

# The Role of Private Self-Awareness in Appearance Related Comparison Processes after Exposure to Idealized Instagram Pictures



Master Thesis

January 2020

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Track: Business Communication and Digital Media

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Word count: 15,440

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### Abstract

This study is one of the first to include the state of private self-awareness, defined as people's ability to direct one's attention toward the self instead of to the external environment, in a social networking site (SNS) context. The study's goal was to investigate how private self-awareness and state appearance comparison, one's appearance-related comparison processes present at a given time, influence body dissatisfaction after being exposed to idealized body images on Instagram. Additionally, it aimed to unveil gender differences, as previous research regularly focused on female body dissatisfaction. Private self-awareness was evoked by instructing the participants to choose a photo of their body that they had to upload to Instagram, combined with a caption. Those participants, including those in low private self-awareness conditions, were then exposed to three Instagram posts, where the presented bodies were either idealized or not. The results found that exposure to ideal versus non-ideal bodies did not influence body dissatisfaction. Among women, private self-awareness moderated the relationship between the exposure to idealized pictures and state appearance comparison. Among men, there was no relationship between private self-awareness, picture type, and state appearance comparison. Furthermore, this study found a new way of evoking the state of private self-awareness. Focusing on a picture of an individual's own body and thinking of autobiographical information to add underneath that picture as an Instagram caption lead to more self-directed attention among participants. This research yields both theoretical and practical implications.

## Introduction

Instagram is a purely photo-based social networking site (SNS), where pictures can easily be edited and shared with others. The application had 500 million daily active users at the end of 2017 (Clement, 2018) and its users are mostly young, with 71% being under the age of 35 (Clement, 2019). Because of its photo-based essence, Instagram users are exposed to a visual representation of others. Visual self-presentation takes place as a result of this, when a myriad of pictures are available to share with fellow users (Geurin-Eagleman & Burch, 2016). The continued exposure to other people and their bodies can have several negative effects on Instagram users' well-being. How these negative effects actually arise is still relatively unexplored.

When being exposed to the bodies of others, people may compare their own bodies to the portrayed ones and this can increase the viewer's body dissatisfaction (Arroyo & Brunner, 2016; Fox & Vendemia, 2016; Hendrickse, Arpan, Clayton, & Ridgway, 2017; Sherlock & Wagstaff, 2018). Comparison processes on Instagram have been found to be mostly appearance-related (Hendrickse, Arpan, Clayton, & Ridgway, 2017). Also, the frequency of Instagram use has been related to an increase in body dissatisfaction (Brown & Tiggemann, 2018; Sherlock & Wagstaff, 2018). Research on what specific factors of Instagram use contribute to the increase of body dissatisfaction as a result of Instagram use is still lacking. This study will therefore focus on the effect of exposure to idealized bodies on Instagram.

Scholars often measure body dissatisfaction in terms of a discrepancy between one's current and one's desired ideal body (Hildebrandt, Shiovitz, Alfano, & Greif, 2008). This ideal body is characterized by a drive for thinness for women, with a small waist and little body fat (Low et al., 2003) and a muscular image for men, with "well-developed chest and arms, with wide shoulders tapering down to a narrow waist" (Pope, Pope, Phillips, & Olivardia, 2000, p. 30). Body dissatisfaction has been found to be a predictor of negative outcomes like depressive symptoms (Ferreiro, Seoane, & Senra, 2011) and eating disorders (Tylka, 2004). Idealized images of the human body are often conveyed through popular mass media like magazines (Pope, Olivardia, Borowiecki, & Cohane, 2001), music television (Tiggemann & Slater, 2004), and nowadays, Instagram. This research will focus on two psychological mechanisms that can affect how the viewer compares his/her own body to the one displayed in the picture.

The first psychological mechanism that can be active when looking at idealized Instagram pictures is social comparison. According to Social Comparison Theory, human beings

have the internal drive to “evaluate [their] opinions and abilities” when being exposed to others (Festinger, 1954, p. 117). This comparison can work in two ways, upward and downward. When comparing upward, people regard others as better, more good-looking or superior to them, whereas downward social comparison refers to beliefs of superiority against other people, being better or more good-looking than others and looking down on them (Buunk & Gibbons, 2006).

Research found that Instagram use leads to more upward comparison (Schmuck, Karsay, Matthes, & Stevic, 2019). Furthermore, social comparison is also found to be moderating the relationship between exposure to fitness posts and negative body talk (Arroyo & Brunner, 2016). This implies that the exposure to Instagram pictures that evoke upward social comparison can lead to more body dissatisfaction. Comparing one’s body to another, however, inherently implies taking the own body into account. In other words, the exposure to someone’s body leads to an evaluation of one’s own body as compared to the presented one.

The second psychological mechanism is private self-awareness, defined as “people’s ability to direct one’s attention towards the self instead of to the external environment” (Fenigstein, Scheier, & Buss, 1975, p.522). This state is characterized by more awareness of, and responsiveness to, one’s own emotions (Duval & Wicklund, 1972; Yao & Flanagin, 2006), behavior based on privately held beliefs, values, and feelings about the self (Fenigstein et al., 1975) and an increased salience of one’s physical and affective states (Scheier, 1976). Being in this state can thus act as a prime of one’s own body, and this heightened consciousness can be salient when being exposed to an image of another body. For example, Gonzales and Hancock (2011) manipulated self-awareness by letting participants look at their own Facebook page, thus priming them with their own bodies and memories. As comparison implies an evaluation of the self as opposed to the other, heightened private self-awareness may influence this relationship as the self has been primed.

As some research has investigated the links between private self-awareness and computer-mediated communication (Joinson, 2001; Yao & Flanagin, 2006), little research has focused on private self-awareness in the context of SNSs like Instagram. As Carver and Scheier (1981) noted, one’s behavior is more intensely being assessed when in a state of private self-awareness. It could be the case, therefore, that private self-awareness can increase social comparison processes that are active when Instagram users see a picture of someone they compare themselves with. However, not being primed with oneself, and thus not being in a state of private self-awareness, might reduce social comparison when another body is presented. Since SNSs provide affordances for social comparison (Perloff, 2014), private self-awareness among users might help diminish the negative effects social comparison has on them as a result

of using SNSs like Instagram.

Since previous research focused on body dissatisfaction, the Instagram pictures in this study will revolve around physical idealization. Furthermore, the role of social comparison in relation to body dissatisfaction will be scrutinized, as well as the influence of private self-awareness in the social comparison process. As previous research revealed that upward social comparison processes are activated when being exposed to someone's body (Tiggemann & McGill, 2004), appearance comparison seems to be one of the realms that social comparison encompasses. Exposure to idealized Instagram pictures is thus expected to trigger social comparison processes related to the focal person's state appearance. State appearance comparison assesses the amount of actual appearance processing and comparison in which participants engage. The present research will focus on the following research question: How do state appearance comparison and private self-awareness influence body dissatisfaction?

## Body Dissatisfaction

### Antecedents and outcomes of body dissatisfaction

The concept of body dissatisfaction and its antecedents and outcomes has been studied thoroughly, and the most important ones will be specified below. Body dissatisfaction has been defined as “the discrepancy between a person’s idealized body type and their perceived body image” (Silberstein, Striegel-Moore, Timko, & Rodin, 1988). Studies found that social comparison (Heinberg & Thompson, 1992), appearance comparison tendency (Fatt, Fardouly, & Rapee, 2019), and state appearance comparison (Tiggemann & Zaccardo, 2015) predict body dissatisfaction. All of these antecedents revolve around the appearance of the individual and evaluations of that in relation with some idealized body type. Regarding these idealized body types, women’s body dissatisfaction is predicted by the thin-ideal internalization (Stice, 2001), whereas for men, it is predicted by the muscular-ideal internalization (Fatt et al., 2019). Furthermore, adult teasing (Matz, Foster, Faith, & Wadden, 2002) and a person’s actual weight (Goldfield et al., 2010) were seen as antecedents. On Instagram, exposure to “fitspiration” pictures (e.g., pictures designed to motivate people to exercise and pursue a healthier lifestyle, often containing women with thin and toned bodies) leads to more body dissatisfaction, for both men (Fatt et al., 2019) and women (Tiggemann & Zaccardo, 2015). Lastly, self-esteem is proven to be an antecedent of body dissatisfaction (Heinberg, Thompson, & Stormer, 1995; Matz et al., 2002; Tiggemann, 2005).

Apart from being an antecedent, Tiggemann (2005) suggested that self-esteem can be an outcome of body dissatisfaction as well. High school girls’ body dissatisfaction was found to predict self-esteem at two moments in time, separated by 2 years. Other outcomes concern an increase in depressive symptoms when dissatisfied with one’s body (Benas & Gibb, 2007; Ohring, Graber, & Brooks-Gunn, 2001; Stice & Bearman, 2001), negative affect, and dieting (Stice, 2001). Various eating disorders have been identified as outcomes as well, such as eating disturbance (Schulte & Thomas, 2013) and bulimia (Stice, 2001; Thompson et al., 1999). Among bulimics, Wiederman and Pryor (1999) found another predictor of body dissatisfaction other than their eating disorder, namely a drive for thinness. This term will be elaborated upon in a later paragraph. Certain patterns can be discovered in some of the key influences determining body dissatisfaction, one of which describing three sociocultural influences.

### Sociocultural antecedents: The Tripartite Influence Model

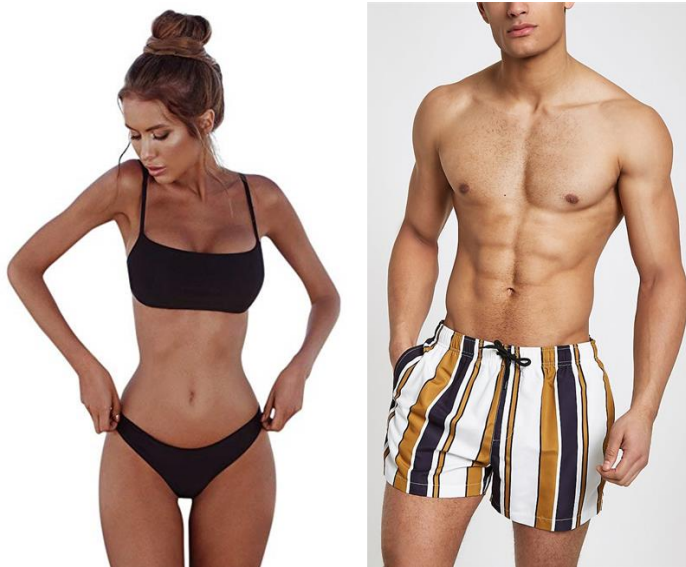
An influential model describing antecedents of body dissatisfaction, is the Tripartite Influence Model, developed by Thompson, Heinberg, Altabe, and Tantleff-Dunn (1999). This model posits that body dissatisfaction, among other negative psychological outcomes like eating disturbances, is influenced by three primacy core sources of influence; peers, parents, and media. These three influences exert their effect on body dissatisfaction via two primary mechanisms, appearance comparison and internalization of the thin ideal. Validation of this model has been established by several later researches (e.g., Keery, Van den Berg, & Thompson, 2004; Menzel et al., 2011; Rodgers, McLean, & Paxton, 2015; Van den Berg, Thompson, Obremski-Brandon, & Coover, 2002).

Research looking into the influence of peers in eating and weight-related behaviors found that high school girls who dieted, got bullied more often (Paxton, Schutz, Wertheim, & Muir, 1999). This weight-related teasing was found to predict body image dissatisfaction among adult women (Thompson, Cattarin, Fowler, & Fisher, 1995) and college women (Stormer & Thompson, 1996). Furthermore, bulimia patients reported more peer pressure to become thin than control participants did (Stice, Ziemba, Margolis, & Flick, 1996). The second core source of influence looks at the role of parents in negative body image and related outcomes. For example, parents' pressure to be thin predicted eating disturbances (Levine, Smolak, Moodey, & Shuman, 1994). Kanakis and Thelen (1995) found that bulimic patients and girls with subclinical eating behavior got teased by family members more often than control participants. Finally, the Tripartite Influence Model describes media exposure as the third antecedent of body dissatisfaction. Overall television viewing was a predictor of body dissatisfaction (Harrison & Cantor, 1997), but Tiggemann and Pickering (1996) specifically found soap operas to be the strongest predictor. As popular media often contain commercials, Heinberg and Thompson found that exposure to commercials containing the thin ideal was found to increase body image disturbance (Heinberg & Thompson, 1995). Media exposure was also proven to be a key influence in a longitudinal study by Rodgers, McLean, and Paxton (2015). They found that adolescent girls showed more social appearance comparison behavior after exposure to the media ideal, and this predicted body dissatisfaction later on. The three sociocultural influences described in the Tripartite Influence Model do not seem to work in the same way for men and women. This is possibly due to a difference in how the ideal body is conceptualized for these genders.



### The ideal body differs for men and women

What constitutes the ideal body standard seems to vary between different societies (Garner & Garfinkel, 1980) and different genders (Low et al., 2003). In western countries, mass media have contributed to an idealization of thinness which further can be distinguished into a drive for thinness for women and a drive for muscularity for men (Vartanian, Giant, & Passino, 2001). For women, this drive for thinness has been termed “the thin ideal” (McCarthy, 1990). This ideal consists of a standard of thinness, with a lower than average weight, a toned body, and few curves (Morris, Cooper, & Cooper, 1989), except for the lower torso and upper body, which should be curvaceous (Crossley, Cornelissen, & Tovée, 2012). This thin ideal has been found to be bound to Western cultures, whereas in non-Western cultures, body fat is seen as more attractive as it implies wealth and prosperity (Owen & Laurel-Seller, 2000; Swami & Tovée, 2005). For men, on the other hand, the ideal body is lean, athletic, and above all, muscular (Kelley, Neufeld, & Musher-Eizenman, 2010). A broad upper body that narrows down to a slim waist, termed a “V-shape”, has been identified to represent a strong, muscular body type (Crossley et al., 2012). This muscular ideal has been found to exist across multiple cultures (Frederick et al., 2007). The latter authors discuss the origin of the muscular ideal from an evolutionary perspective. They argue that women would be more attracted to men who display exaggerated sexual characteristics, including muscularity. Also, women may derive direct benefits by mating with a muscular male, because of the feelings of increased protection (Frederick et al., 2007, p. 104). Examples of ideal bodies for men and women are displayed in Figure 1.



