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Department of General Psychology

Ph.D. course in Psychological Sciences

Cycle XXXVI

Body Image in the Social Media era:

Analysis of the associations between photo-based behaviors and content available on social media and symptoms of Body Dysmorphic Disorder and Muscle Dysmorphic Disorder

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All humans wear many masks—to adapt to society, to protect their true selves.

But they've stopped knowing the difference between the true face and the mask. They began to confuse the two for each other.

And so, they started looking for themselves… Ironic, isn't it? Masks trick even the wearer.

Jun - Persona 2: Innocent Sin

Acknowledgments

There are several people I must mention in achieving this important milestone.

First, I want/must express my gratitude to the person who brought me to the path of body image studies, Dr. Silvia Cerea. Her guidance allowed me to improve as a researcher and as a professional. I'd like to consider her my co-co-supervisor and first mentor. Similarly, I'm grateful for the opportunity to grow that Professor Marta Ghisi and Professor Andrea Spoto granted me throughout the years.

I'm thankful for my colleagues (Nicole, Bianca, Alberto, Federica, Erika, Sophie, Tong, Rachele, Chiara, Silvia, Federica, Jiewen, Matilde, Qiuran, Anna, Tania, and many others). It was a pleasure to face Ph.D. life together, as well as to share research knowledge with each other. I wish the best for them.

I would like to mention the Physical Appearance Research Team at the University of Melbourne, led by Dr. Scott Griffiths, and the amazing people I met there. Moreover, many thanks to Dr. Helena Vall-Roqué who collaborated with me during the conduction of the study presented in Chapter 6.

Finally, I want to thank my family. Thank you very much.

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Introduction

Body image is a mental representation constituted by thoughts, perceptions, emotions, and behaviors related to the body and physical appearance (Cash & Pruzinsky, 1990; Grogan, 2006). It could be divided in negative and positive body image, which are not mere opposites and are characterized by specific components (Tylka & Wood-Barcalow, 2015a). Components and characteristics of negative body image are body dissatisfaction (Cash & Szymanski, 1995; Grogan, 2008; Stice & Shaw, 2002), body distortion (Gardner, 2012), body checking behaviors, and body avoidance behaviors (Walker & Murray, 2012). Negative body image is a core feature of Body Image Disorders (BIDs), which include Body Dysmorphic Disorder (BDD) and Muscle Dysmorphic Disorder (MDD) (Cerea, Ghisi, et al., 2021; Cororve & Gleaves, 2001; Gonzales & Blashill, 2021; Phillipou et al., 2018). The former is a psychological disorder included in the category "Obsessive Compulsive and Related Disorders" of the 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders – Text Revision* (DSM-5-TR; American Psychiatric Association [APA], 2022). Indeed, BDD is characterized by excessive preoccupations with perceived flaws in the physical appearance, that appears as intrusive and obsessive. Individuals with BDD usually cope with these preoccupations engaging in compulsive behaviors (e.g., mirror checking, skin picking), avoidance behaviors (e.g., avoidance of social situations), and mental acts (e.g., appearance comparisons; APA, 2022). Moreover, people with BDD are characterized by interest in cosmetic surgery and aesthetic medicine (Crerand et al., 2005). As for MDD, a specifier of BDD, its phenomenology is characterized by preoccupation with body build, perceived as too much small or insufficiently muscular, compulsive behaviors (e.g., monitoring of one's appearance), mental acts (e.g., appearance comparison), dysfunctional eating habits (e.g., "cutting" and "bulking" phases), and exercise addiction (APA, 2022; Martenstyn et al., 2023; Pope et al., 1997).

Among several components, positive body image is defined by body appreciation, which refers to love and appreciation toward the body (Linardon et al., 2022; Tylka & Wood-Barcalow,

2015a), and body functionality appreciation, which refers to appreciation for everything the body is capable of doing (Alleva et al., 2017; Alleva & Tylka, 2021). Positive body image has been described as a protective factor (Tylka & Wood-Barcalow, 2015a), enabling to deal with the dysfunctional effect of negative body image (Alleva & Tylka, 2021; Guest et al., 2019; Linardon, 2021).

Scholars approached the study of body image in relation to social media, given the highly visual nature of some platforms, defined as appearance-focused or image-centric (Griffiths, Murray, et al., 2018). Moreover, they identified specific aspects of social media use that relate to body image, that comprehend appearance-focused social media use: photo-based behaviors and social media content. Photo-based behaviors includes attitudes and behaviors related to the production of self-photos (Lonergan et al., 2020). Two of particular relevance are photo investment, which refers to concerns and preoccupations occurring during the process of generating and sharing a self-photo, and photo manipulation, which refers to behaviors related to the modification of a self-photo before sharing it online (McLean et al., 2015). Social media content includes different types of images, widespread online, that typically include a portrayal of a person, such as beauty-related content (Seekis & Barker, 2022), body positive content (Cohen, Irwin, et al., 2019; Hallward et al., 2023; Harriger et al., 2023; Lazuka et al., 2020), and body neutrality content (Hallward et al., 2023). Scholars described associations between photo-based behaviors (e.g., Lonegan et al., 2019) and social media content (e.g., Nelson et al., 2022; Seekis & Barker, 2022) and body image dimensions. In particular, they mostly found positive associations between photo-based behaviors and body dissatisfaction (e.g., Lonegan et al., 2019; McLean et al., 2015; Modica, 2020) and the putative protective role of positive body image (e.g., Duan et al., 2022; Wang et al., 2019); however, not all the studies confirmed these associations (McGovern et al., 2022). On the other hand, social media content demonstrated associations with body image dimensions that vary according to the type of content examined: for example, beauty content demonstrated a positive association with dysmorphic concerns (Seekis & Barker, 2022), while body positive content demonstrates a positive association

with body appreciation (e.g., Stevens & Griffiths, 2020). Regardless, some mixed findings were also highlighted (e.g., Stevens & Griffiths, 2020; Vendemia et al., 2021).

Given the lack of studies addressing the relation involving BDD and MDD symptoms and appearance-focused social media content, as well as the protective role of positive body image, the present Ph.D. thesis aimed to address several objectives:

1. To explore the associations between photo-based behaviors, BDD and MDD symptoms and associated constructs (i.e., interests in cosmetic surgery and exercise addiction) and the protective role of positive body image (i.e., body appreciation and body functionality appreciation).
2. To address the role of beauty- and body positive-related content in putatively predicting BDD symptoms and positive body image (i.e., body appreciation and body functionality appreciation), considering the mediation of appearance comparison and internalization of general attractiveness.
3. To examine how TikTok creators ascribe meaning to body and appearance in #bodyneutrality content and to suggest the possible utility for BDD and MDD symptoms.

Structure of the thesis

In Chapter 1 and Chapter 2, the thesis will provide a theoretical background. Both Chapters will include definitions of the relevant constructs addressed in the thesis. Both body image and social media dimensions are presented, as well as the theoretical models that enable to describe their relation: The Tripartite Influence Model (Thompson et al., 1999), the uses and gratification theory (Katz et al., 1973; Rodgers, 2016), and Goffman's dramaturgical model (Goffman, 1959; Hogan, 2010). Then, in Chapter 3, an overview of the objectives pursued in the present thesis will be presented.

From Chapter 4 to Chapter 7, the studies conducted will be presented. In Chapter 4 and Chapter 5, the relations involving BDD and MDD symptoms, photo-based behaviors, and associated constructs will be discussed. Moreover, the protective role of body appreciation and body functionality appreciation will be examined. In Chapter 6, the associations between negative (i.e., BDD symptoms) and positive (i.e., body and body functionality appreciation) and beauty- and body positive-related accounts and content will be presented, considering the putative mediation role of appearance comparison and internalization of general attractiveness. In Chapter 7, findings concerning a thematic analysis of #bodyneutrality TikTok videos will be provided, alongside a discussion of the main implications for BDD and MDD symptoms.

In the section named "General Discussion and Conclusions", a comprehensive discussion of all the findings related to body image dimensions and social media will be provided, leading to possible practical implications, limitations of the presented studies, and future directions.

In conclusion, the Appendix will provide information on the Italian validation of the Photo Investment Scale, which was employed during the conduction of the studies presented in Chapter 4 and Chapter 5.

1. Chapter 1 - Body Image: a complex psychological construct

Body image is a complex psychological construct broadly defined as a mental representation comprising thoughts, perceptions, emotions, and behaviors related to the body and to the physical appearance (Cash & Pruzinsky, 1990; Grogan, 2006). It has been distinguished in negative and positive body image, considered as independent constructs, that do not represent two opposite sides within the same continuum (Tylka & Wood-Barcalow, 2015a). Accordingly, they are characterized by specific components, later discussed in the following sections.

1.1.Negative body image: definition and role in Body Image Disorders

Negative body image has been extensively studied in the past years. It is characterized by several components, such as body dissatisfaction, body distortion, body checking behaviors, and body avoidance behaviors. Among these components, body dissatisfaction has received the most attention, and it has been often utilized to assess negative body image overall. It entails a negative evaluation of physical appearance, derived from a perceived discrepancy between the "real" physical appearance and the ideal one (Cash & Szymanski, 1995; Grogan, 2008; Stice & Shaw, 2002). Body distortion involves the perceptual domain and could be described as an inaccurate and dysfunctional way in which the body is estimated (Gardner, 2012). Within the behavioral domain, body checking is described as a frequent evaluation of one's own body to gain information and monitor physical appearance. Examples of body checking behaviors include monitoring the weight through the use of scales, controlling one's own physical appearance in a mirror, and asking others for constant reassurance about the appearance, weight, and size of the body (Walker & Murray, 2012). Opposite to body checking, body avoidance behaviors involve attempts to actively avoid information related to the body and situations in which individuals could expose their bodies to themselves or to other people. Examples of body avoidance behaviors include avoiding looking at one's own appearance through mirrors or reflective surfaces, avoiding to undress in front of other people (e.g., at the beach), or wearing loose-fitting clothes (Walker & Murray, 2012).

Concerning body dissatisfaction, some scholars initially suggested the presence of a "normative discontent" among women, who were more dissatisfied with their bodies than men (Rodin et al., 1984). Later, scholars discussed that normative discontent could be a phenomenon also spread among men (Tantleff-Dunn et al., 2011) and highlighted that gender differences in body dissatisfaction could be related to different sources of dissatisfaction (Furnham et al., 2002). In fact, more women than men are dissatisfied with their weight, while, on the opposite, men seem to be more concerned about their muscularity than women (Karazsia et al., 2017). Moreover, body dissatisfaction seems to be involved in well-being. Well-being encompasses various aspects of physical, mental, and emotional health, including life satisfaction, positive emotions, and psychological functioning (Diener, 2000). Several scholars underscored the negative influence of body dissatisfaction in this broad psychological construct. For example, they found an association with depression symptoms (Griffiths et al., 2016; Sharpe et al., 2018), anxiety symptoms (Barnes et al., 2020; Griffiths et al., 2016; Pritchard et al., 2021), and poor health-related quality of life (Griffiths et al., 2016; Mond et al., 2013). Accordingly, body dissatisfaction could be considered a relevant element to address for the population's well-being.

Several scholars reported that negative body image could be the core component of several psychological disorders, called BIDs, namely Anorexia Nervosa (AN) and Bulimia Nervosa (BN; two eating disorders [EDs]), BDD, and MDD (Cerea, Ghisi, et al., 2021; Cororve & Gleaves, 2001; Gonzales & Blashill, 2021; Phillipou et al., 2018). Despite differing in the main areas of concern (e.g., Toh et al., 2020), individuals with these psychological disorders demonstrated similar levels of body dissatisfaction (Hrabosky et al., 2009) and similar associations with other relevant constructs, such as perfectionism and altered experience of emotions (Phillipou et al., 2019), or body checking behaviors (Hartmann et al., 2019). Similarly, high associations between BDD and EDs symptoms were found among non-clinical women (Mitchinson et al., 2013) and between MDD symptoms and EDs symptoms among men with a diagnosis of MDD or AN (Murray et al., 2012). High comorbidities

among these diagnoses have been reported as well. For example, in a sample of people with BDD, 9.0% had comorbid lifetime AN, and 6.5% had comorbid lifetime BN (while 17.5% had an ED not otherwise specified; Ruffolo et al., 2006). Similarly, in a sample of individuals with current EDs, scholars found a lifetime prevalence rate of 15.0% for BDD (Kollei et al., 2013).

1.1.1. Body Dysmorphic Disorder

BDD is a psychological disorder included in the Obsessive-Compulsive and Related Disorders category with the latest version of the DSM-5-TR (APA, 2022). Individuals with a diagnosis of BDD refer preoccupations towards one or more perceived physical imperfections, that appear slight or not observable to others (APA, 2022). Perceived flaws usually involve specific areas of the body, such as skin, face shape or overall face, nose, and mouth/lips or teeth (Malcolm et al., 2021). In response to these preoccupations, individuals tend to perform repetitive behaviors, such as mirror checking to control the defects throughout the day (Hartmann et al., 2019; Veale, Miles, et al., 2016; Windheim et al., 2011), and mental acts, such as appearance comparisons involving other people or a past memory of oneself (APA, 2022). Indeed, individuals with BDD tend to compare their areas of concern with the ones of other people, especially with same-gender targets that are considered more attractive than them (Anson et al., 2015). BDD is also characterized by avoidance behaviors, such as avoiding exposure to one's own physical appearance (APA, 2022; Windheim et al., 2011) or avoidance of social situations, including social gatherings (APA, 2022; Ritzert et al., 2020). Individuals with BDD could also face distressing situations through safety behaviors, such as applying a large amount of make-up or adopting a specific hairstyle (Malcolm et al., 2021; Phillips et al., 2005). Due to their symptoms, people with BDD experience high distress and/or impairment, damaging several areas of functioning, such as familial, interpersonal, and occupational (APA, 2022). Usually, they might seek practical solutions for their concerns, that include compulsive behaviors, such as excessive skin picking or tanning, that ultimately hamper their health (Sun & Rieder, 2022). Additionally, they might seek for aesthetic medicine and cosmetic procedures (e.g., aesthetic plastic

surgery, dermatology) to drastically remove the perceived imperfections (APA, 2022; Sun & Rieder, 2022). However, being involved in these procedures does not resolve their preoccupations, as later discussed (Bowyer et al., 2016). Individuals with BDD are also at higher risk for suicidality: They are four times more likely to experience suicidal ideation and almost three times more likely to engage in suicide attempts compared to individuals without BDD (Angelakis et al., 2016).

BDD is still an underdiagnosed psychological disorder: Few people would seek help from a professional due to shame, stigma, and fear of being misunderstood (Schulte et al., 2020). Available data demonstrated a prevalence of 1.9% in adults, 2.2% in adolescents, and 3.3% in student populations (Veale, Gledhill, et al., 2016). More specifically, a prevalence of 1.63% was found among adults in Italy (Cerea et al., 2018). The prevalence increased in settings where individuals with BDD might seek a solution for their preoccupations, such as in general cosmetic surgery (13.2%), rhinoplasty surgery (20.1%), orthodontics/cosmetic dentistry settings (5.2%), cosmetic dermatology outpatients (9.2%), and acne dermatology clinics (11.1%) (Veale, Gledhill, et al., 2016). A prevalence of 18.52% was found among bodybuilders (Farzaneh Dehkordi & Jamilian, 2022). Pertaining to its onset, scholars individuated two different ages of onset: an early onset (before 18 years old) and a late onset (after 18 years old) (Bjornsson et al., 2013). The former was found to be more frequent in comparison to the latter (Bjornsson et al., 2013), even if individuals with a late onset are still reported in available studies, and 18 years old could be found as the mean age of onset among patients with BDD (Malcolm et al., 2021). BDD could affect men and women equally (McGrath et al., 2023). However, some studies suggested a slightly higher prevalence and risk of developing this disorder in women compared to men (APA, 2022; Buhlmann et al., 2010); accordingly, subclinical BDD could be more frequent among women (Cerea et al., 2018).

1.1.1.1. Aesthetic medicine and cosmetic surgery

The term “aesthetic medicine” usually refers to procedures and techniques to improve and enhance the appearance, texture, and contours of the skin, face, and body (Prendergast, 2011).

Conversely, “cosmetic surgery” refers to procedures that revise or change the appearance, color, texture, structure, or position of bodily features, which may be considered otherwise as within the broad range of normality (Atiyeh et al., 2020). Although these two disciplines might overlap, aesthetic medicine usually employs techniques that are minimally invasive (e.g., botulinum toxin injection, filler injection), or non-invasive (e.g., chemical peels, intense pulsed light), while cosmetic surgery could be invasive (e.g., breast enhancement or reduction, rhinoplasty) (Prendergast, 2011).

Interest in aesthetic and cosmetic procedures has been growing in the last years (International Society of Aesthetic Plastic Surgery, 2022). More people, beyond rich and famous people (Atiyeh et al., 2020), are getting involved in cosmetic procedures to improve their physical appearance and overall attractiveness, to the point that people would consider it a widespread practice (Bonell et al., 2022).

Patients undergoing aesthetic and cosmetic procedures include people with BDD. As previously mentioned, they usually believe that these procedures are a valuable strategy to remove perceived physical flaws (APA, 2022; Crerand et al., 2005). Accordingly, as previously presented, a high prevalence of BDD has been found among patients who require interventions in settings of aesthetic medicine and cosmetic surgery (Veale, Gledhill, et al., 2016). Few scholars reported short-term improvements (Sun & Rieder, 2022), high levels of satisfactions, or no effect on various aspects of BDD in patients with BDD that underwent cosmetic procedures (Tignol et al., 2007). However, scholars mostly agree that engaging in these procedures does not solve preoccupations about perceived flaws: Individuals with BDD might exacerbate their preoccupations, shift their area of concern to another one, or be extremely dissatisfied with the outcome; hence, they could meet a diagnosis of BDD even post operation (APA, 2022; Bowyer et al., 2016). Interestingly, an onset of BDD could be also found in people that undertook cosmetic procedure. In this regard, in a study conducted in accordance with a plastic surgery department, scholars highlighted that 6.6% of the patients were diagnosed with BDD and avoided cosmetic surgery, while 1.2% of their patients who

undergone cosmetic surgery was diagnosed with BDD only post-operation. Individuals included in this latter group were unsatisfied with the procedure, asked for a refund, or were believed to have sought cosmetic surgery procedure elsewhere after the operation (Lai et al., 2010). Accordingly, practitioners demanded an accurate assessment of this psychological condition that should always precede possible involvement in aesthetic procedures (Sun & Rieder, 2022).

1.1.2. Muscle Dysmorphic Disorder or Muscle Dysmorphia

To date, MDD is considered a specifier for BDD (APA, 2022); thus, meeting the criteria for BDD is a prerequisite for a diagnosis of MDD. However, MDD is characterized by unique characteristics. In fact, individuals with MDD are often preoccupied with their body build, perceived as too much small or insufficiently muscular, despite the presence of a toned or normal body build (APA, 2022; Martenstyn et al., 2022; Pope et al., 1997). Similar to BDD, MDD could be associated with checking behaviors (e.g., mirror checking to scrutinize muscle development), avoidance behaviors (e.g., avoidance of social gatherings and invitations), or safety behaviors (e.g., covering with oversize clothes) (Martenstyn et al., 2022; Olivardia, 2001). Moreover, MDD symptoms commonly include dysfunctional eating behaviors, such as control over calorie intake. Individuals with this psychological disorder reported to follow a strict diet plan, alternating a "cutting" phase, involving the induction of a caloric deficit to decrease body fat, and a "bulking" phase, to increase calorie intake leading to build muscularity. This cycle would ultimately lead individuals to increase body mass and muscles (Martenstyn et al., 2022). Moreover, individuals with MDD tend to consume high-protein food and could be involved in the use of Appearance and Performance Enhancing Drugs and Supplements (Hildebrandt et al., 2012; Nagata et al., 2022). These substances include both legal (e.g., protein supplements and creatine supplements) or illegal (e.g., anabolic-androgenic steroids) substances (Nagata et al., 2022), and their use could be associated with severe physical problems (e.g., adverse cardiovascular outcomes) (Kanayama et al., 2020; Or et al., 2019). Some scholars considered the presence of dysfunctional eating behaviors a core feature of this disorder to the point

that they conceived MDD as an ED. Indeed, it was initially named as “reversed anorexia” since individuals with MDD aimed to increase the body build instead of reducing it, contrary to AN (Murray et al., 2010). However, compulsive behaviors, i.e., compulsive exercising, were ultimately recognized as central to the diagnosis (Pope et al., 1997). MDD is indeed characterized by excessive involvement in physical activities and physical exercise (Pope et al., 1997; Santarnecchi & Déttore, 2012). These exercise routines are commonly rigid and excessive, mainly focus on muscle building (Martenstyn et al., 2023), and become the main activity for the person, who tends to plan their life around them: missing a workout could be considered a great source of distress (Martenstyn et al., 2023; Pope et al., 1997). Reliance on physical activities is so extreme that some scholars recognized the presence of a form of exercise addiction (Pope et al., 1997). Furthermore, MDD is associated with a high risk of suicide attempts: 50% of individuals with MD reported lifetime suicide attempts (Pope et al., 2005), and MDD symptoms are indeed positively associated with suicide ideation (Grunewald et al., 2022).

Data on the prevalence of MDD are still lacking (Strobel et al., 2020). Studies mostly relied on self-report measures to assess MDD. For example, the prevalence of individuals at risk for MDD was 5% among Italian university students, women and men (Gorrasi et al., 2020), and 6.99% among male university students in Buenos Aires (Compte et al., 2015). Moreover, a recent cross-sectional study highlighted a prevalence of 1.8% among Australian adolescents: 2.2% and 1.4% among boys and girls, respectively (Mitchison et al., 2022). Interestingly, no significant differences in prevalence rates emerged in these two groups (Mitchison et al., 2022). In fact, even though this psychological disorder mainly affects men in comparison to women (Gorrasi et al., 2020; Tod et al., 2016), MDD was also reported among women (Gruber & Pope, 1999). The increased preference for a thin, muscular physical appearance among women (Bozsik et al., 2018) could explain the increased presence of MDD in this population in the past years. Moreover, similar to BDD, this psychological disorder seemed to have a higher prevalence in specific settings in which muscularity is highly valued

(Pope et al., 1997), such as bodybuilding (25%; Longobardi et al., 2017) and weightlifting (17%; Nieuwoudt et al., 2015). As for the onset, scholars identified 19 years old as the mean age (Cafri et al., 2008; Cooper et al., 2020; Olivardia et al., 2000).

1.1.2.1. Physical activity, sport, and physical exercise

Practicing physical activity, sport, or physical exercise is generally considered a healthy behavior, associated with positive outcomes, such as subjective well-being (e.g., life satisfaction, happiness, positive affect) (Zhang et al., 2020) and improvement in depression and anxiety symptoms within an intervention setting (Singh et al., 2023). However, especially when it is excessive, detrimental effects are documented. Accordingly, scholars defined exercise addiction as a form of behavioral addiction (Rosenberg & Feder, 2014) characterized by six core aspects: salience, mood modification, tolerance, withdrawal, conflict, and relapse (Griffiths, 1997). Individuals with symptoms of exercise addiction could value physical exercise as the most important activity in their life, dominating thoughts, feelings, and behaviors (salience) and utilizing physical activity as a strategy to modify their mood (mood modification). Throughout time, they could feel the need to increase the amount of physical activity to achieve the initial mood-modifying effects (tolerance) and, on the opposite, experience unpleasant effects when it is stopped or suddenly reduced (withdrawal). Engagement in physical activity could generate interpersonal and intrapsychic conflicts with other activities or individuals (conflict). Finally, despite trying to interrupt their engagement in physical activity for months or years, individuals with exercise addiction symptoms could struggle with the urge to repeat earlier patterns of the activity (relapse; Gori et al., 2023). Exercise addiction has been distinguished in two forms: primary, when it manifests by itself as the main psychological problem, or secondary, when it is a "consequence" of another psychological disorder (Berczik et al., 2012). Thus, secondary exercise addiction occurs when the patient's main goal is another, such as body weight or shape control (Dalle Grave et al., 2008). Indeed, it has been extensively described in some psychological disorders: Engaging in an excessive, rigid workout routine is reported as a

dysfunctional behavior in EDs (Dalle Grave et al., 2008) and MDD (Martin Ginis & Bassett, 2012). As briefly discussed above, exercise addiction is indeed one of the core features of MDD (Martenstyn et al., 2023; Pope et al., 1997). Nevertheless, individuals with MDD do not resolve their preoccupations concerning body build despite excessively engaging in exercising routines (Martenstyn et al., 2023), similar to what has been described for people with BDD and their engagement in aesthetic medicine and cosmetic surgery.

