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Dissonance-Based Eating Disorder Preventive Intervention and Attentional Biases in Body-Dissatisfied University Women: A Cluster Randomized Controlled Trial

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Dissonance-Based Eating Disorder Preventive Intervention and Attentional Biases in Body-
Dissatisfied University Women: A Cluster Randomized Controlled Trial

by

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A THESIS

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Abstract

Body dissatisfaction is associated with maladaptive attentional biases theorized to contribute to the development of eating disorders. The Body Project is a cognitive dissonance-based preventive intervention that reduces body dissatisfaction and other eating disorder risk factors. It is unknown whether Body Project participation reduces attentional biases associated with body dissatisfaction. This question is important given attempts to reduce such maladaptive attentional biases have been largely unsuccessful in past research. Additionally, research has yet to examine Body Project participation's effects on body appreciation in university women, an at-risk demographic, which is important because research has shown body appreciation to protect women from negative effects of media exposure. We evaluated the efficacy of Body Project participation in reducing attentional biases and self-reported outcomes, including body appreciation, via a cluster randomized controlled trial. A sample of 168 body-dissatisfied university women were randomized to: Body Project, Media Psychoeducation (active control), or Waitlist control condition. An additional 64 body-satisfied university women completed assessments only to examine whether a subset of the current sample replicated past attentional bias findings. Outcome data were collected at Baseline, post-intervention, and 1-month follow-up. Attention was assessed via eye-tracking and additional outcomes via questionnaires. Results showed that, as hypothesized, Body Project participation reduced attention to images of "thin" models compared to Waitlist, but not for weight-related words. It also led to improved body appreciation compared to Waitlist, and replicated self-report outcomes in the literature, although effects were not seen at 1-month follow-up. Together, results indicate Body Project participation's effects extend to cognitive processes suggesting an avenue to reduce maladaptive attentional biases, and that Body Project participation's effects on body appreciation extend to

university women. The Media Psychoeducation condition performed similarly on several outcomes as the Body Project condition, including some attentional biases, suggesting media literacy programs may be a viable alternative to reduce several eating disorder risk factors. Future studies should examine whether effects on attention are sustained at follow up, and components analyses are needed to determine the program's active ingredients for various outcomes.

Keywords: dissonance; the Body Project; prevention; eating disorders; attention; eye-tracking; body appreciation; body dissatisfaction

Preface

This thesis is original, unpublished, independent work by the author, L. Tobin. The research reported in this thesis was covered by Ethics Certificate number REB16-1338, issued by the Conjoint Faculties Research Ethics Board at the University of Calgary for the project “Does a Cognitive Dissonance-Based Eating Disorder Prevention Intervention Reduce Attentional Biases in Body-Dissatisfied Women?” on April 11, 2017.

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List of Abbreviations

CRCT	Cluster randomized controlled trial
SPIRIT	Standard Protocol Items: Recommendations for Interventional Trials
RPS	Research Participation System
ANOVA	Analysis of Variance
ICC	Intraclass correlation coefficient
VAS	Visual Analogue Scale
BMI	Body mass index
BAS-2	Body Appreciation Scale-2
BSQ	Body Shape Questionnaire
BD-VAS	Body Dissatisfaction Visual Analogue Scale
SATAQ-4R	Sociocultural Attitudes Towards Appearance Questionnaire-4 Revised
EDE-Q	Eating Disorder Examination Questionnaire
LMM	Linear mixed modeling

Background

1.1 Introduction

Eating disorders are amongst the most prevalent psychiatric disorders affecting women in Westernized cultures (Stice, Rohde, & Shaw, 2013), and are associated with a range of medical complications (Mehler, 2011; J. Mitchell & Crow, 2006). In severe cases, eating disorders can lead to death (Arcelus, Mitchell, Wales, & Nielsen, 2011). They show a chronic course, as those who present for treatment have suffered an average of seven years (Stice, Marti, & Rohde, 2013). Unfortunately, 80% of those with eating disorders do not receive treatment (Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011), and of those who do receive treatment, only approximately 40-50% of clients are symptom-free at the end of treatment (Stice, Marti, et al., 2013). In addition, existing treatments can be time-consuming and costly (Stice, Becker, & Yokum, 2013). From both public health and humanitarian perspectives it is best to prevent eating disorders prior to their emergence. Thus, an important public health priority is to develop and research effective prevention programs for eating disorder risk factors (Stice, Becker, et al., 2013).

The proposed study extended existing research on a preventive intervention that targets body dissatisfaction, a key risk factor in the development and maintenance of eating disorders (Stice, Gau, Rohde, & Shaw, 2017; Stice, Marti, & Durant, 2011). We examined the effects of this intervention on maladaptive attentional biases observed in body-dissatisfied women, which are theorized to contribute to the development and maintenance of eating disorders (Vitousek & Hollon, 1990; Tobin, Sears, Zumbusch, & Von Ranson, 2018). We also determined whether the intervention's salutary effects on body appreciation, previously identified in adolescent girls

(Halliwell, Jarman, McNamara, Risdon, & Jankowski, 2015), extended to a sample of university women and to a 1-month follow-up.

1.2 The Body Project

In a meta-analytic review of eating disorder prevention programs, cognitive dissonance-based interventions were found to be the most effective targeted body image interventions to date for girls and women aged 14 and older (Stice, Shaw, & Marti, 2007). Another review of eating disorder prevention programs has similarly found cognitive dissonance prevention interventions for eating disorders to produce reliable, reproducible, and clinically meaningful effects in efficacy trials (Stice, Becker, et al., 2013). Cognitive dissonance is thought to occur when there is a discrepancy between one's beliefs or attitudes, and behaviour (Festinger, 1957). The experience of dissonance is thought to create discomfort, and resultantly individuals change their beliefs to be in line with their behaviours. Thus, the core tenet of cognitive dissonance-based interventions is the concept of engaging participants in counter-attitudinal behaviours (e.g., speaking out against the thin ideal) to enact change through cognitive dissonance (Stice, Presnell, Gau, & Shaw, 2007). For those with pre-existing body image issues, these selective primary interventions have led to reductions in body dissatisfaction, thin-ideal internalization, risk for onset of eating disorders, negative affect, and psychosocial impairment (Stice, Shaw, et al., 2007).

The Body Project (Stice, Rohde, & Shaw, 2013), a manualized cognitive dissonance-based preventive intervention, targets body dissatisfaction, thin-ideal internalization, and eating disorder symptoms. This intervention is based on the dual pathway model of eating pathology (Stice, 2001). According to this model, pressure to be thin and internalization of a thin ideal (i.e., thin-ideal internalization) lead to body dissatisfaction. These factors then lead to dieting and

negative affect, which increase an individual's risk for engaging in binge eating and compensatory behaviours. Therefore, to prompt a reduction in thin-ideal internalization and body dissatisfaction, in the Body Project program, girls and young women discuss costs of pursuing the thin/appearance ideal in verbal, written, and behavioural exercises, providing several opportunities to vocalize opposition towards social forces that drive the thin ideal. These tasks are purported to create cognitive dissonance and influence individuals to change their beliefs to align with their behaviours. Support for cognitive dissonance as the proposed mechanism of this manualized intervention comes from demonstrations that higher cognitive dissonance versions of the intervention produce larger reductions in eating disorder symptoms than lower cognitive dissonance versions (Green, Scott, Diyankova, & Gasser, 2005; McMillan, Stice, & Rohde, 2011). Additionally, reductions in thin-ideal internalization have been shown to mediate the effects of this intervention on reducing eating disorder symptoms (Seidel, Presnell, & Rosenfield, 2009; Stice, Presnell, et al., 2007). In addition to inducing cognitive dissonance, dissonance preventive interventions often incorporate psychoeducation, media literacy, and behavioural components (Halliwell & Diedrichs, 2014).

The Body Project program was the first eating disorder prevention program demonstrated to significantly reduce eating disorder symptoms (Stice, Mazotti, Weibel, & Agras, 2000). Results from more than 35 trials conducted by independent research teams have shown the Body Project program and its adaptations to reduce body dissatisfaction, thin-ideal internalization, eating pathology, and several other eating disorder risk factors in adolescent and adult female populations (Becker, MacKenzie, & Stewart, 2015; Becker & Stice, 2017; Stice, Becker, et al., 2013). Additionally, reductions in risk factors for eating disorders, eating disorder symptoms, functional impairment, and onset of eating disorders have demonstrated effects at follow-up,

which have persisted up to 3-year follow-up compared to control conditions (e.g., Becker, Smith, & Ciao, 2005; Halliwell & Diedrichs, 2014; Matussek, Wendt, & Wiseman, 2004; K. Mitchell, Mazzeo, Rausch, & Cooke, 2007; Stice, Marti, Spoor, Presnell, & Shaw, 2008; Stice, Rohde, Durant, & Shaw, 2012; Stice, Shaw, Burton, & Wade, 2006). The intervention has also been shown to increase resiliency towards negative effects of the media on body dissatisfaction and thin-ideal internalization at 1-month post-intervention (Halliwell & Diedrichs, 2014). In summary, the Body Project is an effective preventive intervention for eating disorders with enduring effects (Stice, Rohde, & Shaw, 2013).

A limitation of the evidence base for the Body Project is that the vast majority of trials have not included objective (e.g., biological, cognitive, obesity onset) measures, which ensure demand characteristics are not responsible for self-reported intervention effects (Becker & Stice, 2017). In research on the Body Project, objective measures examined to date include reduced rates of obesity onset (Stice et al., 2006), reduced brain reward region response to thin model images assessed via fMRI (Stice, Yokum, & Waters, 2015), and reduced EKG-assessed markers of cardiac abnormalities (Green et al., 2017). Although these studies provide preliminary evidence that Body Project participation can affect biological outcomes, no research has yet explored the potential effects of Body Project participation on attentional biases, implicit cognitive biases that are less susceptible to demand characteristics than self-report measures (Wiers & Stacy, 2006). Attentional biases for weight-related information are theorized to contribute to both the development and maintenance of eating disorders (Vitousek & Hollon, 1990), and research has supported the role of attentional bias in the development and maintenance of body dissatisfaction (Rodgers & DuBois, 2016), making attentional bias important to target.

1.3 Attentional Bias and Body Dissatisfaction/Eating Disorders

Cognitive theories of body dissatisfaction (Cash & Labarge, 1996; Williamson, White, York-Crowe, & Stewart, 2004) and eating disorders (Vitousek & Hollon, 1990) suggest schemas related to appearance, weight, and shape influence individuals' information processing about body image, including attentional processes. Schemas for body image are purported to lead to biases that cause selective attention to and processing of environmental body image-related information. It is hypothesized that biases in attention and other cognitive processes lead to unhealthy behaviours, including disordered eating (Vitousek & Hollon, 1990; Williamson et al., 2004) and negative emotions surrounding body image (Williamson et al., 2004), suggesting that attentional and other cognitive biases influence the etiology and maintenance of body dissatisfaction and eating disorders (Cash & Labarge, 1996; Vitousek & Hollon, 1990; Williamson et al., 2004). Additionally, the high prevalence of appearance-related stimuli in the environment may lead individuals with such biases to be vulnerable to worsening body dissatisfaction (Rodgers & DuBois, 2016).

According to a recent review, 22 studies had examined attentional biases related to body dissatisfaction, and eye-gaze tracking was the dominant paradigm used to measure attention, as it was used in 11 of the 22 studies (Rodgers & DuBois, 2016). Attentional biases to weight and body-related stimuli exist in individuals at risk for development of eating disorders, (e.g., Gao, Wang, et al., 2011; Li, Jackson, & Chen, 2011; Markis & McLennan, 2011). Eye-tracking studies suggest that, compared to controls, body-dissatisfied individuals orient more toward desired (Cho & Lee, 2013; Gao et al., 2014) and feared appearance-related stimuli (Gao, Deng, et al., 2011; Gao et al., 2014; Gao, Wang, Chen, Wang, & Zhao, 2012; Gao, Wang, et al., 2011). A reciprocal relationship has also been demonstrated such that deliberately redirecting attention

toward non-preferred appearance-related stimuli results in body dissatisfaction (Joseph, 2014; Smeets, Jansen, & Roefs, 2011; Smith & Rieger, 2006, 2009), which suggests these attentional biases are not just a result of body dissatisfaction, but may also play a role in the development and maintenance of body image concerns.

There has been some debate in the literature regarding attention to thin-and fat-related information (Tobin et al., 2018). Some researchers hypothesize that maladaptive weight-related schemas lead those with body image difficulties to preferentially process schema-congruent information (such as fat-related stimuli) and to avoid schema-incongruent information (such as thin-related stimuli) (Cassin, von Ranson, & Whiteford, 2008; Gao, Wang, et al., 2011). Several studies have supported this hypothesis, finding attentional biases for fat-related stimuli and an avoidance of or no bias for thin-related stimuli in weight/body-dissatisfied women (Gao, Wang, et al., 2011; Glauert, Rhodes, Fink, & Grammer, 2010) and women with an eating disorder (Rieger et al., 1998; Shafran, Lee, Cooper, Palmer, & Fairburn, 2007). However, other researchers hypothesize that maladaptive weight-related schemas lead women with body-image difficulties to preferentially process all weight- or body-related information (including both “thin” and “fat”), which has been supported in body-dissatisfied women (Gao et al., 2014; Markis & McLennan, 2011; Tobin et al., 2018; Withnell, Sears, & Von Ranson, 2019) and women with an eating disorder (Dobson & Dozois, 2004; Lee & Shafran, 2004; Smeets, Roefs, van Furth, & Jansen, 2008).

A replicated finding has been an attentional bias for both thin-related and fat-related stimuli in body-dissatisfied women (Gao et al., 2014; Gao et al., 2013; Tobin et al., 2018; Withnell et al., 2019). For example, compared to body-satisfied women, body-dissatisfied women gazed longer at both “fat” and “thin” words, providing support for an attentional bias

towards weight words among women with body dissatisfaction (Tobin et al., 2018). Body and weight-dissatisfied women have also been found to demonstrate an attentional bias to both fat- and thin-related images (Gao et al., 2014; Withnell et al., 2019). Demonstration of attentional bias for both word and image stimuli is important because words may be interpreted as information that is self-relevant, as they may resemble an individual's inner discourse (Rodgers & DuBois, 2016), whereas images may reflect an individual's environment. Social comparison is thought to be activated when stimuli are perceived as reflecting the environment (Tafjel & Turner, 1986). Thus the stimuli used to measure attention provide insight into potential mechanisms involved in attentional bias. Additionally, word stimuli allow for control of multiple features, such as valence, normative frequency, and number of letters, increasing the internal validity of this stimulus type (Tobin et al., 2018). This level of control is somewhat more difficult with images, given the various differences in the foreground and background of images, however as images may be more reflective of one's environment, this would mean increased external validity for this stimulus type. The findings of an attentional bias for both weight-related words and images in body-dissatisfied women demonstrates the robustness of this bias to both stimuli types.

Findings of attentional bias for appearance-related stimuli in body-dissatisfied women and the reciprocal nature of induced attentional bias on body dissatisfaction provide support for the role cognitive biases play in models of the development and maintenance of body image dissatisfaction (Rodgers & DuBois, 2016). These biases are also important to target in prevention programs aimed at reducing other eating disorder risk factors, such as self-reported thin-ideal internalization and body dissatisfaction. Given that the core aim of cognitive dissonance-based interventions is to cause a shift in attitudes or beliefs (Stice, Rohde, & Shaw, 2013), which are

core components of our schemas (Beck, 1990), the Body Project program may shift automatic attentional processes thought to be caused by maladaptive body-image schemas.

