effect, *c'* (PAPS-T on appearance dissatisfaction)	1.48**	[.78, 2.18]
Indirect effect with 95% CI	.02	[-.12, .20]

Note. PAPS-T = physical appearance perfectionism scale-total score. *p* < .05. **p* < .01. ***p* < .001.

Table 4

Direct and Indirect Effects of CERQ Dimensions on the Relationship between Physical

Appearance Perfectionism and Confidence

Regression paths	*b*	95% CI
Rumination		
Mediation *a* path (PAPS-T on rumination)	.20***	[.11, .28]
Mediation *b* path (Rumination on confidence)	-3.79***	[-5.57, -2.00]
Direct effect, *c'* (PAPS-T on confidence)	.04	[-.68, .75]
Indirect effect with 95% CI	-.75	[-1.32, -.33]
Catastrophizing		
Mediation *a* path (PAPS-T on catastrophizing)	.14***	[.06, .21]
Mediation *b* path (Catastrophizing on confidence)	-4.47***	[-6.44, -2.50]
Direct effect, *c'* (PAPS-T on confidence)	-.10	[-.77, .57]
Indirect effect with 95% CI	-.62	[-1.11, -.22]
Self-blame		
Mediation *a* path (PAPS-T on self-blame)	.08*	[.01, .15]
Mediation *b* path (Self-blame on confidence)	-1.02	[-3.32, 1.28]
Direct effect, *c'* (PAPS-T on confidence)	-.63	[-1.35, .09]
Indirect effect with 95% CI	-.08	[-.34, .09]
Other-blame		
Mediation *a* path (PAPS-T on other-blame)	.08	[-.01, .16]
Mediation *b* path (Other-blame on confidence)	-2.67**	[-4.56, -.77]
Direct effect, *c'* (PAPS-T on confidence)	-.51	[-1.19, .17]
Indirect effect with 95% CI	-.20	[-.50, 01]
Acceptance		
Mediation *a* path (PAPS-T on acceptance)	-.02	[-.11, .06]
Mediation *b* path (Acceptance on confidence)	.41	[-1.65, 2.48]
Direct effect, *c'* (PAPS-T on confidence)	-.71*	[-1.41, -.00]
Indirect effect with 95% CI	-.01	[-.16, .11]
Positive reappraisal		
Mediation *a* path (PAPS-T on positive reappraisal)	-.01	[-.09, .08]
Mediation *b* path (Positive reappraisal on confidence)	1.63	[-.26, 3.53]
Direct effect, *c'* (PAPS-T on confidence)	-.71*	[-1.39, -.02]
Indirect effect with 95% CI	-.01	[-.24,.17]
Positive refocusing		
Mediation *a* path (PAPS-T on positive refocusing)	-.03	[-.12, .05]
Mediation *b* path (Positive refocusing on confidence)	3.75***	[1.97, 5.52]
Direct effect, *c'* (PAPS-T on confidence)	-.59	[-1.22, .03]
Indirect effect with 95% CI	-.12	[-42, .16]
Refocus on planning		
Mediation *a* path (PAPS-T on refocus on planning)	.09*	[.01, .17]
Mediation *b* path (Refocus on planning on confidence)	-.03	[-2.06, 2.00]

Direct effect, *c'* (PAPS-T on confidence)	-.71	[-1.44, .01]
Indirect effect with 95% CI	-.00	[-.19, .19]
Putting it in perspective		
Mediation *a* path (PAPS-T on putting in perspective)	-.02	[-.10, .07]
Mediation *b* path (Putting in perspective on confidence)	1.53	[-.45, 3.51]
Direct effect, *c'* (PAPS-T on confidence)	-.69	[-1.38, .00]
Indirect effect with 95% CI	-.03	[-.24, .14]

Note. PAPS-T = physical appearance perfectionism scale-total score. **p* < .05. ***p* < .01. ****p* < .001.

Table 5

Direct and Indirect Effects of CERQ Dimensions on the Relationship between Physical

Appearance Perfectionism and Depression

Regression paths	*b*	95% CI
Rumination		
Mediation *a* path (PAPS-T on rumination)	.20***	[.11, .28]
Mediation *b* path (Rumination on depression)	2.58**	[.75, 4.41]
Direct effect, *c'* (PAPS-T on depression)	.58	[-.16, 1.31]
Indirect effect with 95% CI	.51	[.11, .98]
Catastrophizing		
Mediation *a* path (PAPS-T on catastrophizing)	.14***	[.06, .21]
Mediation *b* path (Catastrophizing on depression)	2.56*	[.49, 4.64]
Direct effect, *c'* (PAPS-T on depression)	.74*	[.03, 1.44]
Indirect effect with 95% CI	.35	[.03, 1.44]
Self-blame		
Mediation *a* path (PAPS-T on self-blame)	.08*	[.01, .15]
Mediation *b* path (Self-blame on depression)	.18	[-2.05, 2.41]
Direct effect, *c'* (PAPS-T on depression)	1.08**	[.38, 1.77]
Indirect effect with 95% CI	.01	[-.19, .20]
Other-blame		
Mediation *a* path (PAPS-T on other-blame)	.08	[-.01, .16]
Mediation *b* path (Other-blame on depression)	1.23	[-.67, 3.14]
Direct effect, *c'* (PAPS-T on depression)	1.00**	[.31, 1.68]
Indirect effect with 95% CI	.09	[-.05, .41]
Acceptance		
Mediation *a* path (PAPS-T on acceptance)	-.02	[-.11, .06]
Mediation *b* path (Acceptance on depression)	-1.30	[-3.27, .67]
Direct effect, *c'* (PAPS-T on depression)	1.06**	[.39, 1.73]
Indirect effect with 95% CI for boys	.03	[-.09, .18]
Positive reappraisal		
Mediation *a* path (PAPS-T on positive reappraisal)	-.01	[-.09, .08]
Mediation *b* path (Positive reappraisal on depression)	-2.72**	[-4.46, -.97]
Direct effect, *c'* (PAPS-T on depression)	1.07**	[.44, 1.70]
Indirect effect with 95% CI	.02	[-31, .30]
Positive refocusing		
Mediation *a* path (PAPS-T on positive refocusing)	-.03	[-.12, .05]
Mediation *b* path (Positive refocusing on depression)	-2.44**	[-4.27, -.62]
Direct effect, *c'* (PAPS-T on depression)	1.01**	[.37, 1.65]
Indirect effect with 95% CI	.08	[-.12, .30]
Refocus on planning		