1.2. Positive body image: definition and components

Most of the current available studies focused on negative body image and BIDs. Indeed, they tend to neglect possible functional aspects of body image, such as positive body image (Gillen et al., 2018). Positive body image is a multidimensional holistic construct, characterized by different components. The component mainly used to assess positive body image is body appreciation (Linardon et al., 2022), which refers to love, appreciate, and honor the body for its features, functionality, and health, besides focusing on the mere physical appearance (Tylka & Wood-Barcalow, 2015a; Tylka, 2018). Another factor is body acceptance and love, which refers to acceptance, respect, comfort, and love for the body (Tylka & Wood-Barcalow, 2015a). Positive body image is also characterized by a broad conceptualization of beauty, which is the perception that a wide range of characteristics related to physical appearance should be considered beautiful, such as different shapes and sizes, or aspects related to personal style (Tylka & Wood-Barcalow, 2015a). Behaviorally, positive body image implies to regularly engage in self-care behaviors (i.e., adaptive appearance investment), such as grooming behaviors, and enhancing one's natural features, related to physical appearance (e.g., use of moisturizers or sunscreen) (Tylka & Wood-Barcalow, 2015a). Moreover, individuals with a positive body image demonstrated the ability to filter information in a body-protective manner, accepting information consistent with a positive body image and rejecting detrimental information (e.g., the importance of aligning with sociocultural beauty ideals). However, displaying a protective filter does not mean to be immune to possible negative messages for body

image, but it means to accept possible negative feelings arising and moving toward self-care, and not body dissatisfaction (Tylka & Wood-Barcalow, 2015a). Finally, positive body image is also characterized by inner positivity, namely, being able to connect positive body image, positive feelings (such as optimism and happiness), and adaptive behaviors (such as self-care behaviors) (Tylka & Wood-Barcalow, 2015a).

Another important component of positive body image is body functionality appreciation, which refers to appreciating, respecting, and honoring the body for what it is capable of doing, including physical capabilities, biological processes, sensations and perceptions, creativity, self-care, and communication practices (e.g., experiencing the world through the senses, moving in an environment, dancing, interacting with other people), and not only being aware of them (Alleva et al., 2017; Alleva & Tylka, 2021). This construct could be considered the junction between body image and body functionality, which only refers to what the body can do (Alleva & Tylka, 2021). The construct of body functionality, including functionality appreciation, is not exclusive to able-bodied individuals: even when facing physical limitations caused by illness, acquired injury, structural differences, or ageing, individuals still experience a functional body (Alleva & Tylka, 2021).

Positive body image is an independent construct from negative body image; thus, the two constructs should not be considered at the opposite end of the same continuum (e.g., positive body image as the absence of negative body image, and vice versa; Tylka, 2012; Tylka & Wood-Barcalow, 2015a). However, a recent meta-analysis underscored that these constructs and their dimensions are often found to be highly negatively associated with one another (Linardon et al., 2022).

Gender differences were described concerning positive body image: A meta-analysis highlighted that body appreciation seems to be higher among men compared to women (He et al., 2020). However, not all positive body image dimensions demonstrated these gender differences. In fact, a recent meta-analysis revealed that women and men have similar levels of body functionality appreciation (Linardon et al., 2023).

Positive body image was described as having a protective role for several aspects of psychological well-being (Swami et al., 2018), life satisfaction, and flourishing (Davis et al., 2020; Swami et al., 2015), lower levels of depression symptoms (Gillen, 2015; Linardon et al., 2023; Ramseyer Winter et al., 2019), and lower levels of anxiety symptoms (Gillen, 2015; Ramseyer Winter et al., 2019). Moreover, it seems to be protective against the onset of dysfunctional eating behaviors (Linardon, 2021). Additionally, scholars acknowledged the importance of considering positive body image in interventions aimed at improving body image. Indeed, most of the available psychological interventions could achieve a reduction in body dissatisfaction and symptoms of BIDs, leading to the mere tolerance of one's body and appearance (Tylka & Wood-Barcalow, 2015a). Fostering positive body image could enable individuals to have a more functional and balanced attitude toward the body (Piran, 2015). Among available interventions, the Expand Your Horizon intervention, which aims to improve body image by training participants to focus on the functionality of their body and on being grateful, mindful, and appreciative of them, demonstrated to be effective in ameliorating positive body image overall, such as body appreciation and satisfaction with body functionality (Alleva & Tylka, 2021; Guest et al., 2019).

2. Chapter 2 - Social media use and body image

2.1. Social media: definition and types

Social media are utilized worldwide, and their usage is in constant growth (Perrin, 2015). They overcome traditional media in popularity since they not only enable users to select which content they want to consume, as in traditional media (Katz et al., 1973), but they also enable them to interact, to produce, and to share content (Bodroža et al., 2022; Hogue & Mills, 2019). People engage in social media use at any age, and a higher prevalence has been described among young adults (18-29 years old) (Perrin, 2015) and adolescents (Odgers & Jensen, 2011).

Social media could be differentiated according to its use and engagement. Scholars mainly described active and passive use of social media. Active use involves any activity on social media that facilitates direct exchange with others, such as direct messaging, posting, sharing private links, or commenting and liking other people's content (Hogue & Mills, 2019; Verduyn et al., 2022). On the other hand, passive use mainly pertains to viewing other people's content without directly interacting with it, such as scrolling and monitoring other people's profiles, pictures, videos, or updates (Verduyn et al., 2022). Pertaining gender, women are reported to be more engaged in active social media use than men (e.g., self-photo sharing and posting; Dhir et al., 2016). When considering general well-being and ill-being, active and passive social media use are considered to be differentially associated. Active use should be related to positive outcomes since it elicits support and positive feedback from other users, while passive use should be associated with negative outcomes since it might lead to envy and social comparison (Verduyn et al., 2017). Indeed, active use seems to be more associated with well-being (e.g., happiness) and passive use with ill-being (e.g., depression symptoms) (Valkenburg et al., 2022). However, scant support for this proposition was found in literature (Valkenburg, 2022). A possible explanation could be found in the difficulty in clearly defining the conceptual difference between active and passive social media use (e.g., reading the support received from other people after actively engaging with them could be highlighted as a form

of passive use instead of active social media use) and to disentangle personal susceptibilities to social media use (Valkenburg et al., 2022).

Within the body image field, a consistent position on social media influence has been described, despite some mixed findings that still emerged. Within this field of study, scholars identified a group of social media mostly influential for body image, defined as appearance-focused or image-centric, which includes Instagram, Snapchat, Pinterest, Facebook, (Griffiths, Murray, et al., 2018), and TikTok (Maes & Vandenbosh, 2022; Pryde & Prichard, 2022). These social media enable users to produce photos and videos that portray a person or groups and to view a wide range of content portraying other people. These features could be considered appearance-focused (Holland & Tiggemann, 2016) since they involve the production or the consumption of content that convey a representation of a physical appearance (Saiphoo & Vahedi, 2019). Attitudes and behaviors surrounding the production of a self-photo or a selfie could be named social media photo-based behaviors. The study of how viewing social media images might influence body image revolves around social media content. A great number of studies have highlighted that social media use, especially appearance-focused use, is associated with negative outcomes for body image (Holland & Tiggemann, 2016; Ryding & Kuss, 2020; Saiphoo & Vahedi, 2019). However, this effect depends on the specific aspects of its use that it was considered. When scholars examine putative functional elements of social media use, such as viewing body positivity content, appearance-focused social media use was found associated with positive outcomes for body image, such as body appreciation and body satisfaction (Rodgers et al., 2022; Stevens & Griffiths, 2020).

2.2. Models focused on the relation between body image and social media use

Several models were developed or adapted to explain the association between social media use and body image. The uses and gratification theory (Katz et al., 1973) posits that consumers of media are characterized by specific needs and motivations; thus, they have an active role in pursuing social media use, ultimately resulting in consequences for well-being, including body image

(Rodgers, 2016). Similarly, Goffman's dramaturgical model (Goffman, 1959) enables to explain how individuals actively handle offline self-presentation and could be of use to explain engagement on social media, more specifically online self-presentation (Hogan, 2010). These two models conceive the individual as having an active engagement in social media use and could be mostly of relevance when discussing photo-based behaviors. Moreover, the first theory would be of use to explain the effect of social media content on body image, based on the active decision to consume such content. Relatedly, the Tripartite Influence Model (Thompson et al., 1999) is a sociocultural model that enables to describe how exposure to family, peers, media, and social media could influence body image. Opposite to the first two models, this model posits the individual as a recipient of external influences, and it would be useful to describe how social media content could have an effect on body image.

2.2.1. Uses and gratification theory

The uses and gratification theory was initially developed to describe how different audiences engage in media usage. Later, it was utilized to define the needs people try to fulfill and the motivation underlying the use of certain forms of media (Katz et al., 1973). This theory states that the media audience is aware of their needs and active in choosing the pertinent media. Therefore, each media "competes" with other forms of media or with other sources of satisfaction to meet the audience's needs (Katz et al., 1973). Uses and gratification theory was later applied and adapted to social media use. Indeed, as previously stated, social media users not only choose what social media content to consume, but they can also interact and produce content (Bodroža et al., 2022; Hogue & Mills, 2019). Even more so, active interaction in social media shapes the content that will be presented to the user: social media often rely on an algorithm that suggests the viewer accounts and content based on previous interactions on said platforms (Harriger et al., 2022).

The main motivations underlying social media use include social interaction, information seeking, passing time, entertainment, relaxation, communicatory utility, convenience utility,

expression of opinions, information sharing, and surveillance/knowledge about others (Whiting & Williams, 2013). Body-oriented motivations were found too: Rodgers et al. (2021) described popularity (e.g., to impress others and be perceived as desired), social connections (e.g., to participate in social events), values and needs (e.g., to promote personally relevant issues), and appearance (e.g., to receive feedback, compare, and improve appearance) as motivation to engage in social media use among adolescents. Thus, users might seek certain social media or choose a specific form of engagement because they have specific appearance-oriented needs, such as searching for reassuring feedback on their physical appearance or appearance-related information (Rodgers, 2016; Tylka et al., 2023). Thus, they might engage in photo-based behaviors to reach an idealized self-presentation that would ultimately be useful to receive social approval (e.g., among adolescents; Rousseau, 2021) or they might search for appearance-, diet-, and weight- and shape-related content (Rodgers, 2016; Tylka et al., 2023). This process would have a bidirectional effect on body image: Displaying a certain attitude toward body image (e.g., body dissatisfaction, BDD or MDD symptoms) would lead the user engaging in appearance-focused use that, in turn, would increase attention and relevance of physical appearance. In these cases, social media use would have the role of a maintaining factor for body image disturbances.

2.2.2. Goffman's dramaturgical model applied to social media use

Goffman's dramaturgical model (1959) supplies interesting insights on how users may interact with social media use, especially considering photo-based behaviors. Goffman's model (1959) conceives life as a stage, where performances (i.e., activities enacted in a specific timeframe in front of an observer or a group of observers) take place. Within a performance, individuals can deliberately choose to provide or not details about themselves, a process defined as "impression management" (Goffman, 1959). The performance takes place in specific bounded settings: the front stage and the backstage. The front stage comprises where the individual presents the idealized version of the self, adapted to the specific role assumed in the circumstance (e.g., the appropriate student,

lecturer, teacher). The backstage is where the idealized version is realized and comprises all the efforts put into “keep up the appearances”. Nevertheless, the backstage is where the impression fostered by the idealized version of the self could be easily contradicted (Goffman, 1959). Finally, the audience comprises the observer(s) that spectate the performance and is the recipient of the idealized version of the self and of the unintentional details given off as part of the performance (Goffman, 1959). According to Goffman’s model, performances are temporally and spatially bounded: The individual interacts with a specific group of people, in a specific social situation, at a specific timeframe, which would be different given differences in one of the elements. Accordingly, individuals might experience conflict when different fronts collide: for example, when a person replies to a phone call from a family member during a meeting with a group of friends (Goffman, 1959).

Goffman’s model was applied to online media and social media use as well. Hogan (2010) adapted it considering the peculiar characteristics of social media and defined this new model as exhibition approach. Accordingly, this approach suggests that individuals submit reproducible artifacts (content) to storehouses (databases) contained in exhibition sites (social media). These exhibition sites are managed by curators (algorithms designed by site maintainers), who selectively bring artifacts out of the storage for particular audiences (other social media users). The audience in these spaces consists of those who have and those who make use of access to the artifacts. Within this model, individuals do not entirely have the possibility to control the audience and the time when the content will be consumed (Hogan, 2010). However, individuals are still able to control their self-presentation, to share an idealized self-presentation, and to select the information to share (Casale, Fioravanti, Flett, et al., 2021).

According to this conceptualization, social media users are still provided with the possibility to control their self-presentation online, even if it significantly differs from the one achieved offline, and they are also aware of the impossibility of completely controlling it. However, they might engage in certain behaviors to prevent other users from having a specific representation of them. Accordingly,

they might engage in “preparatory behaviors”, considerable as backstage behaviors, to curate their artifacts. When the artifact involves a self-photo or selfie, the preparatory behaviors might involve photo-based behaviors, such as photo investment and photo editing (Steains, 2019). Considering BIDs, it is plausible that a certain attitude toward body image, such as being highly concerned over perceived physical flaws (e.g., BDD or MDD symptoms), would result in certain photo-based behaviors, such as excessive photo editing to conceal physical imperfections and to provoke positive feedback from other people. A different outcome could be described for individuals highly appreciative of their bodies, who may not feel the need to alter their appearance in the self-photo (Tan, Cheng, et al., 2021).

2.2.3. Tripartite Influence Model

The Tripartite Influence Model (Thompson et al., 1999) was developed to describe how the sociocultural context could influence the development and the maintenance of body dissatisfaction and dysfunctional body-related behaviors. The model posits that three sociocultural sources, namely family, peers, and media, would influence appearance comparison processes and internalization of beauty ideals, which, in turn, would have an effect on body image dimensions (Thompson et al., 1999). Familial and parental influence reside in comments about the offspring’s physical appearance and body-oriented behaviors (e.g., eating behaviors) and in the modeling of parental behaviors (e.g., the parent openly discussing personal concern about physical appearance with the child; Rodgers & Chabrol, 2009). Peer influence, especially salient during adolescence, would enhance an “appearance culture”, in which each individual regularly discusses their attractiveness and how to improve it, increasing reliance on physical appearance (Jones et al., 2004). As for media, commercials, and content available on television and magazines demonstrated to have an impact on setting the sociocultural beauty ideals to conform with, as well as providing means of appearance comparisons (Huang et al., 2021). Collectively, these sociocultural sources would influence the endorsement of sociocultural beauty standards (i.e., internalization of beauty ideals) (Thompson & Stice, 2001),

which comprise thinness, muscularity, and general attractiveness (Schaefer et al., 2017). The other mechanism involved is appearance comparison, which identifies the innate tendency to compare one's appearance to others (Festinger, 1954; Stormer & Thompson, 1996). Appearance comparison could be upward when it is directed toward a person perceived as properly embodying an ideal physical appearance, and downward when the mean of comparison is a person perceived as less attractive (Collins, 1996). In turn, sociocultural influences and psychological mechanisms would worsen body satisfaction and increase the likelihood of engaging in dysfunctional body-oriented behaviors. These dysfunctional behaviors were initially considered only as dysfunctional eating behaviors, such as restrictive eating and bulimic behaviors (Keery et al., 2004), but the model was also evaluated in relation to attitudes toward cosmetic surgery (Menzel et al., 2011).

This model was studied among adult women and adolescent girls initially (Keery et al., 2004); however, its findings were replicated in samples comprising adult men (e.g., Schaefer et al., 2021; Tylka, 2011), individuals with different cultural background (e.g., Chinese: Barnhart et al., 2022; Australian and French: Rodger et al., 2011), sexual minorities (e.g., Convertino et al., 2021; Tylka & Andorka, 2012), and transgender individuals (Strübel et al., 2020). Moreover, scholars accounted for the influence of social media (Jarman et al., 2021; Jung et al., 2022; Roberts et al., 2022) and, interestingly, investment in other people's selfies (Wang et al., 2022). These advances in the model provided insights on the fact that social media would provide idealized content, which align with sociocultural beauty ideals and foster their internalization and upward appearance comparisons (Jarman et al., 2021; Jung et al., 2022; Roberts et al., 2022). Moreover, this model could explain how exposure to social media content would influence BDD and MDD symptoms.

2.3. Photo-based behaviors and body image

As previously mentioned, social media (especially appearance-focused social media) enable users to engage in photo-based behaviors/photo-based activities/selfie behaviors. There is still a lack of clear consensus for their definition: they include a cluster of attitudes and behaviors related to the

production of self-photos and broadly involve editing and manipulating selfies, posting photos, scrutinizing one's own selfies or others' selfies, as well as responses to one's or others' selfies (Lonergan et al., 2020). Thus, photo-based behaviors include photo posting/sharing, photo editing/manipulating, photo investment, and investment in other people's selfies (Lonergan et al., 2020). These social media behaviors demonstrated a unique association with negative and positive body image dimensions (e.g., Lonergan et al., 2019; 2020). Mixed findings were sometimes described, mostly related to the specific photo-based behavior examined. Moreover, extant studies mostly focused on body satisfaction or dissatisfaction, while no available studies addressed the relation between photo-based behaviors and BDD and MDD symptoms, making this investigation worthy of note.

Mixed findings were described for photo posting/sharing. It has been found to worsen self-image in women and men (Mills et al., 2018; Shome et al., 2020) and to be associated with body dissatisfaction among Chinese college students (Wang et al., 2020). Conversely, this photo-based behavior was positively associated with greater body appreciation (Veldhuis et al., 2020) and body satisfaction among women (Cohen et al., 2018). These inconsistent findings may be explained at the individual level: Photo posting/sharing might be preceded by different motivations (e.g., celebrating one's body or perceiving the body as an object; Veldhuis et al., 2020) or by the role of other photo-based behaviors that are more impactful on the body image dimensions (e.g., photo manipulation; Tiggemann et al., 2020).

Some consistent findings were found in studies examining investment in others' selfies, conducted among adolescents. It was found to be associated with facial dissatisfaction (Wang et al., 2022) and with a higher risk to develop EDs (Lonergan et al., 2020).

Concerning positive body image, some studies considered its dimensions as a possible protective factor from the putative negative effect of photo-based behaviors on body image. Indeed, positive body image dimensions were tested as a moderator in the relation involving photo-based

behaviors and negative body image dimensions. For example, body appreciation moderated the relation between social media use and body dissatisfaction among female undergraduates (Duan et al., 2022) and between selfie-viewing and facial dissatisfaction among adolescents (Wang et al., 2019).

Among photo-based behaviors, two of them require particular attention in the body image field: photo investment and photo manipulation.

2.3.1. Photo Investment

Photo investment could be described as the efforts put into choosing the right self-photo to share online and the concerns related to other people's reactions to it (McLean et al., 2015). Extant studies mostly corroborated the dysfunctional role of photo investment in body image, being associated with negative body image dimensions. In fact, photo investment was found to be significantly associated with body dissatisfaction among women and men (Cohen et al., 2018; Hao, 2023; Lonergan et al., 2019; Modica, 2020). Interesting findings were highlighted in younger cohorts: Photo investment was described as a putative risk factor for the development of EDs in adolescent girls and boys (Lonergan et al., 2020). Studies on photo investment are still limited, and a deeper analysis of the relation between this photo-based behavior and negative body image is required. Especially, no studies addressed whether photo investment would be associated with BDD or MDD symptoms and psychological dimensions involved in these psychological disorders (i.e., attitude toward cosmetic surgery and exercise addiction). In deepening this association, a clearer understanding of the role of this photo-based behavior, as well as of self-photos overall, in these two BIDs will be reached. Moreover, no available study addressed whether positive body image dimensions could have a protective role in the impact of this photo-based behavior, acting as a moderator.

2.3.2. Photo Manipulation

Photo manipulation (or photo editing) involves behaviors toward improving the appeal of the photo, using filters and software, before posting it online (McLean et al., 2015). It could be directed toward the physical appearance of the subject portrayed, making specific parts of the body larger or smaller or smoothing the skin (Gioia et al., 2021), toward the overall photo, such as applying a filter to modify the light and the darkness of the photo (Fox & Rooney, 2015; Gioia et al., 2021) or cropping the photo (Fox & Rooney, 2015), and toward the background of a photo (Vendemia & DeAndrea, 2021). Several studies addressed this photo-based behavior, and mixed findings emerged (for a meta-analysis: McGovern et al., 2022). Within studies employing samples of women and men, some scholars found the presence of relations between photo manipulation and body dissatisfaction (Beos et al., 2021; Lonergan et al., 2019; Modica, 2020; Pham et al., 2022), and internalization of beauty ideals (Hao, 2023), while others described non-significant associations between photo manipulation and body dissatisfaction (Chae, 2017; Cohen et al., 2018; Veldhuis et al., 2020). These differences might be explained by cultural differences or by differences in measures utilized to assess photo manipulation (which would tap into different aspects of photo manipulation) (McGovern et al., 2022). Moreover, it was suggested that photo editing may protect against the negative implications of culturally idealized beauty ideals on negative body image dimensions by protecting users' positive feelings towards their bodies (McGovern et al., 2022). In short, mixed findings underscored the need to further address its associations with negative body image, assessing dimensions that have not received enough attention yet. Indeed, no available studies addressed the relation between photo manipulation and BDD or MDD symptoms. Even if the assessment of filter use was suggested for BDD (Maymone & Kroumpouzos, 2022), an analysis of the association with this construct is still warranted. In achieving this, a clearer understanding of the role of this photo-based behavior in BDD and MDD symptoms will be reached and, given mixed findings in the literature, ascertained as well.

Photo manipulation was also investigated in relation to attitudes toward cosmetic surgery, highlighting a positive association between the two constructs (Beos et al., 2021; Chen et al., 2019;

Lyu et al., 2021; Sun, 2021; Varman et al., 2021). In fact, selfie-posting before modifying a self-photo was associated with increased interest in cosmetic surgery (Shome et al., 2020). Relatedly, in a longitudinal study conducted in a sample of adolescent girls and boys, baseline levels of selfie-editing predicted facial (but not body) dissatisfaction which, in turn, was associated with the consideration of being involved in cosmetic surgery in the future (Wang et al., 2021). Photo manipulation could enable the individual to create an ideal self-presentation, matching sociocultural beauty standards (Rousseau, 2021). Accordingly, social media users could be led into thinking that cosmetic surgery is a valuable solution to reduce the perceived gap (Shome et al., 2020; Sun, 2021). Interestingly, an experimental study found the opposite result: engaging in any form of photo manipulation on a selfie was associated with a reduced attitude toward cosmetic surgery (Vendemia & DeAndrea, 2021). Authors explained this finding as engaging in photo modifications of any kind may lessen one's momentary desire to undergo major physical modifications offline in the short term (Vendemia & DeAndrea, 2021). Given the inconsistencies among studies, the relation between photo manipulation and attitude toward cosmetic surgery should be further addressed. Achieving this would be especially relevant when considering BDD symptoms, due to the importance of attitudes toward cosmetic surgery in people with BDD symptoms.

An interesting phenomenon described in the literature that related to photo manipulation, attitude toward cosmetic surgery, and BDD is the "Snapchat Dysmorphia" (Ramphul & Mejias, 2018). It describes a condition in which patients are reaching out to the cosmetic surgeon with a modified selfie and requesting a procedure to recreate the same effect. Nevertheless, the desired final result is often unrealistic (Ramphul & Mejias, 2018; Sun & Rieder, 2022). This phenomenon may be fueled by cosmetic surgeons themselves since they are reported as using software to modify self-photos utilized for advertisement (Othman et al., 2021). Snapchat Dysmorphia may be of relevance for individuals with BDD since it would create false expectations about cosmetic surgery outcomes.

Nevertheless, as previously mentioned, studies addressing the relation between photo manipulation, BDD symptoms, and attitude toward cosmetic surgery are still warranted.

Moreover, studies focusing on MDD symptoms are still lacking in this field. A relevant finding in this regard could be the one of Modica (2020), who found an association between photo manipulation and body dissatisfaction, assessed as dissatisfaction with muscularity, body fat, and height, in a sample of men. Thus, MDD symptoms could demonstrate a positive relation with this photo-based behavior as well. Additionally, photo manipulation could have a role in other psychological dimensions involved in MDD, such as exercise addiction symptoms, as an offline strategy to reduce the perceived discrepancy between the modified self-photo and the real physical appearance, as hypothesized for BDD symptoms and attitude toward cosmetic surgery.

Finally, positive body image could have a protective role in the relation involving photo manipulation and body image dimensions. However, no available studies tested whether it would be a moderator in these associations. The only relevant finding in this domain is the one of Veldhuis et al. (2020), who found a non-significant association between body appreciation and photo editing in a sample of women.

2.4. Social media content

Besides photo-based behaviors, appearance-focused social media use includes the consumption of various forms of content. Studies in the body image field identified several types of social media content that would be particularly relevant for body image, such as thinspiration content (Ghaznavi & Taylor, 2015; see p. 39 for a definition), fitspiration content (Tiggemann & Zaccardo, 2015; see p. 39 for a definition), beauty-related content (Seekis & Barker, 2022), nutrition-related content (Minadeo & Pope, 2022), content related to recovery from a previous ED (Goh et al., 2022; Herrick et al., 2021), body positive content (Cohen, Irwin, et al., 2019; Hallward et al., 2023; Harriger et al., 2023; Lazuka et al., 2020), and body neutrality content (Hallward et al., 2023). This categorization is usually based on the identifier adopted by users while creating the content: for

example, individuals who want to create a body positive content and to share it on Instagram or TikTok usually attach to the image a specific hashtag, such as #bodypositivity or #bopo. Hence, each hashtag would relate to a specific group of content and users would be able to reach out to it by searching on the toolbar provided by the social media. This process implies shared knowledge among users about the meaning of each hashtag and which form of content could be more or less appropriate for it.