*Figure 1.* A female ideal body (a thin overall body with a narrow waist, but a curvaceous upper body and lower torso) and a male ideal body (a thin overall body with a muscular, broad upper body that narrows down to a slim waist).

For both men and women, the exposure to idealized bodies in media leads to an increased body dissatisfaction. Representations of ideal bodies became omnipresent since their appearance in mass media like magazines and television (Cusumano & Thompson, 1997; Mazur, 1986). An example of research focusing on traditional media as sources of influence, is that of Leit, Gray, and Pope (2002). They indicated that exposure to idealized bodies in advertisements lead to a bigger discrepancy between males' own muscularity and their ideal level of muscularity. A large review study of Blond (2008) demonstrated that an accumulation of previous research showed a moderate, but significant increase of body dissatisfaction when males were exposed to muscular ideal images. The relationship between exposure to ideal bodies and body dissatisfaction had also been found for females. A meta-analytic review by Ferguson (2013) found that this relationship is more strongly present among women than among men. Since Instagram has turned into a medium where pictures of these ideal bodies are ubiquitous, it is expected that similar results will be found on this medium. Therefore, hypothesis 1 is formulated for replication purposes. The method section will elaborate more on the criteria for these non-idealized pictures.

H1: Exposure to idealized Instagram pictures leads to more body dissatisfaction than being exposed to non-idealized pictures.

### Social comparison and state appearance comparison

#### Upward social comparison and state appearance comparison

Concerning the opinion influence process in social groups, Leon Festinger stated that there exists, in the human organism, "a drive to evaluate his opinions and his abilities" (1954, p. 117). He further extends his theory by stating that social comparison processes always use only those cues available in order to evaluate the discrepancies between oneself and the other. In other words, the evaluation of the self in relation to others is grounded in whatever cues are available. There can be objective, non-social information available that leads to the evaluation, but in the absence of this, other cues such as physical ones can be sought for. The resulting comparison can take two directions. When the comparison is pointed in a downward direction, the other is

seen as a less fortunate other, which is found to enhance subjective well-being (Wills, 1981). On the other hand, the upward social comparison process encompasses the belief that others are better, more good-looking or superior to themselves. Upward social comparison is theorized to yield negative feelings about oneself (Buunk & Gibbons, 2006). For instance, the exposure to idealized advertising imagery that evoked upward social comparison lead to a decrease in self-rated attractiveness among both male and female participants (Cash, Cash, & Butters, 1983; Gulas & McKeage, 2000; Richins, 1991).

Although social comparison can - in the absence of other cues - be focused on the physical appearance of the self and the other, the concept of state appearance comparison revolves specifically around the activation of appearance processing. Cash (1998) argued that the amount of appearance comparison can rely on individuals' personality traits. The extent to which people are appearance-schematic can predict whether they describe themselves in terms of their physical attributes. Whether a personality trait or a state, Tiggemann and McGill (2004) found that social comparison and state appearance comparison correlate highly. The latter authors developed a scale to measure state appearance comparison, specifically designed to tap into the actual comparison of participants' own appearance as opposed to the presented one. Social comparison processes can be present in everyday practices, for instance when browsing through a SNS.

### Social comparison on Instagram

In the course of the 1990s, Joseph Walther argued that computer-mediated communication (CMC) users tend to idealize impressions of themselves and of their communication partners (Walther, 1996, 1997). The same line of reasoning can be applied to SNSs, where users have the ability to present themselves in any desired way. It is even argued that the affordances of SNSs invite social comparison with peers and celebrities, turning SNSs into "comparison incubators" (Ho, Lee, & Liao, 2016). Reasoning for why SNSs elicit social comparison comes from Mehdizadeh (2010), who postulates that people tend to present their most ideal selves when disclosing information on Facebook. Motivations for people presenting this ideal image can be sought in Goffman's theory of self-presentation (Rui & Stefanone, 2013). This theory describes that people construct positive images by catering information in response to others' feedback (Goffman, 1978). Repeated exposure to these idealized presentations of bodies, and the upward social comparison that comes with that, has been found to yield negative effects on

self-esteem and well-being (Chen, Fan, Liu, Zhou, & Xie, 2016; Schmuck et al., 2019) and body image (Haferkamp & Krämer, 2011).

Previous research relating the upward social comparison process to SNSs often took Facebook as the platform of focus, or let the platform unspecified. Early research using Instagram as the SNS platform suggested that frequency of Instagram use was related to more loneliness (Yang, 2016) and more depressive symptoms (Lup, Trub, & Rosentahl, 2015) when those people showed more social comparison as a result of the Instagram use. Additionally, Hendrickse et al. (2017) found a strong link between Instagram photo activity and increased appearance-related comparison among college women. This finding supports the statement that the visual based focus of the medium invites visual self-presentation, with appearance comparison as a result (Geurin-Eagleman & Burch, 2016). Other studies specifically focusing on Instagram often use the same primary core sources of influence as the ones described in the Tripartite Influence Model. Tiggemann and Zaccardo (2018) stated that the negative effects of exposure to idealized images can be attributed to social comparison with the ideal body image, as evoked by the three key influences. While Instagram's prime focus is on connecting peers, the most followed accounts on the platform consists mainly of celebrities (The Telegraph, 2016). This implies that both peer and celebrity images are prevalent as key influences in people's Instagram use. It is predicted that exposure to these images of the ideal body evoke more state appearance comparison as opposed to pictures with a non-ideal body type.

H2: Exposure to idealized Instagram pictures leads to more state appearance comparison than being exposed to non-idealized pictures.

The effect that exposure to celebrity and peer images have on body dissatisfaction, was found to be mediated by state appearance comparison (Brown & Tiggemann, 2016; Tiggemann, Hayden, Brown, & Veldhuis, 2018). The images of celebrities and peers ranged from full body shots to facial close-ups, reinforcing the body as the main target of comparison. Brown and Tiggemann (2016) found no differences between the celebrity and peer images on body dissatisfaction, indicating that these two influences (stemming from the Tripartite Influence Model) contributed evenly to decreased levels of body dissatisfaction. A more detailed look at state appearance comparison is provided by Fardouly et al. (2018), who distinguished appearance comparison tendency in general and appearance comparison to the women displayed in the stimuli. Besides reproducing the same results as Brown and Tiggemann regarding the mediating role of appearance comparison (2016), Fardouly and colleagues further

concluded that comparison to the stimuli (fitspiration images) also significantly mediated the relationship between frequency of viewing fitspiration images and body dissatisfaction. This relationship between state appearance comparison and body dissatisfaction has yet only been found on female participants. As Fox and Vendemia (2016) postulate, this relationship could differ for males. Their study found that although men did engage in upward body social comparison after SNS use, women felt worse than men. This result implies that men are affected by appearance comparison, only not as extreme as women. This study will use both male and female participants to gain more knowledge on how the state appearance comparison process works for both of the genders. The third hypothesis is thus formulated as follows.

H3: State appearance comparison leads to more body dissatisfaction than when no state appearance comparison is present.

State appearance comparison and someone's tendency to conduct in that comparison has been found to mediate the effect of both peer and media influences on body dissatisfaction (Brown & Tiggemann, 2016; Fardouly, Willburger, & Vartanian, 2018; Fatt et al., 2019). While being largely overlooked in literature, males showed somewhat similar effects to females, regarding the effects of exposure to fitspiration posts. Exposure to muscular-ideal photos yielded an indirect effect on body dissatisfaction via appearance comparison tendency (Fatt et al., 2019). Fox and Vendemia (2016) found similar results: men did show upward social comparison processes after looking at attractive pictures of others, but as a result, women felt worse than men. To enquire investigation of the mediating role of state appearance comparison in the relationship between idealized Instagram pictures and body dissatisfaction, a mediation hypothesis is formulated. Besides investigating the mediating effect of state appearance comparison in general, gender differences will be sought for, in order to scrutinize to what extent exposure to idealized Instagram pictures influences body dissatisfaction differently for men and women.

H4: The relationship between the exposure to idealized Instagram pictures and body dissatisfaction is mediated by state appearance comparison.

## Private self-awareness

### Objective self-awareness

Objective self-awareness describes the theory that the “object” of attention can be directed either outward toward the external environment or inward toward him- or herself (Duval & Wicklund, 1972). The theory focuses on self-evaluation, where attention is pointed toward the discrepancy between a perceived norm and one’s own behavior. This discrepancy can be evaluated with the external environment or the self as a point of reference. Focusing on the external environment as a norm as opposed to the self was later termed public self-awareness. People who are in a state of public self-awareness see themselves as a social object that has an effect on others, with the emphasis of reactions of others to the self (Fenigstein et al., 1975). Being in the state of private self-awareness, on the other hand, the attention is focused toward the self. It focuses on the more personal and covert aspects of the self, which cannot be seen by others (Scheier, Carver, & Gibbons, 1979). Sometimes also termed private self-consciousness, being self-aware makes people aware of their inner feelings, thoughts, and memories. Duval and Wicklund (1972) stated that the attention cannot be directed at both the public and the private self simultaneously, hereby implying that a focus on the emotions, thoughts and feelings of the self cannot be intertwined with an evaluation of the self as opposed to a public norm.

### Private self-awareness on social networking sites

Research on computer-mediated communication has used the focus on either the private or the public self-awareness to unveil various outcomes of the states. Yao and Flanagin (2006) found that participants in a state of private self-awareness were perceived as more socially attractive by their communication partners working together on a virtual task. In addition, Joinson (2001) found that people are more willing to spontaneously self-disclose information about themselves when in a state of heightened private self-awareness. However, both studies found these results only when private self-awareness was combined with low public self-awareness. This seems to reinforce Duval and Wicklund’s (1972) claim that self-awareness can only be pointed toward the self or the public, but not both at the same time, at least in a CMC context. Joinson argues that the online environment of CMC automatically induces heightened private self-awareness because CMC is often undertaken “in a quiet room alone” (2001, p. 189).

This statement has been confirmed by Nielsen (2017). However, specific ways in which SNSs are used may differ from how CMC is undertaken.

Research that relates private self-awareness to SNSs like Facebook and Instagram, however, is scarce. Gonzales and Hancock (2011) were one of the first to test self-esteem effects of exposure to Facebook using self-aware participants. They found that objective self-awareness increased self-esteem. The authors used two different ways to manipulate self-awareness. Both manipulations - placing a mirror next to the screen where the survey was being conducted on and looking at one's own Facebook page prior to the survey - hinted at evoking private rather than public self-awareness. Awareness of one's activity on SNSs refers back to selective self-presentation techniques users apply to show only the most ideal parts of the self (Fox & Vendemia, 2016). Attention to self-awareness in relation to SNSs and social comparison has seemed to stagnate after Gonzales and Hancock's (2011) account of self-esteem effects. Because being exposed to pictures of the self reinforces consciousness of the own body, perceptions about the discrepancy between the ideal body and the own body are more readily available. Private self-awareness can therefore bolster state appearance comparison when one is exposed to idealized Instagram pictures.

H5: Increased private self-awareness positively influences the relationship between exposure to idealized Instagram pictures and state appearance comparison.

### Combining the effects of private self-awareness and state appearance comparison

As discussed, the addition of private self-awareness to a model where social comparison and exposure to idealized Instagram pictures lead to body dissatisfaction, is still an unexplored topic in research. In the present study, it is hypothesized that heightened private self-awareness will lead to more state appearance comparison than no private self-awareness. As a possible result of more state appearance comparison, effects on body dissatisfaction can be different for people with more private self-awareness. Bessenoff (2006) indicated that the mediating effect of social comparison in the relationship between thin-ideal media exposure and negative psychological outcomes can be moderated by self-discrepancy. This concept describes salient discrepancies between the self-concept and some important standard. It is associated with private self-awareness in the sense that the deviation between the own body as opposed to the idealized other becomes more significant. Being aware of this discrepancy increased social comparison and this, in turn, bolstered body dissatisfaction (Bessenoff, 2006). In the current

study, private self-awareness specific to the participants' body can enhance appearance comparison with the presented body, as their body is more actively present in the mind than participants who are not self-aware. In other words, it is hypothesized that being exposed to idealized pictures when being in a state of private self-awareness will strengthen the relationship between the exposure and state appearance comparison. Figure 2 presents the conceptual model for this study.

H6: Private self-awareness moderates the direct and indirect effects of exposure to idealized Instagram pictures on body dissatisfaction, with more state appearance comparison and higher body dissatisfaction for private self-aware participants.

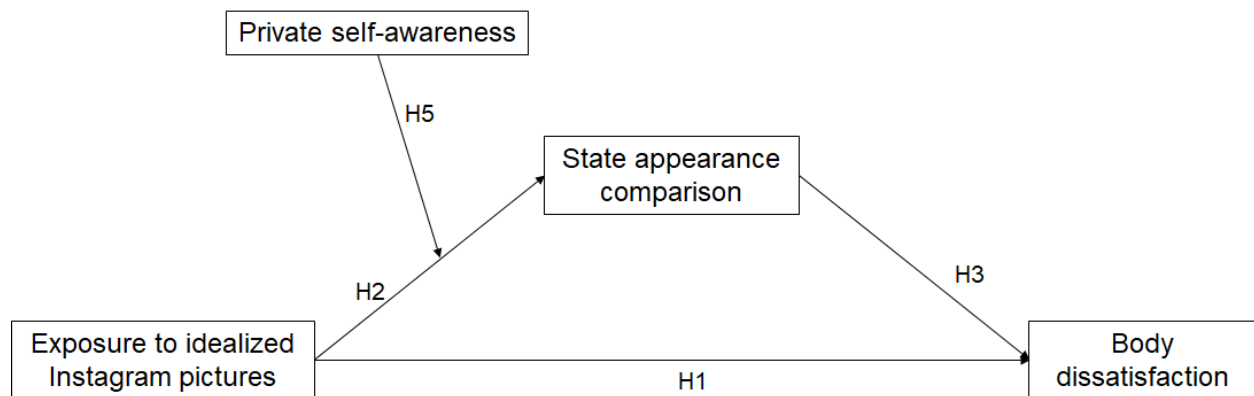


Figure 2. Conceptual model. Some hypotheses are not present in the model. H4: The relationship between the exposure to idealized Instagram pictures and body dissatisfaction is mediated by state appearance comparison. H6: Private self-awareness moderates the direct and indirect effects of exposure to idealized Instagram pictures on body dissatisfaction, with more state appearance comparison and higher body dissatisfaction for private self-aware participants.



