9-27-2023

Body Dissatisfaction and Depression: Investigating the Moderating Roles of Maladaptive Investment in Appearance and Rumination

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BODY DISSATISFACTION AND DEPRESSION: INVESTIGATING THE MODERATING ROLES OF MALADAPTIVE INVESTMENT IN APPEARANCE AND RUMINATION

by

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A Thesis
Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the Requirements for
the Degree of Master of Arts
at the University of Windsor

Windsor, Ontario, Canada

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September 5, 2023

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ABSTRACT

Body dissatisfaction has been shown to predict the onset of depression (Bornioli et al., 2020; Paxton et at, 2006; Ferreiro et al., 2014; Sharpe et al., 2018). However, those for whom body dissatisfaction may be especially likely to result in depression has received little attention. The goal of the current study is to test the moderating roles of rumination and maladaptive investment in appearance in the association between body dissatisfaction and depression. It is suggested that those who are more maladaptively invested in their appearance may experience body dissatisfaction as particularly distressing because they place a high degree of importance on their appearance. As well, rumination may intensify the experience of body dissatisfaction and consequently, the degree of depression associated with it. From this, it was proposed that the association between body dissatisfaction and depression would be most pronounced for those who greatly value their appearance and who engage in ruminative thoughts.

Participants (N = 498) responded to self-report measures of depression, body dissatisfaction, rumination, and maladaptive investment in appearance. Data analysis was conducted using moderated multiple regression. It was found that body dissatisfaction and rumination significantly predicted depression scores, and that rumination significantly moderated the association between body dissatisfaction in appearance. The results of this study suggest that body dissatisfaction is particularly likely to result in depression for those who tend to ruminate frequently.

This study is important as its results may contribute to finer tailoring of interventions aimed at reducing or preventing depression. Interventions aimed at reducing ruminative thoughts about disliked aspects of appearance may reduce the contribution of body dissatisfaction to the development of depression. Limitations and future directions are discussed.

ACKNOWLEDGEMENTS

I would like to extend my sincerest thanks to my research supervisor, Dr. Josee Jarry. This project would not have been possible without her continued guidance and support. I am extremely grateful to have learned extensively from Dr. Jarry throughout these past two years. Her research excellence inspires me to strive for the highest standards of scientific exploration. I am truly honoured to have worked with Dr. Jarry on this paper, and I thank her for always encouraging my ongoing academic, professional, and personal development. Dr. Jarry's contributions and dedication to this project has made it one in which I take profound pride. Additional thanks go to my thesis committee members, Dr. Chantal Boucher and Dr. Elizabeth Donnelly, as well as the statistics consultant, Dr. Dennis Jackson, for offering their thoughtful comments and time to this paper.

I want to thank my family as well, as I would not be where I am today without their unwavering love and support. I am so blessed to have such special people in my life. To my new husband, Addison, I cannot thank you enough for all that you do to help me excel within my educational endeavors and life in general. Thank you for always being there to cheer me on. I am incredibly grateful for the unconditional support you have offered me, and the selflessness you have shown to ensure that I pursue my dreams. Thank you to my parents. You are the reason for all my successes. Thank you for never letting me give up and for always seeing greatness in me. I am endlessly thankful that you have taught me the value of discipline, self-improvement, and kindness.

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INTRODUCTION

1.1 Problem Statement

The purpose of the current study is to examine the moderating roles of rumination and maladaptive investment in appearance in the association between body dissatisfaction and depression. Since body dissatisfaction commonly precedes depression in prospective studies and given the widespread negative consequences of depression, it is important to understand the characteristics of those in whom this association may be especially pronounced. In this study, whether body dissatisfaction is more likely to be associated with depression in men and women who frequently engage in ruminative thoughts and greatly value their appearance will be explored. The main variables implicated in this study, and their proposed relationships with each other, are described below.

1.2 Body Image

Everyone has a perception of their body. As such, everyone has a body image. Cash (2011), conceptualized body image as a multifaceted construct that includes subjective attitudes about physical appearance. Body image attitudes encompass both an evaluative and an investment component (Cash, 2011). The evaluative component refers to the way in which people judge their appearance. This evaluation can be positive or negative with resulting levels of body satisfaction.

The investment component is a key attitudinal element of body image and pertains to the importance placed on appearance. Body image investment involves a behavioural and a cognitive component (Cash, 2011). The behavioural facet is called motivational salience and refers to the degree of efforts expended to manage and improve appearance to look more attractive to oneself and others. The cognitive component of body image investment is named

self-evaluative salience and consists of the extent to which appearance is central to appraisals of self-worth and influences one's interpersonal and affective experiences (Cash, 2011). Furthermore, self-evaluative salience refers to a schema in which stimuli, such the self and one's surroundings, are perceived and processed through the lens of appearance.

Self-evaluative salience usually is associated with lower well-being outcomes when compared to motivational salience and is conceptualized as an inherently maladaptive form of appearance investment given that individuals believe that their value, identity, and success in life is determined by their appearance (Cash et al., 2004). For instance, in a descriptive review, Jarry and colleagues (2019) found that self-evaluative salience was related to more negative psychological variables such as depression and anxiety than was motivational salience, and that the correlations with these negative outcomes were stronger for self-evaluative salience than for motivational salience. Additionally, motivational salience was correlated with several positive outcomes such as lower body mass index (BMI), higher body satisfaction, and less depression (Jarry et al., 2019). In contrast, self-evaluative salience was not related to any positive outcomes, rather it was consistently associated with negative outcomes such as disturbances in eating behaviour and body image (Jarry et al., 2019). Because of its consistent association with psychological dysfunction and for ease of understanding, self-evaluative salience will be referred to from now on as "maladaptive investment in appearance."

1.3 Body Dissatisfaction

An individual's personal evaluation of their own body directly influences their experience of body satisfaction. Thus, a negative appraisal of appearance leads to body dissatisfaction. With this, body dissatisfaction is conceptualized as inherently subjective since it pertains to having an unfavorable perception of, or judging negatively, one's own body. Body

dissatisfaction has become an increasingly important area of research. Children as young as 3-years-old express body dissatisfaction due to concerns about their weight (León et al., 2018). For instance, in an international systematic review of children aged 3 to 6-years-old, approximately 40 – 76% of girls and 55 – 77% of boys were dissatisfied with their body, in that they wanted to be thinner or larger than their current weight (León et al., 2018). Within the Western countries included in this review, significantly more girls than boys were dissatisfied with their body, whereas this was not the case within the Far Eastern countries (León et al., 2018). The prevalence of body dissatisfaction was found to be significantly higher in the Far Eastern countries investigated in the study, when compared to the Western countries (León et al., 2018). Furthermore, older children reported a desire to be thinner more frequently when compared to their younger counterparts, suggesting that the preference for thinness increases with age (León et al., 2018). This desire for thinness is evident also in studies involving early adolescents where, within a sample of girls and boys aged 8 to 13-years-old, 50% desired to lose weight and 16% had made attempts to do so (Schur et al., 2000).

In addition to its early onset, body dissatisfaction tends to persist throughout development. In a longitudinal study, Davison et al., (2003) found that 5-year-old girls who reported greater weight concerns and body dissatisfaction relative to their peers continued to report higher relative levels of these variables at 9 years of age (Davison et al, 2003). This finding suggests that body dissatisfaction may remain stable from childhood into early adolescence. The experience of body dissatisfaction is quite common also during adolescence. A large international survey showed that within Western countries, approximately 34 – 61% of teenage girls and 14 – 39% of teenage boys are dissatisfied with their body (Al Sabbah et al., 2009). Yet, the prevalence of body dissatisfaction was found to vary according to demographic

variables in this study, such that girls, overweight adolescents, and older adolescents were more frequently dissatisfied than boys, non-overweight adolescents, and younger adolescents, respectively (Al Sabbah et al., 2009). As well, the prevalence of body dissatisfaction varied based on region, where the highest rate of dissatisfaction reported for boys was in Italy and the highest rate for girls was in Czech Republic (Al Sabbah et al., 2009). Moreover, in longitudinal research conducted with adolescent girls and boys, participants' levels of body dissatisfaction were found to gradually increase from the age of 14 into mid-adulthood (Wang et al., 2019). As a result of this steady increase, participants' degree of body dissatisfaction was found to be significantly higher in mid-adulthood, when compared to their ratings during early adolescence (Wang et al., 2019). However, the researchers concluded that the increases in participants' degree of body dissatisfaction over time could be accounted for by the simultaneous increases in weight, since the trend was no longer significant once BMI was controlled for (Wang et al., 2019).

Body dissatisfaction appears to be prevalent and persistent in the years spanning middle to late adulthood as well. Researchers found that 71 – 89% of women aged 45 to 75 years old are dissatisfied with their body, with the highest prevalence being 93% in those aged 35 to 44 (Runfola et al., 2013). Additionally, the intensity of body dissatisfaction was found to significantly increase with age, although this association was attenuated after controlling for BMI (Runfola et al., 2013). Therefore, body dissatisfaction seems to be a common and enduring trait, that may be experienced differently based on an individual's culture, age, gender, and weight.

The high prevalence and persistence of body dissatisfaction is important because studies have shown a link between body dissatisfaction and poor psychological outcomes such as stress,

low self-esteem, and eating disturbances (Johnson & Wardle, 2005). In particular, body dissatisfaction has been reliably shown to predict depression in prospective studies (Bornioli et al., 2020; Paxton et at, 2006; Ferreiro et al., 2014; Sharpe et al., 2018).

1.4 Body Dissatisfaction and Depression

Depressive disorders are a group of psychological disorders characterized by a persistently low mood with notable changes in cognition and or somatic alterations, that lead to a reduced capacity to function (American Psychiatric Association, 2013, p. 155). This group of disorders will be referred to collectively as 'depression' for the purposes of this paper. Depression is a common mental health disorder and is classified as a leading cause of global disability (Friedrich, 2017). In a systematic review of the global prevalence of depression, researchers found a 4.7% point-prevalence, when controlling for the different methodological approaches used across the studies (Ferrari et al., 2013). However, the lifetime prevalence of depression is much higher with rates of 20% found in a large community sample of adults in the United States (Hasin et al., 2018). Furthermore, the yearly global incidence of depression was estimated to be about 3% and its prevalence was shown to increase over time (Ferrari et al., 2013). The onset of depression steeply increases after puberty and is much more common in individuals aged 18-29 versus those who are 60 years of age or older (American Psychiatric Association, 2013, p. 165). Additionally, starting in early-adolescence women are up to three times more likely to experience depression than are men (American Psychiatric Association, 2013, p. 165).

Depression is associated with multiple comorbid conditions including anxiety, substance-related, and eating disorders (American Psychiatric Association, 2013, pp. 167 - 168). Depression also is associated with an increased risk of suicide, as those with depression are 20 -

27% more likely to complete suicide compared to those free of depression (Lépine & Briley, 2011). Furthermore, depression is related to physical health concerns such as obesity, and to potentially unsafe behaviour such as sexual risk-taking (Lehrer et al., 2006; Luppino et al., 2010). As such, identifying contributors to depression is important for the implementation of effective prevention and intervention programs that could mitigate its negative consequences.

The relationship between body dissatisfaction and depression has been studied extensively. There is clear evidence of a link between body dissatisfaction and depression both cross-sectionally (Johnson & Wardle, 2005; Chen et al., 2015) and longitudinally (Bornioli et al., 2020; Paxton et at, 2006; Ferreiro et al., 2014; Sharpe et al., 2018). Longitudinal studies suggest that body dissatisfaction precedes depression and predicts its development over time. Given this implied causal relationship between body dissatisfaction and depression, it is important to understand for whom this pattern may be more pronounced.

1.4.1 The Body Dissatisfaction Driven Hypothesis

Stice and Bearman (2001) proposed a theory to explain how body dissatisfaction may entrain depression. It is commonly understood that this body dissatisfaction driven hypothesis proposes two main reasons why body dissatisfaction is an important contributor to depression. First, a failure to achieve socially valued appearance ideals is likely to lead directly to depressive affect, due to the discrepancy this failure creates. Second, since appearance often is believed to be under one's control, a failure to meet appearance ideals is likely to be attributed to personal inadequacies and such attributions are depressogenic.

Applying the Body Dissatisfaction Driven Hypothesis to Men. Although this theory was developed to explain how body dissatisfaction contributes to depression in women, other researchers have applied it to adolescent girls and boys (Holsen et al., 2001; Paxton et al., 2006;

Sharpe et al., 2018). Paxton et al., (2006) suggest that the pressure to be thin in women is mirrored by the pressure to meet unattainable societal ideals related to muscularity for men, with similar consequences for both genders (Cafri et al., 2005). Further, men's dissatisfaction with muscularity has been correlated with depressive symptoms, suggesting that failure to meet muscular ideals may entrain depression (Cafri et al., 2002). Overall, researchers suggest that the process by which body dissatisfaction leads to depression may be similar for men and women, despite their differences in societal appearance ideals (Holsen et al., 2001; Paxton et al., 2006; Sharpe et al., 2018). As such, the discussion of this theory will be applied to both genders in the current study.

Though the body dissatisfaction driven hypothesis aims to specifically elucidate the role of body dissatisfaction in the development of depression, it is consistent with other established theories of depression that also are generalizable across genders. The elements of Stice and Bearman's (2001) body dissatisfaction driven hypothesis of depression, and how they are consistent with other well-known theories and supported by empirical evidence, are described below.

Discrepancy Between Current and Ideal Appearance. Stice and Bearman (2001) posit that in the context of western culture, body dissatisfaction entrains depression for women because they often are evaluated based on their physical appearance. Because being overweight is viewed negatively and thinness is promoted as an appearance ideal, women tend to experience strong pressure to be thin, and thus internalize the thin-ideal (Stice & Bearman, 2001). The internalization of societal expectations of thinness are then proposed to be perpetuated through interactions with one's family, peers, and the media via means such as weight-related comments, the encouragement of restrictive eating, and the glorification of ultrathin bodies (Stice &

Bearman, 2001). Similarly, the development of body dissatisfaction in adolescent boys was found to be associated with similar mechanisms, such as perceived interpersonal and media pressures to attain appearance ideals (see McCabe & Ricciardelli, 2004). Thus, failure to meet societal standards of thinness or muscularity creates a perceived discrepancy, which entrains body dissatisfaction for women and men, respectively. Individuals may subsequently experience depression because of this felt discrepancy and feelings of inadequacy that are associated with their body dissatisfaction.

Although the body dissatisfaction driven hypothesis pertains to the pressure to meet ideals of thinness, appearance standards that depict a fit ideal may be becoming more prevalent in the media today. The emergence of this new fit ideal portrays female bodies that are lean and toned and is likely attributable to recent body positivity campaigns that promote health and fitness rather than thinness alone. The promotion of the fit ideal can be found via fitspiration found on social media platforms. Though fitspiration advocates for living a healthy lifestyle with the goal of building physical strength, it has been shown to be associated with negative consequences comparable to those associated with thinspiration, which promotes the pursuit of the thin ideal. For instance, results of research conducted with female undergraduate students found that those who viewed fitspiration and thinspiration messages reported lower state body satisfaction than those in the control condition (Dignard & Jarry, 2021). With this, exposure to fitspiration or thinspiration was found to exert similar effects on state body satisfaction given that both conditions were associated with comparable levels of reported state satisfaction (Dignard & Jarry, 2021). Furthermore, those that viewed fitspiration engaged in more appearance comparisons than those who viewed thinspiration (Dignard & Jarry, 2021). Finally, positive body image acted as a protective factor against body dissatisfaction for those who were exposed

to thinspiration, but not for those exposed to fitspiration (Dignard & Jarry, 2021). This study suggests that though recent appearance ideals may place less emphasis on the pursuit of the thin ideal and be affiliated with the body positivity movement, the promotion of the fit ideal may be equally or more harmful than that of the thin ideal.

The first proposition within the body dissatisfaction driven hypothesis of depression is supported by research showing that of those who are dissatisfied with their body, teenage girls are more likely to be dissatisfied due to perceiving themselves as overweight, whereas teenage boys are more likely to attribute their body dissatisfaction to perceptions of being underweight (Soares Filho et al., 2021). This finding suggests that body dissatisfaction in girls is likely to stem from a failure to meet the thin ideal, while the failure to meet the muscular ideal may create body dissatisfaction in boys. Additionally, body dissatisfaction was significantly associated with depressive symptoms only for those who assessed themselves to be overweight, compared to those who were dissatisfied due to being underweight (Soares Filho et al., 2021). The researchers thus suggested that this effect was driven by the girls included in the study because they comprised the majority of the dissatisfied due to overweight category (Soares Filho et al., 2021). This finding suggests that body dissatisfaction leads to depression in those for whom it is anchored in the experience of failure to achieve societal expectations of thinness and that this effect may be most prevalent within women.

This element of Stice and Bearman's (2001) theory has been applied to boys in a study by Holsen and colleagues (2001). These researchers found that body dissatisfaction was the strongest predictor of depression from age 13 to 15 in girls, whereas body dissatisfaction was the strongest predictor of depression from age 15 to 18 for boys (Holsen et al., 2001). It is suggested that body dissatisfaction is more strongly related to depression for early adolescent girls because

this is a time when pubertal changes, like increased fat mass, are likely to bring them further away from the thin ideal (Holsen et al., 2001). However, early adolescence is proposed to be a time when pubertal changes, such as increased muscle mass, are likely to bring boys in line with muscular ideals. Therefore, boys are less likely to be depressed due to body dissatisfaction during this age range, since the discrepancy between their current and ideal body is diminished (Holsen et al., 2001).

The notion that a failure to attain the thin or muscular ideal leads depression is supported by Pyszczynski and Greenberg's (1987) theory of depressive self-focus. This theory suggests that perceived failure within personally important domains leads to an enhanced focus on the self, and specifically, the discrepancies between the current and ideal self within the given domain. When discrepancies between the current and ideal self cannot be reduced, this entrains increased self-focus aimed at reducing the discrepancy (Pyszczynski & Greenberg, 1987). From this, a depressive self-focused style is formed where the individual is more likely to focus on the self after negative events than after positive ones, which leads to self-criticism, reduced self-esteem, and greater negative emotions (Pyszczynski & Greenberg, 1987). This depressive self-focused style is thus posited to initiate and intensify depression (Pyszczynski & Greenberg, 1987). Because appearance is a socially valued personal characteristic, perceived failure within this domain is likely to heighten focus on the discrepancies between current and ideal appearance. Since appearance ideals are unattainable for most people (Stice & Bearman, 2001), a failure to meet these ideals is almost inevitable. This failure may then serve to enhance one's negative focus on the self. As a result of this depressive self-focus, the discrepancy between one's actual appearance and societal appearance ideals will become more salient, which is likely to promote a negative self-image and ultimately, depressive affect.