Mediation *a* path (PAPS-T on refocus on planning)	.09*	[.01, .17]
Mediation *b* path (Refocus on planning on depression)	-1.24	[-3.17, .69]
Direct effect, *c'* (PAPS-T on depression)	1.20***	[.51, 1.89]
Indirect effect with 95% CI	-.11	[-.40, .05]
Putting it in perspective		
Mediation *a* path (PAPS-T on putting in perspective)	-.02	[-.10, .07]
Mediation *b* path (Putting in perspective on depression)	.1.09**	[.42, 1.76]
Direct effect, *c'* (PAPS-T on depression)	1.04**	[.40, 1.68]
Indirect effect with 95% CI	.05	[-.21, .31]

Note. PAPS-T = physical appearance perfectionism scale-total score. *p* < .05. **p* < .01. ***p* < .001.

Table 6

Direct and Indirect Effects of CERQ Dimensions on the Relationship between Physical

Appearance Perfectionism and Anxiety

Regression paths	*b*	95% CI
Rumination		
Mediation *a* path (PAPS-T on rumination)	.20***	[.11, .28]
Mediation *b* path (Rumination on anxiety)	1.11	[-1.12, 3.35]
Direct effect, *c'* (PAPS-T on anxiety)	.25	[-.65, 1.14]
Indirect effect with 95% CI	.22	[-.17, .67]
Catastrophizing		
Mediation *a* path (PAPS-T on catastrophizing)	.14***	[.06, .21]
Mediation *b* path (Catastrophizing on anxiety)	1.11	[-1.33, 3.68]
Direct effect, *c'* (PAPS-T on anxiety)	.30	[-.55, 1.16]
Indirect effect with 95% CI	.1	[-.13, .57]
Self-blame		
Mediation *a* path (PAPS-T on self-blame)	.08*	[.01, .15]
Mediation *b* path (Self-blame on anxiety)	-.94	[-3.52, 1.65]
Direct effect, *c'* (PAPS-T on anxiety)	.54	[-.27,.1.35]
Indirect effect with 95% CI	-.08	[-.39, .12
Other-blame		
Mediation *a* path (PAPS-T on other-blame)	.08	[-.01, .16]
Mediation *b* path (Other-blame on anxiety)	2.25*	[.08, 4.42]
Direct effect, *c'* (PAPS-T on anxiety)	.29	[-49, 1.07]
Indirect effect with 95% CI	.17	[-.01, .52]
Acceptance		
Mediation *a* path (PAPS-T on acceptance)	-.02	[.02, .31]
Mediation *b* path (Acceptance on anxiety)	-.23	[-2.55, 2.08]
Direct effect, *c'* (PAPS-T on anxiety)	.46	[-.33, 1.25]
Indirect effect with 95% CI	.01	[-.13, .13]
Positive reappraisal		
Mediation *a* path (PAPS-T on positive reappraisal)	-.01	[-.09, .08]
Mediation *b* path (Positive reappraisal on anxiety)	-2.32*	[-4.42, -.23]
Direct effect, *c'* (PAPS-T on anxiety)	.45	[-.31, 1.21]
Indirect effect with 95% CI	.02	[-.26, .27]
Positive refocusing		
Mediation *a* path (PAPS-T on positive refocusing)	-.03	[-.12, .05]
Mediation *b* path (Positive refocusing on anxiety)	-1.37	[-3.58, .84]
Direct effect, *c'* (PAPS-T on anxiety)	.42	[-.36, 1.20]
Indirect effect with 95% CI	.04	[-.09, .22]

Refocus on planning		
Mediation *a* path (PAPS-T on refocus on planning)	.09*	[.01, .17]
Mediation *b* path (Refocus on planning on anxiety)	-1.67	[-3.90, .57]
Direct effect, *c'* (PAPS-T on anxiety)	.62	[-.18, 1.41]
Indirect effect with 95% CI	-.15	[-.46, .06]
Putting it in perspective		
Mediation *a* path (PAPS-T on putting in perspective)	-.02	[-.10, .07]
Mediation *b* path (Putting in perspective on anxiety)	-1.16	[-3.40, 1.08]
Direct effect, *c'* (PAPS-T on anxiety)	.45	[-33, 1.23]
Indirect effect with 95% CI	.02	[-.14, .18]

Note. PAPS-T = physical appearance perfectionism scale-total score. **p* < .05. ***p* < .01. ****p* < .001.

Discussion

This is the first study to examine how physical appearance perfectionism is related to cognitive coping and to changes in body image and mood amongst young women, following appearance comparison to idealized body types on Instagram. This is also the first study to examine cognitive processes that explain *why* appearance comparison to Instagram models is associated with worsened body image. These findings add to our knowledge about the effect of personality on body image and mood following exposure to idealized body types on Instagram, which has been sparsely researched. These findings extend past research by identifying the specific types of thoughts that women experience during social comparison to idealized body images on Instagram, which heighten their feelings of body image dissatisfaction.