The current study examined whether participation in the Body Project program reduced maladaptive attentional biases for weight-related information associated with body dissatisfaction (compared to a waitlist control condition), which has been largely unsuccessful in past research (Glashouwer, Jonker, Thomassen, & de Jong, 2016; Loughnan, Mulgrew, & Lane, 2015; Withnell et al., 2019). For example, a systematic review on the use of cognitive bias modification on attentional biases for appearance and self-worth stimuli found cognitive bias modification to be largely ineffective at eliciting bias change overall (Matheson, Wade, & Yiend, 2019).

Findings have been equivocal regarding whether attentional biases to weight and appearance stimuli can be heightened, with several studies reporting an increase in attentional biases after exposure to thin models (Johansson, Lundh, & Andersson, 2005; Labarge, Cash, & Brown, 1998; Lane, Mulgrew, Mahar, White, & Loughnan, 2017; Markis & McLennan, 2011) but several studies reporting no change in attentional bias after thin model exposure (Cassin et al., 2008; Smith & Rieger, 2010; Tobin et al., 2018). Additionally, there has been less research examining whether maladaptive attentional biases for weight- or appearance-related information can be reduced (Withnell et al., 2019). Of these studies, almost all were unable to improve attentional biases related to body dissatisfaction (Glashouwer et al., 2016; Khaleghi, 2018; Loughnan et al., 2015; Withnell et al., 2019), with one study finding an attentional bias modification procedure using the dot-probe task to be effective in training women to direct their attention away from appearance-related words (L. Allen, Mulgrew, Rune, & Allen, 2018). However, these attentional bias modification findings were specific to only women high in self-

reported appearance importance, and did not extend to women with high or low levels of shape concern, similar to past research (Loughnan et al., 2015).

If research was to demonstrate that Body Project participation improved maladaptive attentional biases relative to a control condition, it might provide a new direction for research aimed at reducing such biases (i.e., cognitive dissonance-based preventive interventions targeting body dissatisfaction). Additionally, as attentional biases are less susceptible to self-reporting biases than questionnaires and more reliably measure cognitive processing (Wiers & Stacy, 2006), if research was to demonstrate that Body Project participation reduced maladaptive attentional biases compared to a control condition, it would increase confidence that the intervention has changed cognitive processes and not just self-reported perceptions.

1.4 Body Appreciation

In addition to the need for examination of the effects of Body Project participation on attentional biases, body appreciation is a self-report outcome that also warrants further investigation with this preventive intervention in a university student sample. Body appreciation has been defined as accepting, holding favourable opinions toward, and respecting the body, and not accepting media-promoted appearance ideals as the only form of beauty (Avalos, Tylka, & Wood-Barcalow, 2005). Body appreciation is inversely related to body dissatisfaction and thin-ideal internalization (Tylka & Wood-Barcalow, 2015), the two core constructs targeted in the Body Project program. However, body appreciation predicted additional variation in well-being after body satisfaction had been accounted for, and is considered distinct from body satisfaction (Avalos et al., 2005). It has also been found to protect women from the negative effects of media exposure on body dissatisfaction (Andrew, Tiggemann, & Clark, 2015); women high in body appreciation gave lower ratings for the importance of discrepancies between their own

appearance and the appearance of models who reflected the thin-ideal (Halliwell, 2013), even in participants with high levels of thin-ideal internalization. Thus, there is evidence that body appreciation can protect women from negative effects of media exposure, making it important to research ways to increase body appreciation in those particularly at risk for the development of eating disorders, such as university women (Phillips & Pratt, 2005).

Research with high school girls, middle-aged women with overweight or obesity, and men has shown positive effects of cognitive dissonance-based preventive interventions on body appreciation (Halliwell et al., 2015; Jankowski et al., 2017; Olson, Thaxton, & Emery, 2018). However, effects of Body Project participation on body appreciation in university-aged women, a demographic at risk for the development of eating disorders (Phillips & Pratt, 2005), have yet to be explored. Additionally, sustainability of Body Project participation's effects on body appreciation in women has been limited, with one study demonstrating sustained effects of Body Project participation on body appreciation post-intervention and at a three month follow-up in young British men, however these effects were not retained for post-intervention or three month follow-up under intention-to-treat analysis (Jankowski et al., 2017). The present study examined whether Body Project participation's effects on body appreciation extend to university women, and if effects persisted in a university women sample at a 1-month follow-up.

1.5 Aims and Hypotheses

The integration of dissonance prevention and attentional bias research related to eating disorders has important implications, providing a potentially fruitful target for reducing eating disorder risk factors as well as a unique measure (i.e., cognitive bias) to examine Body Project participation's effects. Additionally, research demonstrating the protective nature of body appreciation on the negative effects of thin-ideal media (Andrew et al., 2015) highlights the

importance of continued research on programs shown to improve body appreciation in populations at risk for development of an eating disorder.

Our *primary aim* was to examine whether participation in the Body Project reduces attentional biases associated with body dissatisfaction in a randomized controlled trial. Our *primary hypothesis* was that women who complete this intervention would show a greater reduction in attentional biases (both attentional maintenance and attentional re-engagement) to weight-related images and words (both thin- and fat-related) at post-intervention compared to a waitlist control condition in which women did not receive the intervention. As an exploratory aim we also explored whether participation in an active control condition (media psychoeducation) showed greater reduction in the same attentional biases at post-intervention compared to the waitlist control condition to determine whether effects are specific to Body Project participation.

The *three secondary aims* of the present study were as follows:

1. We aimed to examine Body Project participation's effects on body appreciation in university women post-intervention and at 1-month follow-up. We hypothesized that women in the Body Project condition would show a greater increase in body appreciation from baseline to post-intervention, and from baseline to 1-month follow-up, compared to the waitlist control condition. We also explored whether participation in the media psychoeducation active control condition showed a greater increase in body appreciation from baseline to post-intervention, and from baseline to 1-month follow-up, compared to the waitlist control condition.
2. To assess how effectively we delivered the Body Project program, changes in body dissatisfaction, eating disorder psychopathology, and thin-ideal internalization at post-

intervention and at 1-month follow-up were evaluated. Similar to findings from a line of research that included a media psychoeducation active control condition and examined similar-aged women with body image concerns as the current study (Becker et al., 2005), it was hypothesized that compared to the waitlist control condition, women in both the Body Project and media psychoeducation conditions would show greater reductions in self-reported body dissatisfaction and eating disorder psychopathology symptoms from baseline to post-intervention, and from baseline to 1-month follow-up. It was also expected that only women in the Body Project condition would show a greater reduction in thin-ideal internalization than the waitlist condition from baseline to post-intervention, and from baseline to 1-month follow-up.

3. To examine how consistent attentional biases to weight-related stimuli were in the current sample compared to previous findings (Rodgers & DuBois, 2016; Tobin et al., 2018; Withnell et al., 2019), attentional biases in body-satisfied vs. body-dissatisfied women were compared. It was hypothesized that body-dissatisfied women who did not receive the intervention (i.e. the waitlist condition) would display greater attentional maintenance and re-fixation biases to thin- and fat-related words compared to a group of body-satisfied women who did not receive the intervention (body-satisfied condition), replicating past research (Tobin et al., 2018). It was also hypothesized that these findings would extend to thin- and fat-related images, as shown in past research (Gao et al., 2014; Withnell et al., 2019). The waitlist condition was also not expected to differ from the body-satisfied condition in changes in attentional biases between first assessment and second assessment (conducted one week after first assessment), as they did not receive any preventive intervention and thus no changes in attention would be expected for either group.

Methods/Design

2.1 Study Design

This study was a three-arm, single-blinded (except at 1-month follow-up), superiority cluster randomized controlled trial (CRCT) with a repeated measures design. Table 1 presents the overall study design, enrollment process, allocation, and follow-up of participants. Appendix A shows the Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT) checklist. The trial was conducted at the Department of Psychology, University of Calgary, Canada. All potential participants completed a pre-screen self-report Likert scale measure for body dissatisfaction or body satisfaction.

Table 1. *SPIRIT Schedule of Enrolment, Interventions, and Assessments*

TIMEPOINT	STUDY PERIOD				
	Enrolment	Allocation	Post-allocation		
	<i>Prior to Week 1</i>	<i>1 day prior to Week 1</i>	<i>Week 1</i>	<i>Week 2</i>	<i>1-Month Follow-Up</i>
ENROLMENT:					
Eligibility screen (via RPS)	X				
Participants Sign up for Study on RPS	X				
Informed consent			X*		
Allocation of Time Slots		X			
INTERVENTIONS:					
<i>The Body Project</i>			◀──▶		
<i>Media Psychoeducation</i>			◀──▶		

Waitlist**					
Body-Satisfied Assessment-Only					
ASSESSMENTS:					
Demographic Information			X		
Eye-Tracking Assessment			X	X	
Self-Report Questionnaires			X	X	X***

*Informed consent at Week 1 immediately prior to initiating testing.

**In the debriefing at the end of session 2, Waitlist condition participants were offered to be involved the Body Project intervention *after* completion of the study period (i.e., after one month’s time from session 2).

***All conditions except Body-Satisfied assessment-only completed 1-month follow-up assessment.

Participants screened as “body-dissatisfied” were permitted to sign up for study time slots via the Department of Psychology bonus credit system (Research Participation System; RPS; Sona, <https://ucalgary.sona-systems.com/>). This system allows undergraduate students at the University of Calgary who are enrolled in at least one Psychology course to participate in research studies in exchange for course credit. Time slots were randomly allocated to a Body Project condition, a Waitlist control condition, or a Media Psychoeducation active control condition. The study employed a parallel design for body-dissatisfied participants with a 1:1:1 allocation ratio. Up to five participants were able to enroll per time slot, with a goal of approximately four participants per group, allowing for no-shows or not all timeslots being filled. Predicted timeslot usage and no-shows were based on previous research with the RPS system (Tobin et al., 2018). Participants who were allocated to the Body Project condition

received the Body Project cognitive dissonance preventive intervention. Those allocated to the active control group received a Media Psychoeducation preventive intervention, adapted from previous research (Becker et al., 2005). Those in time slots allocated to the Waitlist control condition were given the opportunity to receive the Body Project program five to six weeks after their initial assessment, after all assessments had been completed.

Participants screened as “body-satisfied” were permitted to sign up for time slots for a different study on the RPS system. This group was not included in the random allocation sequence because it was included in the study solely to permit comparisons of attentional bias between body-satisfied and body-dissatisfied women, with the aim of comparing the current sample with previous attentional bias findings (secondary aim 3).

Assessments were administered immediately before and immediately after the Body Project and Media Psychoeducation interventions (both of which entailed two group sessions, delivered exactly one week apart), and one month after completion of the respective intervention. For the Waitlist condition, assessments were administered during the same time frame as the Body Project and Media Psychoeducation conditions, exactly one week apart, with a follow-up assessment one month after completion of the second assessment. For the Body-Satisfied attention comparison condition, assessments were also administered exactly one week apart, with no 1-month follow-up.

2.2 Statistical Power and Sample Size Calculation

We conducted a power analysis to ensure the study would have adequate power to detect whether Body Project participation had a significant effect on attentional biases, our primary aim. The sample size required to detect this effect was based on an a priori power estimate (Faul, Erdfelder, Lang, & Buchner, 2007). Given the complexity of power estimations for multilevel

models, this a priori estimate was based on a mixed-model analysis of variance (ANOVA) model to ensure there was sufficient power to detect whether Body Project participation had a significant effect on attentional bias scores from baseline to session 2, compared to the Waitlist condition. This estimate was conducted with an alpha of 0.05 and a power of 0.80. Eye-tracking studies tend to suggest that those with high body dissatisfaction levels orient more to desired (e.g., “thin”) and feared (e.g., “fat”) appearance stimuli compared to controls, with medium to large effect sizes (Rodgers & DuBois, 2016). To be conservative, a medium effect size was chosen. This initial power calculation revealed that we would need 44 participants per group.

Additionally, adjustment for clustering (Campbell, Piaggio, Elbourne, & Altman, 2012) with design effect = 1.15, yielded a required sample size of 50 participants per group (Body Project and Waitlist control). The design effect assumes an intraclass correlation coefficient (ICC) of 0.05 and an average of four participants per group. Given the lack of previous data on the effects of this intervention on attention as well as cluster randomization in this literature, the inflation factor for this trial was based on a generic estimate of a small intraclass correlation (ICC = 0.05) (Hox, 2002). Additionally, researchers have suggested a minimum of 30 to 50 participants in Level 2 for multilevel linear modeling (Scherbaum & Ferrer, 2009). Assuming an equal number of participants in each group, we also aimed to have 50 participants in the Media Psychoeducation active control group and 50 participants in the Body-Satisfied assessment only group, resulting in a target sample size of 200. In past research (Becker et al., 2005) the attrition rates were: cognitive dissonance group 12%, Media Psychoeducation group 14%, and Waitlist control group 11%. We used the highest attrition rate of 14% to be conservative. Thus to achieve a sample size of 50 participants per group, we aimed to recruit up to 57 participants per group (or until a sample size of at least 50 per group at post-intervention

was reached), for a total of up to 228 participants. We aimed to recruit approximately 15 clusters per trial arm.

2.3 Recruitment Process and Population

Participants were recruited through the Department of Psychology RPS. A mass-screening question posed to all RPS participants at the start of each semester asked participants to rate their current level of body satisfaction or dissatisfaction on a Likert scale from 0 (Extremely satisfied with my body) to 10 (Extremely dissatisfied with my body). This screener question was adapted from existing visual analogue scale (VAS) measures of body, appearance, and weight dissatisfaction (Heinberg & Thompson, 1995; Tobin et al., 2018). Prescreen scores were divided into three tertiles at the beginning of each semester: lower, middle, and upper. Individuals whose scores fell in the upper tertile were deemed “body-dissatisfied” and those in the lower tertile were deemed “body-satisfied.” A tertile split on body dissatisfaction scores was chosen for the present study as it had been used to define body-satisfied and body-dissatisfied women in past studies showing significant attentional biases for weight words (Tobin et al., 2018) in body-dissatisfied women compared to body-satisfied women.

Inclusion criteria for participants were: (1) a University of Calgary student enrolled in a psychology course that allowed participation in the RPS system in exchange for bonus credits; (2) female-identified gender, determined by self-report; (3) prescreened as “body-dissatisfied” for Body Project, Media Psychoeducation, and Waitlist conditions; prescreened as “body-satisfied” for Body-Satisfied assessment-only condition, as per RPS screener question; and (4) no uncorrected visual impairment, self-reported. Exclusion criteria were: (1) participated in any previous studies that have used the word or image stimuli used for the current study, including stimuli development rating studies, determined by RPS study database; (2) participated in the

current study already; (3) only participants who were able and willing to come into the lab were eligible to participate in the study. Female-identified gender was required for eligibility, as women are at higher risk for eating disorders than men (K. Allen, Byrne, Oddy, & Crosby, 2013) and because research has shown that dissatisfaction with one's body is highly prevalent amongst women in Western cultures (Phares, Steinberg, & Thompson, 2004; Rodin, Silberstein, & Striegel-Moore, 1984). Additionally, Stice and colleagues (2013) recommended recruiting women with body image concerns for the Body Project program because they are at heightened risk for eating pathology, and prevention program effects tend to be larger for those at heightened risk. Table 2 presents the overall population frequencies of students in the RPS system and frequencies of participants categorized into lower, middle, and upper body dissatisfaction tertiles.

