

AN IMAGERY RESCRIPTING INTERVENTION FOR INTERNALIZED WEIGHT STIGMA
IN WOMEN WITH ELEVATED WEIGHT CONCERNS

LINDSAY E. SAMSON

A THESIS SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF ARTS

GRADUATE PROGRAM IN PSYCHOLOGY
YORK UNIVERSITY
TORONTO, ONTARIO

July 2021

© Lindsay Samson 2021

Abstract

Weight stigma, or negative attitudes directed toward individuals based on larger body size, is associated with decreased physical and psychological wellbeing, particularly when these attitudes are internalized and directed towards the self. The current study aimed to determine whether an online imagery rescripting intervention is effective at reducing internalized weight stigma and associated risk (fear of self-compassion and disordered eating) and protective (body image flexibility and self-compassion) factors in women with elevated weight concerns. Female undergraduate students ($N = 171$, 18-30 years of age) completed a screening measure and baseline assessment, and then all participants underwent a body dissatisfaction induction to re-experience their first body shame memory. Participants were then randomly assigned to either an imagery rescripting intervention group or a control group who underwent informal mindfulness. Participants in the imagery rescripting group were instructed to complete five days of imagery rescripting practice. Outcome measures were completed by all participants on day seven of the study. Contrary to hypotheses, participants in both groups displayed significant improvements on internalized weight stigma, body image flexibility, and disordered eating, whereas neither group improved on self-compassion or fear of self-compassion. Qualitative data suggest that individuals in the control group found the study to be impactful. The discussion examines the potential role of placebo and demand characteristic effects in the study results, as well as the potential impact of re-experiencing body shame combined with introspective questionnaires in producing change over the course of the study. Although the current study did not yield significant results, other recent studies have found imagery rescripting to be a promising intervention for those at risk of eating disorders. Future research should continue to explore

imagery rescripting as a possible intervention for internalized weight stigma and other risk and protective factors in individuals with elevated weight concerns.

Keywords: weight stigma, eating disorders, body image flexibility, self-compassion, fear of self-compassion, imagery rescripting.

Acknowledgements

I would like to thank my supervisor Dr. Jennifer Mills, and committee member, Dr. Joel Goldberg, for their feedback and support. I would also like to thank Alexandra Markwell for her assistance with this study.

Table of Contents

Abstract	ii
Acknowledgements	iv
Table of Contents	v
List of Tables	vii
List of Figures	viii
 Chapter One: Introduction	 1
Weight Stigma	1
Body Image Flexibility	3
Self-Compassion	5
Fear of Self-Compassion	6
Weight Stigma Interventions	7
Imagery Rescripting	12
The Current Study	17
 Chapter Two: Method	 18
Participants	18
Measures	25
Procedure	30
 Chapter Three: Results	 36
Data Screening	36
Manipulation Check	36
Hypothesis 1: Changes in Internalized Weight Stigma	39
Hypothesis 2: Changes in Body Image Flexibility	39
Hypothesis 3: Changes in Self-Compassion	40
Hypothesis 4: Changes in Fear of Self-Compassion	41
Hypothesis 5: Changes in Disordered Eating	41
Homework Fidelity Analysis	42
Moderation Analysis	47
 Chapter Four: Discussion	 51
Possible Explanations for Pattern of Results	53
Limitations	56
Strengths	61
Future Directions	62
Conclusions	62
 References	 64
 Appendices	 78
Appendix A: Imagery Rescripting Instructions	78
Appendix B: Control Group Instructions	84
Appendix C: Weight Concerns Scale	85

Appendix D: Demographic Questions.....	86
Appendix E: Body Dissatisfaction	87
Appendix F: Negative Mood	88
Appendix G: Weight Bias Internalization Scale-Modified	89
Appendix H: Body Image Acceptance and Action Questionnaire	90
Appendix I: Self-Compassion Scale.....	91
Appendix J: Fear of Compassion for Self-Scale	93
Appendix K: Eating Disorder Examination Questionnaire	94
Appendix L: Imagery Rescripting Quality Rating Scheme.....	97

List of Tables

Table 1. Group Differences at Baseline	23
Table 2. Descriptive Statistics.....	24
Table 3. Manipulation Check Group Differences	37
Table 4. Intercorrelations at Baseline	38
Table 5. Fidelity and Homework Completion Regressions	46
Table 6. Hierarchical Regression Moderation Analyses.....	49
Table 7. Control Condition Participant Quotes.....	55

List of Figures

Figure 1. Study Procedure Schematic	34
Figure 2. Flow Diagram of Participant Inclusion	35
Figure 3. EDE-Q Condition x BMI Interaction	50

An Imagery Rescripting Intervention for Internalized Weight Stigma in Women with Elevated Weight Concerns

Weight stigma, or negative attitudes directed toward individuals based on larger body size (Pearl & Puhl, 2018), can be experienced externally from others or directed toward the self. This bias is often rooted in beliefs that higher-weight individuals¹ are lazy or incompetent (Puhl & Brownell, 2001), as well as western society's deep-rooted preference for thin bodies (Thompson & Stice, 2001). Research has demonstrated that the stigma experienced by higher-weight individuals is associated with negative physical and psychological health outcomes, particularly for individuals who internalize this stigma (Pearl & Puhl, 2018; Puhl & Suh, 2015).

In terms of weight stigma directed toward an individual by another person or persons, evidence of stigmatization and discrimination related to weight has been recognized in many important areas such as employment, education, and healthcare (Puhl & Brownell, 2001). For instance, researchers have found that higher-weight individuals (particularly women) receive lower wages overall compared to thin individuals (Baum & Ford, 2004; Pagan & Dávila, 1997) and are perceived as less deserving of job promotions despite equal qualifications (Brink, 1988). Many higher-weight individuals also experience teasing and/or bullying related to their body size, which is linked to poor self-esteem, depressive symptoms, and suicidal ideation and attempts, even after controlling for actual body weight (Eisenberg et al., 2003). Higher-weight individuals are also repeatedly and overtly reminded that their bodies are not acceptable by public health and media campaigns (Puhl et al., 2013). When these individuals do seek

¹ In order to avoid stigmatizing individuals in larger bodies, in this document I use the phrase “higher-weight” to describe individuals who are considered “overweight” or “obese” according to their body mass index. See Meadows and Daníelsdóttir (2016) for a discussion of the rationale behind this shift in language.

healthcare, they are less likely to receive adequate care than their thin peers (Phelan et al., 2015; Puhl & Brownell, 2006).

Internalized weight stigma (also referred to as weight bias internalization or weight self-stigma) refers to the process of applying negative stereotypes associated with a larger body size to the self (Durso & Latner, 2008; Puhl & Suh, 2015). Both experiencing and internalizing weight stigma are associated with negative physical and mental health outcomes, however there is some evidence that internalization may be a stronger predictor of negative outcomes (e.g., Pearl & Puhl, 2016). Weight bias internalization, as measured by the Weight Bias Internalization Scale (Durso & Latner, 2008), has been consistently associated with body image disturbance, shape and weight concerns, eating pathology, and other forms of psychopathology (e.g., depression) among higher-weight individuals (Carels et al., 2010; Durso & Latner, 2008; Durso et al., 2012; Puhl et al., 2007; Roberto et al., 2012). Individuals who endorse attitudes consistent with internalized weight bias tend to believe they are less competent, less attractive, and less deserving of meaningful relationships compared to others, due to their weight (Durso & Latner, 2008; Pearl & Puhl, 2014).

Recent estimates suggest that over 40% of adults in the United States exhibit mean levels of weight bias internalization, with 20% of adults displaying high levels (Puhl et al., 2018). In Canada, 63.1% of people over the age of 18 are higher weight-individuals (Statistics Canada, 2019), indicating that the pervasiveness of internalized weight stigma is probably very high. Furthermore, it is possible that internalized weight stigma affects individuals across the weight spectrum, such as individuals who were formerly higher-weight, individuals with poor body image, or individuals who have eating disorders (Pearl & Puhl, 2014). Thus, as internalized

weight stigma may affect individuals in bodies of any size, it is important to address this issue across the weight spectrum.

Body Image Flexibility

It is conceivable that established factors that protect against body image and eating concerns may be mechanisms of change in interventions aimed at reducing internalized weight stigma. For instance, psychological flexibility, or the ability to remain in contact with the present moment, tolerate any emotions and thoughts that arise, and act in accordance with one's values, is associated with greater levels of health and psychological wellbeing (Kashdan & Rottenberg, 2010) and has been considered a mechanism of change in psychotherapeutic outcomes (Ciarrochi et al., 2010). Research evidence suggests that psychological flexibility is protective against psychopathology. For example, a recent meta-analysis of correlational studies found that psychological inflexibility had a medium to large positive association with different types of self-stigma (Krafft et al., 2018), indicating that individuals who display higher levels of psychological flexibility tend to have lower levels of self-stigmatizing attitudes. Body image flexibility specifically, or the ability to experience difficult thoughts and emotions about one's body without letting these feelings keep one from living a valued life (Sandoz et al., 2013), is associated with lower levels of body dissatisfaction and disordered eating, as well as higher levels of self-compassion, mindfulness, intuitive eating (i.e., eating in accordance with internal hunger and fullness cues; Tylka & Kroon Von Diest, 2013), and distress tolerance (Rogers et al., 2018).

Body image flexibility has been modeled as both a moderator and mediator in eating disorder research. For example, in their comprehensive review, Rogers et al. (2018) reported that in 20% of the studies they reviewed, body image flexibility was amenable to change following

intervention, and was typically conceptualized as a change mechanism rather than a direct focus of treatment. In a recent treatment study, body image flexibility was a stronger predictor and moderator of eating disorder symptoms at each time point of a cognitive behavioral intervention than other well-established predictors of treatment response, such as body image avoidance, body checking, psychological distress, and readiness for change (Pellizer et al., 2018). In regards to its role as a mediator, in a cross-sectional survey of undergraduates, Wendell et al. (2012) found that body image flexibility mediated the relation between disordered eating cognitions (e.g., fear of weight gain) and eating pathology after controlling for gender and body mass index (BMI). In regards to weight stigma in particular, in a community sample of women, Duarte and Pinto-Gouveia (2016) found that current body image flexibility (and body shame) mediated the relation between body-related victimization in childhood (i.e., being teased and/or bullied for body shape and size) and binge eating symptoms in adulthood. Further supporting the role of body image flexibility as a mediator in the relation between weight stigma and eating behavior, Webb and Hardin (2016) found that body image flexibility (and self-compassion) mediated the relation between internalized weight stigma and intuitive eating in a sample of college women.

To our knowledge, only one weight stigma intervention study to date has included a measure of psychological flexibility. Lillis et al. (2009) carried out an acceptance and mindfulness intervention in higher-weight adults who had recently completed a weight loss program. The authors found that weight self-stigma decreased and general psychological flexibility increased over the course of the intervention. Changes in weight-based and general psychological flexibility mediated changes in weight self-stigma and other outcomes of interest, such as psychological distress and quality of life. Taken together, these findings suggest that

body image flexibility may be an important mechanism of change to consider in weight stigma interventions.

Self-Compassion

Another important protective factor, self-compassion, consists of treating oneself with kindness and understanding, perceiving one's distress to be part of the human experience, and mindfully holding painful thoughts in awareness rather than automatically buying into them (Neff, 2003a). The ability to practice self-compassion is associated with decreased body image concerns and eating pathology (Braun et al., 2016; Turk & Waller, 2020). In terms of its relationship to weight stigma specifically, it is possible that self-compassion acts as a buffer in the self-stigma process. In a correlational study of higher-weight women, Forbes and Donovan (2019) found that weight stigma experienced from others was associated with lower levels of self-compassion, which in turn was associated with higher levels of psychopathology. Similarly, in a large population-based study, Puhl et al. (2020) found that men and women who had experienced weight stigma (i.e., weight teasing) had lower levels of self-kindness. For women only, lower self-kindness was associated with body-size-based discrimination and having others make negative weight-based remarks.

Weight stigma and self-compassion are often shown to mediate relations where the other is involved. For example, in a recent correlational study of undergraduate women, internalized weight stigma, self-objectification, and body shame mediated the relation between self-compassion and body checking, an important eating disorder risk factor involving excessive monitoring of body size and weight (Huellemann & Calogero, 2020). In a population survey, Hilbert and colleagues (2015) found that among higher-weight adults, self-compassion was negatively associated with internalized weight stigma, partially mediating the relation between

internalized weight stigma and depression, health status, and quality of life. The authors concluded that self-compassion acted as a safeguard against the potentially damaging consequences of weight stigma. In this study, self-compassion was not significantly related to BMI. Similarly, in a sample of college women of varying body sizes, Webb and Hardin (2016) found that higher levels of internalized weight stigma were associated with lower levels of self-compassion, body image flexibility, and intuitive eating. Furthermore, the relation between internalized weight stigma and intuitive eating was mediated by body image flexibility and self-compassion, after controlling for BMI. Finally, in a community sample of women ($N = 131$), Geller et al. (2015) found that the isolation and self-kindness subscales of the Self-Compassion Scale predicted levels of internalized weight stigma after controlling for BMI and age. Taken together, these studies suggest that self-compassion is probably an important protective factor against the negative effects of weight stigma, and should thus be considered as a potential mechanism of change in weight stigma interventions.

Fear of Self-Compassion

Self-compassion is often difficult to implement, especially when one is accustomed to a more self-critical style of relating with oneself. As such, fear of self-compassion, which can be understood as barriers to the ability to practice self-compassion, may also be important to examine in relation to internalized weight stigma. Some examples of barriers to self-compassion include feeling as if implementing self-compassion will result in loss of drive to achieve, or feeling as if one is undeserving of self-compassion (Gilbert et al., 2011). Fear of self-compassion is associated with greater eating disorder pathology and psychiatric distress among individuals with eating disorders (Geller et al., 2019, 2020), and individuals with low levels of self-compassion and high levels of fear of self-compassion tend to have a poorer response to eating

disorder treatment (e.g., Kelly et al., 2013). To our knowledge, only one study has examined the link between fear of self-compassion and weight stigma specifically. In a recent cross-sectional study of undergraduate women, Huellemann and Calogero (2020) found that internalized weight stigma, self-objectification, and body shame mediated the relation between fear of self-compassion and body checking. As self-compassion may ameliorate the negative effects of internalized weight stigma (Hilbert et al., 2015), it is important to examine whether barriers to self-compassion also play a significant, yet likely opposite, role in the self-stigmatizing process.

Given that research has consistently found that body image flexibility and self-compassion are protective against body image issues and eating concerns (Rogers et al., 2018), and that fear of self-compassion is associated with greater psychopathology (Geller et al., 2020; Kelly et al., 2013), it is important to consider how these factors relate to internalized weight stigma and to determine if they are modifiable.

Current Interventions for Internalized Weight Stigma

There have been a number of promising interventions aimed at reducing internalized weight stigma thus far. These interventions fall into four general categories of approaches: Health at Every Size® (HAES®) based, cognitive behavioral-based, acceptance and commitment-based, and compassion-focused. Most approaches have been group-based, ranging from relatively brief activities and workshops, to months-long courses of group therapy.

HAES® is a weight-neutral approach to health that focuses on increasing health-supporting behaviors independent of weight status (Bacon & Aphramor, 2011). In terms of HAES® based interventions for weight stigma, O'Hara and colleagues (2021) had female students participate in a 10-15 minute group-based activity informed by HAES® principles, which largely focused on encouraging women to engage in positive affirmations and gratitude

for their bodies rather than focusing on weight or appearance. Although participants showed significantly higher levels of body appreciation and self-reflection on body acceptance post-intervention (which was maintained at 10-week follow-up), there was not a significant change in internalized weight stigma or size acceptance compared to baseline levels. This study did not include a control group.

Scagliusi et al. (2020) assigned higher-weight Brazilian women to one of two forms of HAES[®] interventions: an intensive HAES[®] program (I-HAES[®]) which incorporated an explicit focus on weight stigma, and a conventional HAES[®] program, which was treated as a control group. The authors completed a qualitative analysis in order to explore changes in body acceptance and responses to experienced weight stigma among the participants. Compared to the control group, the I-HAES[®] group showed improvement in many areas, such as higher levels of body acceptance, more willingness to try new activities, and greater ability to confront individuals who stigmatize based on weight. In contrast, those in the control group were less accepting of their bodies and were more likely to agree with and desire to experience more weight-based stigma in order to motivate themselves to lose weight.

In a series of intervention studies, Pearl and colleagues have taken a cognitive behavioral therapy approach to the reduction of weight self-stigma. Pearl et al. (2018) completed a pilot study of an eight-week cognitive-behavioral group-based weight stigma intervention (the Weight Bias Internalization and Stigma Program; BIAS). The participants were eight higher-weight adults who had experienced weight stigma, and six similar participants who were placed in a quasi-control group. Psychoeducation surrounding weight stigma was provided, including the effects of weight stigma on eating and exercise behaviors. Post intervention, participants in the

BIAS program reported significantly greater decreases in internalized weight stigma and fat phobia compared to the control group, and greater increases in weight-related self-efficacy.

Pearl et al. (2020) completed a randomized controlled trial (RCT) testing the BIAS program from the previous pilot study. Seventy-two higher-weight adults with elevated levels of internalized weight stigma were randomly assigned to either a behavioral weight loss group or a combined behavioral weight loss and BIAS group. Participants attended 16 group sessions over the course of 26 weeks. This program incorporated intentional focus on weight loss including specific caloric intake recommendations (1200-1800 kcal per day depending on weight). The main outcomes of interest were changes in internalized weight stigma and weight self-stigma at weeks 12 and 26. Changes in mood, body image, eating behaviors, self-monitoring, and weight were also assessed. At weeks 12 and 26, there were no significant differences between the two groups in changes in internalized weight stigma, however those in the BIAS program showed greater reductions in self-devaluation (a component of weight self-stigma) at both timepoints. Percent weight lost at week 26 did not significantly differ between groups, and these changes in weight did not correlate with changes in internalized weight stigma.

At a subsequent six-month follow-up (i.e., 52 weeks from the beginning of the program), although levels of internalized weight stigma, weight self-stigma, and fat phobia were significantly lower than baseline, they did not differ between groups (Pearl, Wadden, Bach, Tronieri et al., 2020). Participants in the BIAS group reported significantly greater reductions in distress following instances of experienced weight stigma at week 52 compared to the behavioral weight loss only group. Across groups, participants declined in terms of weight loss, dietary restraint, and food tracking from weeks 26 to 52. In this time frame, over half of the participants regained one or more percentage points of lost weight, and these participants also exhibited

significant increases in internalized weight stigma compared to those who did not experience this level of weight regain.