Our findings generally supported our hypotheses. As predicted, young women who were instructed to compare their appearance to Instagram models reported increased weight and appearance dissatisfaction, and lowered confidence. These results yielded a medium effect size for confidence, and large effect sizes for weight and appearance dissatisfaction. These changes did not occur in an appearance-neutral control group. These findings support social comparison theory, which posits that upwards comparisons to superior others results in negative feelings when one realizes there is a discrepancy between themselves and a superior other; this can result in a more negative self-perception and a desire to reduce that discrepancy (Festinger, 1954).

These findings are in line with other research that supports social comparison theory, and which has found that exposure and social comparison to idealized body types is associated with poorer body image and confidence amongst young women (Brown & Tiggemann, 2016; Fardouly & Holland, 2018; Lin & Kulik, 2002; Tiggemann & McGill, 2004; Tiggemann & Zaccardo, 2015). It is noteworthy that, during debriefing at the end of the experiment, the majority of participants in the experimental condition indicated that they did not believe that they had been affected by the Instagram model images that they saw. Because of the format of the VAS measures used, participants could not recall their prior response, which reduces the likelihood of biased responding. Participants' debriefing at the end of the study suggest that participants were not aware of their actual results. The majority of participants stated that the images had not upset them or made them feel worse about themselves because they were used to seeing these types of images every day on their own Instagram feeds. It may be so normalized in Western society to see idealized images in various forms of the media that young women may actually lack insight into how these images negatively affects their body image. Another explanation for why individuals might minimize or deny any adverse effects of exposure to social media images is self-deception. Social media use is extremely common among young women and they may convince themselves that viewing these types of images are not harmful. Participants' feedback may suggest that while the effects of being exposed to Instagram models significantly and negatively affects women's body image, the effects are relatively subtle.

Unexpectedly, the experimental condition did not experience any changes in depression or anxiety following exposure to idealized body types on Instagram. This is in contrast to some of the past research which has found that exposure and social comparison to idealized others is associated with depression and anxiety levels (Baker & Perez Algorta, 2016; Brown &

Tiggemann, 2016; Padao et al., 2018; Tiggemann & McGill, 2004). However, several of the studies that found associations between exposure to idealized images and mood, combined depression, anxiety, and anger states to reflect negative affect and negative mood in general (Brown & Tiggemann, 2016; Tiggemann & McGill, 2004) and perhaps that explains the differences between the results of our study and the results of other studies. It is also possible that no changes were found in feelings of depression or anxiety because these were interpreted to reflect clinically disordered mood states. Therefore, participants may not have felt their feelings were strong enough to be classified as feelings of depression or anxiety. We used the same adjectives used by other researchers on the VAS measure, but it may have been better to use emotions such as "sadness" instead of "depression" in order to capture mood states experienced on a day-to-day basis in a nonclinical sample. On the other hand, weight and appearance dissatisfaction and confidence could be more psychologically relevant states to appearance comparison, which explains why they were affected but mood was not.

Also as predicted, physical appearance perfectionism was directly associated with weight and appearance dissatisfaction, as well as depression. This is consistent with past research which has found that physical appearance perfectionism is associated with increased body dissatisfaction (Shang & Yang, 2014; as cited in Yang et al., 2017; Yang & Stoeber, 2012; Yang et al., 2017). Our results extend previous literature that had only examined correlational relationships between physical appearance perfectionism and body dissatisfaction, by examining how physical appearance perfectionism was associated with experimentally induced body dissatisfaction, as well as experimentally induced depression and anxiety. These results suggest that those who are perfectionistic about their physical appearance are more likely to experience

weight and appearance dissatisfaction, as well as feelings of depression after comparing themselves to idealized body types on Instagram.

Contrary to our hypotheses, physical appearance perfectionism was not directly related to either anxiety or confidence. However, physical appearance perfectionism was *indirectly* related to confidence through the effects of rumination and catastrophizing, suggesting that rumination and catastrophizing fully explain why physical appearance perfectionism is related to lower confidence. It appears that physical appearance perfectionism is related to greater tendency to continually dwell upon the shape and appearance of one's body and how it feels to be discrepant from idealized body types, and to also catastrophize about how horrible that experience and feeling of discrepancy is, which then results in lowered confidence amongst young women. Rumination and catastrophizing also mediated the relationships between physical appearance perfectionism and appearance dissatisfaction, weight dissatisfaction, and depression. Taken together, these results suggest that individuals who are high in physical appearance perfectionism have a greater tendency to engage in rumination and catastrophizing when coping with stressful events, such as comparing oneself to idealized body types on Instagram. In turn, these maladaptive coping strategies explain negative outcomes such as dissatisfaction with one's weight and appearance, lower confidence, and greater feelings of depression. Our results are consistent with past research which has found that the relationships between general perfectionism and depression, negative affect, or eating disorder symptoms has been mediated by rumination or catastrophizing (Castro et al., 2017; Flett et al., 2011; Macedo et al., 2017; Nepon et al., 2011; Riviere & Douilliez, 2017; Senra et al., 2017; Short & Mazmanian, 2013), but extend the literature to show that similar relationships also exist between physical appearance perfectionism and body dissatisfaction. In particular, participants who ruminated after comparing

themselves to the models endorsed thoughts such as, *"I dwell upon the feelings comparing my body to the models' has evoked in me"*, and "*I am preoccupied with what I think and feel about my body after comparing it to the models'*". Therefore, the current study shows that young women who are high in physical appearance perfectionism dwell upon or become preoccupied with the negative feelings that are evoked by comparing their bodies to the models' bodies, which in turn causes them to feel more weight and appearance dissatisfaction and lower confidence. Alternatively, participants who catastrophized after the comparison to the models, endorsed thoughts such as, "*I keep thinking about how terrible my body is compared to the models*'" and ""*I am thinking that how I feel after comparing myself to the models is the worst feeling a person can experience*", and "*I continually think about how horrible the comparison of my body to the models' has been.*" In sum, the current findings suggest that young women who are high in physical appearance perfectionism are especially sensitive to upwards appearance comparisons to idealized body types, and are likely to find those comparisons distressing because of the ways in which they process or cope with them cognitively.