Personal Attributions of Failure. Stice & Bearman (2001) suggest also that an ultrathin figure is conceptualized as attainable within our culture, and women are made to believe that their appearance is under their control and therefore, should be able to achieve the thin ideal. As such, the thin ideal is understood to be achievable via strategies such as exercise and dieting. The muscular ideal also is promoted as attainable for men, and men have been found to employ strategies such as dieting and steroid use to attain this ideal (see Cafri et al., 2005 for a review). However, these attempts ultimately fail since both the thin and muscular ideals are unachievable for most people. From this, the failure to attain appearance ideals despite one's efforts, is likely to result in depression (Stice & Bearman, 2001). This is because ideals related to attractiveness cannot be achieved yet are perceived as attainable. As a result, perceptions of personal failure likely are attributed to a lack of sufficient effort when appearance standards are not met, which may contribute to the development of depression.

This second component of the body dissatisfaction driven hypothesis is consistent with attributional theories of depression. Attributional theories suggest that individuals attribute the outcomes of events to internal or external factors (Abramson et al., 1978). Internal factors are those that are specific to an individual, such as their personal characteristics, whereas external factors are those specific to the environment, such as the characteristics of one's surroundings (Abramson et al., 1978). For example, if someone is dissatisfied with their body and believes that the characteristics with which they are dissatisfied are due to a lack of willpower to change them, this would be an internal attribution. However, if someone is dissatisfied with their body and believes that the are unhappy with certain features of their appearance due to their exposure to societal pressures or unattainable thin ideals, this would be an external attribution.

Attribution theories further postulate that when individuals attribute their shortcomings to internal rather than external factors, they become predisposed to negative affect and depression (Abramson et al., 1978). This is supported by research findings showing that when individuals blame themselves for negative outcomes, they are more vulnerable to depressive states (Cohen et al., 2020; Jannati et al., 2020). Applied to appearance, this suggests that when men and women are made to believe that societal appearance ideals are attainable and that their appearance is controllable (Stice & Bearman, 2001), they are likely to attribute a failure to meet these ideals to internal traits, such as not expanding sufficient effort. In line with attributional theories, when a failure to meet societal ideals is attributed to internal personal inadequacies, versus external factors, depression is likely to result (Abramson et al., 1978).

Summary. In sum, the body dissatisfaction driven hypothesis suggests two central mechanisms through which body dissatisfaction may lead to depression. First, since appearance is an important dimension of social evaluation, failure to attain societal appearance ideals is likely to lead to depressive affect (Stice & Bearman, 2001). This is because the discrepancy between one's real and ideal appearance induces body dissatisfaction, which is likely to foster depression due to feelings of inadequacy. This idea is supported by Pyszczynski and Greenberg's (1987) theory of depressive self-focus such that a failure to attain societal appearance ideals will lead to increased focus on the perceived discrepancies, and ultimately result in a chronic self-focus style that is depressive in nature. Second, appearance and body weight are often considered to be domains over which individuals have control, yet societal expectations of appearance often are virtually unattainable for women (Stice & Bearman, 2001) and men (Cafri et al., 2005). Thus, when attempts at achieving appearance ideals ultimately fail, individuals are likely to blame themselves for this shortcoming (Stice & Bearman, 2001). Attributional theories are consistent

with this claim, in that depression is suggested to ensue from internal attributions for negative outcomes (Abramson et al., 1978).

1.4.2 The Differential Impact of Body Dissatisfaction on Depression

Although clear associations between body dissatisfaction and depression have been documented, it appears that body dissatisfaction does not predict depression for everyone. For instance, the strength of the relationship between body dissatisfaction and depression varies by gender and across developmental time points (Ferreiro et al., 2014; Paxton et al., 2006; Sharpe et al., 2018). Specifically, in a longitudinal study, body dissatisfaction was identified as a predictor of later depression in early adolescent girls and mid-adolescent boys, but not for mid-adolescent girls and early adolescent boys (Paxton et al., 2006). In a different longitudinal study, body dissatisfaction was an equally strong predictor of depression for girls and boys during the transition from early to mid-adolescence (Ferreiro et al., 2014). However, girls experienced significantly more body dissatisfaction in early adolescence, which led to higher levels of depression in mid-adolescence when compared to their male counterparts (Ferreiro et al., 2014).

Similar results were found in a cross-lagged longitudinal study in which adolescents' body dissatisfaction and depressive symptoms were measured at baseline and then five and ten years later. Specifically, higher body dissatisfaction at baseline predicted more depressive symptoms five years later for girls, such that levels of body dissatisfaction in their early teens predicted depressive symptoms in their late teens (Sharpe et al., 2018). Additionally, body dissatisfaction within girls' late teenage years and early 20s predicted future depressive symptoms in their mid 20s and late 20s, respectively (Sharpe et al., 2018). Yet for boys, body dissatisfaction only predicted depressive symptoms from late adolescence to early adulthood,

whereas depression predicted of body dissatisfaction from early to late adolescence and across early adulthood (Sharpe et al., 2018).

Furthermore, within the study by Sharpe and colleagues (2018), weight status influenced the observed association between body dissatisfaction and depression, where the inclusion of BMI rendered the correlation between body dissatisfaction in late teens and depressive symptoms in early adulthood nonsignificant for girls (Sharpe et al., 2018). Yet for boys, the inclusion of BMI had no effect on any of the correlations between earlier body dissatisfaction predicting depression. However, when BMI was controlled for, significant associations between earlier depression predicting later body dissatisfaction emerged (Sharpe et al., 2018). Other research with Chinese adolescents has yielded similar results, in that weight status significantly moderated the relationship between body dissatisfaction and depression, where the association between body dissatisfaction and depression was stronger for those underweight than for those of a normal weight as determined by BMI (Chen et al., 2015). As well, body dissatisfaction was strongly associated with depression for girls across all levels of weight status but for boys, the correlation was significant only for the underweight and normal-weight levels (Chen et al., 2015). These results suggest that BMI may influence the relationship between body dissatisfaction and depression, and that the role it plays may differ based on gender. These results may reflect an effect of culture also, since other studies have found body dissatisfaction to be associated with depression only for Brazilian adolescents who perceived themselves to be overweight versus underweight (Soares Filho et al., 2021). As such, BMI and culture may interact to influence the extent to which body dissatisfaction is predictive of depression.

The inconsistent pattern of association between body dissatisfaction and depression across gender and age suggest that other factors may play a role in the relationship between these

variables. It is possible that some individual differences moderate the association between body dissatisfaction depression, such that body dissatisfaction is more likely to lead to depression for certain people.

1.5 Maladaptive Investment in Appearance as a Moderator

A particularly germane variable in the association between body dissatisfaction and depression may be maladaptive investment in appearance. Those high in maladaptive investment in appearance ascribe a great deal of importance to their appearance (Cash, 2011). These individuals are appearance schematic, such that they view appearance as highly meaningful and influential within all domains of life (Cash, 2011). This heightened valuation of appearance may enhance emotional distress associated with body dissatisfaction, thus increasing the strength of the relationship between body dissatisfaction and depression. This is supported by the finding showing that body dissatisfaction is a consistent and strong predictor of depressive symptoms during adolescence (Paxton et al., 2006; Ferreiro et al., 2014), a time when appearance is theorized to be particularly salient due to pubertal changes in appearance, an increased ability to reflect on the self, and the internalization of societal expectations (Holsen et al., 2001). Being dissatisfied with appearance when it is considered especially important may explain the elevated distress caused by body dissatisfaction during this developmental period.

As well, those higher in maladaptive investment in appearance experience more body dissatisfaction. In a systematic review of appearance investment, maladaptive investment in appearance was consistently associated with body dissatisfaction within correlational, experimental, and longitudinal designs (Jarry et al., 2019). For example, in a longitudinal study, Hargreaves and Tiggemann (2002) found that adolescent girls who held stronger appearance-

related schemas at time one experienced heightened body dissatisfaction two years later. The authors suggested that appearance-specific information, such as images of beauty ideals, is more influential in the thoughts, affect, and behaviours of those who are appearance schematic, because they experience this content as more personally relevant (Hargreaves & Tiggemann, 2002). As a result, a frequent focus on, and processing of, appearance-specific information may contribute to the establishment of body dissatisfaction (Hargreaves & Tiggemann, 2002). Given that those who are appearance schematic are more likely to be dissatisfied with their body (Hargreaves & Tiggemann, 2002; Jarry et al., 2019), they may also experience correspondingly higher levels of depression. As well, body dissatisfaction may directly entrain stronger negative emotions for those who are high in maladaptive investment in appearance, since information about appearance is proposed to be more impactful for these individuals (Hargreaves & Tiggemann, 2002).

As well, maladaptive investment in appearance may serve to strengthen the relationship between body dissatisfaction and depression because perceived appearance flaws are likely to be seen as interfering with the attainment of other important goals. For instance, McIntosh and Martin (1992) propose that when individuals link lower-order goals to higher-order goals, they are more likely to experience depression because negative events are perceived as more detrimental to the self. Indeed, the researchers found that those who linked lower-order goals to higher-order ones experienced higher levels of depression as a result of daily stressors, compared to those who did not link their goals in this manner (McIntosh et al., 1995). With this, it is likely that those high in maladaptive investment in appearance link lower-level goals, such as being attractive, to higher-level goals, like being loved or happy. Thus, body dissatisfaction may be more likely to lead to depression for those high in maladaptive investment in appearance because

the failure to meet appearance-related goals are believed to directly inhibit the attainment of other important goals that are central to the self.

Maladaptive investment in appearance also is strongly correlated with both body dissatisfaction and depression in men and women (see Jarry et al., 2019 for a review). It appears that body dissatisfaction may be connected directly to maladaptive investment in appearance both for men and women, since interventions aimed at decreasing body dissatisfaction were found also to reduce maladaptive investment three-weeks later (Cash & Hrabosky, 2003). In a study of male cancer patients, maladaptive investment in appearance was shown to be directly and positively correlated with measures of depression in a path analysis study (Tu & Wang, 2022). For women, maladaptive investment in appearance has been associated with increases in both body dissatisfaction and depression over time (Moreira & Canavarro, 2010). For instance, in a sample of female breast cancer patients, baseline levels of maladaptive investment in appearance negatively predicted appearance satisfaction and higher levels of depression six months post-treatment (Moreira & Canavarro, 2010). With this, it is posited that maladaptive investment in appearance may involve a tendency to engage in negative evaluations more generally, and this cognitive bias may result in both body dissatisfaction and depression (Sinton & Birch, 2006).

In sum, maladaptive investment in appearance may intensify the relationship between body dissatisfaction and depression for three main reasons. The first reason is that individuals high in maladaptive investment in appearance are more dissatisfied with their appearance than those low in appearance investment (Hargreaves & Tiggemann, 2002; Jarry et al., 2019), and therefore are likely experience more negative affect because their appearance is highly important

to them. Secondly, since appearance-related goals may be directly associated with higher-order goals for those maladaptively invested in their appearance, body dissatisfaction is likely to be more distressing because it implies failure in other central areas of life. Finally, the association between body dissatisfaction and depression may be strengthened due to the enhancing effect of maladaptive investment in appearance on both variables (Sinton & Birch, 2006).

1.5.1 Maladaptive Investment in Appearance and the Body Dissatisfaction Driven Hypothesis

The notion that maladaptive investment in appearance may moderate the relationship between body dissatisfaction and depression is consistent with Stice & Bearman's (2001) body dissatisfaction driven hypothesis of depression. Because those high in maladaptive investment in appearance place a greater amount of importance on their appearance, the discrepancy between current appearance and beauty ideals likely would be more salient and distressing for these individuals. As a result, those high in maladaptive investment in appearance may judge themselves more harshly and perceive higher levels of personal failure due to not meeting appearance ideals. These processes have then the potential to increase the depressive affect associated with body dissatisfaction.

1.6 Rumination as a Moderator

Rumination involves the repetitive focus of attention on the potential causes and consequences of one's negative emotional states, without an element of active problem solving (Nolen-Hoeksema, 1991). For example, if an individual is dissatisfied with their body and repetitively thinks about the parts of their body with which they are dissatisfied, this would constitute a ruminative response. As well, an individual who ruminates may also dwell on the

perceived consequences of their body dissatisfaction, such as not being accepted or being judged by others. In turn, rumination is likely to prevent active coping strategies such as cognitive reframing, where the individual re-evaluates how detrimental their perceived appearance flaws truly are.

It is possible that the capacity of body dissatisfaction to predict depression varies based on the degree to which an individual ruminates. The link between rumination and depression has been proposed theoretically (Beck, 1967; Nolen-Hoeksema, 1991) and is supported empirically (Nolen-Hoeksema, 2000). Beck's Cognitive Model suggests that those who ruminate have inhibitory control deficits, resulting in automatic cognitive processes that are negatively valanced (Beck, 1967). This cognitive bias directs attention toward negative stimuli, creating a positive feedback loop that perpetuates negative thoughts and a ruminative response style (Beck, 1967). Thus, individuals are unable to inhibit their repetitive evaluations of, and attention to, negative stimuli, which initiates and maintains depressive symptoms. In this case, individuals who are dissatisfied with their body and prone to ruminate would likely allocate more attention to the elements of their appearance with which they are dissatisfied. As a result, these individuals would be more susceptible to developing depressive symptoms, which are then sustained by their ruminative thoughts about appearance.

Having a ruminative response style also has been shown to contribute to the initiation and maintenance of depression directly, through dwelling on perceived shortcomings (Nolen-Hoeksema, 2000). Thus, those who ruminate about how they do not conform to appearance standards may be particularly prone to developing depression. Nolen-Hoeksema (1991), asserts also that individuals who ruminate dwell on negative situations and the unpleasant thoughts that

are evoked, which interferes with effective problem solving and consequently maintains the aversive situation and negative emotions that accompany it. Likewise, when rumination occurs, individuals are unable to engage in distracting activities, which have been shown to decrease depressive affect (see Nolen-Hoeksema, 1991 for a review). Applied to body dissatisfaction, individuals that tend to ruminate may repetitively focus on their perceived physical appearance flaws and their negative thoughts about their appearance. These ruminative thoughts would then interfere with participating in activities, such as exercise, that may reduce their dissatisfaction or distract them from it. From this, body dissatisfaction is more likely to result in depression when people ruminate on it.

Rumination also may strengthen the association between body dissatisfaction and depression because those who are body dissatisfied are likely to ruminate more frequently, and this rumination may directly intensify their depressive affect. Martin and Tesser (1996) propose that when goals are not attained, rumination is likely to ensue so that relevant steps are taken to mitigate the potential negative consequences of not attaining the goal. This ruminative process is proposed to result in depressive affect and be especially pronounced for unmet goals that are most important to the individual (Martin & Tesser, 1996). Evidence for this theory has been offered in an experiencing-sampling study where within individuals, higher self-focused rumination occurred when individuals did not fully attain important, compared to less important, goals (Moberly & Watkins, 2009). Furthermore, when important goals were not attained, participants experienced higher levels of negative affect than when less important goals were not attained (Moberly & Watkins, 2009). Taken together, this suggests that individuals may be particularly likely to ruminate on appearance flaws, since these flaws can be conceptualized as

an unmet goal within a highly important social domain. In turn, frequent rumination serves to augment one's negative affective states, increasing their susceptibility to depression.

Rumination on disliked elements of appearance appears to have consequences relevant to the development of depression. Specifically, Verplanken and Velsvik (2008) suggest that when individuals frequently think about their body in a negative way, a mental habit is formed such that these thoughts become automatic. In support of this proposition, the authors found that habitually engaging in negative body-related thought was significantly associated with low self-esteem over and above the effect of one's level of body dissatisfaction (Verplanken & Velsvik, 2008). Since low self-esteem is a risk factor for depression (Orth et al., 2008), these results imply that body dissatisfaction may be more likely to engender depression when the negative thoughts about appearance that accompany it occur often and are automatic.

Relatedly, serial mediation models show that body dissatisfaction is associated with appearance-specific rumination in women (Dondzilo et al., 2021a) and men (Dondzilo et al., 2021b). Dondzilo et al. (2021a) used a dot probe task to determine the relationship between attentional bias towards thin ideal bodies and body dissatisfaction. For female participants, higher levels of attentional engagement with thin ideal images were indirectly related to increased body dissatisfaction via appearance comparisons and appearance-specific rumination. The same pattern was found in males, when attentional engagement was directed towards muscular ideal bodies (Dondzilo et al., 2021b). These results imply that those who selectively attend to appearance ideals relevant to them and engage in social comparisons may ruminate about appearance-related information more extensively, which intensifies body dissatisfaction.

Rumination about eating, body weight, and body shape also has been shown to lead to greater body dissatisfaction in two experimental studies (Etu & Gray, 2010; Rivière et al., 2018). Specifically, in a study by Etu and Gray (2010), participants read a scenario that induced feelings of body dissatisfaction, and then were instructed to focus on the thoughts and feelings that were evoked by the story. In the study by Rivière and colleagues (2018), participants were instructed to compare their appearance to that of a model and were then presented with cues related to the appearance of their body (e.g., my current weight). Those in the rumination conditions were directed to focus on the causes and consequences of the cues or how the cues made them feel (Rivière et al., 2018). In both studies participants who were induced to ruminate on appearance concerns experienced significantly more body dissatisfaction compared to those who were not instructed to ruminate. Since rumination appears to further increase body dissatisfaction, the subsequent distress that body dissatisfaction produces also is likely to be intensified.

In summary, the extant literature implies that the relationship between body dissatisfaction and depression may be exacerbated in those who tend to ruminate, given its bidirectional association with depression and body dissatisfaction. First, since rumination has been associated with increases in depression over time (McLaughlin & Nolen-Hoeksema, 2011), it may serve to directly increase depression in those who are body dissatisfied. Similarly, body dissatisfaction may be perceived as a failure to attain a personally important goal, which is likely to lead to depressive states via increased rumination (Martin & Tesser, 1996). Second, body dissatisfaction may be linked to more depression for those who ruminate because their rumination is likely to include a focus on appearance related concerns. Since appearance-specific rumination has been shown to worsen body dissatisfaction (Etu & Gray, 2010; Rivière et al., 2018), the depression that results from body dissatisfaction is likely to increase simultaneously.

1.6.1 Rumination and the Body Dissatisfaction Driven Hypothesis

In terms of Stice & Bearman's (2001) body dissatisfaction driven theory, rumination may contribute to the two posited mechanisms of action by which body dissatisfaction is posited to entrain depression. First, rumination has the potential to exacerbate perceptions of the discrepancy between one's current appearance and cultural beauty ideals. In other words, the more one ruminates on the discrepancy between their current and ideal appearance, the more salient and distressing the discrepancy is likely to be. Similarly, this increased focus on the self that rumination on discrepancies engenders, may directly increase depressive mood states (Brinker & Dozois, 2009; Pyszczynski & Greenberg, 1987). Second, rumination also may enhance the internal attribution of failure to meet appearance standards socially framed as attainable with enough effort. For instance, if individuals ruminate on the internal shortcomings to which they attribute their failure to meet beauty ideals, this is likely to enhance feelings of inadequacy and the level of depression that these perceived failures generate. As well, ruminating on shortcomings, such as not exerting enough effort, may increase the degree to which individuals blame themselves for not meeting appearance standards. This increased self-blame for negative outcomes is likely then to exacerbate the experience of depression (Cohen et al., 2020; Jannati et al., 2020).