Table 2

Population Frequencies of Students in the RPS System and Frequencies of Participants Categorized into Body Dissatisfaction Tertiles

Term	Total number of students on RPS	Identified as “Male” or “Other” Gender	Identified as “Female”	Females who did not answer prescreen question	Females who Answered Prescreen Question	Females Categorized into Each Tertile		
						Lower	Middle	Upper
			Frequencies (%)		Frequencies (% of answered)			
SS 2017	108	27 (25.0)	81 (75.0)	3 (2.8)	78 (72.2)	25 (32.1)	27 (34.6)	26 (33.3)
Fall 2017	1812	471 (26.0)	1341 (74.0)	32 (1.8)	1309 (72.2)	414 (31.6)	459 (35.1)	436 (33.3)
Winter 2018	1512	404 (26.7)	1108 (73.3)	13 (0.9)	1095 (72.4)	359 (32.8)	369 (33.7)	367 (33.5)
Total	3432	902 (26.3)	2530 (73.7)	48 (1.4)	2482 (72.3)	798 (32.2)	855 (34.4)	829 (33.4)

Note. SS = Spring/Summer; % = Percentages of total students on RPS; % of answered = Percentages of females who answered prescreen question. Lower tertile corresponded to a rating on the RPS body dissatisfaction screener question of 0-3, middle tertile corresponded to a rating of 4-6, and upper tertile corresponded to a rating of 7-10. The possible range of scores on the RPS body dissatisfaction screener question was 0-10.

Note that RPS only allowed participants to sign up for the study that allocated timeslots to Body Project, Waitlist, and Media Psychoeducation conditions if they had been deemed “body-dissatisfied” based on their response to the mass screener question. Similarly, RPS only allowed participants to sign up for the study with timeslots for the Body-Satisfied assessment-only condition if they had been deemed “body-satisfied” based on the pre-screen question. Additionally, RPS only allowed participants to sign up for the study if they identified as a “Female”, for all conditions, and had not participated in the current study already or any of the stimuli development studies noted above.

Participants who met the eligibility requirements were able to sign up for a timeslot for one of the two studies on the RPS online system (Sona; <https://ucalgary.sona-systems.com/>). They were not contacted prior to attending the first session. Study timeslots with the body-dissatisfaction eligibility requirement were randomly assigned to one of three conditions: (1) the Body Project condition; (2) Media Psychoeducation active control condition; and (3) a Waitlist control condition. Assignment of timeslot clusters to conditions was determined by a Microsoft Excel randomization generator. The random allocation sequence was generated by a colleague in the Department of Psychology. Randomization of clusters was performed as complete (simple) randomization with a goal of 1:1:1 allocation, and the allocation sequence was concealed in sealed envelopes until the day prior to each group, to allow group facilitators sufficient time to prepare for intervention delivery. Thus, participants were automatically assigned to an intervention condition based on the timeslot they chose. The author oversaw this process the day prior to each group. Timeslots in the study with the body-satisfaction eligibility requirement were not randomly assigned, as there was only one Body-Satisfied condition.

Participants in all conditions were blind to the fact that there were multiple training groups, as well as to which condition they were assigned (no mention of “the Body Project,” “Media Psychoeducation,” “Waitlist,” “eating disorder prevention,” or related concepts were made), at baseline and session 2. All three randomized groups were provided the following generic information about the study: “The purpose of this study is to understand how individuals differ in their attention to different words and images, as well as to discuss the thin ideal as portrayed in the media. In particular, it is to understand how both individual difference factors and knowledge of this information can influence attention.” However, given that the follow-up study was administered as a separate study on RPS, participants were debriefed at the end of session 2 of the main study, and at this time were informed of the condition they were assigned to and the purposes of the study. For this reason, participants were not blind for the follow-up assessment, and implications of this design specific are considered in the discussion.

While researchers administering the pre- and post-assessments were the same researchers delivering the interventions and so were not blind to condition, steps were taken to maximize the objectivity of assessment administration. Specifically, in-lab self-report assessment measures were delivered via computers, with the same written instructions on the survey given to all participants. Additionally, eye-tracking data assessment is considered a more objective measure of automatic cognitive processes than self-report. Researchers were trained on instructions to provide all participants prior to administration of self-report and eye-tracking measures, and trained on the study administration protocol. One month follow-up measures were completed online.

Retention strategies included: offering sessions during the day and on evenings and weekends to provide a range of timeslots for varying participant schedules (which doubled as a

strategy to maximize initial recruitment), and holding session 2 at the same time as the first session. Participants were awarded bonus credits in a psychology course for their study participation. Participants were offered to have their name placed in a draw to win a gift card prize or 0.5 bonus credit for filling out the follow-up online survey.

2.4 Ethics, Permissions, Consent, and Discontinuation of Participants

The present study was reviewed and approved by the Conjoint Faculties Research Ethics Board at the University of Calgary (#REB16-1338). The study was registered with ClinicalTrials.gov (#NCT03219814, initial release date July 18, 2017). All participants received written and verbal information regarding study procedures, and informed consent was obtained prior to engagement in the study. Appendix B displays informed consent and debriefing forms used for this study. To ensure confidentiality, all data are kept in digital files with password protection, and individuals' names were removed from password-protected data. Participants were allowed to discontinue the study and withdraw their consent at any time, and their data would be erased up until the point they submitted their survey data (at which point it could not be deleted due to anonymity of the data). No participants during the study withdrew their consent.

2.5 Preventive Interventions

2.5.1 The Body Project. Participants in the Body Project condition completed the Body Project Peer Leader, 2-Session Version, Canadian Edition (Becker, Stice, Rohde, & Shaw, 2017). In the Body Project condition, groups of participants were asked to consider the costs of pursuing the thin ideal in verbal, written, and behavioural exercises. Participants were asked to assume the role of a body activist, and were given several opportunities to vocalize opposition to the social forces that drive the thin ideal. With an average of four women per group, the Body Project sessions in the current study took approximately 75 minutes each, for a total duration of

2.5 hours. Of note, previous research has demonstrated that with treatment dosages less than the current study (four 20-minute sessions, Halliwell & Diedrichs, 2014; one two-hour session, Matusek et al., 2004), these adaptations of the Body Project program have still been found to significantly reduce body dissatisfaction, thin-ideal internalization, eating behaviours, and resiliency to thin-ideal media at 1-month follow up. The two-session intervention consisted of the following specific tasks:

2.5.1.1 Session 1. To begin this session, participants were asked to describe the thin ideal, as well as to discuss ways in which it is maintained, and to identify who benefits from this thin ideal. They were then asked to complete a written exercise in which they listed the costs in pursuing the thin ideal. Afterwards, participants were asked to share these costs with the group, and the group engaged in discussion about how attainable this thin ideal is, taking the costs into account. Participants were assigned a counter-attitudinal exercise for homework: they were asked to stand in front of a mirror wearing as little clothing as felt comfortable for 5-10 minutes, and to note only positive attributes of themselves while doing so. The positive attributes could include physical, emotional, intellectual, and social qualities. They were also asked to complete a behavioural challenge in which they challenged themselves to do something they normally did not do because of body image concerns, such as going to the pool in a swimsuit or wearing their hair up, over the week between sessions. Finally, they were asked to write a short letter to a younger girl talking about the pressures of pursuing the thin/appearance-ideal. They were informed that they would be sharing their experience of the homework exercises with the group in the second session.

2.5.1.2 Session 2. Participants began this session by sharing with the group the letter they had written to a younger girl, debriefing about the behavioural challenge, and sharing with group

members the positive attributes they had noticed when completing the mirror exercise. They were then asked to discuss body activism, as well as future pressures to conform to the appearance ideal and how they will respond to these pressures. Additionally, they were asked to practice quick comebacks to “fat talk” statements. They were then engaged in a role-play exercise. The goal of this role-play was to convince each of the group facilitators to give up the pursuit of the thin ideal. Group facilitators role-played as: a student who is suffering from anorexia nervosa; a compulsive exerciser; and an excessive and unhealthy dieter. These subgroups were asked to brainstorm reasons why each of the “characters” depicted by the group facilitators should discontinue pursuit of the thin ideal. At the end of the session, group members were engaged in discussion about the role-play and asked to make any final remarks on their experience. Finally, participants were asked to complete two exit exercises; a self-affirmation exercise, and writing a second letter to a younger girl.

2.5.2 Media Psychoeducation. Participants in the Media Psychoeducation condition completed tasks adapted from Becker et al.’s (2005) Media Psychoeducation active control group, which included no cognitive dissonance tasks. This two-session intervention consisted of the following specific tasks:

2.5.2.1 Session 1. This session began with a description of the thin ideal. The group was then asked to discuss the media’s influence on the thin ideal. The focus of this discussion was on advertising, and ways in which advertisements perpetuate the thin ideal. Participants then watched a 35-minute psychoeducational video on the influence that advertisements have on body image and perpetuating the thin ideal, “Killing us Softly 4: Advertising’s Image of Women” (Jhally, 2010). Participants were asked to discuss their reactions to this video. In addition to the outlined tasks in the Media Psychoeducation session 1 of Becker et al.’s (2005) protocol, we

assigned participants a Media Psychoeducation exercise as homework, to ensure consistency with the Body Project condition's protocol, which assigns homework. Participants were asked to spend approximately 5-10 minutes on the internet coming up with images of models they believed had been altered or Photoshopped, with the purpose of learning that even the "thin-ideal" celebrities are not always as they seem. They were asked to record their thoughts on a handout while completing the exercise. Participants were informed that they would be sharing their experience of the homework exercise with the group in the second session.

2.5.2.2 Session 2. This session began with a discussion of the homework exercise and thoughts participants had while looking for Photoshopped images in the media. Participants were then engaged in discussion surrounding the attainability of the thin ideal; this discussion was expanded to include all forms of media, not just advertising (e.g., social media). Participants then discussed efforts needed by celebrities to achieve the thin ideal. Participants were asked to consider and discuss differences between individuals in the media images and themselves, as well as whether achieving this "ideal" is realistic. Participants then watched a 20-minute video on eating disorders, "Dying to be Thin" (McPhee, 2000), which included information about the long-term effects of eating disorders. The video also contained individual stories from those who have recovered from an eating disorder, as well as stories from individuals who have stopped trying to pursue the thin ideal. After viewing the video, participants were asked to discuss the video and provide any final comments. Finally, as an exit exercise participants were asked to spend approximately 5-10 minutes on the internet coming up with images of models they believed were perpetuating new trends in the appearance ideal, and to record their thoughts.

2.6 Outcome Variables and Measures

Table 3 shows the outcome variables and measures and their administration timing for all conditions. Demographic information (self-reported age, education, and ethnicity) was obtained at the beginning of the first assessment for all conditions. Participants were also asked to self-report their height and weight at the first assessment along with the above demographic information, from which the body mass index (BMI) for each participant was calculated and used to describe the current sample. The BMI (kg/m^2) provides an estimate of adiposity (Manson, Skerrett, & Willett, 2002), and measured and self-reported height and weight are found to intercorrelate highly ($r > .90$) (Gorber, Tremblay, Moher, & Gorber, 2007).

Table 3

Outcome Variables and Measures for the Body Project, Media Psychoeducation, Waitlist, and Body-Satisfied Conditions

Construct	Measure	Administration		
		Baseline	Session 2	1-Month Follow-Up
Primary Outcomes				
Attentional Maintenance Bias for: Thin-Related Images and Words Fat-Related Images and Words Neutral Images and Words	Average time fixating on each image or word type as percentage of the total time spent fixating on entire image/word set	All conditions	All conditions	No conditions
Attentional Re-Engagement Bias for: Thin-Related Images and Words Fat-Related Images and Words Neutral Images and Words	Average number of re-fixations on each image or word type as percentage of the total number of re-fixations during the 8-second presentations	All conditions	All conditions	No conditions
Secondary Outcomes				
Body Appreciation	Body Appreciation Scale – 2 (BAS-2)	All conditions	All conditions	Body Project, Media Psychoeducation, Waitlist
Body Dissatisfaction	Body Shape Questionnaire (BSQ)	All conditions	All conditions	Body Project, Media Psychoeducation, Waitlist
State Body Dissatisfaction	Body Dissatisfaction Visual Analogue Scale (BD-VAS)	All conditions	All conditions	Body Project, Media Psychoeducation, Waitlist

Thin-Ideal Internalization	Sociocultural Attitudes Towards Appearance Questionnaire – 4 revised (SATAQ-4R). Scales: Internalization: Thin/Low Body Fat Internalization: Muscular Internalization: General Attractiveness Pressures: Media (exploratory)	All conditions	All conditions	Body Project, Media Psychoeducation, Waitlist
Eating Pathology	Eating Disorder Examination Questionnaire (EDE-Q 6.0). Scales: Global Score Restraint Eating Concern Shape Concern Weight Concern	All conditions	All conditions	Body Project, Media Psychoeducation, Waitlist

2.6.1 Primary outcome measure: Attentional bias. Eye-movement tracking was used to assess participants' attentional biases to weight-related images and words. During eye-tracking, eye movements were recorded using the EyeLink 1000 system for eye-tracking (SR Research Ltd., Ottawa, Ontario), which uses video-based infrared tracking technology. This system uses a mean gaze error of less than 0.5 degrees of visual angle, it uses a sampling rate of 1000 Hz, and it allows for a 2 millisecond temporal resolution. A ViewSonic G22f 21-inch monitor was connected to the eye-tracking system, and was placed approximately 60 cm from the participant. To increase tracking accuracy, participants were also asked to rest their chin on a chin rest to reduce head movements. Additionally, participants were required to fixate on a dot in the middle of the screen between each word or image set in order for the program to continue to the next set, to ensure eye-gaze is in the middle of the screen before stimuli were presented.

For eye-tracking data collection, 29 sets of four words presented simultaneously, and 32 sets of four images presented simultaneously were shown to each participant altogether. The stimuli sets were shown for 8 seconds each and eye gaze was tracked and recorded throughout the 8 seconds. Specifically, for word stimuli participants were each shown: 12 “thin”-neutral word sets which consisted of one thin-related word and three neutral words; 12 “fat”-neutral word sets which consisted of one fat-related word and three neutral words; and 5 purely-neutral word sets which consisted of four neutral words and serve as distractor sets. The word sets have been used in previous eye-tracking research and were previously validated (Tobin et al., 2018). For image stimuli participants were each shown: 16 “thin”-neutral image sets which consisted of one thin-related image, one image of a woman of average size doing a task in real life like reading or walking, one household image, and one garden-related image; and 16 “fat”-neutral image sets which consisted of a fat-related image, one image of a woman of average size doing a

task in real life like reading or walking, one household image, and one garden-related image. These image sets were based on image sets described in previous research (Gao et al., 2014). One word (in word sets) or one image (in image sets) was presented in each of the four quadrants of the screen. See “Eye-tracking stimuli development” sections below for more details on the word and image stimuli. To account for preferences in looking direction, presentation of fat- and thin-related words or images were counterbalanced such that they were presented an equal number of times in each quadrant of the screen. Word and image sets were presented in randomized order. There were two different blocks of stimuli sets (one block was presented at session 1, and one block at session 2), and the presentation order of these two blocks was counterbalanced between participants. Thus, while there were 58 word sets and 64 image sets altogether, a block that contains only half of these image and word sets was presented at each session. It took approximately 8-10 minutes for an eye-tracking assessment per session, which included time taken to calibrate the eye tracker.