Contrary to our predictions, the relationships between physical appearance perfectionism and appearance dissatisfaction, weight dissatisfaction and confidence were not mediated by lower levels of engagement in the cognitive process of acceptance. Based on past research, we had hypothesized that failing to engage in acceptance about how one's body looks in comparison with highly attractive models' bodies would result in less confidence and more body dissatisfaction. Past research has found that when women compared themselves to idealized body types but engaged in acceptance techniques where they accepted their feelings about their body without evaluating them as negative or trying to change them, they experienced lower body dissatisfaction (Atkinson & Wade, 2012; Naumann et al., 2016; Wade et al., 2009). Therefore,

we expected that if those who were high in physical appearance perfectionism engaged in low levels of acceptance they would be more likely to experience body dissatisfaction and low confidence. However, we did not find that engagement in acceptance mediated the relationship between physical appearance perfectionism and weight or appearance dissatisfaction or confidence. Perhaps this was because physical appearance perfectionism was not found to be significantly correlated with or predictive of acceptance, which has also been found in past studies that have examined the relationship between general perfectionism and acceptance (Castro et al., 2017; Rudolph et al., 2007).

Also, contrary to our hypotheses, positive reappraisal did not mediate the relationship between physical appearance perfectionism and depression or anxiety. Therefore, the relationship between physical appearance perfectionism and greater depression and anxiety could not be explained by a failure to positively reappraise the experience of comparing oneself to the models as a chance to grow or learn from the situation. However, given that physical appearance perfectionism was not significantly associated with or predictive of any of the adaptive coping strategies from the CERQ this result is not surprising.

Physical appearance perfectionism was positively predictive of rumination, catastrophizing, and self-blame. Therefore, being perfectionistic about one's appearance seems to make young women be more likely to ruminate, catastrophize, or blame themselves for the way their body looks. In turn, rumination and catastrophizing were positively predictive of weight dissatisfaction, appearance dissatisfaction, and depression, and negatively predictive of confidence. Self-blame was only predictive of weight dissatisfaction, indicating that blaming oneself for not looking like idealized others results in more weight dissatisfaction, but not more appearance dissatisfaction. This could be because young women feel as though weight is

something that is within their control to change so if their weight is not to their satisfaction they can hold themselves responsible for their dissatisfaction. However, facial appearance is something that is more fixed and difficult to change, and therefore perhaps less responsibility falls on the self when one is dissatisfied with their appearance. The way questions were worded for this subscale of the CERQ in this study, might have conveyed that the questions were referring to body shape and weight, rather than appearance, which might have explained this finding. For example, thoughts that were characteristic of self-blame in this study included, "*I think about the mistakes I have made in keeping my body fit*" and "*I think that basically the cause of my body dissatisfaction must lie within myself.*" Both of these items seem to implicitly refer to participants' commitment to exercise regimens or attempts to manage body shape and weight, rather than appearance. On the other hand, other-blame was positively predictive of anxiety, and negatively predictive of confidence, indicating that blaming others for one's dissatisfaction with their body is associated with more anxiety and less confidence. Therefore, amongst the maladaptive coping strategies of the CERQ rumination and catastrophizing were the most consistent predictors of negative body image and mood, which has been supported by past research (Garnefski & Kraaig, 2005; Potthoff et al., 2016). The other maladaptive coping strategies were differentially related to body image and mood outcomes.

Amongst the adaptive coping strategies, physical appearance perfectionism was only directly and positively predictive of refocus on planning, and not any of the other adaptive coping strategies. However, the adaptive coping strategies were directly predictive of body image and mood outcomes. Positive refocusing was negatively predictive of weight dissatisfaction, appearance dissatisfaction, and depression, and positively predictive of confidence, indicating that redirecting one's thoughts to more pleasant experiences during

stressful situations is protective against feelings of body dissatisfaction and depression, and is associated with increased confidence. Examples of positive refocusing included: "*I think of something nice instead of thinking about my body*" and "*I think of pleasant things that have nothing to do with my bod*y. This type of positive distraction coping strategy seems to have been protective against feelings of body dissatisfaction and depression, which has also been supported by past research on positive distraction thoughts and body satisfaction (Wade et al., 2009). Additionally, acceptance of one's body and its discrepancy from the Instagram models' bodies was predictive of less weight dissatisfaction, which is consistent with other research that has found acceptance to be associated with less body dissatisfaction (Atkinson & Wade, 2012; Naumann et al., 2016; Wade et al., 2009). Also, putting things in perspective was associated with less depression, indicating that if young women cope with the feelings evoked by comparison to the models by recognizing that those feelings could have been much worse than other feelings, or much worse for someone else, this is protective against depression. Finally, positive reappraisal was associated with both less anxiety and depression, which is consistent with past research that has found that the tendency to positively reappraise a negative situation by looking for the positive learning outcomes or potential growth of a situation was associated with less depressive or anxious feelings (Garnefksi & Kraaij, 2007; Garnefski & Kraaij, 2005; Garnefski, et al., 2004; Martin & Dahlen, 2005). Therefore, amongst the adaptive coping strategies, positive refocusing seemed to be particularly protective for body image in the context of upwards appearance-based comparisons to Instagram models, while positive reappraisal was more protective for mood.