Several studies have taken an acceptance and commitment therapy (ACT) approach to the reduction of internalized weight stigma. Levin et al. (2018) conducted an open pilot trial (i.e., no control group) to evaluate the efficacy of a guided self-help ACT intervention in a sample of 13 higher-weight individuals with elevated levels of weight self-stigma. Following the intervention, participants showed significantly higher levels of health-related quality of life and weight management behaviors, and significantly lower levels of weight self-stigma, emotional eating, and depression. These improvements were maintained at three-month follow up. Important process variables also showed improvement over time, including weight-related psychological inflexibility. Although weight loss was not directly addressed by the intervention, participants lost an average of 4.18 pounds over the course of the seven-week program, which was not statistically significant. Weight was not objectively measured at follow-up. Participants' self-reported weight did not significantly differ from baseline at post-intervention or follow-up. In a follow-up study, Potts et al. (2020) carried out a pilot RCT of an ACT self-help intervention for higher-weight individuals with high levels of internalized weight stigma. Participants were randomized to one of three conditions: ACT self-help book plus phone coaching, ACT self-help book plus email prompts only, or a waitlist control group. Both intervention groups showed improvements on weight self-stigma post-intervention relative to the control group with large effect sizes. There was no change in participants' weight.

In another ACT-based intervention study, participants who had completed at least six months of a weight loss program were randomly assigned to one of two conditions: a one-day workshop based on mindfulness and acceptance principles specifically targeting weight self-

stigma, or a waitlist control group (Lillis et al., 2009). At three-month follow-up, workshop participants exhibited significantly improved levels of weight self-stigma, psychological wellbeing, BMI, and other outcomes of interest compared to the control group. The positive effects of the intervention on weight self-stigma and psychological wellbeing were not due to weight loss. Mediation analyses indicated that changes in both general and weight-specific psychological flexibility mediated changes in self-stigma and psychological wellbeing.

Palmeira and colleagues' Kg-Free (2017) is a group intervention that combines ACT, mindfulness, and compassion-focused approaches, and uses self-compassion to address weight stigma specifically. Palmeira et al. (2017) conducted an RCT in order to assess the efficacy of Kg-Free, which aimed to reduce weight self-stigma and emotional and uncontrolled eating, and increase quality-of-life, among higher-weight women who were seeking weight loss treatment. Participants were randomly assigned to an intervention or control group. The Kg-Free intervention consisted of 10 weekly group sessions plus two additional booster sessions. The control group took part in medical and nutritional appointments without psychological intervention. At the end of treatment, the Kg-Free group exhibited significantly greater health-related quality of life and exercise levels, and a significant reduction in weight self-stigma, problematic eating, BMI, and other outcomes of interest compared to the control group. Increases in self-compassion and mindfulness did not significantly differ between groups. Interestingly, changes in weight self-stigma, eating, and quality-of-life were unrelated to weight loss.

In a follow-up study, Palmeira et al. (2019) evaluated the Kg-Free intervention in a group of higher-weight women with an emphasis on mechanisms of change. Participants showed significant improvements on weight self-stigma, quality of life, mindfulness, self-compassion,

emotional eating, shame, self-criticism, BMI, and weight-related experiential avoidance post-intervention, and these changes were maintained at three-month follow-up. Changes in weight self-stigma were mediated by improvements in shame, self-criticism, weight-related experiential avoidance, mindfulness, and self-compassion. This study did not include a control group.

Lastly, Carter et al. (2020) recently carried out a compassion-focused pilot study to specifically target body shame in five higher-weight individuals using a 12-week course of compassion-focused group therapy. As shame is conceptualized as the emotional component of stigma (Luoma et al., 2012) and the study (which focused on building compassion) was carried out as a targeted treatment for higher-weight individuals, it is relevant to a discussion of interventions for internalized weight stigma. The intervention resulted in reduced body shame, increased compassion (for self and from others), and improved health behaviours post-intervention. At three-month follow-up, reduction in body weight shame was maintained by three out of five participants, reduction in shame from others was maintained by two participants, increased self-compassion was maintained by one participant, and all five participants exhibited increased health-promoting behaviors (physical exercise and healthier eating attitudes). This study did not involve a weight loss component and did not include a control group.

Imagery Rescripting

Given the relative paucity of research on interventions for internalized weight stigma and that many of the promising interventions are weeks-long and likely require substantial financial resources, it may be beneficial to test interventions that are accessible for a large number of people and may also be used as adjuncts to traditional eating disorder treatment. One technique that may potentially be effective in reducing internalized weight stigma in a relatively short period of time is a visualization-based technique called imagery rescripting. Imagery rescripting

was originally designed as an intervention for individuals suffering from post-traumatic stress disorder (PTSD) due to childhood sexual abuse. Rooted in schema theory and information processing models of PTSD, the goal of the original imagery rescripting intervention was to use a combination of imaginal exposure, mastery imagery, and cognitive restructuring to improve PTSD symptomatology (Smucker et al., 1995).

Typically in imagery rescripting, individuals are first asked to recall a traumatic memory from childhood or adolescence in detail in the present tense (imaginal exposure; Smucker et al., 1995). Next, individuals are asked to rescript the memory, which involves reimagining the event with their adult self-present. The adult-self intervenes in the situation, coming to the aid of the younger self, which provides a previously absent sense of mastery over the distressing event. In the final phase of imagery rescripting, individuals are asked to imagine their current adult-self soothing their past-self. It is suggested that the rescripting process can modify pathological schemas and negative patterns of cognition associated with problematic interpretations of past traumatic events (Smucker et al., 1995), ultimately allowing for more adaptive schemas to take their place (Holmes et al., 2007).

Experimental research has demonstrated that imagery-based cognitive processing evokes stronger affective responses than verbal processing (e.g., Holmes & Mathews, 2005; Holmes et al., 2008). This has led researchers to suggest that compared to verbal interventions, imagery-based interventions have a stronger association with emotion and may therefore have a greater impact on cognition (e.g., Holmes et al., 2008). Thus, imagery-based strategies may be better able to help modify emotional core beliefs in individuals with elevated weight, shape, and eating concerns compared to the verbal therapeutic techniques that are more commonly used (Pennesi & Wade, 2018). In relation to weight stigma specifically, it may be the case that attitudes

consistent with internalized weight stigma (e.g., the belief that one is less deserving of meaningful relationships because of body size) are tied to painful memories from the past, such as weight-based teasing or negative comments made about the body from trusted others. Thus, imagery rescripting may be well-suited to modify the stigmatizing core beliefs and schemas that developed following these distressing experiences, as has been demonstrated in individuals with eating disorders (Cooper, 2011; Somerville & Cooper, 2007).

Three studies have investigated the use of imagery techniques to modify negative core beliefs in individuals with eating disorders. In a case report, Ohanian (2002) demonstrated the effects of a single imagery rescripting session in combination with cognitive behavioral therapy (CBT), and found that while eight sessions of standard CBT reduced initial bulimia symptoms by 50%, one session of imagery rescripting led to a 75% reduction in remaining symptoms one month later, and an almost complete remission of binge-purge behaviors two months later, which was maintained 14 weeks post-rescripting. In a sample of women with bulimia nervosa, Cooper et al. (2007) compared a single session imagery-based intervention (imagery modification) to a control group who verbally discussed a distressing memory. The authors found that imagery modification was more effective at reducing negative emotional beliefs about the self which was in turn associated with lower negative mood and fewer urges to binge. Lastly, Dugué et al. (2019) recently carried out a study in which adults with binge eating disorder or bulimia nervosa recalled a social rejection memory and then underwent one session of either cognitive restructuring (a verbal technique used to modify core beliefs) or imagery rescripting. Results were comparable for both approaches, providing evidence that both cognitive restructuring and imagery rescripting are helpful techniques for reducing negative emotions and modifying rational and emotional core beliefs in adults with binge eating pathology. Relatedly, early

research combining CBT and virtual reality techniques aimed at reprocessing painful body image memories (e.g., weight-based teasing) suggests that this approach improves body dissatisfaction and weight loss maintenance among higher-weight women with binge-eating disorder (Cesa et al., 2013).

Recently, two studies have examined imagery rescripting as a prevention strategy in individuals at risk of developing eating disorders. Pennesi and Wade (2018) used a body-focused imagery rescripting intervention with at risk women (as defined by a score of ≥ 47 on the Weight Concerns Scale). After screening, female university students ($N = 107$) were randomly assigned to one of three conditions: imagery rescripting, cognitive dissonance (an established intervention for reducing body dissatisfaction), or control (mind wandering exercise). After completing baseline questionnaires, each participant completed a body dissatisfaction induction and their respective online intervention. This baseline session was completed in person on a computer, with remaining portions of the study being completed online. Those in the imagery rescripting and cognitive dissonance conditions completed five days of practice of their respective interventions, in order to increase exposure to the exercises. Post-intervention, participants who underwent imagery rescripting had higher body image flexibility compared to the cognitive dissonance group, and higher self-compassion and lower disordered eating compared to the control group (Pennesi & Wade, 2018). The authors also found that changes in disordered eating in the imagery rescripting condition (compared to cognitive dissonance/control) were mediated by changes in body image flexibility and self-compassion, suggesting that online imagery rescripting improves these two malleable protective factors against disordered eating (Pennesi & Wade, 2018). In an analysis of fidelity to the imagery rescripting intervention, it was discovered

that quality of responses (scored using a quality rating scheme developed for the study) and number of practice exercises completed did not predict change in outcome measures.

In a follow up study, Zhou et al. (2020) randomly assigned female university students at risk of eating disorders ($N = 130$) to one of four conditions: body-focused or general imagery rescripting, psychoeducation, or a control group (mind-wandering exercise) in order to determine which interventions would lead to improvements in their outcomes of interest (disordered eating symptoms, body image flexibility, self-compassion, fear of self-compassion, and dysfunctional attitudes). Both imagery rescripting groups and the psychoeducation group exhibited a significant decrease in disordered eating and an increase in body image flexibility compared to the control group, with the psychoeducation group showing the strongest response. While the psychoeducation intervention did not impact self-compassion, fear of self-compassion, or dysfunctional attitudes (i.e., clinical perfectionism and low self-esteem), the body-specific imagery rescripting improved self-compassion and fear of self-compassion compared to the psychoeducation and control groups, and the general imagery rescripting group showed improvement on dysfunctional attitudes compared to the control group. Again, quality of imagery rescripting responses and number of practice exercises completed did not predict change in outcome measures.

In sum, given the negative physical and mental health consequences associated with internalized weight stigma, it is important to examine both short and longer-term reduction strategies. Imagery rescripting is one of these short-term strategies. Although imagery rescripting strategies have been successfully applied in the context of CBT-based treatment for bulimia nervosa (Cooper et al., 2007; Ohanian, 2002), and there is preliminary evidence to support the use of online imagery rescripting to prevent eating disorders in at-risk women (Pennesi & Wade,

2018; Zhou et al., 2020), this is the first study to examine imagery rescripting as an intervention for internalized weight stigma. As shame is conceptualized as the emotional component of stigma (Luoma et al., 2012), and compassion is considered to be the antidote to shame (Gilbert & Procter, 2006), imagery rescripting may be a suitable intervention for internalized weight stigma given its focus on building compassion for the self. Alternatively, it is possible that given the already established positive impact of imagery rescripting on body image flexibility, self-compassion, fear of self-compassion, and disordered eating in individuals with higher than average weight and shape concerns, its positive effects could generalize to internalized weight stigma as well.

The Current Study

The current study aimed to determine if an imagery rescripting intervention could decrease internalized weight stigma in women with elevated weight concerns. The current study examined this intervention among women of all weights, as internalized weight stigma is inconsistently correlated with objective body size. As a secondary aim, the current study also explored the impact of the intervention on theoretically relevant constructs including body image flexibility, self-compassion, fear of self-compassion, and disordered eating. Participants were randomly assigned to one of two conditions, body-focused imagery rescripting or a control group. In Part I (day one), participants completed baseline measures (internalized weight stigma, body image flexibility, self-compassion, fear of self-compassion, disordered eating, mood, and body dissatisfaction). This was followed by a body dissatisfaction induction wherein participants recalled their first negative body-related experience. After this induction, mood and body dissatisfaction measures were administered as a manipulation check, and then participants were randomly assigned to the imagery rescripting or control intervention. This was followed by five

days of homework practice for individuals in the imagery rescripting group only. In Part II of the study (day seven), participants completed the outcome measures a second time (internalized weight stigma, body image flexibility, self-compassion, fear of self-compassion, and disordered eating). See Figure 1 for a visual depiction of the study flow.

The primary hypothesis was that internalized weight stigma (i.e., weight bias internalization) would decrease significantly in the imagery rescripting condition but not in the control condition. The secondary hypotheses were that body image flexibility and self-compassion would increase and fear of self-compassion and disordered eating would decrease over the course of the intervention in the imagery rescripting condition but not the control condition.

Lastly, it was hypothesized that BMI would moderate change in the outcome variables over time. Some previous research has found that individuals with higher BMI tend to have higher levels of internalized weight stigma (e.g., Pearl et al., 2021), whereas other research has found that internalized weight stigma is not correlated with objective body size (e.g., Durso & Latner, 2008). Furthermore, BMI is associated with eating disorder symptom severity and interacts with weight suppression to predict response to eating disorder treatment (e.g., Berner et al., 2013). Thus, in the current study it was hypothesized that BMI may moderate change over time, however a specific directional hypothesis was not made.

Methods

Participants

Two hundred and forty-one women ages 18-30 years were recruited through the York University undergraduate research participant pool for an online Qualtrics-based study called “An Investigation of Strategies to Combat Negative Body-Related Beliefs.” Inclusion criteria for

the study included women who had elevated weight concerns, as indicated by a score of ≥ 40 on the Weight Concerns Scale (WCS; Killen et al., 1994, 1996). A score of 47 or above on the WCS has been used in previous research to identify women at risk of eating disorders (Jacobi et al., 2004; Killen et al., 1994, 1996). This threshold was lowered to a score of 40 in the current study in order to capture individuals with elevated weight concerns, without restricting our sample to those at risk of developing a clinical eating disorder. This scale screens for elevated weight and shape concerns by asking participants about fear of weight gain, worry related to body shape, dieting behaviours, feelings of fatness, and the importance of body weight relative to other aspects of their lives. Individuals with elevated weight concerns were designated as the key selection criterion because this intervention has been shown to have the most relevance and benefit for this population of individuals (Pennesi & Wade, 2018; Zhou et al., 2020). Participants also had to be able to read and write in English, and only female-identifying students were included in the study as it would likely be difficult to recruit a sufficient number of male participants who would meet study criteria.

In terms of exclusion criteria, individuals who indicated they currently had or believed they had an eating disorder were excluded from participation for ethical reasons. These individuals were screened out by a question in the survey that asked “Do you currently have an eating disorder diagnosis or believe that you have an eating disorder?” We then provided these women with information about appropriate support and treatment options. Seven individuals who answered yes to this question were screened out of the study. However, 23 participants (eight control, 15 imagery rescripting) re-entered the baseline survey after changing their response to the screening question and participated in the baseline survey. Given their high motivation to

participate, they were allowed to complete the remainder of the study components after providing informed consent.

Due to the evocative nature of imagery rescripting, participants who currently engaged in self-harm behavior were also screened out of the study at baseline in order to mitigate risk to these participants. These individuals were screened out by a question in the survey that asked “Do you currently engage in self-injury behaviors (e.g., cutting, burning, etc.)?” If the participant answered yes to this question, the survey redirected them to a list of mental health resources. Seven individuals indicated that they currently engaged in self-harm, and all seven (three control, four imagery rescripting) re-entered and completed the baseline survey after changing their response to the screening question. Again, given these individuals’ high motivation to participate, they were allowed to remain in the study.

The study took approximately 90 minutes to complete, including ‘homework’ time of at least five minutes per day for five days for the experimental condition only. In exchange for participation, students received 1.5 research participation credits toward their York University Introductory Psychology research requirement.

Sample Size Estimation

A power analysis using G*Power 3.1 was conducted for a mixed analysis of variance with two groups. A sample size of 34 (17 per condition) would provide sufficient power (.80) to detect a moderate effect size (.25) at a significance level of $\alpha = .05$, whereas a sample size of 200 would provide sufficient power to detect small effects with power of .80 and $\alpha = .05$. Although we exceeded our recruitment target of 200 participants, due to levels of attrition and issues with participants not following instructions, we had a final sample of approximately 171 participants who could be included in the pre-post analyses.

Participant Characteristics

Although 241 participants were recruited and randomized to condition, a final sample size of $N = 171$ was analyzed for several reasons. First, there was attrition between Part I and Part II (16.6%). Furthermore, some participants (4.6%) entered the baseline survey more than once and completed both interventions. The Part II data for these individuals were thus excluded. Lastly, despite screening for individuals who had a score of 40 or above on the WCS, some participants reported lower weight concerns at baseline than they had during screening, resulting in these individuals no longer meeting the cutoff of 40 on the WCS. Thus, these individuals (7.0%) were excluded from the pre-post analyses.

Introduction to Psychology students ($N = 2,909$) completed the psychology pre-screen. Of these individuals, 464 met inclusion criteria for the current study, and 251 volunteered to participate. Forty participants did not return for Part II, seven participants were screened out because of self-reported eating disorders, three were excluded due to a data collection error, and 13 were excluded for not following directions during Part I (e.g., entering the baseline survey more than once). All of these participants were thus excluded from the pre-post analyses. See Figure 2 for details regarding inclusion in the final sample.

The current participant information describes those individuals included in the primary pre-post analyses ($N = 171$). Eighty percent of the final sample had WCS scores ≥ 47 ($M = 62.90$, $SD = 17.80$), a cut-off that has been used to identify individuals who are at risk of developing an eating disorder (Jacobi et al., 2004; Killen et al., 1994, 1996; Pennesi & Wade, 2018; Zhou et al., 2020). All included participants had a score of 40 or above on the WCS. *T*-tests revealed no significant differences in any study variables between the two conditions, indicating that random assignment was successful in creating two equivalent groups. See Table 1

for a breakdown of baseline participant characteristics by condition, and Table 2 for descriptive statistics of main outcome variables in Parts I and II of the study. Participants' BMI ranged from 15.20 to 44.60 ($M = 25.48$, $SD = 5.20$), and ages ranged from 18 to 30 years old ($M = 19.92$, $SD = 2.40$). Participants self-identified as South Asian (32.9%), Caucasian (19.1%), Middle Eastern (15.6%), African (9.2%), East Asian (6.4%), South East Asian (4.0%), Latina/Hispanic (2.9%), Caribbean (2.9%), or "Other" (6.4%).