1.7 Thesis Objectives

The goal of the current study is to test a possible moderating effect of maladaptive investment in appearance and rumination in the relationship between body dissatisfaction and depression. Those who deem their physical appearance to be highly important are more likely to be distraught by the perceived appearance flaws that their body dissatisfaction encompasses, than

those who do not greatly value their appearance. As well, rumination is associated with depression which implies that the distress caused by body dissatisfaction will be exacerbated for those who ruminate on their appearance flaws more frequently. Therefore, maladaptive investment in appearance and rumination are likely to have a compounding effect, enhancing depression the most for those who highly value their appearance and frequently ruminate on features with which they are dissatisfied.

Although maladaptive investment in appearance and rumination have been implicated as important factors in the development of body dissatisfaction and depression, their potential interactive effect has never been tested. Given the theoretical and empirical evidence suggesting that they may interact to magnify the association between body dissatisfaction and depression, the following hypotheses will be tested:

1.8 Hypotheses

Hypothesis 1

Given the demonstrated association between body satisfaction and depression (Bornioli et al., 2020; Paxton et al, 2006; Ferreiro et al., 2014; Sharpe et al., 2018), a main effect of body dissatisfaction is expected such that higher body dissatisfaction will be associated with higher depression.

Hypothesis 2

Given the demonstrated association between maladaptive investment in appearance and depression (Sinton & Birch, 2006), a main effect of maladaptive investment in appearance is expected such that higher maladaptive investment in appearance will be associated with higher depression.

Hypothesis 3

Given the demonstrated association between rumination and depression (McLaughlin & Nolen-Hoeksema, 2011), a main effect of rumination is expected such that higher rumination will be associated with higher depression.

Hypothesis 4

Given that high maladaptive investment in appearance is posited to magnify the distress associated with body dissatisfaction (Hargreaves and Tiggemann, 2002), a 2-way interaction between maladaptive investment in appearance and body dissatisfaction is expected such that body dissatisfaction will be a stronger predictor of depression for those who are high in maladaptive investment in appearance compared to those who are low in maladaptive investment in appearance.

Hypothesis 5

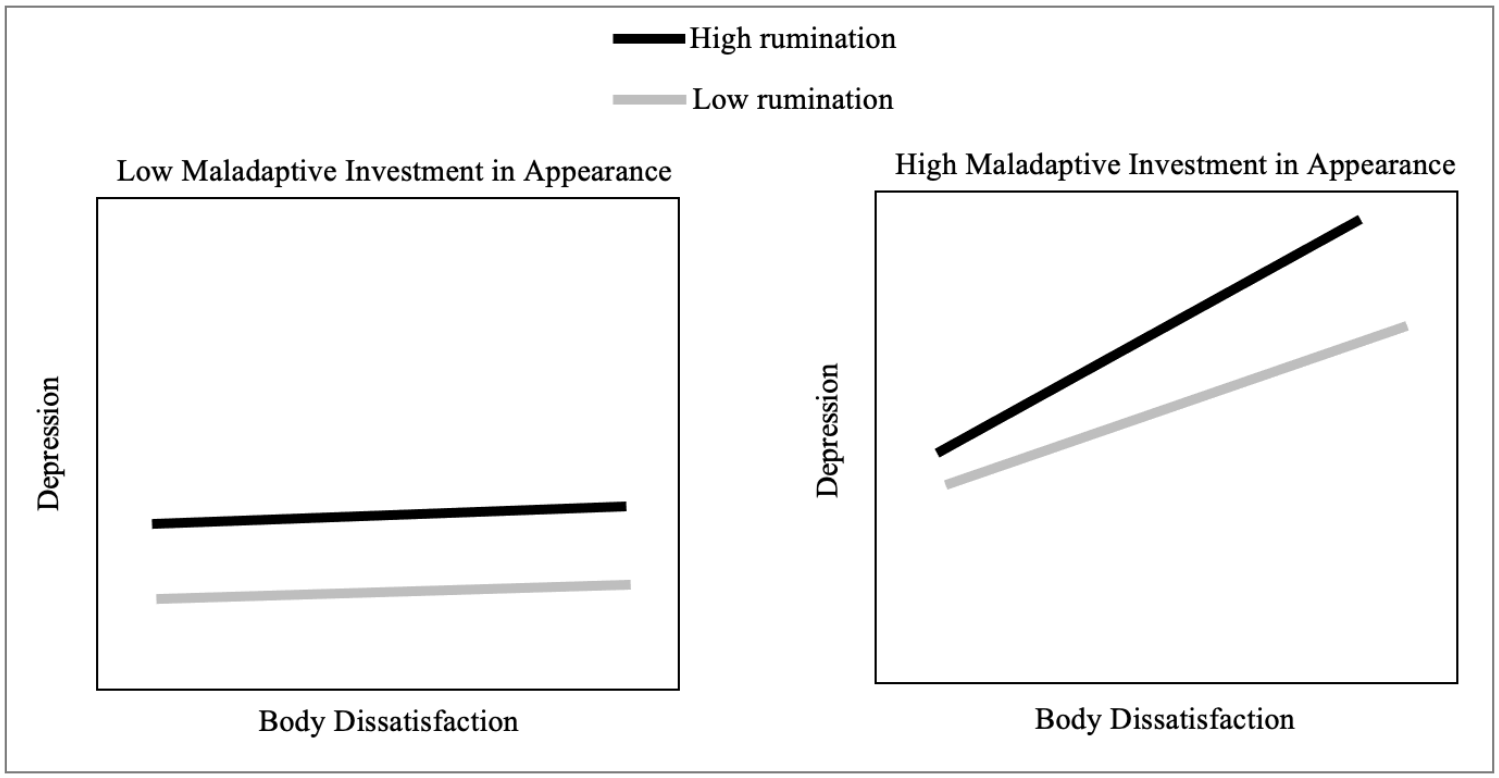
Since rumination is related to increased body dissatisfaction and depression (Etu & Gray, 2010; McLaughlin & Nolen-Hoeksema, 2011; Rivière et al., 2018), a 2-way interaction between rumination and body dissatisfaction is predicted such that body dissatisfaction will be a stronger predictor of depression for those who are high in rumination.

Hypothesis 6

Since those high in maladaptive investment in appearance are likely to experience body dissatisfaction as more distressing (Hargreaves & Tiggemann, 2002), and because rumination increases body dissatisfaction (Etu & Gray, 2010; Rivière et al., 2018), a 3-way interaction is predicted such that body dissatisfaction will be the strongest predictor of depression for those who are high in both rumination and maladaptive investment in appearance (see Figure 1).

Figure 1

Proposed 3-Way Interaction



CHAPTER 2

METHODS

2.1 Participants

An a priori power analysis was conducted using G*Power to determine the number of participants required to detect a small effect size ($f^2 = .03$). The covariates (age and BMI), independent variable (body dissatisfaction), two moderating variables (maladaptive investment in appearance and rumination), and three interaction terms (body dissatisfaction*maladaptive investment in appearance, body dissatisfaction*rumination, and body dissatisfaction*maladaptive investment in appearance*rumination) were entered into the analysis. As such, the total number of predictors was 8, with the number of predictors being tested set to 6. This analysis was conducted based on an alpha of .05 and a power level of .80, which suggested that a minimum of 461 participants should be recruited. With this, the current study planned to recruit a minimum of 500 participants to account for incomplete or invalid responses.

Participants were 566 individuals of all genders recruited from the University of Windsor's Psychology participant pool. Participants were required to be 18 years of age or older and fluent in English. Because body dissatisfaction predicts depression both for men and women (Sharpe et al., 2018), participants of all genders were included together in the main analyses to test all six hypotheses. As well, each hypothesis was tested including only those who identified as women in the analyses, to explore the effects of gender by examining changes in the results that occurred when men and other genders were excluded from the analyses. Similarly, since body dissatisfaction is understood to be influenced by culture (Al Sabbah et al., 2009; León et al., 2018), the hypotheses were tested separately for those from Western countries. Last,

additional exploratory analyses were conducted including only Western ethnicity women. Exploratory analyses were conducted with women and Western subsamples specifically, since past research suggests that women and those form Western countries experience greater body dissatisfaction compared to men and those from Eastern countries, respectively (Altabe, 1998; Quittkat, 2019; Swami et al., 2010).

2.2 Procedure

This was a cross-sectional study conducted online. The study was posted on the University of Windsor's participant pool website. Those who volunteered to participate in the study received a link to complete the study online, hosted on the Qualtrics platform. First, participants read and signed an informed consent form. They then completed a questionnaire collecting demographic information before proceeding to the survey in which the measures appeared in a randomized order. After completion of the survey, participants were debriefed and received compensation in the form of course credit.

2.3 Measures

2.3.1 Appearance Schemas Inventory – Revised (ASI-R; Cash et al., 2003)

The ASI- R is a 20-item self-report questionnaire that measures attention to appearance and beliefs about its importance, meaning, and influence. The ASI-R measure includes a 12-item self-evaluative salience subscale which measures the extent to which individuals are maladaptively invested in their appearance as a source of self-worth (e.g., "When I see good looking people, I wonder about how my own looks measure up"). The ASI-R includes also an 8-item motivational salience subscale that measures the extent to which individuals engage in behaviours that manage their appearance. Items within this subscale include statements such as "Before going out, I make sure I look as good as I possibly can". Items are responded to on a 5-

point Likert scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Mean scores of the responses are calculated such that scores range from 1 to 5 for each subscale, with higher scores indicating higher levels of the respective type of appearance investment. Only the self-evaluative salience subscale will be utilized in the current study to measure maladaptive investment in appearance.

The ASI-R has demonstrated good psychometric properties within a sample of university students (Cash et al., 2003). The ASI-R also demonstrated good convergent validity with seven other well-established measures of body image and its related constructs (Cash et al., 2003). The internal consistency of the self-evaluative salience (α = .84) and maladaptive salience subscales (α = .77) was shown to be acceptable in the current sample.

2.3.2 Body Esteem Scale for Adolescents and Adults (*BESAA*; Mendelson et al., 2001)

The BESAA is a 23-item self-report questionnaire that measures feelings about one's appearance and weight and will be used to measure body dissatisfaction in the current study. It includes three subscales that assess overall feelings about appearance (BE – Appearance) with 10 items, satisfaction with weight (BE – Weight) with 8 items, and evaluations of one's body and appearance that are attributed to others (BE – Attribution) with 5 items. The BESAA includes items such as "I like what I look like in pictures" (BE – Appearance), "My weight makes me unhappy" (BE – Weight), and "My looks help me get dates" (BE – Attribution). Items are responded to on a 5-point Likert scale form 0 (*Never*) to 4 (*Always*), based on the level of agreement with each statement. Negatively worded items are reversed scored, such that higher total scores indicate greater body satisfaction.

The BESAA was found to be psychometrically sound in a large sample of elementary school, high school, and university students (Mendelson et al., 2001). The BESAA exhibited

sound convergent validity with appearance and social subscales of other self-esteem measures (Mendelson et al., 2001). Three-month test-retest reliabilities were also high (r = .83 - .92). The internal reliability of the BE – Attribution, BE – Weight, and BE – Appearance subscales in the current study ranged from good to excellent, with α = .75, α = .92, and α = .93, respectively.

Within the current study, the BESAA subscales were reverse coded such that the provided responses represented individuals' levels of dissatisfaction within the three body esteem domains. Additionally, only the BE – Appearance subscale was used in this study as a measure of body dissatisfaction since body dissatisfaction encompasses negative evaluations of all elements of one's appearance, not just their weight (Cash, 2011). For this reason, the reverse-coded BE – Appearance subscale of the BESSA that was used in the present study is referred to as body dissatisfaction throughout the remainder of this paper.

2.3.3 Beck Depression Inventory - Second Edition (*BDI-II*; Beck et al., 1996)

The BDI -II is a 21-item self-report measure that assesses attitudes and symptoms that occur frequently in depression. The two subscales assess affective and somatic symptoms of depression with 8 and 13 items, respectively. The affective subscale includes items such as "I feel sad" and the somatic subscales includes items like "My appetite is not as good as it used to be". Each of the items are rated on a 4-point scale from 0 to 3 based, with higher scores corresponding to greater severity of the given symptom. Scores on each of the items are totaled, with higher scores indicating greater severity of depression. Scores are then compared to cut-off scores for four different categories of severity, where scores less than 10 suggest minimal or no depression, scores between 10 and 18 suggest moderate to severe depression, and scores of 30 or higher indicate severe depression (Beck et al., 1996).

The sound psychometric properties of the BDI-II have been displayed consistently within studies. The BDI-II demonstrated adequate concurrent validity with other self-report and clinical ratings of depression, with correlations of .60 and .74, respectively found in the nonpsychiatric samples (Beck et al., 1988). Within the original study, the one-week test-retest reliability of the BDI-II was high, with a correlation of .93 (Beck et al., 1996). The internal consistency of the BDI-II was high within the present sample (α = .93).

2.3.4 Ruminative Thought Style Questionnaire (*RTS*; Brinker & Dozois, 2009)

The RTS is a 20-item self-report measure that evaluates a general tendency to ruminate, such that thoughts are repetitive, recurrent, uncontrollable, and intrusive in nature but that the valence and temporal direction of the thoughts are not relevant (Brinker & Dozois, 2009). This measure contains items about global rumination like "I find myself reliving events again and again" or "When I have a problem, it will gnaw at my mind for a long time". Items are scored on a Likert scale from 1 (*Not at all*) to (*Very well*) based on how well the statement describes the respondent. Scores on each item are totaled to produce an overall score on the measure, with higher scores indicated greater levels of rumination.

The RTS proved to be psychometrically sound during its conception, in two studies conducted with a sample of university students. The RTS demonstrated sound convergent validity with other well-validated measures of depression, anxiety, and repetitive thought in both studies (Brinker & Dozois, 2009). As well, the two-week test-retest reliability of the RTS was high, with a correlation vale of .80. In the current study, this measure demonstrated excellent internal reliability (α = .94).

The RTS was selected for this study given that current measures of appearance rumination focus specifically on rumination about diet, weight, and shape concerns that are

typically associated with eating disorders (Cowdrey & Park, 2011). However, within the current research, body dissatisfaction represents all aspects of one's physical appearance with which they are unsatisfied, not just those pertaining to weight and shape. Therefore, a more general measure of rumination was deemed more useful, given that a broader scope of content about which individuals ruminate could be captured. Additionally, using this global measure of rumination provides greater utility given that it assesses a ruminative thought style irrespective of the topic being dwelled upon. Thus, using the RTS to measure rumination allows for the examination of how having a general tendency to ruminate may interact with body dissatisfaction to enhance depressive outcomes.

2.3.5 Demographics

The demographics questionnaire will gather self-report information pertaining to age, gender, income, country of origin, marital status, occupational status, years of education, weight, and height. These variables will be used to describe the characteristics of the sample. BMI will be calculated based on participants' reported height and weight by diving their weight in kilograms by their height in metres squared (BMI = kg/m^2). Age and BMI will be controlled for in the analyses since these variables have been shown to covary with body dissatisfaction (Al Sabbah et al., 2009; León et al., 2018; Runfola et al., 2013; Wang et al., 2019) and to impact its relationship with depression (Chen et al., 2015; Paxton et al, 2006; Sharpe et al., 2018).

CHAPTER 3
RESULTS

The following statistical analyses were conducted using IBM's Statistical Package for the Social Sciences (SPSS) software, version 28 for MacOS, and the PROCESS macro plugin for SPSS version 4.2 (Hayes, 2022).

3.1 Data cleaning

A total sample of 566 undergraduate students from the University of Windsor participated in this study. Data were screened for completeness and validity. Cases with careless responding (n= 11) were classified as those with two or more failed attention checks and were removed from the data set. Additionally, 18 cases were removed as they were duplicate responses. Response variance was examined by computing the standard deviation of each case. There were two cases with a standard deviation of 0 on the rumination measure, but these participants passed the attention checks, so their data were retained. Items for which participants selected 'prefer not to answer' were coded as missing and imputed along with all other missing data (see Missing Data Analyses). Cases with 10% or more missing data (i.e., did not respond to nine or more items pertaining to the main study variables) were removed from the analyses, since statical analyses are increasingly suspectable to bias when this proportion of data is missing (Bennett, 2001). This resulted in 39 cases being removed due to having a large proportion of missing data. In total, 68 cases were removed, and the final sample included 498 participants.

3.2 Demographics

Participants ranged in age from 18 to 51 years old (M = 21.4, SD = 4.7). Most were female, with 87.3% cisgender women (n = 435), 9.4% cisgender men (n = 47), 1.2% non-binary,

genderqueer, agender, or similar identity (n = 6), 0.4% transgender men (n = 2), and 0.2% transgender women (n = 1). There were 1.2% (n = 6) of participants who selected 'prefer not to say' and 0.2% (n =1) who did not provide a response to this question. Ethnic identity was as follows: 61.2% White (n = 305), 13.5% Arab (n = 67), 7% Mixed (n = 35), 3.4% Black/African (n = 17), 1.8% Chinese (n= 9), 2% South East Asian (n = 10), 1.6% Latino (n = 8), 5.8% South Asian (n = 29), 1.2% Caribbean (n = 6), 0.4% Aboriginal (n = 2), 0.4% Filipino (n = 2), 0.4% Korean (n =2), 0.8% West Asian (n = 4), and 0.2% other ethnicity (n = 1) There was one participant who did not report their ethnicity. The relationship status of the participants was 58.6% single (n = 292), 36.5% in a relationship (n = 182), and 3.4% other relationship status (n = 17). Three participants (0.6%) selected 'prefer not to say' and four participants (0.8%) failed to provide a response to this question.

3.3 Missing Data Analyses

Missing data analyses were conducted for age, weight, height, BMI, and the Beck Depression Inventory (BDI), Body Esteem Scale for Adults and Adolescents (BESAA), maladaptive investment in appearance as measured with the Self-Evaluative Salience (SES) subscale of the Appearance Investment Inventory – Revised (ASI-R), and Ruminative Thought Scale (RTS) items. These analyses determined that approximately 41% (*n* = 204) of cases and 61% (*n* = 54) of items contained missing data. Further, the items with the greatest number of missing responses included question 22 on the BDI ("Loss of Interest in Sex"), which was missing in 10% of cases (*n* = 50), and question 21 on the BESAA ("My looks help me to get dates"), which was missing in 8.2% of cases (*n* = 41). All other items were missing less than 4% of data. Approximately 8% of participants failed to report their age (*n* = 43), 11.4% did not report their weight (*n* = 57), and 1.2% had missing height data (*n* = 6). Consequently, BMI could

not be computed for about 12% of cases (n = 59).