Implications

These findings have clinical implications for the treatment and prevention of body dissatisfaction, eating disorders, and mood disorders. Our findings reflected that viewing and comparing oneself to attractive models on social media resulted in lower confidence and increased weight and appearance dissatisfaction amongst young women. This is concerning given that 60% of Instagram users visit the platform every day, and Instagram use is strongly associated with social comparison (Stapleton, Luiz, & Chatwin, 2017). Comparison to idealized body types on Instagram causes lower confidence and increased weight and appearance dissatisfaction, and therefore puts young women at risk for clinical eating disorders, as body dissatisfaction is the primary risk factor for the development of eating disorders (Stice, Marti, & Durant, 2011). Women who are high in physical appearance perfectionism are especially vulnerable to the adverse effects of social comparison on Instagram, as physical appearance perfectionism was predictive of appearance and weight dissatisfaction and depression, following social comparison on Instagram. In particular, engagement in rumination and catastrophizing is particularly harmful for women high in physical appearance perfectionism, as these coping strategies explained the relationship between physical appearance perfectionism and weight and appearance dissatisfaction, confidence, and depression. However, these results suggest that changing cognitive coping patterns could change the relationship between physical appearance perfectionism and body image and mood. Clinical interventions could target reducing these negative cognitive coping patterns to prevent negative body image and mood caused by upwards appearance comparisons on Instagram. Clinical interventions could also focus on teaching young women how to engage in positive refocusing and positive reappraisal, given that positive refocusing was associated with lower levels of body dissatisfaction, and positive reappraisal was

associated with less negative mood. For example, teaching young women how to positively refocus would entail encouraging women to distract themselves from negative body-related thoughts by instead thinking of pleasant things that have nothing to do with their bodies. Teaching these cognitive coping strategies could be relatively easy to do, and past research has shown that teaching adaptive cognitive coping strategies is associated with less body dissatisfaction (Atkinson & Wade, 2012; Naumann et al., 2016; Wade et al., 2009).

Strengths and Limitations

It was a strength that the current study experimentally demonstrated that social comparison to idealized body types on Instagram causes negative changes in body image and mood, rather than investigating this relationship through correlational methods. This was also the first study to investigate how physical appearance perfectionism is related to cognitive coping and to mood, which contributes to the sparse research on physical appearance perfectionism. It was also a strength that the study had a relatively large and diverse sample.

Despite these strengths there were several limitations. It was a limitation that the present study exposed participants to thin and fit ideal images sequentially and didn't measure the difference in mood and body image for each set of images. Therefore, it cannot be determined whether the observed changes were attributable to exposure to the thin ideal, fit ideal, or by other features of the models. It was also a limitation that the current study only examined one component of body image, namely feelings and thoughts about body dissatisfaction, and did not measure other components of body image, such as feelings about one's body functionality or body satisfaction, which differs from body dissatisfaction. Additionally, our sample only included young women between the ages of 18-25 years, and therefore results cannot be generalized to older women or men. Because the pre and post VAS outcome measures were

administered directly before and after viewing the Instagram images it is possible participants were able to guess what the experimenters were intending to measure, and therefore it is possible that participants could have engaged in response bias to try to fulfill the experimenters' hypotheses. However, VAS scales have been reliably used in experimental research to assess pre- and post- fluctuations in psychological states (Heinberg &Thompson, 1995) and are advantageous because they can be filled out quickly and previous responses are difficult to remember since the lines are not numbered. Furthermore, the current results are consistent with past research that took additional procedural steps to reduce demand characteristics (e.g., filler questionnaires, deception in the cover story).

Future Research

Amidst the emerging research on the adverse effects of social media on body image, an obvious question is how those harmful effects can be averted. Future research would benefit from continuing to explore how physical appearance perfectionism is related to mental health outcomes, as research on physical appearance perfectionism is currently sparse. Future studies should compare the effect of thin and fit ideal body types on mental health outcomes, to see if one causes more distress than the other. Future research should also examine other mediators that explain the relationship between physical appearance perfectionism and body image and mood, such as self-esteem and social comparison frequency. It would also be important to examine if the two subscales of the PAPS are differentially related to mood, body image, and cognitive coping. Studies should also be replicated that include men and relevant outcomes such as drive for muscularity, to see how physical appearance perfectionism and Instagram use influences men's mental health. Finally, future research would also benefit from examining if teaching participants how to positively refocus or positively reappraise negative situations can reduce

body dissatisfaction and negative mood after social comparison to others on Instagram, relative to active engagement in rumination and catastrophizing.

Conclusions

Experimentally induced upwards appearance comparisons to Instagram models resulted in decreases in state confidence, and increases in state weight dissatisfaction and appearance dissatisfaction in a sample of young women. Young women who are perfectionistic about their appearance are relatively more vulnerable to lower confidence, and more appearance dissatisfaction, weight dissatisfaction, and depression following upwards appearance comparisons to Instagram models, and this is due to their tendency to cope with these comparisons by ruminating and catastrophizing about how their body compares to others. These results indicate that personality and ways of coping play a significant role in how young women's mood and body image are affected by exposure to idealized body types on social media. Clinical interventions for body dissatisfaction and negative mood caused by upwards appearance-based comparisons should target reducing unhelpful cognitive coping strategies and increasing the use of helpful coping strategies.

References

Arcelus, J., Garcia-Dantas, A., Sanchez-Martin, M., & Del Rio, C. (2015). Influence of
perfectionism on variables associated to eating disorders in dance students. *Revista de
Psicologia del Deporte, 24*, 297-303.

Atkinson, M.J., & Wade, T.D. (2012). Impact of metacognitive acceptance on body
dissatisfaction and negative affect: Engagement and efficacy. *Journal of Consulting and
Clinical Psychology, 80*, 416-425. doi: 10.1037/a0028263

Baker, D.A., & Perez Algorta, G. (2016). The relationship between online social networking and
depression: A systematic review of quantitative studies. *Cyberpsychology, Behavior, and
Social Networking, 19*, 638-648. doi: 10.1089/cyber.2016.0206

Boone, L., Soenens, B., & Braet, C. (2011). Perfectionism, body dissatisfaction, and bulimic
symptoms: The intervening role of perceived pressure to be thin and thin ideal
internalization. *Journal of Social and Clinical Psychology, 30*, 1043-1068.