2.6.1.1 Eye-tracking stimuli development: Word stimuli. Word stimuli were taken from a previous study in which they were developed that examined attentional biases to thin- and fat-related words in undergraduate women with body dissatisfaction (Tobin et al., 2018). In this study, words were rated by female undergraduates enrolled in a psychology course via an online survey. Participants in this survey each rated a random 50% of 380 words on: the words’ categories (asked to rate each word as either “thin,” “fat,” “neutral,” or “unsure”) and valences (asked to rate each word’s valence from -3 “very negative” to +3 “very positive”). There were 300 neutral, 40 thin-related, and 40 fat-related words rated in total. First, over 70% of participants were required to agree with the word’s category, and fewer than 10% of participants could be unsure of the word’s category in order for the word to be included as a stimulus in the

eye tracker. Of words meeting these requirements, words in the “thin”-neutral and “fat”-neutral word sets were matched on number of letters and selected to have similar printed frequencies and rated valence. The words in the all-neutral word sets were matched to the words in the other two types of word sets on number of letters (Tobin et al., 2018).

2.6.1.2 Eye-tracking stimuli development: Image stimuli. Using similar methodology as that described in previous research (Gao et al., 2014), image sets were comprised of five categories: images of “larger” female bodies (fat-related), images of “smaller” female bodies (thin-related), images of average-sized women engaged in a real-life activity, images related to gardens, and images related to the household. To develop and validate these stimuli we conducted an online survey through Qualtrics (www.qualtrics.com) for the current study. Prior to completing the survey, participants provided informed consent. The survey was completed in exchange for bonus credit by 100 undergraduate women enrolled in a psychology course, who were not involved in the eye-tracking experiment.

In the survey participants were presented with the five categories of images, which were downloaded from free Internet sites. The survey included 45 images of “larger” bodies, 45 images of “thin” bodies, and 90 images of an average-sized woman doing a task normally completed in daily life. Similar to previous research (Gao et al., 2014), the average-sized woman images were included to serve as neutral control stimuli that are also images of women, however, in these images weight and body shape information are less salient. The survey included 70 images related to gardens and 70 images related to the household, also to serve as neutral controls. Altogether 320 images were rated, but each participant only rated a randomly-selected one-third of the images. Thus from the 100 participants, each image was rated by approximately 33 to 34 participants. The survey asked participants to rate the valence of all images (including

garden and household) on a scale from -3 (extremely negative) to 3 (extremely positive). Participants were also asked to rate the body size of all images of women on a scale from -3 (extremely thin) to 3 (extremely fat) and to rate their attractiveness on a scale from -3 (extremely unattractive) to 3 (extremely attractive).

From the survey ratings of body size, 32 of the images of “thin” bodies with the lowest mean body size rating were selected as thin-related stimuli for the eye-tracker. Thirty-two of the images of “fat” bodies with the highest mean body size ratings were selected as fat-related stimuli for the eye-tracker. The 64 average-sized women-in-real-life images with a mean body size rating closest to neutral body size were selected as average stimuli for the eye-tracker. Sixty-four garden and 64 household images selected from the survey to be similar to the images of women on ratings of valence were included as stimuli for the eye-tracker. The images combined in each image set were made to have similar valence ratings.

2.6.1.3 Attentional maintenance bias outcome measure. The average time spent fixating (total fixation times summed across trials) on thin-related, fat-related, and neutral words and images as a percentage of the total fixation time on the entire word or image set during the 8-second word/image set presentation was calculated to provide attentional maintenance bias scores for each participant. A higher attentional maintenance bias score reflects a higher percentage of total fixation time on the stimuli of interest.

2.6.1.4 Attentional re-engagement bias outcome measure. The average number of re-fixations (fixations that return to the stimulus of interest after eye gaze has left the stimulus the first time) on the thin-related, fat-related, and neutral words and images as a percentage of the total number of re-fixations during the 8-second word/image set presentation was calculated to

provide attentional re-engagement bias scores for each participant. A higher attentional re-engagement bias score reflects a higher percentage of re-fixations on the stimuli of interest.

2.6.2 Secondary outcome measures.

2.6.2.1 Body appreciation. To assess body appreciation, we used the Body Appreciation Scale-2 (BAS-2) (Tylka & Wood-Barcalow, 2015). Participants were asked to respond to 10 items on a 5-point Likert scale that ranges from never (1) to always (5). Items are related to feeling respect for one's body, being attentive to one's body's needs, appreciating the different and unique characteristics of one's body, and feeling comfortable in one's body. The Body Appreciation Scale has demonstrated good construct validity, test-retest reliability, and internal consistency with college women (Avalos et al., 2005), and these psychometric measures have been supported in the BAS-2 (Tylka & Wood-Barcalow, 2015). Cronbach's alpha for the current sample was .94. For each participant, a BAS-2 score was calculated by taking the average of her responses across the 10 items, thus the BAS-2 score range was from 1 to 5.

2.6.2.2 Body dissatisfaction. To assess body dissatisfaction, we administered the Body Shape Questionnaire (BSQ) (Cooper, Taylor, Cooper, & Fairbum, 1987), a 34-item questionnaire widely used to measure body dissatisfaction. The BSQ assesses concern over the past four weeks about body shape and the experience of "feeling fat" on a 6-point Likert scale (from "never" to "always"). Higher scores reflect greater body dissatisfaction levels. It has demonstrated good test-retest reliability and good concurrent validity with university and community women (Cooper et al., 1987; Rosen, Jones, Ramirez, & Waxman, 1996). Cronbach's alpha for the current sample was .97. For each participant, a BSQ score was calculated by taking the total score of her responses across the 34 items, thus the BSQ score range was from 34 to 204.

To assess state body dissatisfaction, we administered the Body Dissatisfaction Visual Analogue Scale (BD-VAS). The BD-VAS was adapted for this study from existing VAS measures of appearance and weight dissatisfaction (Heinberg & Thompson, 1995), and has been used in previous research examining attentional biases related to body dissatisfaction (Tobin et al., 2018). Participants were asked to indicate their current level of body dissatisfaction by drawing a vertical line along a 100-cm horizontal line with endpoints of 0 (“extremely satisfied with your body”) and 100 (“extremely dissatisfied with your body”).

2.6.2.3 Thin-ideal internalization. To assess thin-ideal internalization, we used selected subscales from the internalization subscale of the Sociocultural Attitudes Towards Appearance Questionnaire – 4 Revised – Female Version (SATAQ-4R) (Schaefer, Harriger, Heinberg, Soderberg, & Thompson, 2017). The four subscales included in this study were: Internalization: Thin/Low Body Fat, Internalization: Muscular, Internalization: General Attractiveness, and Pressures: Media (these subscales are referred to hereafter as Thin/Low Body Fat, Muscular, General Attractiveness, and Media Pressures, respectively). For the internalization subscales of this measure participants were asked to indicate their agreement with 15 questions on a 5-point Likert scale, which ranges from definitely disagree (1) to definitely agree (5). For the Media Pressures subscale participants were asked to rate their agreement with four questions with relevance to the media, on the same 5-point Likert scale. Construct validity, internal consistency reliability, and test-retest reliability have been demonstrated for the SATAQ-4R in college women (Schaefer et al., 2017). Cronbach’s alpha for the Thin/Low Body Fat, Muscular, General Attractiveness, and Media Pressures subscales in the current sample were .75, .90, .83, and .90, respectively. For each participant, a subscale score was calculated for each of the four subscales

by taking the average of her responses across the items indicated for that subscale. Thus the range for subscale scores was from 1 to 5.

2.6.2.4 Eating pathology. To assess eating pathology, we administered the Eating Disorder Examination Questionnaire (EDE-Q 6.0) (Fairburn & Beglin, 2008). The EDE-Q is a 32-item self-report questionnaire derived from the Eating Disorder Examination interview, which is designed to assess the specific psychopathology of eating disorders. It includes four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. A Global score is calculated from the average of the four subscale scores. Cronbach's alpha for the Restraint, Eating Concern, Shape Concern, Weight Concern, and Global score in the current sample were .83, .76, .91, .84, and .90, respectively.¹ For each participant, a subscale score was calculated for each of the four subscales by taking the average of her responses across the items indicated for that subscale. The Global score was calculated by taking the average of the four subscales. The range for the four subscales and the Global score was from 0 to 6.

2.7 Procedure for Body Project and Media Psychoeducation Conditions

Participants who were randomized to either the Body Project or Media Psychoeducation intervention conditions signed up on RPS to attend a group study. Upon arrival of all participants, the intervention facilitators introduced themselves and invited informed consent from the participants. Once informed consent was obtained, the facilitators provided a brief introduction, and administered the baseline self-report measures (Table 3). While these questionnaires were being filled out, participants were asked to go into a nearby eye-tracking

¹ Of note, two measures of weight stigma – the Anti-Fat Attitudes Questionnaire (Crandall, 1994) and the Weight Self-Stigma Questionnaire (Lillis, Luoma, Levin, & Hayes, 2010) – were administered along with the self-report assessments, but will not be described further as they were part of a separate study.

room in a staggered fashion, one at a time, to complete the eye-tracking assessment. The assessment procedure took approximately 45 minutes in total to assess all participants in the group. Once the initial self-report questionnaires and eye-tracking assessments were complete, the facilitators then administered session 1 of either the Body Project or Media Psychoeducation intervention. Upon completion of this session, participants were asked to return for the second half of the group, one week from that appointment.

During the second session, the facilitators began with session 2 of either the Body Project or Media Psychoeducation intervention. Upon completion of the intervention, participants were once again asked to take turns completing the eye-tracking assessment with a research assistant in a separate room, and completed the post-intervention self-report measures (Table 3) while they waited, which again took approximately 45 minutes.

Finally, participants were emailed one month after completion of the second session with a link for the 1-month online follow-up self-report measures (Table 3).

Both the Body Project and Media Psychoeducation conditions were led by a clinical psychology doctoral student trained in administration of the Body Project (the author) and one of two undergraduate co-facilitators also trained in administration of the Body Project, which involved completing a two-day workshop led by a qualified Body Project professional trainer. The Body Project and Media Psychoeducation interventions were audio-recorded so that they could be rated for treatment fidelity.

2.8 Procedure for the Waitlist Condition

Participants who were randomized to the Waitlist condition also signed up on RPS to attend the same group study as above, in the same research laboratory. The procedure was

identical to that of the Body Project and Media Psychoeducation conditions, except the Waitlist participants did not participate in an intervention condition.

2.9 Procedure for the Body-Satisfied Assessment Only Condition

Participants who were screened as body-satisfied via the RPS screener question signed up on RPS to attend a different group study than the study described above for body-dissatisfied participants. The procedure was identical to that of the Body Project and Media Psychoeducation conditions, except participants in the Body-Satisfied assessment only condition did not participate in an intervention. Additionally, they did not complete a 1-month follow-up survey, as this condition was used only as an attentional bias validation check to compare their attention to weight stimuli with body-dissatisfied women's attention, with the aim of replicating past research in the current sample (Tobin et al., 2018).

2.10 Statistical Analyses

2.10.1 Preliminary analyses. Variables were all inspected for approximate normality and extreme outliers. Examination of normality via Q-Q plots did not indicate significant enough normality deviations to warrant transformation (Maas & Hox, 2004). Extreme outliers were winsorized to the value corresponding to three standard deviations from the mean. Missing data was not imputed, as the chosen statistical method was robust against missing data. A significance level of .05 was used for all preliminary analyses. Baseline characteristics between groups were compared using one-way ANOVAs for continuous variables and χ^2 analyses for categorical variables to ensure randomization success. Additionally, a χ^2 test was performed to compare dropout rates amongst the Body Project, Media Psychoeducation, Waitlist, and Body-Satisfied conditions. Fidelity ratings were also compared between the Body Project and Media

Psychoeducation conditions using *t*-tests, and reliability coefficients between the two fidelity raters' scores were analyzed.

2.10.2 Analyses. A significance level of .05 was used for tests of all research hypotheses. We used linear mixed modeling (LMM) (also known as mixed-effects modeling) for all analyses except for those specifically replicating past research (Tobin et al., 2018) to compare attention in body-satisfied and body-dissatisfied women (secondary aim 3 - replication analyses). A significant strength of LMM in longitudinal analyses is its ability to flexibly handle missing data (West, Welch, & Galecki, 2014). For example, LMM also incorporates all available data, modeling missing data using maximum likelihood estimation, thereby not restricting analyses to only fully completed cases, which increases statistical power (West et al., 2014). Additionally, in cluster-randomized designs, the randomized clusters (i.e. treatment groups) may have an impact on outcome scores, as characteristics of a treatment group such as the therapists or group cohesion, may influence scores. Multilevel modeling accounts for this correlation among individual's scores within the clusters (Finch, Bolin, & Kelley, 2014).

All LMM analyses were conducted using R version 3.5.0. A separate LMM analysis was conducted for each outcome variable. For each LMM analysis, we used a three-level LMM design in which repeated time measurements were set as level 1 (time points were nested within participants, as is the case for longitudinal studies), participants were set as level 2 (participants were nested within clusters), and clusters (time slots) were set as level 3. BMI was included in the model as a control variable, given that BMI significantly differed between groups in sample characteristic analyses (see below). Given that BMI was included in the models as a control, BMI outcomes are not interpreted in the results. Given that an interaction between Condition and Time was the primary value of interest for all hypotheses, an interaction term between Condition

and Time was included in the model. The model also included baseline levels of the outcome variable as a control. A random intercept was specified in the model, as model fit statistics did not significantly improve when adding random intercepts, or when subsequently adding random slopes to the model. Thus, the most parsimonious model, which best represented real life conditions (e.g., individuals starting at different points on the outcome variable), was chosen. The following variables were fixed effects: Time, Condition, and BMI. The autocorrelation structure used was CAR1. Maximum likelihood estimation was used in all LMM models.

Note that a correction for multiple comparisons was not applied for LMM analyses, as specific a priori hypotheses were provided for each outcome variable for almost all main analyses beforehand based on the literature, post hoc tests were not conducted for main analyses, and there were not several analyses conducted on the same outcome variables in the main analyses (Armstrong, 2014). Additional calculations were conducted to determine a standardized effect size for significant interaction effects. We used the following formula developed by Feingold (2009) to calculate the effect size for the difference between the control (Waitlist) and treatment condition in linear slopes in a growth modeling analysis, transformed into a standardized mean difference (Cohen's d) between conditions at post-intervention (or 1-month follow-up when this was the effect of interest). The formula, as described in Feingold (2015) is as follows: $d = (b * \text{duration}) / \text{SD}$. In this formula, b represents the unstandardized coefficient for the condition effect (as presented in Tables 10-17), duration is the number of time points minus one, and SD represents the pooled within-group standard deviation for the outcome measure.

For the comparisons of attentional biases between body-satisfied and body-dissatisfied women (secondary aim 3 – replication analyses) to determine if the current sample replicates past research by demonstrating an overall attentional bias for both thin- and fat-related stimuli

(Tobin et al., 2018), we used a 2 (Condition: Body-Satisfied, Waitlist) x 2 (Image Type: Thin-related, Fat-related) x 2 (Time: Baseline, Session 2) mixed-model ANOVA to analyze attentional maintenance bias scores for images. Linear mixed modeling was not used for these analyses, as the aim was to replicate the specific analyses used past research (Tobin et al., 2018). Time was included in the ANOVA to examine whether these attentional biases remained stable over time in these two conditions that did not receive an intervention between assessments. The same mixed-model ANOVA was then conducted for attentional maintenance bias scores for thin- and fat-related words, attentional re-engagement bias scores for thin- and fat-related images, and attentional re-engagement bias scores for thin- and fat-related words. All mixed-model ANOVAs were conducted using SPSS version 25. These analyses indicated whether there were attentional biases in the body-dissatisfied women of the current sample that would be amenable to change via the cognitive dissonance intervention.