Table 1*Group Differences at Baseline*

Variable	Control	Intervention	<i>t</i> (<i>df</i>)	<i>p</i>
	Mean (<i>SD</i>)	Mean (<i>SD</i>)		
WCS	67.40 (14.82)	65.24 (14.26)	0.98 (171)	.33
WBIS-M	4.59 (1.28)	4.31 (1.19)	1.46 (171)	.15
BI-AAQ	42.79 (15.48)	43.21 (12.85)	-0.19 (168)	.85
SCS	2.66 (0.53)	2.68 (0.57)	-0.34 (171)	.74
FC Self	1.43 (0.83)	1.29 (0.81)	1.07 (170)	.29
EDE-Q	3.27 (1.06)	3.07 (1.05)	1.22 (171)	.22
Body Dissatisfaction	67.93 (23.29)	62.90 (24.23)	1.38 (169)	.17
Negative Mood	22.38 (8.08)	23.43 (8.50)	-0.83 (170)	.41
BMI	25.73 (5.55)	25.23 (4.83)	0.62 (163)	.54
Age	20.13 (2.43)	19.71 (2.36)	1.14 (170)	.25

Note. WCS = Weight Concerns Scale, WBIS-M = Weight Bias Internalization Scale – Modified, BI-AAQ = Body Image Acceptance and Action Questionnaire, SCS = Self-Compassion Scale, FC Self = Fear of Compassion for Self-Scale, EDE-Q = Eating Disorder Examination Questionnaire, BMI = body mass index.

Table 2*Descriptive Statistics for Main Outcome Variables in Parts I and II of the Study*

Variable	Part I (N = 171)		Part II (N = 171)	
	Control	Intervention	Control	Intervention
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
WBIS-M	4.59 (1.28)	4.31 (1.19)	4.49 (1.23)	4.02 (1.28)
BI-AAQ	42.79 (15.48)	43.21 (12.85)	44.49 (13.81)	46.04 (13.15)
SCS	2.66 (0.53)	2.68 (0.57)	2.70 (0.61)	2.75 (0.61)
FC Self	1.43 (0.83)	1.29 (0.81)	1.52 (0.84)	1.37 (0.96)
EDE-Q	3.27 (1.06)	3.07 (1.05)	3.11 (1.24)	2.71 (1.25)

Note. WBIS-M = Weight Bias Internalization Scale – Modified, BI-AAQ = Body Image Acceptance and Action Questionnaire, SCS = Self-Compassion Scale, FC Self = Fear of Compassion for Self-Scale, EDE-Q = Eating Disorder Examination Questionnaire.

Measures

Screening Measure

Weight Concerns Scale. The Weight Concerns Scale (WCS; Killen et al., 1994, 1996) consists of five items scored on four-point, five-point, or seven-point scales. It assesses worry about weight and shape, fear of weight gain, last time on a diet, importance of weight, and feelings of fatness. Individual item scores are transformed into a score of 0-100, and the total score is the average of all five of these normalized items. The WCS has been used in previous studies to screen for at risk individuals (e.g., Jacobi et al., 2011) and was used in the imagery rescripting studies that the current study is based on (Pennesi & Wade, 2018; Zhou et al., 2020). This measure was included in the prescreen package all introductory psychology students complete. It was also administered at baseline, since participants' scores could possibly change between completion of the screener and participation in the study, which could have been as many as seven months apart. As previously mentioned, we included individuals with a score of 40 or above at baseline in the analyses for the purposes of capturing women with elevated weight concerns. This measure has previously demonstrated good psychometric properties in a sample of college students using an online format (Dias et al., 2015). The internal consistency of the WCS in this sample was $\alpha = .51$. A Cronbach's alpha value above .60 is considered to be acceptable (Ursachi et al., 2015), and thus the internal consistency of the WCS in this sample was quite low. Upon a bivariate correlational analysis, it was discovered that item three, which asks how recently the individual was on a diet, was not significantly correlated with the other items. When this item was removed, Cronbach's alpha was acceptable (.60). However, all WCS items were used for scoring so as to facilitate comparison between our study and others.

State Measures

Body Dissatisfaction. Three visual analogue scales (VAS) were used to measure state body dissatisfaction before and after the body dissatisfaction induction. Adapted from Heinberg and Thompson (1995), participants were asked to indicate their response to the questions “How satisfied do you feel about your weight right now? (recoded),” “How satisfied do you feel about your appearance right now? (recoded),” and “How distressed are you by your feelings about your body right now?” Responses were recorded on a 100-pixel horizontal sliding scale from not at all to very much, ranging from 0 (extreme satisfaction) to 100 (extreme dissatisfaction). Higher scores indicate greater state body dissatisfaction. VAS items are useful because they can be completed quickly, can reliably measure small fluctuations in body satisfaction, and participants cannot remember their exact previous answer when VAS are given before and after a manipulation (Tiggemann et al., 2013). The body image VASs constructed by Heinberg and Thompson (1995) have demonstrated good convergent validity with the Eating Disorders Inventory – Body Dissatisfaction Subscale (Garner et al., 1983). This measure was included as a manipulation check and was administered at baseline and again after the body dissatisfaction induction in Part I of the study, as it was expected that the induction should increase body dissatisfaction in both conditions (Zhou et al., 2020). The internal consistency of this measure was $\alpha = .60$ at baseline and $\alpha = .52$ post-manipulation. Inspection of bivariate correlations revealed that VAS three, which asks how distressed the participant is by feelings about their body, had low correlations with the other two items. With item three removed, $\alpha = .84$ at baseline and $\alpha = .88$ post-manipulation. Thus, item three was removed from the manipulation check analysis.

Negative Affect. State negative affect was measured using the Negative Affect scale of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988), which consists of 10

words that describe different negative emotional states. Participants are asked to indicate the extent to which they feel each emotion in the present moment on five-point scales, ranging from very slightly or not at all (1) to extremely (5). Higher scores indicate greater negative affect. The momentary version of the PANAS is a reliable measure of state negative affect (Merz & Roesch, 2011). This measure was administered at baseline and again after the body dissatisfaction induction during Part I of the study as a manipulation check, as it was expected that the body dissatisfaction induction should produce lower mood in both conditions (Zhou et al., 2020). The internal consistency of this measure was $\alpha = .88$ at baseline and $\alpha = .92$ post-manipulation.

Outcome Measures

Internalized Weight Stigma. The Modified Weight Bias Internalization Scale (WBIS-M; Pearl & Puhl, 2014) is a modified version of the Weight Bias Internalization Scale (Durso & Latner, 2008), and allows for measurement of internalized weight stigma (i.e., weight bias internalization) across the weight spectrum. Specifically, the WBIS-M measures the extent to which individuals apply negative weight-based stereotypes to themselves and/or base their self-worth on body weight and size. The scale consists of 11 items, each of which is rated on a seven-point scale ranging from “Strongly Disagree” (1) to “Strongly Agree” (7). WBIS-M scores are calculated by averaging the 11 items, with higher scores indicating higher levels of internalized weight stigma. Based on an adult normalized sample from the United States, a score of 4.88 or above on the WBIS-M is considered to represent high levels of internalized weight stigma (Puhl et al., 2018). The WBIS-M has demonstrated strong internal consistency and construct validity in a sample of men and women living in the United States (Pearl & Puhl, 2014). Internalized weight stigma was measured at baseline (Part I), and again seven days later during Part II of the study in order to determine if the intervention resulted in decreased WBIS-M scores in participants in the

imagery rescripting condition. The internal consistency of the WBIS-M in this sample was $\alpha = .89$ at baseline (Part I), and $\alpha = .92$ in Part II of the study.

Body-Image Flexibility. The body image acceptance and action questionnaire (BI-AAQ; Sandoz et al., 2013) measures body image flexibility, or the ability to experience difficult thoughts and emotions about one's body without letting these feelings keep one from living a valued life. The BI-AAQ consists of 12 items scored on seven-point scales from one, "never true" to seven, "always true." Scores are calculated by reverse-scoring and summing responses, yielding possible total scores from 12 to 84. Higher scores on the BI-AAQ indicate greater body image flexibility. The BI-AAQ has demonstrated good construct validity and adequate internal consistency and test-retest reliability in a sample of female and male undergraduate students (Sandoz et al., 2013). The BI-AAQ was administered at baseline (Part I), and again in Part II of the study, in order to determine if body image flexibility increased in the imagery rescripting condition over the course of the intervention. The internal consistency of the BI-AAQ in this sample was $\alpha = .91$ at baseline (Part I), and $\alpha = .91$ in Part II of the study.

Self-Compassion. The Self-Compassion Scale (SCS; Neff, 2003b) is a 26-item scale which measures global self-compassion, including three aspects of positive self-compassion: self-kindness, common humanity, and mindfulness, and three aspects of negative self-compassion: self-judgment, isolation, and over-identification. Items are rated on five-point scales and negative items are reverse-scored. The global score is obtained by averaging the six subscales, with higher scores indicating greater self-compassion. The SCS has demonstrated good internal consistency and test-retest reliability in previous studies (Neff, 2003b; Neff, 2016). The SCS was administered at baseline (Part I), and again in Part II of the study, in order to determine if self-compassion increased in the imagery rescripting condition over the course of

the intervention. The internal consistency of the SCS in this sample was $\alpha = .88$ at baseline (Part I), and $\alpha = .91$ in Part II of the study.

Fear of Self-Compassion. The 15-item Fears of Compassion for Self-scale (FC Self; Gilbert et al., 2011) measures fear of (or barriers to) self-compassion. Although the scale has demonstrated a one-factor structure in non-clinical samples (Gilbert et al., 2011), recent research determined that the FC Self had a two-factor structure in a clinical sample of individuals with eating disorders (Geller et al., 2019). The Meeting Standards subscale (seven items) assesses concerns related to standards dropping. For instance, some individuals may believe that if they implement self-compassion, they will lose their drive for achievement. A sample item from this subscale is: “I fear that if I become kinder and less self-critical to myself then my standards will drop.” The Emotional Vulnerability subscale (eight items) assesses emotional concerns. For instance, some individuals may avoid practicing self-compassion because they believe it would bring about sadness, grief, or other difficult feelings. Sample items from this subscale include: “I feel that I don't deserve to be kind and forgiving to myself” and “If I really think about being kind and gentle with myself it makes me sad.” Items are rated on five-point scales with higher scores indicating greater fear of self-compassion. Scores are averaged across items. The FC Self has demonstrated strong psychometric properties in a sample of undergraduate students and therapists (Gilbert et al., 2011). The FC Self was administered at baseline (Part I), and again in Part II of the study, in order to determine if fear of self-compassion decreased in the imagery rescripting condition over the course of the intervention. The internal consistency of the FC Self in this sample was $\alpha = .92$ at baseline (Part I), and $\alpha = .94$ in Part II of the study.

Disordered Eating. The 28-item Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) assesses behavioral and cognitive symptoms of disordered eating (e.g.,

preoccupation with shape and weight) over the last 28 days. Participants choose from seven options, indicating whether they have engaged in each behavior from 0 days to everyday in the last 28 days. Four subscales (eating, shape, weight, and dietary restraint) are calculated by summing and averaging five (eating, weight, restraint) or eight (shape) items each. The total score is the average of these four subscale scores, and can range from zero to six. Higher scores indicate higher levels of disordered eating. Consistent with Pennesi and Wade (2018) and Zhou et al. (2020), the scale was adapted in Part II to capture disordered eating symptoms over the previous seven days, with options ranging from no days to six-seven days in order to account for the one-week course of the study. Originally, a global score of 4.0 on the EDE-Q was used to identify probable eating disorder cases (Fairburn & Beglin, 1994). More recent research has lowered this threshold. Mond et al. (2004) suggest using a global score of 2.30 or higher on the EDE-Q together with the occurrence of any binge eating and/or exercise with the purpose of weight control to identify probable eating disorder cases among young women. Rø et al. (2015) suggest a cut-off of 2.50 on the global score to identify eating disorder cases. The EDE-Q has previously shown good concurrent validity and acceptable criterion validity in a community sample of female adults (Mond et al., 2004), and has demonstrated excellent internal consistency and test-retest reliability in a sample of female undergraduate students (Luce & Crowther, 1999). The EDE-Q was administered at baseline (Part I). A modified EDE-Q was administered as an outcome measure in Part II of the study to determine if there was a decrease in disordered eating over the course of the study in the imagery rescripting condition. The internal consistency of the EDE-Q in this sample was $\alpha = .90$ at baseline (Part I), and $\alpha = .93$ in Part II of the study.

Procedure

Ethics approval was obtained from the York University Human Participants Review

Committee. Participants who met study inclusion criteria (female, 18-30 years old, fluent in speaking/reading English, normal/corrected vision, a score of 40 or above on the WCS, and did not currently have an eating disorder) were able to read a brief description about the study on the York University undergraduate research participant pool website, which explained that we were interested in examining different strategies to combat negative body-related beliefs. Participants were then able to sign up to participate if they were interested.

Participants had access to the link to complete Part I of the study at the time of study sign up. Data were collected online using the Qualtrics platform, with the principal investigator available via email to answer questions. Written instructions were provided as part of the survey to participants in both conditions, and embedded video instructions (produced for this study) were also provided for those in the imagery rescripting condition, consistent with the protocol of Pennesi and Wade (2018). All body dissatisfaction induction and intervention instructions given to participants were identical to Zhou et al. (2020), and were used with permission.

Reliving Task (5 minutes)

After completing informed consent and the baseline measures (internalized weight stigma, body image flexibility, self-compassion, fear of self-compassion, disordered eating, body dissatisfaction, and negative mood), all participants completed a body dissatisfaction induction which consisted of writing about their first memory of an unpleasant body experience in the first-person perspective (see Appendix A). Specifically, all participants were first asked to close their eyes and picture a recent unpleasant body experience which brought up feelings of shame or embarrassment about their bodies. Examples were provided, such as appearance-related teasing, comparing one's body with peers, or uncomfortable feelings after seeing oneself in a mirror. They were then asked to reflect on the thoughts and emotions associated with this memory, and

to identify the earliest event they could remember that was associated with these feelings (i.e., their earliest negative body-related memory). They were then asked to write about this event in as much detail as possible, in the first person, as if it were happening to them “right now.”

Immediately after this induction, participants again completed the state measures (body dissatisfaction and negative mood) in order to determine whether participants in both groups began their interventions with similar (and increased) levels of body dissatisfaction and negative mood. All participants were then randomly assigned to either the imagery rescripting or control condition to complete the remainder of the baseline intervention.

Imagery Rescripting Protocol

Observing Task (5 minutes). Participants in the imagery rescripting condition were then asked to visualize and write about the same memory (i.e., their earliest negative body-related experience), but this time from an observer’s perspective (i.e., in the third person), as if they were watching the event happen to their younger self. After completing the writing task, participants were then prompted to think about what their younger self needed in that situation in order to feel better and whether their adult self would like to do anything to help the younger self.

Rescripting Task (5 minutes). Participants in the imagery rescripting condition were again asked to visualize and write about the same event in the first person (i.e., as if it were happening right now), but this time their older, wiser, more compassionate adult self was with them and could do something helpful to intervene in the situation if they desired her to.

Participants were then asked to write about what happened in the re-imagined memory in as much detail as possible.

Control Protocol

Individuals assigned to the control group were asked to let their mind wander for ten minutes without trying to control their thoughts in any way (see Appendix B for the complete instructions). All control condition protocol instructions were given in written format only, as the video instructions in the imagery rescripting condition were considered to be an active part of the imagery rescripting intervention.

Homework

After completing Part I, participants received an email that detailed the next steps for the study, which differed depending on the condition to which they had been randomly assigned. Those who were randomly assigned to the imagery rescripting condition completed five days of once-per-day imagery rescripting practice (i.e., the participant writes about their older, more compassionate self intervening in the previously recalled memory) online via Qualtrics, consistent with the methodology of Pennesi and Wade (2018) and Zhou et al. (2020). The survey allowed them to submit their practice session after five minutes, however, they were allowed to take as long as they wished completing the homework. Those in the control condition did not complete homework.

Outcome Measures

Participants in both conditions completed the outcome measures via Qualtrics seven days after completing Part I. Namely, they completed measures of internalized weight stigma, body image flexibility, self-compassion, fear of self-compassion, and disordered eating. This last survey took approximately 15 minutes to complete. Finally, participants viewed a debriefing form that outlined the purpose of the study. This form also included the researchers' contact information and a list of mental health resources.