Studies on the impact of specific content on body image mostly focused on thinspiration, fitspiration, and body positive content, while other forms of content received less attention (e.g., beauty content and body neutrality content). Some studies addressed the relation between exposure to social media content and positive body image dimensions (e.g., body appreciation). However, fewer studies addressed the relation between being exposed to social media content and BDD or MDD symptoms.

2.4.1. Thinspiration and fitspiration content

As previously mentioned, thinspiration and fitspiration content are two forms of content that received a lot of attention in the field of body image. Thinspiration content refers to content portraying mostly girls and women, extremely thin and with evident bony features, and showcasing messages that celebrate thinness and strategies to maintain low body fat, such as dietary restraint (Alberga et al., 2018; Ghaznavi & Taylor, 2015; Talbot et al., 2017; Wick & Harriger, 2018). Consequently, this content would foster the internalization of a thinness ideal. More popular than thinspiration (Tiggemann et al., 2018), fitspiration involves content meant to motivate people to exercise and to achieve a healthy lifestyle and showcases images of individuals with a toned and muscular body build, workout routines, and motivational quotes to exercise (Alberga et al., 2018; Boepple et al., 2016; Talbot et al., 2017; Tiggemann & Zaccardo, 2018). This content could mostly foster the internalization of a muscular ideal. Both forms of content are highly sexualized and include messages of guilt for weight and shape to motivate weight control (Alberga et al., 2018; Boepple et al., 2016;

Deighton-Smith & Bell, 2018; Ghaznavi & Taylor, 2015; Tiggemann & Zaccardo, 2018; Wick & Harriger, 2018). These two forms of content demonstrated to overlap, and scholars described a subtype of fitspiration content that emphasize thinness and a thin body figure (Talbot et al., 2017).

Given their extreme emphasis on physical appearance and eating behaviors, scholars investigated how exposure to thinspiration and fitspiration contents would affect body image dimensions, mostly focusing on negative body image (e.g., body dissatisfaction, appearance comparison). Nevertheless, findings mainly demonstrated a negative impact of thinspiration on body satisfaction (Dignard & Jarry, 2021; Stevens & Griffiths, 2020), body fat satisfaction (Yee et al., 2020), muscularity satisfaction (Yee et al., 2020), and appearance comparison (Dignard & Jarry, 2021), among women and men. Despite not consistent findings (Fatt et al., 2019; Pryde & Prichard, 2022; Stevens & Griffiths, 2020), scholars mainly highlighted that fitspiration content could induce body dissatisfaction (Cataldo et al., 2022; Dignard & Jarry, 2021; Fardouly et al., 2018; Tiggemann & Anderberg, 2020), dissatisfaction for muscularity and body fat (Yee et al., 2020), internalization of muscularity ideal (Fatt et al., 2019), and appearance comparison (Fatt et al., 2019; Pryde & Prichard, 2022). Moreover, the impact of thinspiration and fitspiration on body satisfaction emerged as similar (Dignard & Jarry, 2021).

Interestingly, no studies directly assessed BDD and MDD symptoms. However, given the emphasis of thinness within thinspiration content, it is less likely of relevance both for BDD symptoms, which are not centered on concerns related to shape and size (Toh et al., 2020), and for MDD symptoms, which are mostly related to muscularity (APA, 2022). A similar reasoning would explain the lack of studies addressing the relation between fitspiration content and BDD symptoms. Indeed, scholars suggested that fitspiration content would affect MDD symptoms (Griffiths, Castle, et al., 2018) and a study conducted in Germany described this association (Schoenenberg & Martin, 2020). As for positive body image, exposure to fitspiration images seemed to reduce state body appreciation, demonstrating its detrimental effect on positive body image too (Barron et al., 2021).

2.4.2. Body positive content

Body positive content originated from the 1960s feminist-grounded fat acceptance movement, which protested discrimination against fat people (Afful & Ricciardelli, 2015). Similarly, body positivity aims to challenge the prevailing thin-ideal messages in the media and foster acceptance and appreciation of bodies of all shapes, sizes, and appearances (Cwynar-Horta, 2016). This movement has spread across different social media, including appearance-focused ones, like Instagram (Cohen, Irwin, et al., 2019; Lazuka et al., 2020) and TikTok (Hallward et al., 2023; Harriger et al., 2023). Body positive content usually include images mainly portraying women (Cohen, Irwin, et al., 2019; Harriger et al., 2023; Lazuka et al., 2020), displaying features that do not conform to beauty standards (e.g., stomach rolls, cellulite, stretch marks; Cohen, Irwin, et al., 2019; Harriger et al., 2023; Lazuka et al., 2020), representing a wider range of body shapes and sizes, such as overweight (Cohen, Irwin, et al., 2019; Harriger et al., 2023; Lazuka et al., 2020). Moreover, this content usually portrays themes related to positive body image, such as broad conceptualization of beauty and inner positivity (Cohen, Irwin, et al., 2019; Lazuka et al., 2020).

However, scholars pointed out that body positive content could be problematic and include dysfunctional messages. In fact, scholars described the presence of messages related to thin or fit praise (Cohen, Irwin, et al., 2019; Lazuka et al., 2020) and objectification (Cohen, Irwin, et al., 2019; Lazuka et al., 2020) in Instagram images. Moreover, a recent content analysis conducted with TikTok videos found that the presence of themes related to body positive image and body positivity (i.e., body acceptance/love; inner positivity; fat acceptance; protective filtering of information in a body-protective manner; conceptualizing beauty broadly; adaptive investment in body care; body appreciation) has reduced compared to previous findings on Instagram images (Harriger et al., 2023). However, this trend was also found for the presence of negative appearance-focused themes (i.e., weight loss/diet/exercise, clothing/beauty appearance, thin praise, weight/fat stigmatizing, body/weight/food shaming, and fat acceptance) and perceived self-objectification (Harriger et al.,

2023). Moreover, it emerged that individuals embodying sociocultural beauty ideals (e.g., clear skin, white teeth, styled hair) increased, and people with greater body size were fewer (Harriger et al., 2023). Another limitation of body positive content is the lack of diversity in cultural and gender representation since creators are mostly portrayed as young white women (Cohen, Irwin, et al., 2019; Harriger et al., 2023; Lazuka et al., 2020).

Studies addressing the impact of body positive content mainly demonstrated a positive effect on body image. People exposed to body positive content reported increased body satisfaction and body appreciation (Cohen, Fardouly, et al., 2019; Nelson et al., 2022; Stevens & Griffiths, 2020), and it was mostly concluded that this kind of content would be ultimately functional for body image (Rodgers et al., 2022; Tylka et al., 2023). However, some inconsistencies could be found. Increased levels of body appreciation after viewing body positive content were comparable to increased levels after being exposed to non-appearance-focused content (cityscapes; Manning & Mulgrew, 2022). Another study found a negligible association between viewing body positive content and body satisfaction (Kvardova et al., 2022). Furthermore, exposure to body positive content in general (Cohen, Fardouly, et al., 2019), as well as sexualized body positive selfies (Schettino et al., 2023; Vendemia et al., 2021), was found to increase self-objectification. Relatedly, high levels of viewing body positive content on TikTok strengthen the direct relation between TikTok use and upward appearance comparison and the indirect relations between TikTok use and body dissatisfaction through upward appearance comparison and upward appearance comparison and body surveillance in serial (Bissonette Mink & Szymanski, 2022). Scholars explained these inconsistencies recognizing that body positive content might be protective for body image only when it respects positive body image themes (Tylka et al., 2023). However, given its heterogeneity described in content analyses (Cohen, Irwin, et al., 2019; Harriger et al., 2023; Lazuka et al., 2020), body positive content could reasonably have a detrimental effect when it does not entirely align with body positive themes, but it is still presented under the same category.

Studies focusing on the relation between body positive content and BDD or MDD symptoms are not available to date. Given the mixed findings presented, body positive content could be either beneficial in reducing these symptoms or detrimental in increasing attention towards physical imperfections. Similarly, it would be of interest to further test the relation with positive body image dimensions: Despite findings corroborating its protective role, body positive content could reduce appreciation, love, and respect towards the body as well.

2.4.3. Other forms of appearance-focused content: beauty and body neutrality content

Despite most of the studies focused on thinspiration, fitspiration, and body positive content, social media could broadcast other types of appearance-focused content. Two of them are beauty content and body neutrality content.

Social media could display content created by celebrities, influencers (i.e., micro-celebrities that achieved fame on social media; Tiggemann & Anderberg, 2020), or peers endorsing make-up, skincare, beauty products, or cosmetic procedures. They could also show tutorials or routines that involve the usage of body or face products (e.g., make-up tutorials), or reviews of new products available to consumers (Seekis & Barker, 2022). These types of content fall under the umbrella term of "beauty content" (Seekis & Barker, 2022). Viewing content labeled as "beauty" was associated with decreased levels of self-perceived attractiveness among women (Sherlock & Wagstaff, 2019). Accordingly, beauty content could be particularly relevant for BDD symptoms since it would emphasize reliance on physical appearance and the importance of being physically attractive. Relatedly, a recent study found that self-reported exposure to beauty content would be associated with BDD symptoms, and the relation would be partly mediated by upward appearance comparison and internalization of an ideal of general attractiveness among women (Seekis & Barker, 2022). In turn, this content would have a direct effect on consideration to be involved in cosmetic surgery, not mediated by dysmorphic concerns (Seekis & Barker, 2022). Interestingly, this study shed light on the relevant effect of social media content on BDD symptoms. However, no available studies addressed

the relation between beauty content and positive body image dimension. In fact, this content could be particularly detrimental not only for negative body image and BIDs but also for positive body image, enhancing the importance of being physically attractive.

Concerning body neutrality content, fewer studies were conducted. The main reason is that no clear theoretical definition of this construct is available yet (Hallward et al., 2023; Smith et al., 2023). Some scholars highlighted that body neutrality would be characterized by a decreased emphasis on body/appearance altogether (Cohen et al., 2021; Tylka et al., 2023). Other scholars emphasized that body neutrality might involve both shifting attention toward body functionality rather than appearance and reducing the importance placed on appearance altogether (Bissonnette Mink & Szymanski, 2022; Hallward et al., 2023). Finally, body neutrality is described as an alternative approach to body positivity to improve one's relation with appearance/body compared to body positivity (Bissonnette Mink & Szymanski, 2022; Cohen et al., 2021: Smith et al., 2023). Accordingly, no studies have clearly addressed what body neutrality content portrays: the only available content analysis included both body positivity and body neutrality available on TikTok, making it difficult to clearly understand what body neutrality content portray by itself. In this analysis, the Authors concluded that body neutrality content aligns with the general knowledge surrounding body neutrality: to reduce the importance of body and appearance when valuing oneself and to emphasize body functionality appreciation (Hallward et al., 2023). Accordingly, no available study examined the associations between either negative and positive body image dimensions and body neutrality content (Hallward et al., 2023).

3. Chapter 3 – objectives and hypotheses of the thesis

According to the abovementioned available literature, there is a need to further assess the relation between body image and social media. Accordingly, the objectives of the studies conducted were:

Objective 1: To examine the relations between BDD symptoms, MDD symptoms, and photo-based behaviors, namely photo manipulation and photo investment. In particular, the putative predictive role of photo-based behaviors for BDD and MDD symptoms was tested. In achieving this, the role of other associated constructs was accounted for:

- Putative moderation of positive body image dimensions (i.e., body appreciation and body functionality appreciation).
- Relation of photo-based behaviors with consideration to be involved in cosmetic surgery in the future and exercise addiction, mediated by BDD and MDD symptoms.

This objective will be addressed in Chapter 4 and Chapter 5.

Objective 2: To further address the role of appearance-focused Instagram content, namely body positive and beauty content, in putatively predicting BDD symptoms and positive body image dimensions (i.e., body appreciation and body functionality appreciation), taking into account the possible mediation of appearance comparisons and internalization of the beauty ideal. As previously mentioned, these forms of content are the one that mostly relate to BDD symptoms and positive body image. Instagram was selected as the social media platform to study since it was the most utilized appearance-focused social media platform at the time the study was developed.

This objective will be addressed in Chapter 6

Objective 3: To analyze body neutrality content on TikTok and to reach a better understanding of this novel construct, suggesting a possible role for BDD and MDD symptoms and positive body image dimensions.

This objective will be addressed in Chapter 7.

4. Chapter 4 - Associations between photo-based behaviors and BDD and MDD symptoms and analysis of the moderation of body appreciation.

The current Chapter is adapted from Mancin, P., Ghisi, M., Spoto, A., & Cerea, S. (In preparation). *Through the looking glass: associations between Body Image Disorders symptoms and photo based-behaviors and the protective role of body appreciation.*

4.1. Rationale of the study

As mentioned above, despite most of the studies focused on addressing the relation between photo-based behaviors and body dissatisfaction (e.g., Lonergan et al., 2019), there is still a lack of studies addressing specifically BDD and MDD symptoms.

Moreover, studies addressing the relations between photo-based behaviors and positive body image are lacking as well. The only currently available study underscored a non-significant relation between body appreciation and photo editing (Veldhuis et al., 2020), while photo investment has not been assessed yet. Body appreciation could have a moderating role in the relation between negative body image dimensions and photo-based behaviors, as suggested by previous studies (Duan et al., 2022; Wang et al., 2019). Appreciating one's own body for its natural features may diminish the inclination to partake in photo-based behaviors that often contribute to maintaining a negative attitude toward the body, as typically observed in individuals with BDD and MDD symptoms.

The current study: aims and hypotheses

The current study presented two main aims.

First aim: To assess the relations between BDD and MDD symptoms, photo manipulation, and photo investment in women and men. (H1) The putative predictive role of photo-based behaviors for BDD and MDD symptoms was explored, after considering gender and general distress as possible confounding variables. However, given previous mixed findings (e.g., McGovern et al., 2022), the possibility that the direction of the relation could be opposite will be discussed.

Second aim: To examine the protective role of body appreciation. According to previous studies (e.g., Duan et al., 2022; Wang et al., 2019), (H2) body appreciation could moderate the relations between BDD and MDD symptoms and photo-based behaviors.

4.2. Method

4.2.1. Participants

The sample comprised 553 participants: 394 women and 159 men. Participants' age ranged between 18 and 67 years (M = 25.97; SD = 8.27) and their education ranged between 5 and 22 years (M = 14.71; SD = 2.70). Half of the participants were students (52.3 %), while 24.1 % were full-time employed, 5.8 % were part-time employed, 5.2 % were fixed-time employed, 2.2 % were unemployed, .7 % were retired, .2 % were not able to work due to disability, and 1.3 % identified as housewives. Forty-six (8.3 %) participants did not identify in the previous categories. As far as marital status, 44.5 % were single, 40.3 % had a fiancé/were in a non-domestic relationship, 13 % were married/in a domestic relationship, and .7 % were separated/divorced. Eight (1.4 %) participants did not identify in the previous categories.

4.2.2. Procedure

Participants were recruited through personal acquaintances and social media platforms. Participants included in the study reported to 1) utilize Facebook, Instagram, Snapchat, or TikTok; 2) be active in self-photo sharing; and 3) be at least 18 years old. People interested in participating completed an online link that included the informed consent with information on the study's purposes, the voluntary nature of their participation, and the possibility to withdraw from the study without penalty. Then, participants filled in a sociodemographic schedule, including personal and social media-related information, and self-report questionnaires.

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Committee of the School of Psychology at the University of Padova (7E65AD16025355D433951AF77D77477D).

4.2.3. Measures

Demographics and social media use. A brief informative form was designed to assess personal information (i.e., gender, age, years of education, marital status, occupational status) alongside anamnestic details (i.e., current or past psychological or psychiatric issues, regular medication use). Participants were also asked to report the frequency of taking and sharing self-photos on social media on a Likert scale, ranging from 1 (never) to 10 (always). Moreover, individuals were asked to assess the frequency of use of several social media platforms, including Facebook, Instagram, Snapchat, and TikTok, using a Likert scale ranging from 1 (almost never) to 10 (always). If participants did not have an account or did not utilize a social media platform, they were asked to flag "I don't use it/I don't have an account".

Photo investment. The Photo Investment Scale (PIS; McLean et al., 2015; validation of the Italian version described in the Appendix) is a self-report measure aimed to assess photo investment, including efforts expended in choosing the right photo to post and concerns for other people's reactions to one's own photo. It consists of 8 items on a visual analogue scale (from 0 to 100) with opposing statements. The PIS demonstrated good internal consistency and temporal stability in its original form (McLean et al., 2015). In the current sample, the McDonald's ω for the PIS total score was .81.

Photo manipulation. The Photo Manipulation Scale – Revised (PMS-R; Italian version by Gioia et al., 2021) is an 8-item self-report measure designed to assess photo manipulation and photo editing prior to sharing self-photos on social media, utilizing a five-point Likert scale from 1 ("never") to 5 ("always"); higher scores indicate higher levels of photo manipulation. The PMS-R is composed of a total score and three subscales: photo filter, body image manipulation, and facial image

manipulation. The overall measure demonstrated adequate internal consistency, as well as each subscale, among Italian adolescent boys and girls (Gioia et al., 2021). For the purposes of the study, only the total score was considered. In the current sample, the McDonald's ω for the PMS-R total score was .74.

Body Dysmorphic symptoms. The Questionario sul Dismorfismo Corporeo (QDC; Cerea et al., 2017) is a self-report questionnaire made up of 40 items on a 7-point Likert scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The QDC assesses the presence of BDD symptoms through its components: appearance concerns; repetitive behaviors (i.e., mirror checking, excessive grooming, reassurance seeking); mental acts (i.e., comparing the "defective" body areas with the same body areas of other people); avoidance behaviors (i.e., avoidance of social situations); search for cosmetic and surgical procedures; suicidal thoughts due to appearance concerns. Higher scores indicate higher levels of BDD symptoms. The QDC demonstrated excellent internal consistency and good one-month test-retest reliability among women and men. In the current sample, the McDonald's ω for the QDC total score was .95.

Muscle Dysmorphia symptoms. The Muscle Dysmorphia Disorder Inventory (MDDI; Hildebrandt et al., 2004; Italian version by: Santarnecchi & Dèttore, 2012; Cerea et al., 2022) is a 13-item self-report questionnaire assessing symptoms typically described in MDD. Participants rate the degree to which they agree with each statement with a 5-point Likert scale, ranging from 1 ("never") to 5 ("always"). The MDDI enables to compute a total score and three subscales, which assess three core components of MDD: Drive for Size (i.e., thoughts and concerns about perceiving one's physical appearance as too small or insufficiently muscular); Appearance Intolerance (i.e., negative beliefs and emotions experienced in relation to body build, and body exposure avoidance); Functional Impairment (i.e., adherence to exercise routine, negative emotions due to routine interruption, and avoidance of social situations because of negative feelings and body-related preoccupations). The original version of the questionnaire showed adequate internal consistency values for each subscale

and for the total score (Hildebrandt et al., 2004). The Italian version of the MDDI showed adequate internal consistency for the subscales (except for the Appearance Intolerance subscale) and for the total score among men engaging in competitive bodybuilding, men engaging in non-competitive bodybuilding, and non-training men (Santarnecchi & Dèttore, 2012). Similarly, the total score and its subscales demonstrated good internal consistency among women engaging in non-competing bodybuilding and powerlifting and women engaging in physical activity (Cerea et al., 2022). For the purposes of the study, only the total score was considered for the analysis. In the current sample, the McDonald's ω for the MDDI total score was .78.

Body appreciation. The Body Appreciation Scale – 2 (BAS-2; Tylka & Wood-Barcalow, 2015b; Italian version by Casale et al., 2021) is a 10-item self-report questionnaire that assesses appreciation, respect, and love toward one's own body. Participants rate the agreement with each item using a 5-point Likert scale, ranging from 1 ("never") to 5 ("always"). As found for the original version (Tylka & Wood-Barcalow, 2015b), the Italian version of the BAS-2 showed excellent internal consistency and gender invariance (Casale et al., 2021). In the current sample, the McDonald's ω for the BAS-2 total score was .95.

General distress. The Depression Anxiety Stress Scale – 21 (DASS-21; Lovibond & Lovibond, 1995; Italian version by Bottesi et al., 2015) is a self-report questionnaire, which comprises 21 items on a 4-point Likert scale (from 0 = "did not apply to me at all" to 3 = "applied to me very much"). The DASS-21 assesses the presence of general distress experience in the last seven days through items that investigate mood, anxiety, and stress-related aspects. The Italian version of the DASS-21 showed adequate internal consistency, reliability, and construct validity (Bottesi et al., 2015). Even though this instrument comprises three scales and one total score, only the DASS-21 total score was considered for the analyses since it was recommended as the most reliable dimension for assessing general distress (Bottesi et al., 2015). In the current sample, the McDonald's ω for the DASS-21 total score was .90.

4.2.4. Statistical analyses

Firstly, descriptive analyses were carried out alongside Pearson's correlation between variables. Then, two hierarchical regression models were performed, utilizing the QDC and the MDDI total scores as dependent variables and age, gender (coded as a dummy variable; 1 = men; 2 = women), general distress (DASS-21 total score), photo-based behaviors (PIS and PMS-R total scores), and body appreciation (BAS-2 total score) as independent variables. Before performing the regression models, the QDC, the MDDI, the PIS, the PMS-R, and the BAS-2 total scores were normalized and transformed into z-scores to avoid multicollinearity while computing moderations among the independent variables entered in the regression models.

The first hierarchical regression model comprised the QDC total score as a dependent variable. Age, gender and the DASS-21 total score were entered as control variables in Step 1, while the PIS total score and the PMS-R total score were included in Step 2. Moreover, the BAS-2 total score was included in Step 3. Finally, the interaction between the PIS total score and the BAS-2 total score and the interaction between the PMS-R total score and the BAS-2 total score were included in Step 4. The second hierarchical regression model comprised the MDDI total score as a dependent variable. Gender and the DASS-21 total score were entered as control variables in Step 1, while the PIS and the PMS-R total scores were included in Step 2. The BAS-2 total score was entered in Step 3 and the interaction between the PIS total score and the BAS-2 total score and the interaction between the PMS-R total score and the BAS-2 total score were included in Step 4.

All analyses were performed using jamovi (version 2.3; The jamovi project, 2022).

4.3. Results

Descriptive correlations among variables are presented in Table 4.1.

Table 4.1 *Correlations between age, general distress, Body Dysmorphic Disorder symptoms, Muscle Dysmorphic Disorder symptoms, photo investment, photo manipulation, and body appreciation.*

	1	2	3	4	5	6	7
1. Age	1						
2. DASS-21 total score	-.11*	1					
3. QDC total score	-.16***	.50***	1				
4. MDDI total score	-.09*	.38***	.62***	1			
5. PIS total score	-.18***	.34***	.53***	.33***	1		
6. PMS-R total score	-.17***	.18***	.36***	.11**	.35***	1	
7. BAS 2 total score	-.002	-.47***	-.69***	-.52***	-.46***	-.19***	1

Note. *p < .05, **p < .01, ***p < .001; DASS-21 total score = Depression Anxiety Stress Scale – 21 total score; QDC total score = Questionario sul Dismorfismo Corporeo total score; MDDI total score = Muscle Dysmorphic Disorder Inventory total score; PIS = Photo Investment Scale; PMS-R = Photo Manipulation Scale - Revised; BAS-2 total score = Body Appreciation Scale – 2 total score.

The hierarchical regression model including BDD symptoms as a dependent variable is presented in Table 4.2. The model in Step 1 was statistically significant ($p < .001$): a younger age, self-identifying as a woman, and general distress emerged as significantly associated and, collectively, explained 29.7% of the variance in the QDC. In Step 2, the inclusion of the PIS and the PMS-R total scores significantly increased the variance explained in the model ($R^2_{change} = .138$; $F_{change} = 66.64$; $p < .001$): gender, general distress, investment and manipulation in photos emerged as significantly associated with the dependent variable. In Step 3, the BAS-2 total score was included ($F_{change} = 221.88$; $p < .001$). It emerged as significantly associated, alongside age, gender, the DASS-

21 total score, the PIS total score, and the PMS-R total score, and explained an additional 16.3% of the variance. Finally, in Step 4, each interaction between the photo-based behaviors and the BAS-2 total score was included (R^2_{change} = .004; F_{change} = 2.97; p = .05). Interestingly, the interaction between the PIS total score and the BAS-2 total score approached significance, alongside age, gender, the DASS-21 total score, the PIS total score, the PMS-R total, and the BAS-2 total score. Thus, a younger age, self-identifying as a woman, experiencing high levels of general distress, engaging in photo investment and manipulation, and reporting lower levels of body appreciation emerged as significantly associated with BDD symptoms. Moreover, body appreciation emerged as a potential moderator in the relation involving BDD symptoms as predicted by photo investment.