Results

3.1 Sample Characteristics, Baseline Analyses, and Randomization

In total there were 232 participants: 52 in the Body Project condition, 54 in the Media Psychoeducation condition, 62 in the Waitlist control condition, and 64 in the Body-Satisfied assessment only condition. The mean age of participants was 20.50 years ($SD = 3.37$; range = 16-39 years). The mean BMI self-reported by participants was 23.08 kg/m^2 ($SD = 4.45$; range = 16.13-44.63 kg/m^2). The most commonly reported ethnicity was White (42.0%) and the most commonly reported current year of undergraduate degree was first year (34.9%). Table 4 shows sociodemographic characteristics and BMI for each condition. A one-way ANOVA revealed BMI differed among the body-dissatisfied conditions that were randomized to interventions (Body Project, Media Psychoeducation, Waitlist), $F(2, 165) = 4.79$, partial $\eta^2 = .06$, $p = .010$.

Follow-up *t*-tests (Bonferroni adjustment applied for multiple follow-up comparisons, with a significance level of .017) showed that BMI was higher in the Media Psychoeducation condition ($M = 25.14, SD = 5.65$) than the Waitlist control condition ($M = 22.45, SD = 3.47$), $t(86) = 3.03, p = .003$ (equal variances not assumed). Additionally, as reported in previous research (Tobin et al., 2018), BMI was lower in the Body-Satisfied condition ($M = 21.19, SD = 2.48$) when compared to the body-dissatisfied Waitlist condition to which is it compared in further analyses, $t(110) = 2.35, p = .021$ (equal variances not assumed). There were no differences among the four conditions in age, $F(3, 228) = 0.27, p = .846$, or current year of their undergraduate degree, $\chi^2(12, N = 232) = 9.46, p = .663$. Given the low numbers in the different ethnicity cells, all non-white ethnicities were collapsed into a single group. Percentages of White vs. all other ethnicities did not differ among the four conditions, $\chi^2(3, N = 231) = 6.69, p = .083$.

Table 4

Sociodemographic Characteristics and Body Mass Index: Descriptive Statistics

Condition	Body Project (<i>n</i> =52)	Media Psychoeducation (<i>n</i> =54)	Waitlist (<i>n</i> =62)	Body-Satisfied (<i>n</i> =64)
Characteristic	M (SD)	M (SD)	M (SD)	M (SD)
Age (years)	20.63 (4.01)	20.48 (3.54)	20.71 (3.24)	20.20 (2.80)
Body mass index (BMI; kg/m ²)	24.03 (4.91)	25.14 (5.65)	22.45 (3.47)	21.19 (2.48)
	%	%	%	%
Year of degree				
First	38.5	38.9	27.4	35.9
Second	26.9	31.5	25.8	21.9
Third	19.2	16.7	21.0	20.3

Fourth	9.6	13.0	21.0	14.1
Fifth or more	5.8	0	4.8	7.8
Ethnicity				
Aboriginal	0.0	0.0	0.0	1.6
Arab/West Asian	5.8	7.5	6.5	3.1
Black	3.8	1.9	3.2	4.7
Chinese	11.5	7.5	12.9	10.9
Korean	0.0	1.9	3.2	3.1
Latina	1.9	5.7	1.6	1.6
South Asian	5.8	15.1	6.5	4.7
Southeast Asian	11.5	26.4	16.1	17.2
White	53.8	32.1	46.8	35.9
Other	5.8	1.9	3.2	17.2
^a All other ethnicities	46.2	67.9	53.2	64.1

Note. ^aAll ethnicities aside from “White” were collapsed into the “All other ethnicities” category, to be used for group comparisons due to low numbers in the different ethnicity cells.

Baseline characteristics for primary and secondary outcome variables were compared among the three conditions involving randomization to an intervention (i.e., Body Project, Media Psychoeducation, Waitlist) to check randomization success. Baseline attentional maintenance and attentional re-engagement scores for each condition are included in Table 5. Baseline characteristics for self-reported outcome variables for each condition are included in Table 6. Post hoc Pearson correlations between attentional bias scores and self-reported outcome variables for the Body Project, Media Psychoeducation, and Waitlist conditions are displayed in Appendix C. No differences among participants in the three conditions were found in outcome measures at baseline, with the exception of scores on the “Media Pressures” subscale of the SATAQ-4R, $F(2, 165) = 5.94, p = .003, \text{partial } \eta^2 = .07$. Follow-up *t*-tests (Bonferroni

adjustment applied for multiple follow-up comparisons, with a significance level of .017) revealed that “Media Pressures” subscale scores were higher in the Media Psychoeducation condition ($M = 4.27, SD = .66$) than both the Body Project condition ($M = 3.86, SD = .94$), $t(104) = 2.65, p = .009$, and the Waitlist control condition ($M = 3.70, SD = 1.06$), $t(104) = 3.52, p = .001$ (equal variances not assumed).

Table 5

Attentional Bias Scores for Eye-Tracking Stimuli for Body Project, Media Psychoeducation, Waitlist, and Body-Satisfied Conditions

Attentional Bias Score	Baseline				Session 2			
Maintenance (%)	BP (n=52)	MP (n=54)	WL (n=61)	BS (n=62)	BP (n=50)	MP (n=50)	WL (n=55)	BS (n=54)
Images	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Thin-Related Images	32.68(13.03)	32.39 (12.52)	30.89 (12.69)	29.20 (11.62)	29.71 (10.30)	33.10 (13.16)	34.81 (12.78)	29.70 (12.25)
Fat-Related Images	31.84 (11.55)	32.37 (10.48)	29.95 (11.38)	26.95 (11.11)	32.01 (11.55)	30.98 (10.12)	33.50 (12.49)	27.15 (10.47)
Average Size Images	25.96 (5.71)	26.14 (5.37)	25.32 (5.22)	24.83 (4.38)	27.03 (5.65)	26.32 (5.66)	24.76 (4.47)	25.79 (5.46)
Garden Images	17.72 (5.90)	17.73 (5.28)	18.24 (6.30)	19.04 (4.77)	17.71 (5.51)	16.21 (5.50)	17.21 (5.82)	18.21 (5.01)
Household Images	18.90 (6.28)	18.33 (5.69)	20.01 (7.17)	21.37 (7.43)	19.61 (6.74)	18.82 (7.20)	18.99 (6.06)	20.61 (7.23)
Words								
Thin-Related Words	23.55 (6.88)	23.80 (5.44)	24.79 (7.27)	23.63 (6.12)	22.38 (5.44)	24.19 (6.63)	25.35 (6.72)	23.04 (6.18)
Fat-Related Words	23.38 (7.42)	24.41 (5.60)	23.25 (6.88)	20.88 (4.80)	22.53 (4.41)	22.86 (5.95)	24.52 (6.52)	21.13 (4.47)
Neutral Words	23.37 (1.64)	23.09 (2.06)	23.27 (1.90)	23.45 (2.02)	23.69 (1.84)	23.26 (2.34)	23.25 (1.74)	23.52 (2.49)
Re-Engagement (%)	BP (n=52)	MP (n=54)	WL (n=61)	BS (n=62)	BP (n=50)	MP (n=48)	WL (n=55)	BS (n=54)
Images	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Thin-Related Images	33.74 (16.37)	32.44 (16.01)	29.73 (15.59)	28.77 (15.59)	31.20 (15.17)	31.52 (16.58)	35.46 (16.74)	29.12 (17.17)
Fat-Related Images	31.76 (16.76)	32.95 (13.61)	31.11 (13.72)	26.94 (16.63)	30.23 (15.47)	30.53 (15.62)	32.00 (16.00)	27.28 (15.83)
Average Size Images	31.08 (9.25)	31.56 (8.25)	31.30 (7.40)	29.22 (8.67)	32.03 (11.03)	32.73 (9.50)	28.92 (8.47)	30.61 (9.12)
Garden Images	17.27 (7.89)	16.61 (7.57)	18.05 (8.93)	20.06 (7.75)	17.88 (7.46)	17.63 (6.52)	16.89 (9.02)	18.86 (9.23)
Household Images	19.34 (9.52)	19.12 (8.07)	20.31 (9.68)	22.99 (11.82)	19.41 (10.28)	18.55 (10.38)	20.60 (10.23)	22.73 (11.22)
Words								
Thin-Related Words	23.96 (7.57)	24.25 (7.73)	25.14 (8.60)	24.21 (9.30)	24.21 (8.80)	24.06 (8.67)	26.27 (10.87)	23.37 (8.19)
Fat-Related Words	23.79 (9.15)	25.20 (7.24)	25.43 (9.02)	20.43 (8.48)	23.68 (8.43)	24.06 (7.95)	24.75 (9.61)	21.77 (7.12)
Neutral Words	25.33 (1.89)	25.07 (1.64)	24.91 (1.86)	25.68 (1.83)	25.29 (2.02)	25.23 (1.65)	24.88 (2.05)	25.67 (1.63)

Note. BP = Body Project condition; MP = Media Psychoeducation condition; WL = Waitlist condition; BS = body- satisfied condition. Note that participants' eye-tracking data was required to pass quality checks to be included in analyses, thus this table includes only data that passed quality checks.

Table 6

Self-Report Outcome Scores for Body Project, Media Psychoeducation, Waitlist, and Body-Satisfied Conditions

Outcome Measure	Baseline				Session 2				1-Month Follow-Up		
	BP	MP	WL	BS	BP	MP	WL	BS	BP	MP	WL
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
BAS-2	3.10 (.73)	2.96 (.67)	3.15 (.86)	3.93 (.65)	3.42 (.75)	3.17 (.66)	3.18 (.90)	3.93 (.71)	3.25 (.78)	3.15 (.70)	3.4 (.87)
BSQ	108.87 (32.34)	109.81 (27.95)	106.36 (34.65)	81.17 (30.46)	94.60 (28.71)	99.08 (31.56)	105.47 (35.76)	77.80 (29.82)	100.92 (32.15)	98.83 (37.20)	94.89 (33.65)
BD-VAS	57.65 (18.27)	61.78 (19.13)	55.40 (24.84)	43.97 (31.19)	57.49 (23.34)	63.60 (20.25)	55.93 (24.79)	39.23 (30.14)	57.63 (20.94)	67.60 (18.87)	57.00 (23.64)
SATAQ-4R											
TLBF	3.40 (.85)	3.71 (.91)	3.52 (.89)	3.12 (.86)	3.18 (.92)	3.2 (.98)	3.62 (.83)	3.08 (.89)	3.39 (.96)	3.45 (1.07)	3.58 (.87)
Muscular	3.05 (1.04)	2.99 (1.14)	2.83 (1.08)	2.89 (.94)	3.02 (.98)	2.88 (1.11)	2.89 (1.01)	2.91 (.91)	3.10 (1.11)	2.94 (1.00)	2.90 (1.09)
GA	4.29 (.76)	4.26 (.68)	4.15 (.67)	3.90 (.63)	4.08 (.73)	4.10 (.77)	4.15 (.71)	3.91 (.66)	4.23 (.79)	4.14 (.71)	4.14 (.72)
Media Pressures	3.86 (.94)	4.27 (.66)	3.70 (1.06)	3.45 (1.09)	3.83 (1.13)	4.05 (.83)	3.78 (1.10)	3.48 (1.08)	3.96 (1.06)	3.94 (1.10)	3.80 (.94)
EDE-Q 6.0											
Restraint	1.69 (1.36)	1.87 (1.44)	1.82 (1.49)	1.29 (1.37)	1.35 (1.26)	1.54 (1.48)	1.76 (1.53)	1.25 (1.43)	1.48 (1.38)	1.64 (1.66)	1.44 (1.41)
Eating Concern	1.47	1.65	1.52	.84	1.26	1.33	1.41	.87	1.52	1.39	1.02

	(1.28)	(1.24)	(1.19)	(1.05)	(1.23)	(1.38)	(1.44)	(1.07)	(1.32)	(1.45)	(1.13)
Shape Concern	3.49	3.53	3.34	1.91	2.66	3.09	3.21	1.90	2.98	2.95	2.87
	(1.50)	(1.40)	(1.54)	(1.38)	(1.45)	(1.57)	(1.57)	(1.42)	(1.62)	(1.78)	(1.60)
Weight Concern	2.99	3.19	2.74	1.67	2.52	2.78	2.60	1.58	2.76	2.66	2.27
	(1.61)	(.58)	(1.56)	(1.41)	(1.67)	(1.61)	(1.53)	(1.44)	(1.52)	(1.61)	(1.66)
Global Score	2.39	2.26	2.36	1.43	1.95	2.18	2.25	1.40	2.19	2.16	1.90
	(1.24)	(1.20)	(1.30)	(1.13)	(1.26)	(1.38)	(1.33)	(1.21)	(1.31)	(1.50)	(1.34)

Note. BP = Body Project condition; MP = Media Psychoeducation condition; WL = Waitlist condition; BS = Body-Satisfied condition; BAS-2 = Body Appreciation Scale - 2; BSQ = Body Shape Questionnaire; SATAQ-4R = Sociocultural Attitudes Towards Appearance Questionnaire – 4 revised; TLBF = Thin/Low Body Fat; GA = General Attractiveness. See Appendix D for the number of participants that completed each self-report measure at each time point.

3.2 Treatment and Assessment Dropout Rates

Figure 1 shows the participant flow diagram over the study duration. For the body-dissatisfied conditions, 168 participants completed session 1 and 155 participants completed both study sessions. Dropout rate by session 2 did not differ between the Body Project (3.85% or 2/52), Media Psychoeducation (7.41% or 4/54), and Waitlist control (11.29% or 7/62) conditions, $\chi^2(2, N = 168) = 2.21, p = .33$. The percentage of participants in the body-dissatisfied conditions who completed the session 2 assessment was 92.26% overall ($n = 155/168$), with 96.15% ($n = 50/52$) in the Body Project condition, 92.59% ($n = 50/54$) in the Media Psychoeducation condition, and 88.71% ($n = 55/62$) in the Waitlist condition. The percentage of participants in the body-dissatisfied conditions who completed the 1-month follow-up assessment was 66.07% overall ($n = 111/168$), with 73.08% ($n = 38/52$) in the Body Project condition, 64.81% ($n = 35/54$) in the Media Psychoeducation condition, and 61.29% ($n = 38/62$) in the Waitlist condition. The percentage of participants in the Body-Satisfied condition who completed the session 2 assessment was 87.50% ($n = 56/64$). Appendix D shows the number of participants who completed the outcome variables at each time point.