## Method

### Participants

The original sample included 168 responses. However, two participants requested their data to be deleted, and 22 responses were incomplete. As a result, data from 144 participants were analyzed. Half of the participants ( $N = 71$ ) were recruited using a convenience sampling method at Utrecht University. The other half ( $N = 73$ ) were recruited by means of the Human Subject Pool, which provided bachelor and pre-master students of the Tilburg University track Communication and Information Sciences. The mean age was 21.92 ( $SD = 2.76$ ) with a minimum of 18 and a maximum of 33. The survey was filled in by 43 males (29.9%) and 101 females (70.1%). To test the distribution of male and female participants among the conditions, a  $\chi^2$  test of association was performed. There was no significant association between gender and each of the four conditions ( $\chi^2(3) = 3.98, p = .26$ ). Therefore, no conditions consisted of significantly more males or females than expected. All participants had an Instagram account and most of them (81.3%) used it more than once a day. Tilburg University students received course credits for their participation. This study has been approved by means of ethical clearance by the Research Ethics and Data Management Committee of Tilburg School of Humanities and Digital Sciences.

### Design

This study used a 2 (idealized Instagram pictures versus non-idealized pictures) x 2 (high versus low private self-awareness) between-subjects design. The most important independent variables were state appearance comparison, picture type, and private self-awareness. Media-internalization, physical attraction, wishful identification, and perceived similarity were added as control variables. The dependent variable was body dissatisfaction, measured before and after the exposure. A difference score was computed to calculate the change in body dissatisfaction after the exposure.

### Stimuli

The stimuli consisted of Instagram pictures containing bodies where at least most parts of the upper body was uncovered. In order to collect those pictures, the Instagram explore page

was searched using hashtags like #fitspiration, #bodyappreciation, #bodypositive, #bodypositivity, #bodytransformation, and #bikini. Ideal bodies for males were graded as such when they had a broad upper body and a narrow waist, whereas ideal female bodies were selected when they were thin and had a curvy lower torso and a curvaceous upper body (Crossley et al, 2012). Stemming from the same hashtags, all pictures of bodies not fitting the description of an ideal body were selected for the non-ideal condition. The prerequisite was that the body had to be presented in such a clear way that it received the most attention, instead of another element of the picture. Again, the bodies had to be uncovered at least from the upper body. Lastly, picture quality had to be sufficient.

A pretest was conducted to ensure that these pictures indeed were judged as either ideal or not. Participants of the pretest were therefore only asked to indicate whether they thought the bodies of the people in the pictures were ideal and whether they lived up to the ideal body standard. Attractiveness of the people in the pictures was not graded, as Hildebrandt and Walker (2006) found that ideal and attractive figures are different constructs. Additionally, the main focus of this study's stimuli was the person's body - and not its attractiveness. An additional question asked whether gender specific ideal elements of the bodies were present, namely thinness for women and muscularity for males. Resembling with the actual study, pictures with males were graded by males and pictures with females were graded by females. All questions were asked on a 7-point Likert scale. Five men and five women fitting the target group of this study were asked to grade the pictures.

First, a reliability analysis was conducted to see whether the three questions ("*These people (1) have an ideal body, (2) live up to the ideal body standard, (3) are thin/muscled*") were internally consistent. Pictures that yielded Cronbach's alphas less than the 0.6 benchmark for reliable scores (Field, 2013) were deleted. Next, for both genders, the three highest scoring pictures were selected for the ideal conditions and the lowest scoring pictures were selected for the non-ideal conditions.

Averages were computed to see whether ideal bodies were indeed graded higher on the three questions than the non-ideal pictures. The female ideal pictures ( $M = 6.18$ ,  $SD = 0.58$ ) were graded as more ideal and thinner than the non-ideal pictures ( $M = 3.91$ ,  $SD = 1.37$ ). This difference was significant ( $Mdif = 2.27$ ,  $t(4) = 3.69$ ,  $p = .02$ ) and generalized to the population, 95% CI [1.24, 3.29]. The difference represented a large-sized effect,  $d = 2.16$ . The male ideal pictures ( $M = 5.82$ ,  $SD = 0.68$ ) were also graded as more ideal and more muscular than the non-ideal pictures ( $M = 1.80$ ,  $SD = 0.78$ ). This difference was significant ( $Mdif = 4.02$ ,  $t(4) =$

16.63,  $p = .00$ ) and generalized to the population, 95% CI [3.51, 4.38]. The difference represented a large-sized effect,  $d = 5.49$ . Table 1 shows the scores for each picture.

Table 1

*Means, Standard Deviations (SD) and Cronbach's alpha for ideal and non-ideal pictures.*

Picture	<i>M</i>	<i>SD</i>	$\alpha$
Females			
Non-ideal picture 1	4.23	1.12	0.717
Non-ideal picture 3	3.93	1.66	0.826
Non-ideal picture 4	3.67	1.70	0.888
Ideal picture 2	6.13	0.51	0.687
Ideal picture 3	6.27	0.43	0.618
Ideal picture 4	6.13	0.90	0.616
Males			
Non-ideal picture 2	1.60	0.80	0.789
Non-ideal picture 3	2.07	1.04	0.881
Non-ideal picture 4	1.73	0.98	0.845
Ideal picture 2	4.87	1.83	0.832
Ideal picture 3	6.27	0.64	0.770
Ideal picture 4	6.33	0.47	0.675

On the basis of this pretest, the final stimuli consisted of three ideal and three non-ideal pictures for males and females. The Instagram usernames were blurred to protect the privacy of the people who posted the pictures. In the survey, the posts were placed underneath each other to resemble an Instagram feed. All pictures can be found under Appendix B: Stimuli.

The software package used to conduct the analyses was IBM SPSS Statistics version 24. Andrew F. Hayes' PROCESS macro (Hayes, 2012) was used as an extension for some of the tests. Bootstrapping was performed for analyses where the assumption of normality was not met. The number of bootstrap samples was kept even at 1,000 for all tests. The results section will mention when bootstrapping was conducted, as well as any other measure taken to correct for the violation of assumptions.

## Procedure

Prior to the survey, participants were told that they were going to be presented with three Instagram pictures. They were advised to scroll through these pictures as if they were scrolling through their Instagram feed. Furthermore, they were asked to conduct the survey in a similar setting as where they would normally use Instagram in, in order to secure predictive validity. They were told that this setting should preferably be private in which external impulses were kept to a minimum. This setting resembled Joinson (2001)'s remark, who stated that CMC is oftentimes conducted in "a quiet room alone". Aiming to distribute the participants across all conditions in an efficient way, people without pictures of their own bodies on their phone were put in the low private self-awareness condition, and vice versa. After reading the information letter and signing the consent form, participants were asked demographic information and prior body dissatisfaction questions. Next, participants in the high private self-awareness conditions received the task to browse through their photo collection and select one that they would find suitable to upload to Instagram. They were told that the picture did not actually have to be posted. Requirements of the picture were that the body should be present from head to toe, with as most parts as possible uncovered. Participants were told to focus on this picture and return back to the survey, where they had to write a caption that they would put underneath the picture. Next, they were presented with the stimuli. Participants in the low private self-awareness conditions did not receive this task and were presented with the stimuli right away. After seeing the Instagram pictures, participants answered manipulation check of private self-awareness and their state appearance comparison was measured. Next, the subsequent set of body dissatisfaction questions were asked, together with the control variables and indications of

the preferred and actual body size. Finally, participants got the possibility to request data deletion, were debriefed and thanked for their participation.

### Materials and measurements

**Private self-awareness.** Traditionally, a mirror was used to direct more attention to the self (Carver & Scheier, 1981; Duval & Wicklund, 1973; Fejfar & Hoyle, 2000). Other manipulations included having participants write autobiographical information (Duval, Duval, & Neely, 1979), and showing participants images of the self (Storms, 1973). The latter method is in line with Scheier (1976), who stresses the fact that heightened private self-awareness is associated with an increased salience of one's physical and affective states. In the context of SNSs, Gonzales and Hancock (2011) chose to let the participants browse through their own Facebook page in order to evoke self-awareness.

In order to create as much ecological isomorphism as possible, participants in the high private self-awareness conditions were asked to browse through their collection of photos on their mobile phone. They were given the task to choose one in which their body is shown as uncovered as possible, for example in a vacation picture. In this part of the task, participants' attention is directed toward the self and they are primed with their own body. To evoke private self-awareness even more, participants were asked to write a short caption belonging to that photo, as if they were to upload that picture to Instagram. As captions often include descriptions of the situational context of the photo, or comments on the person's feeling at that time, coming up with such a caption can be seen as autobiographical information in a micro form. Writing autobiographical information has been found to be a method of increasing self-focus, where more attention is directed toward the self (Duval et al., 1979). This method thus combines some of the most frequent ways in which private self-awareness is evoked (Duval et al., 1979; Gonzales & Hancock, 2011; Storms, 1973).

Participants in the condition where private self-awareness was not evoked were not asked to participate in this task. Some studies undertook action to reduce private self-awareness for these control conditions, such as by showing episodes of a cartoon (Joinson, 2001) or letting participants solve anagrams (Prentice-Dunn & Rogers, 1982). In order to enhance the ecological isomorphism of this study, none of these distraction activities were undertaken. In order to make sure the participants in the private self-aware conditions actually felt that more attention was pointed toward the self, manipulation check questions were asked after exposure to the pictures.

In order to assess to what extent participants indeed focused their attention toward the self, an adoption of the Situational Self-Awareness Scale (SSAS) was presented to the participants. This scale, developed by Govern and Marsch (2001), originally consisted of 9 items. The scale distinguished private and public self-awareness, as well as non-self-focus - termed “surroundings”. Three questions were specifically aimed at private self-awareness (e.g., “Right now, I am (1) conscious of my inner feelings; (2) reflective about my life; (3) aware of my innermost thoughts). These three statements initially yielded good reliability (Cronbach’s  $\alpha = 0.70$ ). Factor loadings of the SSAS unveiled that item 4 (“*Right now, I am self-conscious about the way I look*”, originally aimed at public self-awareness) had high resemblance to the private self-awareness questions (Auzoult, 2013). Since the present study’s specific focus on physical appearance, this item was added to the SSAS. The resulting adoption of the SSAS consisted thus of four statements, to be answered on a 7-point Likert scale ( $1 = \textit{strongly disagree}$ ,  $7 = \textit{strongly agree}$ ). In this study, the scale’s internal reliability was high (Cronbach’s  $\alpha = 0.86$ ).

**State appearance comparison.** To assess to what extent the participants compared their appearance with the people displayed in the pictures, the State Appearance Comparison Scale (SACS) stemming from Tiggemann and McGill (2004) was used. This scale used three 7-point Likert-type items, where participants first indicated to what extent they thought about their appearance when viewing the Instagram posts ( $1 = \textit{no thought about my appearance}$ ,  $7 = \textit{a lot of thought}$ ). The second and third item concerned the extent to which participants compared their overall appearance and specific body parts with those of the people they saw in the Instagram posts ( $1 = \textit{no comparison}$ ,  $7 = \textit{a lot of comparison}$ ). High scores indicated a lot of appearance-related comparisons. The scale initially yielded high internal reliability (Cronbach’s  $\alpha = 0.91$ ), and comparable reliability scores were found later on (Bury, Tiggemann, & Slater; 2016; Tiggemann & Brown, 2018; Tiggemann, Slater, Hawkins, & Firth, 2013). The present study showed a similar reliability (Cronbach’s  $\alpha = 0.87$ ). All questions of this scale, as well as all other questions and the whole outline of the survey can be found in Appendix A.

**Body dissatisfaction.** The level of body dissatisfaction was measured by three visual analogue scale (VAS) items. Following Heinberg and Thompson (1995), two items assessed weight and appearance dissatisfaction (“*Right now, how do you feel about your appearance / your weight?*”). Outcomes of these two items showed high correlation with the Eating Disorders Inventory-Body Dissatisfaction (EDI-BD) Subscale (Heinberg & Thompson, 1995). An additional item was added to measure participants’ dissatisfaction with their body shape. Each scale

consisted of a 100mm horizontal line with endpoints labeled “very satisfied” and “very dissatisfied”. The advantage of VASs is that recall of previous answers is difficult due to the large scale of possible answers. This improves the sensitivity to small changes (Tiggemann & McGill, 2004). Participants were asked to answer the items before and after the exposure to the Instagram pictures, making it possible to measure the difference in body dissatisfaction. The items reported high internal consistency, both before (Cronbach’s  $\alpha = 0.92$ ) and after (Cronbach’s  $\alpha = 0.95$ ) the exposure.

**Media-internalization.** Besides social comparison, the Tripartite Influence Model describes internalization of the thin ideal as the second mediator that can potentially explain the relationship between the three key influences and body dissatisfaction. Internalization describes the extent to which individuals endorse the media ideal and live up to social standards for physical appearance, in order to attain these standards (Rodgers et al., 2015). Thompson et al. (1999) posited that media influence can lead to an internalization of the ideal body, which can in turn can lead to an increase in body dissatisfaction. As people can differ in their degree of internalization of ideal body types, this study used media-internalization as a control variable. The Internalization subscale of the Sociocultural Attitudes Towards Appearance Questionnaire (Thompson, Van den Berg, Roehrig, Guarda, & Heinberg, 2004) consisted of 9 items that assessed the degree to which people adopted the media-ideal and to what extent they used it as a standard for comparison. Items were scored on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). An example item was: “I compare my body to the bodies of movie stars”. Menzel et al. (2011) tested this scale on both genders and found good internal reliability scores for both men (Cronbach’s  $\alpha = 0.94$ ) and women (Cronbach’s  $\alpha = 0.95$ ). As this scale motivated participants to think of what the ideal body constituted for them, these questions may have acted as a prime for the activation of thoughts regarding discrepancies between one’s own body and another ideal one. Answering these items could thus act as an activation of private self-awareness. The internalization items were therefore asked after exposure to the Instagram pictures.

Participants of the pretest noticed that some of the media listed in the statements are somewhat outdated, or not part of popular culture anymore. Specifically, participants indicated that they could not clearly imagine how people that appear in magazines look like. In order to make the scale more suitable for contemporary popular media, the term “magazines” was changed to “social media”. The resulting scale resulted in a high internal consistency (Cronbach’s  $\alpha = 0.92$ ).