Upon analyzing the missing data, Little's MCAR test was significant x^2 (6674) = 7097.40, p =. 000, indicating that the data was not missing completely at random. Examination of the missing data pattern charts in SPSS showed that participants had a propensity to fail to report their age only, in that about 8% of cases had missing age data but complete data for all other study variables. The pattern in which participants were missing BMI only (due to failing to report their weight and/or height) occurred in 8% of cases as well. The final two prevalent patterns of missing data were a failure to answer item 22 on the BDI ("Loss of Interest in Sex") only and item 21 on the BESAA ("My looks help me to get dates") only. Both patterns occurred in 5% of cases. It is likely that participants frequently chose not to respond to these questions due to the heightened personal nature of the item's content compared to other items. Since these items still contained a relatively small amount of missing data (i.e., < 10%), the data were imputed.

After analyzing the proportions and patterns of missing data, expectation maximization imputation was used to fill in the missing observations. This method was used since it typically yields reliable standard error estimates in studies with a sample size of 200 or greater (Cohen et al., 2003, p. 440). Age, weight, height, BMI, and all items from the BDI, BESAA, SES, and RTS scales were included to compute the imputed values. Weight and height variables were included since these variables are used to compute BMI. As such, including weight and height allows for a more reliable imputation of BMI, where either weight or height was provided. Although BMI was missing more than 10% of data, estimation maximization imputation was used to impute missing values, as multiple imputation is a suggested method for dealing with missing BMI data (Mishra & Dobson, 2004).

3.4 Assumption Checking

3.4.1 Sample Size and Independence of Observations

Before conducting the main analyses, the data were examined to ensure the assumptions of multiple regression analysis (MRA) were upheld. First, the sample size assumption was met since there were more than 15 observations per each of the five predictor variables (Field, 2013, p.931). The independence of observations assumption was met as well, since participants responded to the survey items independently (Field, 2013, p. 560).

3.4.2 Absence of Outliers and Influential Observations

As suggested by Cohen and colleagues (2003), before testing for multivariate outliers, univariate outliers for each variable were examined. This was done by calculating z-scores for the depression, body dissatisfaction, maladaptive investment in appearance, age, BMI, and rumination variables. Standardized scores for weight and attribution dissatisfaction of the Body Esteem Scale for Adults and Adolescents (BESAA) were computed and examined as well since correlations for these variables were analyzed (see Table 1). Z-scores that surpassed the cut-off of +/- 3 were classified as univariate outliers for the respective variable. As a result, there was one outlier detected on each of the depression and rumination variables, and two outliers detected on the maladaptive investment in appearance variable. There were nine outliers on the BMI and 15 cases with age outliers. These outlier values were Winsorized, by the outlier was replaced with a value one unit greater or less than the highest or lowest number that was not an outlier on the respective variable (Field, 2013, p. 619).

Next, multivariate outliers in the dataset were detected by conducting a regression that included body dissatisfaction, maladaptive investment in appearance, rumination, age, and BMI

as predictors, and depression as the outcome variable. Outliers on the outcome variable were found by calculating standardized and studentized residual values, screening for values with z-scores outside -3 and 3 (Field, 2013). This resulted in 2 cases being identified as having *z*-scores outside of this range on both measures. Mahalanobis distance values were calculated and transformed onto a chi-square distribution with degrees of freedom equal to the number of predictors in the model (i.e., 5), to detect multivariate outliers on the predictor variables. Cases with *p* values less than .001 were screened for (see Tabachnik & Fidell, 2012). There were 11 observations that surpassed the Mahalanobis distance cut-off. Leverage, or hat, elements were calculated such that values greater than 3 (k+1) / N (or 0.036) were considered multivariate outliers (Cohen et al., 2003). There were 19 cases identified as exceeding the specified cut-off (0.035) of acceptable leverage values. Influential observations were screened using Cook's distance values with a cut-off of 1.0, and standardized DFFITS and DFBETAS values with a cut-off of +/- 1 (Cohen et al., 2003). There were no cases that exceeded the Cook's distance, DFFITS, or DFBETAS cut-offs.

As a result, 11 cases that surpassed both the Mahalanobis distance and Leverage cut-offs and two cases that surpassed both the standardized and studentized residual cut-off were classified as multivariate outliers. The regression model including body dissatisfaction, maladaptive investment in appearance, rumination, age, and BMI predicting depression was conducted with and without the eight remaining outliers to determine their influence on the model. The *b* coefficients were comparable between the regression model with and without the outliers included. Therefore, these outliers were retained in the analyses since they did not appear to be exerting undue influence upon the parameters of the regression model and the final sample remained the same (N =498).

3.4.3 Normality of Errors

Next, the normality of errors for the dependant variable was tested by visually inspecting a histogram and scatterplot of the standardized residuals. The residuals seemed to be normally distributed as they formed a bell-shaped curve on the histogram chart. The errors appeared to be normally distributed within the scatterplot of the residual and predicted residual values. The points on the scatterplot were within -3 and 3 and approximately evenly distributed on the plot, as the observations were contained within a rectangular formation with no obvious concentration of points. As well, the box plot of the standardized residuals had error bars that were approximately equal in length and the line depicting the mean was in the centre of the box.

The normal P-P and Q-Q plots of the standardized residuals also were explored. The errors were distributed along the P-P line with no vast deviations, suggesting that the residuals were normally distributed. The Q-Q plot of the standardized residuals appeared normal as well since most of the points were on or very close to the trend line. The Shapiro-Wilks and Kolmogorov-Smirnov tests of normality for the standardized residuals were significant ($p = .005$ and $p = .01$, respectively), suggesting that the error terms were not normally distributed. However, the assumption of normality of errors was considered upheld since the visual inspection of the data was deemed to exhibit acceptable normality.

3.4.4 Homoscedasticity of Errors

The homoscedasticity of errors for the dependent variable was assessed by visually inspecting a scatterplot of the residual values. From the scatterplot, the residuals appeared to be homoscedastic as the band around the points were approximately equal in width, such that the data points were not more condensed at either end of the graph. However, the observations in the

bottom left of the graph seemed to be sparse, suggesting that low values of depression were underpredicted. Nonetheless, the data points did not look to be distributed in an apparent fanning-out pattern. Thus, the assumption of homoscedasticity was upheld.

3.4.5 Linearity and Independence of Errors

The assumption of linearity for the dependent variable was evaluated using the residual scatter plot as well. The data points on the scatter plot were approximately mirrored on either side of the middle line indicating a linear relationship between the predictors and residuals. Additionally, the residual scatter plot was used to determine if the assumption of independence of errors was met. This assumption is typically met when the independence of observation assumption is upheld. The Durbin-Watson test had a value of 1.9, which was within the acceptable range of 1.5 – 2.5, indicating that the errors were independent. Also, the independence of errors assumption did not seem to be violated as there was an even dispersion of observations on the residual scatterplot, and the points fell between -3 and 3.

3.4.6 Multicollinearity and Singularity

Finally, to ensure the predictor variables were not too highly correlated with each other, multicollinearity and singularity were inspected by examining the correlation matrix for values greater than .90. Also, tolerance and variance inflation factor (VIF) values were assessed such that values less than 0.1 and greater than 10, respectively would indicate significant multicollinearity (Cohen et al., 2003). There were no instances of multicollinearity or singularity since the highest correlation was .67 between maladaptive appearance investment and body dissatisfaction. The lowest tolerance value was 0.47, and the highest VIF value was 2.1.

3.5 Correlations and Multiple Regression Analysis

As expected, maladaptive investment in appearance, rumination, and body dissatisfaction were all positively correlated with depression. Additionally, maladaptive investment in appearance was positively correlated with body dissatisfaction and rumination. Finally, rumination was positively correlated with body dissatisfaction. The correlation matrix and descriptive statistics for all study variables appear in Table 1.

Table 1

Descriptive Statistics and Correlations for All Study Variables

Variable	*N*	*M*	*SD*	1	2	3	4	5	6	7	8
1. Rumination	498	94.766	22.64	-							
2. Maladaptive Investment	498	3.53	0.68	.56**	-						
3. Depression	498	19.75	12.29	.55**	.45**	-					
4. Attribution Dissatisfaction	498	1.91	0.73	.13**	.13**	.25**	-				
5. Body Dissatisfaction	498	2.06	0.82	.47**	.67**	.59**	.48**	-			
6. Weight Dissatisfaction	498	2.09	0.97	.33**	.50**	.43**	.37**	.72**	-		
7. BMI	498	24.20	5.30	.06	.10*	.11*	.31**	.31**	.53**	-	
8. Age	498	21.19	3.57	-.11*	-.10*	-.13**	-.09*	-.07	.07	.24**	-

Note. **$p < .01$, *$p < .05$ (2-tailed).

Next, a multiple regression analysis was conducted to determine whether the independent variables significantly predicted depression scores. The main effect of body dissatisfaction (Hypothesis 1), maladaptive investment in appearance (Hypothesis 2), and rumination (Hypothesis 3) predicting depression was tested by entering all predictor variables simultaneously as a block into a multiple regression model in SPSS. Age and BMI were entered

into the model as covariates since they were significantly correlated with depression. Results from this analysis indicated that the overall model significantly predicted depression, $F(5, 492) = 77.94$, $p < .001$. The total model accounted for about 44% of the variance in depression scores ($R^2 = 0.442$, adjusted $R^2 = 0.436$). The significant predictors in the model were body dissatisfaction ($\beta = 0.47$, $SE = 0.73$, $t(492) = 9.62$, $p < .001$) and rumination ($\beta = 0.36$ $SE = 0.02$, $t(492) = 8.70$, $p < .001$), offering support for Hypotheses 1 and 3, respectively. Maladaptive investment in appearance, age, and BMI did not significantly predict depression scores above and beyond the other predictors in the model. Consequently, Hypothesis 2 was not supported, as shown in Table 2.

Table 2

Regression Table for Main Study Variables

	Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
Model	B	Std. Error	Beta	t	Sig.	Lower bound	Upper Bound	Zero-order	Partial	Part
(Constant)	-3.22	3.85		-0.84	.403	-10.78	4.34			
Rumination	.20	.02	.36	8.70	<.001	.15	.24	.55	.37	.29
Maladaptive Investment	-1.25	.89	-.07	-1.40	.161	-2.99	.50	.45	-.06	-.05
Body Dissatisfaction	7.03	.73	.47	9.62	<.001	5.60	8.47	.69	.40	.32
BMI	-.08	.09	-.04	-.97	.331	-.25	.09	.11	-.04	-.03
Age	-.17	.12	-.05	-1.38	.168	-.41	.07	-.13	-.06	-.05

Note. Dependent Variable: Depression

3.6 Moderation Analysis

Before conducting the moderation analyses, the data were screened for univariate outliers and influential observations on the interaction terms. The body dissatisfaction*maladaptive investment in appearance, body dissatisfaction*rumination, maladaptive investment in appearance*rumination, and body dissatisfaction*maladaptive investment in appearance*rumination interaction terms were calculated by multiplying each of the respective variables together. Upon inspecting the z-scores for each of the interaction term variables, there were two dissatisfaction*rumination and six body dissatisfaction*maladaptive investment in appearance*rumination cases that had values outside the +/-3 cut-off. These scores were Winsorized to align them with the rest of the sample.

Multivariate outliers on the four interaction terms were detected by entering them into a regression model predicting depression, along with the body dissatisfaction, maladaptive investment in appearance, and rumination variables. There were two cases with standardized and studentized residuals outside of the +/- 3 range. There were 24 cases with Mahalanobis distance *p* values < .001, and 26 cases that had Leverage values that surpassed the 3 (*k*+1)/N (or 0.048) cut-off. No values surpassed the Cook's distance, standardized DFFITS, or DFBETAS cut-offs.

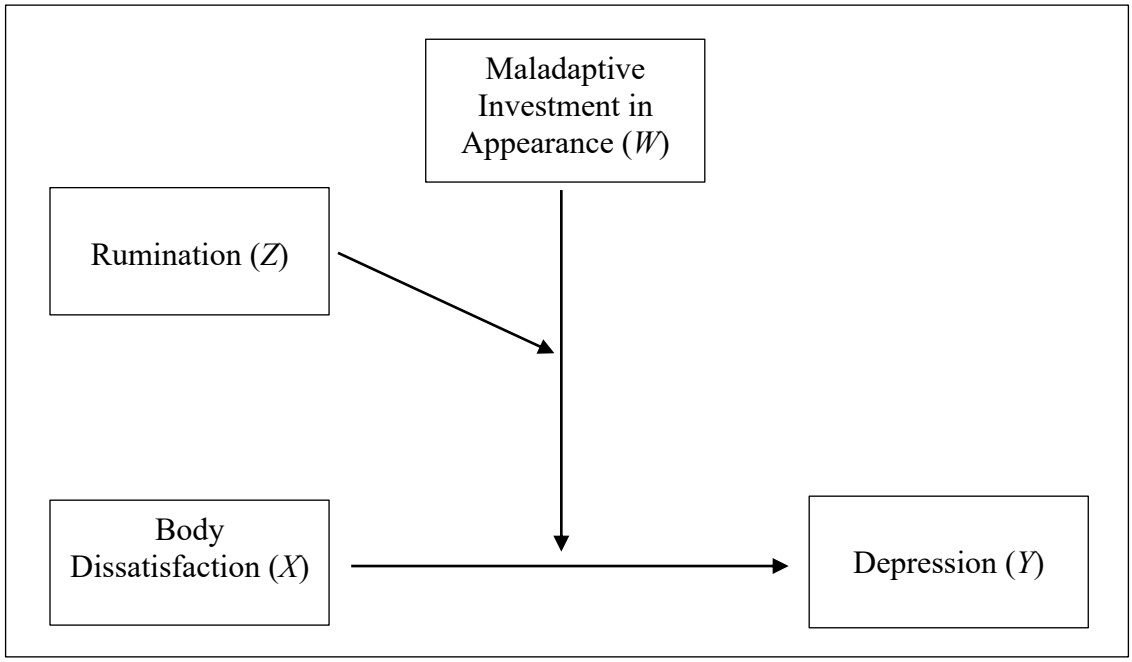
To determine the influence of the 24 outliers on both Mahalanobis distance and Leverage elements and two cases that had outlying standardized and studentized residual values, a regression that included body dissatisfaction, maladaptive investment in appearance, rumination, and their four interaction terms predicting depression was conducted in PROCESS Macro, with and without the 26 outlying cases. Again, these outliers were not excluded from the analyses since the significance of the regression terms and the *b* coefficients were comparable across models ($N = 498$).

3.6.1 PROCESS Macro Analyses

To establish whether maladaptive investment in appearance (Hypothesis 4) and rumination (Hypothesis 5) significantly moderated the relationship between body dissatisfaction and depression, and whether there was a significant three-way interaction between body dissatisfaction, maladaptive investment in appearance, and rumination (Hypothesis 6), moderation analyses were conducted using the PROCESS Macro version 4.2 plugin for SPSS (Hayes, 2022). All variables were entered into model 3 of the PROCESS software with body dissatisfaction as the predictor variable (*X*), depression as the criterion variable (*Y*), maladaptive investment in appearance as the first moderator (*W*), and rumination as the second moderator (*Z*; see Figure 2). Age and BMI were not included as covariates since they did not significantly predict depression in the previous multiple regression model. PROCESS Macro enters all variables and interaction terms into an Ordinary Least Squares (OLS) regression model simultaneously. These analyses were conducted with 5000 bootstrap estimates. Within PROCESS, each of the predictor variables is mean-centered. Levels of the predictors are created such that those considered high are 1 or more standard deviations above the mean, average are within 1 standard deviation from the mean, and low are 1 or more standard deviations below the mean. PROCESS then creates slopes as if participants were categorized into these level groups.

Figure 2

Conceptual Diagram of Moderated Moderation Model



The results of the moderation analyses revealed that approximately 48% of the variance in depression was accounted for by including body dissatisfaction, maladaptive investment in appearance, rumination, and the four interaction terms (i.e., body dissatisfaction*maladaptive investment in appearance, body dissatisfaction*rumination, maladaptive investment in appearance*rumination, and body dissatisfaction*maladaptive investment in appearance*rumination) in the regression model ($R^2 = 0.46$). As such, this overall model significantly predicted depression scores, $F(7,490) = 59.04$, $p < .001$.

The variables that significantly predicted depression scores were body dissatisfaction ($B = 6.67$, $SE = 0.71$, $t(490) = 9.40$, 95% CI [5.28, 8.07], $p < .001$) and rumination ($B = 0.23$, $SE = 0.02$, $t(490) = 9.35$, 95% CI [0.18, 0.27], $p < .001$). The only significant interaction term in this

model was body dissatisfaction*rumination (B = 0.10, SE =0.04, t(490) = 2.91, 95% CI [0.03, 0.16], p < .01). As such, support was offered for Hypothesis 5, but not for Hypotheses 4 or 6 (see Table 3).

Table 3

Regression Table for the Moderation Analysis

	Unstandardized Coefficients				95% Confidence Interval for B	
Model	B	Std. Error	t	Sig.	Lower Bound	Upper Bound
(Constant)	19.10	.49	39.18	<.001	18.14	20.06
Rumination	.23	.02	9.35	<.001	.18	.27
Maladaptive Investment	-.54	.92	-0.59	.555	-2.36	1.27
Body dissatisfaction	6.67	.71	9.40	<.001	5.28	8.07
Int 1	-.33	.86	-0.38	.702	-2.02	1.36
Int 2	.10	.03	2.91	.004	.03	.16
Int 3	-.01	.04	-0.37	.714	-.08	.06
Int 4	-.04	.03	-1.35	.178	-.10	.02

Note. Dependent Variable: Depression. Int 1 = body dissatisfaction*maladaptive investment, Int 2 = body dissatisfaction*rumination, Int 3 = maladaptive investment*rumination, Int 4 = body dissatisfaction*maladaptive investment*rumination.