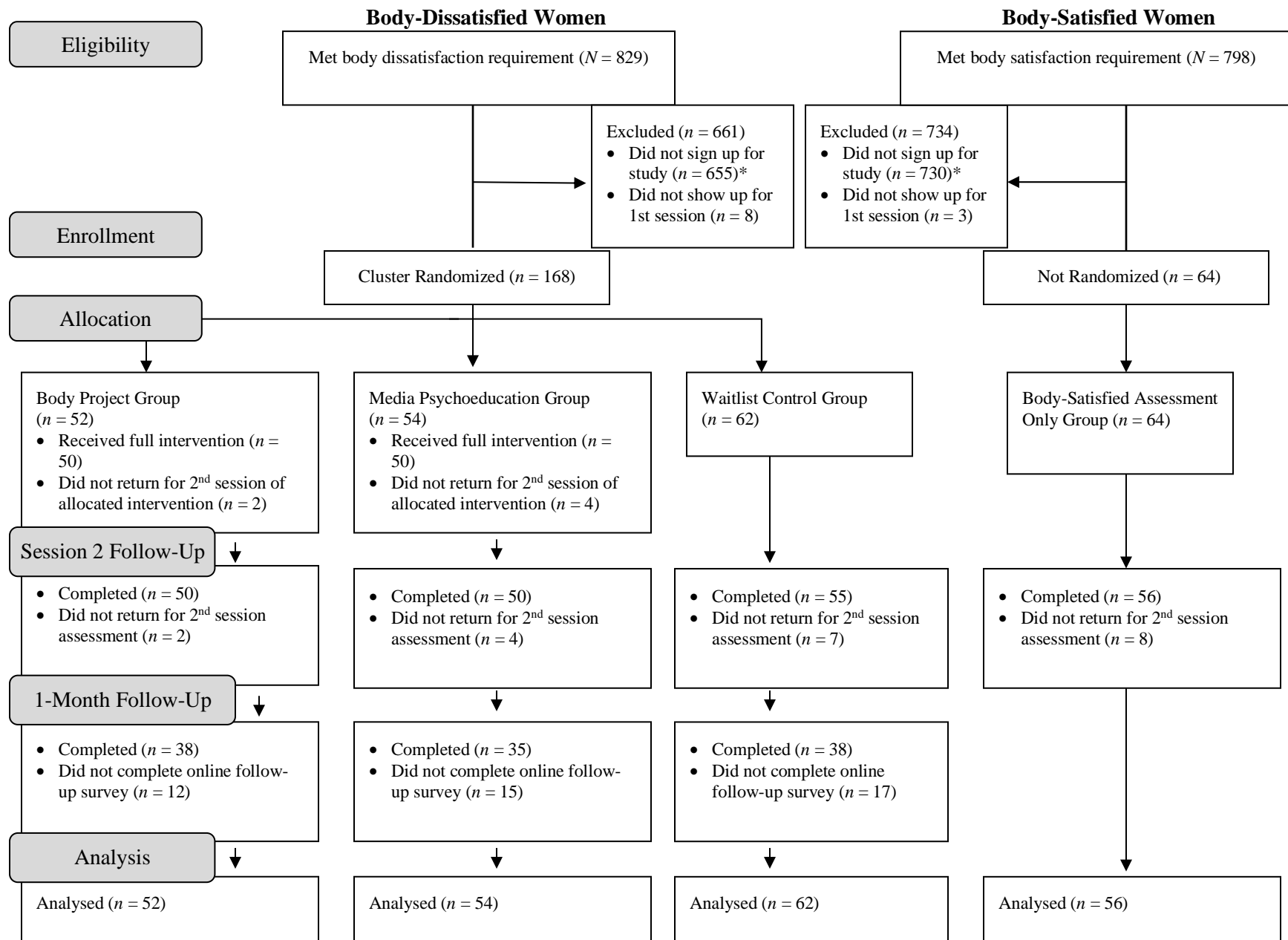


Figure 1. Participant flow diagram. *Note that of the participants who did not sign up for the study, it is unknown how many were not permitted to sign up for the study on the Research Participation System due to their prior participation in a stimuli development study.

Note that in completer/dropout comparisons only the body-dissatisfied conditions were compared on demographic and baseline variables, given those were the randomized conditions in the intervention study. There were no differences revealed between body-dissatisfied women who completed both intervention sessions (either Body Project, Media Psychoeducation, or Waitlist) and dropouts (those who did not return for session 2) in age, BMI, year of current undergraduate degree, or percentage of those identified as White vs. all other ethnicities. Table 7 shows sociodemographic characteristics and BMI for intervention completers vs. dropouts.

Table 7

Sociodemographic Characteristics and Body Mass Index

Characteristic	Means (SD)		<i>t</i>	<i>df</i>	<i>p</i>
	Completers (<i>n</i> =155)	Dropouts (<i>n</i> =13)			
Age (years)	20.57 (3.55)	21.08 (3.90)	.49	166	.627
Body mass index (BMI; kg/m ²)	23.63 (4.71)	25.88 (5.70)	1.63	166	.105
	%	%	χ^2	<i>df</i>	<i>p</i>
Year of degree			3.17	4	.530
First	34.8	30.8			
Second	24.8	23.1			
Third	19.4	15.4			
Fourth	13.5	30.8			
Fifth or more	3.9	0			
Ethnicity (dichotomized)			2.58	1	.108
White	46.1	23.1			
^a All other ethnicities	53.9	76.9			
All other ethnicities					
Arab/West Asian	5.8	15.4			
Black	2.6	7.7			

Chinese	11.7	0
Korean	1.3	7.7
Latina	3.2	0
South Asian	8.4	15.4
Southeast Asian	17.5	23.1
Other	3.2	7.7

Note. “All ethnicities aside from “White” were collapsed into the “All other ethnicities” category, to be used for group comparisons due to low numbers in the different ethnicity cells.

There was a difference between body-dissatisfied women who completed both sessions of the study and those who dropped out after session 1 in baseline attentional re-engagement for thin-related images (see Table 8). In particular, at baseline, study completers scored higher than dropouts on attentional re-engagement for thin-related images, and attentional re-engagement for fat-related images. Dropouts scored higher than completers on attentional maintenance for household images and attentional re-engagement for household images. There were no other differences between dropouts and completers on the primary outcome variables. There were also no differences between dropouts and completers on any secondary self-report outcome variables (see Table 9). However, lack of power in the dropout group may have limited the ability to detect these differences.

Table 8

Comparisons between Body-Dissatisfied Study Completers and Dropouts on Baseline Attentional Bias (Primary) Outcomes

Outcome Measure	Means (SD)		<i>t</i>	<i>df</i>	<i>p</i>
	Completers (<i>n</i> = 154)	Dropouts (<i>n</i> = 13)			

Attentional Maintenance Bias for:

Thin-Related Words	24.21 (6.75)	22.65 (4.03)	.82	165	.413
Fat-Related Words	23.60 (6.82)	24.09 (4.42)	.25	165	.801
Neutral Words	23.23 (1.90)	23.40 (1.46)	.32	165	.749
Thin-Related Images	32.34 (12.86)	27.06 (9.63)	1.45	165	.150
Fat-Related Images	31.57 (11.10)	28.36 (11.54)	1.00	165	.320
Average Size Images	25.78 (5.45)	25.83 (4.99)	.03	165	.749
Garden Images	17.79 (5.89)	19.41 (5.26)	.97	165	.336
Household Images	18.82 (6.41)	22.67 (5.95)	2.09	165	.038*

Attentional Re-Engagement Bias for:

Thin-Related Words	24.56 (8.00)	23.55 (8.03)	.44	165	.662
Fat-Related Words	24.67 (8.59)	26.88 (7.40)	.90	165	.371
Neutral Words	25.22 (1.81)	24.91 (1.64)	.38	165	.703
Thin-Related Images	32.58 (16.17)	23.18 (10.30)	^a 3.00	17.45	.008**
Fat-Related Images	32.57 (14.68)	24.01 (11.87)	2.05	165	.042*
Average Size Images	31.18 (8.15)	32.89 (9.39)	.72	165	.475
Garden Images	17.21 (8.12)	18.90 (8.76)	.72	165	.476
Household Images	19.18 (9.06)	24.96 (8.10)	2.22	165	.027*

Note. ^aEqual variances not assumed. Study completers were those who attended both session 1 and session 2 of the study. Dropouts were those who only attended session 1. *Denotes significance at the $p \leq .05$ level, ** Denotes significance at the $p \leq .01$ level.

Table 9

Comparisons between Body-Dissatisfied Study Completers vs. Dropouts on Baseline Self-Report (Secondary) Outcomes

Outcome Measure	Means (SD)		<i>t</i>	<i>df</i>	<i>p</i>
	Completers (<i>n</i> = 155)	Dropouts (<i>n</i> = 13)			
BAS-2	3.07 (.77)	3.15 (.72)	.34	166	.733

BSQ	107.88 (31.84)	112.62 (31.61)	.52	166	.607
BD-VAS	57.54 (21.43)	65.39 (17.73)	1.28	166	.202
SATAQ-4R					
Thin/Low Body Fat	3.58 (.89)	3.09 (.67)	1.95	166	.053
Muscular	2.97 (1.09)	2.69 (1.09)	.88	166	.378
General Attractiveness	4.23 (.70)	4.19 (.70)	.20	166	.839
Media Pressures	3.96 (.94)	3.56 (.80)	1.51	166	.134
EDE-Q 6.0					
Restraint	1.78 (1.41)	2.00 (1.64)	.53	166	.596
Eating Concern	1.55 (1.26)	1.51 (.85)	.11	166	.912
Shape Concern	3.45 (1.47)	3.00 (1.48)	1.06	166	.292
Weight Concern	2.97 (1.53)	2.87 (1.38)	.23	166	.816
Global Score	2.44 (1.26)	2.35 (1.14)	.26	166	.797

Note. BAS-2 = Body Appreciation Scale – 2; BSQ = Body Shape Questionnaire; BD-VAS = Body Dissatisfaction Visual Analogue Scale; SATAQ-4R = Sociocultural Attitudes Towards Appearance Questionnaire – 4 revised; EDE-Q 6.0 = Eating Disorder Examination Questionnaire – 6.0. Study completers were those who attended both session 1 and session 2 of the study. Dropouts were those who only attended session 1.

3.3 Treatment Fidelity

After completion of the study, two paid undergraduate research assistants, not previously involved in the study but trained in administration of the Body Project, completed fidelity ratings of facilitator fidelity to the Body Project manual. Note that participant adherence (e.g., homework compliance, engagement in discussions) was not assessed. A randomly selected 50% of sessions were rated, as per prior research (Stice, Rohde, Shaw, & Gau, 2017). Both the Body Project groups and Media Psychoeducation groups were rated for facilitator adherence to the Body Project manual, to compare fidelity ratings between the two interventions, one that was

intended to adhere to the Body Project manual and one that was not. While raters were not told which intervention types they were rating, they could not be truly blind to intervention due to obvious differences between them (e.g., the Media Psychoeducation intervention involved video clips replacing large sections of the Body Project interventions).

Fidelity ratings were based on a facilitator adherence measure developed for the 2-session version of the Body Project program (Kilpela et al., 2016), which we used in the current study. The facilitator adherence measure was provided to us by one of the authors of this study (C. Becker, personal communication, May 10, 2018) via email. The specific measure provided to us was used for the 2-session version of “The Body Project 4 All,” a mixed-gender version of the body image program; we adapted the measure for use with the current female-only sample. The facilitator adherence measure can be found in Appendix E. The facilitator adherence measure allows fidelity raters to rate the specified components of the Body Project intervention on a scale from 1 (“did not complete at all”) to 4 (“fully completed”). There was a total of 77 ratable items for the current study, meaning the total possible score on the measure was 308/308, which would correspond to a 100% adherence score. The intraclass correlation coefficient to assess interrater agreement on fidelity was .98 for the Body Project sessions and .82 for the Media Psychoeducation sessions. The average facilitator adherence score for the Body Project sessions was 281.33/308 ($SD = 15.93$), or 91.23%. The average facilitator adherence score for the Media Psychoeducation sessions to the Body Project facilitator adherence measure was 145.07/308 ($SD = 8.99$), or 47.10%. The Body Project facilitator adherence scores were higher than the Media Psychoeducation facilitator adherence scores, $t(24) = 27.38, p < .001$.

3.4 Attentional Biases

Table 5 lists attentional maintenance and attentional re-engagement bias scores for “fat”- and thin-related words and images, and neutral stimuli for all four conditions (Body-Satisfied, Waitlist, Body Project, and Media Psychoeducation). The minimum fixation duration was 100ms for inclusion of eye-tracking data in analyses; adjacent, sequential fixations less than 100ms were merged into one single fixation. Note that the eye tracker could not calibrate for one participant in the Body-Satisfied condition at baseline and session 2, and thus eye-tracking data were not collected for this participant. Additionally, eye-tracking data for each participant had to meet quality checks in order to be included in analyses. Specifically, the average total dwell time on the screen had to be at least 5000ms for inclusion in analyses. One participant in the Waitlist condition and one participant in the Body-Satisfied condition at baseline, and one participant in the Body-Satisfied condition at session 2, had their eye-tracking data excluded from analyses due to poor quality eye-tracking data (i.e., having a total dwell time < 5000ms). Additionally, re-fixation scores could not be calculated for two participants in the Media Psychoeducation condition at session 2 due to poor eye-tracking data quality. Table 5 also lists total number of participants with adequate eye-tracking data included in analyses for each attentional bias variable.

3.5 Self-Report Outcome Measures

Table 6 lists scores for the BAS-2, BSQ, BD-VAS, SATAQ-4R, and EDE-Q 6.0 questionnaires. Scores are included for all four conditions (Body-Satisfied, Waitlist, Body Project, and Media Psychoeducation).

3.6 Primary Aim

3.6.1 Attentional maintenance biases for images. Full model results for attentional maintenance biases for all five categories of images (thin-related, fat-related, average, garden, and household) are presented in Table 10. Figure 2 displays the least squared means and standard errors for each analysis, to visually represent the direction of change in the data for each condition from baseline to session 2. Results demonstrated there was a difference between the Body Project and Waitlist conditions in change over time for attentional maintenance to thin-related images ($d = -.24$). Specifically, as demonstrated in Figure 2A, attentional maintenance to thin-related images decreased more from baseline to session 2 for Body Project compared to Waitlist. However, Body Project and Waitlist did not differ in change over time for attentional maintenance to fat-related images. As expected, Body Project and Waitlist did not differ in change over time for any of the control stimuli (average, garden, or household images).

Results demonstrated there was a difference between the Media Psychoeducation and Waitlist conditions in change over time for attentional maintenance to fat-related images ($d = -.17$). Specifically, as demonstrated in Figure 2B, attentional maintenance to fat-related images decreased more from baseline to session 2 for Media Psychoeducation compared to Waitlist. Media Psychoeducation and Waitlist did not differ in change over time for attentional maintenance to thin-related images, or any of the control stimuli.

Also note that the reference (Waitlist) condition demonstrated an increase in attentional maintenance for both thin-related and fat-related images from baseline to session 2 (as seen in Figures 2A and 2B, respectively). Additionally, note that attentional maintenance scores for thin-related images were higher for Body Project than Waitlist at baseline (as seen in Figure 2A).

Table 10

Multilevel Model Results for Attentional Maintenance Biases for Images

	Thin-Related Images			Fat-Related Images			Average Images			Garden Images			Household Images		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time	3.03	1.31	.022*	2.97	1.40	.035*	-.42	.69	.537	-.71	.60	.238	-.44	.62	.480
Condition (BP)	8.25	3.53	.025*	4.37	3.60	.232	-1.10	1.79	.541	-1.07	1.63	.514	-2.45	1.87	.199
Condition (MP)	5.05	3.52	.159	6.65	3.58	.071	-.22	1.78	.902	.14	1.63	.933	-2.90	1.86	.129
BMI	-.43	.19	.024*	.05	.17	.774	.20	.08	.011*	.02	.09	.831	.08	.10	.400
Time x Condition (BP)	-5.86	1.90	.002**	-2.51	2.03	.218	1.51	.99	.131	.51	.87	.561	1.13	.90	.212
Time x Condition (MP)	-2.47	1.89	.194	-4.34	2.02	.033*	.51	.99	.610	-.72	.87	.406	1.00	.90	.269

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media

Psychoeducation condition. *Time* refers to the change from baseline to session 2 in the reference condition (Waitlist). For *Condition*, each row represents the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline. For *Time x Condition*, each row represents the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level. ** Denotes significance at the $p \leq .01$ level.