**Physical attraction.** McCroskey and McCain (1974) stated that the more attracted we are to another person, the more influence that person has on us. This can imply that attractive people leave more impressions on us than unattractive people. This attractiveness can have an effect on the way state appearance comparison processes and changes in body dissatisfaction play out. For this reason, physical attraction toward the people on the Instagram pictures was added as a control variable in this study. A modification of McCroskey and McCain's (1974) scale was used, which contained 5 items to be answered on a 7-point Likert-type scale. An example item was: "I think the person in the photo is quite handsome". The items proved to measure the same construct "physical attractiveness", as proven by McCroskey and McCain's (1974) factor analysis. The factor accounted for 18% of the total variance after rotation. Furthermore, the authors did not control for sex differences, which makes the scale suitable for the present study's setup, given the gender alignment of the participants and the displayed people. The authors proved the scale to be internally reliable (Cronbach's  $\alpha = 0.80$ ). The present study also found high internal consistency (Cronbach's  $\alpha = 0.93$ ).

**Wishful identification.** In the context of television viewing, identification with media characters is seen as an outcome that is believed to mediate audience responses (Hoffner & Buchanan 2005). More specifically, wishful identification describes an individual's aspiration to be like a displayed person (Kamins, Brand, Hoeks, & Moe, 1989). Wishing to identify, or the desire to be or look like another person may mark the existence of a discrepancy between the actual and the ideal self (Greenwood, 2009) and increases of this discrepancy have been linked to an increased body dissatisfaction (Strauman, Vookles, Berenstein, Chaiken, & Higgins, 1991). This construct was therefore added as a control variable. Hoffner and Buchanan (2005) created a scale to measure wishful identification. The scale consisted of five 5-point Likert scale items (e.g., "Sometimes I wish I could be more like [name influencer]") and initially yielded high internal reliability for both males (Cronbach's  $\alpha = 0.80$ ) and females (Cronbach's  $\alpha = 0.84$ ). The factor accounted for 45.5% of the total variance for males and 53.7% for females. Also, all factor loadings exceeded 0.50, indicating that the questions aimed at one and the same construct. The questions proved to be internally reliable in the present study as well (Cronbach's  $\alpha = 0.84$ ).

**Similarity.** People identify more strongly with others whom they regard as similar to themselves (Hoffner & Buchanan, 2005). It could be the case that people who perceive the other to be similar to them, activate less comparison processes because they perceive the



discrepancy between the two as minimal. Because similarity of the self and the other can have an effect on the relationship between the exposure to idealized pictures and social comparison processes, this construct was added as a control variable. Hoffner and Buchanan (2005) created a scale to measure similarity, consisting of four semantic differential items (e.g., “How much is [name influencer] like me?”) that ranged from 1 to 7, with higher scores indicating greater perceived similarity. An adaptation of this scale that focused more generally on “people” instead of “influencers” was used in this study. The scale initially showed high internal reliability for both males (Cronbach’s  $\alpha = 0.79$ ) and females (Cronbach’s  $\alpha = 0.81$ ). For both genders, all factor loadings exceeded 0.42, indicating that the questions aimed at one and the same construct. The present study produced a similarly high internal reliability score (Cronbach’s  $\alpha = 0.75$ ).

**Attitudes toward body size.** One finding of the pretest was that what constitutes an ideal body does not solely rely on the culture one lives in, it can also differ on personal preferences. Someone’s ideal body can for example be thick, with a curvaceous upper and lower torso. Effects of exposure to thin people can thus differ for people with several body sizes. Also, there can be a discrepancy between the current body size and the preferred body size. Hildebrandt and Walker (2006) recommended to use multiple ways to measure body dissatisfaction, especially among males, since language use can result in measuring different latent variables. Therefore, two additional control questions were asked where participants were presented with a range of body sizes, similar to Stevens et al., (1999). Participants were asked to indicate one that most accurately represented (1) their actual body size and (2) their preferred body size (Figure 3). This visual representation of a body was preferred over another common method of controlling for body size, namely the Body Mass Index (BMI; e.g., as used in Brown & Tiggemann, 2016). This measure only takes into account weight and length while ignoring muscles, which weighs more than fat. This can make the measure somewhat inaccurate. Also, when people think about their bodies and/or look in a mirror, their body is perceived in a visual manner instead of a number.

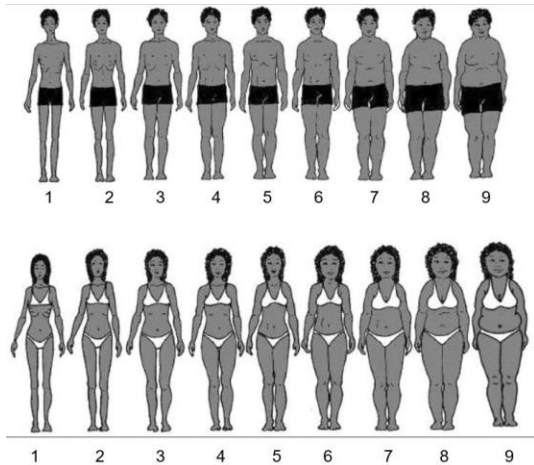


Figure 3. Body sizes for participant's current and preferred body sizes.

## Results

### Manipulation check

The manipulation of private self-awareness was successful. Participants in private self-aware conditions ( $M = 4.53$ ,  $SD = 1.18$ ) reported higher scores on the SSAS than those in conditions where private self-awareness was not evoked ( $M = 3.55$ ,  $SD = 1.51$ ). This difference was significant, ( $Mdif = 0.97$ ,  $t(142) = 4.34$ ,  $p < .01$ ) The difference represents a large-sized effect,  $d = 0.72$ .

### Descriptives and correlations

Mean scores and standard deviations for all relevant variables used in this study are organized by condition in table 2 and organized by group in Table 3. On average, the sample appeared to be moderately dissatisfied with their body, both before ( $M = 47.69$ ,  $SD = 23.98$ ) and after ( $M = 45.41$ ,  $SD = 25.12$ ) exposure to the Instagram pictures. The standard deviation however was considered high among both moments, implicating that the mean scores were no comprehensive representation of the observed data.

The change of body dissatisfaction before and after the exposure differed significantly for males and females. Because normality could not be assumed<sup>1</sup>, bootstrapping was performed in the independent sample(s) *t*-test. While men ( $M = -9.46$ ,  $SD = 24.14$ ) felt more satisfied after the exposure than before, women ( $M = 0.72$ ,  $SD = 15.83$ ) barely showed different scores. The difference between the two genders was significant,  $Mdif = -10.24$ ,  $t(57.97) = -2.56$ ,  $p = .03$ , 95% CI [-18.11, -2.95]. Female scores were however less spread out across the sample, given the smaller standard deviation.

The Pearson *r* correlations between all relevant variables are shown in table 4. Age notably correlated negatively with private self-awareness ( $r(142) = -.252$ ,  $p = .00$ ), state appearance comparison ( $r(142) = -.252$ ,  $p = .00$ ), media-internalization ( $r(142) = -.275$ ,  $p = .00$ ), physical attraction ( $r(142) = -.209$ ,  $p = .01$ ), and wishful identification ( $r(142) = -.294$ ,  $p < .01$ ). Furthermore, the more frequently people used Instagram, the more they internalized the media standard as their own standard ( $r(142) = .258$ ,  $p = .00$ ). The discrepancy between an estimation of participants' current and preferred body size correlated with body dissatisfaction, both before ( $r(142) = .168$ ,  $p = .04$ ) and after exposure ( $r(142) = .345$ ,  $p < .01$ ), and its change ( $r(142) = .241$ ,  $p = .00$ ). This discrepancy also correlated positively with, amongst others, state appearance comparison ( $r(142) = .328$ ,  $p < .01$ ). State appearance comparison positively correlated with media-internalization ( $r(142) = .495$ ,  $p < .01$ ), physical attraction ( $r(142) = .323$ ,  $p < .01$ ), wishful identification ( $r(142) = .389$ ,  $p < .01$ ), and perceived similarity ( $r(142) = .167$ ,  $p = .05$ ). Lastly, all control variables (physical attraction, wishful identification, and perceived similarity) all positively correlated fairly strongly with each other.

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<sup>1</sup> Male participants:  $D(43) = .309$ ,  $p < .01$ , Female participants:  $D(101) = .159$ ,  $p < .01$ .

Table 2  
*Participant characteristics organized by condition*

Variable	<u>High PSA &amp; ideal pictures</u>		<u>High PSA &amp; non-ideal pictures</u>		<u>Low PSA &amp; ideal pictures</u>		<u>Low PSA &amp; non-ideal pictures</u>	
	<u>(N = 36)</u>		<u>(N = 40)</u>		<u>(N = 35)</u>		<u>(N = 33)</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	21.36	2.60	21.10	2.39	22.83	3.27	22.55	2.43
IG frequency	5.61	0.93	5.95	0.22	5.34	1.47	5.70	0.59
Body size discrepancy	1.44	1.08	1.18	0.96	1.14	0.81	1.36	1.06
BD before	45.01	23.19	48.29	25.58	47.54	22.73	50.04	24.91
BD after	48.25	22.52	43.03	29.05	45.67	20.61	44.95	27.74
SSAS	4.39	1.17	4.65	1.20	3.81	1.31	3.28	1.67
SACS	4.18	1.65	3.78	1.55	3.68	1.54	3.25	1.63
Media-internalization	2.95	0.85	2.94	0.85	2.75	1.01	2.52	0.82
Physical attraction	5.05	1.20	3.37	1.53	4.90	1.41	2.94	1.34
Wishful identification	2.80	1.03	2.35	0.88	2.50	0.79	2.12	0.82
Perceived similarity	3.06	0.98	3.17	1.13	3.01	1.22	2.97	1.09

*Note.* IG = Instagram. PSA = private self-awareness; Age in years; IG frequency (5 = once every day, 6 = more than once every day); Body size discrepancy (difference between indicated and preferred body size, available scores: 1 - 9); Situational Self-Awareness Scale (available scores: 1 - 7); State Appearance Comparison Scale (available scores: 1 - 7); Media-internalization (available scores: 1 - 5); Physical attraction (available scores: 1 - 7); Wishful identification (available scores: 1 - 5); Perceived similarity (available scores: 1 - 7).

Table 3

*Participant characteristics organized by group*

Variable	<u>High PSA conditions</u> (N = 76)		<u>Low PSA conditions</u> (N = 68)		<u>Idealized picture conditions</u> (N = 71)		<u>Non-idealized picture conditions</u> (N = 73)	
	M	SD	M	SD	M	SD	M	SD
Age	21.22	2.48	22.69	2.87	22.08	3.02	21.75	2.50
IG frequency	5.79	0.68	5.51	1.14	5.48	1.23	5.84	0.44
Body size discrepancy	1.30	1.02	1.25	0.94	1.30	0.96	1.26	1.00
BD before	46.74	24.37	48.75	23.67	46.26	22.84	49.08	25.12
BD after	45.50	26.12	45.32	24.15	46.98	21.49	43.90	28.29
SSAS	4.53	1.18	3.55	1.51	4.10	1.27	4.03	1.58
SACS	3.97	1.60	3.47	1.59	3.93	1.61	3.54	1.60
Media-internalization	2.94	0.85	2.64	0.92	2.85	0.93	2.75	0.86
Physical attraction	4.16	1.61	3.95	1.69	4.97	1.30	3.17	1.45
Wishful identification	2.56	0.98	2.31	0.82	2.65	0.93	2.24	0.86
Perceived similarity	3.11	1.06	2.99	1.15	3.03	1.10	3.08	1.11

*Note.* IG = Instagram. PSA = private self-awareness; Age in years; IG frequency (5 = once every day, 6 = more than once every day); Body size discrepancy (difference between indicated and preferred body size, available scores: 1 - 9); Situational Self-Awareness Scale (available scores: 1 - 7); State Appearance Comparison Scale (available scores: 1 - 7); Media-internalization (available scores: 1 - 5); Physical attraction (available scores: 1 - 7); Wishful identification (available scores: 1 - 5); Perceived similarity (available scores: 1 - 7).

Table 4

*Pearson r correlations for all relevant variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age	-											
2. IG frequency	-.136	-										
3. Body shape discrepancy	-.118	.127	-									
4. BD before	.007	.063	.168*	-								
5. BD after	-.112	.047	.345**	.695**	-							
6. BD difference	-.155	-.018	.241**	-.339**	.440**	-						
7. SSAS	-.252**	.110	.237**	.092	.192*	.137	-					
8. SACS	-.252**	.121	.328**	.160	.240**	.114	.359**	-				
9. Media-internalization	-.275**	.258**	.319**	.130	.178*	.070	.240**	.495**	-			
10. Physical attraction	-.209*	-.010	.113	-.005	.104	.142	.133	.323**	.208*	-		
11. Wishful identification	-.294**	.151	.201*	.128	.188*	.087	.190*	.389**	.388**	.542**	-	
12. Perceived similarity	-.111	-.031	.007	.267**	.183*	-.094	-.015	.167*	.082	.173*	.445**	-

Note. \* Correlation is significant at the .05 level (2-tailed). \*\* Correlation is significant at the .01 level (2-tailed). IG = Instagram. PSA = private self-awareness; Age in years; IG frequency (5 = once every day, 6 = more than once every day); Body size discrepancy (difference between indicated and preferred body size, available scores: 1 - 9); Situational Self-Awareness Scale (available scores: 1 - 7); State Appearance Comparison Scale (available scores: 1 - 7); Media-internalization (available scores: 1 - 5); Physical attraction (available scores: 1 - 7); Wishful identification (available scores: 1 - 5); Perceived similarity (available scores: 1 - 7).

## Hypothesis testing

Correlations shown in table 4 revealed that all four control variables mentioned in the method section (e.g., media-internalization, physical attraction, wishful identification, and perceived similarity) did not correlate with the changes in body dissatisfaction. These variables were therefore not analyzed as possible covariates, since no association exists between these variables and the dependent variable.

