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Chapter

BODY IMAGE INVESTMENT AND SELF-REGULATION OF WEIGHT CONTROL BEHAVIORS

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ABSTRACT

Body image investment refers to the psychological significance that people attribute to their body image evaluations and to the consequences of those evaluations to their self-definition and adaptive functioning. The current social environment fosters the development of a dysfunctional body image investment, due to the high emphasis placed on the pursuit of ultra-slender body ideals and concurrent devaluation and stigmatization of overweight and obesity. Appearance becomes central to many people's identity, and their self-worth and well-being contingent on meeting the thin body ideals, achievable by only a few. As a result, many people, especially women, feel pressured to lose weight and end up engaging in unhealthy, often non-sustainable, behavioral efforts to lose weight and improve appearance. However, being motivated to lose weight for reasons such as changing appearance and body weight could be experienced as controlling and/or as a self-imposed pressure to engage in treatment. Consequently, it can elicit a less autonomous form of self-regulation regarding weight-related behaviors, which in turn might constitute an additional obstacle to successful and sustainable weight management.

The available evidence consistently supports the adverse consequences of dysfunctional investment in appearance (which goes beyond body dissatisfaction) on people's psychosocial functioning and regulation of weight-related behaviors. Yet, in contrast to body dissatisfaction, the dimension of body image investment has often been ignored by researchers, including in obesity studies. Informed by self-determination theory, the authors will focus on describing the investment dimension of body image, explain how sociocultural demands contribute to the salience of a dysfunctional (as opposed to a more adaptive) investment in appearance, and discuss the motivational dynamics underpinning people's decisions to engage in weight control behaviors such as

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physical activity and eating patterns. Recent findings will be summarized, showing that the enhancement of body image investment during obesity treatment helps improving key psychosocial and behavioral variables that facilitate weight management. This information will be complemented with new data from ongoing research. Finally, implications for future weight control interventions will be addressed.

INTRODUCTION

Body image is widely recognized as a complex, multidimensional construct consisting of an individual‘s mental representation of body-related perceptions and attitudes (i.e., thoughts, feelings, and behaviors), especially focused on but not limited to physical appearance [1]. Prior research has confirmed that body image attitudes comprise an evaluative component (also known as body (dis)satisfaction) and an investment component (cognitive-behavioral salience of one's appearance) [2-3]. Yet, a limited conceptualization and measurement of the body image construct has dominated research in the last few decades [4]. Simple measures of cognitive-affective appraisals about one's appearance, including self-ideal discrepancies and body (dis)satisfaction evaluations (i.e., of evaluative body image) have often been questionably used to quantify, and equated with, body image disturbance [5]. However, such discontent with appearance may vary in its impact on an individual's psychological well-being and therefore cannot be considered a sufficiently sound index of disturbance per se. For some individuals, being dissatisfied with their body weight or shape can have minimal or even benign implications on their body image-related quality of life; for others, the negative implications can be severe. Hence, the former view is reductionist because it ignores the psychological significance that people place in their (negative) body image evaluations and the consequences of those evaluations concerning personal distress and adaptive functioning [5]. In other words, it neglects body image investment. Research within the obesity field is no exception. This chapter will address the main features of this body image component and discuss their implications to the self-regulation of weight control behaviors.

BODY IMAGE INVESTMENT

Body image investment refers to the degree of cognitive and behavioral importance that people assign to their body and the extent to which the body's appearance defines their sense of self. Although this dimension has both positive and negative features, it typically reflects a dysfunctional investment, as opposed to a more adaptive valuing and managing of one's appearance, in order to regulate body image evaluations and emotions [2]. It comprises features like people's misguided thoughts and assumptions about appearance (e.g., "One's outward physical appearance is a sign of a person's inner character", "By controlling my appearance, I can control social and emotional events in my life"), body-related negative emotions (e.g., "I felt ashamed of my body", "I felt so bad about my shape that I have cried"), and associated behavioral consequences (e.g., "I react by overeating", "I make a special effort to hide what's troublesome about my looks", "I withdraw and interact less with others"). Yet, the core feature of body image investment pertains to appearance-related self-schemas, i.e., cognitive structures derived from past experience that summarize one's thoughts and beliefs

about appearance and its centrality to one's self [6-7]. These schemas are believed to be actively triggered and maintained by appearance-related internal or environmental events and cues [8].