Table 4.2 *Results of Multiple Hierarchical Regression Analysis for the Prediction of Body Dysmorphic Disorder symptoms and the moderation of Body Appreciation.*

Predictors		B	ES	β	*T*	*p*	*F*	*df*
Step 1							77.4***	3,549
	Intercept	59.33	8.15		7.28	< .001		
	Age	-.49	.18	-.10	-2.66	.008		
	Gender	17.42	3.38	.19	5.15	< .001		
	DASS-21 total score	1.69	.13	.47	12.85	< .001		
Step 2							84.2***	5,547
	Intercept	73.74	7.46		9.88	< .001		
	Age	-.14	.17	-.03	-.85	.40		
	Gender	8.93	3.20	.10	2.79	.005		
	DASS-21 total score	1.25	.12	.34	10.04	< .001		
	PIS total score	14.49	1.54	.34	9.42	< .001		
	PMS-R total score	5.92	1.53	.14	3.89	< .001		
Step 3							135.4***	6,546
	Intercept	98.39	6.51		15.11	< .001		
	Age	-.41	.14	-.08	-2.86	.004		
	Gender	6.05	2.70	.06	2.24	.03		
	DASS-21 total score	.62	.11	.17	5.50	< .001		
	PIS total score	7.21	1.39	.17	5.20	< .001		
	PMS-R total score	5.85	1.29	.14	4.54	< .001		
	BAS-2 total score	-20.92	1.41	-.50	-14.90	< .001		
Step 4							103.1***	8,544
	Intercept	95.73	6.58		14.55	< .001		
	Age	-.39	.14	-.08	-2.75	.006		
	Gender	6.78	2.72	.07	2.50	.01		

DASS-21 total score	.61	.11	.17	5.39	< .001
PIS total score	7.28	1.39	.17	5.26	< .001
PMS-R total score	5.66	1.33	.13	4.26	< .001
BAS-2 total score	-20.80	1.40	-.49	-14.84	< .001
PIS x BAS-2	-2.39	1.23	-.06	-1.95	.05
PMS-R x BAS-2	-.81	1.27	-.02	-.64	.53

Note. DV: QDC total score = Questionario sul Dismorfismo Corporeo total score; Step 1: R^2 = .297; Step 2: R^2 = .435; Step 3: R^2 = .598; Step 4: R^2 = .602; *p < .05, **p < .01, ***p < .001; DASS-21 total score = Depression Anxiety Stress Scale – 21 total score; PIS = Photo Investment Scale; PMS-R = Photo Manipulation Scale - Revised; BAS-2 total score = Body Appreciation Scale – 2 total score.

The hierarchical regression model including MDD symptoms as a dependent variable is presented in Table 4.3. The model in Step 1 was statistically significant (p < .001): both gender (self-identifying as a man) and general distress emerged as significantly associated and, collectively, explained 19.6% of the variance in the MDDI total score. In Step 2, the PIS and the PMS-R total scores were included (F_{change} = 22.60; p < .001): gender, general distress, and photo investment emerged as significantly associated with the dependent variable, while photo manipulation did not. The variables added in this step explained an additional 6.1% of variance in the model. In Step 3, the BAS-2 total score was included (F_{change} = 112.90; p < .001). It emerged as significantly associated, alongside gender, the DASS-21 total score, and the PIS total score, and explained an additional 12.7% of the variance in the MDD total score. Finally, in Step 4, each interaction between the photo-based behaviors and the BAS-2 total score was included, but did not significantly increase the variance explained in the model (R^2_{change} = .002; F_{change} = 1.02; p = .36) and they did not emerge as significantly associated with the dependent variable. Thus, self-identifying as a man, experiencing higher levels of general distress, engaging in photo investment, and reporting lower levels of body appreciation were significantly associated with MDD symptoms; no moderation emerged.

Table 4.3 *Results of Multiple Hierarchical Regression Analysis for the Prediction of Muscle Dysmorphic Disorder symptoms and the moderation of Body Appreciation.*

Predictors		B	ES	β	*T*	*p*	*F*	*df*
Step 1							44.6***	3,549
	Intercept	25.41	1.41		18.04	< .001		
	Age	-.05	.03	-.06	-1.62	.11		
	Gender	-3.31	.58	-.22	-5.67	< .001		
	DASS-21 total score	.24	.02	.41	10.46	< .001		
Step 2							37.9***	5,547
	Intercept	26.82	1.38		29.41	< .001		
	Age	-.02	.03	-.02	-.53	.60		
	Gender	-4.09	.59	-.27	-6.92	< .001		
	DASS-21 total score	.19	.02	.32	8.21	< .001		
	PIS total score	1.71	.28	.25	6.00	< .001		
	PMS-R total score	.37	.28	.05	1.30	.19		
Step 3							56.9***	6,546
	Intercept	30.34	1.30		23.30	< .001		
	Age	-.05	.03	-.07	-1.90	.06		
	Gender	-4.50	.54	-.30	-8.33	< .001		
	DASS-21 total score	.10	.02	.17	4.41	< .001		
	PIS total score	.67	.28	.11	2.42	.02		
	PMS-R total score	.37	.26	.05	1.39	.17		
	BAS-2 total score	-2.98	.28	-.44	-10.63	< .001		
Step 4							42.9***	8,544
	Intercept	30.42	1.32		23.03	< .001		
	Age	-.05	.03	-.07	-1.88	.06		
	Gender	-4.56	.55	-.30	-8.36	< .001		
	DASS-21 total score	.10	.02	.17	4.36	< .001		
	PIS total score	.64	.28	.09	2.31	.02		
	PMS-R total score	.46	.27	.07	1.71	.09		
	BAS-2 total score	-2.97	.28	-.43	-10.54	< .001		
	PIS x BAS-2	-.19	.25	-.03	-.77	.44		
	PMS-R x BAS-2	.36	.26	.05	1.41	.16		

Note. DV: MDDI total score = Muscle Dysmorphic Disorder Inventory total score; Step 1: R^2 = .196; Step 2: R^2 = .257; Step 3: R^2 = .385; Step 4: R^2 = .387; *p < .05, **p < .01, ***p < .001; ; DASS-21 total score = Depression Anxiety Stress Scale – 21 total score; PIS = Photo Investment Scale; PMS-R = Photo Manipulation Scale - Revised; BAS-2 total score = Body Appreciation Scale – 2 total score.

4.4. Discussion

The current study presented two main aims: 1) to assess the possible predictive role of photo-based behaviors (i.e., photo investment and photo manipulation) on BDD and MDD symptoms and, consequently, their associations 2) to address the protective role and the moderation of body appreciation.

Step 2 of each regression model was utilized to address the first aim. Findings showed that BDD symptoms were significantly associated with self-identifying as a woman, experiencing higher levels of general distress, and higher levels of engagement in photo investment and manipulation. As for MDD, self-identifying as a man, higher levels of general distress, and being highly invested in self-photos seemed to be associated with higher levels of MDD symptoms (collectively, H1 was mostly supported).

Findings from Step 4 of regression models were examined for the second aim. Body appreciation demonstrated a potential moderator role only in the relation involving BDD and photo investment (H2 was partly supported).

Concerning the first aim, BDD symptoms also were related with self-identifying as a woman, general distress, photo investment, and photo manipulation. Furthermore, as suggested in a previous study (Cerea et al., 2018), women are indeed at higher risk of developing BDD symptoms than men. Moreover, the significant association with general distress aligns with the phenomenology of the symptoms characterizing this disorder (APA, 2022). Interestingly, both photo-based behaviors emerged as significantly associated with BDD symptoms. This finding corroborated previous similar studies that addressed dimensions of negative body image (e.g., body dissatisfaction: Lonergan et al., 2019). Spending time and effort choosing the right photo to post online, as well as the presence of worries about other users' reactions to it, might ultimately lead to an increase in BDD symptoms. These findings align with the Tripartite Influence model (Thompson et al., 1999) and with the bidirectional effect described within the uses and gratification theory (Rodgers, 2016). Indeed, while

using social media platforms, users might be extremely involved in taking care of their online self-presentation. During this process, they might be continuously exposed to their own appearance portrayed in the self-photo, that, in turn, would increase attention toward their perceived flaws and lead them to experience BDD symptoms.

Given the cross-sectional nature of the study and the analysis performed, it is also plausible that, given pre-existing concerns over perceived physical flaws and related behaviors, users could dedicate excessive time and effort to online self-presentation. Moreover, photo investment could assume the role of online safety behaviors: individuals would take excessive care of their self-photo to conceal perceived imperfections and, ultimately, seek reassurance from other users about their "normal" appearance from "likes" and positive comments. This explanation is corroborated by the uses and gratification theory applied to social media use and body image (Rodgers, 2016): social media platforms, especially appearance-focused ones, could be appealing to individuals with BDD symptoms since they enable them to control their self-presentation and to receive reassurance about their physical appearance. Similarly, Goffman's dramaturgical model may sustain this speculation (Goffman, 1959; Hogan, 2010): individuals characterized by BDD symptoms may engage more frequently in photo-based behaviors as a form of impression management technique, to provide an idealized version of themselves.

To note, age emerged as significantly associated with BDD symptoms after Step 2, in Step 3 and 4. This finding aligned with some studies that described how this psychological disorder was more likely to affect younger individuals (Veale, Gledhill, et al., 2016).

As for MDD symptoms, self-identifying as a man, general distress, and photo investment emerged as significantly associated, while photo manipulation did not. The association with self-identifying as a man could be explained by past literature describing a higher prevalence of MDD symptoms among males (Gorrasi et al., 2020; Tod et al., 2016). Moreover, general distress is indeed an aspect that could relate to the presence of MDD symptoms (APA, 2022). As for photo investment,

this novel finding enabled to hypothesize that this photo-based behavior could be involved in MDD symptoms, expanding previous literature (e.g., Lonergan et al., 2019; Modica, 2020). The underlying mechanism could be similar to the one previously described for BDD symptoms: spending time selecting the photo to share online and worrying about how it would be perceived by other users could ultimately lead to an excessive focus on physical appearance and to perceive the body build as insufficiently toned and muscular. In turn, this process could elicit dysfunctional eating behaviors and reliance on exercise to increase muscularity and decrease body fat. This explanation aligned with the Tripartite Influence Model (Schaefer et al., 2021; Thompson et al., 1999). However, given the cross-sectional nature of the study and the analysis performed, another interpretation of this finding may be that MDD symptoms could lead individuals to dedicate time and effort to online self-presentation. In doing so, people would be able to provide an idealized version of themselves (i.e., extreme muscularity) and receive reassurance for their concerns. This interpretation is well aligned with the uses and gratification theory applied to social media use and body image (Rodgers, 2016) and Goffman's dramaturgical model (Goffman, 1959; Hogan, 2010). Interestingly, photo manipulation did not emerge as significantly associated with MDD symptoms. A possible explanation could be that, to date, filters, editing apps, and editing software are mostly oriented toward "beautifying" the physical appearance (e.g., getting rid of pimples and modifying the texture of the skin) (Tiggemann, 2022), while they could be less suitable for modifying the muscularity of the body. However, these explanations remain hypothetical since the study did not assess cause-effect relations or beliefs about photo editing behaviors.

Taking these findings together, it is possible to hypothesize that, after controlling for possible confounding variables (i.e., gender and general distress), BDD/MDD symptoms could be predicted by photo investment. However, given the cross-sectional nature of the study, it is not entirely possible to exclude that the relation could be also inverted: photo-based behaviors could have been influenced by previous levels of BDD and MDD symptoms. This finding corroborated and expanded previous

studies (e.g., Lonergan et al., 2019): engaging in photo-based behaviors could lead individuals to being preoccupied with perceived physical flaws and to dysfunctional behaviors typically described in BDD and MDD since they increase attention to physical appearance and self-presentation. Vice versa, being concerned over perceived physical flaws and engaging in dysfunctional body-oriented behaviors typically described in BDD and MDD (e.g., control over calories, appearance comparisons, mirror checking, excessive exercise) could lead people to excessively focus on their appearance displayed in the self-photo, ultimately increasing time and effort put into choosing the right photo to post and the concern over its quality and how other users would react to it.

Concerning the second aim, body appreciation was found negatively associated with BDD and MDD symptoms. These findings corroborated the negative associations described between body appreciation and dimensions of negative body image (Linardon et al., 2022). Thus, increasing appreciation and respect toward the body could ultimately be beneficial in reducing the emphasis on physical appearance, body image concerns, and associated dysfunctional behaviors. However, given the cross-sectional nature of the study, it could be possible that being less characterized by BIDs symptoms would ultimately lead individuals in valuing their body, as well as appreciating its functionality and health, and not to focus only on its perceived physical flaws.

Finally, body appreciation was almost found as a moderator for the relation between BDD symptoms and photo investment only. Thus, we could speculate that the greater a person appreciate and respect the body, the weaker the relation between the two construct could get. A possible explanation could be that appreciating body features that are not only related to physical appearance would reduce its emphasis on the process of photo investment and, in turn, its influence on BDD symptoms. This interesting potential finding further could corroborate the protective role of body appreciation for individuals' well-being (Linardon et al., 2022): being able to appreciate one's body could ultimately reduce the putative negative association of photo investment on BDD symptoms. Surprisingly, this effect was not found for MDD symptoms. A possible explanation of this null finding

could be that MDD symptoms are mostly characterized by excessive reliance on physical exercising and its appearance-related outcomes (Martenstyn et al., 2023). Hence, it is possible to hypothesize that it would be more influential to tackle this dysfunctional behavior first, reframing physical exercising and its outcomes in a more functional way.

Limitations and Future Directions

This study presented several limitations that require to be addressed. First, the study design is cross-sectional: despite aiming on assessing the predictive role of photo-based behaviors, the direction of the relation remains highly speculative and requires further examination. Second, the moderation involving body appreciation in the relation between BDD symptoms and photo investment only approached significance. Hence, further studies are required. Third, information about physical activities currently practiced, that could be informative for MDD symptoms, were not collected. Thus, the relation between MDD symptoms and photo-based behaviors should be later tested in a sample of individuals physically active. Fourth, photo-based behaviors were not assessed objectively to understand whether self-reported behaviors could match current behaviors observed in natural settings.

Future studies should consider utilizing a different design (e.g., longitudinal design) to test the possible cause-effect relation between BDD/MDD symptoms and engagement in photo-based behaviors. Moreover, including patients with a diagnosis of BDD/MDD would allow us to identify whether these photo-based behaviors are reported also at clinical levels. Other dimensions of positive body image should be considered (e.g., broad conceptualization of beauty) since they could have a more relevant role when considering photo-based behaviors. Moreover, an examination of feedback received on self-photos (e.g., likes, comments) would shed light on their real importance while being involved in photo-based behaviors.

Conclusions

The current study found that BDD and MDD symptoms are associated with photo investment and the relation could be bidirectional. Moreover, BDD symptoms could have a bidirectional relation with photo manipulation as well, while MDD symptoms could not. Finally, body appreciation was demonstrated to be partially a protective factor and potentially moderated only the relation involving photo investment being a possible predictor of BDD symptoms.

5. Chapter 5 - Associations among photo-based behaviors, BDD/MDD symptoms, consideration of cosmetic surgery, and exercise addiction and analysis of the moderation of positive body image.

This chapter was adapted from Mancin, P., Cerea, S., Bottesi, G., Spoto, A., & Ghisi, M. (In preparation). *See it, feel it, fix it. Examining the relations involving photo-based behaviors, Body Image Disorders symptoms, and body modification behaviors.*

5.1. Rational of the study

As discussed in the previous Chapter (Chapter 4), BDD and MDD symptoms could be predicted by and are significantly associated with both photo-based behaviors. However, further studies are required to address how photo-based behaviors are involved in these disorders. Relatedly, it would be useful to address other core features of BDD and MDD, namely attitude toward cosmetic surgery and exercise addiction symptoms. Providing these novel insights would enable scholars to have a deeper understanding of the mechanism underlying the role of photo-based behaviors in these disorders.

Moreover, it emerged that body appreciation could have a protective role in the relation between BDD symptoms and photo investment dimensions. However, it only approached significance; hence, this finding should be further explored with a larger sample size. However, body appreciation did not moderate any relations involving MDD symptoms neither its effect approached significance. As suggested in the previous Chapter, it could be of relevance to focus on a positive body image dimension that would be more closely related to physical activity since MDD symptoms involve excessive physical exercising and attention to the appearance-related effects (Martenstyn et al., 2023; Pope et al., 1997). Accordingly, body functionality appreciation could be of relevance: Being able to appreciate the body for what is capable of doing would provide a more functional interpretation of physical exercising, celebrating natural body movement and functions (Alleva &

Tylka, 2021). Moreover, it might increase attention toward the task (Soulliard et al., 2019) during physical activity, distancing from appearance-related elements.

The current study: aims and hypotheses

The current study has two aims.

First aim: to address the associations between photo-based behaviors and the consideration of engaging in cosmetic surgery and exercise addiction symptoms and to underscore if, respectively, BDD and MDD symptoms could be mediators. Concerning the associations among BDD symptoms, photo-based behaviors, and consideration of cosmetic surgery, (H1) photo manipulation could have a direct and indirect effect on consideration of cosmetic surgery, mediated by BDD symptoms, as suggested by a previous similar study (Wang et al., 2021). However, due to a lack of studies addressing photo investment, (RQ1) would photo investment have a direct and/or indirect association with consideration of cosmetic surgery through BDD symptoms?

Similarly, no clear hypothesis could be made for photo investment, MDD symptoms, and exercise addiction symptoms: (RQ2) Would photo investment have a direct and/or indirect association with exercise addiction through MDD symptoms? To reach a clearer understanding of these relations, the latter model was tested only among individuals who are physically active or who engage in any form of physical activity.

Second aim: to examine the moderating role of body appreciation in the relation between photo investment and BDD symptoms and to explore the putative moderating role of body functionality appreciation in the relation between photo investment and MDD symptoms.

According to findings from the previous Chapter (Chapter 4), (H2a) body appreciation could be a moderator in the relation between photo investment and BDD symptoms and (H2b) body functionality appreciation could moderate the relation between photo investment and MDD symptoms.

5.2. Method

5.2.1. Participants

Main sample. The main sample comprised 1023 participants: they reported to post at least once a year a photo that portrays themselves, either realized by themselves or by another person, portraying themselves alone or with other people. They were all cisgender people since they reported a gender that would correspond to their sex attributed at birth: 610 women and 413 men. Their age ranged from 18 to 76 years (M = 38.3, SD = 13.28) and their education from 5 to 27 years (M = 14.8, SD = 3.08). Concerning marital status, 27.6% were single, 22.2% had a fiancé/were in a non-domestic relationship, 42.9% were married/in a domestic relationship, 5% were separated/divorced, and .9% were widowed. Fifteen (1.5%) participants did not identify in the previous categories. Concerning occupational status, half of the sample comprised individuals with a full-time job (50%), while 24.2% were students, 7% were part-time employed, 4.8% were fixed-time employed, 1.8% were unemployed, 2.8% were retired, and 3% identified as housewives. Sixty-five (6.4%) participants did not identify in the previous categories.

Physically active sample. In the main sample, 639 participants reported to be physically active (range 1 - 7 times of practice a week; M = 3.01; SD = 1.36): 347 women and 292 men. Their age ranged from 18 to 75 years (M = 37.9, SD = 12.88) and their education from 6 to 27 years (M = 15.1, SD = 2.93). Concerning marital status, 29% were single, 22.4% had a fiancé/were in a non-domestic relationship, 41.8% were married/in a domestic relationship, 4.7% were separated/divorced, and .5% were widowed. Eleven (1.7%) participants did not identify in the previous categories. Concerning occupational status, as for the main sample, half of the sample comprised individuals with a full-time job (52.4%), while 23% were students, 6.4% were part-time employed, 5.3% were fixed-time employed, 1.3% were unemployed, 2.8% were retired, and 1.7% identified as housewives. Forty-five (7.1%) participants did not identify in the previous categories.

5.2.2. Measures

Demographics. Participants completed a brief informative form, assessing personal information (i.e., sex assigned at birth, gender, age, years of education, marital status, occupational status, the practice of any physical activity) and anamnestic details (i.e., current or past psychological or psychiatric issues, regular medication use).

Social media use. Participants were asked to indicate on which social media platform they share their self-photos, choosing from a list that included Facebook, Instagram, Snapchat, and TikTok. If participants did not share any self-photos on social media, they were provided with the option "I don't share self-photos in any way". Later, these participants were excluded from the study. Moreover, they were also asked to report the frequency of sharing photos online (1) portraying only themselves and realized by themselves, (2) portraying themselves with other people and realized by themselves, and (3) portraying only themselves and realized by another person. Responded were provided with 5 options (0 = "never", 1 = "once a year", 2 = "once a month", 3 = "once a week", 4 = "once a day", 5 = "more than once a day").

Photo investment. The Photo Investment Scale (PIS; McLean et al., 2015; Italian version in the Appendix) is a self-report measure consisting of 8 items on a visual analogue scale, ranging from 0 to 100, with opposing statements. It assesses efforts expended in choosing the right photo to post and concerns for other people's reactions to one's photo. The PIS demonstrated good internal consistency and temporal stability in its original form (McLean et al., 2015) and in its Italian translation, which highlighted a single-factor structure and good convergent validity. In the main sample, the McDonald's ω for the PIS total score was .81, as well as in the physically active sample.

Photo manipulation. The Photo Manipulation Scale - Revised (PMS-R; Italian version by Gioia et al., 2021) is a self-report measure made up of 8 items rated on a 5-point Likert scale, from 1 ("never") to 5 ("always"). It assesses photo manipulation and photo editing prior to sharing self-photos on social media, utilizing a five-point Likert higher scores indicate higher levels of photo manipulation. The PMS-R is composed of three subscales: photo filter use, body image manipulation,

and facial image manipulation. The PMS-R demonstrated adequate internal consistency for the total score and each subscale among Italian adolescent boys and girls (Gioia et al., 2021). For the purposes of the study, only the total score was considered. In the current sample, the McDonald's ω for the PMS-R total score was .80, while in the physically active sample was .78.

Body Dysmorphic symptoms. The Italian - Body Image Concern Inventory (I-BICI; Littleton et al., 2005; Italian version by Luca et al., 2011) is a self-report questionnaire assessing dysmorphic concerns. It consists of 19 items evaluating preoccupation about the perceived flaw, checking and camouflaging behaviors, reassurance seeking, and social avoidance. Participants rate the extent to which the situations described in each item occur on a 5-point Likert scale, ranging from 1 ("never") to 5 ("always"). The I-BICI enables to compute a total score and two subscales: dysmorphic symptoms (i.e., dissatisfaction regarding physical appearance, checking and camouflaging a perceived defect) and symptom interference (i.e., interference with functioning due to appearance concerns). As found for the original version of the questionnaire, the I-BICI demonstrated good internal consistency indices values both for the total score and each subscale (total score: Cronbach's α = .91; dysmorphic concern: Cronbach's α = .90; symptom interference: Cronbach's α = .79), as well as convergent and discriminant validity (Luca et al., 2011). In the current sample, the McDonald's ω for the I-BICI total score was .94.

Consideration of cosmetic surgery. The Acceptance of Cosmetic Surgery Scale (ACSS; Henderson-King & Henderson-King, 2005; Italian version by Stefanile et al., 2014) is a 15-item self-report measure comprised of 13 items and a 7-point Likert scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The ACSS enables to compute a total score and three subscales: the Intrapersonal subscale, assessing participants' beliefs about the intrapsychic benefits of surgery in terms of increased satisfaction with one's appearance or improvement of self-image; the Social subscale, assessing social motivations for the decision to have cosmetic surgery, and the Consider subscale, assessing the likelihood that the respondent would consider having cosmetic surgery. As

found for the original version (Henderson-King & Henderson-King, 2005), the Italian version of the questionnaire (Stefanile et al., 2014), validated in a sample of women only, demonstrated an excellent internal consistency (Interpersonal subscale: Cronbach's α = .82; Social subscale: Cronbach's α = .81; Consider subscale: Cronbach's α = .87; total score: Cronbach's α = .91). For the analyses, only the subscale Consider was selected and its McDonald's ω was .94.

Body appreciation. The Body Appreciation Scale - 2 (BAS-2; Tylka & Wood-Barcalow, 2015b; Italian version by Casale et al., 2021) is a 10-item self-report questionnaire that assesses appreciation, respect, and love toward one's own body. Participants rate the agreement with each item using a 5-point Likert scale, ranging from 1 ("never") to 5 ("always"). As found for the original version (Tylka & Wood-Barcalow, 2015b), the Italian version of the BAS-2 showed excellent internal consistency and gender invariance (Casale et al., 2021). In the current sample, the McDonald's ω for the BAS-2 total score was .94.