Hypothesis 1 stated that exposure to idealized Instagram pictures would lead to more body dissatisfaction than being exposed to non-idealized pictures. To test this, an independent sample(s) *t*-test was performed. The difference score was not normally distributed for the ideal pictures conditions (z-score skewness = 5.41, z-score kurtosis = 11.38) and the non-ideal pictures conditions (z-score skewness = -8.56, z-score kurtosis = 11.48). Therefore, the *p*-value may not be reliable and more weight should be placed on the bootstrapped 95% confidence intervals that will be provided. On average, changes in body dissatisfaction for people who were exposed to idealized Instagram pictures ( $M = 0.72$ ,  $SD = 15.54$ ) were higher than for people who saw non-idealized pictures ( $M = -5.19$ ,  $SD = 21.90$ ). This difference was not significant ( $Mdif = 5.91$ ,  $t(142) = 1.86$ ,  $p = .07$ ) and generalized to the population, 95% CI [-0.05, 12.15]. On the basis of this, hypothesis 1 had to be rejected.

To investigate whether there was a difference in body dissatisfaction between men and women, an additional independent sample(s) *t*-test was conducted. Men did not show significantly different changes in body dissatisfaction when they were exposed to idealized pictures as opposed to non-idealized pictures,  $Mdif = 7.33$ ,  $t(41) = 0.99$ ,  $p = .33$ , and this generalized to the population, 95% CI [-7.65, 22.30]. The same was true for women,  $Mdif = 4.45$ ,  $t(99) = 1.42$ ,  $p = .16$ , this generalized to the population, 95% CI [-1.77, 10.67]. There were therefore no different results for both genders.

It was further hypothesized that exposure to idealized Instagram pictures would lead to more state appearance comparison than being exposed to non-idealized pictures. A second independent sample(s) *t*-test was conducted to test this hypothesis. The data for state appearance comparison were normally distributed and Levene's test was not significant, indicating equal variances ( $F = .08$ ,  $p = .77$ ). Therefore, all relevant assumptions were met. On average, participants in the idealized pictures conditions ( $M = 3.93$ ,  $SD = 1.61$ ) showed more appearance comparison than those in the non-idealized pictures conditions ( $M = 3.54$ ,  $SD = 1.60$ ). This difference was however not significant,  $Mdif = 0.39$ ,  $t(142) = 1.45$ ,  $p = .15$ .

Hypothesis 2 was therefore rejected.

A second independent sample(s) *t*-test was conducted to see if men showed different appearance comparison processes than women. Normality could not be assumed for the male ( $D(24) = 0.184, p = .04$ ) and female ( $D(49) = 0.159, p = .00$ ) non-idealized picture conditions. Therefore, the *p*-value may not be reliable and more weight should be placed on the bootstrapped 95% confidence intervals that will be provided. Men did not show significantly different appearance comparison scores when they were exposed to ideal pictures as opposed to non-idealized pictures,  $Mdif = 0.37, t(41) = 0.78, p = .43, 95\% CI [-0.52, 1.28]$ . The same was true for women,  $Mdif = 0.33, t(41) = 0.99, p = .29, 95\% CI [-0.31, 0.98]$ . There were therefore no different results for both genders.

An additional test was performed to complement the results of hypothesis 2. Private self-awareness was evoked for half of the participants in picture type conditions. As a result, these people might have shown different appearance comparison scores. A factorial ANOVA was performed to test this prediction. Only the condition of non-idealized pictures conditions showed a slight platykurtic distribution, *z*-score kurtosis = -2.16. The factorial ANOVA is fairly robust against violations of normality. However, the outcomes may not be completely reliable. The assumption of equal variances was met. The ANOVA showed no significant main effect of private self-awareness,  $F(1, 140) = 3.76, p = .05$ . Appearance comparison scores for private self-aware participants ( $M = 3.97, SD = 1.60$ ) were not significantly higher than those for participants who were not private self-aware ( $M = 3.47, SD = 1.59$ ). There was also no significant interaction effect,  $F(1, 140) = 0.00, p = .95$ . Differences in appearance comparison scores could thus not be attributed to the picture type shown to the participant, nor the degree of private self-awareness. There was still no significant interaction effect present when comparing male ( $F(1, 39) = 2.16, p = .15$ ) and female ( $F(1, 97) = 0.96, p = .33$ ) participants.

Hypothesis 3 stated that people who showed state appearance comparison would be more dissatisfied with their body than people who did not show state appearance comparison. This hypothesis was tested by means of a regression analysis, with state appearance comparison as predictor ( $M = 3.73, SD = 1.61$ ) and the change in body dissatisfaction ( $M = -2.28, SD = 19.20$ ) as outcome. The assumption of collinearity was met, since the VIF value (VIF = 1.00) did not exceed 10. The regression analysis showed that a change in body dissatisfaction cannot be predicted by state appearance comparison,  $b = 1.36, \beta = 0.11, t(142) = 1.36, p = .18$ . However, the diagnostics cast some doubt on the generalizability of the model since the residuals were negatively skewed and leptokurtic (*z*-score skewness = -8.07, *z*-score kurtosis = 19.46) and therefore deviated significantly from normal. To assess whether the model



was sensitive to these violations of assumptions, bootstrapping was performed. The bootstrapped coefficients showed similar results as the previous analysis,  $b = 1.36$ ,  $p = .27$ , 95% CI [-1.00, 4.07]. State appearance comparison did not show predictive power on the change of body dissatisfaction before and after exposure to Instagram pictures. Therefore, hypothesis 3 had to be rejected.

Comparing men and women did not show different results. Appearance comparison scores for male participants did not significantly predict changes in body dissatisfaction,  $b = 0.12$ ,  $p = .97$ , 95% CI [-6.05, 6.34]. The same was true for female participants,  $b = 1.05$ ,  $p = .43$ , 95% CI [-1.37, 3.77].

The following three hypotheses all concerned predictions based on previously established relationships. The previous three hypotheses however found no significant relationships between picture type, appearance comparison, and a change in body dissatisfaction. Given this lack of statistical validation, it would seem logical to not investigate the following hypotheses, since they are not based on statistically significant relationships. However, the analyses were conducted anyway to make these analyses more exhaustive and to unveil gender differences. Any statistically significant findings will be interpreted with caution.

Hypothesis 4 stated that the relationship between the exposure to idealized IG images and body dissatisfaction is mediated by state appearance comparison. This hypothesis was tested using Hayes' PROCESS macro model 4 (Hayes, 2012). Since all relevant assumptions have been discussed in tests above, they will not be mentioned again. The measure taken for the violation of the assumption of normality was that the 95% confidence interval levels will be reported in the model. The model tested picture type as independent variable and state appearance comparison as mediator to predict a change in body dissatisfaction. This did not significantly improve the null model ( $R^2 = .03$ ,  $F = 2.41$  [2, 141],  $p = .09$ ). Figure 4 shows that, as already seen in H1, no relationship exists between the picture type that participants were exposed to and changes in body dissatisfaction. State appearance comparison did not significantly change after exposure to either ideal bodies or non-idealized pictures, as seen in H2. This state appearance comparison thus did not show up as a mediator for the relationship between exposure and body dissatisfaction,  $b = 1.15$ ,  $p = .25$ . Hypothesis 4 had to be rejected.

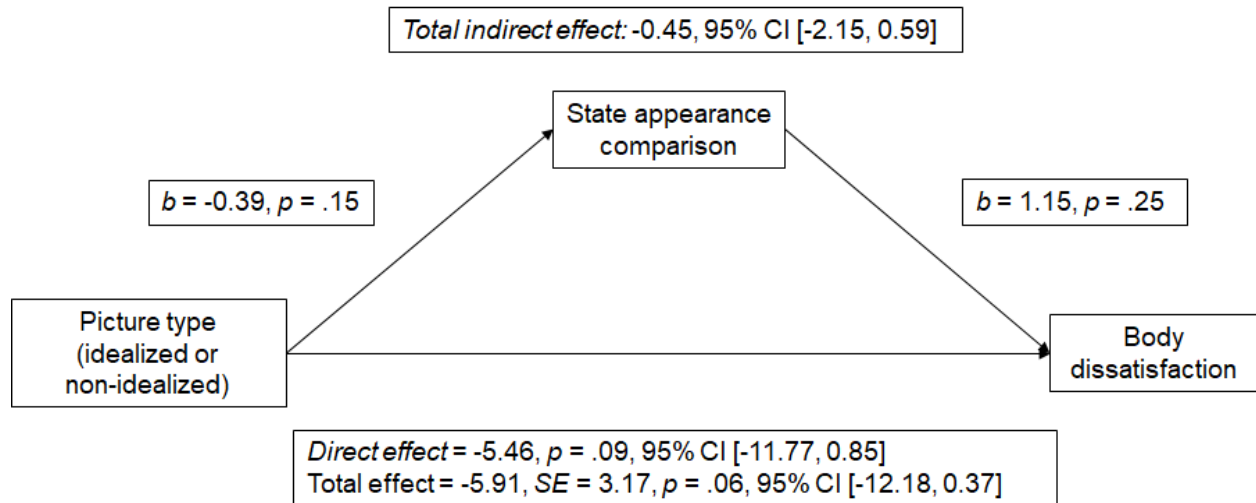


Figure 4. Visualization of the mediation model for hypothesis 4.

Two additional mediation analyses were performed to explore gender differences. The relationships between the concepts in the mediation model did not alter when looking at males and females separately. Figures 5 and 6 show the visualization of these mediation models.

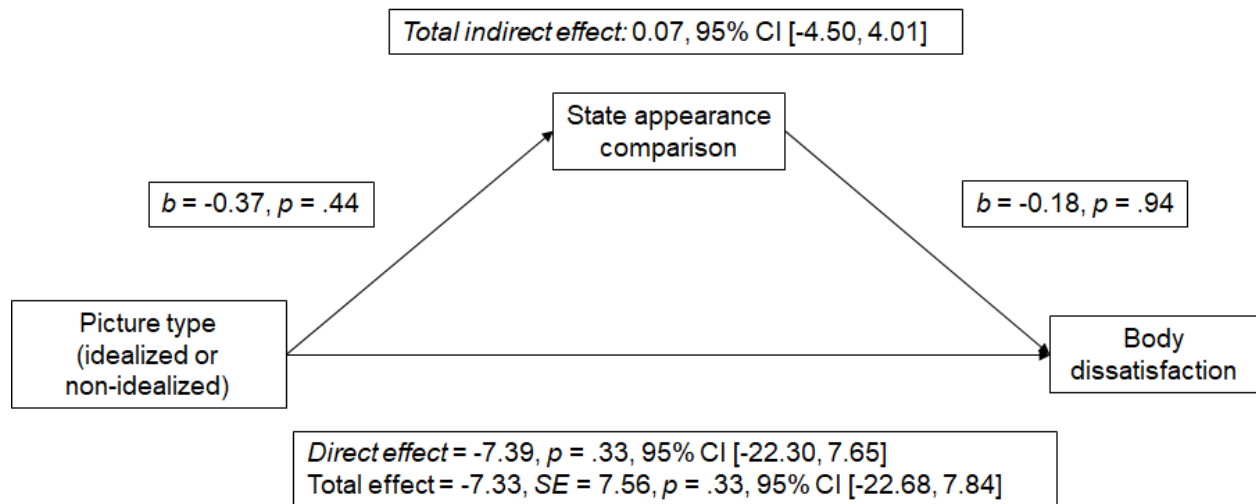


Figure 5. Visualization of the mediation model for hypothesis 4: male participants.

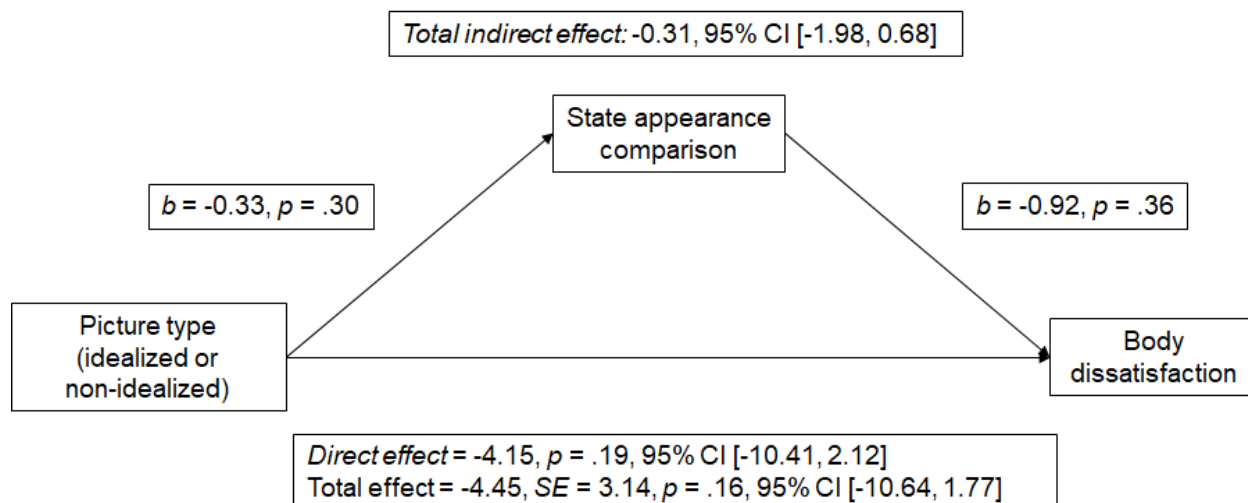


Figure 6. Visualization of the mediation model for hypothesis 4: female participants.

Hypothesis 5 concerned the moderating role of private self-awareness in the relationship between exposure and state appearance comparison. In order to test this, Hayes’ PROCESS macro model 1 was used (Hayes, 2012). Table 5 shows the descriptives and the correlation of the variables. Spearman’s  $\rho$  was used to determine the correlation, since the data was not normally distributed but the sample size was acceptable. The SSAS score was used as the independent variable in the analysis, rather than the conditions the participants were put in, because the manipulation check for private self-awareness was successful. Additionally, people in conditions where private self-awareness was not evoked could still have reported high self-awareness on the SSAS. Therefore, these people should be treated as participants high on private self-awareness because of their high scores on the SSAS, regardless of the condition they were in.