Boone, L., Soenens, B., & Luyten, P. (2014). When or why does perfectionism translate into
eating disorder pathology? A longitudinal examination o the moderating and mediating
role of body dissatisfaction. *Journal of Abnormal Psychology, 123*, 412-418. doi:
10.1037/a0036254

Brown, Z., & Tiggemann, M. (2016). Attractive celebrity and peer images on Instagram: Effect
on women's mood and body image. *Body Image, 19*, 37-43.
http://dx.doi.org/10.1016/j.bodyim.2016.08.007

Cash, T. F., & Pruzinsky, T. (2002). Future challenges for body image theory, research, and
clinical practice. In T. F. Cash & T. Pruzinsky (Eds.), *Body image: A handbook of theory,
research, and clinical practice* (2nd ed., pp. 509–516). New York, NY: Guilford Press.

Castro, J., Soares, M.J., Pereira, A.T., & Macedo, A. (2017). Perfectionism and negative/positive

affect associations: The role of cognitive emotion regulation and perceived

distress/coping. *Trends in Psychiatry and Psychotherapy, 39*, 77-87.

http://dx.doi.org/10.1590/2237-6089-2016-0042

Chang, E.C., Yu, T., Chang, O.D., & Jilani, Z. (2016). Evaluative concerns and personal

standards perfectionism as predictors of body dissatisfaction in Asian and European

American female college students. *Journal of American College Health, 64*, 580-584.

http://dx.doi.org/10.1080/07448481.2016.1178121

Donovan, C.L., Chew, D., & Penny, R. (2014). Perfecting weight restriction: The moderating

influence of body dissatisfaction on the relationship between perfectionism and weight

control practices. *Behaviour Change, 31*, 189-204. doi: 10.1017/bec.2014.11

Downey, C.A., & Chang, E.C. (2007). Perfectionism and symptoms of eating disturbance in

female college students: Considering the role of negative affect and body dissatisfaction.

Eating Behaviors, 8, 497-503. doi: 10.1016/j.eatbeh.2007.02.002

Dunn, J.G.H., Craft, J.M., Causgrove Dunn, J., & Gotwals, J.K. (2011). Comparing a domain-

specific and global measure of perfectionism in competitive female figure skaters.

Journal of Sport Behaviour, 34, 22-25.

Eckler, P., Kalyango, Y., & Paasch, E. (2017). Facebook use and negative body image among

U.S. college women. *Women & Health, 57*(2), 249-267.

https://doi.org/10.1080/03630242.2016.1159268

Ellison, N.B. Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends;" Social

capital and college students' use of online social network sites. *Journal of Computer-

Mediated Communication, 12,* 1143-1168.

https://doi.org/10.1111/j.1083-6101.2007.00367.x

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image, 13,* 38-45.

Fardouly, J., & Holland, E. (2018). Social media is not real life: The effect of attaching disclaimer-type labels to idealized social media images on women's body image and mood. New *Media and Society, 20,* 4311-4328.

https://doi.org/10.1177/1461444818771083

Fardouly, J., & Vartanian, L.R. (2015). Negative comparisons about one's appearance mediate the relationship between Facebook usage and body image concerns. *Body Image, 12,* 82-88. http://dx.doi.org/10.1016/j.bodyim.2014.10.004

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191. http://dx.doi.org/10.3758/BF03193146

Ferguson, C.J. (2013). In the eye of the beholder: Thin-ideal media affects some, but not most, viewers in a meta-analytic review of body dissatisfaction in women and men. *Psychology of Popular Media Culture, 2*, 20-37. doi: 10.1037/a0030766

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*, 117–140. http://dx.doi.org/10.1177/001872675400700202

Flett, G.L., Coulter-L-M., Hewitt, P.L., & Nepon, T. (2011). Perfectionism, rumination, worry, and depressive symptoms in early adolescents. *Canadian Journal of School Psychology, 26*, 159-176. doi: 10.1177/0829573511422039

Flett, G.L., Madorsky, D., Hewitt, P.L., & Heisel, M.J. (2002). Perfectionism cognitions,

rumination, and psychological distress. *Journal of Rational-Emotive and Cognitive Behavior Therapy, 20*, 33-47.

Frost, R.O., Heimberg, R.G., Holt, C.S., Mattia, J.I., & Neubauer, A.L. (1993). A comparison of two measures of perfectionism. Personality and Individual Differences, 14, 119-126.

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449–468. http://dx.doi.org/10.1007/ BF01172967

Garnefksi, N., & Kraaij, V. (2005). Relationships between cognitive emotion regulation strategies and depressive symptoms: A comparative study of five specific samples. *Personality and Individual Differences, 40*, 1659-1669. doi:10.1016/j.paid.2005.12.009

Garnefski, N., & Kraaij, V. (2007). The Cognitive Emotion Regulation Questionnaire: Psychometric features and prospective relationships with depression and anxiety in adults. *European Journal of Psychological Assessment, 23*, 141-149. doi: 10.1027/1015-5759.23.3.141

Garnefksi, N., & Kraaij, V. (2018). Specificity of relations between adolescents' cognitive emotion regulation strategies and symptoms of depression and anxiety. *Cognition and Emotion, 23,* 1401-1408. https://doi.org/10.1080/02699931.2016.1232698

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences, 30*, 1311–1327. https://doi.org/10.1016/S0191-8869(00)00113-6

Garnefski, N., Teerds, J., Kraaij, V., Legerstee, J., & van den Kommer, T. (2004). Cognitive emotion regulation strategies and depressive symptoms: Differences between males and females. *Personality and Individual Differences, 36,* 267-276. doi:10.1016/S0191-8869(03)00083-7

Harris, P.W., Pepper, C.M., & Maack, D.J. (2008). The relationship between maladaptive

perfectionism and depressive symptoms: The mediating role of rumination. *Personality*

and Individual Differences, 44, 150-160. doi: 10.1016/j.paid.2007.07.011

Hayes, A.F. (2017). Introduction to mediation, moderation, and conditional process analysis: A

regression-based approach (2nd ed.). New York, NY: The Guilford Press.