Muscle Dysmorphic symptoms. The Muscle Dysmorphia Disorder Inventory (MDDI; Hildebrandt et al., 2004; Italian version by: Santarnecchi & Dèttore, 2012; Cerea et al., 2022) is a self-report measure comprised of 13 items and a 5-point Likert scale, ranging from 1 (never) to 5 (always). Participants rate the extent to which they agree with items related to symptoms typically described in MD. The MDDI enables to compute a total score and three subscales: Drive for Size (i.e., thoughts and concerns about perceiving one's physical appearance as too small or insufficiently muscular); Appearance Intolerance (i.e., negative beliefs and emotions experienced in relation to body build, and body exposure avoidance); Functional Impairment (i.e., adherence to exercise routine, negative emotions due to routine interruption, and avoidance of social situations because of negative feelings and body-related preoccupations). The original version of the questionnaire demonstrated adequate internal consistency values for the total score and each subscale (Hildebrandt et al., 2004), as well as the Italian version, that demonstrated good internal consistency indices (except for the Appearance Intolerance subscale) in a sample comprising men engaging in competitive

bodybuilder, men engaging non-competitive bodybuilder, and non-training men (Santarnecchi & Dèttore; 2012). Adequate internal consistency was highlighted also in a sample comprising women engaging in non-competing bodybuilding and powerlifting and women engaging in physical activity (Cerea et al., 2022). For the purposes of the study, only the total score was considered for the analysis. In the physically active sample, the McDonald's ω for the MDDI total score was .80.

Exercise addiction. The Exercise Addiction Inventory (EAI; Terry et al., 2004; Italian version by Gori et al., 2021) is a self-report measure used as a screening tool for assessing exercise addiction. It is made up of 6 items investigating the presence and severity of symptoms typically described in behavioral addictions (i.e., salience, mood modification, tolerance, withdrawal symptoms, conflict, relapse) in relation to physical exercise. Participants are asked to rate the extent to which they agree with each item through a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Both the original version (Terry et al., 2004) and the Italian version (Gori et al., 2021) of the scale showed a good internal consistency in a sample of regular exercisers (McDonald's ω = 0.72). In the physically active sample, the McDonald's ω for the EAI total score was .75.

Body functionality appreciation. The Functionality Appreciation Scale (FAS; Alleva et al., 2017; Italian version by Cerea, Todd, et al., 2021) is a 7-item self-report measure investigating appreciation, respect, and awareness for body functionalities and capabilities. Participants rate the extent to which they agree with each item through a 5-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). As found for the original version (Alleva et al., 2017), the Italian version of the FAS demonstrated adequate internal consistency (McDonald's ω = .89, 95 % CI = .87, .91), gender invariance, and test-retest reliability measures (Cerea, Todd, et al., 2021). In the physically active sample, the McDonald's ω for the FAS total score was .90.

5.2.3. Procedure

Participants were recruited through personal acquaintances and social media platforms. To be included in the study, participants needed to 1) be active in self-photo sharing on Facebook,

Instagram, Snapchat, or TikTok (i.e., report to share self-photos on one of these appearance-focused social media platforms and report to post at least one self-photo per year); and 2) be at least 18 years old. An online link was provided to every interested participant. The link included an informed consent with information about the study's purposes, the voluntary nature of the participation, and the possibility to withdraw from the study without penalty. Following this, participants were provided with a sociodemographic schedule, assessing personal and social media-related information, and the questionnaires.

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Committee of the School of Psychology at the University of Padova (protocol number: 4834).

5.2.4. Statistical analyses

As recommended by Raykov and Marcoulides (2006), a minimum sample size would be at least 10 times the number of free model parameters. Based on this recommendation, the number of free parameters (first model: $n = 15$; second model: $n = 9$), including direct effects, indirect effects, and moderation in the proposed model, required a minimum sample size of 150 participants for the first path analysis and 90 for the second path analysis. Then, descriptive analyses were carried out.

Two distinct path analyses including the selected variables have been. The first path analysis was conducted with the main sample. For this analysis, the PIS and the PMS-R total scores were included as exogenous variables in the model, while the I-BICI total score and the subscale Consider of the ACSS as endogenous variables. The BAS-2 total score and the interaction between the BAS-2 total score and the PIS total score were included among the exogenous variables for evaluating the moderation. Furthermore, a second path analysis was conducted utilizing the physically active sample. The PIS total score was included as an exogenous variable in the model, while the MDDI and the EAI total scores as endogenous variables. The PMS-R total score was not included according to the findings displayed in Chapter 4. The FAS total score and the interaction between the FAS total score and the PIS total score were included among the exogenous variables to test the moderation. In

both models, every variable was standardized (*z*-score) and the estimation method chosen was Maximum Likelihood.

To assess factor structure adequacy, the following fit indices were considered: the model chi-square (χ^2), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and its 90% Confidence Interval [CI], and the Standardized Root Mean Square Residual (SRMR). The CFI should show values ≥ .95, the TLI should show values ≥ .95, the RMSEA should show values < .06, and the SRMR should show values < .09 to assess a good fit for the model (Hu & Bentler, 1999).

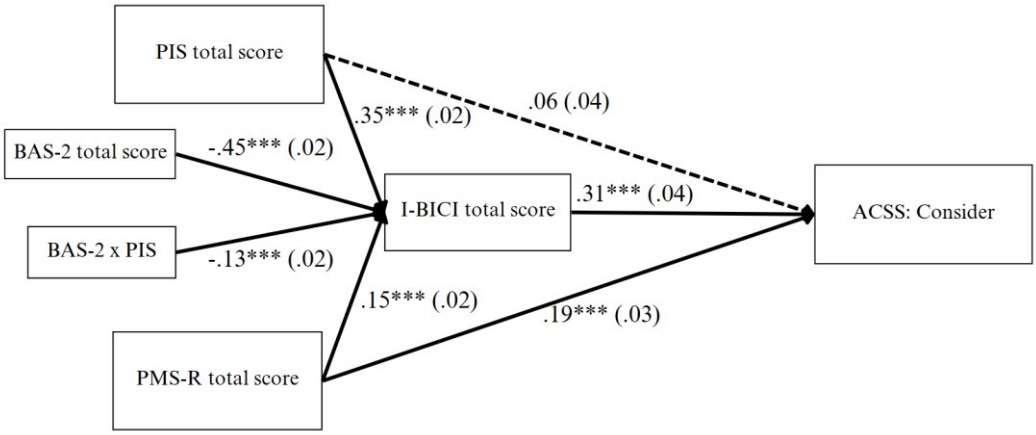
All analyses were performed using jamovi (version 2.3; The jamovi project, 2022).

5.3. Results

Associations among photo-based behaviors, BDD symptoms, and consideration of cosmetic surgery, and moderation of body appreciation

Fit indices of the model presented in Figure 5.1 were adequate: model $\chi^2_{(2)} = 2.24$; $p = .33$; CFI = .99; TLI = .99; RMSEA = .01 (90% CI: <.001, .06); SRMR = .007. Each path was significant except for the direct association between the PIS total score and the Consider subscale of the ACSS that emerged as non-significant ($p = .08$). The moderation of the BAS-2 total score emerged as significant. The model explained 56.8% of the variance in the I-BICI total score and 21.7% of the variance in the Consider subscale of the ACSS. As for indirect effects, the PIS total score and the PMS-R total score demonstrated a significant indirect effect on the Consider subscale of the ACSS, mediated by the I-BICI total score (PIS total score: $\beta = .11$; SE = .01; $p < .001$; PMS-R total score: $\beta = .05$; SE = .01; $p < .001$).

Figure 6.1. *Path analysis including standard coefficient (β) and standard errors for the associations among photo investment and manipulation, BDD symptoms, and consideration of cosmetic surgery.*



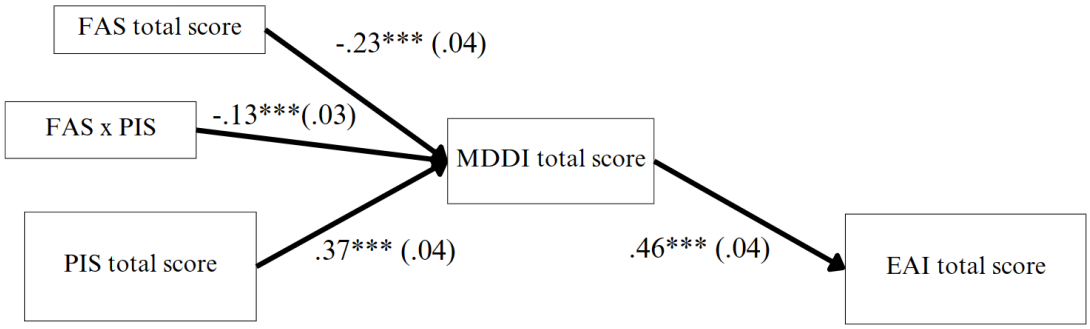
Note. *$p < .05$, **$p < .01$, ***$p < .001$; PIS total score = Photo Investment Scale total score; BAS-2 total score: Body Appreciation Scale 2 total score; PMS-R total score = Photo Manipulation Scale – Revised total score; I-BICI total score = Italian – Body Image Concern Inventory total score; ACSS: Consider = Consider subscale of the Acceptance of Cosmetic Surgery Scale.

Associations among photo-based behaviors, MDD symptoms, and exercise addiction symptoms, and moderation of body functionality appreciation

First, the hypothesized model was computed. However, fit indices were inadequate (model $\chi^2_{(2)} = 14.7$; $p < .001$; CFI = .962; TLI = .867; RMSEA = .10 [90% CI: .06, .15]; SRMR = .028). After examining the path, the direct link between the PIS total score and the EAI total score was identified as non-significant ($\beta = -.01$; SE = .04; $p = .71$) and removed to test whether the fit of the model would improve. Indeed, fit indices were mostly adequate, even if the TLI and the RMSEA were problematic still: model $\chi^2_{(3)} = 14.8$; $p = .002$; CFI = .965; TLI = .917; RMSEA = .079 (90% CI: .042, .120); SRMR = .029. As presented in Figure 6.2, each path was significant. The FAS total score emerged

as a moderator in the relation between the PIS total score and the MDDI total score: higher levels of appreciation toward body functionality are associated with less strength in the relation. The model explained 23.4% of the variance in the MDDI total score and 21.6% of the variance in the EAI total score. As for indirect effects, the PIS total score demonstrated a significant indirect effect on the EAI total score, mediated by the MDDI total score (β = .17; SE = .02; p < .001).

Figure 6.2. *Path analysis including standard coefficient (β) and standard errors for the associations among photo investment, MDD symptoms, and exercise addiction.*



Note. *p < .05, **p < .01, ***p < .001; PIS total score = Photo Investment Scale total score; FAS total score = Functionality Appreciation Scale total score; MDDI total score = Muscle Dysmorphic Inventory total score; EAI total score = Exercise Addiction Inventory total score.

5.4. Discussion

The current study aimed to: 1) assess the relations involving photo investment, photo manipulation, and consideration of cosmetic surgery, including the mediation of BDD symptoms, and the relations involving photo investment and exercise addiction, including the mediation of MDD symptoms; 2) examine the moderation role of body and body functionality appreciation.

Current findings demonstrated that photo investment was indirectly associated with consideration of cosmetic surgery through BDD symptoms (RQ1), while photo manipulation demonstrated both a direct and an indirect association (H1 supported). Moreover, photo investment demonstrated an indirect association with exercise addiction symptoms through MDD symptoms (RQ2). As for the second aim, the moderating role of body appreciation in the relation between photo investment and BDD symptoms was replicated, while body functionality appreciation was demonstrated to moderate the relation between photo investment and MDD symptoms (H2a and H2b supported).

The suggested model including photo-based behaviors (i.e., photo investment and photo manipulation), BDD symptoms, and consideration to be involved in cosmetic surgery in the future was supported. Photo investment and photo manipulation demonstrated a direct association with BDD symptoms, as supported by findings of Chapter 4. Moreover, photo investment demonstrated only an indirect association with consideration of cosmetic surgery, mediated by BDD symptoms. Thus, spending time and effort on online self-presentation could ultimately lead social media users to be more interested in engaging in cosmetic surgery in the future, possibly to cope with dysmorphic concerns and related behaviors. Photo investment could contribute to maintain the mechanism underlying BDD symptoms: it could enhance the importance of being physically attractive to appear socially acceptable. In turn, people with BDD symptoms would consider cosmetic surgery as a reliable strategy to modify their appearance (Bowyer et al., 2016). This explanation is supported by the Tripartite Influence Model (Thompson et al., 1999) and, partly, by the bidirectional implications of the uses and gratification theory (Rodgers, 2016): engagement in social media use and in self-presentation practices could induce extensive exposure to one's own self-photo, which could trigger excessive emphasis on physical appearance and BDD symptoms.

Concerning photo manipulation, it showed an association with consideration of cosmetic surgery partially mediated by BDD symptoms. Thus, individuals involved in self-photo enhancement

may be motivated to undergo cosmetic surgery through two mechanisms: to cope with BDD symptoms (the extreme negative body image pathway) and to improve their physical appearance (the "appearance-improvement" pathway). According to the first pathway, photo manipulation could foster the achievement of an ideal self, enhancing a discrepancy between the ideal and real, "offline" physical appearance that the individual may urge to reduce. Such discrepancy could enhance body dissatisfaction (Cash & Szymanski, 1995), BDD symptoms, and involvement in extreme strategies to modify the appearance. This finding well aligned with previous ones (Sun, 2021; Wang et al., 2021) and underscored the hypothetical negative influence of photo manipulation in the maintenance of BDD. The second pathway could relate to the fact that photo manipulation would induce social media users the need to improve their physical appearance to appear more appealing. Hence, selfie editing may lead users to believe that their appearance can be enhanced through cosmetic alterations, even when they are not troubled by concerns about perceived flaws. Another hypothesis could be that individuals edit their selfies not because they are dissatisfied with their appearance, but because they want to look better than others or, at least, resemble others based on social comparison (Chae, 2017); in turn, they would decide to modify their appearance also offline. As for photo investment, the extreme emphasis on appearance that might be elicited by photo manipulation could be triggered by social media use and online self-presentation, as supported by the Tripartite Influence Model (Thompson et al., 1999) and the uses and gratification theory (Rodgers, 2016).

The suggested model including photo investment, MDD symptoms, and exercise addiction symptoms was partially supported. The association between photo investment and MDD symptoms, presented in Chapter 4, was replicated also among physically active individuals. Moreover, photo investment did not demonstrate a direct association with exercise addiction symptoms, which required to be excluded from the model, but it demonstrated an indirect effect mediated by MDD symptoms. Thus, excessive concerns over the quality of the photo and other people's reactions to it would lead social media users engaging in physical activities to be excessively dedicated to it, due to MDD

symptoms. As described for BDD, photo investment emerged as a putative detrimental factor for MDD since it could foster a dysfunctional attitude toward physical activity. The underlying mechanism could be the same as previously presented: photo investment may increase attention toward the physical appearance portrayed in the self-photo (Tripartite Influence Model: Thompson et al., 1999; uses and gratification theory: Rodgers, 2016).

Body appreciation emerged as a significant moderator in the relation between photo investment and BDD symptoms, provided support for the initial findings previously described (Chapter 4). Furthermore, body functionality appreciation demonstrated a similar effect in the relation between photo investment and MDD symptoms in physically active social media users. Thus, being able to appreciate what the body is able to do and appreciating its natural and spontaneous capabilities would reduce the importance of physical appearance and concerns about muscularity. Moreover, it might enable social media users to consider physical activity as functional to the body's health, instead of a means to increase muscle build. In doing so, it might reduce the detrimental effect of photo investment, which could be involved in a process that fosters preoccupations with muscle build. This finding corroborates the importance of interventions focused on body functionality appreciation to improve overall body image (Alleva & Tylka, 2021): they would be beneficial also in reducing the influence of social media pressures in the case of MDD symptoms.

Limitations and Future Directions

The findings need to be considered within several limitations. First, even if the models are based on reliable, extant theories and findings, the cross-sectional design of the study limited the discussion of the findings: associations among variables were described and the possible causality of the association is merely speculative. Then, participants in the physically active group were not controlled or divided according to the type of physical activity performed nor their level. Thus, future studies should consider including a selected sample of athletes practicing, for example, sports at high risk for MDD symptoms (e.g., bodybuilding; Longobardi et al., 2017). Finally, the fit indices of the

model including photo investment, MDD symptoms, and exercise addiction still presented some issues. Hence, the model should be further tested in other samples to replicate its findings and ascertain its accuracy.

Future studies should employ a clinical sample and aim to replicate these findings with individuals who received a diagnosis of BDD or MDD to corroborate the role of photo-based behaviors in these psychological disorders. Moreover, a longitudinal design would allow to clarify the direction of the associations. Then, a randomized controlled trial, suggesting an intervention aimed at improving positive body image (e.g., body appreciation and body functionality appreciation) would enable to further address the protective role of this construct against the dysfunctional effect of photo-based behaviors on body image.

Conclusions

The current study highlighted that photo-based behaviors (i.e., photo investment and photo manipulation) are associated with potentially dysfunctional body-related behaviors, namely consideration of cosmetic surgery and exercise addiction symptoms. These associations were mediated by higher levels of BDD and MDD symptoms. Positive body image dimensions could have a protective role in reducing the strength of the association between photo investment and both BDD and MDD symptoms.

6. Chapter 6 - The associations between self-reported frequency of following Instagram beauty and body positive accounts and content, BDD symptoms, and positive body image dimensions.

This chapter was adapted from Mancin, P., Cerea, S., Bottesi, G., & Ghisi, M. (2023). Instagram use and negative and positive body image: the relationship with following accounts and content and filter use among female students. *Current Psychology.* https://doi.org/10.1007/s12144-023-05204-w

6.1. Rationale of the study

Instagram, a widely utilized appearance-focused social media, provides users with a wide array of appearance-focused content. Due to the highly visual nature of these Instagram features, scholars recognized their negative role on body image (Holland & Tiggemann, 2016).

Concerning Instagram content, few studies examined beauty (i.e., make-up or fashion) accounts and content on Instagram. Recently, exposure to this content was associated with BDD symptoms (Seekis & Barker, 2022); the latter effect emerged to be mediated by appearance comparison and internalization of beauty ideals (Seekis & Barker, 2022). This study addressed social media in general. Thus, there could be relevant differences when considering beauty content available on Instagram only since it is considered an appearance-focused social media (Griffiths, Murray, et al., 2018). Moreover, few studies considered body positive images and their relation with body image dimensions. Exposure to body positive images emerged to be related to increased body satisfaction (e.g., Cohen, Fardouly, et al., 2019; Nelson et al., 2022); nevertheless, a detrimental effect was found too (e.g., Vendemia et al., 2021). However, to my knowledge, no studies addressed BDD symptoms and body functionality appreciation. Moreover, this negative effect could be mediated by appearance comparison and internalization of beauty ideals, as for other types of content. Given few, mixed results on this topic, further studies are required.

The current study: aims and hypotheses

The present study aimed to further examine the relation between Instagram use and negative and positive body image in a sample of female undergraduate students. Associations between self-reported frequency of following Instagram beauty and body positive accounts and content on body image disturbances (i.e., BDD symptoms) and positive body image dimensions (i.e., body and body functionality appreciation) were investigated. Moreover, these associations were tested investigating whether appearance comparison and internalization of an ideal of general attractiveness would emerge as possible mediators.

Thus, (H1a) self-reported frequency of following beauty-related accounts and content on Instagram could have a relation with high levels of BDD symptoms, mediated by appearance comparison with idealized images published on Instagram and striving for an overall attractive appearance.

Moreover, as described in a similar study (Barron et al., 2021), (H1b) self-reported frequency of following beauty-related accounts and content could be negatively associated with positive body image dimensions. This association could be mediated by appearance comparison and internalization of an ideal of general attractiveness.

Conversely, given mixed findings (e.g., Cohen, Fardouly, et al., 2019; Nelson et al., 2022; Vendemia et al., 2021), (H1c) self-reported frequency of following body positive accounts and content could be either positively or negatively associated with BDD symptoms and positive body image dimensions. This effect could be mediated by appearance comparison and internalization of an ideal of general attractiveness.

6.2. Method

6.2.1. Participants

The sample included 149 female students. The mean age of the sample was 21.58 (SD = 1.44; range 19 – 27 years) and the mean years of education was 15.01 (SD = 1.52; range 13 – 18 years). Pertaining to relationship status, 79 participants (53%) were single, while 70 (47%) had a fiancé/were in a non-domestic relationship.

6.2.2. Measures

Demographics. All participants completed a socio-demographic schedule including information about sex, age, education, relational and occupational status, as well as about the presence of any current or past medical or psychological disorder.

Instagram use. Several questions related to Instagram use were asked. First, participants were asked if they had an Instagram account. Then, participants reported how frequently they followed accounts and content related to beauty (e.g., fashion and make-up) and Body Positive (i.e., accounts focused on acceptance of one's own body) using a Likert scale ranging from 0 ("never") to 10 ("always").

Instagram Appearance Comparison. The Instagram Appearance Comparison Scale (IACS; Di Gesto et al., 2020) is a self-report questionnaire made up of 15 items on a 5-point Likert scale, ranging from 1 ("never") to 5 ("very often"). The IACS assesses the frequency and direction of social comparison performed on Instagram and showed a two-factor structure with excellent internal consistency: Cronbach's α was .94 for the Frequency subscale and .79 for the Direction subscale. According to previous papers (Di Gesto et al., 2020; 2021), a total score for the IACS was computed to assess the general tendency of engaging in appearance comparison on Instagram, including frequency and negative effects of appearance comparison. In this sample, the overall scale demonstrated a McDonald's ω of .95 (95% CI = .94, .96).

BDD symptoms. The Questionario sul Dismorfismo Corporeo (QDC; Cerea et al., 2017) is a self-report questionnaire made up of 40 items on a 7-point Likert scale, ranging from 1 ("strongly

disagree") to 7 ("strongly agree"). The QDC assesses the presence of BDD symptoms through its components: appearance concerns; repetitive behaviors (i.e., mirror checking, excessive grooming, reassurance seeking); mental acts (i.e., comparing the "defective" body areas with the same body areas of other people); avoidance behaviors (i.e., avoidance of social situations); search for cosmetic and surgical procedures; suicidal thoughts due to appearance concerns. Higher scores indicate higher levels of BDD symptoms. An excellent internal consistency was described ($\alpha = .95$), as well as a high 1-month test-retest reliability ($r = .91$). In the current sample, an excellent internal consistency has been found (McDonald's $\omega = .94$, 95% CI = .93, .95).

Functionality Appreciation. The Functionality Appreciation Scale (FAS; Alleva et al., 2017; Italian version by Cerea et al. 2021) is a self-report questionnaire made up of 7 items on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Higher scores indicate an appreciation of body capabilities (e.g., bodily senses and abilities). The Italian version of the FAS showed an adequate internal consistency in both women and men (McDonald's $\omega = .89$, 95 % CI = .87, .91; McDonald's $\omega = .89$, 95 % CI = .88, .91, respectively), demonstrated invariance across gender, and achieved test-retest reliability (Cerea et al. 2021). In the current sample, the FAS showed an adequate internal consistency (McDonald's $\omega = .88$, 95% CI = .85, .91).

Body Appreciation. The Body Appreciation Scale - 2 (BAS-2; Tylka & Wood-Barcalow, 2015b; Italian version by Casale et al., 2021) is a 10-item self-report questionnaire that assesses appreciation, respect, and love toward one's own body. Participants rate the extent to which they agree with each item using a 5-point Likert scale, from 1 ("never") to 5 ("always"). Higher scores indicate appreciation and love toward one's own body. The Italian version of the BAS-2 showed excellent internal consistency (Cronbach's α was .93 and McDonald's ω was .93 among females; Cronbach's α was .89 and McDonald's ω was .89 among males) and gender invariance (Casale et al., 2021). In the current sample, the BAS-2 showed an adequate internal consistency (McDonald's $\omega = .94$, 95% CI = .92, .95).

Internalization of the general attractiveness ideal. The Sociocultural Attitudes Toward Appearance Questionnaire - 4 Revised (SATAQ-4R; Schaefer et al., 2017; Italian version by Stefanile et al., 2019) is a self-report questionnaire that assesses internalization of beauty ideals and appearance-related sociocultural influences. Thus, the SATAQ-4R is composed of seven subscales, three related to internalization (thinness/low body fat, muscular, general attractiveness) and four related to social pressures (family, peers, significant others, media). Participants rate the extent to which they agree with each item using a 5-point Likert scale, with response options from 1 ("definitely disagree") to 5 ("definitely agree"). The SATAQ-4R is available in two gender-oriented forms: one for females (31 items) and one for males (28 items). Each version showed excellent to adequate internal consistency values for each subscale (Cronbach's αs ranging from .82 to .95 in the female version; Cronbach's αs ranging from .80 to .97 in the male version), reliability (Pearson's *r* values ranging from .68 to .88 in the female version; Pearson's *r* values ranging from .60 to .86 in the male version), and construct validity (Stefanile et al., 2019). For the purposes of the study, only the subscale related to the internalization of the general attractiveness ideal was utilized. The McDonald's ω was .82 (95% CI = .77, .86).

6.2.3. Procedure

Participants were recruited at the University of Padova. To be eligible for the study, participants needed to be female and at least 18 years old. Participants were instructed to fill in an online link composed of an informed consent, a socio-demographic information schedule, and a battery of self-report questionnaires. This link was presented during classes and students were invited to participate in a study with the objective to investigate the relation between body image and social media usage. No compensation for their participation was provided. After the end of the class, students completed the link on their own. Before entering the study, participants were informed about the purposes of the study; moreover, they were aware of the voluntary nature of their participation, and they were able to withdraw from the study without penalty.