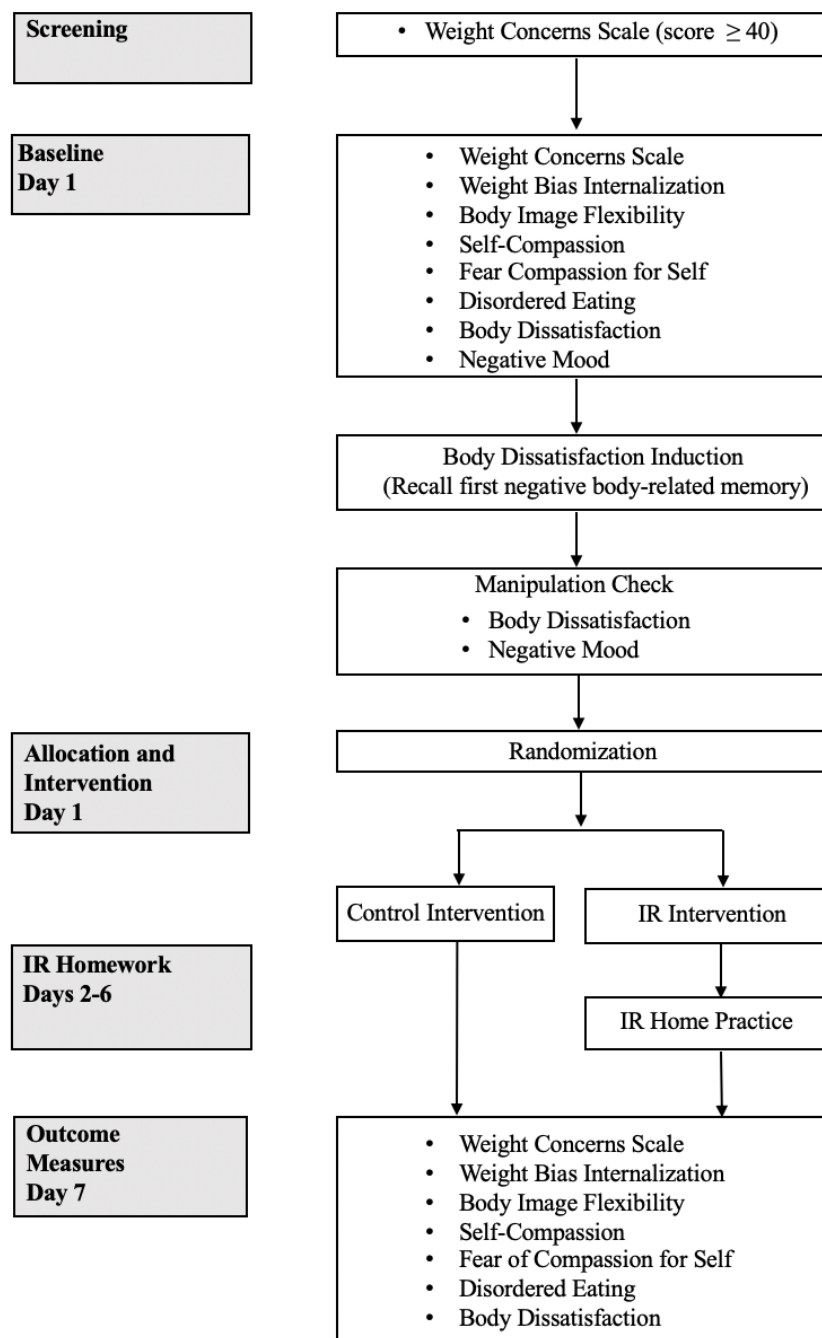
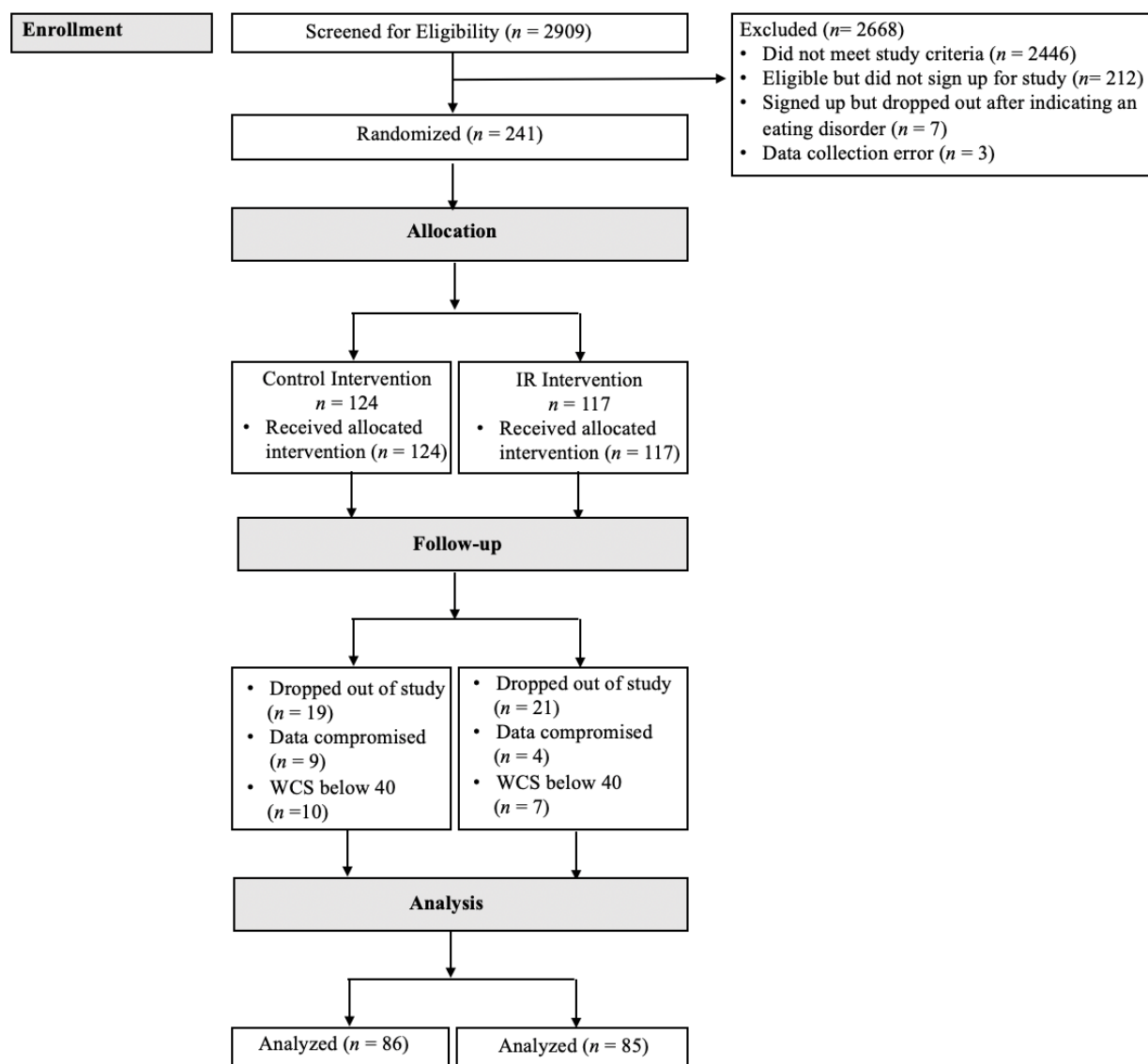
Figure 1*Visual Schematic of Study Procedure*

Figure 2*Flow Diagram of Participant Inclusion*

Results

Data analyses procedures are described for each section of the results below. An alpha of .05 was used for significance testing.

Data Screening

Statistical analyses were conducted using SPSS version 27. Univariate inspection of histograms, skewness, and kurtosis suggested that variables were non-normally distributed across most measures. Transformations and outlier removal were considered separately in the context of each model that was fit. Where applied, they are described in the relevant sections below.

Manipulation Check

A series of paired sample *t*-tests was used to determine if the body dissatisfaction induction (i.e., recalling first negative body memory) resulted in higher body dissatisfaction and negative mood as was intended. At this point in the study, participants had not been assigned to condition (see Figure 1). There were no significant differences in body dissatisfaction, $t(163) = 0.12, p = .90$, or negative mood, $t(167) = -1.16, p = .25$, from pre to post manipulation, indicating that the manipulation did not increase body dissatisfaction and negative mood for the sample as a whole. Next, independent sample *t*-tests were performed in order to compare the two groups on these two measures at post-manipulation (i.e., immediately prior to entering their interventions). The results indicated that there was a marginally significant difference in body dissatisfaction between the two groups at post-manipulation, $t(163) = 2.02, p = .05$, but there was not a significant difference in negative mood, $t(167) = -0.32, p = .75$. These results indicate that the groups entered their respective interventions with comparable levels of negative mood, but that the control group had slightly higher body dissatisfaction than the imagery rescripting group post-manipulation (see Table 3).

Table 3*Manipulation Check Group Differences*

Condition and Variable	Baseline	Post-Manipulation
	Mean (<i>SD</i>)	Mean (<i>SD</i>)
Control		
Body Dissatisfaction	67.93 (23.29)	68.11 (24.85)
Negative Mood	22.38 (8.08)	23.33 (9.80)
Imagery Rescripting		
Body Dissatisfaction	62.90 (24.23)	60.23 (25.16)
Negative Mood	23.42 (8.50)	23.80 (9.33)

Note. The minimum possible score for body dissatisfaction is zero, the maximum possible score is 100. The minimum possible score for negative mood is 10, and the maximum possible score is 50.

The purpose of the body image induction was to ensure that the two intervention groups would report similar and heightened levels of body dissatisfaction and negative mood going into the intervention. We were satisfied to continue with the planned analyses without statistically adjusting for the marginally higher body dissatisfaction scores in one of the groups. Inspection of the means confirmed that scores were not at the maximum or minimum ends of the scale on either measure, ruling out ceiling or floor effects. Moreover, the main analyses involved pre-post intervention repeated measurements that examined changes over time. See Table 4 for zero-order correlations amongst study variables at baseline.

Table 4*Intercorrelations Amongst Outcome Variables at Baseline*

Variable	1	2	3	4	5	6	<i>M</i>	<i>SD</i>
1. Internalized Weight Stigma	---						4.45	1.24
2. Body Image Flexibility	-.66***	---					43.00	14.17
3. Self-Compassion	-.33***	.26***	---				2.67	0.55
4. Fear of Self-Compassion	.46***	-.39***	-.35***	---			1.36	0.82
5. Disordered Eating	.64***	-.60***	-.22**	.36***	---		3.17	1.06
6. BMI	.44***	-.24***	-.13	.08	.25***	---	25.48	5.20

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Hypothesis One: Internalized Weight Stigma

The first hypothesis was that internalized weight stigma (measured by the WBIS-M) would display a significant decrease over time in the imagery rescripting condition, but not in the control condition. This hypothesis (and subsequent secondary hypotheses) was examined using a two-way mixed analysis of variance (ANOVA), with one between-subjects factor (condition) and one within-subjects factor (time). All assumptions for a mixed ANOVA with two levels of the within-subjects factor were met. There was no interaction between condition and time on levels of WBIS-M, $F(1, 170) = 2.39, p = .12$, partial $\eta^2 = .01$, indicating that the two groups did not change in significantly different ways over the course of the intervention. The main effect of time showed a statistically significant difference in mean WBIS-M score at Part I and Part II, $F(1, 170) = 9.30, p = .003$, partial $\eta^2 = .05$. On average, all participants' WBIS-M scores were higher in Part I ($M = 4.44, SE = .09$) than in Part II ($M = 4.26, SE = .10$). There was also a statistically significant main effect of condition on WBIS-M scores, $F(1, 170) = 4.57, p = .03$, partial $\eta^2 = .03$. On average, participants in the control group had higher WBIS-M scores ($M = 4.54, SE = .13$) than those in the imagery rescripting group ($M = 4.16, SE = .13$). Taken together, these results suggest that hypothesis one was not supported. That is, rather than a significant decrease in internalized weight stigma over time in only the imagery rescripting intervention condition, participants in both conditions showed a significant decrease in internalized weight stigma over the course of the study.

Hypothesis Two: Body Image Flexibility

Hypothesis two was that body image flexibility (measured by the BI-AAQ) would increase over the course of the intervention in the imagery rescripting condition but not in the control condition. Again, this hypothesis was examined using a two-way mixed ANOVA, and all

assumptions were met. There was no interaction between condition and time on levels of BI-AAQ, $F(1, 164) = 0.69, p = .41$, partial $\eta^2 = .004$, indicating that the two groups did not change in significantly different ways over the course of the intervention. There was a significant main effect of time, revealing a difference in mean BI-AAQ score between Part I and Part II, $F(1, 164) = 10.67, p < .001$, partial $\eta^2 = .06$. On average, participants' body image flexibility scores were lower in Part I ($M = 42.98, SE = 1.09$) than in Part II ($M = 45.52, SE = 1.04$). There was no main effect of condition on BI-AAQ scores, $F(1, 164) = 0.22, p = .64$, partial $\eta^2 = .001$. Taken together, these results suggest that hypothesis two was not supported. That is, rather than a significant increase in body image flexibility over time due to the imagery rescripting intervention, participants in both conditions showed a significant increase in body image flexibility over the course of the intervention.

Hypothesis Three: Self-Compassion

Hypothesis three was that feelings of self-compassion (measured by the SCS) would increase over the course of the intervention in the imagery rescripting condition but not in the control condition. Again, this hypothesis was examined using a two-way mixed ANOVA. All assumptions were met, except there were two model outliers. Removing these outliers did not change the results, so the original results are reported. There was no interaction between condition and time on SCS scores, $F(1, 170) = 0.11, p = .74$, partial $\eta^2 = .001$, indicating that the two groups did not change in significantly different ways over the course of the intervention. There was no main effect of time on mean SCS scores between Part I and Part II, $F(1, 170) = 3.37, p = .07$, partial $\eta^2 = .02$. There was also no main effect of condition on SCS scores, $F(1, 170) = 0.11, p = .74$, partial $\eta^2 = .001$. Taken together, these results suggest that hypothesis three

was not supported. That is, there was no significant change in feelings of self-compassion over time in the imagery rescripting group due to the intervention.

Hypothesis Four: Fear of Self-Compassion

Hypothesis four was that fear of self-compassion (measured by the FC Self Scale) would decrease over the course of the intervention in the imagery rescripting condition but not in the control condition. Again, this hypothesis was examined using a two-way mixed ANOVA, and all assumptions were met. There was no interaction between condition and time on levels of FC Self, $F(1, 169) = .01, p = .91$, partial $\eta^2 = .00$, indicating that the two groups did not change in significantly different ways on this measure over the course of the intervention. There was no main effect of time on mean FC Self scores between Part I and Part II, $F(1, 169) = 3.49, p = .06$, partial $\eta^2 = .02$. There was also no main effect of condition on FC Self scores, $F(1, 169) = 1.16, p = .28$, partial $\eta^2 = .007$. Taken together, these results suggest that hypothesis four was not supported. That is, there was not a significant change in fear of self-compassion over time in the imagery rescripting group due to the intervention.

Hypothesis Five: Disordered Eating

Hypothesis five was that disordered eating (measured by the EDE-Q) would decrease over the course of the intervention in the imagery rescripting condition but not in the control condition. Again, this hypothesis was examined using a two-way mixed ANOVA, and all assumptions were met. There was no interaction between condition and time on levels of EDE-Q, $F(1, 170) = 1.45, p = .23$, partial $\eta^2 = .01$. There was a statistically significant main effect of time on EDE-Q scores between Part I and Part II, $F(1, 170) = 11.60, p < .001$, partial $\eta^2 = .06$. On average, participants reported higher levels of disordered eating symptoms in Part I ($M = 3.17, SE = 0.08$) than in Part II ($M = 2.94, SE = 0.10$). There was no main effect of condition on

EDE-Q scores, $F(1, 170) = 2.94, p = .09$, partial $\eta^2 = .02$. Taken together, these results suggest that hypothesis five was not supported. That is, rather than a significant decrease in disordered eating over time due to the imagery rescripting intervention, participants in both conditions showed a significant decrease in disordered eating over the course of the intervention.

Imaging Rescripting Intervention Fidelity

A quality rating scheme developed by Pennesi and Wade (2018) was used to determine whether fidelity to the imagery rescripting intervention over the five days of homework contributed to outcome scores in the imagery rescripting group, controlling for baseline scores (see Appendix L). The coding scheme assigns a value of 0-12 to the imagery rescripting homework responses completed by participants, evaluating each response on four dimensions: whether the response includes a detailed description of a personal unpleasant body experience, whether the response uses first person language to describe the past self and third person language to describe the older adult self, whether the adult self is present and actively intervenes in the situation, and lastly, how well the response makes reference to compassionate language. Each of these four dimensions are coded on a scale of zero to three based on their quality, and then the four scores are summed for a total score out of 12 for the written response. Possible scores range from zero to 12.

Using this quality rating scheme for the current study, the first author and an undergraduate research assistant in the supervisor's lab selected at random and scored six homework responses independently with subsequent discussion of their ratings until agreement was reached. Once rating agreement was consistently reached, raters independently scored a random selection of 10 imagery rescripting homework responses. Inter-rater reliability was high as indicated by the overall intra-class correlation ($r = .93$). All subsequent responses were rated

by the research assistant. The number of practice intervention exercises completed during the follow-up period was also recorded. Although each participant in the imagery rescripting condition was asked to complete a maximum of five homework exercises, several participants completed the homework six times over the course of the five homework days.

A fidelity score was calculated for each homework response completed, and then an average fidelity score for each participant was calculated by adding their fidelity scores for each homework exercise, and dividing this score by the number of homework exercises they completed. Fidelity score was not calculated for one participant whose homework responses were not recorded due to a technology error. Additionally, another participant had copied and pasted her third homework response into the last two homework surveys, and thus only her three original exercises were used to calculate her fidelity score. Fidelity coding was available for those imagery rescripting participants who completed at least one homework exercise ($n = 80$).

Hierarchical multiple regressions were used to investigate whether fidelity during the homework exercises or number of intervention exercises completed predicted outcome scores in Part II, controlling for scores in Part I.

For the WBIS-M (internalized weight stigma) fidelity regression model, there were two residual outliers (i.e., studentized residual was greater than three standard deviations). These points were not influential; however, the distribution was non-normal, and thus these points were removed. When the regression was re-run, there was one residual outlier, and the distribution was still skewed. This point was removed and the regression was re-run. There were no longer any outliers and the distribution was approximately normal. For the BIAA-Q (body image flexibility) fidelity regression, there were two residual outliers. These points were not influential; however, the distribution was skewed, and thus these points were removed. When the model was

re-run, the distribution was approximately normal. For the SCS (self-compassion) fidelity regression, there was one residual outlier. Although this data point was not deemed to be influential, the distribution was skewed, and thus this outlier was removed. When the model was re-run, there were two residual outliers. The distribution was still skewed, and thus these outliers were removed one at a time and the model was re-run each time. After this, there was one residual outlier and the distribution was still slightly skewed. This data point was removed and the model was re-run, after which the distribution was approximately normal. For the EDE-Q (disordered eating) regression, there was one residual outlier and the distribution was slightly skewed. The outlier was thus removed. The regression was re-run and there was one residual outlier, which was removed. After the regression model was run for a third time, there were no outliers and the distribution was approximately normal. All other assumptions were met for these five regression models.