Heinberg, L. H., & Thompson, J. K. (1995). Body image and televised images of thinness and

attractiveness: A controlled laboratory investigation. *Journal of Social and Clinical*

Psychology, 14, 325-338. http://dx.doi.org/10.1051/jscp.1995.14.4.325

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts:

Conceptualization, assessment, and association with psychopathology. *Journal of*

Personality and Social Psychology, *60*, 456–470. http://dx.doi.org/10.1037/0022-

3514.60.3.456.

Hogue, J.V., & Mills, J.S. (2019). The effects of active social media engagement with peers on

body image in young women. *Body Image, 28*, 1-5.

https://doi.org/10.1016/j.bodyim.2018.11.002

Kawamura, K.Y., Hunt, S.L., Frost, R.O., Marten BiBartolo, P. (2001). Perfectionism, anxiety,

and depression: Are the relationships independent? *Cognitive Therapy and Research, 25,*

291-301.

Lin, L. F., & Kulik, J. A. (2002). Social comparison and women's body satisfaction. *Basic and*

Applied Social Psychology, 24(2), 115-123. doi: 10.1207/153248302753674622

Macedo, A., Marques, C., Quaresma, V., Soares, M.J., Amaral, A.P., Araujo, A.I., & Pereira,

A.T. (2017). Are perfectionism cognitions and cognitive emotion regulation strategies

mediators between perfectionism and psychological distress? *Personality and Individual*

Differences, 119, 46-51. http://dx.doi.org/10.1016/j.paid.2017.06.032

Malik, S., & Ghayas, S. (2016). Construction and validation of Academic Perfectionism Scale:

Its psychometric properties*. Journal of Psychological Research, 31*, 293-310.

Margolis, S.E., & Orsillo, S.M. (2016). Acceptance and body dissatisfaction: Examining the

efficacy of a brief acceptance based intervention for body dissatisfaction in college

women. *Behavioural and Cognitive Psychotherapy, 44,* 482-492.

doi:10.1017/S1352465816000072

Martin, R.C., & Dahlen, E.R. (2005). Cognitive emotion regulation in the prediction of

depression, anxiety, stress, and anger. *Personality and Individual Differences, 39*, 1249-

1260. doi:10.1016/j.paid.2005.06.004

Morrison, T. G., Kalin, R. & Morrison, M. A. (2004). Body-image evaluation and body-image

investment among adolescents: A test of sociocultural and social comparison theories.

Adolescence, 39, 571–592.

Myers, T. A., & Crowther, J. H. (2009). Social comparison as a predictor of body dissatisfaction:

A meta-analytic review. *Journal of Abnormal Psychology, 118*(4), 683-698.

doi: 10.1037/a0016763

Naragon-Gainey, K., & Watson, D. (2018). What lies beyond neuroticism? An examination of

the unique contributions of social-cognitive vulnerabilities to internalizing disorders.

Assessment, 25, 143-158. doi: 10.1177/1073191116659741

Naumann, E., Tuschen-Caffier, B., Voderholzer, U., Schafer, J., & Svaldi, J. (2016).

Effects of emotional acceptance and rumination on media-induced body dissatisfaction in anorexia and bulimia nervosa. *Journal of Psychiatric Research, 82*, 119-125. http://dx.doi.org/10.1016/j.jpsychires.2016.07.021

Nepon, T., Flett, G.L., Hewitt, P.L., & Molnar, D.S. (2011). Perfectionism, negative social feedback, and interpersonal rumination in depression and social anxiety. *Canadian Journal of Behavioural Science, 43*, 297-308, doi: 10.1037/a0025032

Padoa, T., Berle, D., & Roberts, L. (2018). Comparative social media use and the mental health of mothers with high levels of perfectionism. *Journal of Social and Clinical Psychology, 37,* 514-535.

Perloff, R. M. (2014). Social media effects on young women's body image concerns: Theoretical perspectives and an agenda for research. *Sex Roles, 71*, 363–377. http://dx.doi.org/10.1007/s11199-014-0384-6

Pew Research Center (2018). "Social media use in 2018." Retrieved from http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/

Pokrajac-Bulian, A., Ambrosi-Randic, N., Kukic, M. (2008). Thin-ideal internalization and comparison process as mediators of social influence and psychological functioning in the development of disturbed eating habits in Croatian college females. *Psychological Topics, 17,* 221-245.

Potthoff, S., Garnefksi, N., Miklosi, M., Ubbiali, A., Dominguez-Sanchez, F.J., Costa Martins, E.,…& Kraaij, V. (2016). Cognitive emotion regulation and psychopathology across cultures: A comparison between six European countries. *Personality and Individual Differences, 98*, 218-224. http://dx.doi.org/10.1016/j.paid.2016.04.022

Riviere, J., & Douilliez, C. (2017). Perfectionism, rumination and gender are related to

symptoms of eating disorders: A moderated mediation model. *Personality and Individual Differences, 116*, 63-68. http://dx.doi.org/10.1016/j.paid.2017.04.041

Rudolph, S.G., Flett, G.L., & Hewitt, P.L. (2007). Perfectionism and deficits in cognitive emotion regulation. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 25*, 343-357, doi: 10.1007/s10942-007-0056-3

Senra, C., Merino, H., & Ferreiro, F. (2017). Exploring the link between perfectionism and depressive symptoms: Contributions of rumination and defense styles. *Journal of Clinical Psychology, 1*, 1-13. doi: 10.1002/jclp.22571

Short, M.M., & Mazmanian, D. (2013). Perfectionism and negative repetitive thoughts: Examining a multiple mediator models in relation to mindfulness. *Personality and Individual Differences, 55*, 716-721. http://dx.doi.org/10.1016/j.paid.2013.05.026