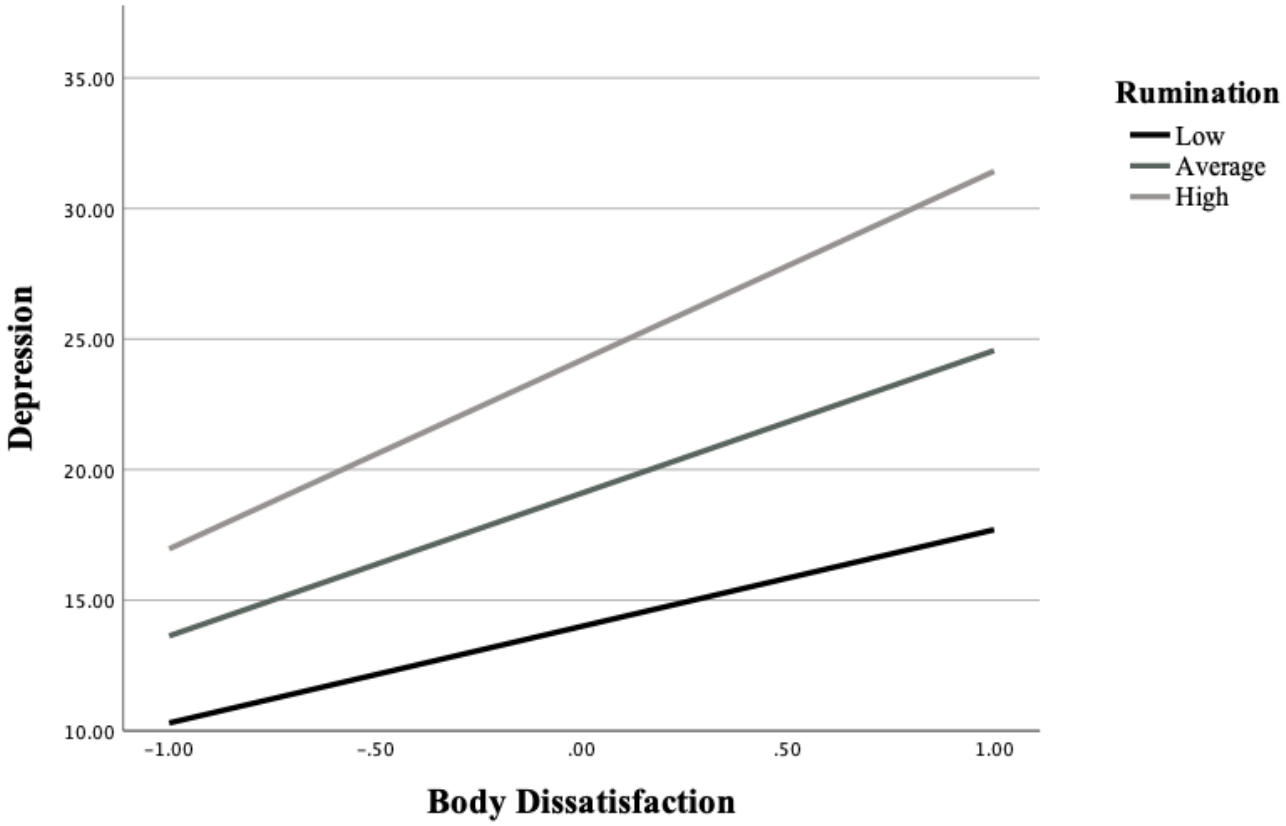
3.6.2 Probing the Interaction

The effect size for the body dissatisfaction by rumination interaction term was calculated to determine the strength of the association between the interaction term and the dependant variable, independent of the other predictors in the regression model. The effect size was calculated using the formula for Cohen's (1988) d statistic*:* $d = 2*r / \sqrt{(1-r^2)}$. The body

dissatisfaction*rumination interaction term exerted a small effect within this model (d = 0.20; Cohen, 1988). As well, the moderating effect of rumination on the relationship between body dissatisfaction and depression was probed by plotting the interaction. The line graph was created using the values provided by PROCESS Macro for visualizing the conditional effects of the focal predictor, as demonstrated in Figure 3.

Figure 3

Line Graph Depicting Body Dissatisfaction by Rumination Interaction



Furthermore, to examine the Johnson-Neyman regions of significance for the body dissatisfaction by rumination interaction, body dissatisfaction was entered into a PROCESS model predicting depression, with rumination as a moderator. Body dissatisfaction was a

significant predictor of depression when rumination scores were 52.26 (i.e., scores approximately two standard deviations below the mean of the rumination variable) or above. Within the data set, approximately 95.6% of rumination scores were above this value, and 4.4% were below. These analyses indicate that the association between body dissatisfaction and depression is weaker at lower levels of rumination, than at higher levels of rumination. This means that those who are dissatisfied with their body and have a higher tendency to ruminate score higher in depression than those who are dissatisfied with their body and ruminate less frequently.

3.7 Sub Analyses

3.7.1 Women Only

To determine whether including participants of all genders influenced the trend of the results, the same analyses were conducted with only participants who identified as women (i.e., cis or trans gender women, $n = 436$). Those who did not report their gender or selected 'prefer not to say' ($n = 7$) were excluded from these analyses (refer to demographics in Table 4).

Table 4

Demographics Table Including Only Those Who Identified as Women

Variable	*n*	%	*M*	*SD*
Age	-	-	21.34	4.65
Aboriginal	2	0.5	-	-
White	273	62.6	-	-
Chinese	7	1.2	-	-
Black	13	0.9	-	-
Southeast Asian	6	1.4	-	-
West Asian	3	0.7	-	-
South Asian	26	6.0	-	-
Korean	1	0.2	-	-
Latino	6	1.4	-	-
Filipino	2	0.5	-	-
Mixed	30	6.9	-	-
Caribbean	5	1.1	-	-
Arab	60	13.8	-	-
Missing ethnicity	2	0.4	-	-

This dataset was screened for univariate outliers by calculating z-scores for the rumination, maladaptive investment in appearance, depression, body dissatisfaction, BMI, and age variables. There were 13 age, eight BMI, two rumination, and four maladaptive investment scores that were outside of the +/- 3 cut-off. These cases were adjusted by Winsorizing, where the outlying value was changed to a value one unit greater or less than the next highest or lowest number that was not an outlier on the respective variable (Field, 2013, p. 619).

Next, examination of multivariate outliers revealed that two cases had standardized and studentized residual values greater than 3. As well, there were eight Mahalanobis distance outliers ($p < .001$) and 14 Leverage value outliers (greater than $3(k+1)$ /N or 0.041). There were

no cases that had outlying values on Cook's distance, standardized DFFITS, or standardized DFBETAS. The regression was tested with and without the inclusion of the eight cases that were outliers on both Mahalanobis distance and Leverage and two cases that were outliers on both standardized and studentized residual values. Since these 10 cases did not seem to exert any undue influence upon the model, they were included in the analyses. The remaining assumptions of MRA were checked using the same process as outlined for the main analyses. As a result, all other assumptions were deemed to be met.

Correlations and Regression Analysis

The correlations for women were similar to those in the main analyses, such that there was a significant positive correlation between all the main study variables, as shown in Table 5.

Table 5

Correlation Table for Main Study Variables Including Only Those Who Identified as Women

Variable	*n*	*M*	*SD*	1	2	3	4	5	6
1. Rumination	436	95.61	22.04	-					
2. Maladaptive Investment	436	3.58	0.64	.55**	-				
3. Depression	436	20.01	12.10	.52**	.42*	-			
4. Body dissatisfaction	436	2.08	0.79	.44**	.65*	.56**	-		
5. BMI	436	24.08	5.26	.06	.11*	.11*	.32**	-	
6. Age	436	21.11	3.58	-.12*	-.13**	-.15**	-.09	.26**	-

Note. **$p < .01$, *$p < .05$ (2-tailed).

A multiple regression model with rumination, maladaptive investment in appearance, and body dissatisfaction predicting depression was conducted including only participants who

identified as women. Additionally, BMI and age were included as covariates in the model because they were significantly correlated with depression. The results of this regression model were like the results of the multiple regression model from the main analyses in that the only significant predictors of depression were rumination (β = 0.35, *SE* = 0.03, *t*(430) = 7.9, *p* < .001) and body dissatisfaction (β = 0.44, *SE* = 0.80, *t*(430) = 8.42, *p* < .001). Overall, this model was significant, *F*(5, 430) = 59.92, *p* < .001 and accounted for approximately 41% of the variance in depression scores (R^2 = 0.411, adjusted R^2 = 0.404; see regression model in Table 6).

Table 6

Regression Table for Main Study Variables Including Only Those Who Identified as Women

	Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
(Constant)	-2.40	4.29		-0.56	.577	-10.83	6.04			
Rumination	.19	.03	.35	7.90	<.001	.15	.24	.52	.36	.29
Maladaptive Investment	-1.12	1.00	-.06	-1.12	.262	-3.08	.84	.42	-.05	-.04
Body dissatisfaction	6.73	.80	.44	8.42	<.001	5.16	8.30	.56	.38	.31
BMI	-.06	.10	-.03	-0.68	.500	-.25	.12	.11	-.03	-.03
Age	-.22	.13	-.06	-1.64	.102	-.48	.04	-.15	-.08	-.06

Note. Dependent Variable: Depression

Moderation Analysis

For those who identified as women, interaction terms for the rumination, maladaptive investment in appearance, and body dissatisfaction variables were calculated and screened for

outliers. There was one body dissatisfaction*maladaptive investment in appearance, one body dissatisfaction*rumination, and five body dissatisfaction*maladaptive investment in appearance*rumination z-scores outside of the +/-3 cut-off. These outlying values were Winsorized.

Next, multivariate outliers on the four interaction terms were inspected by testing a regression model with body dissatisfaction, maladaptive investment in appearance, rumination, and their four interaction terms predicting depression. Two cases had standardized and studentized residual values greater than three. Additionally, there were 21 cases that had both Mahalanobis *p* values less than .001 and Leverage values greater than the specified cut-off (0.055). There were no cases that had values outside the acceptable ranges for Cook's distance or standardized DFFITS and DFBETAS. PROCESS Macro regression models predicting depression were conducted with and without these 23 outliers. The inclusion of outliers in the model did not lead to any notable differences in the regression coefficients, so these values were retained in the analysis ($n = 436$).

Body dissatisfaction predicting depression was entered into PROCESS Macro model 3 (Hayes, 2022), with maladaptive investment in appearance and rumination as moderator variables. Five-thousand Bootstrap estimates were conducted for this analysis. From this, the results resembled those from the original analyses as the overall model was significant ($F(7,428) = 45.12$, $p < .001$), accounting for about 42% of the variance in depression ($R^2 = 0.4246$). Rumination ($B = 0.23$, $SE = 0.03$, $t(428) = 8.48$, 95% CI [0.17, 0.28], $p < .001$) and body dissatisfaction ($B = 6.63$, $SE = 0.78$, $t(428) = 8.54$, 95% CI [5.11, 8.16], $p < .001$) significantly predicted depression, however the body dissatisfaction by rumination interaction term was not

significant in this subsample (B = 0.06, SE = 0.04, t(428) = 1.71, 95% CI [-0.01, 0.14], p = .088; refer to Table 7).

Table 7

Regression Table for the Moderation Analysis Including Only Those Who Identified as Women

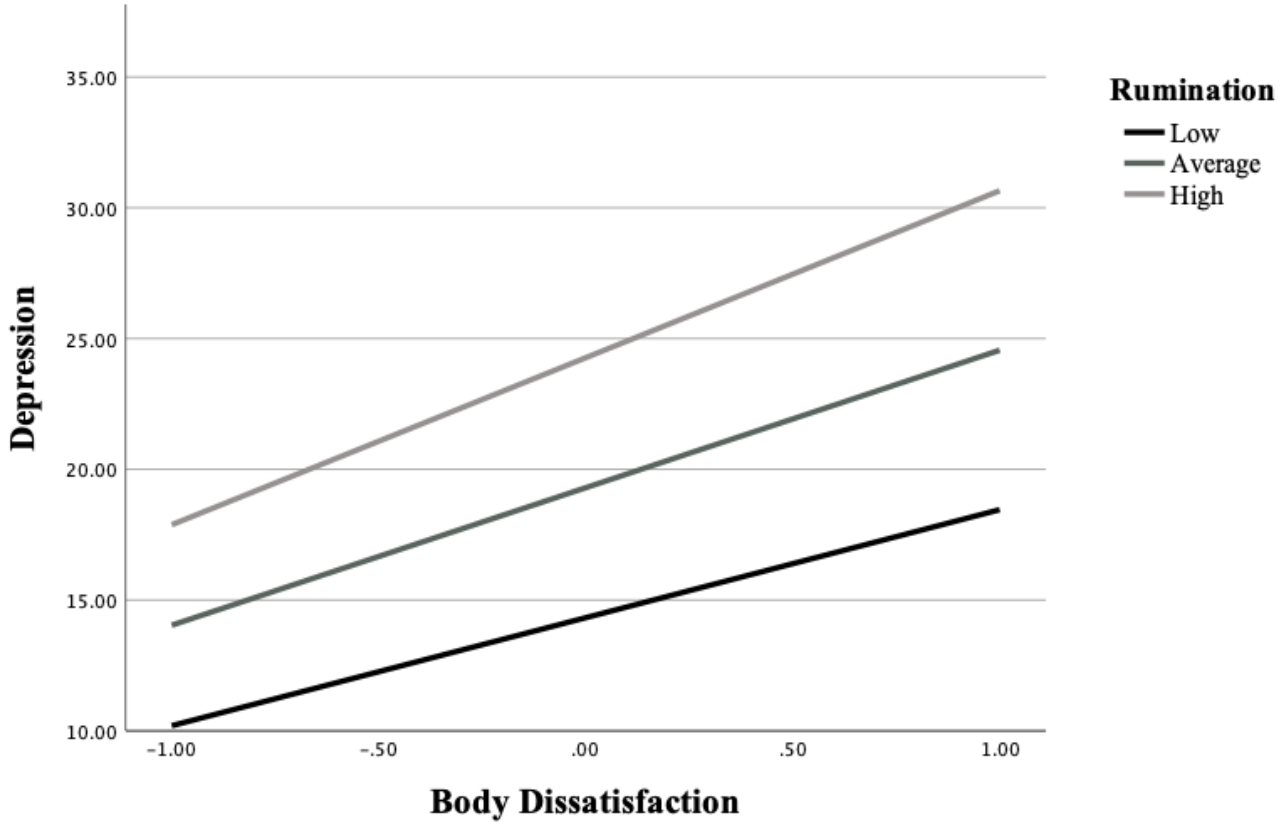
	Unstandardized Coefficients				95% Confidence Interval for B	
Model	B	Std. Error	t	Sig.	Lower Bound	Upper Bound
(Constant)	19.30	.52	36.85	<.001	18.27	20.33
Rumination	.23	.03	8.48	<.001	.17	.28
Maladaptive Investment	-.25	1.03	-0.24	.809	-2.27	1.77
Body dissatisfaction	6.63	.78	8.54	<.001	5.11	8.16
Int 1	.58	1.01	0.57	.567	-1.40	2.55
Int 2	.06	.04	1.71	.088	-.01	.14
Int 3	-.01	.04	-0.15	.882	-.08	.07
Int 4	-.05	.03	-1.64	.101	-.12	.01

Note. Dependent Variable: Depression. Int 1 = body dissatisfaction*maladaptive investment, Int 2 = body dissatisfaction*rumination, Int 3 = maladaptive investment*rumination, Int 4 = body dissatisfaction*maladaptive investment*rumination.

Although non-significant at the $p < .05$ level, the two-way moderation was explored by graphing the body dissatisfaction*rumination interaction, to probe the direction of the effect (see Figure 4).

Figure 4

Body Dissatisfaction by Rumination Interaction Including Only Those Who Identified as Women



Upon inspecting the graph, the trend of the body dissatisfaction by rumination interaction appeared to resemble the results of the full sample analyses, such that the slopes of the lines are similar to those depicted in Figure 3. It is possible that this effect did not reach significance given that this sample included less participants and therefore the analyses possessed less power than those conducted with the full sample. Irrespective of this, this finding suggests that women who were dissatisfied with their body and ruminated frequently, reported greater, but not significantly more, depression than those who were dissatisfied but did not ruminate often.

3.7.2 Western Ethnicity Only

Further exploratory analyses were conducted to discover whether the results would differ

when only those from Western countries were included. Countries were categorized as West and East based on their geographical location and culture, whereby although not exclusively situated in the Western or Eastern hemisphere, Western Europe and Australia were classified as West and all Islamic nations were classified as East (Ahmed, 1992; Mestrovic, 1994). Therefore, participants of any gender who identified as White, Aboriginal Canadian, Latino, Caribbean, or a combination of two or more of these countries were classified as 'Western' and thus retained for these sub-analyses (n = 329). Those who's endorsed ethnicity was Arab, Black/African, Chinese, Filipino, Japanese, Korean, or Asian were classified as Eastern, and were therefore removed from the Western ethnicity only analyses. Furthermore, participants who did not report their ethnicity were excluded from these analyses as well (n =1; see demographics in Table 8).

Table 8

Demographics Table Including Only Western Ethnicity Participants

Variable	*n*	%	*M*	*SD*
Age	-	-	21.75	5.18
Cis/Trans woman/girl	294	89.4	-	-
Cis/Trans man/boy	28	8.5	-	-
Non-binary, genderqueer, agender, or similar identity	4	1.2	-	-
Missing gender	3	0.9	-	-

This dataset was screened for univariate outliers by calculating z-scores for the rumination, maladaptive investment in appearance, depression, body dissatisfaction, BMI, and

age variables. As a result, there were two maladaptive investment, one depression, six BMI, and 13 age scores that were outside of the +/- 3 cut-off. These cases were Winsorized.

Next, multivariate outliers were detected by conducting a regression with rumination, maladaptive investment in appearance, depression, body dissatisfaction, BMI, and age predicting depression. This model indicated that one case was an outlier on the dependent variable as it had both standardized and studentized residual values greater than 3. As well, there were five Mahalanobis distances with a *p* value less than .001. Nine Leverage values were greater than the 3 (*k*+1)/N (or 0.055) cut-off. None of the cases had Cook's distances, standardized DFFITS, or standardized DFBETAS outside of the acceptable range.

To determine the influence of the dependant variable outlier and five values that surpassed the Mahalanobis and Leverage cut-offs, the regression was conducted with and without these cases included in the model. The regression models were comparable and thus the outliers were included in the analyses since they did not appear to be highly influential.

The remaining assumptions of multiple regression analysis were investigated using the same methods applied to the full sample. Visual inspection and/or the accompanying statistical tests determined that all assumptions were upheld.

Correlations and Regression Analysis

As was the case for the results from the main analyses, all the main study variables were significantly positively correlated (all correlations in Table 9).

Table 9

Correlation Table for Main Study Variables Including Only Western Ethnicity

Variable	*n*	*M*	*SD*	1	2	3	4	5	6
1. Rumination	329	95.50	21.59	-					
2. Maladaptive Investment	329	3.58	0.64	.54**	-				
3. Depression	329	19.56	12.22	.54**	.44**	-			
4. Body dissatisfaction	329	2.13	0.76	.47**	.64**	.60**	-		
5. BMI	329	24.59	5.48	.04	.09	.11*	.34**	-	
6. Age	329	21.50	4.09	-.13*	-.09	-.14**	-.08	.25**	-

Note. **$p < .01$, *$p < .05$ (2-tailed).