For the WBIS-M (internalized weight stigma) regression model with number of homework exercises completed as the predictor, there were two residual outliers. These data points were not deemed to be influential; however, the distribution was skewed, and thus the points were removed and the regression model was re-run. When the regression was re-run, there was one non-influential residual outlier (-3.01) and the distribution approximated a normal distribution. This outlier was therefore retained. For the BI-AAQ (body image flexibility) regression, there were two residual outliers. These data points were not deemed to be influential; however, the distribution was skewed, and thus the points were removed and the regression model was re-run. This normalized the distribution and there were no further outliers. For the SCS (self-compassion) regression, there were two residual outliers and the distribution was skewed. These two data points were removed and the model was re-run. The distribution was

still skewed and there was one residual outlier. This outlier was removed and the model was re-run. Again, there was one residual outlier, and the distribution remained slightly skewed, thus this outlier was removed and model was re-run. The distribution was then approximately normal. For the EDE-Q (disordered eating) regression, there was one residual outlier and the distribution was slightly skewed. The outlier was thus removed. The regression was re-run and there was one residual outlier, which was removed. The regression was run for a third time, at which point there were no further outliers and the distribution was approximately normal. All other assumptions were met for these five regression models.

Fidelity to the intervention was a significant predictor of outcome score over and above baseline score for fear of self-compassion (FC Self). There was also a marginally significant result for internalized weight stigma (WBIS-M). Number of homework exercises completed did not significantly predict scores for any of the outcome variables. See Table 5 for the results of the fidelity analysis.

Table 5*Hierarchical Regression Results with Fidelity and Homework Completion Predicting Outcome**Controlling for Baseline Scores*

Variable	R^2	β	t	P
Fidelity WBIS-M				
Baseline WBIS-M	.64	.80	12.16	< .001
Fidelity Score	.66	-.06	-1.88	.06
Homework Exercises Completed				
Baseline WBIS-M	.62	.78	11.19	< .001
# of homework exercises	.62	-.05	-0.82	.42
Fidelity BI-AAQ				
Baseline BI-AAQ	.49	.68	8.73	< .001
Fidelity Score	.50	.50	1.31	.20
Homework Exercises Completed				
Baseline BI-AAQ	.51	.66	8.58	< .001
# of homework exercises	.51	.65	0.83	.41
Fidelity SCS				
Baseline SCS	.75	.86	15.08	< .001
Fidelity Score	.76	.02	1.11	.27
Homework Exercises Completed				
Baseline SCS	.75	.85	15.37	< .001
# of homework exercises	.75	.00	-0.04	.97
Fidelity FCSelf				
Baseline FCSelf	.57	.92	10.59	< .001
Fidelity Score	.59	-.06	-1.98	.05*
Homework Exercises Completed				
Baseline FCSelf	.55	.89	10.31	< .001
# of homework exercises	.57	-.09	-1.64	.11
Fidelity EDE-Q				
Baseline EDE-Q	.60	.86	9.53	< .001
Fidelity Score	.60	-.07	-2.37	.80
Homework Exercises Completed				
Baseline EDE-Q	.60	.88	10.49	< .001
# of homework exercises	.60	-.08	-0.46	.65

Note. *Denotes significant outcome of interest with $p < .05$. Significant and marginally significant results of interest are bolded. WBIS-M = Weight Bias Internalization Scale – Modified, BI-AAQ = Body Image Acceptance and Action Questionnaire, SCS = Self-Compassion Scale, FC Self = Fear of Compassion for Self-Scale, EDE-Q = Eating Disorder Examination Questionnaire.

Moderation Results

A series of hierarchical multiple regression analyses were performed to examine BMI as a possible moderator of the effects of the intervention on the outcome measures of interest. To this end, five separate hierarchical linear regressions were conducted; one for each of the five outcome variables. In each regression model, the baseline outcome variable (e.g., Part I WBIS-M), condition, and BMI, were included in the first step, and the interaction term (condition x BMI) was included in the second step. All continuous predictor variables were mean-centered prior to analyses.

Model Assumptions

For the WBIS-M (internalized weight stigma) regression model there were two residual outliers, and no influential data points. As the distribution was slightly skewed, these points were removed one at a time and the model was re-run. There was one more residual outlier, and the data were still slightly skewed. The outlier was removed and the model was re-run. There was one residual outlier (3.06), however it was deemed to not be influential, and the distribution was approximately normal, and thus this outlier was retained. All other assumptions were met. For the BI-AAQ (body image flexibility) regression model, there were two residual outliers, and no influential data points. As the distribution was skewed, these points were removed one at a time and the model was re-run. After removing these data points, all assumptions were met.

For the SCS (self-compassion) regression model, there were four residual outliers, and no influential data points. As the distribution was quite skewed, these points were removed, and the model was re-run. After re-running the model, there was one residual outlier (3.09), and the distribution was still slightly skewed. This data point was removed, and the model was re-run. Although there was one residual outlier (3.05), it was deemed to not be influential and the

distribution was approximately normal. Thus, this outlier was retained. All other assumptions were met.

For the FC Self (fear of self-compassion) regression model, there was one residual outlier. This was removed and the analysis was re-run, after which all assumptions were met. For the EDE-Q (disordered eating) regression model, there was one residual outlier, and no influential data points. As the distribution was slightly skewed, this data point was removed. The model was re-run. There was one residual outlier and the distribution was still skewed, and thus this data point was removed. The model was re-run, after which all assumptions were met.

As can be seen in Table 6, the addition of the interaction term did not produce significant results, and thus BMI was not a significant moderator of response to the intervention. However, there was one marginal interaction ($p = .09$) for EDE-Q (disordered eating). Visual inspection of a scatterplot suggested that, controlling for baseline EDE-Q score, individuals in the control group with higher BMIs had higher levels of disordered eating in Part II compared to individuals with higher BMIs in the imagery rescripting group, whereas individuals with lower BMIs had similar levels of disordered eating in the control and imagery rescripting groups in Part II of the study (see Figure 3).

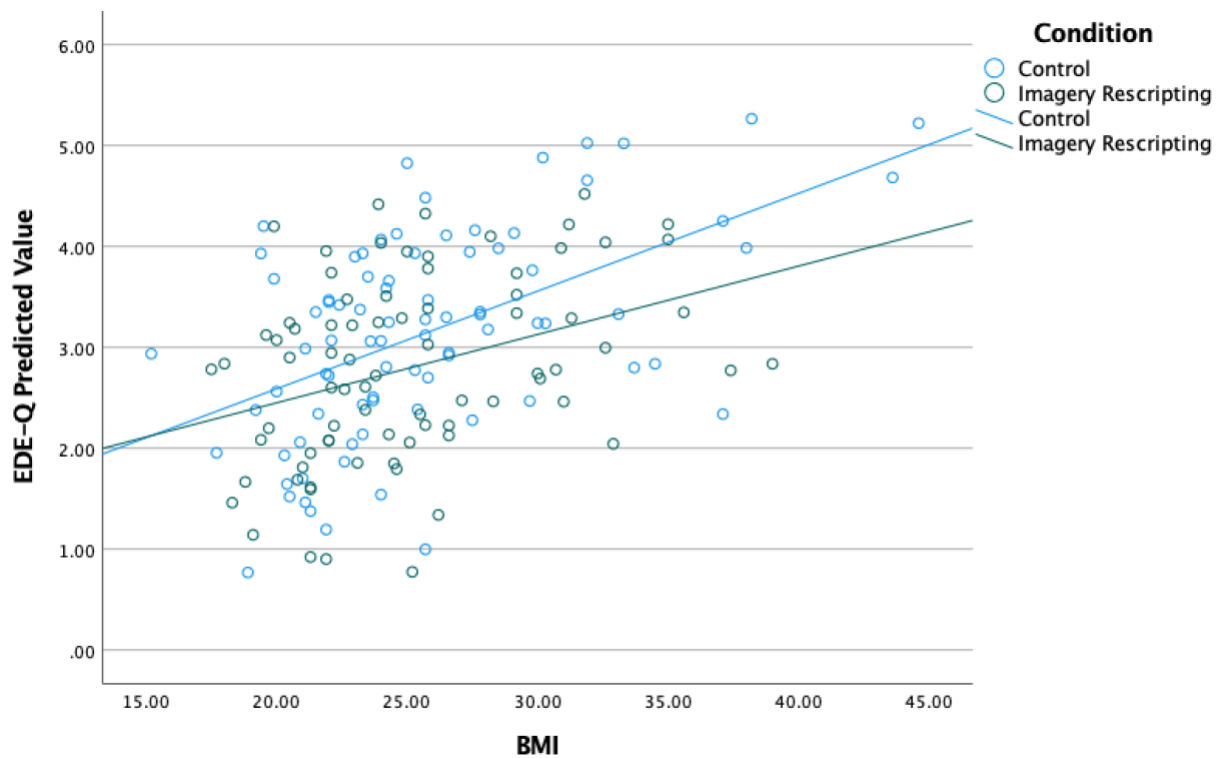
Table 6*Results of Hierarchical Regression Moderation Analyses*

Variable	R^2	β	t	p
WBI-M				
Baseline WBI-M	.73	.79	17.33	< .001
Condition		-.13	-1.23	.22
BMI		.03	2.33	.02
Condition x BMI	.73	-.03	-1.52	.13
BI-AAQ				
Baseline BI-AAQ	.60	.67	14.02	< .001
Condition		.76	0.59	.56
BMI		-.49	-2.94	.004
Condition x BMI	.61	.39	1.53	.13
SCS				
Baseline SCS	.74	.87	20.39	< .001
Condition		-.01	-0.14	.89
BMI		-.01	-0.83	.41
Condition x BMI	.74	.01	0.65	.52
FC Self				
Baseline FC Self	.60	.83	14.99	< .001
Condition		-.06	-0.69	.49
BMI		.01	0.74	.46
Condition x BMI	.60	-.01	-0.60	.55
EDE-Q				
Baseline EDE-Q	.60	.83	13.75	< .001
Condition		-.13	-1.04	.30
BMI		.06	3.77	< .001
Condition x BMI	.61	-.04	-1.73	.09

Note. Marginally significant result of interest is bolded. WBIS-M = Weight Bias Internalization Scale – Modified, BI-AAQ = Body Image Acceptance and Action Questionnaire, SCS = Self-Compassion Scale, FC Self = Fear of Compassion for Self-Scale, EDE-Q = Eating Disorder Examination Questionnaire.

Figure 3

Marginal EDE-Q Condition x BMI Interaction



Discussion

The primary goal of this study was to determine whether an online imagery rescripting intervention was effective in reducing internalized weight stigma and associated risk (fear of self-compassion and disordered eating) and protective (body image flexibility and self-compassion) factors in women with elevated weight concerns. This intervention was compared to a control group who completed a mind-wandering exercise, and like the experimental group, had also undergone a body dissatisfaction induction during which they were required to reflect upon an early memory of being ashamed of their body. While individuals in the control group did not complete homework, those in the imagery rescripting condition were asked to complete five days of practice before participants in both conditions completed the outcome measures seven days later in Part II of the study. To our knowledge, this is the first study to attempt a brief online intervention for internalized weight stigma in women across the weight spectrum.

Findings did not support the hypothesis that participants in the imagery rescripting condition would exhibit decreased internalized weight stigma over the course of the intervention compared to individuals in the control group. Findings also did not support the secondary hypotheses that the imagery rescripting group would show greater increases in body image flexibility and self-compassion, and greater decreases in fear of self-compassion and disordered eating, compared to the control group. Rather, participants in both conditions improved in terms of self-reported internalized weight stigma, body image flexibility, and disordered eating over the course of the study. There was no significant change in self-compassion or fear of self-compassion in either group over the course of the study. Furthermore, based on previous research, it was expected that BMI would moderate change in the outcome variables over time.

However, moderation analyses indicated that BMI was not a significant moderator of response to the intervention for any of the outcome variables.

Lastly, an analysis of fidelity to the intervention (i.e., quality of imagery rescripting written responses and number of homework sessions completed) revealed that the number of homework sessions participants completed did not predict their scores at outcome controlling for baseline scores for any of the outcome variables. Fidelity to the imagery rescripting instructions (i.e., quality of written responses) did predict outcome scores for fear of self-compassion and internalized weight stigma (marginally), but did not predict outcome scores for body image flexibility, self-compassion, or disordered eating. That is, controlling for baseline scores, those in the imagery rescripting condition who had higher levels of fidelity to the intervention displayed lower levels of fear of self-compassion in Part II of the study. This may suggest that with a high level of effort, practicing the imagery rescripting exercise leads to greater reductions in fear of self-compassion. These results may also suggest that fear of self-compassion is more difficult to shift than the other eating disorder risk and protective factors which showed improvement over the course of the study in both conditions (i.e., internalized weight stigma, body image flexibility, and disordered eating), and thus may require more careful and deliberate practice to do so. Given findings that high levels of fear of self-compassion are related to eating disorder pathology in clinical samples (Geller et al., 2019, 2020) and that high levels of fear of self-compassion are associated with worse response to eating disorder treatment (Kelly et al., 2013), it could be the case that barriers to self-compassion need to be addressed with a higher level of sustained care and effort than other eating disorder risk and protective factors.

Possible Explanations for Observed Pattern of Results

One possible explanation for the non-significant differences in change between the imagery rescripting condition and control condition across outcome measures may be attributed to regression to the mean, a statistical phenomenon wherein scores that are more extreme than the true mean value at baseline are followed by scores that are closer to the true mean value, making normal fluctuations in responses appear to be real change (Barnett et al., 2004). This could be responsible for the significant main effect of time in both conditions. That is, it could be the case that participants in both conditions appeared to improve on internalized weight stigma, body image flexibility, and disordered eating over the course of the study only because their scores were more extreme than normal at baseline. If this was the case, then participants' scores returning to mean levels in Part II was not due to either intervention, but to a natural process of readjustment to mean levels. We attempted to avoid misinterpreting regression to the mean as real effects of the intervention by analyzing repeated measurements pre- and post-intervention in all analyses and by including a control group. Nevertheless, it is possible that the significant main effect of time and non-significant condition x time interaction effect could be an indication of regression to the mean.

Another possible explanation for the main effect of time is the placebo effect. As both groups were told they were receiving an intervention that would help with body image, it could be the case that a placebo effect occurred in the control group and this is why there were no significant differences in change between conditions. In other words, the control group expected to receive a helpful intervention, and this expectancy effect may have led to their improvement over time in internalized weight stigma, body image flexibility, and disordered eating.

Relatedly, it could also be the case that participants in the control group found the study to be therapeutic, and this is why they also improved on internalized weight stigma, body image flexibility, and disordered eating. The body dissatisfaction induction may have been quite meaningful to participants, as it may have raised awareness of previously hidden or unexpressed body shame. This task was also preceded by questionnaires that asked participants about their feelings towards their bodies, problematic eating behaviors and cognitions, how much their feelings about their bodies interfere with their lives, and how kindly they treat themselves. Thus, it could be the case that the evocative nature of the questionnaires and body dissatisfaction induction led to a high level of introspection for some individuals in the control group, and thus resulted in improvements in internalized weight stigma, body image flexibility, and disordered eating over the course of the study. The randomization check data suggest that the control group was somewhat more vulnerable to body shame at the beginning of the study and thus may have been more impacted by the induction than the imagery rescripting group.

Consistent with this explanation, in a general question that was administered before debriefing, we asked participants what they thought about the study. Some participants from the control group gave responses that suggested that they found the study to be enlightening regarding how they had been treating themselves and how much focus they had put on the way their bodies looked. See Table 7 for examples of responses to this question by members of the control group.

Table 7*A Sample of Control Condition Evaluations of the Study*

Participant	BMI	Quote
1	30.30	"This study really made me think my own body image and perception of myself. It made me think about [my] own insecurities. And at the same time, it made me realize that maybe I should be kinder to myself...I am a little concerned now about how much I think about my own weight and shape."
2	27.60	"The study made me really think of how I view myself. I know I tend to block out things about me that I hate, including my weight. I realize that I try to keep myself busy and neglect these thoughts. After I finish these questions, I honestly do not know what to think..."
3	24.30	"This study showed me how uncompassionate I can be towards myself."
4	28.50	"It was eye-opening."
5	19.50	"It...brought up a lot of emotions."
6	26.60	"It made me recognize something I prioritize in my life which makes me extremely unhappy."
7	24.00	"I thought this study was a good eye-opener because I do some things without even realizing it. For example, I secretly eat and it happens so unconsciously that I don't even realize why I eat when no one's looking. I personally think the study was interesting to recognize my own perspective on body image and how important it is in my life."
8	31.90	"This study really put in perspective on how much I emphasis on my weight and how I let it take over every aspect of my life."
9	24.20	"I think this study is perfect for people like me, who struggle with a negative body image on a daily basis (or often). My negative perception of myself has been prevalent lately, so this study couldn't have happened at a better time."
10	21.10	"It was informative, as it made me question a lot of things I was doing unconsciously and hadn't wondered about. It made me realize how healthy/unhealthy my thought process has been and gave me a new perspective to look at it from."

Lastly, another possible explanation for why both groups changed over time is demand characteristics. All participants were aware that this was a study aimed at improving the way women felt about their bodies, and they knew that they would be assigned to one of two types of interventions. Thus, participants may have responded to the questionnaires in a way that was consistent with the apparent purpose of the study (i.e., to compare the effects of two body image interventions). Specifically, given that the findings which were clearly linked to body image (internalized weight stigma, body image flexibility, and disordered eating) changed significantly in the hypothesized direction in both groups, but the two outcomes which were not explicitly linked to body image did not significantly change (self-compassion and fear of self-compassion), participants may have been responding in ways that were consistent with the belief that their respective intervention should improve their body image (Nichols & Maner, 2008). When asked what they thought the purpose of the study was, participants generally reported that the purpose of the study was to improve body image and/or determine how women felt about their bodies, so it is possible that demand characteristics were at play. However, rationale for a given intervention or treatment is important, as shared rationale has positive impacts on expectancy and engagement (Ahmed & Westra, 2009). Thus, although it is important to note that demand characteristics may have affected the results of the study, the importance of being honest about the general purpose of the study outweighed the risk of participants responding in line with demand characteristics.

Limitations

There were several limitations in the present study. First, the control condition involved a mind wandering exercise, which Pennesi and Wade (2018) note could be thought of as similar to a mindfulness exercise. Thus, the control condition may have had an active psychotherapeutic

effect, making it more difficult to detect differences between groups. The mind-wandering exercise also did not control for the writing or practice effects present in the imagery rescripting condition. Future imagery rescripting research may want to employ a control intervention that accounts for these aspects of the intervention while limiting the therapeutic effect, such as having participants write about an aspect of their daily life that can be recalled without emotion over a number of days.