Numerous studies have shown that poor body image results from a combination of disturbances in both evaluative and investment components of body image, and that these two are associated with adverse psychosocial consequences, including poor psychological adjustment, negative affect, low self-esteem, increased depression and anxiety, impaired sexual functioning, maladaptive eating behaviors, and reduced quality of life [1, 9-12]. Despite this, body image distressful attitudes may vary in their impact on an individual's psychological well-being, and effectively, it has been suggested that body image dysfunctional investment might have more detrimental effects on psychological well-being than evaluative body dissatisfaction, which per se is not considered a valid indicator of emotional distress and psychosocial impairment [13]. Prior studies appear to corroborate this hypothesis, showing that dysfunctional investment in appearance considerably exceeds the contribution of body dissatisfaction to the prediction of psychosocial functioning [e.g., 2, 13-14]. For example, Cash et al. found that appearance-schemas (i.e., the core facet of body image investment) predicted social anxiety, depressive symptoms, and eating disturbance, above and beyond a simple index of body dissatisfaction [2]. In another study, Jakatdar et al. found that cognitive distortions related to body image thoughts predicted quality of life and disturbed eating attitudes above and beyond evaluative body image [14]. Greater precision in understanding and evaluating the multidimensional nature of the body image construct, and in particular its investment dimension, is thus required to clarify body image development, functioning, and change [4, 15].

DYSFUNCTIONAL INVESTMENT IN APPEARANCE: SOCIOCULTURAL ROUTES

Social Standards and Implicit Meanings

The current standard for thinness, as well as other unrealistic standards of beauty for women, are all-pervading but impossible to achieve for the average women without resorting to extreme and unhealthy behaviors, [16]. Hence, it does not startle that, nowadays, concerns about weight and appearance are considered normative and that many women feel pressured to lose weight [17]. This might be even more pronounced for overweight and obese women, provided that the social valuation of thinness is accompanied by the devaluation and stigmatization of overweight and obesity. It should be noted, however, that the "perfect body" ideal is no longer a primarily female concern [18]. Evidence shows that emphasis on, and objectification of, the ideal male body is growing, such that the well-toned upper torso has become so muscular that it is unattainable for most men [e.g., 19]. Even so, men appear not to be as acutely affected by sociocultural pressures as women. Thus, the present chapter will generally focus on women's concerns and investment in appearance.

According to sociocultural explanations, body image concerns and unhealthy investment appear to derive from three major factors: the culturally-sanctioned thin ideals and their

symbolic meaning, the stigma associated with obesity, and the role of physical appearance as a core aspect of femininity [20-21].

The culturally-endorsed ideals of feminine beauty have changed over time, moving away from a preference for a more curvaceous shape. Research confirms this fact, indicating that media models have become progressively thinner, often exceeding the 15% underweight criteria used to diagnose anorexia [22-23]. These unrealistic and unhealthy ideals, achievable by only a few, are so ubiquitous in the media (e.g., TV, internet, magazines, and shops) that women cannot avoid a sheer exposure to them [24]. But what makes women strive for these ideals and become dysfunctionally invested in their appearance?

The feminine "perfect body" ideals carry an array of implicit, symbolic meanings, which convey that only the beautiful and the thin are valued and loved, and which connote it with success, happiness, health, and being in control of one's life [18, 25]. According to Dittmar, there is a halo effect around the "body perfect" ideal, where the idealized media models not only communicate that beauty and prosperity should be central life goals for everyone, but also establish what it means to be beautiful, successful and happy [18]. The problem is that people tend to be unaware of the implicit social messages conveyed in the media, and of its pervasive influence [25]. They are misled to believe they are expressing their selves and conquering happiness when they are actually shaping and monitoring their identities according to the unrealistic ideals transmitted by these messages [18].

On top of this, mass media also explicitly instruct how to comply with these messages, by advertising an array of "solutions" to get women closer to the culturally-sanctioned ideals. Women are told that they can have the perfect body if only they consume more products: cellulite control creams, "miraculous" diet pills, individualized meal plans, workout sessions with personal trainers, and cosmetic surgery are just a few examples [18, 25]. Hence, advertising not only encourages the cult of ultra-slender ideals; it also offers the solutions making women believe they *should* and *can* be thin. However, we live in a complex society dominated by capitalist interests and, in truth, supportive of a cultural paradox, which cultivates thinness at the same time it creates a toxic environment prone to weight gain [25]; this is supportive of the widening gap between the ultra-thin ideals portrayed in the media and women's actual body sizes. As Wolf argued, "Ideal beauty is ideal because it does not exist" [26; p.176].

Complementing the positive stereotype regarding physical attractiveness is the negative stereotype towards obesity. Nowadays, the decline in female body size ideals contrasts with the increase of ordinary women's average weight, with recent health statistics showing that overweight rates are well above 50% in several industrialized countries [27-29]. The rising in obesity rates would not represent a problem if socially prevailing pro-thin bias were not accompanied by anti-fat bias, as it seems to be the case [e.g., 30]. Unfortunately, the stigma and discrimination associated with obesity is highly prevalent, and often due to widespread negative stereotypes, viewing obesity as a "voluntary", controllable condition, and overweight and obese persons as lazy, unmotivated, lacking in self-discipline and competence to control their urges [31]. Hence, obesity is seen not only as an aesthetic flaw but as a character defect as well, further increasing the emphasis on the pursuit of thinness, and naturally, the prevalence of body image disturbances [20].