A multiple regression model with rumination, maladaptive investment in appearance, and body dissatisfaction predicting depression was conducted including Western ethnicity participants only. BMI and age were included as covariates in the model since these variables were significantly correlated with depression. The results of this regression model were like the results of the original multiple regression model that included all participants. Again, the overall model was significant $F(5, 323) = 52.56$, $p < .001$, explaining approximately 45% of the variance in depression ($R^2 = 0.449$, adjusted $R^2 = 0.44$). Similarly, only the rumination ($\beta = 0.33$, $SE = 0.03$, $t(323) = 6.54$, $p < .001$) and body dissatisfaction ($\beta = 0.48$, $SE = 0.95$, $t(323) = 8.13$, $p < .001$) variables were significant in the model (refer to Table 10).

Table 10

Regression Table for Main Study Variables Including Only Western Ethnicity

	Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
Model	B	Std. Error	Beta	t	Sig.	Lower bound	Upper Bound	Zero-order	Partial	Part
(Constant)	-5.72	4.61		-1.24	.215	-14.78	3.34			
Rumination	.19	.03	.33	6.54	<.001	.13	.24	.54	.34	.27
Maladaptive Investment	-.83	1.10	-.04	-0.76	.448	-2.99	1.32	.44	-.04	-.03
Body dissatisfaction	7.71	.95	.48	8.13	<.001	5.84	9.57	.60	.41	.34
BMI	-.09	.10	-.04	-0.90	.367	-.30	.11	.11	-.05	-.04
Age	-.17	.13	-.06	-1.31	.191	-.43	.09	-.14	-.07	-.05

Note. Dependent Variable: Depression

Moderation Analysis

Before conducting the moderation analysis, outliers on the four interaction terms were explored by calculating standardized scores for each variable. There was one body dissatisfaction*maladaptive investment in appearance, one body dissatisfaction*rumination, and five body dissatisfaction*maladaptive investment in appearance*rumination z-scores that were outside of the +/-3 range. These seven values were Winsorized by replacing them with a value one unit greater or less than the highest or lowest value that was not an outlier on the respective variable (Field, 2013, p. 619).

Next, multivariate outliers were identified by conducting a regression model including body dissatisfaction, rumination, maladaptive investment in appearance, and their four interaction terms as predictor variables and depression as the dependant variable. There was one

case with both standardized and studentized residuals greater than 3. There were 15 values that had outlying Mahalanobis distance values (p <.001) on a chi-square distribution with degrees of freedom equal to the number of predictors in the model (i.e., seven). The same 15 cases had values that surpassed the 0.073 Leverage cut-off. No Cook's distance or standardized DFFITS and DFBETAS values surpassed one or +/-1, respectively.

A regression model conducted with PROCESS Macro that included the 16 outliers was compared to a model that excluded these cases. The outliers were considered influential observation since their inclusion modified the direction, weight, and significance of the regression coefficients. Therefore, these cases were excluded from the moderation analysis (n = 313).

The moderating effects of maladaptive investment in appearance and rumination in the association between body dissatisfaction and depression were tested for only those with a 'Western' ethnicity. Body dissatisfaction predicting depression with maladaptive investment in appearance and rumination as moderators, was entered into a double moderation model (model number 3) in PROCESS Macro with 5000 Bootstrap estimates (Hayes, 2022). All variables in the model were centred.

The results of these analyses indicated that the overall model significantly predicted depression scores, $F(7, 305) = 32.42$, $p < .001$, and accounted for about 43% of its variance (R^2 = 0.427). This regression model was the same as the model that included all participants, in that body dissatisfaction ($B = 6.19$, $SE = 0951$, $t(305) = 6.54$, 95% CI [4.33, 8.06], $p < .001$) and rumination ($B = 0.22$, $SE = 0.03$, $t(305) = 6.88$, 95% CI [0.16, 0.28], $p < .001$), were significant predictors of depression. However, in this model the body dissatisfaction by rumination interaction term was not significant ($p = 0.34$). Additionally, although the maladaptive

investment in appearance by rumination interaction term was not significant at the $p < .05$ level ($B = 0.11$, $SE = 0.06$, $t(305) = 1.81$, 95% CI [-0.01, 0.22], $p = .07$), it was explored further to examine the trend in the results (refer to Table 11).

Table 11

Regression Table for the Moderation Analysis Including Only Western Ethnicity

	Unstandardized Coefficients				95% Confidence Interval for B	
Model	B	Std. Error	t	Sig.	Lower Bound	Upper Bound
(Constant)	18.84	.60	31.26	<.001	17.66	20.03
Rumination	.22	.03	6.88	<.001	.16	.28
Maladaptive Investment	.26	1.28	0.21	.837	-2.25	2.78
Body dissatisfaction	6.19	.95	6.54	<.001	4.33	8.06
Int 1	-1.84	1.39	-1.33	.185	-4.57	.89
Int 2	.05	.05	0.96	.337	-.05	.15
Int 3	.11	.06	1.81	.072	-.01	.22
Int 4	.01	.06	0.21	.838	-.11	.14

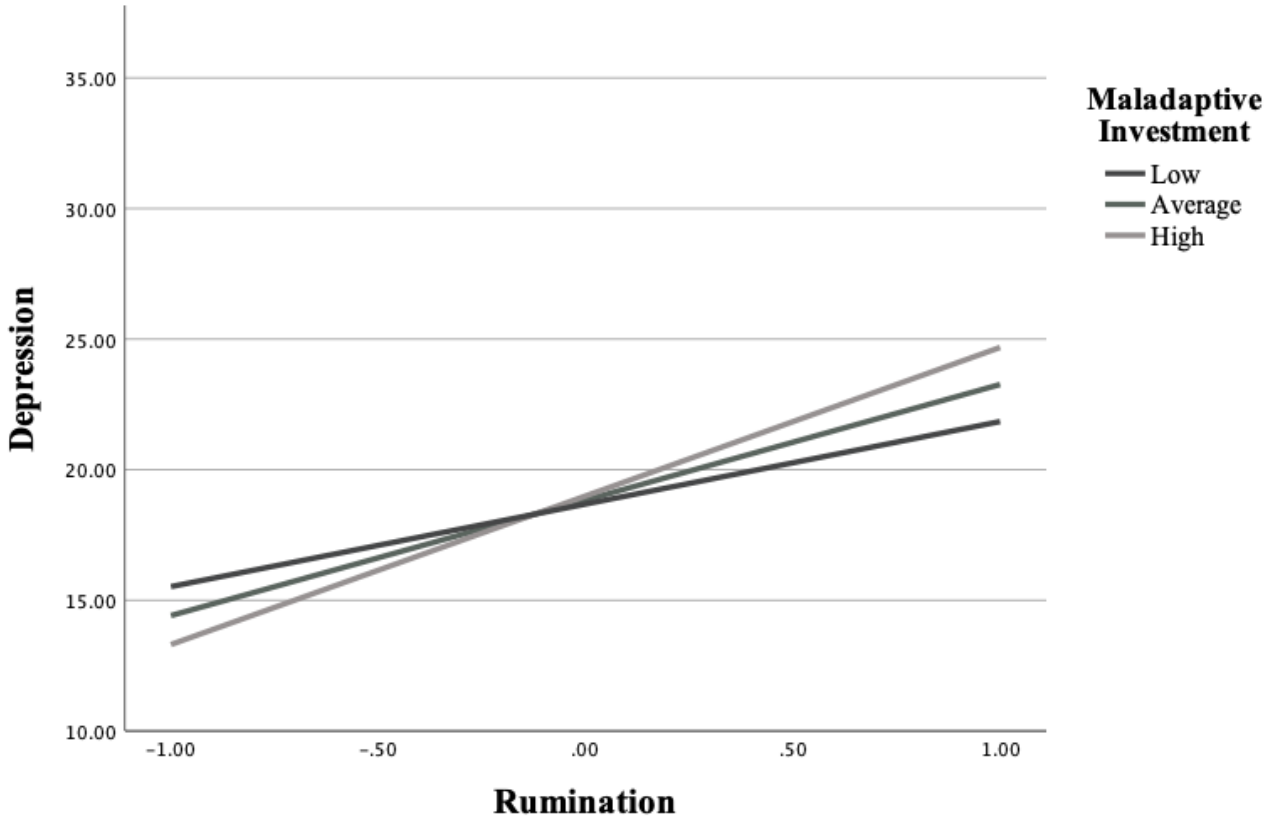
Note. Dependent Variable: Depression. Int 1 = body dissatisfaction*maladaptive investment, Int 2 = body dissatisfaction*rumination, Int 3 = maladaptive investment*rumination, Int 4 = body dissatisfaction*maladaptive investment*rumination.

To probe the maladaptive investment in appearance*rumination interaction term, the moderation was graphed using the data for visualizing conditional effects provided by PROCESS. The interaction was graphed using mean-centered values for each of the predictors, where high levels of the predictors are 1 or more standard deviations above the mean, average

are within 1 standard deviation from the mean, and low are 1 or more standard deviations below the mean (see Figure 5).

Figure 5

Line Graph Depicting Maladaptive Investment by Rumination Interaction Including Only Western Ethnicity



As depicted in the graph, depression scores are higher at increased levels of rumination for all participants. As well, this trend is slightly more pronounced for those high comparand to low in maladaptive investment in appearance, although this difference is not statistically significant. Overall, these results suggest that for 'Western' ethnicity individuals, there may be a trend amongst those who ruminate frequently and score high in maladaptive appearance

investment to report higher depression than those who do not ruminate often and have low levels of maladaptive investment. Given that this interaction effect was not significant, and these analyses were exploratory, these results require replication in future studies to determine their validity.

3.7.3 Western Ethnicity Women Only

Last, exploratory analyses were conducted to discover if those who identified as women of 'Western' ethnicity exhibited a pattern of results different than that found within the full sample analyses. This sample included cisgender and transgender women who identified as White, Aboriginal Canadian, Latino, Caribbean, or a combination of two or more of these ethnicities (n = 294). The seven participants who did not report their gender and the one participant who did not report their ethnicity were excluded from these analyses.

Univariate outliers on the main study variables were detected by calculating standardized scores for each participant. As a result, one case had a maladaptive investment z-score outside of the +/-3 range. There were 11 age and six BMI z-scores outside of this cut-off as well. These outlying values were adjusted via Winsorizing. Multivariate outliers were detected also, by testing a regression with the main study variables predicting depression. There was one standardized/studentized residual, five Mahalanobis, and eight Leverage value outliers. None of the cases had problematic Cook's distances, standardized DFFITS, or standardized DFBETAS.

A multiple regression with body dissatisfaction, maladaptive investment in appearance, rumination, BMI, and age predicting depression was conducted with and without five cases that had both Mahalanobis and Leverage values outside of the acceptable ranges and the one residual outlier. The removal of the six outliers did not produce any notable changes within the regression

model and therefore they were retained in the analyses. Using assumption checking process described in the main analyses, all other assumptions were judged to be met.

Correlations and Regression Analysis

As was the case for the results from the previous analyses, the rumination, maladaptive investment in appearance, and body dissatisfaction variables were all positively and significantly correlated with depression and each other (see Table 12).

Table 12

Correlation Table for Main Study Variables Including Only Western Women

Variable	*n*	*M*	*SD*	1	2	3	4	5	6
1. Rumination	294	96.36	21.26	-					
2. Maladaptive Investment	294	3.61	0.62	.53**	-				
3. Depression	294	19.65	12.22	.52**	.45**	-			
4. Body dissatisfaction	294	2.15	0.74	.45**	.63**	.59**	-		
5. BMI	294	24.46	5.58	.03	.10	.11	.35**	-	
6. Age	294	21.38	4.03	-.13*	-.13*	-.16**	-.09	.27**	-

Note. **$p < .01$, *$p < .05$ (2-tailed).

To discover which variables predicted depression scores, rumination, maladaptive investment, and body dissatisfaction were entered into a multiple regression analysis. Age and BMI were included as covariates in the model to control for their association with the dependant variable. Within this model, only rumination ($\beta = 0.31$, $SE = 0.03$, $t(288) = 5.79$, $p < .001$) and body dissatisfaction ($\beta = 0.47$, $SE = 1.04$, $t(288) = 7.44$, $p < .001$) significantly predicted depression. This total model was significant ($F(5, 288) = 45.14$, $p < .001$) and explained

approximately 44% of the variance in depression scores, $R^2 = 0.439$, adjusted $R^2 = 0.30$ (refer to Table 13).

Table 13

Regression Table for Main Study Variables Including Only Western Women

	Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
Model	B	Std. Error	Beta	t	Sig.	Lower bound	Upper Bound	Zero-order	Partial	Part
(Constant)	-6.51	5.07		-1.29	.200	-16.49	3.47			
Rumination	.18	.03	.31	5.79	<.001	.12	.24	.52	.32	.26
Maladaptive Investment	-.22	1.22	-.01	-0.18	.858	-2.62	2.18	.45	-.01	-.01
Body dissatisfaction	7.76	1.04	.47	7.44	<.001	5.71	9.81	.59	.40	.33
BMI	-.10	.11	-.04	-0.87	.387	-.31	.12	.11	-.05	-.04
Age	-.21	.14	-.07	-1.45	.150	-.49	.07	-.16	-.09	-.06

Note. Dependent Variable: Depression

Moderation Analysis

Finally, the body dissatisfaction*maladaptive investment in appearance, body dissatisfaction*rumination, maladaptive investment in appearance*rumination, and body dissatisfaction*maladaptive investment in appearance*rumination interaction terms were created by computing the products of each of the corresponding variables. These interaction terms were screened for univariate outliers by examining standardized scores for each of the variables. There was one body dissatisfaction by maladaptive investment and body dissatisfaction by rumination value with a z-score outside of +/-3. As well, there were five cases that had standardized vales

greater than three on the three-way interaction term. These seven values were Winsorized by taking the largest or smallest value of the variable that was not an outlier and rounding to the next highest or lowest whole number (Field, 2013, p. 619).

A multiple regression model with depression as the dependant variable and body dissatisfaction, maladaptive investment in appearance, rumination, and their four interaction terms as the predictor variables was conducted to explore multivariate outliers. This regression indicated that there was one case with standardized and studentized residual values greater than 3. Additionally, there were 12 Mahalanobis distance and 13 Leverage values that surpassed the specified cut-offs. There were no other cases that surpassed the Cook's distance or standardized DFFITS and DFBETAS cut-offs. A regression model predicting depression was conducted in PROCESS Macro including the three main study variables and the four interaction terms as predictors, with and without the inclusion of the 13 cases that were outside of the acceptable range on two of the aforementioned tests. These models had comparable coefficient *b* weights and significance levels and thus the outliers were not considered to be exerting undue influence upon the regression parameters and were kept in the final moderation analysis ($n = 294$).

Within PROCESS Macro, the study variables were entered into Model 3 with depression as the dependant variable body dissatisfaction as the independent variables, and maladaptive investment and rumination as moderating variables (Hayes, 2022). Each of the variables were mean centred and the model was tested with 5000 bootstrap estimates. The results of the moderation analysis showed that only the main effects of rumination ($B = 0.20$, $SE = 0.03$, $t(286) = 5.95$, 95% CI [0.13, 0.27], $p < .001$) and body dissatisfaction ($B = 7.29$, $SE = 1.0$, $t(286) = 7.30$, 95% CI [5.33, 9.26], $p < .001$) significantly predicted depression in this sample. The

overall moderation model was significant, accounting for about 44% of the variance in depression, $R^2 = 0.439$, $F(7, 286) = 32.04$, $p < .001$ (results in Table 14).

Table 14

Regression Table for the Moderation Analysis Including Only Western Women

	Unstandardized Coefficients				95% Confidence Interval for B	
Model	B	Std. Error	t	Sig.	Lower Bound	Upper Bound
(Constant)	19.46	.63	30.75	<.001	18.21	20.70
Rumination	.20	.03	5.95	<.001	.13	.27
Maladaptive Investment	-.18	1.28	-0.14	.887	-2.70	2.34
Body dissatisfaction	7.29	1.00	7.30	<.001	5.33	9.26
Int 1	-1.47	1.36	-1.08	.282	-4.15	1.21
Int 2	.02	.05	0.32	.749	-.08	.12
Int 3	.07	.05	1.44	.152	-.03	.17
Int 4	-.00	.04	-0.02	.983	-.08	.08

Note. Dependent Variable: Depression. Int 1 = body dissatisfaction*maladaptive investment, Int 2 = body dissatisfaction*rumination, Int 3 = maladaptive investment*rumination, Int 4 = body dissatisfaction*maladaptive investment*rumination.

There were no significant interaction terms in this model. However, it is possible that this subsample may not have had enough power to detect the interaction effect, since G*Power analysis suggested that a sample of at least 366 participants would be required to detect a small to medium effect size.

CHAPTER 4

DISCUSSION

The goal of the current study was to discover for whom body dissatisfaction is most likely to be associated with depression by examining the moderating roles of maladaptive investment in appearance and rumination in this relationship.

4.1 Predicting Depression: Main Effects

4.1.1 Body Dissatisfaction

First, it was predicted that body dissatisfaction would significantly predict depression within the present sample of undergraduate students. This prediction was supported, as higher body dissatisfaction was associated with higher depression within regression analyses. Therefore, the more individuals were dissatisfied with aspects of their physical appearance, the more likely they were to report experiencing greater depression. This finding is consistent with the results of previous cross-sectional studies (Johnson & Wardle, 2005; Chen et al., 2015) that have shown that body dissatisfaction predicts depression in adolescent girls and boys. It is also consistent with findings from longitudinal research which showed that body dissatisfaction is an antecedent in the development of depression in female and male children (Paxton et at, 2006), teens (Bornioli et al., 2020; Ferreiro et al., 2014), and adults (Sharpe et al., 2018). Thus, being body dissatisfied is likely to predict later occurrences of depression.

This result offers support for the Body Dissatisfaction Driven Hypothesis (Stice and Bearman, 2001) as well. This theory posits that body dissatisfaction is due to the discrepancy between one's appearance and existing appearance ideals. Personal attributions of failure that occur when individuals do not meet these ideals then contribute to the development of

depression. As such, body dissatisfaction's association with depression in this study may be attributable feelings of personal inadequacy and self-blame for failure to attain idealized appearance standards.

4.1.2 Maladaptive Investment in Appearance

Secondly, it was hypothesized that maladaptive investment in appearance would significantly predict depression. It was assumed that those who were highly invested in their appearance as a form of self-worth would experience a greater degree of depression. The results of this study showed that maladaptive investment in appearance was strongly and positively correlated with depression. This is consistent with the findings of Sinton & Birch (2006) who showed that young girls with higher levels of appearance schematicity reported experiencing greater depression. However, despite being strongly and positively correlated with depression in the present research, maladaptive investment did not predict a significant proportion of unique variance in depression when included in a regression model with body dissatisfaction. Thus, support was not offered for the second hypothesis in this study. This finding was contrary to results of a previous study that used a regression model controlling for additional variables, such as appearance satisfaction, to show that maladaptive investment significantly predicted depression within female cancer patients (Moreira & Canavarro, 2010). Furthermore, contrary to the current results, maladaptive investment in appearance also has been found to significantly predict depression in regression analyses with male cancer patients (Tu & Wang, 2022). However, the latter two studies focussed on the very specific population of cancer patients, for who appearance investment may have a different meaning given the unique and often very significant impact of the disease and its treatment on patients' appearance (see White, 2000).