Another limitation of the study was the screening measure. We included the Weight Concerns Scale (WCS) as part of the screener that all undergraduate psychology students take. This scale was chosen because it is the measure that was used in previous imagery rescripting research to identify individuals at risk of eating disorders (Pennesi & Wade, 2018; Zhou et al., 2020), for whom a body image intervention would be most helpful and relevant. Because of the way the York University screener is set up, participants sometimes complete these measures months before participating in a particular study, and thus some participants may have had high weight concerns at the time of screening, but could theoretically begin the study with low or average weight concerns. Thus, we administered the weight concerns scale again at baseline. In order to obtain a cohesive sample, those individuals who had a score lower than 40 on the WCS at baseline were removed from the analysis ($N = 17$), which resulted in a smaller sample size than anticipated. Furthermore, because of the way the screening system is set up, we had to screen possible participants based on the midpoint of each item on the scale (corresponding to total scores of ≥ 40), rather than using the normalized scores of 47 out of 100 to capture at-risk individuals. It is possible that by doing this, we could have missed some participants who would have otherwise been eligible for the study. This also means that the cut off score on the WCS for participation in the current study was lower than previous research (40 vs. 47). Thus, this score

may have captured individuals with elevated weight concerns who were not necessarily at risk of developing an eating disorder. However, given that the main focus of the current study was internalized weight stigma, this score likely does a good job of reliably capturing individuals for whom internalized weight stigma is a relevant concern. Future research on imagery rescripting for internalized weight stigma may want to screen for high levels of experienced and/or internalized weight stigma in particular.

Relatedly, another limitation of the study is the low internal consistency of the screening measure. Upon inspection of the bivariate correlations among items, it was discovered that item three, which asks “when was the last time you went on a diet?,” and provides response options corresponding to the last year or never, was not significantly correlated with the rest of the items in the scale. Removal of item three from the scale brings the internal consistency to an acceptable, but not particularly high, value. Research has found that weight concerns and dieting are not correlated (Polivy et al., 2020; Mills et al., 2021). That is, individuals may be concerned about their weight or shape without engaging in an actual behavioral response to these concerns. Thus, although the scale does seem to measure problematic preoccupation with shape and weight, it could be the case that how concerned people are about their weight is not significantly related to actual recent dieting behavior. Perhaps the behavioral question is not necessary to identify people who are over-focused on their shape and weight.

Alternatively, as an anecdotal observation of dieting trends in the last decade, people do not refer to changes in their eating as “dieting” as often as they used to. It seems that people now think of changes in eating patterns more in terms of a change in lifestyle or a permanent shift in eating for health and wellbeing. Even the long-standing dieting company weight watchers recently changed their name to WW, with the tagline “Wellness that Works” to be more in line

with society's shift towards wellness over diets (Miller, 2021). These conceptual shifts make dieting more difficult to identify. Even when someone is engaging in behaviors that would traditionally be identified as dieting behavior (e.g., restricting types and amounts of foods eaten), they may not recognize themselves as being on a "diet," and thus may not report it on a survey. The current issues with the WCS may be due to the current sample (e.g., heterogeneous participants), it may be an issue with the scale needing an update to its language around dieting in order to reflect new societal ideas about what it means to be on a diet, or it may be a combination of both issues. Similar future research may want to consider a different measure for the purpose of screening participants for high weight concerns.

Another limitation of the current study was participants' fidelity to the intervention instructions. In the initial imagery rescripting studies that the current study was based on, fidelity scores (out of 12) were $M = 9.08$, $SD = 2.10$ (Pennesi & Wade, 2018) and $M = 10.26$, $SD = 1.54$ (Zhou et al., 2020). In terms of number of homework exercises completed (out of five), Pennesi and Wade (2018) had a completion rate of $M = 4.54$, $SD = 1.12$, and Zhou et al. (2020) had a completion rate of $M = 5.46$, $SD = 2.20$. In the current study, the mean fidelity score of participants who completed the study was 8.62 ($SD = 2.48$), and the average number of homework exercises completed was 4.49 ($SD = 1.28$). Thus, although the number of exercises completed in the current study is relatively similar to the first study, the average fidelity to the imagery rescripting intervention was lower (and slightly more variable) than in previous research. In the previous two studies, fidelity and number of exercises completed did not predict any changes in outcome measures. In the current study, although number of exercises completed did not predict outcome, average fidelity did predict outcome scores for fear of self-compassion, and there was also a marginally significant result for internalized weight stigma. That is,

participants who had higher quality imagery rescripting written exercises showed greater reductions in internalized weight stigma and fear of self-compassion. Thus, it could be the case that there was a ceiling effect for fidelity in previous research, and participants in the current study put forth lesser effort in the imagery rescripting condition compared to participants in these previous studies. In future research, perhaps fidelity could be maximized if participants received coaching or feedback on the first rescripting exercise so they are aware of what standard to aim for with subsequent practice exercises.

Another limitation of the current study is that it did not take place in person. In the two previous studies, Part I of the study was completed on a computer, but in the laboratory, while subsequent study modules were completed online. However, due to the COVID-19 pandemic, the entire current study had to be completed online. It is possible that the online and anonymous nature of the study led to participants being less invested in completing the intervention components. This may also be responsible for the high rates of attrition observed in the present study. Forty individuals dropped out of the current study, resulting in an attrition rate of 16.60%. Dropout rates in previous studies were 6.19% (Pennesi & Wade, 2018) and 8.46% (Zhou et al., 2020). This discrepancy in dropout rate could indicate that participants were less invested in the current study compared to participants in these previous studies.

Lastly, it could also be the case that because we recruited participants who were not necessarily seeking change in their lives but instead fulfilling research participation requirements, participants in the imagery rescripting condition may not have had an appropriate level of readiness for change (Hötzel et al., 2013). Future research examining imagery rescripting as an intervention for internalized weight stigma may want to focus on participants who are

invested in personal change, such as individuals who are currently seeking treatment for body image or eating issues.

Strengths

One of the strengths of this study is its inclusion of a control group. Given the main effect of time observed in many of the outcome variables, without a control group we may have concluded that the intervention was successful in improving internalized weight stigma, body image flexibility, and disordered eating. The inclusion of a control group increased the internal validity of the research, as we were able to determine that it may not have been the intervention itself that accounted for improvements in these outcomes. Another strength of the study is its repeated measures design, which increases statistical power and helps account for variability among subjects at baseline.

Lastly, an important strength of this research is its diverse sample. In the past, eating disorders were perceived as predominantly affecting Caucasian women (Gordon et al., 2002), resulting in many races and ethnicities being grossly underrepresented in the eating disorder research literature. Therefore, investigating disordered eating and some of the factors that help establish, maintain, and protect against it (e.g., internalized weight stigma, body image flexibility, self-compassion, and fear of self-compassion) in diverse samples is crucial, as is evaluating proposed interventions in these populations. In the current sample, 81% of participants did not identify as Caucasian, whereas in the previous imagery rescripting studies, the samples were predominantly Caucasian (70.1%, Pennesi & Wade, 2018; 63.8%, Zhou et al., 2020).

Future Directions

Research on imagery rescripting as an intervention for individuals with elevated weight and shape concerns is still nascent and thus needs to be explored further. This technique has demonstrated very promising results among individuals at risk of eating disorders in previous studies. As an intervention for internalized weight stigma in particular, although the intervention did not outperform the control group in the current study, imagery rescripting may still have promise, especially perhaps if combined with some form of coaching and/or psychoeducation. Future research should investigate imagery rescripting as an accessible and brief intervention for internalized weight stigma on its own, but it could perhaps be most powerful as an adjunct to established treatments for eating and body image concerns, such as CBT for eating disorders. Future research on the use of imagery rescripting as an intervention for internalized weight stigma may want to recruit individuals who have high levels of internalized weight stigma specifically, and/or individuals who have experienced weight stigma from others.

Conclusions

Previous research has demonstrated that imagery rescripting is associated with improvements in body image flexibility, self-compassion, and disordered eating in women at risk of developing an eating disorder. In the current study, the impact of the imagery rescripting intervention did not significantly differ from that of the control condition. However, the current study differed slightly from previous studies in that it was completed entirely online from participants' homes. As such, although it is easily accessible as a standalone online intervention, it may be most effective as an adjunct to therapy rather than as a brief online intervention in individuals who are not currently receiving psychological treatment. Although the current study had several limitations and the results were largely inconclusive, imagery rescripting may be an

effective intervention strategy for addressing risk and protective factors related to disordered eating symptoms. Future research should explore its potential as an intervention for internalized weight stigma specifically.

References

- Ahmed, M., & Westra, H. A. (2009). Impact of a treatment rationale on expectancy and engagement in cognitive behavioral therapy for social anxiety. *Cognitive Therapy and Research*, 33(3), 314–322. <https://doi.org/10.1007/s10608-008-9182-1>
- Bacon, L., & Aphramor, L. (2011). Weight science: Evaluating the evidence for a paradigm shift. *Nutrition Journal*, 10(1), 9. <https://doi.org/10.1186/1475-2891-10-9>
- Barnett, A. G., Van Der Pols, J.C., & Dobson, A.J. (2004). Regression to the mean: What it is and how to deal with it. *International Journal of Epidemiology*, 34(1), 215–220. <https://doi.org/10.1093/ije/dyh299>
- Baum, C. L., & Ford, W. F. (2004). The wage effects of obesity: A longitudinal study. *Health Economics*, 13(9), 885–899. <https://doi.org/10.1002/hec.881>
- Berner, L. A., Shaw, J. A., Witt, A. A., & Lowe, M. R. (2013). The relation of weight suppression and body mass index to symptomatology and treatment response in anorexia nervosa. *Journal of Abnormal Psychology*, 122(3), 694–708. <https://doi.org/10.1037/a0033930>
- Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered eating: A review of the literature. *Body Image*, 17, 117–131. <https://doi.org/10.1016/j.bodyim.2016.03.003>
- Brink, T. L. (1988). Obesity and job discrimination: Mediation via personality stereotypes? *Perceptual and Motor Skills*, 66(2), 494–494. <https://doi.org/10.2466/pms.1988.66.2.494>
- Carels, R. A., Wott, C. B., Young, K. M., Gumble, A., Koball, A., & Oehlhof, M. W. (2010). Implicit, explicit, and internalized weight bias and psychosocial maladjustment among

- treatment-seeking adults. *Eating Behaviors*, 11(3), 180–185.
<https://doi.org/10.1016/j.eatbeh.2010.03.002>
- Carter, A., Gilbert, P., & Kirby, J. N. (2021). Compassion-focused therapy for body weight shame: A mixed methods pilot trial. *Clinical Psychology & Psychotherapy*, 28(1), 93–108. <https://doi.org/10.1002/cpp.2488>
- Cesa, G. L., Manzoni, G. M., Bacchetta, M., Castelnuovo, G., Conti, S., Gaggioli, A., Mantovani, F., Molinari, E., Cárdenas-López, G., & Riva, G. (2013). Virtual reality for enhancing the cognitive behavioral treatment of obesity with binge eating disorder: Randomized controlled study with one-year follow-up. *Journal of Medical Internet Research*, 15(6), e113. <https://doi.org/10.2196/jmir.2441>
- Ciarrochi, J. Bilich, L., & Godsel, C. (2010). Psychological flexibility as a mechanism of change in Acceptance and Commitment Therapy. In R. Baer (Ed.), *Assessing Mindfulness and Acceptance: Illuminating the Processes of Change*. (pp. 51-76). New Harbinger Publications, Inc.
- Cooper, M. J. (2011). Working with imagery to modify core beliefs in people with eating disorders: A clinical protocol. *Cognitive and Behavioral Practice*, 18(4), 454–465.
<https://doi.org/10.1016/j.cbpra.2010.08.003>
- Cooper, M. J., Todd, G., & Turner, H. (2007). The effects of using imagery to modify core emotional beliefs in bulimia nervosa: An experimental pilot study. *Journal of Cognitive Psychotherapy*, 21(2), 117–122. <https://doi.org/10.1891/088983907780851577>
- Dias, J. C. R., Maroco, J., & Campos, J. A. D. B. (2015). Weight Concerns Scale applied to college students: Comparison between pencil-and-paper and online formats.

Cyberpsychology, Behavior, and Social Networking, 18(3), 188–192.

<https://doi.org/10.1089/cyber.2014.0392>

- Duarte, C., & Pinto-Gouveia, J. (2016). Body image flexibility mediates the effect of body image-related victimization experiences and shame on binge eating and weight. *Eating Behaviors*, 23, 13–18. <https://doi.org/10.1016/j.eatbeh.2016.07.005>
- Dugué, R., Renner, F., Austermann, M., Tuschen-Caffier, B., & Jacob, G. A. (2019). Imagery rescripting in individuals with binge-eating behavior: An experimental proof-of-concept study. *International Journal of Eating Disorders*, 52(2), 183–188. <https://doi.org/10.1002/eat.22995>
- Durso, L. E., & Latner, J. D. (2008). Understanding self-directed stigma: Development of the Weight Bias Internalization Scale. *Obesity*, 16, S80–S86. <https://doi.org/10.1038/oby.2008.448>
- Durso, L. E., Latner, J. D., White, M. A., Masheb, R. M., Blomquist, K. K., Morgan, P. T., & Grilo, C. M. (2012). Internalized weight bias in obese patients with binge eating disorder: Associations with eating disturbances and psychological functioning. *The International Journal of Eating Disorders*, 45(3), 423–427. <https://doi.org/10.1002/eat.20933>
- Eisenberg, M. E., Neumark-Sztainer, D., & Story, M. (2003). Associations of weight-based teasing and emotional well-being among adolescents. *Archives of Pediatrics & Adolescent Medicine*, 157(8), 733–738. <https://doi.org/10.1001/archpedi.157.8.733>
- Fairburn, C.G., & Beglin, S.J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16(4), 363-370. [https://doi.org/10.1002/1098-108X\(199412\)16:4<363::AID-EAT2260160405>3.0.CO;2-%23](https://doi.org/10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-%23)

- Forbes, Y., & Donovan, C. (2019). The role of internalized weight stigma and self-compassion in the psychological well-being of overweight and obese women. *Australian Psychologist*, 54(6), 471–482. <https://doi.org/10.1111/ap.12407>
- Garner, D. M., Olmsted, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2(2), 15-34. [https://doi.org/10.1002/1098-108X\(198321\)2:2<15::AID-EAT2260020203>3.0.CO;2-6](https://doi.org/10.1002/1098-108X(198321)2:2<15::AID-EAT2260020203>3.0.CO;2-6)
- Geller, J., Iyar, M. M., Kelly, A. C., & Srikaneswaran, S. (2019). Barriers to self-compassion in the eating disorders: The factor structure of the fear of self-compassion scale. *Eating Behaviors*, 35, 101334. <https://doi.org/10.1016/j.eatbeh.2019.101334>
- Geller, J., Kelly, A. C., Samson, L., Iyar, M. M., & Srikaneswaran, S. (2020). The relation between two barriers to self-compassion and clinical characteristics in individuals with eating disorders. *European Eating Disorders Review*, 28(6), 766–772. <https://doi.org/10.1002/erv.2764>
- Geller, J., Srikaneswaran, S., & Zelichowska, J. (2015). Resilience to shape and weight concerns and disordered eating: The role of self-compassion. *Advances in Eating Disorders*, 3(1), 4–12. <https://doi.org/10.1080/21662630.2014.945604>
- Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: Development of three self-report measures. *Psychology and Psychotherapy: Theory, Research and Practice*, 84(3), 239–255. <https://doi.org/10.1348/147608310X526511>
- Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy*, 13(6), 353–379. <https://doi.org/10.1002/cpp.507>

- Gordon, K.H., Perez, M., & Joiner, T.E. (2004). The impact of racial stereotypes on eating disorder recognition. *International Journal of Eating Disorders*, 32(2), 219-224.
<https://doi.org/10.1002/eat.10070>
- Heinberg, L. J., & Thompson, J. K. (1995). Body image and televised images of thinness and attractiveness: A controlled laboratory investigation. *Journal of Social and Clinical Psychology*, 14(4), 325–338. <https://doi.org/10.1521/jscp.1995.14.4.325>
- Hilbert, A., Braehler, E., Schmidt, R., Löwe, B., Häuser, W., & Zenger, M. (2015). Self-compassion as a resource in the self-stigma process of overweight and obese individuals. *Obesity Facts*, 8(5), 293–301. <https://doi.org/10.1159/000438681>
- Holmes, E. A., Arntz, A., & Smucker, M. R. (2007). Imagery rescripting in cognitive behaviour therapy: Images, treatment techniques and outcomes. *Journal of Behavior Therapy and Experimental Psychiatry*, 38(4), 297–305. <https://doi.org/10.1016/j.jbtep.2007.10.007>
- Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion*, 5(4), 489–497. <https://doi.org/10.1037/1528-3542.5.4.489>
- Holmes, E. A., Mathews, A., Mackintosh, B., & Dalgleish, T. (2008). The causal effect of mental imagery on emotion assessed using picture-word cues. *Emotion*, 8(3), 395–409. <https://doi.org/10.1037/1528-3542.8.3.395>
- Hötzel, K., von Brachel, R., Schlossmacher, L., & Vocks, S. (2013). Assessing motivation to change in eating disorders: A systematic review. *Journal of Eating Disorders*, 1(1), 38. <https://doi.org/10.1186/2050-2974-1-38>
- Huellemann, K. L., & Calogero, R. M. (2020). Self-compassion and body checking among women: The mediating role of stigmatizing self-perceptions. *Mindfulness*, 11(9), 2121–2130. <https://doi.org/10.1007/s12671-020-01420-8>