Table 5

*Descriptives and correlation of SSAS (Situational Self-Awareness Scale; manipulation check of private self-awareness) and SACS (State Appearance Comparison Scale)*

Variable	M	SD	Spearman’s $\rho$	p
SSAS	4.07	1.43	0.350	< .01
SACS	3.73	1.61		

Because a moderation analysis is a form of regression analysis, all relevant assumptions for a regression needed to be accounted for. To start, the two variables were not normally distributed: private self-awareness,  $D(144) = 0.105$ ,  $p < .01$ , and state appearance comparison,  $D(144) = .134$ ,  $p < .01$ . Therefore the  $p$ -value may not be reliable and more weight should be placed on the bootstrapped 95% confidence intervals that will be provided. There was no perfect multicollinearity found between the two variables. There was no perfect correlation found in the independent variable and the moderator. Tolerance score stayed well above the 0.2 benchmark. The Cook's distance mean is .01, which indicated that none of the cases had an undue influence on the model. Next, some heteroscedasticity was found, indicating that the spread of residuals is different. This was not regarded as a problem for the analysis because virtually all other assumptions are met and bootstrapping will be conducted to control for the abnormal distribution. The Durbin-Watson statistic was 1.90, which shows that the errors are independent. Finally, the residuals were normally distributed. As a conclusion of the assumptions, the bootstrapped 95% confidence interval levels need to be reported.

The model, with private self-awareness as a moderator in the relationship between exposure to idealized or non-idealized pictures and state appearance comparison, significantly improved the null model,  $R^2 = 0.15$ ,  $F[3, 140] = 7.99$ ,  $p < .01$ . The relationship between exposure to idealized Instagram pictures and state appearance comparison however, was not significantly moderated by participants' perception of private self-awareness,  $b = -0.159$ , 95% CI [-0.52, 0.20],  $t = -0.88$ ,  $p = .38$ . The null model improved significantly because of the addition of private self-awareness in the model,  $b = 0.418$ , 95% CI [0.24, 0.50],  $t = 4.64$ ,  $p < .01$ . Private self-awareness ( $M = 4.07$ ,  $SD = 1.43$ ) thus acted as a predictor of state appearance comparison ( $M = 3.73$ ,  $SD = 1.61$ ). The model explained 12.9% of the variance in state appearance comparison  $R^2 = 0.129$ ,  $F(1, 142) = 21.03$ ,  $p < .01$ . Figure 7 shows the graph of the relationship.

Two additional moderation analyses comparing male and female participants found that there were gender differences present. Male's private self-awareness did not moderate state appearance comparison,  $b = 0.613$ , 95% CI [-0.08, 1.31],  $t = 1.78$ ,  $p = .08$ . However, for female participants, private self-awareness did moderate the relationship between picture type and state appearance comparison,  $b = -0.46$ , 95% CI [-0.90, -0.03],  $t = -2.14$ ,  $p = .04$ . Conditional effects showed that only at high levels of private self-awareness, exposure to idealized pictures was related with higher state appearance comparison. Figure 8 shows the interaction.

As a conclusion, hypothesis 5 was only partially accepted. The moderating effect of private self-awareness was only true for female participants. More specifically, at high levels of private self-awareness, exposure to idealized pictures lead to more state appearance comparison than non-idealized pictures. Logically, private self-awareness predicted state appearance comparison for female participants,  $b = .456$ , 95% CI [0.24, 0.67],  $t = 4.20$ ,  $p < .01$ . This predictive power disappeared among male participants,  $b = .148$ , 95% CI [-0.18, 0.47],  $t = 0.92$ ,  $p = .36$ . The more women felt they were self-aware about their inner feelings, thoughts, and memories, the more they showed appearance comparison to the people displayed in the Instagram pictures.

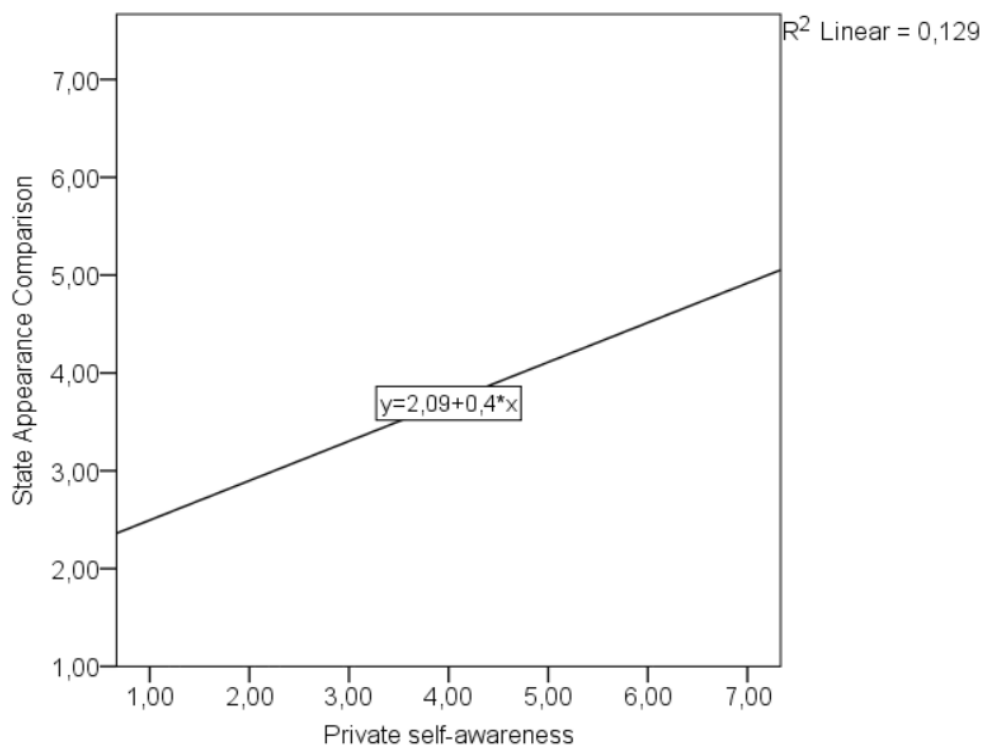


Figure 7. Regression slope of private self-awareness on state appearance comparison.

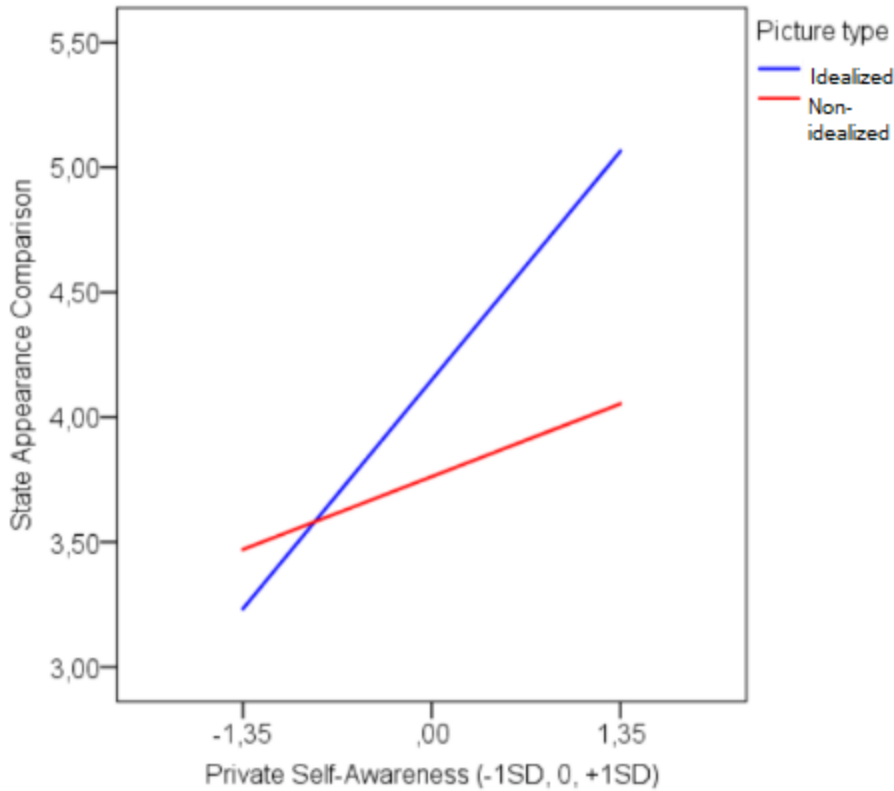


Figure 8. Simple slopes equation of the regression of picture type on state appearance comparison on three levels of private self-awareness.

The sixth and final hypothesis concerned the moderation effect of private self-awareness on the mediating role of state appearance comparison in the relationship between exposure and changes in body dissatisfaction. In other words, it was hypothesized that the whole process of appearance comparison and its influence on body dissatisfaction after exposure to idealized or non-idealized pictures would behave differently for people with different levels of private self-awareness. The prediction was that there would be more state appearance comparison and higher body dissatisfaction for private self-aware participants. The appropriate model is the moderated mediation, or the conditional indirect effect, in Hayes' terms (2012). Hayes' PROCESS macro model 7 was conducted to test this hypothesis. The model took changes in body dissatisfaction as dependent variable Y, state appearance comparison as mediator M, picture type as independent variable X, and private self-awareness as moderator W. Because assumptions were checked for the same variables as before, they will not be discussed again.

Relevant assumptions have been checked before and as a result, 95% confidence intervals will be reported as Hayes' PROCESS only generates this statistic in model 7, instead of the  $p$ -value. Since hypothesis 5 found that private self-awareness predicted state appearance comparison, and table 4 found a positive correlation between the two, multicollinearity was checked using the VIF statistic. This resulted in a score of 1.00, thereby implying present multicollinearity was not present as it stayed well below 10.

The indirect effect of exposure to idealized Instagram pictures on changes in body dissatisfaction via state appearance comparison was not moderated by private self-awareness. This becomes clear after examination of the 95% confidence intervals for low levels,  $b = -0.12$ , 95% CI [-1.98, 0.71], moderate levels,  $b = -0.45$ , 95% CI [-3.39, 1.21], and high levels,  $b = -0.67$ , 95% CI [-1.41, 0.50] of private self-awareness. Because all lower and upper bounds of the confidence intervals cross zero, there are no significant results found in any level of private self-awareness. Figure 8 shows the moderated mediation model. On the basis of this, hypothesis 6 had to be rejected.

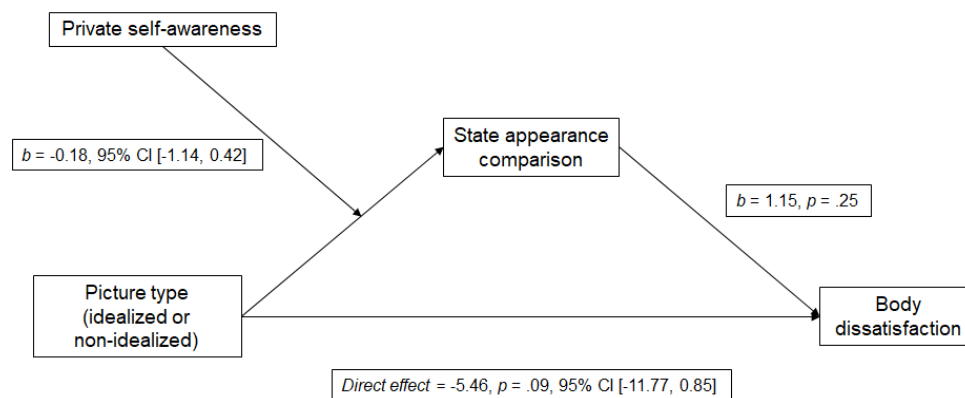


Figure 8. Moderated mediation model.

For men, private self-awareness did not moderate the indirect effect exposure to idealized Instagram pictures on changes in body dissatisfaction via state appearance comparison,  $b = -0.11$ , 95% CI [-5.48, 4.28]. Figure 9 shows the moderated mediation model for men. Likewise results were found for women,  $b = -0.43$ , 95% CI [-1.97, 0.77], as seen in the moderated mediation model in figure 10. Therefore, no gender differences were present.

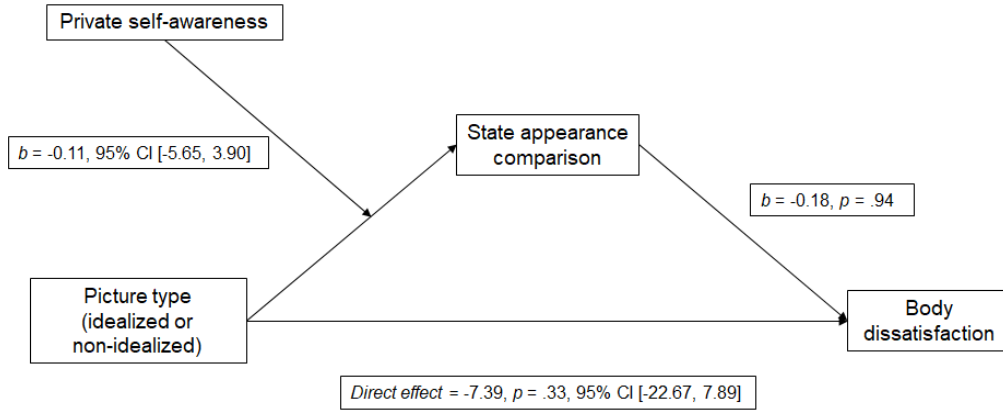


Figure 9. Moderated mediation model for male participants.

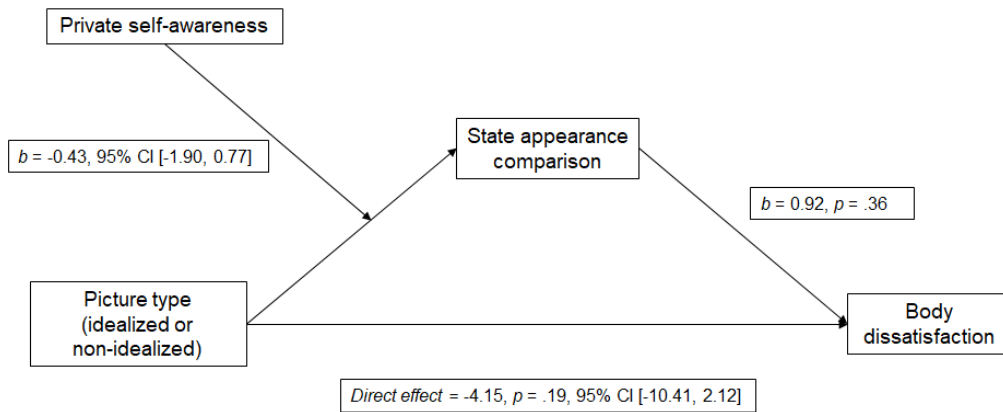


Figure 10. Moderated mediation model for female participants.