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Committee of the School of Psychology at the University of Padova.

6.2.4. Statistical analyses

First, descriptive analyses were performed. To pursue the objective, prior to mediation analyses, Pearson's correlations were computed to select the variables to be included in the models. In the hypothesized mediation models, the QDC total score, the BAS-2 total score, and the FAS total score were considered as dependent variables; self-reported frequency of following beauty- and body positive-related accounts and content were considered independent variables; the IACS total score and the scores at the subscale internalization of General Attractiveness ideal of the SATAQ-4R were considered possible parallel mediators. Mediation analyses were conducted only if the independent variable, the dependent variable, and the mediators emerged as significantly associated with each other ($p < .05$).

All data analyses were conducted using RStudio, version 1.4.1717 (Rstudio Team, 2021), based on R, version 4.1.1 (R Core Team, 2021), and the *Hmisc* (Harrell, 2021), *lavaan* (Rosseel, 2012), *semTools* (Jorgensen et al., 2021), *reghelper* (Hughes, 2021), and *sjstats* (Lüdecke, 2021) packages.

6.3. Results

The putative effect of Beauty and Body Positive related accounts and content on BDD symptoms and positive body image dimensions (i.e., body appreciation and body functionality appreciation).

According to correlations presented in Table 6.1, mediators were positively correlated with the QDC total score. Furthermore, the frequency of following beauty-related accounts and content was positively correlated with the QDC total score and with both mediators.

Table 6.1. *Correlation Matrix of the variables related to body image and Instagram.*

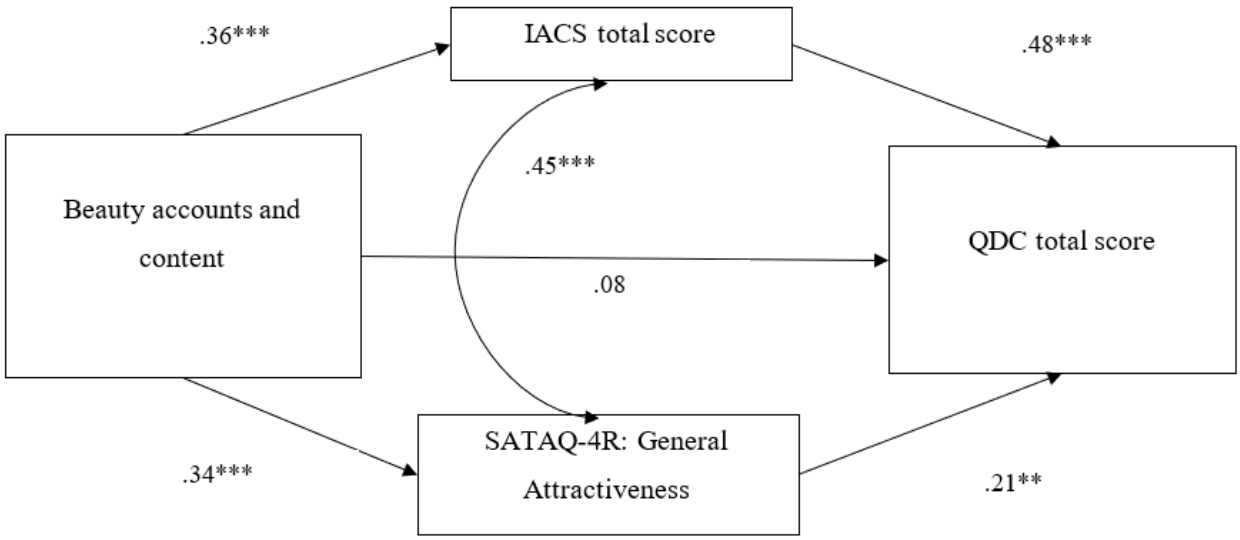
	1	2	3	4	5	6	7
1. QDC total score	1						
2. FAS	-.49***	1					
3. BAS-2 total score	-.70***	.65***	1				
4. Beauty accounts and content	.32***	-.05	-.09	1			
5. BP accounts and content	.22**	.04	-.09	.28***	1		
6. IACS total score	.61***	-.38***	-.65***	.35***	.09	1	
7. SATAQ-4R: General Attractiveness	.48***	-.12	-.30***	.34***	.16	.51***	1

Note. *$p < .05$, **$p < .01$, ***$p < .001$; QDC = Questionario sul Dismorfismo Corporeo; FAS = Functionality Appreciation Scale; BAS-2 = Body Appreciation Scale - 2; Beauty accounts and content = frequency of following Beauty accounts and content; BP accounts and content: frequency of following Body Positive accounts and content; IACS = Instagram Appearance Comparison Scale; SATAQ-4R: General Attractiveness: Sociocultural Attitudes Toward Appearance Questionnaire - 4 Revised – General Attractiveness subscale.

Variables were then introduced in a mediation model. The frequency of following beauty content positively predicted both the IACS total score (B = .11, SE = .03, $p < .001$, $R^2 = .13$) and the SATAQ-4R General Attractiveness subscale (B = .08, SE = .02, $p < .001$, $R^2 = .12$). The direct effect of the beauty accounts and content on the QDC total score emerged as non-significant after controlling for the mediators (B = .96, SE = .87, $p = .27$), while the two mediators emerged as significant predictors (IACS total score: B = 18.97, SE = 2.97, $p < .001$; SATAQ-4R: General Attractiveness subscale: B = 11.74, SE = 4.13, $p = .004$). The model explained 41.8% of the variance in the QDC total score. Covariances between mediators were set and were significant (B = .22, SE =

.05, $p < .001$). The indirect effect of the IACS total score (B = 2.16, SE = .58, $\beta = .17$, $p < .001$) and General Attractiveness subscale (B = .93, SE = .39, $\beta = 07$, $p = .02$) emerged as significant; thus, the frequency of following beauty accounts and content was associated with an increase in BDD symptoms through appearance comparison performed on Instagram and internalization of general attractiveness ideal. Standardized path coefficients of the model are presented in Figure 6.1.

Figure 6.1. *Mediation model including standard coefficient (β) for the relation between frequency of following beauty accounts and content and BDD symptoms.*



Note. *$p < .05$, **$p < .01$, ***$p < .001$; QDC = Questionario sul Dismorfismo Corporeo; Beauty accounts and content = frequency of following beauty accounts and content; IACS = Instagram Appearance Comparison Scale; SATAQ-4R General Attractiveness: General Attractiveness subscale of the Sociocultural Attitudes Toward Appearance Questionnaire - 4 Revised.

Since the self-reported frequency of following body positive accounts and content did not show a significant correlation with the mediators, a multiple regression was performed, entering this measure, the IACS total score, and internalization of general attractiveness ideal as predictors, and

the QDC total score as a dependent variable. As shown in Table 6.2, the overall model was significant. Frequency of following body positive accounts and content emerged as significantly associated with the QDC total score, alongside the IACS total score, and the General Attractiveness subscale of the SATAQ-4R. The overall model explained 43.3% of the variance in the QDC total score. Thus, self-reported frequency of following body positive accounts and content, appearance comparison on Instagram, and internalization of general attractiveness ideal were related to high levels of BDD symptoms.

Table 6.2. *Regression model examining the association of BDD symptoms with body positive content among Instagram users.*

Predictors		B	ES	*β*	*t*	*p*	*F*	*df*
Model							36.91***	3,145
	Constant	3.39	14.54		.23	.82		
	BP accounts/content	1.72	.78	.14	2.22	.03		
	IACS total score	19.61	2.90	.49	6.77	< .001		
	SATAQ-4R: General Attractiveness	11.48	4.08	.21	2.81	.006		

Note. DV: BDD = Body Dysmorphic Disorder; $R^2 = .433$; *$p < .05$, **$p < .01$, ***$p < .001$; BP accounts and content = frequency of following body positive accounts and content; IACS = Instagram Appearance Comparison Scale; SATAQ-4R: General Attractiveness: Sociocultural Attitudes Toward Appearance Questionnaire - 4 Revised – General Attractiveness subscale.

As shown in Table 6.1, the BAS-2 total score and the FAS total score did not show any significant correlation with beauty- and body positive-related accounts and content: thus, no mediation analyses were conducted. Positive body image seemed not to be associated with self-reported frequency of following these accounts and content. However, the BAS-2 demonstrated

significant negative correlations with the IACS total score and the General Attractiveness subscale, while the FAS total score demonstrated a significant negative correlation with the IACS total score.

6.4. Discussion

In the current study, the associations between self-reported frequency of following Instagram beauty- and body positive-related accounts and content, BDD symptoms, and positive body image dimensions (i.e., body and body functionality appreciation), given the putative mediation of appearance comparison and internalization of an ideal of general attractiveness, were explored.

Current findings showed that the frequency of following beauty-related accounts and content was positively associated with BDD symptoms among female university students, and this relation was fully mediated by appearance comparison performed on Instagram and internalization of an ideal of general attractiveness (H1a supported). However, it was not related to positive body image dimensions (H1b not supported). Finally, self-reported frequency of following body positive related accounts and content positively predicted BDD symptoms, without any mediation effect. No correlations emerged with positive body image dimensions (H1c partly supported).

Among females, following accounts and content that advertise fashion and make up brands on Instagram may enhance physical appearance comparisons and foster beliefs about the importance of looking physically attractive. Thus, overall BDD symptoms (e.g., concerns related to perceived physical flaws, as well as mirror checking, avoidance of social situations, and need for reassurance for one's physical appearance) may arise. This result corroborated previous findings (Seekis & Barker, 2022; Thompson et al., 1999) and enabled to hypothesize that beauty content could influence BDD symptoms since it enhanced appearance comparison with the individual portrayed and the internalization of the importance of appearing physically attractive. To note, this finding emerged utilizing the Tripartite Influence Model (Thompson et al., 1999) as a theoretical background; thus, Instagram content was considered influential for BDD symptoms.

On the other hand, self-reported frequency of following Instagram body positive accounts and content was associated with higher levels of BDD symptoms, alongside appearance comparison on Instagram and internalization of an ideal of general attractiveness. Even though a positive association between exposure to body positive images and body satisfaction was previously found (e.g., Cohen, Fardouly, et al., 2019; Nelson et al., 2022; Stevens & Griffiths, 2020), body positive content could include thin and fit praise or be highly sexualized (Cohen, Irwin, et al., 2019; Lazuka et al., 2020; Vendemia et al., 2021) that may ultimately result in a negative effect. Alternatively, it can be hypothesized that being exposed to images showing the "flawed" or "undesirable" physical attributes usually portrayed in these images (Cohen, Irwin, et al., 2019) may be related to more attention toward physical appearance. Therefore, instead of being beneficial, such content could rather be associated with greater BDD symptoms. A third putative explanation is that body positive content could enhance emphasis on being satisfied with physical appearance: viewing people praising their body could be related to more attention toward perceived physical flaws in individuals who are not able to access such positive emotions. Also in this case, the present finding is discussed in accordance with the Tripartite Influence Model (Thompson et al., 1999). However, the cross-sectional design of the study enabled also to hypothesize that female users with BDD symptoms would seek specific forms of content on Instagram (uses and gratification theory: Rodgers et al., 2016). Accordingly, the more they display BDD symptoms, the more they could seek body positive content as a form of coping strategy to deal with their dysfunctional body-related concerns and behaviors.

The frequency of following both types of Instagram accounts and content was not related to positive body image among female university students. These findings corroborate the independence between negative and positive body image (Tylka & Wood-Barcalow, 2015a). Instagram content, such as beauty and body positive, could enhance appearance evaluation, a dimension not included within body appreciation and body functionality appreciation. Thus, positive body image may reasonably not be associated with self-reported frequency of following Instagram content. This study

is in contrast with a previous experimental study (Barron et al., 2021) that found decreased state body appreciation after being exposed to fitspiration images. Besides differences in the type of content examined, this discrepancy might be explained by the dynamicity of positive body image: after a brief exposure, female students could be affected by Instagram content threatening their body image. However, in long term, they may be able to cope with these negative stimuli and maintain their gratitude and love toward the body and its functionality, relying on a "protecting filter" that shields them from negative external influences (Tylka & Wood-Barcalow, 2015a). Results from this study are also in contrast with another finding that highlighted increased body appreciation after being exposed to body positive images (Nelson et al., 2022). A possible explanation might be that our cross-sectional study highlighted the heterogeneity of Instagram content presented as "body positive" (Cohen, Irwin, et al., 2019; Lazuka et al., 2020), which could be lost during the process of selecting stimuli in an experimental study. Given the cross-sectional nature of the study, the uses and gratification theory enables to reach another conclusion: women referring a positive attitude toward their body do not actively seek Instagram appearance-focused content, such as beauty and body positive content. Accordingly, they might be more interested in "appearance-neutral" Instagram content, such as content that does not portray individuals (e.g., animals, nature, interior design, travel images).

Limitations and Future Directions

These findings need to be interpreted considering several limitations. First, the cross-sectional nature of the study did not allow to identify clear causality patterns among the variables under investigation. Second, the sample comprised undergraduate students, limiting the generalizability of the results to the overall female population. However, they represent the most vulnerable population for body dissatisfaction (Cerea, Ghisi, et al., 2021; Lipson & Sonneville, 2017). Similarly, female students at risk or with a current diagnosis of a psychological disorder related to body image (i.e., BDD, bulimia nervosa, anorexia nervosa) were not detected and excluded from the analyses. This

choice was made to have a more ecological and representative sample of the general female student population. Third, generally referring to Instagram accounts and content may have excessively broadened the type of content that the respondents referred to. Since participants were not asked to specify the accounts and content they followed, incoherent responses could have been allowed. Finally, objective measures of Instagram use could have been useful: for example, an analysis of the content currently viewed on Instagram could be implemented.

Future studies should include a male sample. Moreover, individuals with a diagnosis of BDD could be recruited, to assess if these findings hold with a clinical sample. Furthermore, a different design could be implemented. For example, a longitudinal study would allow to follow a selected group of students and analyze the evolution of the relations between frequency of following specific accounts and content and body image dimensions; such study could clarify and detect possible causality between constructs.

Conclusions

In conclusion, this study highlighted that self-reported frequency of following beauty and body positive accounts and content was significantly associated with BDD symptoms, either directly or through the mediation effect of Instagram appearance comparison and internalization of an ideal of general attractiveness. As for positive body image, the relations were overall non-significant.

7. Chapter 7 - Content analysis of #bodyneutrality content on TikTok.

This chapter comprises a short and adapted version of the preliminary findings that would be displayed in Mancin, P., Vall-Roqué, H., Grey, W., & Griffiths, S. (In preparation). *Let's talk about body neutrality: Content analysis of #bodyneutrality content on TikTok.*

7.1. Rational of the study

Body neutrality has emerged as a novel psychological construct that has garnered interest within body image research, despite lacking agreement on its definition (Hallward et al., 2023; Smith et al., 2023). Scholars suggested that body neutrality could allow individuals to reach a more balanced relation with the body and physical appearance and present as an alternative to body positivity (Bissonnette Mink & Szymanski, 2022; Cohen et al., 2021; Smith et al., 2023). It could involve reduced emphasis on body and appearance altogether (Cohen et al., 2021; Tylka et al., 2023) and appreciation of body functionality (Bissonnette Mink & Szymanski, 2022; Hallward et al., 2023). To achieve a clear definition of body neutrality, the meaning that people attach to body neutral content on the social media platform TikTok was analyzed.

The current study

Within the current study, a qualitative content analysis of #bodyneutrality content was conducted, addressing (RQ) how TikTok creators construct meaning on body and appearance within body neutrality content. In doing so, the definition of body neutrality could be ultimately similar to the one already described in previous studies (as presented at p. 44).

Finally, the putative effect of body neutrality content on BDD and MDD symptoms will be presented: since no available studies on the relation between BDD and MDD symptoms is available, no clear hypothesis could be presented, and the putative effect will be described only speculatively.

7.2. Method

This study was approved by the University of Melbourne Office of Research Ethics and Integrity.

7.2.1. Materials and procedure

URLs of publicly accessible and downloadable TikTok videos, displaying the "#bodyneutrality" were collected. The qualitative content analysis was performed utilizing an approach based on the reflexive thematic analysis (Braun & Clark, 2006), as in previous studies with similar objectives (Herrick et al., 2021; Minadeo & Pope, 2022).

7.2.2. Collection of the content

Two new TikTok accounts were created using different devices (iOS and Android) located in Melbourne, Australia.

According to previous studies (Boepple et al., 2016; Cohen, Irwin, et al., 2019; Hallward et al., 2023; Herrick et al., 2021; Lazuka et al., 2020; Minadeo & Pope, 2022; Tiggemann & Zaccardo, 2018), 300 URLs of TikTok videos were considered as adequate to begin the analysis.

7.2.3. Familiarizing with the TikTok videos

Three coders performed the familiarization with the videos: they watched them no more than twice and general comments were noted down. Then, they discussed initial ideas about the RQ in a meeting.

7.2.4. Coding of the TikTok videos and development of themes

Following previous studies that adopted qualitative content analysis on TikTok videos (Herrick et al., 2021), the process of theme-development proceeded as follows: the main coder coded 50 TikTok videos, developed themes, and conducted a meeting consulting the other two coders, merging different point-of-views on the themes developed (Byrne, 2022). This process was repeated three times and a total of 150 TikTok videos were ultimately coded. As discussed by Braun and Clark

(2006) and Herrick et al. (2021), the main objective was to code enough content to reach a reasonable agreement on the themes, until new material would not increase the information provided. The number of TikTok videos coded was ultimately comparable to the one of previous similar studies (e.g., Herricks et al., 2021).

7.2.5. Refinement of themes

After the themes were formulated, the main coder revisited the TikTok videos to modify the themes to create a more coherent discourse surrounding the RQ.

7.3. Results

The five themes developed to answer the RQ were:

1) “Like the others, I have a body that has unique features and I’ll treat my body as just a body”;
2) “I will not judge (negatively) my body or the one of others”, later divided in two subthemes:
    a. “There’s no point in judging it [your body], absolutely no point!”
    b. “You don't have to look a certain way just because someone tells you to”
3) “I am important and healthy, and my appearance shouldn't dictate that”;
4) “I can struggle with body issues: it's a process”;
5) “I can be body positive”.

1) Like the others, I have a body that has unique features and I’ll treat my body as just a body

Within the TikTok videos, the experience of having a body is presented as characterized by unique and shared features. TikTok creators showcased both elements (uniqueness and universality) as coexistent when experiencing having a body.

For example, a TikTok creator (feminine) asked the viewer(s), as part of the society, to normalize a part of the body showcased by the creator herself (lower belly that appeared to be protruding) since "a lot of women have this, and some, a lot that don't even have kids […] and they're fit and everything". To foster this process, she encouraged other TikTok users to showcase the same part of the body within a video.

Displaying the entire body was regarded as a suitable method to promote its normalization. In fact, numerous other TikTok content creators openly encouraged users to showcase their own bodies for this very reason. Relatedly, TikTok creators exhibited aspects of their bodies that might be perceived as undesirable within society, with the goal of destigmatizing them. TikTok creators would also aim to represent a broad range of different bodies as normal, including "fat bodies" or simply body fat. The word "fat" itself is defined as descriptive only, a mere characteristic of the body of a person without any other meaning attached.

Within some TikTok videos, creators introduce functionality and internal signals as features included in the human experience of having a body. For example, a TikTok creator (feminine) describe her choice of "packing up" some leftovers for later since she was full, addressing that you do not have to finish all the food you have prepared for yourself "because you have committed". In doing so, she emphasized the significance of paying attention to internal cues of hunger and satiety. When discussing this idea, she did not present it as something extraordinary but as a universal human experience, comprehensible to the viewer(s) as well.

Another element that allowed TikTok creators to normalize the experience of having a body as a shared and unique experience was provided by describing how it changes through time. In doing so, they presented this experience as normal and not as exceptional for certain individuals.

Accordingly, a TikTok creator (feminine) talked to the viewer(s) about her weight gain during the pregnancies and about the fact that she is not putting efforts in trying to get back to the weight she had before. In concluding the videos, she suggested that going back to the previous weight does not mean becoming "normal" since "all bodies are normal".

Ultimately, numerous videos talked about the topic of clothing and "how to dress", emphasizing that individuals should wear whatever they desire ("I wear the clothes, the clothes don't wear me"). Accordingly, they implied that every body is unique and diverse from the others. Consequently, people should feel empowered to wear what makes them feel comfortable in their own bodies, without focusing on how they look in it.

2) I will not judge (negatively) my body or the body of others

Another theme that emerged is associated with refraining from and discouraging any form of negative judgment regarding bodies and appearances. In an explicit or implicit way, TikTok creators often encourage viewers not to critique their own bodies or refrain from negatively judging the bodies of others. Accordingly, this theme was divided in: *There's no point in judging it [your body], absolutely no point!* and *You don't have to look a certain way just because someone tells you to*.

There's no point in judging it [your body], absolutely no point!

TikTok videos discussed that the viewer(s) should avoid negative self-talk revolving around their bodies and its functions (e.g., eating habits). A TikTok creator (feminine) provide an example of it, showcasing herself and her whole body while displaying some phrases on the screen that matched a pre-recorded voice:

"Don't waste your life's purpose worrying about your body. This is your vessel, is your house, it's where you live. There's no point in judging it, absolutely no point!"

Thus, commenting negatively on one's own body is pointless and dangerous, and it does not produce any gain for the person involved in doing it. Similarly, a creator (feminine) asked women to

stop apologizing for how they look in videos where they address subjects unrelated to appearance since they look great and “it has nothing to do with your point”. Thus, she attempted to underscore how pointless body-oriented negative self-talk is and how frequent it could be, in particular in situation where appearance should not be the center of attention, such as when talking about topics that are not related to body and appearance where the main concerns should be on the message. This aspect was effectively portrayed by the creator herself, who was recording only her face in the TikTok video.

Interestingly, despite the overarching trend centered around avoiding negative self-talk, there were also messages about the significance of refraining from making positive comments about the body. An interesting example of it is presented in a TikTok video in which the creator (feminine), while wearing some make-up, expressed her opinion on body neutrality to the viewer(s) by saying:

“Practicing body neutrality, I’m thinking: okay, this is what my body looks like. Not “YES I LOVE my POOCH. It’s amazing! Nothing wrong with that thinking (body positivity), but it’s not what I’m focusing on”.

Thus, she commented on the fact that body neutrality would not relate to appreciation and love for the body, but to observe it without any form of judgment. Indeed, praising the body could be perceived as body positivity, which is a valuable attitude toward the body, but should not be the element that define being body neutral. In doing so, this message attemped to clearly differentiate body neutrality from body positivity.

You don't have to look a certain way just because someone tells you to

Some TikTok creators informed the viewer(s) about the potential harm of negative judgments from others, whether in online or offline interactions, as they could have adverse effects on one’s body image. Thus, the viewer(s) should distance themselves from these situations. A TikTok creator (feminine), describing what happened to her during a Pilates class, provided an example of this. While

all the people were doing an exercise, she noticed a woman across the room who was concerned about her displaying body hair. To face this, she claimed that she was making sure to show her body hair again for the next lesson. Coherently, her last message was “mind your own body babes”.

Negative judgment could be directed toward eating habits too. An example of this can be seen in a TikTok video, in which the creator (feminine) replied to a follower’s comment advising her to “get off the carbs” while a pre-recorded track was playing. The lyrics of the track conveyed the message that people should not tell her what to eat. Indeed, during the video, the creator showed a series of shots where she had different types of food in her hands. In doing so, she implied that attaching moral judgments to food choices should be considered inappropriate and bothersome.

At times, TikTok creators critiqued society or social media for spreading negative body-focused comments. They asserted that there are aspects of our bodies that we have been conditioned to dislike, referring to features considered flaws. Furthermore, they sustained the idea that social media and society excessively emphasize conforming to beauty ideals, predominantly thinness. Consequently, being body neutral could become a way to resist these hampering sociocultural pressures.

Interestingly, TikTok creators may also condemn positive comments and foster the idea that the body should not be commented entirely. This concept was effectively conveyed in a video where a TikTok creator (feminine) asked people to “please stop mentioning or commenting on my weight”. She explained, “When I say I don’t want to mention my weight, I mean ever. Whether I’m gaining, losing, or staying the same, I don’t want to talk about it”. She provided two main reasons for this request. First, people often greeted her with comments like “You look amazing! Have you lost weight?!” every time they saw her. She acknowledged that they meant well, but she questioned whether they thought she would not notice when they stopped making these remarks. She anticipated that they would, as her weight could fluctuate. Thus, regardless of whether comments on the body and appearance are positive or negative, they can be seen as detrimental, reinforcing the notion that

the body “should look a certain way” and leading individuals to seek this form of positive reinforcement.

In general, while presenting these examples of negative comments received from others, TikTok creators could implicitly warn the viewer(s) about the importance of refraining from these behaviors as well. Thus, they should not be involved in any form of negative judgments on bodies and appearances of other people.