- Jacobi, C., Abascal, L., & Taylor, C. B. (2004). Screening for eating disorders and high-risk behavior: Caution. *International Journal of Eating Disorders*, 36(3), 280–295.
<https://doi.org/10.1002/eat.20048>
- Kashdan, T.B. & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review*, 30(7), 865-878. <https://doi.org/10.1016/j.cpr.2010.03.001>
- Kelly, A. C., Carter, J. C., Zuroff, D. C., & Borairi, S. (2013). Self-compassion and fear of self-compassion interact to predict response to eating disorders treatment: A preliminary investigation. *Psychotherapy Research*, 23(3), 252–264.
<https://doi.org/10.1080/10503307.2012.717310>
- Killen, J. D., Taylor, C. B., Hayward, C., Haydel, K. P., Wilson, D. M., Hammer, L., Kraemer, H., Blair-Greiner, A., & Strachowski, D. (1996). Weight concerns influence the development of eating disorders: A four year prospective study. *Journal of Consulting and Clinical Psychology*, 64(5), 936–940. <https://doi.org/10.1037/0022-006X.64.5.936>
- Killen, J. D., Taylor, C. B., Hayward, C., Wilson, D. M., Haydel, K. F., Hammer, L. D., Simmonds, B., Robinson, T. N., Litt, I., & Varady, A., & Kraemer, H. (1994). Pursuit of thinness and onset of eating disorder symptoms in a community sample of adolescent girls: A three-year prospective analysis. *International Journal of Eating Disorders*, 16(3), 227–238. [https://doi.org/10.1002/1098-108X\(199411\)16:3<227::AID-EAT2260160303>3.0.CO;2-L](https://doi.org/10.1002/1098-108X(199411)16:3<227::AID-EAT2260160303>3.0.CO;2-L)
- Krafft, J., Ferrell, J., Levin, M. E., & Twohig, M. P. (2018). Psychological inflexibility and stigma: A meta-analytic review. *Journal of Contextual Behavioral Science*, 7, 15–28.
<https://doi.org/10.1016/j.jcbs.2017.11.002>

- Levin, M. E., Potts, S., Haeger, J., & Lillis, J. (2018). Delivering acceptance and commitment therapy for weight self-stigma through guided self-help: Results from an open pilot trial. *Cognitive and Behavioral Practice*, 25(1), 87–104.
<https://doi.org/10.1016/j.cbpra.2017.02.002>
- Lillis, J., Hayes, S. C., Bunting, K., & Masuda, A. (2009). Teaching acceptance and mindfulness to improve the lives of the obese: A preliminary test of a theoretical model. *Annals of Behavioral Medicine*, 37(1), 58–69. <https://doi.org/10.1007/s12160-009-9083-x>
- Luce, K. H., & Crowther, J. H. (1999). The reliability of the Eating Disorder Examination Self-Report Questionnaire Version (EDE-Q). *International Journal of Eating Disorders*, 25(3), 349–351. [https://doi.org/10.1002/\(SICI\)1098-108X\(199904\)25:3<349::AID-EAT15>3.0.CO;2-M](https://doi.org/10.1002/(SICI)1098-108X(199904)25:3<349::AID-EAT15>3.0.CO;2-M)
- Luoma, J. B., Kohlenberg, B. S., Hayes, S. C., & Fletcher, L. (2012). Slow and steady wins the race: A randomized clinical trial of acceptance and commitment therapy targeting shame in substance use disorders. *Journal of Consulting and Clinical Psychology*, 80(1), 43–53.
<http://doi.org/10.1037/a0026070>
- Meadows, A., & Daníelsdóttir, S. (2016). What’s in a word? On weight stigma and terminology. *Frontiers in Psychology*, 7. <https://doi.org/10.3389/fpsyg.2016.01527>
- Merz, E. L., & Roesch, S. C. (2011). Modeling trait and state variation using multilevel factor analysis with PANAS daily diary data. *Journal of Research in Personality*, 45(1), 2–9.
<https://doi.org/10.1016/j.jrp.2010.11.003>
- Miller, J. (2021, March 8). *Weight watchers isn’t fooling anyone*. Slate.
<https://slate.com/business/2021/03/weight-watchers-name-change-ww-dieting-culture.html>

- Mills, J. S., Polivy, J., & Herman, C. P. (2021). Distinguishing dieting from restrained eating: A rejoinder to Lowe (2021). *Appetite*, 165, 105295.
<https://doi.org/10.1016/j.appet.2021.105295>
- Mond, J. M., Hay, P. J., Rodgers, B., Owen, C., & Beumont, P. J. V. (2004). Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy*, 42(5), 551–567.
[https://doi.org/10.1016/S0005-7967\(03\)00161-X](https://doi.org/10.1016/S0005-7967(03)00161-X)
- Neff, K. (2003a). Self-Compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, 2(2), 85-101. <https://doi.org/10.1080/15298860309032>
- Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self And Identity*, 2(3), 223-250. <https://doi.org/10.1080/15298860309027>
- Neff, K. D. (2016). The Self-Compassion Scale is a valid and theoretically coherent measure of self-compassion. *Mindfulness*, 7(1), 264–274. <https://doi.org/10.1007/s12671-015-0479-3>
- Nichols, A. L., & Maner, J. K. (2008). The good-subject effect: Investigating participant demand characteristics. *Journal of General Psychology*, 135(2), 151-166.
<https://doi.org/10.3200/GENP.135.2.151-166>
- Ohanian, V. (2002). Imagery rescripting within cognitive behavior therapy for bulimia nervosa: An illustrative case report. *International Journal of Eating Disorders*, 31(3), 352–357.
<https://doi.org/10.1002/eat.10044>
- O'Hara, L., Ahmed, H., & Elashie, S. (2021). Evaluating the impact of a brief Health at Every Size®-informed health promotion activity on body positivity and internalized weight-based oppression. *Body Image*, 37, 225–237.
<https://doi.org/10.1016/j.bodyim.2021.02.006>

- Pagan, J., & Dávila, A. (1997). Obesity, occupational attainment, and earnings. *Social Science Quarterly*, 78(3), 756-770.
- Palmeira, L., Cunha, M., & Pinto-Gouveia, J. (2019). Processes of change in quality of life, weight self-stigma, body mass index and emotional eating after an acceptance-, mindfulness- and compassion-based group intervention (Kg-Free) for women with overweight and obesity. *Journal of Health Psychology*, 24(8), 1056–1069.
<https://doi.org/10.1177/1359105316686668>
- Palmeira, L., Pinto-Gouveia, J., & Cunha, M. (2017). Exploring the efficacy of an acceptance, mindfulness & compassionate-based group intervention for women struggling with their weight (Kg-Free): A randomized controlled trial. *Appetite*, 112, 107–116.
<https://doi.org/10.1016/j.appet.2017.01.027>
- Pearl, R. L., Hopkins, C. H., Berkowitz, R. I., & Wadden, T. A. (2018). Group cognitive-behavioral treatment for internalized weight stigma: A pilot study. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 23(3), 357–362.
<https://doi.org/10.1007/s40519-016-0336-y>
- Pearl, R. L., & Puhl, R. M. (2014). Measuring internalized weight attitudes across body weight categories: Validation of the Modified Weight Bias Internalization Scale. *Body Image*, 11(1), 89–92. <https://doi.org/10.1016/j.bodyim.2013.09.005>
- Pearl, R. L., & Puhl, R. M. (2018). Weight bias internalization and health: A systematic review. *Obesity Reviews*, 19(8), 1141–1163. <https://doi.org/10.1111/obr.12701>
- Pearl, R. L., & Puhl, R. M. (2016). The distinct effects of internalizing weight bias: An experimental study. *Body Image*, 17, 38–42.
<https://doi.org/10.1016/j.bodyim.2016.02.002>

- Pearl, R. L., Puhl, R. M., Lessard, L. M., Himmelstein, M. S., & Foster, G. D. (2021). Prevalence and correlates of weight bias internalization in weight management: A multinational study. *SSM - Population Health*, 13, 100755.
<https://doi.org/10.1016/j.ssmph.2021.100755>
- Pearl, R. L., Wadden, T. A., Bach, C., Gruber, K., Leonard, S., Walsh, O. A., Tronieri, J. S., & Berkowitz, R. I. (2020). Effects of a cognitive-behavioral intervention targeting weight stigma: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 88(5), 470–480. <https://doi.org/10.1037/ccp0000480>
- Pearl, R. L., Wadden, T. A., Bach, C., Tronieri, J. S., & Berkowitz, R. I. (2020). Six-month follow-up from a randomized controlled trial of the weight BIAS Program. *Obesity*, 28(10), 1878–1888. <https://doi.org/10.1002/oby.22931>
- Pellizzer, M. L., Waller, G., & Wade, T. D. (2018). Body image flexibility: A predictor and moderator of outcome in transdiagnostic outpatient eating disorder treatment. *International Journal of Eating Disorders*, 51(4), 368–372.
<https://doi.org/10.1002/eat.22842>
- Pennesi, J.-L., & Wade, T. D. (2018). Imagery rescripting and cognitive dissonance: A randomized controlled trial of two brief online interventions for women at risk of developing an eating disorder. *International Journal of Eating Disorders*, 51(5), 439–448. <https://doi.org/10.1002/eat.22849>
- Phelan, S. M., Burgess, D. J., Yeazel, M. W., Hellerstedt, W. L., Griffin, J. M., & van Ryn, M. (2015). Impact of weight bias and stigma on quality of care and outcomes for patients with obesity: Obesity stigma and patient care. *Obesity Reviews*, 16(4), 319–326.
<https://doi.org/10.1111/obr.12266>

- Polivy, J., Herman, C. P., & Mills, J. S. (2020). What is restrained eating and how do we identify it? *Appetite*, 155, 104820. <https://doi.org/10.1016/j.appet.2020.104820>
- Potts, S., Krafft, J., & Levin, M. E. (2020). A pilot randomized controlled trial of acceptance and commitment therapy guided self-help for overweight and obese adults high in weight self-stigma. *Behavior Modification*, 0(0), 1-24.
<https://doi.org/10.1177/0145445520975112>
- Puhl, R., & Brownell, K. D. (2001). Bias, discrimination, and obesity. *Obesity Research*, 9(12), 788–805. <https://doi.org/10.1038/oby.2001.108>
- Puhl, R. M., & Brownell, K. D. (2006). Confronting and coping with weight stigma: An investigation of overweight and obese adults. *Obesity*, 14(10), 1802–1815.
<https://doi.org/10.1038/oby.2006.208>
- Puhl, R. M., Himmelstein, M. S., & Quinn, D. M. (2018). Internalizing weight stigma: Prevalence and sociodemographic considerations in US adults. *Obesity*, 26(1), 167–175.
<https://doi.org/10.1002/oby.22029>
- Puhl, R., Luedicke, J., & Peterson, J.L. (2013). Public reactions to obesity-related health campaigns: A randomized controlled trial. *American Journal of Preventive Medicine*, 45(1), 36–48. <https://doi.org/10.1016/j.amepre.2013.02.010>
- Puhl, R. M., Moss-Racusin, C. A., & Schwartz, M. B. (2007). Internalization of weight bias: Implications for binge eating and emotional well-being. *Obesity*, 15(1), 19–23.
<https://doi.org/10.1038/oby.2007.521>
- Puhl, R.M., & Suh, Y. (2015). Health consequences of weight stigma: Implications for obesity prevention and treatment. *Current Obesity Reports*, 4(2), 182–190.
<https://doi.org/10.1007/s13679-015-0153-z>

- Puhl, R. M., Telke, S., Larson, N., Eisenberg, M. E., & Neumark-Stzainer, D. (2020). Experiences of weight stigma and links with self-compassion among a population-based sample of young adults from diverse ethnic/racial and socio-economic backgrounds. *Journal of Psychosomatic Research, 134*, 110134. <https://doi.org/10.1016/j.jpsychores.2020.110134>
- Rø, Ø., Reas, D. L., & Stedal, K. (2015). Eating Disorder Examination Questionnaire (EDE-Q) in Norwegian adults: Discrimination between female controls and eating disorder patients: Global EDE-Q cut-off. *European Eating Disorders Review, 23*(5), 408–412. <https://doi.org/10.1002/erv.2372>
- Roberto, C. A., Sysko, R., Bush, J., Pearl, R., Puhl, R. M., Schvey, N. A., & Dovidio, J. F. (2012). Clinical correlates of the weight bias internalization scale in a sample of obese adolescents seeking bariatric surgery. *Obesity, 20*(3), 533–539. <https://doi.org/10.1038/oby.2011.123>
- Rogers, C. B., Webb, J. B., & Jafari, N. (2018). A systematic review of the roles of body image flexibility as correlate, moderator, mediator, and in intervention science (2011–2018). *Body Image, 27*, 43–60. <https://doi.org/10.1016/j.bodyim.2018.08.003>
- Sandoz, E. K., Wilson, K. G., Merwin, R. M., & Kate Kellum, K. (2013). Assessment of body image flexibility: The Body Image-Acceptance and Action Questionnaire. *Journal of Contextual Behavioral Science, 2*(1–2), 39–48. <https://doi.org/10.1016/j.jcbs.2013.03.002>
- Scagliusi, F. B., Ulian, M. D., Gualano, B., Roble, O. J., Unsain, R. F., Carriero, M. R., de Morais Sato, P., SturtzSreetharan, C., Brewis, A., & Wutich, A. (2020). “Before I saw a gas canister, now I see a person”: Post obesity-intervention body acceptance and

- responses to weight stigma among urban Brazilian gorda women. *Human Organization*, 79(3), 176–191. <https://doi.org/10.17730/1938-3525-79.3.176>
- Smucker, M. R., Dancu, C., Foa, E. B., & Niederee, J. L. (1995). Imagery rescripting: A new treatment for survivors of childhood sexual abuse suffering from posttraumatic stress. *Journal of Cognitive Psychotherapy*, 9(1), 3–17. <https://doi.org/10.1891/0889-8391.9.1.3>
- Somerville, K., & Cooper, M. (2007). Using imagery to identify and characterize core beliefs in women with bulimia nervosa, dieting and non-dieting women. *Eating Behaviors*, 8(4), 450–456. <https://doi.org/10.1016/j.eatbeh.2006.12.004>
- Statistics Canada (2019). Health fact sheets: Overweight and obese adults, 2018. (No. 82-265-x). <https://www150.statcan.gc.ca/n1/pub/82-625-x/2019001/article/00005-eng.htm>
- Tiggemann, M., Slater, A., Bury, B., Hawkins, K., & Firth, B. (2013). Disclaimer labels on fashion magazine advertisements: Effects on social comparison and body dissatisfaction. *Body Image*, 10(1), 45–53. <https://doi.org/10.1016/j.bodyim.2012.08.001>
- Thompson, J. K., & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body-image disturbance and eating pathology. *Current Directions in Psychological Science*, 10(5), 181–183. <https://doi.org/10.1111/1467-8721.00144>
- Turk, F., Kellett, S., & Waller, G. (2021). Determining the potential link of self-compassion with eating pathology and body image among women: A longitudinal mediational study. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*. <https://doi.org/10.1007/s40519-021-01144-1>
- Turk, F., & Waller, G. (2020). Is self-compassion relevant to the pathology and treatment of eating and body image concerns? A systematic review and meta-analysis. *Clinical Psychology Review*, 79, 101856. <https://doi.org/10.1016/j.cpr.2020.101856>

- Tylka, T. L., & Kroon Van Diest, A. M. (2013). The intuitive eating Scale-2: Item refinement and psychometric properties. *Journal of Counseling Psychology*, 60(1), 137–153.
<http://dx.doi.org/10.1037/a0030893>.
- Ursachi, G., Horodnic, I. A., & Zait, A. (2015). How reliable are measurement scales? External factors with indirect influence on reliability estimators. *Procedia Economics and Finance*, 20, 679–686. [https://doi.org/10.1016/S2212-5671\(15\)00123-9](https://doi.org/10.1016/S2212-5671(15)00123-9)
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070. <https://doi.org/10.1037/0022-3514.54.6.1063>
- Webb, J. B., & Hardin, A. S. (2016). An integrative affect regulation process model of internalized weight bias and intuitive eating in college women. *Appetite*, 102, 60–69.
<https://doi.org/10.1016/j.appet.2016.02.024>
- Wendell, J. W., Masuda, A., & Le, J. K. (2012). The role of body image flexibility in the relationship between disordered eating cognitions and disordered eating symptoms among non-clinical college students. *Eating Behaviors*, 13(3), 240–245.
<https://doi.org/10.1016/j.eatbeh.2012.03.006>
- Zhou, Y., Pennesi, J., & Wade, T. D. (2020). Online imagery rescripting among young women at risk of developing an eating disorder: A randomized controlled trial. *International Journal of Eating Disorders*, 53(12), 1906–1917. <https://doi.org/10.1002/eat.23370>

Appendix A

Instructions to Participants in Imagery Rescripting Condition

Imagery Rescripting

Please read the following carefully.

Please think about a **recent** event of an **unpleasant body experience where you might have felt ashamed or embarrassed of your body or how your body looks.**

Some examples are:

being teased by your peers about how you look

receiving negative/critical comments with respect to appearance

feeling uncomfortable/insecure about your body when trying on clothes in a change-room,

looking yourself in the mirror, getting ready with friends to go to a party, walking past a group of people who were looking at you, out in public.

Now take a moment to close your eyes and imagine (or visualize) this recent event as it is happening right now. Notice your thoughts and feelings that arise during this exercise.

Please only continue once you have this event in mind.

[Page Break]

Now reflect on those thoughts and feelings you just had and try to identify the **earliest** event you could remember associated with them. It could be something that happened to you when you were a child, or a teenager. Again, take a moment to close your eyes and imagine this earliest event as it is happening right now. Notice your thoughts and feelings that arise.

Some examples are:

being teased by your peers about how you look

receiving negative/critical comments from your parents with respect to appearance

feeling uncomfortable/insecure about your body when getting ready to a party

Please only continue once you have this event in mind.

[Page Break]

1

When you're ready, please write about this **earliest** event that you just recalled in the next 5 minutes.

Reminder: Write about the **earliest** memory of an **unpleasant body experience where you might have felt ashamed or embarrassed of your body or how your body looks.**

Please write in the **first person** and describe the event as it is happening **right now**. You should include as much detail as you can such as where you are, what you are doing, who you are with,

what you can see, how you are feeling (emotions), and what is going through your mind (thoughts).

[Typing Space]

Remember, write in first person, as it is happening right now.

If you think you have finished before the time is up, go back and review what you have already written and rephrase or rewrite as necessary. Please try to keep going. After 5 minutes is up, the next button will appear and you may continue.

[Page Break]

2

Now think about the same memory you wrote earlier. This time, when you close your eyes and imagine (or visualize) this event, **imagine it from an observer's perspective. Imagine that your adult self is in the room observing what's happening to your younger self right now, watching the events unfold.**

Now take a moment to close your eyes and imagine this event as if it were happening to your younger self right now.

Please only continue when you have completed the visualization.