Finally, the role of physical appearance as a core aspect of femininity also constitutes a major influence on the pervasiveness of body image dysfunctional investment in women. Objectification theory contends that the cultural milieu, mostly through mass-mediated

images, sexually objectifies women's bodies, showing them as thin, beautiful, and often fragmented body parts [32]. Sexual objectification functions to socialize girls and women to treat themselves as objects to be evaluated based on appearance [33]. Women learn that their appearance matters, and that other people's evaluations of their body shape can determine how they are treated, and ultimately, affect their social and economic life outcomes [34]. Moreover, women are socialized to place higher priority on interpersonal relationships and taught to believe that their physical attractiveness is responsible for the success of their relationships [35]. As a consequence of this female-gender role stereotype, women tend to overidentify with their bodies, and their identity and sense of self-worth often become contingent on conforming to the prevailing norms for thinness and attractiveness [20, 33].

These three sociocultural factors – ultra-thin ideals, obesity stigma, and the centrality of appearance to women's femininity – contribute to the widening gap between the ultra-thin ideals portrayed in the media and women's actual body sizes, with several negative consequences on body image. These include perceptual distortions translated into body size overestimations, body dissatisfaction and related negative emotions, and the emergence of a dysfunctional investment in managing one's appearance [24, 36]. This form of investment is linked to the adoption of appearance as the central criterion for the definition of women's identity and worth. This results in selective attention to appearance-related messages, engagement in dieting and other unhealthy body-shaping behaviors [1], as it permeates the pursuit of thinness (or weight loss) with the "myth of transformation". Improving appearance (or losing weight) is seen as a promise of changing more than just one's body; it promises to change one's social acceptance, status, and sense of worth [18, 20]. In other words, a woman's self-worth becomes contingent on meeting the societal ideals [36]. Yet, this may largely be an illusion. The pursuit of such goals and behaviors can be rewarding in the short-term but it is counterproductive because it serves to camouflage and perpetuate the true problem, as it only provides temporary satisfaction and relief from body image discomfort [37]. Furthermore, it fails to yield long-term well-being benefits, because it creates an unstable, and short-lived form of well-being, which is conditional on escalating standards and unrealistic weight goals [38].

In weight management contexts, these aspects make many (overweight) women undervalue moderate weight losses if, despite those, they remain far from their stringent ideals. Thus, body image concerns are likely to be a major obstacle to the acceptance of the level of weight loss that individuals can realistically achieve in treatment [39]. It has been suggested that undervaluing the weight loss achieved may contribute to participant's failure to acquire and practice weight maintenance skills [40], which is likely to increase the chances of relapse and weight regain. In effect, body dissatisfaction at the end of obesity treatment appears to predict weight regain [41].

Motivational Dynamics of Body Image Investment: A Self-Determination Theory Perspective

Self-determination theory (SDT) [42-43] offers a different but complementary contribution to the understanding of sociocultural influences on and consequences of dysfunctional body image investment. This theory proposes that individuals go through a natural process of internalization in which they assimilate and attempt to transform social

norms and demands into personally endorsed values and self-regulations. According to SDT, the regulation of behavior can take many forms corresponding to qualitatively different styles of behavioral regulation, that can be differentiated along a continuum of self-determination, ranging from non self-determined or controlled forms of behavioral regulation (i.e., amotivation, external and introjected regulations) to self-determined or autonomous forms of behavioral regulation (i.e., identification, integration, and intrinsic motivation). Behaviors are autonomously regulated to the extent to which they are experienced as chosen and are personally relevant (e.g., entering weight loss treatment to improve health or because it is consistent with one's valued lifestyle). Conversely, behaviors are considered controlled when performed due to pressure or coercion, either by external or internal forces (e.g., entering weight loss treatment following a doctor's orders or to avoid feelings of guilt or shame).

Self-determination theory further suggests that individuals have an innate tendency to be active and autonomously motivated, and thus to regulate their behaviors through choice as an expression of themselves, as long as the appropriate conditions are present. Specifically, SDT postulates that individuals' optimal functioning requires the satisfaction of three basic psychological needs (i.e., autonomy, competence, and relatedness), whose fulfillment is closely associated with the characteristics of the social milieu [42]. Accordingly, when the social environment is excessively controlling and evaluative, pressuring individuals to act in certain ways, psychological needs are not satisfied and, subsequently, the process of internalization gets thwarted and becomes associated with less autonomous functioning. In this case, individuals are generally moved to act as a result of feeling pressured or coerced by internal and environmental forces (e.g., entering weight loss treatment to avoid feelings of guilt or shame, or following a doctor's orders). The continuous thwarting of basic needs results in increased susceptibility to sociocultural messages advocating that the pursuit and attainment of extrinsic goals (e.g., physical attractiveness, fame, economic prosperity) brings happiness and success [38]. However, these goals represent need substitutes that individuals develop to compensate the absence of need satisfaction and, in reality, they only provide a fleeting relief, interfering with genuine need satisfaction and undermining individuals' autonomous functioning even further [42].