### Further exploration of the data

Correlation table 4 unveiled that the main dependent variable, the difference score in body dissatisfaction, did not correlate with any relevant or control variables that could have acted as covariates. However, the body dissatisfaction score after exposure did have significant positive correlations with some variables. More dissatisfaction after exposure to the pictures was related with more feelings of private self-awareness, state appearance comparison, media-internalization, wishful identification, and perceived similarity. This casts some doubts on the accuracy of the difference score of body dissatisfaction. Since the questions after the exposure produced scores that correlated more with relevant variables of this study, it can be argued that these scores were more accurate depictions of body dissatisfaction. Two additional mediation analyses were conducted to investigate possible changes of relations in this study's model.

The first analysis replicated the model of hypothesis 4, as the mediation output provided information on all underlying relationships. Cook's distance ( $M = .01$ ,  $SD = .01$ ) did not raise concern since the maximum value was .08 and thus did not exceed the 1.00 benchmark. The assumption of central leverage value ( $M = .01$ ,  $SD = .01$ ) was met, since the maximum value was .03 and did not exceed 1.00. The assumption of Mahalanobis distance ( $M = 1.99$ ,  $SD = 0.95$ ) was met as well since none of the values did not exceed 15. The standardized residuals contained no scores greater than 3 and the scatterplot resembled a random array, thus also not causing concern. The assumption of collinearity was met, since the VIF value ( $VIF = 1.02$ ) did not exceed 10. Residuals were normally distributed,  $D(143) = .07$ ,  $p = .20$ . Finally, to check for the assumption of independence of errors, the Durbin-Watson test was conducted and resulted in a value of 2.19. This value exceeded 2.00, indicating a slightly negative correlation between adjacent residuals, however not problematic as it is well under 3.00. To conclude, all assumptions were met and the results of the mediation analysis will generalize to the public. The mediation analysis found that this model significantly improved the null model,  $R^2 = 0.059$ ,  $F(2, 141) = 4.40$ ,  $p = .01$ , indicating that about 5.9% of the variance of body dissatisfaction can be explained by the type of picture and the amount of appearance comparison. The data showed that no direct ( $b = -1.66$ ,  $SE = 4.12$ ,  $p = .69$ ) nor indirect ( $b = -1.43$ ,  $SE = 1.17$ , 95% CI [-4.11, 0.48]) effects were present. However, state appearance comparison did significantly predict body dissatisfaction after exposure,  $b = 3.69$ ,  $SE = 1.29$ ,  $p = .01$ .

Investigating the moderating role of private self-awareness in the total alternative model with body dissatisfaction after exposure as the new dependent variable did not yield new insights. Private self-awareness did not moderate the indirect effect of picture type on body dissatisfaction after exposure via appearance comparison. This becomes clear after

examination of the 95% confidence intervals for low levels,  $b = -0.12$ , 95% CI [-1.66, 1.15], moderate levels,  $b = -0.44$ , 95% CI [-2.03, 0.56], and high levels,  $b = -0.67$ , 95% CI [-2.96, 0.87] of private self-awareness. This could possibly be due to the fact that there was no indirect effect present at all.

It was further analyzed whether the control variables would act as covariates in the alternative model. Correlation table 4 showed that all control variables except physical attraction correlated positively with body dissatisfaction. Given the fact that the only statistically significant relationship in the alternative model was the predictive power of appearance comparison on body dissatisfaction after exposure, a hierarchical multiple regression analysis was conducted with all relevant control variables in block 1 and appearance comparison in block 2. All relevant assumptions described above, were met. The analysis found that body dissatisfaction scores after exposure only increased for participants with large discrepancies between their current and preferred body sizes,  $b = 7.80$ ,  $\beta = 0.304$ ,  $t(137) = 3.59$ ,  $p < .01$ . All other control variables did not act as covariates.

A notable descriptive statistic from table 2 was that the people in the photos were graded as more attractive when they had an ideal body, as opposed to the non-ideal body group. This difference was significant,  $Mdif = 1.80$ ,  $t(142) = 7.83$ ,  $p < .01$ . Attractiveness scores did not differ for men and women. An independent samples  $t$ -test pointed out that males with ideal bodies ( $M = 4.05$ ,  $SD = 1.11$ ) were found to be more physically attractive than males without ideal bodies ( $M = 2.57$ ,  $SD = 1.21$ ). This difference was significant ( $Mdif = 1.49$ ,  $t(41) = 4.16$ ,  $p < .01$ ) and represented a large-sized effect, Cohen's  $d = 1.54$ . Comparable results were found for women's ideal bodies ( $M = 5.31$ ,  $SD = 1.21$ ), which were found to be more physically attractive than women without ideal bodies ( $M = 3.47$ ,  $SD = 1.48$ ). This difference was significant as well ( $Mdif = 1.84$ ,  $t(99) = 6.86$ ,  $p < .01$ ) and represented a large-sized effect, Cohen's  $d = 1.36$ .

## Conclusion

### Discussion

In this study, the influence of idealized Instagram pictures on changes in body dissatisfaction was investigated. It was predicted that body dissatisfaction would increase as a result of the exposure to idealized pictures. Furthermore, it was predicted that this relationship was mediated by appearance comparison. Private self-awareness was hypothesized to moderate the relationship between the exposure to these pictures and appearance comparison, as well as the whole model leading to increases in body dissatisfaction.

The first hypothesis stated that exposure to idealized Instagram pictures would lead to more body dissatisfaction than exposure to non-idealized Instagram pictures. This study found no support for this hypothesis. Body dissatisfaction scores from participants who saw idealized bodies showed close to no change, whereas those who saw non-idealized bodies felt more satisfied with their bodies. This difference was however not significant. There were no gender differences. These results are inconsistent with Brown and Tiggemann (2016)'s research, who did find a clear relationship between the exposure to appealing Instagram pictures and body dissatisfaction. The pictures were however stripped off of all Instagram characteristics, resulting in an exposure to "just" a picture. In the present study it was clear that the stimuli were drawn off Instagram. As photo editing practices become more ubiquitous on a visual based platform like Instagram (Vendemia & DeAndrea, 2018), participants of the current study may have been reluctant of the perceived reality of the idealized pictures, possibly resulting in no changes in body dissatisfaction.

Hypothesis 2 stated that more state appearance comparison would be present for participants exposed to idealized versus non-idealized Instagram pictures. This hypothesis had to be rejected. Also, no gender differences were present. Results indicated that some appearance comparison was always present, however no main effect of specific type of picture nor private self-awareness was found. Research by Lup et al. (2015) found similar results only for people with high levels of strangers followed on Instagram. Their results suggest that social comparison as a result of Instagram use only exists when one's followers are known. Applying this line of thought to the present study, where the chance was low that the participants knew the people on the pictures, this can explain why no differences in state appearance comparison were found.

The third hypothesis stated that more state appearance comparison would lead to more body dissatisfaction and vice versa. The results found that body dissatisfaction was not

predicted by state appearance comparison. This contrasted the findings of Fardouly et al. (2018), who found general appearance comparison to be related with more body dissatisfaction. However, target group analysis found that strangers were close to the lowest source of influence for appearance comparison. The people on the present study's photos were likely to be strangers to the participants, which could explain the absence of predictive power of state appearance comparison on body dissatisfaction. In addition, contrary to Fox and Vendemia (2016)'s predictions on gender differences, males' body dissatisfaction was not predicted by state appearance comparison either.

Hypothesis 4 suggested that the relationship between the exposure to idealized Instagram pictures and body dissatisfaction would be mediated by state appearance comparison. However previous hypotheses were rejected, this mediation hypothesis was still performed to make the analyses more comprehensive and to unveil gender differences. The present study found no mediating role of state appearance comparison for neither the general population nor for males or females. This was to be expected, given the absence of significant relationships between the variables as seen in previous hypotheses.

Hypothesis 5 stated that private self-awareness positively influences the relationship between exposure to idealized Instagram pictures and state appearance comparison. For females only, exposure to idealized Instagram pictures was related to more state appearance comparison at high levels of private self-awareness. This new finding implies that women compare their appearance to others more strongly when they are aware of perceptions about themselves. This is in line with Cash (1998), who stated that comparisons tend to be more appearance-focused among women than among men. Gonzales and Hancock (2011) already showed that looking at one's own Facebook page can act as an objective self-awareness prime, and that it is capable of enhancing self-esteem. The current study adds that, besides finding a new prime to enhance the self-awareness state using Instagram, which will be elaborated upon later on, females are more affected by the self-awareness state in the context of appearance comparison than males. The predictive power of private self-awareness persisted when gender was ignored. Focusing one's attention toward oneself and the body lead to more state appearance comparison for the general sample, regardless of the picture type. This finding complements Duval and Wicklund's argumentation that the overarching concept of objective self-awareness can activate discrepancies between oneself and social standards (1972). Participants in the private self-aware conditions could have prompted ideas on differences between their own body and those of people showed to them. These ideas seemed to be active

regardless of the picture type, given that private self-awareness did not act as a moderator in the relationship between picture type and appearance comparison.

Lastly, private self-awareness was added to the mediation model in hypothesis 6. It was expected that private self-awareness would moderate the direct and indirect effects of exposure to idealized Instagram pictures on body dissatisfaction, with more state appearance comparison and higher body dissatisfaction for private self-aware participants. Since the addition of private self-awareness to the present model was new, this hypothesis was relatively exploratory. Unfortunately, body dissatisfaction could not have been explained differently by state appearance comparison when comparing different levels of private self-aware participants, neither for the general sample, nor for males or females.

The manipulation check of private self-awareness in this study showed a large-sized effect between the high and low private self-awareness conditions. The newly proposed manipulation was capable of evoking private self-awareness. This finding thus complements studies that used a mirror (e.g., Carver & Scheier, 1981; Duval & Wicklund, 1973; Fejfar & Hoyle, 2000) to evoke private self-awareness. In a SNS context, Gonzales and Hancock (2011) tested whether looking at one's Facebook page was a way of evoking objective self-awareness, a conceptually similar concept. Despite only assuming instead of testing the manipulation, they found that looking at Facebook enhanced self-esteem. The present study's manipulation resembled the situation where the participant was uploading a picture to Instagram, meaning that selective self-presentation was active. Carefully selecting a picture and adding a caption to it implies paying attention to what aspects of the self should be emphasized. This study has thus shown that the process of selecting a picture to upload on Instagram and adding a caption is a new method of evoking private self-awareness.

A recent trend in society is the body positive movement. This movement entails opposing oneself against the current body ideals, proudly showing that not living up to this ideal can be a beauty of itself. Support for this movement can be found on Instagram (e.g., Cwynar-Horta, 2016), where #bodypositivity generates 3,939,000 search results. Such posts "intend to increase the visibility and normalisation of otherwise underrepresented bodies in traditional media" (Cohen, Irwin, Newton-John, & Slater, 2019, p. 48). Because this movement has continued to thrive in the last decade, negative affect as a result of watching ideal bodies may have decreased. The current sample might have consisted of a significant amount of people supporting this movement, who objected to adhere to the thin or muscular ideal body and thus felt less affected by exposure to those images. Consequently, this movement and its support in

advertisement (Luck, 2016) may mark a turning point in what constitutes an ideal body, and why one should live up to that ideal in the first place.

Correlation table 4 showed that while the difference score of body dissatisfaction failed to show correlations with variables relevant for the hypotheses, the body dissatisfaction after exposure did show some correlations. The decision to measure body dissatisfaction as a difference score was made because it would generate a change overtime, with exposure to the Instagram pictures as the only event happening in between. That way, conclusions based on the change in body dissatisfaction could have been made on the basis of the manipulation. However, the difference score showed no correlation with relevant variables. A possible explanation for this might be found in the formulation of the VAS questions. Tiggemann and McGill (2004) stated that the wide range of answers created improved sensitivity to small changes, however these were not found in the present study. Because standard deviations were considered high, suspicion was raised that the wide range of answers failed to accurately portray a generalizable representation of the sample's collective body dissatisfaction. More specifically, a rating of moderate body dissatisfaction for one participant may have resulted in a score that differed too much from the same rating of body dissatisfaction for another participant. It is therefore recommended to use smaller scales in future research.

This study used Thompson et al. (1999)'s Tripartite Influence Model as the theoretical background of body dissatisfaction. This model describes three key influences of body dissatisfaction. Additionally, appearance comparison and media-internalization are argued to mediate the relationship between these influences and body dissatisfaction. The current study focused only on the influence of media. While several studies found support for the mediating role of appearance comparison and media-internalization (e.g., Cho & Lee, 2013; Fatt et al., 2019; Keery et al., 2004; Menzel et al., 2011; Rodgers et al., 2015; Van den Berg et al., 2002), this study failed to replicate these findings. Possible explanations are related to the measurement of body dissatisfaction as described above. This study did however find a strong positive correlation between appearance comparison and media-internalization, which was in line with the Tripartite Influence Model.

Finally, further exploration of the data found that the people displayed in ideal conditions were graded as more physically attractive than those in the non-ideal conditions. Therefore, the relationships between picture type, appearance comparison and body dissatisfaction might have been confounded by physical attractiveness. Since the original pictures of the Instagram accounts have been kept intact, posters' faces were visible to the participants in all except for one of the stimuli's pictures (see Appendix B). This enabled the participants to base their

physical attractiveness toward the stimuli and the appearance comparison on more than just the bodies of the displayed persons. This finding raises the question whether or not attention should be put on the conceptual difference between ideal and attractive figures in body dissatisfaction research. While Hildebrandt and Walker (2006) found these concepts to be different, it might be true that they still yield similar outcomes concerning body dissatisfaction.

This study sought to answer the following research question: How do state appearance comparison and private self-awareness influence body dissatisfaction? This study attempted to unveil a change in body dissatisfaction as a result of the exposure to idealized versus non-idealized Instagram pictures. There was however no effect of picture type in the change of body dissatisfaction. Appearance comparison had no explaining role in this. However, it was found that private self-aware women showed more appearance comparison to idealized pictures than women low on private self-awareness.