[Page Break]

2

For the next 5 minutes, please write about what you see from an observer's perspective as if it were happening to your younger self right now.

Please write in third person (e.g., if your name is Sarah, write "I see Sarah in the change room, she is trying on a pair of blue jeans..."), and include as much details as you can such as where Sarah is, what Sarah is doing, who Sarah is with, how Sarah might be feeling (emotions), and what Sarah might be telling herself (thoughts).

Please describe what you see from an observer's perspective as if it were happening to your younger self right now.

[Typing Space]

Remember to write in third person, observing the event as it is happening right now.

When you're finished please take a minute to think about what needs to happen in the memory in order for your younger self to feel better or if there is anything your adult self would like to do to help the younger self in that situation.

If you still have time, please go back and review what you have already written and rephrase or rewrite as necessary until the 5 minutes is up.

[Page Break]

3

Think about the same memory you wrote earlier. This time, **you are your younger self again** (in first person), **but your wiser and more compassionate adult self is with you in the room.**

Your adult self can intervene if you want her to. She can offer you compassion or provide new updated information based on what you know now, she can talk to you (or others), or do anything else that feels helpful and right in the situation.

Now take a moment to close your eyes and re-imagine the event as if it were happening to you right now. Remember, this time your adult self is with you and can intervene if you want her to.

Please only continue when you have completed the visualization.

[Page Break]

3

For the next 5 minutes, please write about what you see as if it were happening to you right now **but this time your adult self is with you and can intervene if you want her to.**

Please write in **first person** (e.g., I am in the change room, I am trying on a pair of blue jeans..) *unless you are referring to the adult self* (then use third person, e.g., “adult/older Sarah said...”). Like before, try to be as descriptive as you can, and provide details such as where you are, who you are with, what you can see, how you are feeling (emotions), and what is going through your mind (thoughts).

Please also describe what your wiser, more compassionate adult self does in the situation. (Reminder: She can offer you compassion or provide new updated information based on what you know now, she can talk to you [or others], or do anything else that feels helpful and right in the situation).

[Typing Space]

If you think you have finished before the time is up, go back and review what you have already written and rephrase or rewrite as necessary. Please try to keep going. After 5 minutes is up, the next button will appear and you may continue.

Appendix B

Instructions to Participants in Control Condition

For the next 10 minutes, just sit and let your mind wander wherever it would like to, let your attention drift. There is no need to control your thoughts in any way, just let them wander. You may find that your mind wanders to thoughts about many different things or thoughts of nothing at all. You may find that your mind wanders to thoughts about the unpleasant body experience you described earlier. Wherever your mind wanders it's OK. Just think about whatever you like. Thoughts are not right or wrong. Just let your attention drift. After 10 minutes is up, the next button will appear and you may continue.

Appendix C

Weight Concerns Scale

For all questions below, circle only one number.

1. How much more or less do you feel you worry about your weight and body shape than other females your age?
 1. I worry a lot less than other females.
 2. I worry a little less than other females.
 3. I worry about the same as other females.
 4. I worry a little more than other females.
 5. I worry a lot more than other females.

2. How afraid are you of gaining 3 pounds?

(1)	(2)	(3)	(4)	(5)
Not Afraid	Slightly Afraid	Moderately Afraid	Very Afraid	Terrified

3. When was the last time you went on a diet?
 1. I've never been on a diet.
 2. I was on a diet about one year ago.
 3. I was on a diet about 6 months ago.
 4. I was on a diet about 3 months ago.
 5. I was on a diet about 1 month ago.
 6. I was on a diet less than 1 month ago.
 7. I'm now on a diet.

4. Compared to other things in your life, how important is your weight to you?
 1. My weight is not important compared to other things in my life.
 2. My weight is a little more important than some other things.
 3. My weight is more important than most, but not all, things in my life.
 4. My weight is the most important thing in my life.

5. Do you ever feel fat?

(1)	(2)	(3)	(4)	(5)
Never	Rarely	Sometimes	Often	Always

Appendix D

Demographic Questions

1) What is your age? _____

2) When were you born? _____ (month/year)

3) What sex were you assigned at birth?

☐ Male ☐ Female

4) What is your current gender identity? (check one)

☐ female ☐ male ☐ Transgender

☐ Other identity (please specify): _____

5) What is your ethnic-cultural background? (Check all that apply):

☐ I prefer not to reply

☐ First Nations/Native

☐ Caucasian/European

☐ Latino/Hispanic

☐ African

☐ South Asian (e.g., India, Pakistan, Sri Lanka)

☐ South East Asian (e.g., Philippines, Indonesia, Thailand)

☐ East Asian (e.g., China, Japan, Korea) ☐ Other (please specify): _____

6) What is your height in feet and inches? _____ feet and _____ inches

7) What is your weight in pounds? _____

8) What year of school are you in? _____

9) Do you speak English fluently? _____

10) Do you write in English fluently? _____

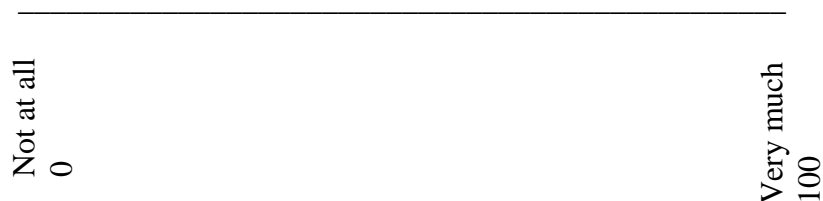
Appendix E

Body Dissatisfaction

Place a vertical line (or, “tick”) on the horizontal lines below that shows how you feel *at the present moment*.

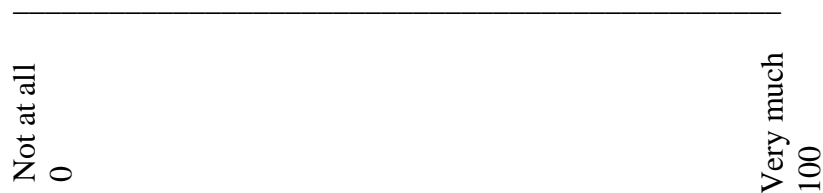
VAS WD

How satisfied do you feel about your weight right now?



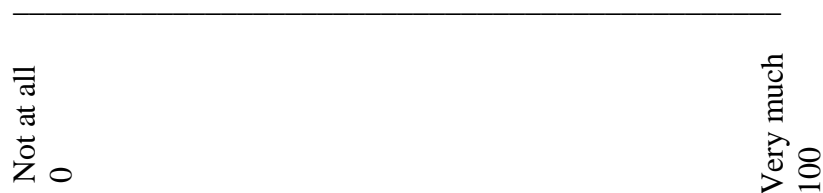
VAS OAD

How satisfied do you feel about your appearance right now?



VAS OD

How distressed are you by your feelings about your body right now?



Appendix F

Negative Mood Scale from the Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way **right now**, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
Very slightly or Not at all	A little	moderately	Quite a bit	Extremely

_____	irritable
_____	distressed
_____	ashamed
_____	upset
_____	nervous
_____	guilty
_____	scared
_____	hostile
_____	jittery
_____	afraid

Appendix G

Weight Bias Internalization Scale – Modified

Please rate your agreement with each item.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly Agree

1. Because of my weight, I feel that I am just as competent as anyone.^a
2. I am less attractive than most other people because of my weight.
3. I feel anxious about my weight because of what people might think of me.
4. I wish I could drastically change my weight.
5. Whenever I think a lot about my weight, I feel depressed.
6. I hate myself for my weight.
7. My weight is a major way that I judge my value as a person.
8. I don't feel that I deserve to have a really fulfilling social life, because of my weight.
9. I am OK being the weight that I am.^a
10. Because of my weight, I don't feel like my true self.
11. Because of my weight, I don't understand how anyone attractive would want to date me.

Note: ^a Item reverse-scored

Appendix H

Body Image Acceptance and Action Questionnaire

Directions: Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following rating scale to make your choices. For instance, if you believe a statement is 'Always True,' you would write a 7 next to that statement.

Never True	Very Seldom True	Seldom True	Sometimes true	Frequently true	Almost Always true	Always true
1	2	3	4	5	6	7

1. Worrying about my weight makes it difficult for me to live a life that I value.
2. I care too much about my weight and body shape.
3. I shut down when I feel bad about my body shape or weight.
4. My thoughts and feelings about my body weight and shape must change before I can take important steps in my life.
5. Worrying about my body takes up too much of my time.
6. If I start to feel fat, I try to think about something else.
7. Before I can make any serious plans, I have to feel better about my body.
8. I will have better control over my life if I can control my negative thoughts about my body.
9. To control my life, I need to control my weight.
10. Feeling fat causes problems in my life.
11. When I start thinking about the size and shape of my body, it's hard to do anything else.
12. My relationships would be better if my bodyweight and/or shape did not bother me

Appendix I

Self-Compassion Scale

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

**Almost
never**

1

2

3

4

**Almost
always**

5

- _____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.
- _____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
- _____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
- _____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
- _____ 5. I try to be loving towards myself when I'm feeling emotional pain.
- _____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.
- _____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
- _____ 8. When times are really difficult, I tend to be tough on myself.
- _____ 9. When something upsets me I try to keep my emotions in balance.
- _____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
- _____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.
- _____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.
- _____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
- _____ 14. When something painful happens I try to take a balanced view of the situation.
- _____ 15. I try to see my failings as part of the human condition.

- _____ 16. When I see aspects of myself that I don't like, I get down on myself.
- _____ 17. When I fail at something important to me I try to keep things in perspective.
- _____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
- _____ 19. I'm kind to myself when I'm experiencing suffering.
- _____ 20. When something upsets me I get carried away with my feelings.
- _____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
- _____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
- _____ 23. I'm tolerant of my own flaws and inadequacies.
- _____ 24. When something painful happens I tend to blow the incident out of proportion.
- _____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.
- _____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Appendix J

Fear of Compassion for Self-Scale

Expressing kindness and compassion towards yourself

1.	I feel that I don't deserve to be kind and forgiving to myself	0	1	2	3	4
2.	If I really think about being kind and gentle with myself it makes me sad	0	1	2	3	4
3.	Getting on in life is about being tough rather than compassionate	0	1	2	3	4
4.	I would rather not know what being 'kind and compassionate to myself feels like	0	1	2	3	4
5.	When I try and feel kind and warm to myself I just feel kind of empty	0	1	2	3	4
6.	I fear that if I start to feel compassion and warmth for myself, I will feel overcome with a sense of loss/grief	0	1	2	3	4
7.	I fear that if I become kinder and less self-critical to myself then my standards will drop	0	1	2	3	4
8.	I fear that if I am more self-compassionate I will become a weak person	0	1	2	3	4
9.	I have never felt compassion for myself, so I would not know where to begin to develop these feelings	0	1	2	3	4
10.	I worry that if I start to develop compassion for myself I will become dependent on it	0	1	2	3	4
11.	I fear that if I become too compassionate to myself I will lose my self-criticism and my flaws will show	0	1	2	3	4
12.	I fear that if I develop compassion for myself, I will become someone I do not want to be	0	1	2	3	4
13.	I fear that if I become too compassionate to myself others will reject me	0	1	2	3	4
14.	I find it easier to be critical towards myself rather than compassionate	0	1	2	3	4
15.	I fear that if I am too compassionate towards myself, bad things will happen	0	1	2	3	4

Appendix K

Eating Disorder Examination Questionnaire

Instructions: The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all the questions. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

(tick <u>one</u> box only to answer each question) On how many days, out of the past 28 days...	0 days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Everyday
1. Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
2. Have you gone for long periods of time (8 or more of your waking hours) without eating anything at all in order to influence your shape or weight?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
3. Have you <u>tried</u> to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
4. Have you <u>tried</u> to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
5. Have you had a definite desire to have an <u>empty</u> stomach with the aim of influencing your shape or weight?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
6. Have you had a definite desire to have a <u>totally flat</u> stomach?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
7. Has thinking about <u>food, eating, or calories</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
8. Has thinking about <u>shape or weight</u> made it more difficult to concentrate on things that you're interested in (for example, working, following a conversation, or reading)?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
9. Have you had a definite fear of losing control over eating?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
10. Have you had a definite fear that you might gain weight?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
11. Have you felt fat?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

12. Have you had a strong desire to lose weight?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days)

13. Over the past 28 days, how many <u>times</u> have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?	_____ times
14. ...On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?	_____ times
15. Over the past 28 days, on how many <u>DAYS</u> have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food <u>and</u> have had a sense of loss of control at the time)?	_____ times
16. Over the past 28 days, how many <u>times</u> have you made yourself sick (vomit) as a means of controlling your shape or weight?	_____ times
17. Over the past 28 days, how many <u>times</u> have you taken laxatives as a means of controlling your shape or weight?	_____ times
18. Over the past 28 days, how many <u>times</u> have you exercised in a “driven” or “compulsive” way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	_____ times

Questions 19 to 21: Please circle the appropriate number. Please note that for these questions the term “binge eating” means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19. Over the past 28 days, on how many days have you eating in secret (i.e., furtively)? ...Do not count episodes of binge eating	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
	0	1	2	3	4	5	6
20. On what proportion of the times that you have eaten have you felt guilty (felt that you’ve done	None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time

wrong) because of its effect
on your shape or weight?
... Do not count episodes
of binge eating

0 1 2 3 4 5 6

21. Over the past 28 days,
how concerned have you
been about other people
seeing you eat? ...Do not
count episodes of binge
eating

Not at all Slightly Moderately Markedly

0 1 2 3 4 5 6

In the past 28 days...	Not at all		Slightly		Moderately		Very Much
22. Has your <u>weight</u> influenced how you think about (judge) yourself as a person?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
23. Has your <u>shape</u> influenced how you think about (judge) yourself as a person?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
24. How much would it upset you if you had been asked to weight yourself once a week (no more, or less, often) for the next four weeks?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
25. How dissatisfied have you been with your <u>weight</u> ?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
26. How dissatisfied have you been with your <u>shape</u> ?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
27. How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
28. How uncomfortable have you felt about others seeing your body (like in communal changing rooms, when swimming or when wearing tight clothes)?	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

Appendix L

Imagery Rescripting Quality Rating Scheme

1) Personal Unpleasant Body Experience. The response describes a personal *unpleasant body experience* from the past where the participant felt ashamed or embarrassed of their body or how their body looked. Where this is done well, the response is descriptive and includes details and emotions (e.g., where or when is the event taking place, what is taking place, who is present, how they might be the feeling [emotions], what they might be telling themselves [thoughts]). An example of an excellent response (a rating of 3) is: *“Steph is standing at the beach with a group of friends. Steph looks worried and anxious but her friends look like they are having fun. She hides behind that oversized t-shirt and is wrapped in an extra towel, she seems concerned about her body. It appears the thoughts she is having are making her overwhelmed and distressed and that this is the last place she would be comfortable.”*

0 = no mention of unpleasant body experience

1 = mentioned unpleasant body experience but didn't describe in detail

2 = described unpleasant body experience in detail but didn't mention emotions or thoughts

3 = described unpleasant body experience in detail and described emotions and/or thoughts

2) First/Third Person Language. The response describes a personal unpleasant body and *both first and third person language is used*. Where this is done well, the response is written in the first person (e.g., “I am in the change room, I'm trying on a pair of blue jeans...”) unless they are referring to their adult self, in which case this is written in the third person (e.g., “*adult Ellie said*”, “*older Ellie approached me*”). An example of an excellent response (a rating of 3) is: *“I am getting ready to go out for one of my best friend's birthdays. I am wearing a short black dress that belongs to my mum. I don't like it because I feel fat in it and you can see the outline of my stomach in the dress. I feel out of my comfort zone and wish I could change. Older Ellie steps in while I am turning around in the mirror trying to see if my stomach disappears from another angle, and she tells me that there is nothing there and that you can't see a thing, and tells me that it is only in my head and that I look beautiful.”*

0 = not written in the first person *or* the third person

1 = written in the first person, but not in the third person (i.e., did not refer to their adult self)

2 = written in the third person, but not in the first person (i.e., did not refer to “I”)

3 = written in the first person (i.e., when referring to the present) and written in the third person (i.e., when referring to their adult self)

3) Adult Self Present & Engaged. The response describes a personal unpleasant body experience and *their adult (or older) self is with them and intervenes or does something in the situation that is right or helpful*. Where this is done well, the response is descriptive and makes explicit reference to their adult self in the room as the events unfold (e.g., reference to “*adult Sarah*”, “*older Sarah*”, “*compassionate Sarah*”) and describes details of their adult self intervening or doing something in the situation that is right or helpful (e.g., what is adult Sarah doing, what did adult Sarah say). An example of an excellent response (a rating of 3) is: “*I’m in the playground playing Cops and Robbers with my friends and classmates. One of the girls stops me and says she no longer wants me on her team because I am slower than the others and larger. I feel crushed. Older Sarah comes up to me. She says not to worry about what others think of me because I have no idea what the future holds. She tells me I’m going to be successful and I’m going to work hard and achieve my dreams.*”

0 = no mention of adult (or older) self present

1 = mentioned adult (or older) self present

2 = mentioned adult (or older) self present and described their adult self intervening or doing something in the situation

3 = mentioned adult (or older) self present and described their adult self intervening or doing something in the situation that is right or helpful (i.e., that may positively influence the situation)

4) Self-Compassion/Compassionate Language. The response describes a personal unpleasant body experience and *their wiser and more compassionate adult self is with them and offers them compassion or provides them with new updated information based on what they know now as an adult*. Where this is done well, the response is descriptive and includes an array of examples of compassionate intervening statements and/or gestures, and the response overall has a strong sense of compassion/self-compassion in the language used. An example of an excellent response (a rating of 3) is: “*I was at home trying on some old clothes. I was with older Amy. As I was trying to out on some old shorts, I realised they were too small for me. I start to become upset and stressed. Older Amy said to me ‘getting bigger is simply a part of growing older, you are not becoming fatter but becoming more like a woman, you look great just the way you are now’.*”

0 = made no reference to intervening statements and/or gestures

1 = made reference to intervening statements and/or gestures, but these were not compassionate

1 = made reference to intervening statements and/or gestures that were compassionate, but the compassion/self-compassion is discounted and overall sense of the response is to minimize compassion/self-compassion

2 = made reference to intervening statements and/or gestures that were compassionate

3 = made reference to intervening statements and/or gestures that were compassionate, and there was a strong sense of compassion/self-compassion in the language used