Psychological need satisfaction and self-determination are associated with enhanced psychological functioning [42]. Accordingly, when autonomous forms of regulation guide behavior, more adaptive behavioral, cognitive, and well-being outcomes are expected to ensue. In contrast, controlled forms of regulation (derived from need frustration) are expected to result in maladaptive outcomes. Considerable evidence, conducted in several life domains, attests to the qualitative advantages of autonomous, relative to controlled, behavioral regulations, supporting this proposition [see 42, 44, for reviews]. In summary, autonomous regulations are associated with higher self-esteem, increased life satisfaction, greater happiness and self-realization, and enhanced mental health, whereas controlled regulations undermine these outcomes.

According to self-determination theory, the sociocultural demands to conform to the ideal physique could be experienced as controlling and overchallenging, thwarting the satisfaction of basic psychological needs and, consequently, encouraging the pursuit of extrinsic goals such as having an attractive appearance to get social acceptance and status. A strong focus on such an extrinsic goal, rather than on intrinsic or well integrated goals (e.g., being healthy and fit), might induce a more contingent approach towards weight management in which one's self-worth becomes largely dependent upon reaching socially imposed standards about the

ideal appearance [38]. As a result, one might become more susceptible to social pressures, either internal (e.g., guilt, shame) or external (e.g., media, family), and thus be drawn to a more controlled regulation of weight-related behaviors [42, 45], which ultimately can provide a significant barrier to successful outcomes and psychological well-being. In effect, the tendency to evaluate self-worth in terms of weight and shape, or to be regulated by controlled reasons to lose weight, predicts poorer weight outcomes and lower treatment adherence [46-47], and even weight regain [48]. This might derive from the fact that the majority of women who feel distressed with their bodies and pressured to achieve the thin ideals, regulate their weight loss behaviors in a rigid or controlling manner, using an all-or-nothing approach [49]. Given the lack of flexibility within this approach, even small deviations or setbacks give rise to feelings of frustration, compromising long-lasting engagement and, ultimately, success [50-51]. On the other hand, internal motivations to lose weight and autonomy, which typically reflect a more flexible regulation of weight-related behaviors, have been positively associated with successful weight management [50-51].

Prior research has provided support for this thesis. For instance, a very recent study found that poorer body image was associated with a greater focus on extrinsic, appearance-related goals towards eating regulation, and with subsequent need frustration [52]. This study also reported associations between appearance-focused eating regulation and increased psychological need thwarting [52]. In line with these findings, Thogersen-Ntoumani et al. showed that pursuing life goals that aim to attain cultural standards of ideal physique is not conducive to psychological need satisfaction and may result in concerns and feelings of inadequacy about one's body image. These authors further showed that health and appearance-focused goals might contribute to unhealthy weight control behaviors through body image concerns and (for health goals only) psychological need satisfaction [53]. There is also consistent evidence for the associations between poor body image and non self-determined regulations. For example, Pelletier and Dion found that body dissatisfaction resulting from the internalization of sociocultural pressures and messages related to thinness was strongly associated with controlled regulations for eating and subsequent psychological mal-adjustment [49]. Similarly, but in exercise contexts, Markland and Ingledew reported positive relations between body size discrepancies and both external and introjected regulations [54], and Thögersen-Ntoumani and Ntoumanis found positive associations between social physique anxiety and both forms of controlled regulation [55]. Finally, there is also evidence of the association between the pursuit of extrinsic goals and less self-determined behavioral regulations. For instance, Aubrey showed that exposure to appearance frames (i.e., do something in order to look better) compared to health frames (i.e., to do something in order to feel better) was related to more body shame and appearance-related reasons to exercise [56], whereas Segar et al. found that weight-related goals were associated with more introjected and less intrinsic behavioral regulation compared to goals like stress reduction and sense of well-being, in a sample of overweight women in midlife [57].

Research testing these associations in the overweight and obese population, especially in the context of obesity treatment, is rather limited. Yet, recently, a randomized controlled trial addressed the impact of self-determined motivation on long-term weight management (and related behaviors), in overweight/obese women [58-59]. Post-hoc analyses assessing baseline associations between body image features, motivation to engage in obesity treatment, and psychological well-being suggested that controlled motivations for enrolling in treatment could be one of the mechanisms explaining the negative effect of poor body image on the

psychological well-being of these women [60]. These findings are particularly relevant in the context of weight management, because they highlight that overweight women distressed with their appearance are more susceptible to enroll in treatment for controlled reasons, which are often associated with poorer psychological profiles – including low self-esteem, reduced life satisfaction, symptoms of depression and helplessness [e.g., 61, 62] –, which in turn might predict higher abandonment rates or less successful outcomes [e.g., 63]. Furthermore, this study was the first to distinguish between body image evaluative and investment dimensions, and to investigate their separate role in the context of obesity treatment. Results revealed that dysfunctional investment in appearance was positively associated with controlled regulation for entering treatment, and negatively associated with psychological outcomes (i.e., self-esteem and mental health), whereas evaluative body image was unrelated to either outcome [60]. These findings are in line with prior research [e.g., 13, 64] and suggest that dysfunctional investment in appearance, rather than body dissatisfaction per se, is more detrimental to the psychological well-being of overweight and obese women, and has worse motivational implications for obesity treatment.