### Limitations and further research

One important implication of this study concerned the measurements taken to enhance ecological isomorphism yielded some limitations regarding the generalizability of results. Because the setup of this study was an online survey, making sure participants focused on the bodies of the people in the pictures was a challenge. The measures taken to make sure participants paid attention to the pictures were threefold. First, participants were textually instructed about this both in the information letter and right before the exposure. Second, a timer only enabled continuation of the survey after the participants spent 7 seconds on the page where the pictures were shown. Third, in selecting the stimuli it was made sure that the body was the primary object of attention in the picture (i.e., it was avoided that the body was surrounded by numerous other appealing objects). Although these measures were deemed sufficient in the current research, it was no strict control mechanism and this threatened this study's internal validity. Future research could replicate this study in a lab, using eye-tracking to analyse what specific (body) parts were focused on the most. Evidence from eye-tracking studies in an advertising context saw that models' face, the lower torso, and breasts received the most attention (Crossley, Cornelissen, & Tovée, 2012; Ju & Johnson, 2010). Additionally, in comparing thin and curvy models, Mañas-Viniegra, Veloso, and Cuesta (2019) found that more attention was put on accessories when they were worn by curvy models as opposed to thin models. This implies that the use of curvy models changes the object of attention away from the body itself, giving more opportunity to direct consumers' attention to the advertised product. This

points toward a possibility that participants in the current study paid more attention to the body when it was thin (or muscled, for males), than when it was more curved, where more attention might have been put on other attributes like the amount of likes, comments, or geolocation.

Second, the spread of body dissatisfaction scores was considered high. A possible cause of this can be the formulation of the VAS items measuring body dissatisfaction. The items were negatively stated on purpose, since reverse coding questions on body satisfaction might have resulted in inaccurate results. The negation was made clear to the participants by underlining the meanings of the two most extreme scores above them. However, this might not have been conveyed well enough, as illustrated by one participant, who noted that she had mistaken the dissatisfaction scale for a satisfaction scale. An investigation of outliers saw that body dissatisfaction scores from several participants dropped severely, one starting at a dissatisfaction average of 91.3 before exposure and ending with 1.00. In total, body dissatisfaction scores of 7 participants changed with more than 50 points. While it could be possible that participants' evaluations of the body changed dramatically as a result of the exposure to the pictures, some suspicion is raised that these participants may have mixed up the extreme ends of the VAS items in the course of the study. Future research may put more emphasis on the negation in scales measuring body dissatisfaction, or even so measure body satisfaction and reverse code the answers.

Third, the online survey setup of this study endangered monitoring of the manipulation of private self-awareness as well. It was not possible to make sure participants saw a picture of themselves which displayed most body parts uncovered, given the participants' privacy. Using a lab experiment to replicate the current study could take away this threat to internal validity. Participants can be asked to bring a vacation photo with them, so that the researcher can make sure that participants in the private self-aware conditions actually see a photo of their own bodies. In the current study, it was not possible to check if this was the case due to privacy reasons. In order to make sure private self-awareness was even more evoked, a second task was given, namely the task of writing an autobiographical caption. The manipulation check was significant, indicating that these participants actually felt more private self-aware than those in the other conditions.

Fourth, the lack of attention to cultural differences regarding the current sample's conceptualization of ideal bodies threatened external validity. As noted, what constitutes an ideal body differs per culture (Garner et al., 1980; Vartanian et al., 2001) and changes overtime (Morris et al., 1989). This study's stimuli consisted of ideal bodies as seen from a Western



perspective. The participants were not asked for their cultural background, making it impossible to explain whether the lack of support for the hypotheses was due to a misalignment of culture. Future research could focus on one culture in its target group, or base the decision of what ideal stimuli looks like on the participants' culture.

Finally, the present research did not take general appearance comparison tendency into account. As Cash (1983) stated, the amount of appearance comparison at a given moment can rely on personality traits. Some people may have more tendency to compare themselves or their appearance to others than others. Whereas this study did ask for the appearance-related comparison at the given moment, future research may take general appearance comparison tendency into account to investigate possible distinct outcomes.

### Implications

This study has some theoretical implications for research on private self-awareness. The addition of private self-awareness to a SNS context is a relatively unexplored topic. This study found that having to post an Instagram picture including a caption is a way of evoking private self-awareness. Being in a state of private self-awareness can direct the focus of attention toward an individual's thoughts and reflections that deal solely with the self (Fenigstein et al., 1975). This study found the state to predict appearance comparison when exposed to idealized Instagram pictures among women. This implies that the focus on an individual's body bolsters appearance-related comparisons when exposed to idealized bodies.

This study has practical implications as well. As the concept of self-awareness is often used in psychoanalysis and clinical psychology, this research may provide insight into how the state of private self-awareness can be evoked in a SNS context. As Instagram is used intensively by young people, using this new method on young patients who are familiar with Instagram might feel more comfortable than conventional methods, like placing a mirror in front of them.

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## Appendices

### Appendix A: Outline of the survey

#### Demographics

- Gender. Male/Female/Don't want to say
- Age.
- Do you have Instagram? Yes/No
- If so, how actively do you use Instagram? Once every month/two weeks/week/day
- On your mobile phone, do you have pictures that contain your body? Preferably one that contains as much uncovered parts as possible. Yes/No
- Prior Body Dissatisfaction questions (VAS).

Qualtrics now randomly classifies participants to either one of the four conditions as described below.

- 1: Private self-awareness and idealized pictures
- 2: Private self-awareness and non-idealized pictures
- 3: No private self-awareness and idealized pictures
- 4: No private self-awareness and non-idealized pictures

#### Private self-awareness condition: task

Imagine yourself planning to post an Instagram picture. You scroll through your pictures first to decide which one you are going to upload. For this task, you're not actually going to post a picture, but we want you to think of a picture where your full body (or most parts of it) are uncovered.

First, read through these instructions and then follow them.

Minimize this survey, go to your photos application and scroll through your pictures. Choose a picture you find suiting for Instagram. This picture should contain your full body, from head to toe, and preferably one where most parts of your body are uncovered. If you do not have one of these, choose one that contains most parts of your body.

Pay close attention to this picture by looking at it for some time.

After this, return to this survey.

Were you able to find a picture of yourself with as most uncovered parts as possible?  
Yes/No

#### Exposure to Instagram pictures

**Manipulation check**

Situational Self-Awareness Scale (Govern & Marsch, 2001)

- 1) Right now, I am conscious of my inner feelings.
- 2) Right now, I am reflective about my life.
- 3) Right now, I am aware of my innermost thoughts.
- 4) Right now, I am self-conscious about the way I look.

Strongly disagree

Somewhat disagree

Disagree

Neither disagree nor agree

Agree

Somewhat agree

Strongly agree

**State Appearance Comparison**

State Appearance Comparison Scale (Tiggemann & McGill, 2004)

1) Please indicate to what extent you thought about your appearance when viewing the Instagram posts.

1 = no thought about my appearance, 7 = a lot of thought; slider from 1 to 7.

2) Please indicate to what extent you compared your overall appearance with those of the people you saw in the Instagram posts.

3) Please indicate to what extent you compared specific body parts with those of the people you saw in the Instagram posts.

1 = no comparison, 7 = a lot of comparison; slider from 1 to 7.

**Body Dissatisfaction**

Visual Analogue Scale (Heinberg & Thompson, 1995)

Please answer the following questions.

1. Right now, how do you feel about your overall appearance?
2. Right now, how do you feel about your weight?
3. Right now, how do you feel about your body shape?

0-100 scale. 0 = very dissatisfied. 100 = very satisfied.

**Media-internalization questions**

Internalization subscale of the Sociocultural Attributes Towards Appearance Questionnaire (Thompson et al., 2004).



1. I would like my body to look like the people who are on TV.
  2. I compare my body to the bodies of movie stars.
  3. I would like my body to look like the models who appear on social media.
  4. I compare my appearance to the appearance of movie stars.
  5. I would like my body to look like the people who are in the movies.
  6. I compare my body to the bodies of people who appear on social media.
  7. I wish I looked like the models in music videos.
  8. I compare my appearance to the appearance of people on social media.
  9. I try to look like the people on TV.
- (1 = definitely disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = definitely agree)

**Control variables:**

**(1) Physical attraction** (McCroskey & McCain, 1974)

Please answer the following statements on the physical attraction of the people in the photos. 1 = strongly disagree. 7 = strongly agree. (7-point Likert-type scale).

- The people in the photos were good looking.  
 I think the people in the photos were quite handsome.  
 I think the people in the photos were very sexy looking.  
 I found the people in the photo very physically attractive.  
 I like the way the people in the photos looked.

**(2) Wishful Identification** (Hoffner & Buchanan, 2005)

Please answer the following statement on identification with the people in the photos. (5-point Likert scale).

- These people are the sort of people I want to be like myself.  
 Sometimes I wish I could be more like the people on the pictures.  
 These people are people I would like to emulate\*.  
 I'd like to do the kind of things the people in the photos do.  
 I would NEVER want to act the way those people do.

\* "to emulate" in Dutch means: *kopiëren, imiteren, nabootsen, nadoen*.

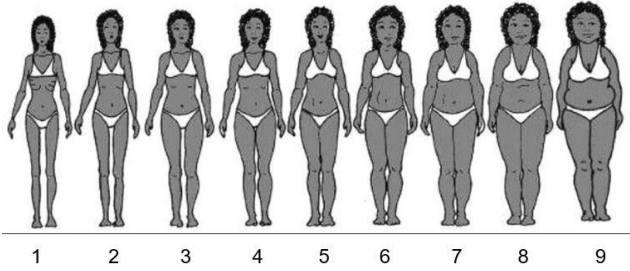
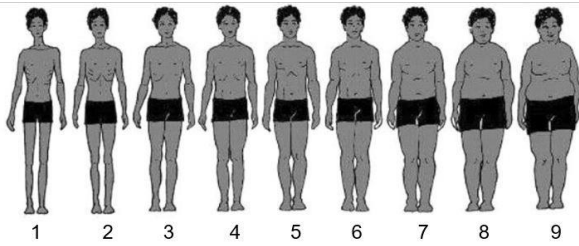
**(3) Similarity** (Hoffner & Buchanan, 2005)

Please answer the following questions on the similarity to the persons on the photos. (1 = not much, 7 = a lot; semantic differential items)

- How much do these people think like me?  
 How much do these people behave like me?  
 How much do these people like me?

**(4) Body size**

Please look at these body sizes and indicate below what body size matches your body size the best.



Please indicate what number...  
Represents my **current** body the best  
Represents my **preferred** body the best

**Debrief**

Appendix B: Stimuli

**Female non-ideal pictures**

# IDEALIZED INSTAGRAM PICTURES AND BODY DISSATISFACTION

Instagram post carousel with two images of women in black bikinis.

**1.023 vind-ik-leuks**  
I post a baiting suit picture like once a year. -...meer  
Alle 39 reacties bekijken  
27 maart 2018 · Vertaling weergeven

**16 vind-ik-leuks**  
Bikini #bodyappriacion  
coksafico Savrsenaaa malaa ♡♡♡♡♡  
keylathaspam We have the same bikini  
7 mei 2016

Instagram post of a woman in a patterned bikini on a beach.

**348 vind-ik-leuks**  
Perfeita aos olhos DELE  
Feliz pela oportunitades...meer  
Alle 11 reacties bekijken  
adriana.paz.39 ♡  
memeiabraga 🍋🍋🍋  
1 dag geleden · Vertaling weergeven

Female ideal pictures



• Volgen



24 vind-ik-leuks

#девушки #красавицы #красотка #фитоняша #спорт #здоровье #красота...meer

Alle 3 reacties bekijken

palmpc.frm HELLO! BEAUTIFUL LADY! WE WANT TO COLLABORATE WITH YOU! PLS SEND US A DM. ❤️❤️

sochilaser 😍

23 oktober • Vertaling weergeven



• Volgen



29 vind-ik-leuks

It's always summer in some parts of the world. 🌤️...meer

theseantan ❤️

23 oktober • Vertaling weergeven



Male non-ideal pictures

Instagram post interface showing two side-by-side images of men. The left image shows a man with chest hair, and the right image shows a man in swim trunks in the ocean. Each image has a caption and a list of comments.


**Post 1 (Left):**


- Profile: [Redacted] • Volgen
- Image: A man with chest hair, looking directly at the camera.
- Interactions: 426 vind-ik-leuks
- Caption: Olha o @cub\_raffa #EDF #Cub #Urso #Bear #Beard #Barba...meer
- Comments: johnatan\_jpa 🥰🥰🥰🥰🐻, eduardoserena 🥰
- Time: 3 dagen geleden • Vertaling weergeven

**Post 2 (Right):**

- Profile: [Redacted] • Volgen
- Image: A man in dark swim trunks standing in the ocean waves.
- Interactions: 236 vind-ik-leuks
- Caption: Que o mar leve o necessário e me traga o suficiente... 🌊☀️...meer
- Comments: nicholasesdras Affff 🥰, halley.menezes 🥰🥰🥰🥰
- Time: 27 oktober • Vertaling weergeven



 **Volgen**  
Lagos, Portugal





♡ 💬 🗑️

**126 vind-ik-leuks**

**Volgen** de olho na minha próxima aventura. não existe olhar pra trás, nem olhar pro lado, pq...meer

Alle 8 reacties bekijken

**understand Magrah** 

**eeliylehto** Cool photo! 

8 september · Vertaling weergeven

Male ideal pictures

The image displays three Instagram posts side-by-side, each featuring a different idealized male physique. The first post on the left shows a man with dark, curly hair and a beard, shirtless, wrapped in a white towel, standing in a bathroom. The middle post shows a man in a dark blue martial arts gi, shirtless, in a dynamic pose with one leg raised, set against a dark background. The third post on the right shows a man with long hair, shirtless, wearing blue shorts, standing on a surfboard in the ocean. Each post includes a profile picture, a 'Volgen' button, and engagement icons (heart, comment, share). The first post has 123 likes and a caption about living in the moment. The second post has 456 likes and a caption about wind. The third post has 13 likes and a caption about paddleboarding.

**Post 1:** 123 vind-ik-leuks  
"No point in holding onto what's broken, so let's live in the moment. When on...meer  
Alle 13 reacties bekijken  
gymlovers\_25 Checkout DM 📩📩📩  
@ajay\_sharma\_0 🙌  
ajay\_sharma\_0 @gymlovers\_25 thanks  
23 oktober · Vertaling weergeven

**Post 2:** 456 vind-ik-leuks  
"Most people never run far enough on their first wind to find out they've got a se...meer  
Alle 43 reacties bekijken

**Post 3:** 13 vind-ik-leuks  
urges you to paddle with him...meer  
13 uur geleden · Vertaling weergeven