3) I am important and healthy, and my appearance shouldn't dictate that

Within #bodyneutrality TikTok videos, self-worth and health are not defined by physical appearance and are not valued based on attractiveness, in adherence to beauty standards, or in fitting a certain body weight (“it is just a number”). People should consider other elements to enjoy life. This message was openly shared by a TikTok creator (feminine) who explained that “fitness, health, movement, and exercise have so many more benefits and purposes other than shrinking a number on a scale”. In fact, “being plus size does not inherently mean that you are unhealthy, just as being thin does not inherently mean that you are healthy”. Thus, she mentioned: “don’t discount somebody’s credibility just by looking at their body”.

Creators can provide examples of aspects to base self-worth that are not related to appearance. For example, a TikTok creator (feminine) said that “there are a million things I’d rather think” rather than weight, such as “planting wildflowers in my garden, spending time with my cows, running a business that creates beautiful things”. These alternatives resided in hobbies, personal interests, and career, all elements that appeared important for her.

Another element worthy of attention could be body functionality. Relying “on the amazing things that my body does” could make people appreciative of their body, even if they are not satisfied with their appearance. Indeed, body functionality is entirely separate from and unrelated to one's physical appearance.

However, some TikTok creators encouraged viewer(s) to stop fixating on every aspect of their bodies. In doing so, they may criticize the body positivity movement since it could result in encouraging people to love and value not only the body, but also its appearance. An illustrative example could be found in a TikTok video where the creator (feminine) simulated a conversation with someone who inquired about body neutrality. She said that "unlike body positivity, that focuses on loving your body and the way it looks, body neutrality focuses on the non-physical aspects of yourself and doesn't even focus on your appearance at all". Accordingly, body neutrality was presented as useful "because sometimes I feel so much pressure to feel hot & sexy when in reality I even don't want to think about my appearance". Indeed, "your worth should have nothing to do with your appearance". In making these claims, the creator not only distanced body neutrality from reliance on appearance but she could also suggest a detachment from body functionality, which could still be viewed as a "physical aspect" of oneself that may be linked to body and, in turn, appearance.

4) I can struggle with body issues: it's a process

Being body neutral was linked to being able to overcome the challenging experience of having a balanced relation with in one's body image and, particularly, with negative body image ("our body was never the problem"). This process may be lengthy because individuals must unlearn old, dysfunctional habits and learn a new mindset. Overcoming these struggles could not only lead to an improved body image but also has a positive impact on one's overall lifestyle since: "when you're neutral about the way that you face the world, I feel like you start to like yourself. And once you like yourself, you don't let people talk crazy to you. The world is your mirror you start to surround yourself with people who f****n like you".

Some TikTok creators presented the idea that changing and improving the relation with the body modifies the body itself. An example is provided by a TikTok video in which the TikTok creator (feminine) presented her journey with her relation with the body ("my body dysmorphia"), using several pictures of herself posted on the background. At the beginning of the video, she told the

viewer(s) that she had a weight gain. While showing pictures portraying her before the weight gain and discussing her past dysfunctional body-oriented behaviors (such as restrictive eating, excessive exercise, and weight monitoring), she acknowledged that she was "miserable". Finally, she presented a recent self-photo and talked about the significant life events that had led her to that point. She explained that her weight gain was "a result of focusing on my mental health, my emotional health, and just taking care of myself". She openly stated that "this is the happiest and most confident version of myself". She ended the video saying: "you have to go on that journey and do that work outside of just losing weight because being validated by a number is not enough".

The struggle to detach from negative body image is presented as particularly difficult; thus, individuals sometimes could still experience insecurities even after making progress. Negative body-oriented thoughts are described as a daily source of struggle for people even if they were able to make progress overcoming body image issues. Indeed, "these thoughts are pretty normal" "in this aesthetically driven world we live in". However, "I have the power to reprogram these thoughts by keeping my eye on my true values and aligning myself with others that have those similar values". Thus, people could work on addressing their insecurities on a daily and weekly basis and seek professional help, such as therapy, when needed.

TikTok creators themselves could be found living a constant struggle with body image issues since they could be excessively focused on finding flaws in their bodies and appearances. In fact, they still talked about these perceived imperfections and suggested that some physical features would generate body dissatisfaction, despite attempting to detach negative meanings from body and appearance and promoting a functional relation with their bodies.

Common insecurities are also addressed in TikTok videos that offer advice on clothing choices, implying that clothing can help "hide insecurities". Accordingly, each individual could prefer wearing specific clothes to cope with their specific body-related insecurity.

5) I can be body positive

Several TikTok videos conveyed messages related to being “body positive” and embracing one’s own body and appearance, even if they do not conform to sociocultural beauty standards. This message was presented both in an implicit and explicit way. An explicit example of body positivity is demonstrated in a TikTok video where a creator (feminine) danced, and the phrase “ugh my belly, it’s so cute” appeared on the screen. However, most of the time the references to body positivity are more subtle. In fact, many TikTok videos displayed the creators smiling while proudly displaying their bodies. This smile could be interpreted as a sign of a positive attitude and of appreciation for the body. For example, a TikTok creator (feminine) recorded herself in a bar, drinking a cocktail, while the phrase “pov: you’re over it” was showing on the screen. Then, she showed herself while smiling and touching her stomach, with the caption “We really out here just embracing it now” on the screen. In this video, she implied a positive attitude toward her body and “embracing” her features, assigning a positive value to them while smiling and touching her body. Interestingly, this TikTok video presented the sole hashtag #bodyneutrality.

7.4. Discussion

The present study examined how TikTok creators construct meaning on body and appearance within body neutrality content. In doing so, five themes were developed:

1) Like the others, I have a body that has unique features and I’ll treat my body as just a body”;
2) “I will not judge (negatively) my body or the one of others” (subthemes: “There’s no point in judging it [your body], absolutely no point!” and “You don't have to look a certain way just because someone tells you to”);
3) “I am important and healthy, and my appearance shouldn't dictate that”;
4) “I can struggle with body issues: it's a process”;
5) “I can be body positive”.

First, TikTok creators cultivated the idea that having a body is a common, human experience, which entails internal signals and functions (e.g., hunger and satiety). Second, they underscored the importance of not commenting negatively on bodies and appearances, both their own and other people's. Third, they comment on valuing oneself or the health on elements that do not relate to appearance, such as personal interests and what the body is capable to do. Fourth, they described the relation with body and appearance as a potential source of struggle, which becomes more explicit when people are distancing from a negative evaluation of body and appearance (i.e., from negative body image). During this process, people should cultivate more functional attitudes and behaviors toward the body, leading toward "neutrality". However, despite reaching this neutral attitude, individuals could still experience challenges with their own bodies, as part of a common experience that could daily occur. Finally, they still fostered the possibility of having a positive attitude toward the body, celebrating and appreciating it.

In part, these themes support previous conceptualizations of body neutrality (e.g., Bissonnette Mink & Szymanski, 2022; Cohen et al., 2021; Tylka et al., 2023) and align with the ones of a recent content analysis (Hallward et al., 2023). Accordingly, body neutrality could refer to normalization, awareness, and respect for the body, its internal signals, and its capabilities, without being critical (i.e., not being dissatisfied with it) or enabling other people/social media/society to damage it. Being body neutral could entail having a positive attitude toward oneself and basing self-worth on features that are not limited to appearance, such as appreciating body functionality. Similarly, it could consider health or well-being as different from fitting beauty ideals. Moreover, being body neutral could mean being aware of the continuous struggle with internal and external messages that could challenge one's relation with their body, or enabling oneself to lean toward "non-toxic" body positivity: not blindly loving one's body, but appreciating it besides not being entirely satisfied with it.

Given this conceptualization of body neutrality and the description of body neutrality content, it is plausible that it could be beneficial in reducing BDD and MDD symptoms. According to the

Tripartite Influence Model (Jarman et al., 2021; Jung et al., 2022; Roberts et al., 2022; Thompson et al., 1999), social media and its content could influence body image dimensions. In this case, content that de-emphasize reliance on appearance and value personal interests and experiences would be beneficial, and reducing attention toward perceived physical flaws (e.g., skin, hair, muscularity) and appearance comparison tendencies. It would also enable to disengage individuals in dysfunctional body-related behaviors, such as cosmetic surgery and exercise addiction, which imply a certain degree of investment in appearance. This would be further corroborated by the TikTok creators themselves since they presented body neutrality as a mean to reach a balanced relation with their bodies. Thus, based on Goffman's dramaturgical model (Goffman, 1959; Hogan, 2010), displaying body neutrality content means to distance oneself from negative body image and, accordingly, from presenting BDD and MDD symptoms. However, since this study did not specifically address this issue (i.e., BDD and MDD symptoms were not assessed after exposing participants to body neutrality content, or in the TikTok creators portrayed in the analyzed videos) this hypothesis remains highly speculative, requiring further studies.

Limitations and Future directions

These findings required to be interpreted considering several limitations. First, the content analyzed was retrieved only within one time point. Thus, it could have become outdated since social media develop at a high speed. Second, content from non-Westernized countries, such as Asian countries, was not selected or included. Third, content that contained #bodypositivity hashtag was not excluded, enabling a potential conceptual overlap.

Future studies should further examine the associations between body neutrality content and negative body image symptoms, especially BDD and MDD symptoms, to better address how this content would relate to body image dimensions (e.g., experimental, or longitudinal studies).

Conclusions

Body neutrality content seem to encourage people to develop a more functional relation with body and appearance, that could be ultimately functional for individuals' well-being. It may be of relevance for people that have a dysfunctional relation with their own body and appearance, such as people with BDD and MDD symptoms.

8. General Discussion and Conclusions

Body image is a complex psychological construct comprising thoughts, perceptions, emotions, and behaviors oriented to the body and physical appearance, which constitute a mental representation of the body itself (Cash & Pruzinsky, 1990; Grogan, 2006). Body image could be divided in two independent constructs, namely negative and positive body image (Tylka & Wood-Barcalow, 2015a). Negative body image is composed of body dissatisfaction (Cash & Szymanski, 1995; Grogan, 2008; Stice & Shaw, 2002), body distortion (Gardner, 2012), body checking, and avoidance behaviors (Walker & Murray, 2012). It is also a core feature of several psychological disorders, such as BDD and MDD (Cerea, Ghisi, et al., 2021; Cororve & Gleaves, 2001; Gonzales & Blashill, 2021; Phillipou et al., 2018). They are defined as two psychological disorders characterized by preoccupations with perceived physical flaws (e.g., hair, skin, muscularity), compulsive behaviors (e.g., mirror checking, skin picking), avoidance behaviors (e.g., avoidance of social situations), and mental acts (e.g., appearance comparisons; APA, 2022). In particular, BDD seems to be characterized by interest in cosmetic surgery and aesthetic medicine (Crerand et al., 2005), while MDD is characterized by excessive involvement in physical exercise (Martenstyn et al., 2023). Both BDD and MDD symptoms are described within the general population: the formers are mostly frequent among women (Cerea et al., 2018), while the latters among men (Gorrasi et al., 2020; Tod et al., 2016).

Positive body image is characterized by other components, such as body appreciation, which entails love and appreciation toward the body (Linardon et al., 2022; Tylka & Wood-Barcalow, 2015a), and body functionality appreciation, which relates to gratitude and awareness of body functionality and capability (Alleva et al., 2017; Alleva & Tylka, 2021). Both dimensions have been described as protective factors and as functional for people's well-being, enabling to reduce the detrimental effect of negative body image (Alleva & Tylka, 2021; Guest et al., 2019; Linardon, 2021).

Body image seems to be affected by social media use (Jarman et al., 2021; Jung et al., 2022; Marques et al., 2022; Roberts et al., 2022; Thompson et al., 1999) and, vice versa, it is plausible that

attitudes toward body image shape how users approach social media use (Hogan, 2010; Marques et al., 2022; Rodgers, 2016). Scholars suggested that appearance-focused social media use would be involved in this relation, which includes photo-based behaviors and social media content (Saiphoo & Vahedi, 2019). Photo-based behaviors include a cluster of attitudes and behaviors related to the production of self-photos (Lonergan et al., 2020), such as photo investment (concerns and preoccupations occurring during the process of creating and sharing a self-photo) and photo manipulation (behaviors related to the modification of a self-photo before sharing it online; McLean et al., 2015). On the other hand, social media content includes different types of images that typically include a portrayal of a person, such as beauty-related content (Seekis & Barker, 2022), body positive content (Cohen, Irwin, et al., 2019; Hallward et al., 2023; Harriger et al., 2023; Lazuka et al., 2020), and body neutrality content (Hallward et al., 2023). Both photo-based behaviors (e.g., Lonegan et al., 2019) and social media content (e.g., Nelson et al., 2022; Seekis & Barker, 2022) demonstrated associations with body image dimensions. However, scholars mostly focused on addressing body dissatisfaction and, to my knowledge, did not address BDD and MDD symptoms, nor associated features (i.e., consideration of cosmetic surgery and exercise addiction). Concerning positive body image, only a few studies tested its moderating role in the relation (Duan et al., 2022; Wang et al., 2019).

Accordingly, the present Ph.D. thesis aimed to further address these gaps in the literature, pursuing several objectives.

Objective 1: to examine the putative predictive role of photo-based behaviors, namely photo manipulation and photo investment, on BDD and MDD symptoms and, consequently, their associations. In achieving this, the putative moderation of positive body image dimensions (i.e., body appreciation and body functionality appreciation) and the relation with consideration to be involved in cosmetic surgery and exercise addiction symptoms were considered.

To address objective 1, findings were presented in Chapter 4, considering a sample of individuals from the general population. Photo investment was predictive and significantly associated with both BDD and MDD symptoms, while photo manipulation only with BDD symptoms. Overall, photo-based behaviors could emerge as predictors of BDD and MDD symptoms. However, given the cross-sectional design of the study, the opposite directions of the relations were discussed too. This finding allowed to identify photo investment as a photo-based behavior that could have an involvement in BDD and MDD symptoms. This association may arise from a heightened focus on physical appearance elicited by photo investment: Users strive to present an idealized self-presentation, often involving the removal of perceived physical flaws. This attention toward physical appearance could be the trigger for appearance concerns. However, given the design of the study, it could be the maintaining factor for these concerns also. Moreover, both processes could coexist. A similar process could be involved with BDD symptoms and photo manipulation: Being able to adjust the appearance portrayed in the self-photo, providing an idealized self-presentation, could induce social media users to identify flaws or to conceal already perceived flaws. Body appreciation emerged as a possible moderator only in the relation involving photo investment and BDD symptoms. Therefore, appreciating the body as a whole could serve as a protective factor, diminishing the prominence of appearance-driven tendencies associated with photo investment and, consequently, reducing its relation with BDD symptoms.

This objective was further addressed in Chapter 5, in which findings on the relation among photo-based behaviors, BIDs symptoms, and associated constructs (i.e., consideration of cosmetic surgery and exercise addiction), obtained in a sample of individuals from the general population, were presented. Photo investment emerged to be associated with BDD symptoms and, in turn, to have an indirect effect on consideration of being involved in cosmetic surgery in the future. Thus, the supposed increased attention toward physical appearance fostered by photo investment seemed to be associated with interest in cosmetic surgery as a consequence of high levels of BDD symptoms (i.e.,

preoccupations with perceived flaws and behaviors aimed to reduce this arousal). A similar finding was described for MDD symptoms: photo investment might increase attention toward physical appearance that induces involvement in excessive exercising due to MDD symptoms. In this case, excessive physical exercise is considered the mean to reduce the gap between the real and ideal muscle build and the distress associated with MDD symptoms. As for photo manipulation, it seems to have both an effect on interest in cosmetic surgery similar to the one described for photo investment (mediated by BDD symptoms) and a unique effect. Indeed, it seems to have a direct effect on consideration of cosmetic surgery, not mediated by BDD symptoms: photo manipulation could induce individuals to alter their appearance in real life, possibly with the aim to improve it. Consequently, while photo investment seems to be mostly detrimental for BIDs symptoms, photo manipulation showed also a unique independent effect, which does not involve BIDs symptoms. As for moderation analysis, body appreciation emerged as a significant moderator in the relation between photo investment and BDD symptoms, corroborating potential findings presented in Chapter 4. Moreover, body functionality appreciation demonstrated an effect in the relation involving photo investment and MDD symptoms similar to the one of body appreciation. Thus, it could reduce the emphasis on appearance and change the meaning of physical activity, appreciated for its natural movements and benefits.

Objective 2: to further address the relation between BDD symptoms, positive body image (i.e., body appreciation and body functionality appreciation) dimensions, and body positive and beauty Instagram content, considering the possible mediation of appearance comparisons and internalization of the beauty ideal.

As for objective 2, the study presented in Chapter 6 provides findings on the relation between self-reported frequency of following beauty and body positive accounts and content on Instagram and BDD symptoms, considering the mediation role of Instagram appearance comparison and internalization of general attractiveness, among female students. The self-reported frequency of

following beauty content demonstrated an indirect effect on BDD symptoms, mediated by appearance comparison and internalization processes, while the self-reported frequency of following body positive content was demonstrated to be directly associated with BDD symptoms. Beauty content could portray extremely attractive individuals, that represent means of comparison and ideal models to pursue. On the other hand, body positive content could enhance attention toward physical appearance by portraying physical attributes and encouraging viewers to be satisfied with their appearance. Thus, it seems that social media content could have a putative negative effect on body image, enhancing BDD symptoms, regardless of the type of content assessed. Interestingly, positive body image seems not to be directly affected by it.

Objective 3: to analyze body neutrality content on TikTok and to reach a better understanding of this novel and scarcely explored construct, suggesting a possible role for BDD and MDD symptoms and positive body image dimensions.

Objective 3 was pursued in the study presented in Chapter 7, where a content analysis of #bodyneutrality content available on TikTok was conducted. This content seems to have the aim to de-emphasize the importance of appearance overall, leading the viewer to suspend any form of judgment and to value non-physical attributes. In doing so, TikTok creators aim to normalize insecurities and struggle with body image. They also enable the viewer to assume a positive attitude toward the body. Thus, it is possible that #bodyneutrality content could be functional for individuals displaying BDD and MDD symptoms since it distances themselves from physical appearance and focuses attention toward other personal features (e.g., career, hobbies). Moreover, it does not actively ask individuals to appreciate and love their bodies and appearances, which could be difficult to achieve when individuals struggle with extreme preoccupations.

Overall, these findings enabled us to conclude that social media use could have a negative impact on BDD and MDD symptoms. Concerns and preoccupations with the quality of the self-photo, modifying one's appearance portrayed, and being exposed to appearance-focused content could

ultimately endanger body image, enhancing preoccupations for perceived physical flaws, compulsive behaviors, mental acts, and related behaviors (i.e., interests in cosmetic surgery and exercise addiction), typical of BDD and MDD symptoms. Vice versa, being characterized by a dysfunctional attitude toward body image, i.e., manifesting BDD and MDD symptoms, could imply a certain type of engagement with social media. Thus, individuals showcasing BIDs symptoms could dedicate more time to refine their self-presentation, aiming to provide an idealized version of themselves, and to search for specific appearance-focused content. However, social media use also provide a solution for its negative effects, disseminating messages related to the importance of distancing from appearance evaluation and celebrating personal values (i.e., through body neutrality content). Doing so could empower people to reach a more balanced relation with their body image and distancing from BIDs. Finally, findings provided support for the protective role of positive body image. Indeed, body appreciation and body functionality appreciation emerged as factors that could reduce the negative impact of photo-based behaviors on BDD and MDD symptoms.

8.1. Research and clinical implications

The findings provided by this Ph.D. thesis could have relevant implications, both in the research field and in the clinical field.

Concerning research, these findings provided insight on the possibility that the relation previously found between body dissatisfaction and several aspects of social media use is also valid when considering BDD and MDD symptoms. Moreover, they enable to further hypothesize that social media could be involved in the phenomenology of these two BIDs. Furthermore, they supported the studies suggesting the protective role of positive body image for individuals' well-being and the relevance of this construct when assessing the relation involving social media use and negative body image. Indeed, the findings suggested that it could be incorporated as a moderator in the available models (e.g., Thompson et al., 1999). Future studies should further explore this issue.

As for the clinical field, these findings highlighted how social media should be addressed when considering BIDs. First, as previously suggested by other scholars (Maymone & Kroumpouzos, 2022), they corroborated the importance of including questions related to appearance-focused social media use (e.g., thoughts and emotions experienced during photo sharing; what kind of content the person searches for on social media) in individuals that refer a conflictual relation with their body and appearance, typical of individuals that may have BDD and MDD. Second, they underscored how practitioners should consider including social media literacy in interventions aimed to reduce body image disturbances typical of BDD and MDD. Social media literacy is meant to enhance critical thinking and to empower social media users with knowledge and skills to participate, produce, and evaluate social media content (Paxton et al., 2022; Tamplin et al., 2018). Thus, practitioners should provide information and organize activities that sensibilize on the potentially detrimental effects of social media engagement, such as worrying about other people's reactions to self-photos and frequently viewing accounts and content that advertise and promote fashion brands. Accordingly, they could advise clients to reduce their frequency of filter use and of viewing content and suggest more functional aspects of social media use (e.g., viewing body neutrality content or non-appearance-focused content). These interventions should be developed in a preventive setting, directed both to the general population and to individuals who are at risk of developing BDD and MDD (e.g., young women, individuals engaging in weightlifting sports). Moreover, these elements should be adapted and evaluated among individuals with BDD and MDD in clinical settings. Since social media could be a maintaining factor, clinicians should assess their clients' habits and tackle the dysfunctional ones. Third, they supported the notion that interventions focused on promoting positive body image could be beneficial also in reducing the negative impact of appearance-focused social media use. Thus, practitioners should foster body appreciation and body functionality appreciation even when dealing with dysfunctional social media use.

8.2. Limitations and Future Directions

These findings should be considered given several limitations. First, most of the findings were obtained utilizing a cross-sectional design and do not draw conclusions on the causality of the emerged relations. Second, participants were not discriminated according to the presence of BDD and MDD in any study. Thus, it is plausible that some of the participants may have met the criteria for these BIDs, as well as the opposite. Given this limitation, the findings could not be generalized to the clinical population. Third, the relation between MDD symptoms and self-reported frequency of following body positive accounts and content was not tested in Chapter 6. However, it is reasonable to hypothesize that similar findings should be reached. Similarly, the moderation of positive body image dimensions was not considered. This choice was made due to the small sample size collected. Fourth, findings presented in Chapter 7 do not include an analysis of the impact of TikTok videos on body image dimensions (i.e., BDD and MDD symptoms). Thus, conclusions were drawn only on a speculative level, given the themes developed.

Future studies should further address the relation between BDD and MDD symptoms and appearance-focused social media use by implementing longitudinal designs. For example, participants could be followed in a specific timeframe and divided into two groups: a group that engages in appearance-focused social media use at a high frequency and a group that engages with a low frequency. In doing so, it would be possible to assess to what extent social media would partake in the development of BIDs symptoms. Indeed, they could be risk factors, increasing the possibility to develop a BID, an exacerbating factor, which would worse one's BIDs symptoms from baseline, or a maintaining factor, keeping BIDs symptoms stable instead of decreasing already high levels. Then, scholars could better examine social media self-presentation through qualitative studies, interviewing users about their online experience. Moreover, future studies should consider including a clinical sample, addressing their behaviors on social media, or samples of individuals at high-risk for developing BDD and MDD symptoms, such as young women and bodybuilders. Finally, psychological interventions (first in prevention and then in clinical settings) incorporating aspects of

social media literacy and a training on fostering positive body image should be developed and tested with randomized controlled trials. In doing so, it would be possible to clarify whether these aspects would be ultimately beneficial.

8.3. Concluding Remark

The present dissertation aimed to further address how social media use could relate to body image, focusing specifically on BDD and MDD symptoms, some associated aspects (e.g., consideration of cosmetic surgery and exercise addiction symptoms), positive body image (i.e., body and body functionality appreciation), and appearance-focused social media use (i.e., photo-based behaviors and social media content). Presented findings mainly corroborated that social media could have a negative impact on body image and that positive body image could be protective. Moreover, they suggested that appearance-focused social media use could also offer a solution for body image negative outcomes (e.g., body neutrality content). Thus, appearance-focused social media use emerged as an element to necessarily consider when dealing with BIDs symptoms. Accordingly, clinicians should enable clients to be more critical and approach a functional engagement.

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Appendix - Analysis of psychometric properties, factorial structure, and invariance of an Italian version of the Photo Investment Scale

The current appendix is adapted from Mancin, P., Cerea, S., Spoto, A., & Ghisi, M. (In submission). The Photo Investment Scale: analysis of psychometric properties, factorial structure, and invariance of an Italian version.

A.1. Rational of the study

The present study aimed to analyze psychometric properties, factorial structure, and gender invariance of the Italian translation of the Photo Investment Scale (PIS; McLean et al., 2015) among men and women.

A.2. Method

A.2.1. Participants

The main sample consisted of 250 participants (women n = 140; 56%). Participants ranged between 18 and 66 years for their age (M = 25.36; SD = 7.97) and between 5 and 21 years for their education (M = 14.40; SD = 2.60). Male and female participants did not differ on age ($t_{(248)}$ = 1.81; p = .07; d = .231) or years of education ($t_{(248)}$ = -.61; p = .54; d = -.078). Out of the main sample, 112 participants (women n = 75; 66.96%) completed the retest of the PIS after 4 weeks. Their age ranged from 18 to 59 years (M = 24.95; SD = 7.17) and their years of education ranged from 7 to 21 years (M = 14.98; SD = 2.23); no gender differences emerged (age: $t_{(110)}$ = 1.38; p = .17; d = .277; years of education: $t_{(110)}$ = 1.42; p = .16; d = .284).