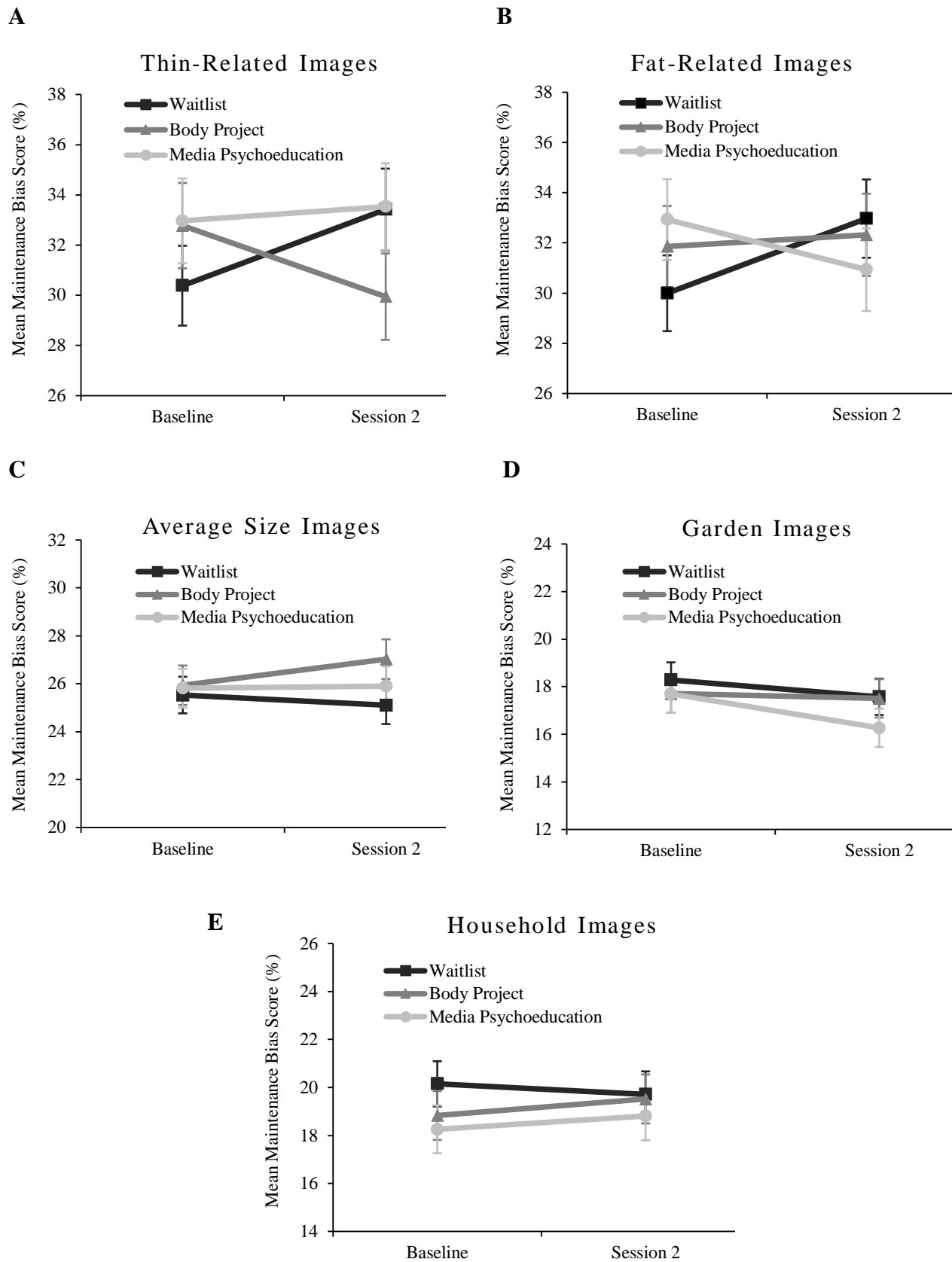


Figure 2. Attentional maintenance biases for images by condition, at baseline and session 2.

3.6.2 Attentional re-engagement biases for images. Full model results for attentional re-engagement biases for all five categories of images (thin-related, fat-related, average, garden, and household) are presented in Table 11. Figure 3 displays the least squared means and standard errors for each analysis, to visually represent the data. Results demonstrated a difference between the Body Project and Waitlist conditions in change over time for attentional re-engagement to thin-related images ($d = -.19$). Specifically, as demonstrated in Figure 3A, attentional re-engagement to thin-related images decreased more from baseline to session 2 for Body Project compared to Waitlist. However, Body Project and Waitlist did not differ in change over time for attentional re-engagement to fat-related images. There was also a difference between the Body Project and Waitlist conditions in change over time for attentional re-engagement to average images ($d = .15$). Specifically, as demonstrated in Figure 3C, attentional re-engagement to average images decreased more from baseline to session 2 for Waitlist compared to Body Project. As expected, Body Project and Waitlist did not differ in change over time for any of the remaining control stimuli (garden images or household images).

Results demonstrated that the Media Psychoeducation and Waitlist conditions did not differ in change over time for attentional re-engagement to thin-related images, nor fat-related images. These two groups also did not differ in change over time for any of the control stimuli.

Also note that the reference (Waitlist) condition demonstrated an increase in attentional re-engagement for thin-related images from baseline to session 2 (as seen in Figure 3A). Additionally, note that attentional re-engagement scores for thin-related images were higher for Body Project than Waitlist at baseline (as seen in Figure 3A).

Table 11

Multilevel Model Results for Attentional Re-Engagement Biases for Images

	Thin-Related			Fat-Related			Average Images			Garden Images			Household Images		
	Images			Images											
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time	4.90	2.12	.022*	.19	1.98	.924	-2.48	1.28	.056	-.79	1.03	.446	.93	1.13	.411
Condition (BP)	12.55	5.26	.022*	3.01	4.99	.550	-4.07	3.24	.217	-2.17	2.58	.407	-.54	3.17	.866
Condition (MP)	9.14	5.25	.090	5.17	4.98	.307	-3.90	3.23	.234	-3.03	2.58	.247	-.13	3.15	.969
BMI	-.54	.23	.023*	-.27	.22	.221	.23	.12	.067	.05	.12	.652	.12	.14	.401
Time x Condition (BP)	-7.72	3.07	.013*	-1.87	2.87	.517	3.69	1.87	.050*	1.30	1.49	.384	-.91	1.64	.579
Time x Condition (MP)	-5.02	3.09	.107	-2.56	2.89	.378	3.62	1.88	.056	1.45	1.50	.336	-1.52	1.65	.358

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media

Psychoeducation condition. *Time* refers to the change from Baseline to Session 2 in the reference condition (Waitlist). For *Condition*, each row represents the difference between the condition denoted in parentheses and the reference condition (Waitlist) at Baseline. For *Time x Condition*, each row represents the change from Baseline to Session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level.

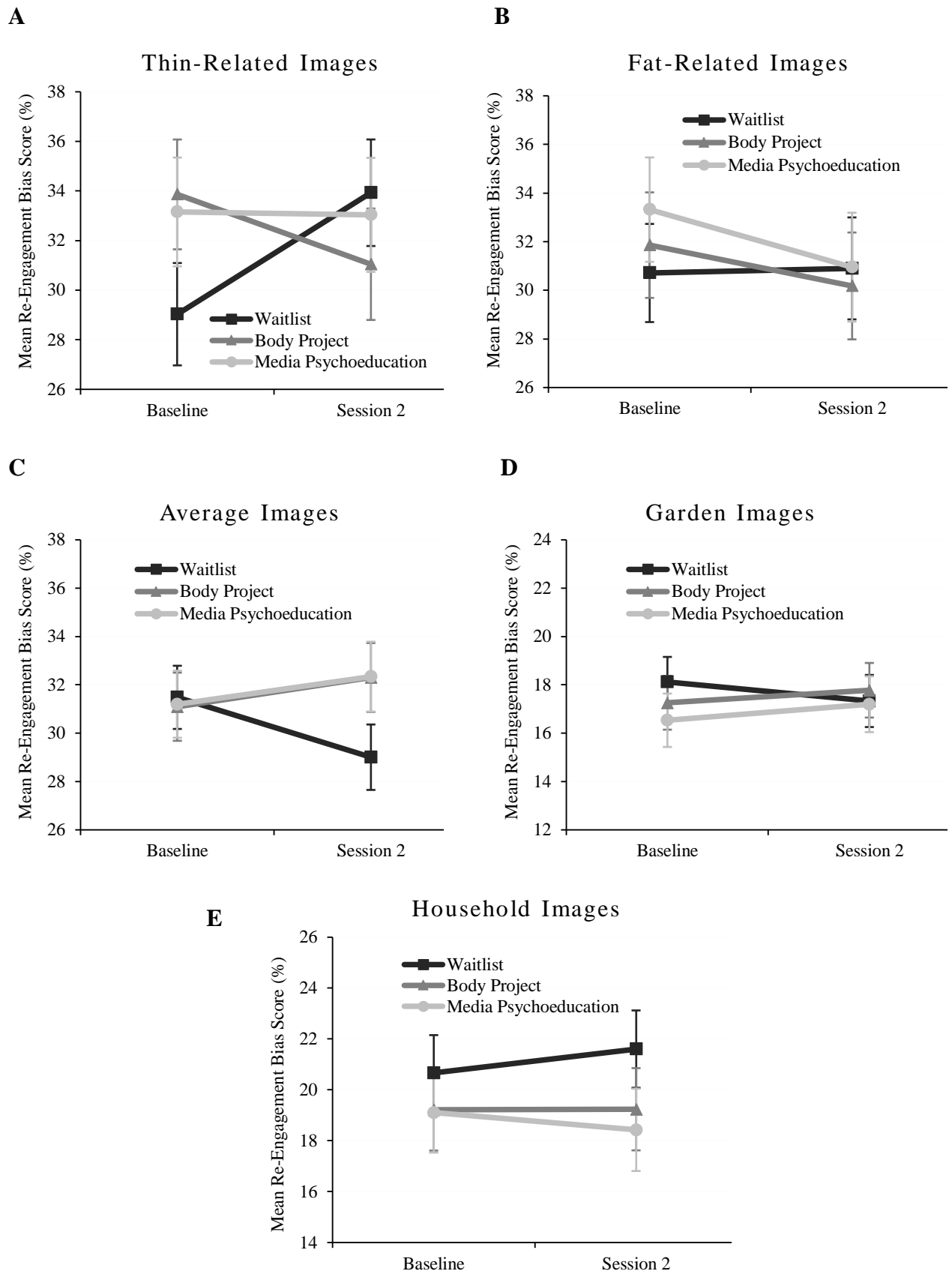


Figure 3. Attentional re-engagement biases for images by condition, at baseline and session 2.

3.6.3 Attentional maintenance biases for words. Full model results for attentional maintenance biases for all three categories of words (thin-related, fat-related, and neutral) are presented in Table 12. Figure 4 displays the least squared means and standard errors for each analysis. Results demonstrated that the Body Project and Waitlist conditions did not differ in change over time for attentional maintenance to thin-related words, nor fat-related words. As expected, Body Project and Waitlist did not differ in change over time for attentional maintenance to neutral words.

Results demonstrated there was a difference between the Media Psychoeducation and Waitlist conditions in change over time for attentional maintenance to fat-related words ($d = -.18$). Specifically, as demonstrated in Figure 4B, attentional maintenance to fat-related words decreased more from baseline to session 2 for Media Psychoeducation compared to Waitlist. Media Psychoeducation and Waitlist did not differ in change over time for attentional maintenance to thin-related words, or neutral words.

Table 12

Multilevel Model Results for Attentional Maintenance Biases for Words

	Thin-Related			Fat-Related			Neutral Words		
	Words			Words					
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time	.34	.85	.695	1.28	.83	.123	.08	.23	.725
Condition (BP)	.67	2.16	.757	2.09	2.07	.318	-.18	.59	.763
Condition (MP)	-.71	2.15	.744	3.87	2.06	.068	-.35	.59	.561
BMI	-.19	.09	.038*	0.00	.09	.987	.05	.03	.079
Time x Condition (BP)	-1.67	1.24	.180	-2.09	1.20	.083	.21	.34	.529
Time x Condition (MP)	.16	1.24	.894	-2.76	1.20	.023*	.05	.34	.891

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media Psychoeducation condition. *Time* refers to the change from Baseline to Session 2 in the reference condition (Waitlist). For *Condition*, each row represents the difference between the condition denoted in parentheses and the reference condition (Waitlist) at Baseline. For *Time x Condition*, each row represents the change from Baseline to Session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level.

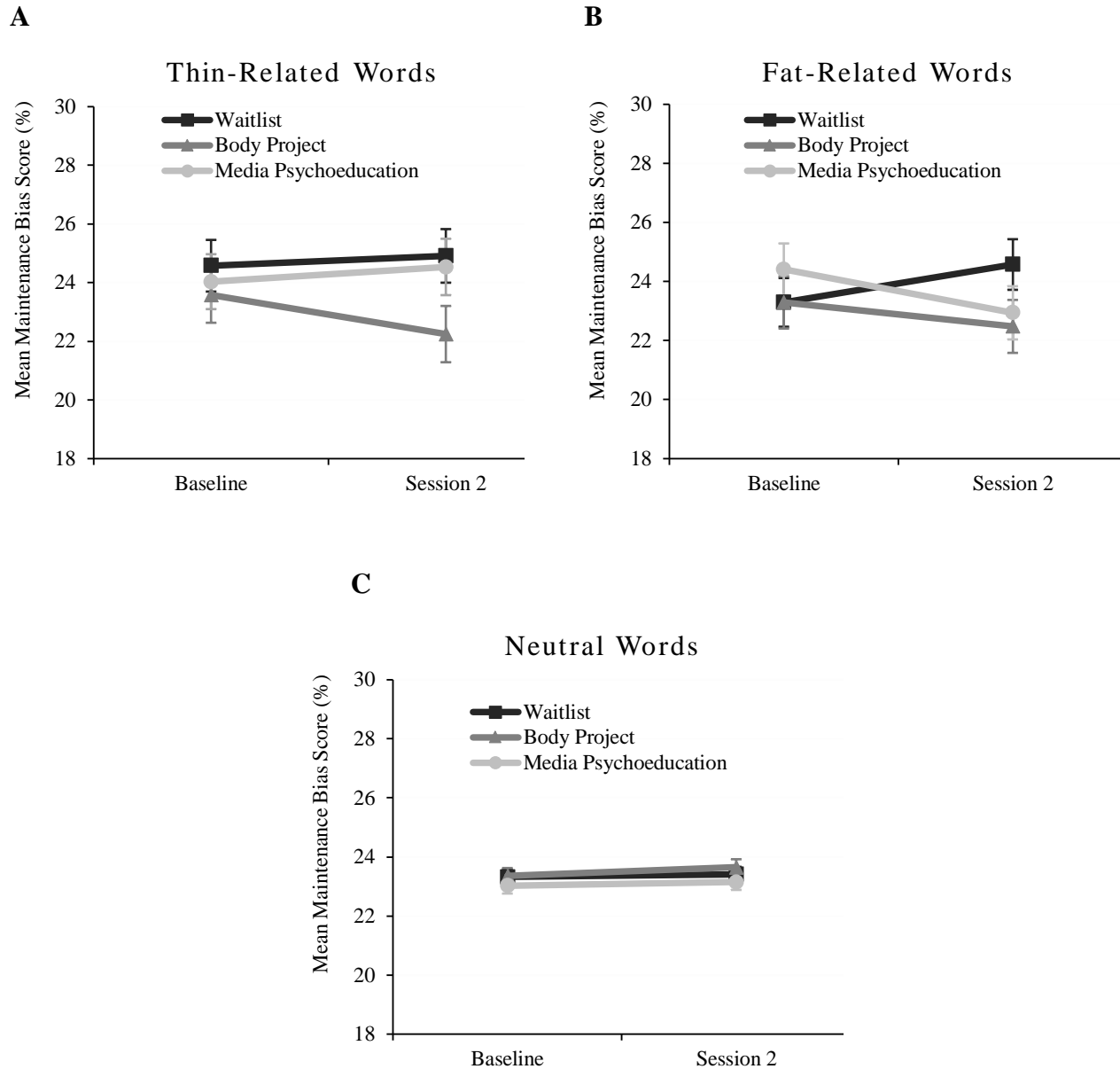


Figure 4. Attentional maintenance biases for words by condition, at baseline and session 2.