It has been claimed that body dissatisfaction and maladaptive investment may be directly related, which may explain why maladaptive investment did not uniquely predict depression in the present study. This claim comes from studies whose results indicated that interventions aimed at reducing body dissatisfaction simultaneously diminished maladaptive appearance investment (Cash & Hrabosky, 2003). Therefore, although in the current study maladaptive investment in appearance exhibited a strong positive correlation with depression, when included with body dissatisfaction in a regression model, it is possible that the variance in depression for which it accounted was not unique, but rather shared with that explained by body dissatisfaction. As a result, maladaptive investment in appearance did not predict depression above and beyond body dissatisfaction.

Additionally, it is possible that, despite being conceptually related, body dissatisfaction, but not maladaptive investment in appearance, predicted depression because body dissatisfaction is likely more directly associated with subjective distress than is appearance investment. Body dissatisfaction may inherently involve a more negatively valenced experience given that it includes deprecating judgments of one's own appearance. On the other hand, maladaptive investment appearance implies a tendency to view appearance as extremely important and to attribute one's inherent value and successes to it. Therefore, being maladaptively invested in appearance may not necessarily directly result in distressing experiences even though it is associated with, and possibly precursor of, aversive outcomes, such as body dissatisfaction. This reasoning is consistent with an experience sampling study whose results showed that highly appearance invested women did not report more negative mood than those who were not highly invested, but those women who were more dissatisfied with their body did report higher negative mood than those who were less dissatisfied (Forand et al., 2010). Therefore, being dissatisfied

with aspects of one's own appearance, compared to being high in appearance schematicity, appears to engender more directly distressing experiences and hence possess a greater potential to result in depression.

4.1.3 Rumination

The third hypothesis of this research was that rumination would predict depression. This prediction was supported given that higher ratings of rumination were significantly associated with greater depression in the present sample. This finding indicates that those who tended to experience global, uncontrollable, repetitive, and recurring thoughts consequently endorsed higher levels of depression. This result reflects previous research showing that having a ruminative response style directly contributes to the initiation and maintenance of depression, since it involves dwelling on their perceived shortcomings (Nolen- Hoeksema, 2000).

The significant association between rumination and depression found in this study supports extant theory. According to Beck's (1967) Cognitive Model of Depression, rumination consists of repetitive thinking about selectively negative stimuli, which has the capacity to prompt and maintain depressive symptoms. Furthermore, Nolen-Hoeksema (1991) asserts that individuals who ruminate tend to dwell on undesirable aspects of situations, which interferes with effective problem solving and results in the persistent negative emotions and low mood typical of depression. In sum, rumination was shown to significantly predict depression in the current study, which could be explained by the inhibited problem-solving and bias towards negative thoughts and feelings it is posited to create.

4.2 Predicting Depression: Moderation Effects

4.2.1 Body Dissatisfaction and Maladaptive Investment in Appearance

Contrary to the fourth hypothesis in this study, maladaptive investment in appearance did not significantly moderate the relationship between body dissatisfaction and depression. Body dissatisfaction was predicted to be a stronger predictor of depression for those who reported greater maladaptive investment in appearance, since being dissatisfied with one's appearance was theorized to be more distressing for those who considered their appearance to be profoundly influential and important. For instance, maladaptive investment leads information about appearance to be more impactful (Hargreaves & Tiggemann, 2002), which implies that body dissatisfaction would be more distressing for those highly appearance invested and hence, likely to engender depression. This reasoning also is consistent with McIntosh and colleagues' (1995) theory of goal linking which, applied to body image, suggests that those maladaptively invested in their appearance may link their failure to attain appearance related goals to the inability to attain more global goals related to success and contentment. This goal linking would increase the depressive affect associated with body dissatisfaction, since not meeting appearance ideals would be viewed as directly inhibiting one's ability to attain other, more consequential, aspirations in life. In addition, results from past research have shown that maladaptive investment in appearance is associated with both increased body dissatisfaction and depression (Sinton & Birch, 2006). Taken together, previous research and theory suggests that high levels of maladaptive appearance investment would potentiate both body dissatisfaction and the depression with which it is associated.

Given that maladaptive investment in appearance did not significantly interact with body dissatisfaction to predict depression, it is possible that maladaptive investment merely results in, rather than interacts with, body dissatisfaction to produce depression. This is supported by researchers postulating that frequently focusing on, and processing, appearance-specific

information contributes to the development of body dissatisfaction, as participants' initial levels of appearance schematicity was associated with increases in body dissatisfaction two years later (Hargreaves & Tiggemann, 2002). Thus, it could be that maladaptive investment predicts depression only because it contributes to the needed psychological conditions for increased body dissatisfaction. This is consistent with the current results which indicate that maladaptive investment does not predict depression above and beyond the effects of body dissatisfaction.

4.2.2 Body Dissatisfaction and Rumination

The results supported the fifth hypothesis in this study such that rumination significantly moderated the relationship between body dissatisfaction and depression. This finding demonstrates that, within the current sample, those who were dissatisfied with aspects of their appearance and tended to habitually think about events in a repetitive way reported experiencing more symptoms of depression. It was presumed that those who experienced high levels of body dissatisfaction and rumination would be more likely to dwell on the features of their appearance with which they were dissatisfied, which would result in greater depression. This reasoning was founded on prior research findings that discovered that those who were prompted to ruminate on the thoughts and feelings they experienced as a result of reading a negative body image scenario involving their weight, reported greater body dissatisfaction than those who did not ruminate (Etu & Gray, 2010). As well, the results of a similar study indicate that ruminating on eating, weight, and shape concerns worsens body dissatisfaction (Rivière et al., 2018). Thus, for those who are highly body dissatisfied, ruminating frequently is likely to enhance their level of dissatisfaction, and thus the depressive states with which body dissatisfaction is connected (Bornioli et al., 2020; Paxton et at, 2006; Ferreiro et al., 2014; Sharpe et al., 2018).

According to theory, failure to attain valued goals leads to increased rumination on the unmet goal (Martin & Tesser,1996). Furthermore, research outcomes show that rumination is associated with increases in depression over time (McLaughlin & Nolen-Hoeksema, 2011). Since body dissatisfaction is potentially perceived as a failure to attain a personally important goal, it is likely to result in increased levels of rumination on negative aspects of appearance, which would ultimately promote depression.

4.2.3 Body Dissatisfaction, Maladaptive Investment in Appearance, and Rumination

The final hypothesis of the present study consisted of a predicted three-way interaction between maladaptive investment in appearance, rumination, and body dissatisfaction predicting depression. It was theorized that individuals would experience higher levels of depression if, in addition to being strongly dissatisfied with their body, they placed a great deal of importance on their appearance and ruminated about the aspects with which they were dissatisfied. In other words, it was expected that being unhappy with one's appearance would be more distressing if an individual deeply cares about their appearance and frequently thinks about the features of their appearance that they dislike. However, appearance investment did not moderate the interaction between body dissatisfaction and rumination to predict depression.

The findings from the current study are contrary to the literature which shows that body dissatisfaction is most depressionogenic for those who ruminate and are high in maladaptive investment, given that body dissatisfaction is more distressing for those high maladaptive investment (Hargreaves & Tiggemann, 2002) and ruminating about negative aspects of one's weight, shape, and eating increases body dissatisfaction (Etu & Gray, 2010; Rivière et al., 2018). However, rumination about disliked aspects of appearance specifically was not measured in the current study, so it cannot be concluded that participants were ruminating specifically about their

body dissatisfaction. Current measures of appearance-specific rumination tend to exclusively focus on eating behaviours and body size and weight (Cowdrey & Park, 2011). Due to this, a measure of general rumination was selected for this study with the premise that a general ruminative style would readily apply to rumination about overall appearance rather than only body size and weight. Nevertheless, it remains unknown whether the general rumination measured in this sample served to amplify individuals' body dissatisfaction directly, as its content could have been unrelated to aspects of appearance.

Moreover, it is possible that maladaptive investment's failure to predict unique variance in depression above body dissatisfaction led to the non-significant three-way moderation. Again, body dissatisfaction and maladaptive investment may be directly related, which could have prevented them from producing a significant interaction. In this sample specifically, there were very few individuals with simultaneous high body dissatisfaction and low maladaptive investment scores, or vice versa. Therefore, it appears that these scores increased in parallel, which may have inhibited them from truly interacting with each other, and with rumination, to predict depression.

4.3 Sub Analyses

Exploratory analyses were conducted to determine if the findings from the main analyses would be replicated within subsamples of participants. The same analyses conducted in the original analyses were repeated including only women, only Western ethnicity, and only women of Western ethnicity, respectively. These exploratory analyses were conducted since body dissatisfaction is influenced by gender (Paxton et al., 2006; Sharpe et al; 2018) and culture (Al Sabbah et al., 2009; León et al., 2018).

4.3.1 Women Only

The sub analyses, including only women, yielded results similar to those found within the entire sample, where body dissatisfaction (Hypothesis 1) and rumination (Hypothesis 3) had a strong, positive correlation with, and predicted unique variance in, depression. Maladaptive investment in appearance, although strongly and positively associated with depression, did not account for significant variance above and beyond the other predictors (Hypothesis 2). Additionally, the body dissatisfaction by rumination interaction term was not significant ($p = .088$) but the pattern of the three-way interaction resembled the results from the main analyses. This lack of significance may be attributable to not having enough power to detect the effect. For instance, the effect size was very small in this case ($d = 0.12$), and a power analysis indicated that a sample of at least 725 participants, with $\beta\text{-}1 = .80$ and $p = 0.05$, would be required to detect a 'small' effect ($f^2 = 0.02$). In sum, it is anticipated that the results from the main analyses can be generalized to a women-only sample. This is especially the case since the majority of the whole sample identified as women ($n = 436$; 87.5%).

4.3.2 West Ethnicity Only

When including only those who identified as having a Western ethnicity, the predictors of depression remained consistent with those from the main analyses. Namely, all predictors were strongly and positively correlated with depression, but only body dissatisfaction (Hypothesis 1) and rumination (Hypothesis 3) predicted unique variance in depression, whereas maladaptive investment in appearance did not (Hypothesis 2). Yet, within this subsample, the body dissatisfaction by rumination interaction term was not significant (Hypothesis 5). This finding suggests that for Western ethnicity participants, body dissatisfaction alone may be adequate to produce distress leading to depression, regardless of their degree of ruminative thoughts. This proposition is consistent with previous findings in the literature demonstrating that college

students with Western ethnicities, such as originating from American and Hispanic regions, report greater weight-related body dissatisfaction than those with Eastern ethnicities, such as those from African and Asian countries (Altabe, 1998). More recently, research conducted with women from ten world regions found that body dissatisfaction was greatest in the American countries, compared to more Eastern world regions such as Asia and Europe (Swami et al., 2010). However, this study found that higher socioeconomic status and exposure to Western media significantly predicted women's levels of body dissatisfaction as well (Swami et al., 2010). Therefore, the authors suggest that these factors may be more indicative of women's body dissatisfaction compared to the world region from which they originate (Swami et al., 2010). Nonetheless, this finding was replicated in the current research where the mean body dissatisfaction score was significantly higher for those from Western compared to Eastern ethnicities, $t(495) = -3.04$, $p < .01$. Consequently, body dissatisfaction may be especially distressing for those with Western ethnicities, and therefore predict depression regardless of the extent to which they ruminate.

Additionally, though rumination was strongly correlated with depression within this subsample, it appears that this association is independent of body dissatisfaction. It may be that those high on the general measure of rumination in this sample were not necessarily ruminating about their body dissatisfaction such that rumination did not have an impact on the relationship between dissatisfaction and depression.

Next, for the West ethnicity participants only, the maladaptive investment in appearance by rumination interaction term was close to significant ($p = .07$). Further probing of this moderation effect indicated that those who reported frequent rumination and scored high in maladaptive appearance investment also reported higher depression. As predicted for the full

sample, this effect may be explained by the fact that both rumination (Beck, 1967; Nolen-Hoeksema, 2000) and maladaptive investment in appearance (Sinton & Birch, 2006) have been found to be associated with depression. Thus, being high in rumination and maladaptive investment may work together to produce greater depression in this subsample also.

It is also possible that maladaptive investment in appearance and rumination share similar components that are distressing. Within the current research, maladaptive investment in appearance and rumination were strongly correlated with each other and with depression. Indeed, the Appearance Schema Inventory administered in this study to measure maladaptive appearance investment has several items that implicate a tendency to ruminate, such as "When something makes me feel good or bad about my looks, I tend to dwell on it." The current results could therefore indicate that the most upsetting elements of maladaptive appearance investment involve an element of rumination. As a result, those who are high in both maladaptive investment and rumination may be more likely to engage in the ruminative processes inherent to appearance investment, leading to increased depressive affect.

The potential moderating effect of rumination in the relationship between body dissatisfaction and depression was detected within Western ethnicity individuals, specifically. This may be the case for this subsample of participants since they reported relatively higher levels of rumination and maladaptive investment in appearance than Eastern ethnicity participants. However, since this effect was small and non-significant within this sample, replication of this result is required to determine its validity.

4.3.3 West Women Only

The last sub analyses explored whether the effects found in the entire sample would hold for those who identified as women of Western ethnicity. The results within this subsample were

like those from the whole sample such that all predictor variables exhibited a strong positive correlation with depression, but only body dissatisfaction (Hypothesis 1) and rumination (Hypothesis 3) predicted depression above the effects of the other predictors. These main effects were therefore consistent across all analyses in the current research, in that greater body dissatisfaction and greater frequency of rumination was associated with higher depression ratings for all participants, regardless of their gender and ethnicity.

Within the women of Western ethnicity only subsample, no significant interaction terms emerged. This suggests that Western women who were dissatisfied with their body were more likely to report higher levels of depression, and that thinking repetitively about events or highly valuing appearance as a source of self-worth did not impact the strength of this association. This finding may be attributable to the greater degrees of body dissatisfaction found in samples of women compared to men (Quittkat, 2019), individuals with Western backgrounds versus those with Eastern backgrounds (Altabe, 1998), and women from the Americas compared to other continents (Swami et al., 2010). This trend also is reflected in the present study where, although only a slight difference, Western ethnicity women reported greater body dissatisfaction than the full sample. As such, since Western ethnicity women experience higher levels of body dissatisfaction, they may endure heightened depression as a result.

Lastly, it is possible that this subsample may have been too small and, therefore, may have yielded an underpowered analysis to detect the true interaction effect. G*Power analysis suggested that a sample of at least 366 would be required to detect a significant effect that was small to medium in size ($f^2 = 0.04$), with $\beta\text{-}1 = .80$ and $p = 0.05$, whereas there were only 294 participants included in the present analyses. Taken together, all sub analyses in the current study were exploratory, and hence need to be replicated with future research.

4.4 Limitations

This study has several limitations. First, the design was cross-sectional and included only self-report responses provided by university students. As a result, it is not possible to know the temporal precedence of the main variables, or whether body dissatisfaction and rumination developed before depression in this sample. Furthermore, university students are a specific subsample of the population, who are typically more Western, educated, industrialized, rich, and democratic compared to the broader population (Henrich et al., 2012). Therefore, the results of the present research may not be generalizable to individuals who are not university students. In addition, the current study included mostly female participants (about 87%). Therefore, the results may not be truly reflective of the experiences of men.

Another limitation of the current study pertains to the measure of rumination used. Given that a general rumination scale was administered in this study, it cannot be determined what was the content of participants' ruminative thoughts. Thus, although rumination typically involves dwelling on upsetting material (Beck, 1967; Nolen-Hoeksema, 1991) and perceived inadequacies (Nolen-Hoeksema, 2000), it can only be assumed that those who are highly dissatisfied with their body would be likely to ruminate on the aspects of their appearance that they dislike. As such, it would be necessary to include an appearance-specific measure of rumination to truly parse out the effect of ruminative thoughts about appearance flaws on depressive outcomes.

Finally, this study was limited by its lack of power to detect significant effects within the exploratory analyses. Since the exploratory analyses were conducted with subsamples of the study population, these analyses did not possess the power to detect significant moderation effects such that a larger sample size was required. Therefore, it

would have been beneficial to conduct an a priori power analysis and recruit the number of participants required to reach adequate statistical power, from each gender and ethnicity subgroup.

4.5 Implications and Future Directions

The current study serves to advance our understanding of body image and depression. This was the first study to investigate how body dissatisfaction interacts with appearance investment and rumination to predict depression. Though body dissatisfaction (Bornioli et al., 2020; Paxton et at, 2006; Ferreiro et al., 2014; Sharpe et al., 2018), maladaptive investment in appearance (Moreira & Canavarro, 2010), and rumination (McLaughlin & Nolen-Hoeksema, 2011) have all been consistently associated with the development of depression in longitudinal studies, the current research was novel in exploring the ways in which these variables may interact to produce depressionogenic effects. This is important since there are multiple factors contributing to depression (American Psychiatric Association, 2013, p. 166), and thus it seems likely that these variables interact with each other rather than operate independently.

Understanding the interplay of body image factors that contribute to depression is useful for implementing strategies effective in the prevention and treatment of depression. For instance, there are therapies aimed specifically at reducing body dissatisfaction (Cash & Hrabosky, 2003) and rumination (Watkins et al., 2007). Because body dissatisfaction was found to interact with rumination to enhance depression in this study, it may be beneficial to combine body dissatisfaction and rumination interventions to prevent or treat the depression elicited by the intersection of these factors. Furthermore, targeting maladaptive investment in appearance may be beneficial for preventing and treating depression as well, since maladaptive investment was correlated with greater body dissatisfaction in the current study, and has been found to contribute

to its development over time (Hargreaves & Tiggemann, 2002). Thus, reducing the extent to which one perceives their appearance as important and foundational to their self-worth could mitigate the development of body dissatisfaction and, therefore, the depression with which it is associated.

Future directions for research include investigating these study variables via experimental designs. For example, it would be useful to induce rumination on body dissatisfaction in participants to observe the effects this has on negative mood states, compared to those who do not ruminate. Also, employing longitudinal research designs in investigations of how the relationship between body dissatisfaction, maladaptive investment in appearance, rumination and depression evolves over time would be helpful to determine which combination of these factors may truly precede depression. Gathering qualitative data would be another fruitful direction for future research, where the content of individuals' body dissatisfaction, appearance investment, and rumination could be explored in relation to experiences of depression.