A.2.2. Measures

Demographics and social media use. A brief informative form was designed to assess personal information (i.e., gender, age, years of education, marital status, occupational status) along with anamnestic details (i.e., current or past psychological or psychiatric issues, regular medication use). Participants were also asked to report the frequency of taking, but not sharing, self-photos and the

frequency of taking and sharing self-photos on social media on a Likert scale, ranging from 1 ("never") to 10 ("always"). Moreover, individuals were asked to assess the frequency of use of several social media platforms, including Facebook, Instagram, and Snapchat, using a Likert scale ranging from 1 ("almost never") to 10 ("always"). If participants did not have an account or did not utilize a social media platform, they were asked to flag "I don't use it/I don't have an account".

Photo investment. The Italian version of the PIS (McLean et al., 2015) consisted of 8 items on a visual analogue scale with opposing statements. Items are presented along a visual analogue scale from 0 to 100; higher scores reflect higher investment in photo sharing through social media.

Photo manipulation. The Photo Manipulation Scale - Revised (PMS-R; Italian version by Gioia et al., 2021) was utilized to assess photo manipulation. The PMS-R is an 8-item self-report measure designed to assess photo manipulation and photo editing prior to sharing self-photos on social media, utilizing a five-point Likert scale from 1 ("never") to 5 ("always"); higher scores indicate higher levels of photo manipulation. The PMS-R is composed of three subscales: photo filter use, body image manipulation, and facial image manipulation. The overall measure demonstrated adequate internal consistency, as well as each subscale, among Italian adolescent boys and girls. In the current sample, the McDonald's ω for the PMS-R total score was .78 (95% Confidence Interval [CI]: .72, .83) and for women and .71 (95% CI: .63, .80) for men, while Greatest Lower Bound (glb) was .90 (95% CI: .87, .93) for women and .81 (95% CI: .69, .91) for men.

Body image control in photos. The Body Image Control in Photos questionnaire -Revised (BICP-R; Boursier & Manna, 2019) was utilized to assess how participants control their physical appearance through self-photos on social media. It is a 16-item self-report questionnaire with a 5-point Likert scale ranging from 1 ("never") to 5 ("always"). The BICP-R is composed of a total score and five factors: selfie-related factor, assessing selfie-related behaviors; privacy filter behaviors factor, assessing the use of privacy restrictions on social media; positive body image factor, related to effort expended self-presenting positively one's body to other users; sexual attraction factor, related

to sexualized dimensions of self-photo portraits; and negative body image factor related to efforts in avoiding a negative body self-presentation to other users. The total score showed good internal consistency, as well as each factor (Boursier & Manna, 2019). In the current sample, the McDonald's ω for the BICP-R total score was .84 (95% CI: .80, .88) for women and .87 (95% CI: .84, .91) for men, while gbl was .92 (95% CI: .91, .95) for women and .94 (95% CI: .94, .97) for men.

A.2.3. Adaptation of the PIS

To prepare the Italian version of the PIS, the translation process followed the standard steps proposed in the psychology literature (Brislin, 1986). First, the 8 items were translated in Italian from the original English version (McLean et al., 2015) by three independent translators, adopting idiomatic Italian at the sixth-grade level, and avoiding terms that would make the interpretation of the items difficult. Secondly, the translators reached an agreement on a common version. Then, the shared version was back-translated by a bilingual individual. The back-translation emerged close to the original one, which was ultimately utilized for the study after a few adjustments. Finally, each item was evaluated by experts in the psychological field for clarity (each of them had more than 10 years of experience in the psychological field). Since appropriate clarity was met, further item refinement was unnecessary.

A.2.4. Procedure

Participants were recruited through personal acquaintances and social media platforms. To be included in the study, participants needed to 1) utilize Facebook, Instagram, or Snapchat; 2) be active in self-photo sharing; and 3) be at least 18 years old. Individuals interested in participating completed an online link that included the informed consent with information about the study goals, the voluntary nature of the participation, and the possibility to withdraw without penalty. Then, participants were asked to answer items related to personal and social media-related information, followed by self-report questionnaires.

Participants were also asked to add their e-mail address to be contacted for the retest after 4 weeks and to create a personal code with the first letters of their name and surname followed by their date of birth. The code was utilized to guarantee privacy and to associate test-retest compilations.

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Committee of the School of Psychology at the University of Padova.

A.2.5. Statistical analyses

There were no missing responses in the dataset. To examine the factorial structure of the PIS, the main sample was used to conduct an Exploratory Factor Analysis (EFA) and a Confirmatory Factor Analysis (CFA).

First, the distribution, skewness, and kurtosis of each item was examined: some items demonstrated a violation of the ±1 interval for skewness and kurtosis (Table A.1).

Table A.1. *Means, standard deviations, skewness, and kurtosis of the items of the PIS.*

Item	Mean (SD)	Skewness (SE)	Kurtosis (SE)
PIS 1	54.58 (30.08)	-.23 (.15)	-1.06 (.31)
PIS 2 (R)	42.77 (32.27)	.33 (.15)	-1.19 (.31)
PIS 3 (R)	59.78 (30.29)	-.36 (.15)	-.95 (.31)
PIS 4	55.64 (28.57)	-.35 (.15)	-.73 (.31)
PIS 5	49.41 (31.07)	-.02 (.15)	-1.13 (.31)
PIS 6	71.94 (25.56)	-1.06 (.15)	.62 (.31)
PIS 7 (R)	57.90 (30.15)	- .09 (.15)	-1.16 (.31)
PIS 8	47.92 (31.15)	-.05 (.15)	-1.18 (.31)

Note. SD = Standard Deviation; SE = Standard Error. Reverse-scored items are denoted with (R) and are presented prior to being reversed.

A ratio of 10:1 (respondents: items) was considered adequate for the sample (Yong & Pearce, 2013); thus, at least 80 respondents were considered for the EFA and 160 for the CFA, due to invariance analyses. Then, the main sample in two datasets was split: the first one was used for the EFA (women n = 60; men n = 30) and the second one for the CFA (women n = 80; men n = 80). A random and even gender distribution was employed for the CFA, while the remaining part of the sample was employed for the EFA. There were no significant differences with respect to age ($t_{(248)}$ = -.33; p = .75; d = -.043), years of education ($t_{(248)}$ = 1.64; p = .10; d = .217), and distribution of both marital ($\chi^2_{(4)}$ = 4.02; p = .40) and occupational ($\chi^2_{(7)}$ = 3.09; p = .88) status.

Due to the results of the item distribution analysis, the EFA was conducted using Weighted-Least Square (WLS) as an estimation method (Mîndrilă, 2010), an oblimin oblique rotation, and fixed numbers for factor extraction based on the scree-plot analysis. According to Yong and Pierce (2013), a model with the number of factors proposed by the scree plot was compared to a model with one more factor and a model with one less factor (Yong & Pierce, 2013). To assess data factorability, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were selected: the KMO should be at least ≥ .70 and Bartlett's test of sphericity should be significant to justify the application of an EFA (Watkins, 2018). To estimate the number of factors extracted and to assess factor structure adequacy, the following fit indices were examined: the model chi-square (χ^2), the Root Mean Square Error of Approximation (RMSEA) and its 90% Confidence Interval [CI], the Tucker-Lewis Index (TLI), and the Bayesian Information Criterion (BIC). The RMSEA should show values < .06, and the TLI should show values ≥ .95 for good fit (Hu & Bentler, 1999). Items' factor loadings were considered appropriate when > .30. The CFA was conducted to test the factorial models extracted with the EFA and to estimate the proper one. Diagonally Weighted-Least Square (DWLS) was utilized as an estimator (Mîndrilă, 2010). The chosen indices of good fit were the factor model χ^2, the Comparative Fit Index (CFI), the TLI, the RMSEA, and the Standardized Root Mean Square Residual

(SRMR). The CFI should show values ≥ .95 for adequate fit, and the SRMR should show values < .09 for good fit (Hu & Bentler, 1999).

Then, a multi-group CFA was performed to assess gender invariance at configural, metric, and scalar levels using the second dataset. Configural invariance examines if the unconstrained model is equal across genders. Metric invariance implies that the magnitude of loading is similar across the two genders. Scalar invariance implies similarity in factor loadings and item intercepts between the male and female groups. Since the sample size is small (n ≤ 300), ΔCFI ≥ -.005 and the ΔRMSEA ≤ .010 or ΔSRMR ≤ .005 (≤ .025 for loading invariance) were considered for invariance (Chen, 2007). Moreover, a chi-square (χ^2) was utilized to test invariance or partial invariance by comparing the constrained with the unconstrained model.

Moreover, internal consistency was assessed utilizing McDonald's Omega (ω) coefficient and its 95% CI (Dunn et al., 2014) and Greatest Lower Bound (glb; Sijstma, 2007). To confirm adequate internal consistency, values should be greater than .70 (Nunnally, 1978).

Within the test-retest sample, temporal stability was assessed utilizing Pearson's correlations and a paired t-test. Effect sizes for the paired t-test were examined with Cohen's *d*: effect sizes are commonly divided as small (*d* = .20), medium (*d* = .50), and large (*d* = .80) based on benchmarks suggested by Cohen (1988). As for convergent validity, tested utilizing the overall sample, Pearson's correlations among the PIS score, the PMS-R total score, and the BICP-R total score were computed. According to Cohen (1992), correlations ≤ .10 were considered weak, ~ .30 were considered moderate, and ~ .50 were considered strong.

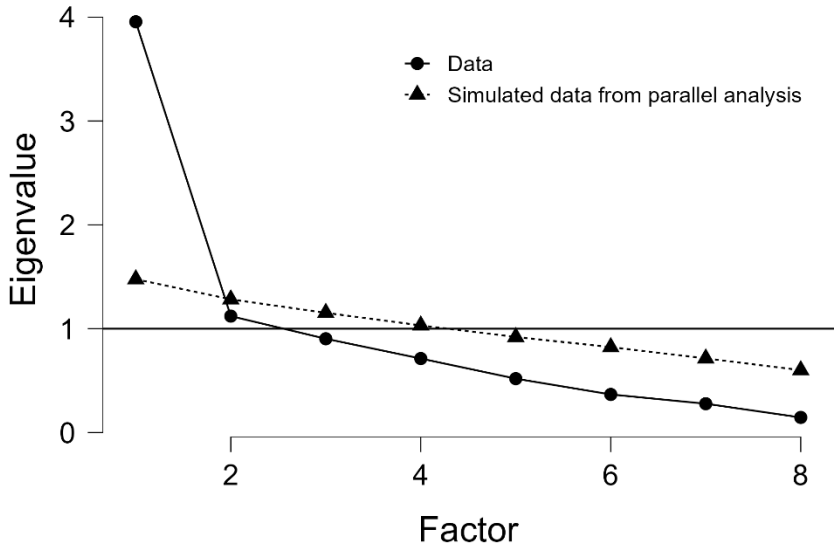
All the analyses were conducted using JASP 0.16.2.0, except for gender invariance, tested with RStudio, version 2022.2.2.485. (Rstudio, 2022), based on R, version 4.2.0 (R Core Team, 2022), and the *lavaan* (Rossell, 2012) and *semTools* (Jorgensen et al., 2021) packages.

A.3. Results and Discussion

Exploratory Factor Analysis

Following Yong and Pearce's guideline (2013) and according to the scree plot inspection, two distinct EFAs were conducted, fixing a priori one and two factors (Figure A.1).

Figure A.1. *Scree plot for the Explorative Factor Analysis of the PIS, originated by JASP.*



Note. The dots represent the eigenvalues of the sample data; the triangles represent simulated data; the straight line allows to identify the eigenvalues with a value > 1.

The KMO was adequate (.72) and Bartlett's test of sphericity emerged as significant ($\chi^2_{(28)} = 326.79$; $p < .001$), allowing to conduct a factor analysis. The first EFA was conducted fixing one factor a priori: all items showed a high factor loading in a single factor, ranging from .815 to .460 (Table A.2). Concerning fit indices, the model χ^2 was significant ($\chi^2_{(20)} = 90.22$; $p < .001$), the RMSEA was .20 (90% CI: .16, .24), the TLI was .67, and the BIC was .222. The factor extracted explained 43.1% of the variance in the measure.

The second EFA was conducted by fixing a priori two factors. As shown in Table A.2, item 3 and item 5 demonstrated strong crossloadings in both factors: according to their major factor loading, item 3 was considered with factor 2, while item 5 was considered with factor 1. Moreover, the fit indices were worse compared to the first solution: the model χ^2 was significant ($\chi^2_{(13)} = 72.98$; $p < .001$), the RMSEA was .23 (90% CI: .18, .28), the TLI was .56, and the BIC was 14.485. The first factor was mostly related to effort in choosing the right photo to share, while the second factor was related to concerns about number of likes received by other users. The two factors were highly associated ($r = -.53$). Finally, according to the rotated solution, the first factor extracted explained 33.5% of the variance, while the second factor explained 18.1% of the variance in the PIS.

Table A.2. *Results for EFA conducted with one and two fixed factors.*

PIS Item	One-factor structure	Two-factor structure	
		Factor 1	Factor 2
(1) It's easy to choose the photo *vs.* It's hard to choose the photo *È facile scegliere la foto* vs. *È difficile scegliere la foto*	**.815**	**.800**	-.076
(2) I take a long time to choose the photo *vs.* I choose the photo very quickly *Ci metto molto per scegliere la foto* vs. *Scelgo la foto molto velocemente* (R)	**-.771**	**-.718**	.114
(3) I feel anxious or worried about the photos I share/post *vs.* I feel very comfortable about the photos I share/post *Mi sento ansioso/a o preoccupata/o per le foto che pubblico/condivido* vs. *Mi sento molto a mio agio per le foto che pubblico/condivido* (R)	**-.652**	**-.346**	**.415**
(4) I share/post whichever photo is available *vs.* I take photos especially for posting/sharing *Pubblico/condivido qualsiasi foto disponibile* vs. *Faccio foto appositamente per pubblicarle/condividerle*	**.460**	**.732**	.264

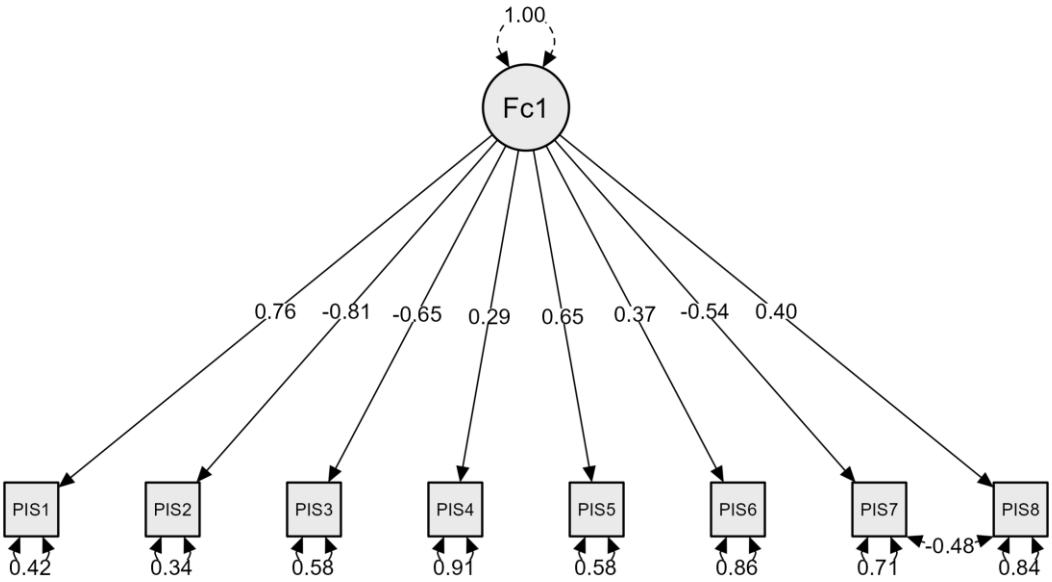
(5) I don't care what others will think about how I look *vs.* I worry about what others will think about how I look *Non mi interessa quello che le altre persone penseranno rispetto a come appaio* vs. *Mi preoccupo di quello che le altre persone penseranno rispetto a come appaio*	**.786**	**.494**	**-.464**
(6) I don't care which photos I share/post *vs.* I carefully select the best photo to share/post *Non mi interessa quali foto pubblico/condivido* vs. *Scelgo attentamente la miglior foto da pubblicare/condividere*	**.651**	**.632**	-.067
(7) I worry about whether anyone will "Like" my photos *vs.* I don't care whether anyone will "Like" my photos *Mi preoccupo del fatto che nessuno metterà "Mi piace/Like" alle mie foto* vs. *Non mi interessa il fatto di non ricevere "Mi piace/Like" alle mie foto* (R)	**-.499**	.031	**.701**
(8) I don't take any notice of how many "Likes" my photos get *vs.* I take notice of how many "Likes" my photos get *Non faccio attenzione a quanti "Mi piace/Like" ricevono le mie foto* vs. *Faccio attenzione a quanti "Mi piace/Like" ricevono le mie foto*	**.512**	.119	**-.511**

Note. The extraction method was weighted least squares with an oblique rotation. Factor loadings above .30 are in bold. Reverse-scored items are denoted with (R).

Confirmatory Factor Analysis

Two distinct CFAs were conducted to match the one and two-factor structures emerged from the EFAs, utilizing DWLS as an estimator. About the one-factor structure, it demonstrated good fit (factor model $\chi^2_{(20)} = 47.30$; $p < .001$; CFI = .95; TLI = .93; RMSEA = .09 [90% CI: .06, .13]; SRMR = .10). To improve the fit of the model, modification indices were examined. Accordingly, the residual covariances of items 7 and 8 were set. The final model is presented in Figure A.2 and demonstrated adequate fit: factor model $\chi^2_{(19)} = 30.93$; $p = .04$; CFI = .98; TLI = .97; RMSEA =.06 [90% CI: .01, .10]; SRMR = .08.

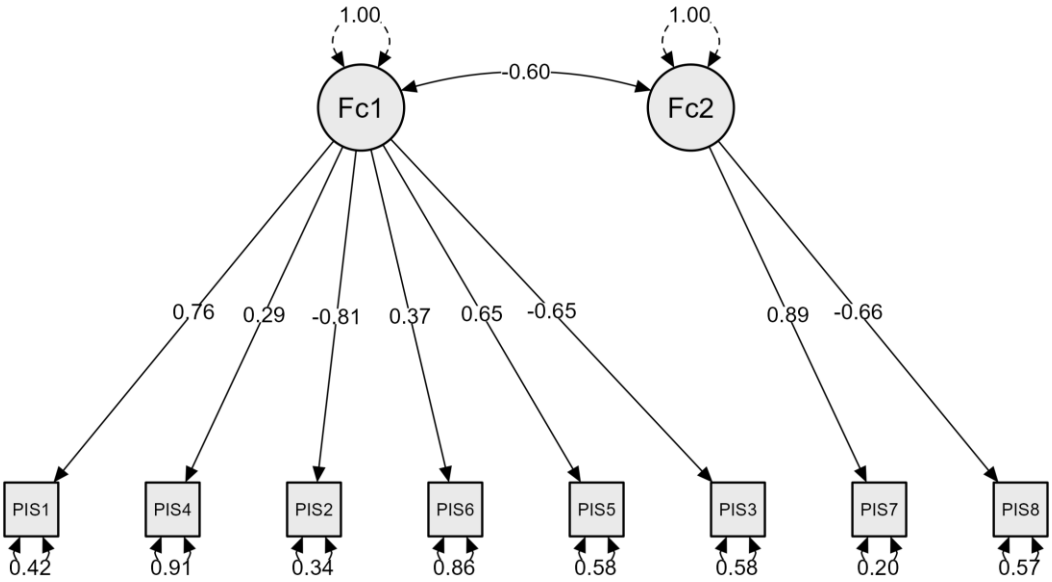
Figure A.2. *Path diagram for the one-factor model of the PIS.*



Note. The circle represents the latent construct, while the squares represent the items. The standardized factor loadings are presented on each path connecting the squares with the circle (all *p*s < .001), and residual variables are presented under each item. The path connecting item 7 and item 8 represents their residual covariance set.

As for the two-factor model, it demonstrated a good fit (factor model $\chi^2_{(19)} = 45.44$; $p < .001$; CFI = .95; TLI = .93; RMSEA = .09 [90% CI: .06, .13]; SRMR = .09), similar to the one described in the previous model. Following modification indices, item 3 was introduced in factor 1. The final model is presented in Figure A.3 and demonstrated adequate fit: factor model $\chi^2_{(19)} = 30.93$; $p = .04$; CFI = .98; TLI = .97; RMSEA =.06 [90% CI: .01, .10]; SRMR = .08.

Figure A.3. *Path diagram for the two-factor model of the PIS.*



Note. The circles represent the two latent constructs, and the path connecting them represents their association. The squares represent the items: standardized factor loadings are presented on each path connecting the squares with the circles (all *p*s < .001), and residual variables are presented under each item.

After a few adjustments, the two factorial structures were similar and demonstrated good fit indices. However, within the two-factor model, the second factor related to concerns over other people's reactions to self-photo shared comprised only two items with similar content (item 7: “I worry about whether anyone will “Like” my photos *vs.* I don’t care whether anyone will “Like” my photos”; item 8: “I don’t take any notice of how many “Likes” my photos get *vs.* I take notice of how many “Likes” my photos get”), while item 5 (“I don’t care what others will think about how I look *vs.* I worry about what others will think about how I look”) that refers to the same aspect of photo investment was included in the other factor. Thus, the two-factor structure could raise concern for the

assessment of preoccupations over other people's reactions within photo investment. According to these considerations, the one-factor structure was preferred over the two-factor one.

Gender invariance

A multi-group CFA was performed to assess gender invariance in the final one-factor structure with the second dataset. The configural model showed invariance, as reported in Table A.3. To support metric invariance, factor loadings for items 4 and 6 were set free. Furthermore, to support scalar invariance, both factor loadings for items 4 and 6 and intercept of item 5 were set free. Therefore, metric and scalar invariances were partially supported.

Table A.3. *Measurement of Gender Invariance.*

Model	χ^2	*df*	CFI	RMSEA	SRMR	Model comparison	$\Delta\chi^2$	Δdf	*p*	ΔCFI	ΔRMSEA	ΔSRMR
Configural	44.12	38	.988	.045	.083							
Partial Metric	50.28	43	.986	.046	.090	Partial Metric vs Configural	6.16	5	.29	-.002	.001	.007
Partial Scalar	57.13	49	.985	.046	.095	Partial Scalar vs Partial Metric	6.85	6	.33	-.001	< .001	.005

Note. The estimator method was Diagonally Weighted Least Squares. CFI = comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Internal consistency

In the main sample, the internal consistency was adequate among women (ω = .83, 95% CI = .79, .88; glb = .93, 95% CI = .91, .95), men (ω = .79, 95% CI = .73, .85; glb = .88, 95% CI = .86, .93), and the overall sample (ω = .82, 95% CI = .79, .85; glb = .92, 95% CI = .89, .93).

Temporal stability and convergent validity

Within the retest sample, the PIS total score showed a strong correlation between test and retest among men (r = .88, p < .001), women (r = .86, p < .001), and the overall sample (r = .88, p < .001). Moreover, according to Cohen's classification (1988), the effect size (Cohen's d) of the difference between test and retest measures was small for men (M_{test} = 42.38, SD_{test} = 19.07; M_{retest} = 41.35, SD_{retest} = 18.56; d = .113), women (M_{test} = 56.49, SD_{test} = 20.98; M_{retest} = 53.72, SD_{retest} = 20.38; d = .251), and the overall sample (M_{test} = 51.83, SD_{test} = 21.35; M_{retest} = 49.64, SD_{retest} = 20.56; d = .210). Thus, the PIS could be described as a measure that evaluate a trait construct that is temporally stable.

As for convergent validity, the PIS demonstrated a moderate association with the PMS-R and a strong association with the BICP-R total score in the overall sample (Table A.4).

Table A.4. *Bivariate Correlation Between Photo Investment, Age, Photo Manipulation, Body Image Control in Photos, Body Dissatisfaction, and Social Anxiety in the overall sample.*

	1	**2**	**3**	**4**
1. Age	1			
2. PIS tot	-.16*	1		
3. PMS-R tot	-.11	.41***	1	
4. BICP-R tot	-.12	.67***	.62***	1

Mean	25.36	52.38	1.61	2.11
(standard deviation)	(7.97)	(19.81)	(.59)	(.63)

Note. *$p < .05$, **$p < .01$, ***$p < .001$; PIS = Photo Investment Scale; PMS-R = Photo Manipulation Scale - Revised; BICP-R = Body Image Control in Photos questionnaire - Revised.

Thus, the PIS could evaluate a construct, i.e., photo investment, that is related to, but different than, other photo-based behaviors, including body image control in photos and photo manipulation.