BODY IMAGE INVESTMENT AND WEIGHT MANAGEMENT: SUMMARY OF RECENT FINDINGS

The management of body image concerns within weight loss interventions is still in the developmental stages, but it seems to be effective in improving body image even with only modest weight losses [e.g., 65, 66]. Indeed, weight reduction is one of the most widely practiced body image remedies [41, 67]. However, while it appears effective in the short-term, it seems less so in the long-term, with body image deterioration accompanying weight regains [66, 68]. Given the short-lived nature of weight loss, alternative methods to enhance body image that are not contingent upon weight loss, and thus may be more helpful in the long-term, have been devised and investigated. Prior research suggests that body image enhancement, conducted either independently (as an alternative) or integrated into weight loss programs, can be achieved in the absence weight change [69-70]. Despite these advances in body image management, several aspects regarding the way it works remain unclear. The study of body image investment changes within weight management interventions, as well as their implications to the self-regulation of weight control behaviors is certainly one of these aspects. Accordingly, recent empirical investigations sought to address the following questions: “How does treatment affect different body image dimensions, especially body image investment?”, “How long do these changes last?”, and “Which mechanisms underpin treatment effects?”. The findings produced by these studies provide additional insight into the role of body image investment in weight management, and are summarized below.

Trajectories and Mechanisms of Change in Body Image Investment

Recently, one study conducted in the context of a randomized controlled trial involving 239 overweight/obese women (the “PESO trial” [59, 71]), analyzed the trajectories of change in body image dimensions over a 12-month behavior change intervention and a 12-month

follow-up period, and explored potential mechanisms involved in body image improvement and maintenance, namely different forms of physical activity [72]. As predicted, the intervention produced considerable improvements in both body image dimensions (small to moderate effect sizes favoring the intervention group). On average, these changes amounted to 21% in body dissatisfaction and 25% in dysfunctional investment (assessed as the difference between the intervention and control groups), which according to Maciejewski and colleagues' criteria can be deemed clinically significant [73]. These effects started fading after the intervention resulting in a gradual deterioration in body image. Nonetheless, 24-month levels of body dissatisfaction and dysfunctional investment in appearance remained below initial levels, which suggests that body image changes during obesity treatment can be achieved and do persist overtime, even though they do diminish to some extent [72].

Intervention effects on body image might be partially accounted for by the body image module included in the program, which implemented several established strategies, to increase participants' body acceptance and satisfaction (e.g., asking participants to view and gradually explore their body in front of a mirror; establishing more realistic weight-related goals and expectations), and to decrease their dysfunctional investment in appearance (e.g., helping participants understand the concept of body image and recognize their social and personal roots; helping them cope with stereotypes and prejudice, challenging the idea that they must look different to be happier) [74]. Yet, the identification of causal factors (i.e., mediating mechanisms) implicated in body image improvement during weight loss interventions remains ripe for investigation, even more so when the change in body image dimensions is under scrutiny. Naturally, the positive influence of changes in weight, although short-lived, cannot be discarded [66, 68, 75]. Still, other mechanisms appear to be involved. For instance, physical activity, which is considered a critical component in weight management [76], might be such a mechanism as illustrated in the study mentioned above. In this regard, Carraça et al. found that physical activity was a significant mediator of the intervention effects on body image, even after adjusting for weight changes, and not exclusively in the short/medium-term [72]. Specifically, results revealed that structured rather than lifestyle (less intense) physical activity was more relevant for the improvement of body image during the 12-month intervention, namely for reducing the dysfunctional investment in appearance; something already observed in prior research [e.g., 77]. On the other hand, this study suggested that lifestyle physical activity could be particularly important in the long-term, if not to improve, at least to attenuate body image deterioration after the intervention; this was a novel and interesting finding, considering the current focus on lifestyle and unstructured physical activity as a means of meeting the recommended doses of exercise for weight management purposes [76].

The previous study [72] also indicated that the mechanisms behind the changes in multiple body image dimensions might be distinct or have different effect magnitudes. In effect, at 12 months, physical activity (structured and lifestyle) was not associated with the evaluative component after the adjustment for body weight change, and therefore did not mediate treatment-related changes in this body image dimension. On the other hand, as previously mentioned, there were significant indirect effects of treatment on body image investment, through structured physical activity.