Finally, including a more diverse sample would be beneficial to explore whether the results of the present study are applicable to those with varying demographic characteristics. Specifically, conducting studies with men only or individuals from various age groups would be necessary to discern the differential impact of these variables on these groups. This is especially important given that body dissatisfaction, maladaptive appearance investment, rumination, and depression are thought to vary according to an individual's age and gender. Specifically, body dissatisfaction was found to consistently predict increases in depression for women across their early teens and late 20s (Sharpe et al., 2018). However, for men, body dissatisfaction was only a significant predictor of future depression within their late teen and early adult years (Sharpe et al., 2018). Further, women's risk of developing depression becomes three times greater than

men's risk in early teen years (American Psychiatric Association, 2013, p. 165). Additionally, women tend to report greater levels of maladaptive investment in appearance than men (Cash et al., 2004), and young and middle-aged women report greater maladaptive investment than older women (Rusticus et al., 2008). Last, studies have shown that women exhibit greater rumination than men in response to negative events (see Nolen-Hoeksema, 1991 for a review) and that girls' and boys' levels of rumination increase over time from ages 10 to 17 (Jose & Brown, 2008). Further, the recent increase in awareness of gender diversity points to the importance of investigating these variables and their interplay in individuals of diverse gender identity. Taken together, these findings highlight the importance of investigating these variables with diverse samples of participants to clarify the ways in which they are impacted by gender and developmental differences.

4.6 Conclusion

In conclusion, the results from this study revealed that body dissatisfaction and rumination uniquely predict depression and that they interact to produce higher depression. These results suggest that once an individual is body dissatisfied, ruminating may enhance the salience of these negative evaluations of their appearance, which in turn may increase the likelihood that they will experience depressive affect. Given the sample and methodology used in this study, future research is necessary to determine the generalizability and causality of the associations found here. Nonetheless, the findings from the present research suggest that implementing interventions tailored to treat body dissatisfaction and rumination may be efficacious for preventing and treating depression.

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APPENDIX A

The Beliefs about Appearance Questionnaire
(ASI-R Short Form)

The statements below are beliefs that people may or may not have about their physical appearance and its influence on life. Decide on the extent to which you personally **disagree or agree** with each statement and enter a number from 1 to 5 in the space on the left. There are no right or wrong answers. Just be truthful about your personal beliefs.

1	2	3	4	5
Strongly Disagree	**Mostly Disagree**	**Neither Agree or Disagree**	**Mostly Agree**	**Strongly Agree**

_____ 1. I spend little time on my physical appearance.

_____ 2. When I see good-looking people, I wonder about how my own looks measure up.

_____ 3. I try to be as physically attractive as I can be.

_____ 4. I have never paid much attention to what I look like.

_____ 5. I seldom compare my appearance to that of other people I see.

_____ 6. I often check my appearance in a mirror just to make sure I look okay.

_____ 7. When something makes me feel good or bad about my looks, I tend to dwell on it.

_____ 8. If I like how I look on a given day, it's easy to feel happy about other things.

_____ 9. If somebody had a negative reaction to what I look like, it wouldn't bother me.

_____ 10. When it comes to my physical appearance, I have high standards.

_____ 11. My physical appearance has had little influence on my life.

_____ 12. Dressing well is not a priority for me.

(continued on the next page)

1	2	3	4	5
Strongly Disagree	**Mostly Disagree**	**Neither Agree or Disagree**	**Mostly Agree**	**Strongly Agree**

_____ 13. When I meet people for the first time, I wonder what they think about how I look.

_____ 14. In my everyday life, lots of things happen that make me think about what I look like.

_____ 15. If I dislike how I look on a given day, it's hard to feel happy about other things.

_____ 16. I fantasize about what it would be like to be better looking than I am.

_____ 17. Before going out, I make sure that I look as good as I possibly can.

_____ 18. What I look like is an important part of who I am.

_____ 19. By controlling my appearance, I can control many of the social and emotional events in my life.

_____ 20. My appearance is responsible for much of what's happened to me in my life.

APPENDIX B

Body Esteem Scale for Adolescents and Adults (BESAA)

Instructions: Indicate how often you agree with the following statements: ranging from "never" (0) to "always" (4). Choose the appropriate number below each statement.

1. I like what I look like in pictures

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

2. Other people consider me good looking

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

3. I'm proud of my body

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

4. I am preoccupied with trying to change my body weight

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

5. I think my appearance would help me get a job

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

6. I like what I see when I look in the mirror

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

7. There are a lot of things I'd change about my looks if I could

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

8. I am satisfied with my weight

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

9. I wish I looked better

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

10. I really like what I weigh

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

11. I wish I looked like someone else

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

12. People my own age like my looks

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

13. My looks upset me

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

14. I'm as nice looking as most people

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

15. I'm pretty happy about the way I look

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

16. I feel I weigh the right amount for my height

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

17. I feel ashamed of how I look

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

18. Weighing myself depressed me

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

19. My weight makes me unhappy

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

20. My looks help me to get dates

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

21. I worry about the way I look

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

22. I think I have a good body

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

23. I’m looking as nice as I’d like to

Never	Seldom	Sometimes	Often	Always
0	1	2	3	4

APPENDIX C

Beck Depression Inventory-II

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today.** Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
0 I do not feel sad.
1 I feel sad much of the time.
2 I am sad all the time.
3 I am so sad or unhappy that I can't stand it.

2. Pessimism
0 I am not discouraged about my future.
1 I feel more discouraged about my future than I used to be.
2 I do not expect things to work out for me.
3 I feel my future is hopeless and will only get worse.

3. Past Failure
0 I do not feel like a failure.
1 I have failed more than I should have.
2 As I look back, I see a lot of failures.
3 I feel I am a total failure as a person.

4. Loss of Pleasure
0 I get as much pleasure as I ever did from the things I enjoy.
1 I don't enjoy things as much as I used to.
2 I get very little pleasure from the things I used to enjoy.
3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
0 I don't feel particularly guilty.
1 I feel guilty over many things I have done or should have done.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.

12. Loss of Interest
0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It's hard to get interested in anything.

13. Indecisiveness
0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decisions than I used to.
3 I have trouble making any decisions.

14. Worthlessness
0 I do not feel I am worthless.
1 I don't consider myself as worthwhile and useful as I used to.
2 I feel more worthless as compares to other people.
3 I feel utterly worthless.

15. Loss of Energy
0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don't have enough energy to do very much.
3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern
0 I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1-2 hours early and can't get back to sleep.

6. Punishment Feelings
0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7. Self-Dislike
0 I feel the same about myself as ever.
1 I have lost confidence in myself.
2 I am disappointed in myself.
3 I dislike myself.

8. Self-Criticalness
0 I don't criticize or blame myself more than usual.
1 I am more critical of myself than I used to be.
2 I criticize myself for all my faults.
3 I blame myself for everything bad that happens.

9. Suicidal Thought or Wishes
0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10. Crying
0 I don't cry any more than I used to.
1 I cry more than I used to.
2 I cry over every little thing.
3 I feel like crying, but I can't.

11. Agitation
0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it's hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

17. Irritability
0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite
0 I have not experienced any change in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration Difficulty
0 I can concentrate as well as ever.
1 I can't concentrate as well as usual.
2 It's hard to keep my mind on anything for very long.
3 I find I can't concentrate on anything.

20. Tiredness or Fatigue
0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex
0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

APPENDIX D

Ruminative Thought Style Questionnaire (RTS)

Instructions: For each of the items below, please rate how well the item describes you.

		Not at all						Very well
1.	I find that my mind often goes over things again and again	1	2	3	4	5	6	7
2.	When I have a problem, it will gnaw on my mind for a long time	1	2	3	4	5	6	7
3.	I find that some thoughts come to mind over and over throughout the day	1	2	3	4	5	6	7
4.	I can't stop thinking about some things	1	2	3	4	5	6	7
5.	When I am anticipating an interaction, I will imagine every possible scenario and conversation	1	2	3	4	5	6	7
6.	I tend to replay past events as I would have liked them to happen	1	2	3	4	5	6	7
7.	I find myself daydreaming about things I wish I had done.	1	2	3	4	5	6	7
8.	When I feel I have had a bad interaction with someone, I tend to imagine various scenarios where I would have acted differently.	1	2	3	4	5	6	7
9.	When trying to solve a complicated problem, I find that I just keep coming back to the beginning without ever finding a solution	1	2	3	4	5	6	7
10.	If there is an important event coming up, I think about it so much that I work myself up	1	2	3	4	5	6	7
11.	I have never been able to distract myself from unwanted thoughts	1	2	3	4	5	6	7
12.	Even if I think about a problem for hours, I still have a hard time coming to a clear understanding	1	2	3	4	5	6	7
13.	It is very difficult for me to come to a clear conclusion about some problems, no matter how much I think about it	1	2	3	4	5	6	7
14.	Sometimes I realize I have been sitting and thinking about something for hours	1	2	3	4	5	6	7
15.	When I am trying to work out a problem, it is like I have a long debate in my mind where I keep going over different points	1	2	3	4	5	6	7
16.	I like to sit and reminisce about pleasant events from the past	1	2	3	4	5	6	7
17.	When I am looking forward to an exciting event, thoughts of it interfere with what I am working on	1	2	3	4	5	6	7
18.	Sometimes even during a conversation, I find unrelated thoughts popping into my head	1	2	3	4	5	6	7
19.	When I have an important conversation coming up, I tend to go over it in my mind again and again	1	2	3	4	5	6	7
20.	If I have an important event coming up, I can't stop thinking about it.	1	2	3	4	5	6	7

APPENDIX E

Demographics Questionnaire

1. What is your current age? _____

*Please type "Prefer not to say" if you are uncomfortable answering this question.

2. If you had to select ONE response that best describes your current gender identity, what would it be?
    a. Cis woman/girl
    b. Trans woman/girl
    c. Cis man/boy
    d. Trans man/boy
    e. Indigenous or other cultural gender identity (e.g., two-spirit)
    f. Non-binary, genderqueer, agender, or a similar identity
    g. Prefer not to say

3. What is your ethnic background?
    a. Aboriginal (North American Indian, Metis, or Inuit)
    b. White
    c. Chinese
    d. Black/African
    e. Southeast Asian (e.g., Vietnamese, Cambodian, Malaysian, Laotian, etc.)
    f. West Asian (e.g., Iranian, Afghan, etc.)
    g. South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.)
    h. Korean
    i. Japanese
    j. Filipino
    k. Mixed
    l. Caribbean
    m. Arab (e.g., Lebanese, Palestinian, Egyptian, Iraqi, etc.)
    n. None of the above

o. Prefer not to say

4. If you selected "None of the above", please specify your ethnic background below

_____

5. In what country were you born? _____
*Please type "Prefer not to say" if you are uncomfortable answering this question.

6. In what country do you live currently? _____
*Please type "Prefer not to say" if you are uncomfortable answering this question.

7. What is your current year in University?
   a. 1
   b. 2
   c. 3
   d. 4
   e. Other
   f. Prefer not to say

8. Are you currently employed?
   a. Yes, part-time
   b. Yes, full-time
   c. No
   d. Prefer not to say

9. What is your present income?
   a) $0 - $24,999
   b) $25,000 - $49,999
   c) $50,000 - $74,999
   d) $75,000 - $99,000
   e) $100,00 - $149,999
   f) $150,000 or more
   g) Prefer not to say

10. What is your marital status?

    a) Single
    b) In a relationship
    c) Engaged

d) Common Law
e) Divorced
f) Widowed
g) Prefer not to say

11. What is your weight in pounds _____ (lbs) **or** kilograms _____ (kg)?

12. What is your height in inches _____ (feet) _____ (inches) **or** centimeters _____ (cm)?

APPENDEX F

Consent Form

CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **“**How You Look Influences How You Feel”

You are asked to participate in a research study conducted by Mallory Forward and supervised by Dr. Josée Jarry from the Department of Psychology at the University of Windsor. Results of this study will be used to fulfil the requirements of a Master’s thesis.

If you have any questions or concerns about the research, please feel to contact the primary investigator, Mallory Forward, by email at forwardm@uwindsor.ca or the faculty supervisor, Dr. Josée Jarry, by email at jjarry@uwindsor.ca or by telephone at 519-253-3000, ext. 2237.

PURPOSE OF THE STUDY

The purpose of this study is to investigate how appearance influences wellbeing.

PROCEDURES

If you consent to participate in this study, you will be asked to:

Complete a survey containing several brief questionnaires presented in a random order. Please complete this survey while you are alone and in a quiet space. The survey is expected to take no longer than one hour to complete. Once completed, you will be provided with a debriefing form and be able to ask questions.

POTENTIAL RISKS AND DISCOMFORTS

As part of this study, you will be asked questions that are personal in nature. You may choose not to respond to questions that you are uncomfortable answering and may withdraw your consent to participate at any time. This study is not expected to pose any significant risk or discomfort to participants. However, some people may experience some mild distress when answering questions about their appearance and wellbeing. You may contact the primary investigator or the faculty supervisor directly to discuss any discomfort that may arise. If you wish to discuss your concerns with someone unaffiliated with this research project, you are encouraged to reach out to the Student Counselling Centre at (519) 252-300 ext. 4616.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

By volunteering to be part of this study, you will be provided with the opportunity to gain experience as a participant in psychological research. This study will contribute to the knowledge base of the general community by clarifying the link between appearance and wellbeing. The findings of this study also may facilitate future research in the field.

COMPENSATION FOR PARTICIPATION

Participants will receive 1 bonus point for 1 hour of participation towards the psychology participant pool, if registered in the pool and enrolled in one or more eligible courses.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Data will be collected anonymously, such that the responses you provide will not contain any identifying information and cannot be traced back to you. The data will be collected and stored online, using Qualtrics, which ensures complete confidentiality. Qualtrics does not record any information from the device accessing the website, except for the answers provided on the questionnaires. Please refer to the following link for more information about Qualtrics' security policy: https://www.qualtrics.com/privacy-statement/

Once the questionnaires are completed, the data will be uploaded to an Excel spreadsheet and stored on the principal investigator's computer which is password protected. Only the principal investigator (Mallory Forward) and the faculty supervisor (Dr. Josée Jarry) will have access to the data file. Upon completion of the study, participant data will be kept for approximately nine years, and then all data will be destroyed. This complies with the psychology discipline guidelines of keeping data for seven years post publication.

PARTICIPATION AND WITHDRAWAL

After volunteering to participate in this study, you may withdraw your consent at any time. If you wish to withdraw your consent, you can do so by exiting the survey and/or contacting the lead investigator (Mallory Forward) via email at forwardm@uwindsor.ca. You are not required to respond questions that you feel uncomfortable answering. If you do not wish to answer certain questions, you may skip these questions and continue your participation in the study. Participation in this study will in no way effect how you are academically evaluated within any course.

The investigator may withdraw you from this research if circumstances arise which warrant doing so. You must provide a valid response profile to receive compensation for participating in this study. Invalid response profiles include those where most or all the questions are left unanswered, or where responses to most or all the questions are the same. If you provide an invalid response profile, you will be notified directly through e-mail and have a chance to redo the study. If you

decline to redo the study or produce another invalid response profile, you may not receive compensation for your participation.

You may choose to withdraw your data from this study at any time within two weeks of completion, by contacting Mallory Forward (forwardm@uwindsor.ca). There will be absolutely no negative consequences if you decide to withdraw from this study. You will not automatically lose your bonus marks for withdrawing, but fewer credits may be given, as outlined above, depending on the proportion of the study that is complete upon your withdrawal.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

A summary of results is expected to be available on the Research Ethics Board Website.

Web address: www.uwindsor.ca/reb

Date when results are available: To be determined

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact:

Research Ethics Coordinator,
University of Windsor,
Windsor, Ontario, N9B 3P4;
Telephone: 519-253-3000, ext. 3948;
e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I understand the information provided for the study **"**Body Image Attitudes and Wellbeing" as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Please select "I agree to participate" and provide your name, signature, and the date below to indicate that you consent to participate. Upon agreeing to participate in this study, you confirm that you are 18 years of age or older and are fluent in English. If you DO NOT consent to participate, please select "I do NOT agree to participate" below. Please print a copy of this form for your records.

- I agree to participate
- I do NOT agree to participate

_____
Name of Participant

_____ _____
Signature of Participant Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____
Signature of Investigator Date

APPENDIX G

Letter of Information for Debriefing

Body dissatisfaction and Depression: Investigating the Moderating Roles of Maladaptive Investment in Appearance and Rumination

Thank you for your participation in this study. This study aimed to investigate the relationship between body dissatisfaction and depression. Body dissatisfaction occurs when individuals negatively evaluate the way they look. Depression is characterized by a persistently low mood that interferes with daily functioning. Previous research has shown that body dissatisfaction may be a cause of depression in men and women. However, not everyone who is dissatisfied with their body experiences depression. Therefore, the purpose of this research was to investigate characteristics that may make individuals more likely to experience depression as a result of being dissatisfied with their body.

This study was the first virtual self-report survey to test if rumination and maladaptive investment in appearance influence the relationship between body dissatisfaction and depression. Rumination is when individuals repetitively think about the causes and consequences of their negative emotions. Maladaptive investment in appearance is when individuals place a great deal of importance on their appearance and consider it to be influential in determining their self-worth. Thus, body dissatisfaction may be more distressing to individuals who highly value their appearance and repetitively think about their appearance flaws.

For this study you completed an online survey in which you answered several self-report questionnaires. The questionnaires you completed were designed to measure body dissatisfaction, depression, maladaptive investment in appearance and rumination. With this, some of these questions involved content that was personal in nature. Some people may feel uncomfortable when asked to disclose the kind of information that was gathered in this study. If you have any concerns or wish to discuss any discomfort you may have experienced while completing this study, please feel free to contact the primary investigator, Mallory Forward. You are also encouraged to contact the Student Counselling Centre at 519-253-3000, ext. 4616, if you wish to discuss your concerns with an independent party. If you have any further questions or concerns about the study, or would like more information, please contact the primary investigator, Mallory Forward, Department of Psychology, at forwardm@uwindsor.ca.

To conduct this study successfully, many participants are required to complete the given survey. It is important that the responses gathered from separate participants be completely independent to uphold the validity of the current research. As such, once you have completed this survey and read this debriefing form, we kindly ask that you do not share any information about this study with *anyone* else. If someone were to complete this survey while knowing its purpose or being aware of another person's responses, it would jeopardize the integrity of this entire research study. Thus, it is required that you keep the content of this study completely *confidential* until its results are posted on the Research Ethics Board website.

If you wish to have your data withdrawn from this study, please contact Mallory Forward via e-mail at forwardm@uwindsor.ca within *two weeks* of completing the survey. If you decide to withdraw from this study, it will not have any negative consequences on your academic standing, course grades, or relationship with the University. Withdrawal also does not cancel your bonus credit and in no case would withdrawing result in having a negative credit applied to your participant pool account.

If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca. Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

VITA AUCTORIS

NAME:	Mallory Forward
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