Smith, M. M., Sherry, S. B., McLarnon, M. E., Flett, G. L., Hewitt, P. L., Saklofske, D. H., & Etherson, M. E. (2018). Why does socially prescribed perfectionism place people at risk for depression? A five-month, two-wave longitudinal study of the Perfectionism Social Disconnection Model. *Personality and Individual Differences, 134,* 49-54. https://doi.org/10.1016/j.paid.2018.05.040

Smith, M. M., Vidovic, V., Sherry, S. B., Stewart, S. H., & Saklofske, D. H. (2018). Are perfectionism dimensions risk factors for anxiety symptoms? A meta-analysis of 11 longitudinal studies. *Anxiety, Stress & Coping: An International Journal, 31*, 4-20. https://doi.org/10.1080/10615806.2017.1384466

Snell, W.E., Jr., Overbey, G.A., & Brewer, A.L. (2005). Parenting perfectionism and the parenting role. *Personality and Individual Differences, 39*, 613–624.

Stapleton, P., Luiz, G., Chatwin, H. (2017). Generation validation: The role of social comparison

in use of Instagram among emerging adults. *Cyberpsychology, Behavior, and Social Networking, 20*, 142-149. doi: 10.1089/cyber.2016.0444

Stice, E., Marti, C. N., & Durant, S. (2011). Risk factors for onset of eating disorders: Evidence of multiple risk pathways from an 8-year prospective study. *Behaviour Research and Therapy, 49,* 622–627. http://dx.doi .org/10.1016/j.brat.2011.06.009

Stikkelbroek, Y., Bodden,D.H.M., Kleinjan, M., Reijnders, M., & van Baar, A.L. (2016). Adolescent depression and negative life events, the mediating role of cognitive emotion regulation. *PLoS ONE, 11*. doi:10.1371/journal.pone.0161062

Stoeber, J., & Stober, F.S. (2009). Domains of perfectionism: Prevalence and relationships with perfectionism, gender, age, and satisfaction with life. *Personality and Individual Differences, 46*, 530-535. doi:10.1016/j.paid.2008.12.006

Stoeber, J., & Yang, H. (2015). Physical appearance perfectionism explains variance in eating disorder symptoms above general perfectionism. *Personality and Individual Differences, 86,* 303-307. http://dx.doi.org/10.1016/j.paid.2015.06.032

Stronge, S., Greaves, L.M., Milojev, P., West-Newman, T., Barlow, F.K., & Sibley, C.G. (2015). Facebook is linked to body dissatisfaction: Comparing users and non-users. *Sex Roles, 73*, 200-213. doi: 10.1007/s11199-015-0517-6

Sumter, S.R., Cingel, D.P., & Antonis, D. (2018). "To be able to change, you have to take risks #fitspo": Exploring correlates of fitspirational social media use among young women. *Telematics and Informatics, 35*, 1166-1175. https://doi.org/10.1016/j.tele.2018.01.013

Sweeney, A.C., & Fingerhut, R. (2013). Examing relationships between body dissatisfaction, maladaptive perfectionism, and postpartum depression symptoms. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 42*, 551-561. doi: 10.1111/1552-6909.12236

Tiggemann, M., & McGill, B. (2004). The role of social comparison in the effect of magazine advertisements on women's mood and body dissatisfaction. *Journal of Social and Clinical Psychology, 23*(1), 23-44.http://dx.doi.org/10.1521/jscp.23.1.23.26991

Tiggemann, M., & Slater, A. (2013). Netgirls: The Internet, Facebook, and body image concern in adolescent girls. *The International Journal of Eating Disorders, 46*, 630–633. http://dx.doi.org/10.1002/eat.22141

Tiggemann, M., & Zaccardo, M. (2015). Exercise to be fit, not skinny: The effect of fitspiration imagery on women's body image. *Body Image, 15*, 61-67. http://dx.doi.org/10.1016/j.bodyim.2015.06.003

Tissot, A.M., & Crowther, J.H. (2008). Self-oriented and socially prescribed perfectionism: Risk factors within an integrative model for bulimic symptomatology. *Journal of Social and Clinical Psychology, 27*, 734-755.

Vohs, K.D., Voelz, Z.R., Pettit, J.W., Bardone, A.M., Katz, K., Abramson, L.Y. …& Joiner, T.E. Jr. (2001). Perfectionism, body dissatisfaction, and self-esteem: An interactive model of bulimic symptom development. *Journal of Social and Clinical Psychology, 20*, 476-497.

Wade, T., George, W.M., & Atkinson, M. (2009). A randomized controlled trial of brief interventions for body dissatisfaction. *Journal of Consulting and Clinical Psychology, 77*, 845-854. doi: 10.1037/a0016879

Wade, T.D., & Tiggemann, M. (2013). The role of perfectionism in body dissatisfaction. *Journal of Eating Disorders, 1*, 1-6.

Welch, E., Miller, J.L., Ghaderi, A., & Vaillancourt, T. (2009). Does perfectionism mediate or

moderate the relation between body dissatisfaction and disordered eating attitudes and behaviors? *Eating Behaviors, 10*, 168-175. doi: 10.1016/j.eatbeh.2009.05.002

World Health Organization (2019). *BMI classification*. Retrieved from http://apps.who.int/bmi/index.jsp?introPage=intro_3.html

Yang, H., & Stoeber, J. (2012). The Physical Appearance Perfectionism Scale: Development and preliminary validation. *Journal of Psychopathology and Behavioral Assessment, 34*, 69–83.

Yang, H., Yang, Y., Xu, L., Wu, Q., Xu, J., Weng, E.,… & Cai, S. (2017). The relation of physical appearance perfectionism with body dissatisfaction among school students 9-18 year of age. *Personality and Individual Difference, 116*, 399-404. http://dx.doi.org/10.1016/j.paid.2017.05.005