Thus, in the short-term (i.e., at program's end), the change in the evaluative dimension appears to be more dependent on weight change than the investment dimension, while the latter seems to be more susceptible to exercise participation [72]. In contrast, in the longer

term, treatment effects on evaluative body image, after controlling for weight changes, were mediated by lifestyle (not structured) physical activity, as were treatment effects on body image investment.

Overall, these findings suggest that beyond weight change, physical activity might be a mechanism of interest, or at minimum an important marker, for improvements in body image, and protect it against the effects of weight regain and other potential threats to body image relapse (e.g., media messages, social pressure, etc.). Still, far more research is needed on the identification of mediators of body image changes within weight loss interventions.

Implications to the Self-Regulation of Weight Control Behaviors

As previously discussed, body image is often compromised in overweight women may be an additional obstacle to successful weight management, predicting poorer outcomes and increased chances of relapse [74, 78]. Several factors contribute to these effects, including the psychological suffering and distress frequently associated with negative body image, maladaptive eating attitudes and behaviors, and less adaptive motivational regulations [49, 60, 79].

In addition, as previously discussed, prior research indicates that dysfunctional investment in appearance has more adverse consequences to one's psychosocial functioning than evaluative body dissatisfaction [2, 60]. Thus, it is important to clarify whether the improvement in multiple body image dimensions, especially in dysfunctional investment, contributes to long-lasting weight management partially due to more favorable psychological profiles.

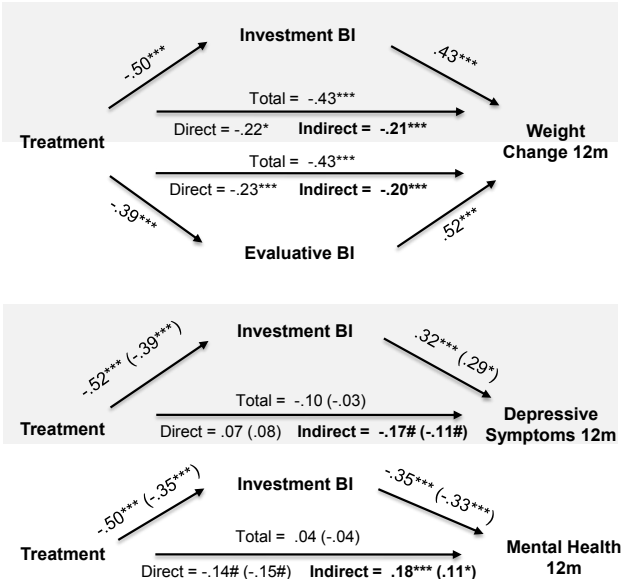

Figure 1. Twelve-month mediation models for weight and psychological outcomes. Body image investment and evaluative body image were tested as putative mediators of treatment effects on weight, depressive symptoms, and mental health. Mediation analyses for psychological outcomes were also

conducted controlling for changes in body weight; path coefficients in parentheses. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

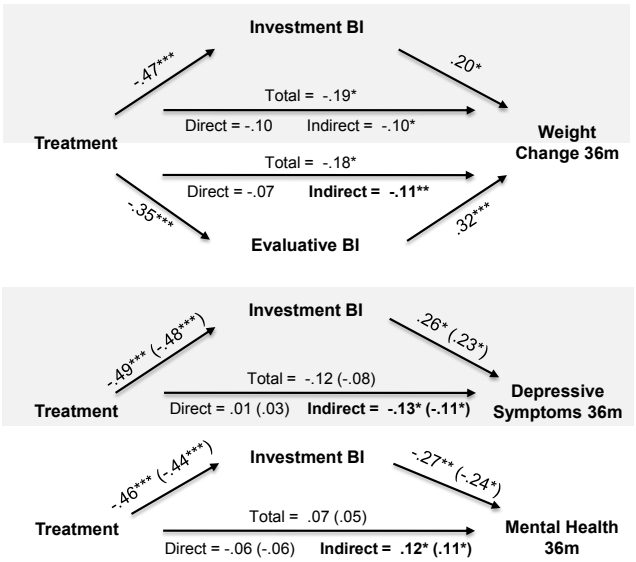

Figure 2. Thirty-six-month mediation models for weight and psychological outcomes. Body image investment and evaluative body image were tested as putative mediators of treatment effects on weight, depressive symptoms, and mental health. Mediation analyses for psychological outcomes were also conducted controlling for changes in body weight; path coefficients in parentheses. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

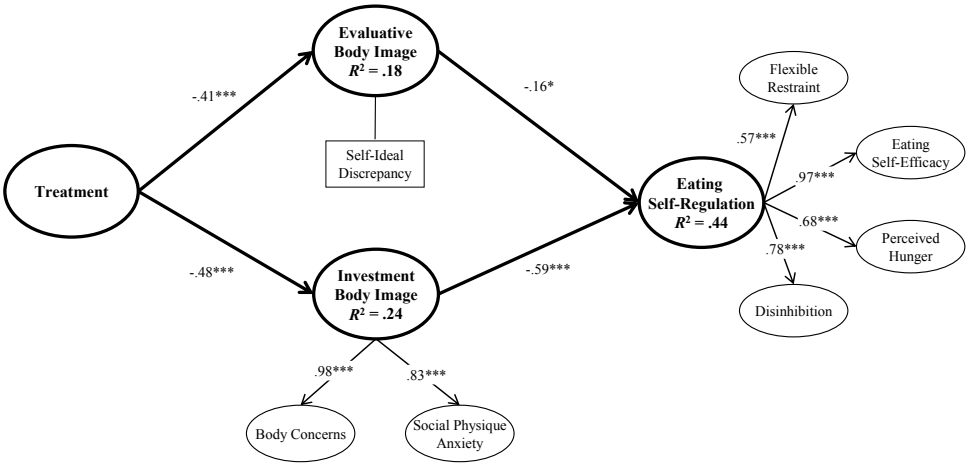

Figure 3. Path model (adapted from Carraça et al. 2011 [82]). Values in the paths represent the bootstrapped PLS estimates; $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

For that purpose, a recent study tested whether the improvement of body image during obesity treatment mediated changes in weight and psychological well-being at intervention's end and after a 2-yr follow-up [80]. Results revealed that changes in evaluative body image were correlated with 12- and 36-month weight change, and significantly mediated treatment

effects (*effect ratios*: .47 and .61, respectively); however, this dimension had no effects on well-being.

On the other hand, reductions in dysfunctional investment in appearance were also associated with better psychological outcomes at both time points, and significantly mediated treatment effects on both outcomes. Notably, the indirect effects of treatment on well-being through body image investment remained significant after adjusting for weight change (see Figures 1 and 2) [80].

These findings suggest that improving body image during obesity treatment, especially the investment dimension, might contribute to more favorable weight outcomes and psychological well-being, not only immediately post-intervention but also in the longer-term. Thus, they are particularly relevant in the context of relapse prevention, supporting the need to address body image issues during obesity treatment. In line with these findings, a previous study had already shown that treatment-induced changes in evaluative and investment body image dimensions differentially affected and mediated the impact of the intervention on eating self-regulation (see Figure 3) [81]. Specifically, results revealed that relative to evaluative body image, the improvement in body image investment more strongly explained change in eating regulation. In addition, while the change in evaluative body image was shown to predict only one of four markers of eating self-regulation (eating self-efficacy), whereas the change in investment affected all four markers. Thus, this study suggested that body image change should also be considered as one valid mechanism through which the regulation of eating behavior could be improved in behavioral weight management interventions, at least in the short-term. Future studies should explore these effects in the long-term.

PRACTICAL IMPLICATIONS AND FUTURE DIRECTIONS

Moving Beyond Body Dissatisfaction

Overall, the findings presented above strongly support the need to move beyond simplistic conceptions of body image, suggesting that greater attention should be given to the dimension of body image investment, that is, to the degree of cognitive, affective, and behavioral importance that people assign to their body [1].

First, body image investment appears to have adverse consequences above and beyond those of body dissatisfaction (including in the context of weight management) resulting in poorer psychological profiles and motivations toward treatment (i.e., less self-determined). Consequently, features of dysfunctional investment such as people's misguided thoughts and assumptions about appearance should be well understood and evaluated if any progress in fully understanding body image development, dysfunction, or change is to be achieved [4]. Researchers and practitioners are thus advised to replace simplistic measures of body image satisfaction by multiple and/or more sophisticated measures which assess several facets of body image, while ensuring that misleading interpretations regarding body image functioning or related outcomes are minimized [15]. Future weight management interventions should include a comprehensive body image assessment if the goal is to get a deeper understanding of participant's body image functioning and possibly use that knowledge when implementing

the intervention (e.g., which stereotypes need to be defied, which negative thoughts need to be addressed and replaced to generate a healthier inner body talk, etc.).

Second, changes in body image investment seem to be relatively independent from weight change, in comparison to the changes in the evaluative dimension. This aspect exposes a basic reality about body image and the weight reduction enterprise. Body image is a psychological construct that refers to people's *subjective* evaluations of their physical attractiveness as opposed to their objective physical appearance. Hence, losing weight does not guarantee a positive body image. In addition, the results reported in this text help understand why even slight weight regains result in body image worsening [68], and why former obese individuals often report a vestigial body image disparagement [82]. Practitioners should not expect that relying merely on weight loss (without addressing body image problems) will magically substitute people's negative body image by a positive or normal one. In fact, current findings suggest that weight loss interventions that do not contemplate body image treatment might not suffice to achieve long-lasting improvements in body image, in particular in the investment component.

Finally, the reduction of dysfunctional investment in appearance appears to have a greater impact in body weight regulation, compared to evaluative body image, by inducing more effective improvements in the regulation of eating behavior. These findings reinforce the benefits of including a body image module within weight management interventions targeting both dimensions but especially focused on body image investment. This could be achieved by actively deconstructing and defying held beliefs and predefined concepts about the centrality of appearance to one's life and sense of self. And more mindfully accepting and neutralizing negative body image emotions, by identifying problematic thoughts and self-defeating behavior patterns and replacing them with healthier thoughts and behaviors [83].

Promoting an Autonomous Regulation of Weight Control Behaviors

When implementing interventions, health professionals would do well to consider the reasons regulating people's engagement in obesity treatment. Self-determination theory suggests that by maximizing patients' experience of autonomy, competence, and relatedness in health care settings, the regulation of health-related behaviors is more likely to be internalized, behavior change will be better maintained [84-85], and greater psychological well-being will be experienced [44]. Hence, health professionals should also consider the inclusion of strategies to promote autonomy and reduce controlled regulations when implementing weight management interventions [59, 71]. Specifically, interventions should be designed in order to provide structure and enable feelings of competence (e.g., practicing skills necessary for completion of specific tasks, or giving informational, task-related positive feedback), and create an autonomy-supportive environment. This could be achieved by providing choices supported by a clear rational which guides and facilitates the decision-making process, while avoiding prescriptions, pressure, demands, and extrinsic rewards, and by acknowledging participants' feelings and perspectives [e.g., 59, 86]. Additionally, interventions could benefit from including strategies to improve body image (especially its investment component), given that increasing healthy investment in appearance, body satisfaction and acceptance, might progressively reduce controlled body-related motives to lose weight, favoring the adoption of more autonomous regulations, and consequently

facilitate well-being and long-term health behavior adherence and weight maintenance. Thus, professionals should be aware of and consider these aspects when evaluating patients' readiness to lose weight, and when providing care.

From "Changing the Body" to "Changing Body Image"

As Mark Twain once said, "The worst loneliness is not to be comfortable with yourself". When people dislike their looks, they will understandably try to figure out how to change their appearance. Instead of thinking about adjusting their attitude towards their body, they contemplate how they can adjust their shape and weight: a slimmer/toned body, larger muscles, a more youthful complexion, larger (or smaller) breasts, etc. This reality is reflected in the high numbers of people, women in particular, that are (re)currently trying to lose weight [87]. These solutions have one basic psychological purpose – to make the person feel better, at least temporarily, about the body she or he lives in. However, as discussed above, these compensatory activities and behaviors do not really contribute to deep-rooted and stable well-being (since they may only serve to meet compensatory psychological needs), and in fact, they may aggravate people's feelings of dissatisfaction, frustration, and hopelessness, sometimes leading to health problems and disturbed eating behaviors that increase the likelihood of additional weight gain.

On the other hand, and contrary to some popular perception, the findings discussed in this chapter suggest that the more positive people are about their bodies, even when they are overweight or obese, the easier it is to lose weight, particularly by eating in a more healthful and balanced way. When people actively challenge held beliefs and predefined concepts about the centrality of appearance to one's life and sense of self, they tend to feel less pressured to achieve certain body ideals, feel more positive and accepting about the body that they have, and define more realistic weight loss goals. Not only do their psychological resources and emotional well-being increase (which should support behavior change) but they also appear to regulate their diets in a more flexible and confident way, relying less on extreme and unhealthy eating practices. So it is important that weight loss professionals learn how to best help patients and clients explore the causes of poor body image and work with them towards improvements in this area. This will likely help people lose weight, if not faster, in a lasting and more sustainable way. Also, professionals should not be concerned that if overweight people accept and like their bodies they will "lose their motivation" and abandon their efforts to lose weight. In fact, the opposite seems to be true. It appears that persons who appreciate their bodies simply start listening to their body's needs and making healthy rather than appearance-based decisions, as well as indulging their bodies (e.g., getting massages, grooming rituals). They naturally, effortlessly, decide to be proactive about their health and start taking charge. "It wasn't about how I looked; it was about how I felt. I want to remain healthy for the rest of my life" [88; p.110].

CONCLUSION

Although body image is currently conceived as a complex, multifaceted construct, much of the literature has focused on the evaluative component, neglecting body image investment [1]. The findings presented herein complement the previous few studies investigating body image investment, and further support that a narrow conceptualization of body image results in an incomplete understanding of its implications, and might even distort how body image is thought to function. In addition, we call the attention of professionals dealing with overweight and obese populations (especially women) to the implications of dysfunctional body image investment on the self-regulation of weight control behaviors, and strongly recommend the inclusion of strategies that specifically address it within weight loss interventions.

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