3.6.4 Attentional re-engagement biases for words. Full model results for attentional re-engagement biases for all three categories of words (thin-related, fat-related, and neutral) are presented in Table 13. Figure 5 displays the least squared means and standard errors for each analysis. Results demonstrated that the Body Project and Waitlist conditions did not differ in

change over time for attentional re-engagement to thin-related words, nor fat-related words. As expected, Body Project and Waitlist did not differ in change over time for attentional re-engagement to neutral words.

Results also demonstrated that the Media Psychoeducation and Waitlist conditions did not differ in change over time for attentional re-engagement to thin-related, fat-related, or neutral words.

Table 13

Multilevel Model Results for Attentional Re-Engagement Biases for Words

	Thin-Related			Fat-Related			Neutral Words		
	Words			Words					
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time	.82	1.28	.524	-.69	1.27	.589	.01	.26	.955
Condition (BP)	-.05	3.09	.988	-2.57	3.05	.405	.43	.64	.503
Condition (MP)	.39	3.08	.901	-.19	3.04	.951	.04	.64	.944
BMI	-.30	.12	.017*	.11	.12	.373	.03	.03	.300
Time x Condition (BP)	-.67	1.86	.718	.79	1.84	.668	-.07	.38	.859
Time x Condition (MP)	-.48	1.87	.799	-.31	1.85	.867	.04	.38	.923

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media Psychoeducation condition. *Time* refers to the change from Baseline to Session 2 in the reference condition (Waitlist). For *Condition*, each row represents the difference between the condition denoted in parentheses and the reference condition (Waitlist) at Baseline. For *Time x Condition*, each row represents the change from Baseline to Session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level.

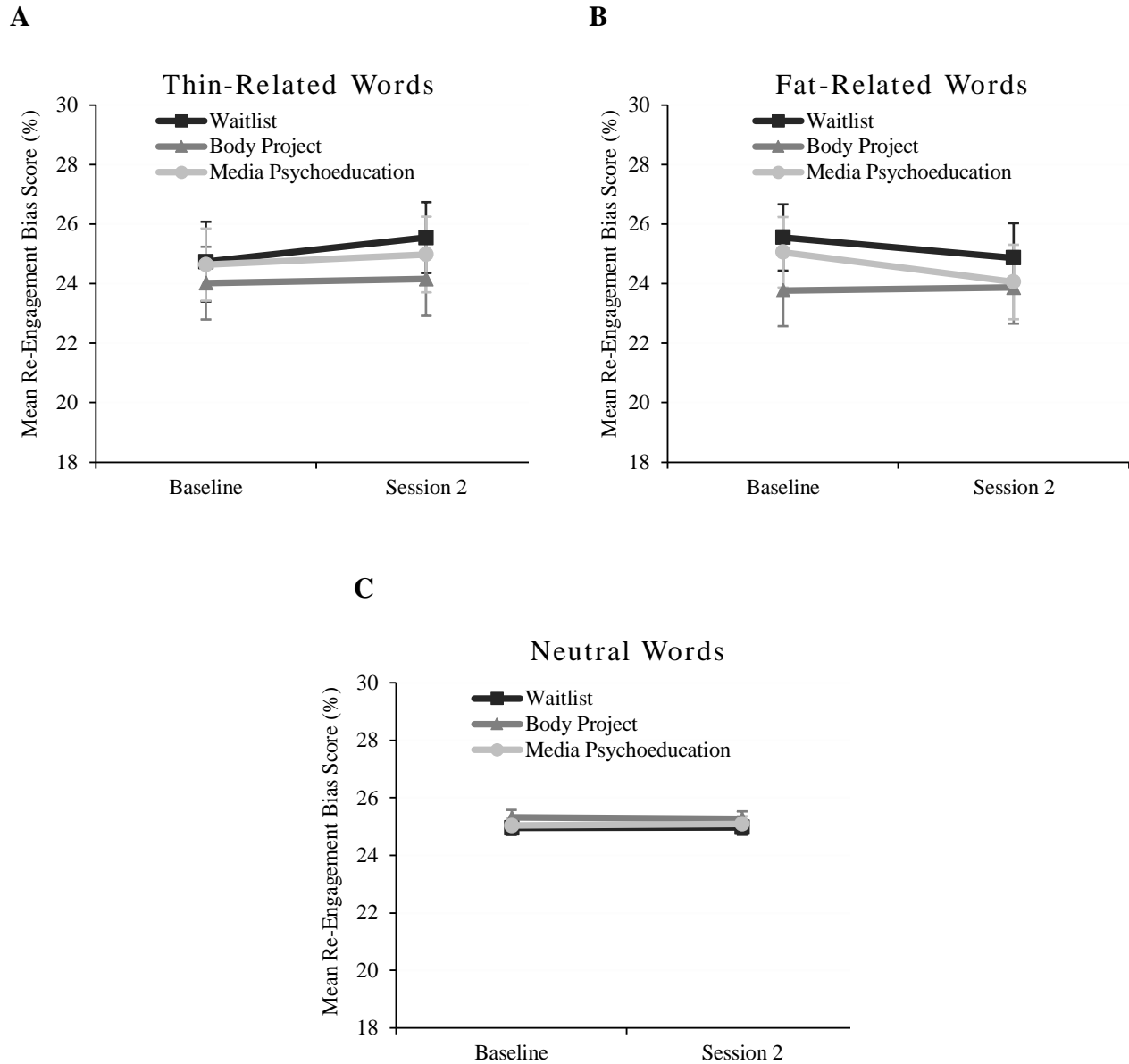


Figure 5. Attentional re-engagement biases for words by condition, at baseline and session 2.

3.7 Secondary Aim 1

3.7.1 Body appreciation. Full model results for BAS-2 scores are presented in Table 14.

Figure 6 displays the least squared means and standard errors for each analysis. Results demonstrated a difference between the Body Project and Waitlist conditions in change over time

from baseline to session 2 on BAS-2 scores ($d = .44$). Specifically, as demonstrated in Figure 6, BAS-2 scores increased more from baseline to session 2 for Body Project compared to Waitlist. However, Body Project and Waitlist conditions did not differ in change over time from baseline to 1-month follow-up on BAS-2 scores.

There was also a difference between the Media Psychoeducation and Waitlist conditions in change over time from baseline to session 2 on BAS-2 scores ($d = .31$). Specifically, as demonstrated in Figure 6, BAS-2 scores increased more from baseline to session 2 for Media Psychoeducation compared to Waitlist. However, Media Psychoeducation and Waitlist did not differ in change over time from baseline to 1-month follow-up on BAS-2 scores.

Table 14

Multilevel Model Results for Body Appreciation

	BAS-2		
	<i>b</i>	SE	<i>p</i>
Time (2)	.03	.07	.625
Time (3)	.07	.08	.391
Condition (BP)	-.02	.15	.912
Condition (MP)	-.13	.15	.387
BMI	-.02	.01	.085
Time (2) x Condition (BP)	.27	.10	.005**
Time (3) x Condition (BP)	.14	.11	.224
Time (2) x Condition (MP)	.19	.10	.049*
Time (3) x Condition (MP)	.14	.11	.209

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media Psychoeducation condition; BAS-2 = Body Appreciation Scale – 2 scores. *Time (2)* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Time (3)* refers to the change from baseline to 1-month follow-up in the reference

condition (Waitlist). For *Condition*, each row represents the difference between the group denoted in parentheses and the reference condition (Waitlist) at baseline. For *Time (2) x Condition*, each row represents the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). For *Time (3) x Condition*, each row represents the change from baseline to 1-month Follow-Up in the group denoted in parentheses compared to the reference condition (Waitlist). *Denotes significance at the $p \leq .05$ level, **Denotes significance at the $p \leq .01$ level.

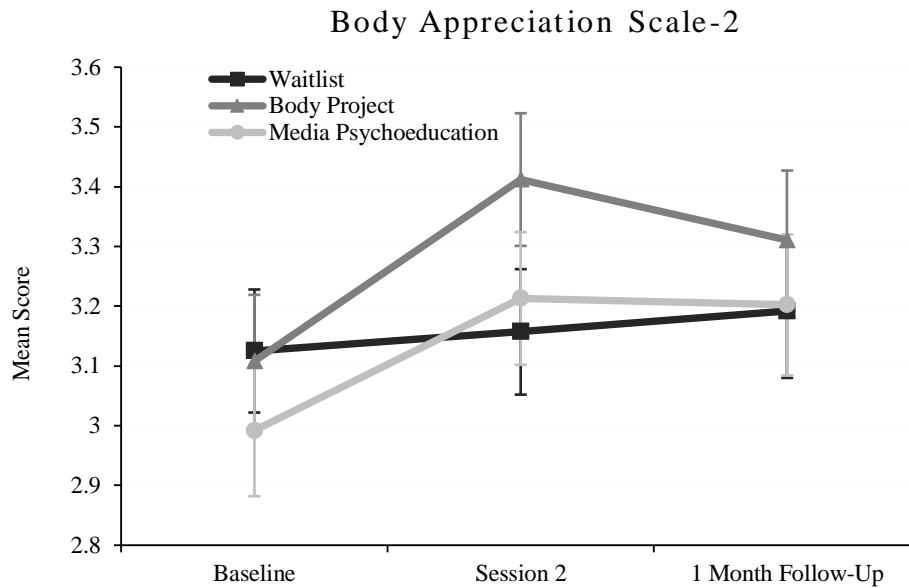


Figure 6. Body appreciation scores by condition, at baseline, session 2, and 1-month follow-up.

3.8 Secondary Aim 2

3.8.1 Body dissatisfaction. Full model results for BSQ scores (body dissatisfaction) and BD-VAS scores (state body dissatisfaction) are presented in Table 15. Figure 7 displays the least squared means and standard errors for each analysis. Results demonstrated a difference between the Body Project and Waitlist conditions in change over time from baseline to session 2 on BSQ

scores ($d = -.29$). Specifically, as demonstrated in Figure 7A, BSQ scores decreased more from baseline to session 2 for Body Project compared to Waitlist. However, Body Project and Waitlist did not differ in change over time from baseline to 1-month follow-up on BSQ scores.

Results also demonstrated that there was a difference between the Media Psychoeducation and Waitlist conditions in change over time from baseline to session 2 on BSQ scores ($d = -.25$). Specifically, as demonstrated in Figure 7A, BSQ scores decreased more from baseline to session 2 for Media Psychoeducation compared to Waitlist. However, Media Psychoeducation and Waitlist did not differ in change over time from baseline to 1-month follow-up on BSQ scores. Also note that the reference (Waitlist) condition demonstrated a decrease in BSQ scores from baseline to 1-month follow-up (as seen in Figure 7A).

Results demonstrated that the Body Project and Waitlist conditions did not differ in change over time (either baseline to session 2, or baseline to 1-month follow-up) on BD-VAS scores. Similarly, the Media Psychoeducation and Waitlist conditions did not differ in change over time (either baseline to session 2, or baseline to 1-month follow-up) on BD-VAS scores.

Table 15

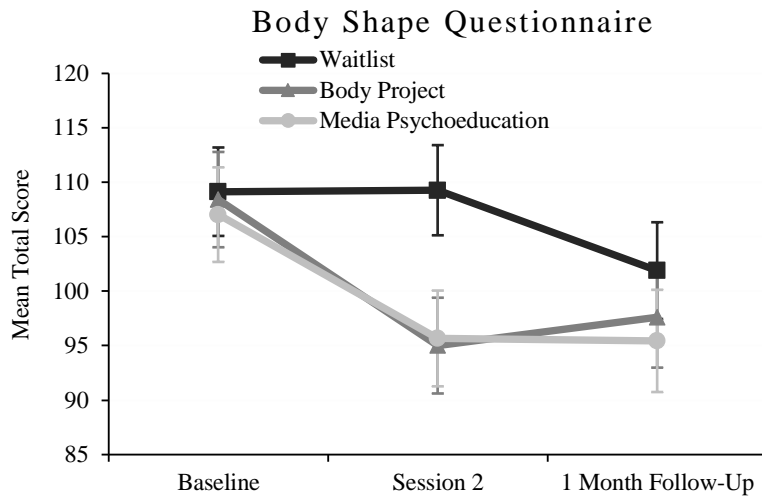
Multilevel Model Results for Body Dissatisfaction Measures

	BSQ			BD-VAS		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time (2)	.14	2.45	.955	.79	2.65	.767
Time (3)	-7.25	3.29	.028*	.79	3.65	.829
Condition (BP)	-.73	5.98	.904	1.20	4.12	.773
Condition (MP)	-2.10	6.02	.729	4.60	4.12	.274
BMI	2.09	.49	<.001**	.64	.31	.039
Time (2) x Condition (BP)	-13.54	3.54	<.001**	-1.50	3.85	.697

Time (3) x Condition (BP)	-3.58	4.68	.444	2.01	5.17	.698
Time (2) x Condition (MP)	-11.51	3.56	.001**	1.21	3.85	.754
Time (3) x Condition (MP)	-4.35	4.77	.363	3.80	5.28	.472

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media Psychoeducation condition; BSQ = Body Shape Questionnaire; BD-VAS = Body Dissatisfaction Visual Analogue Scale. *Time (2)* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Time (3)* refers to the change from baseline to 1-month follow-up in the reference condition (Waitlist). For *Condition*, each row represents the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline. For *Time (2) x Condition*, each row represents the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). For *Time (3) x Condition*, each row represents the change from baseline to 1-month follow-up in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level. ** Denotes significance at the $p \leq .001$ level.

A



B

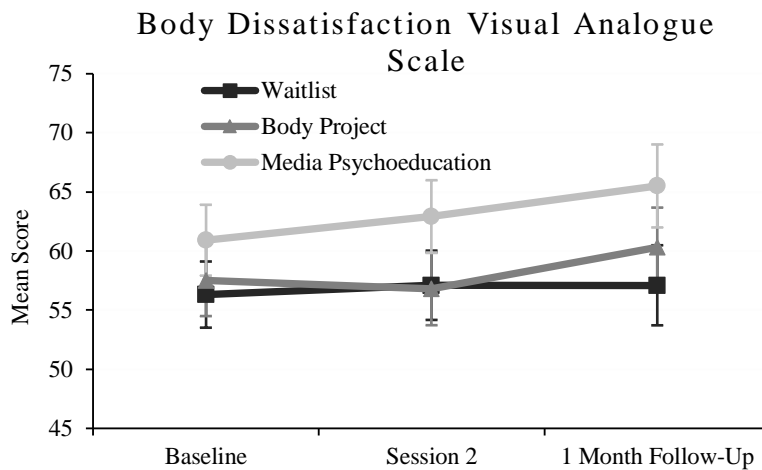


Figure 7. Body dissatisfaction scores by condition, at baseline, session 2, and 1-month follow-up.

3.8.2 Eating disorder psychopathology. Full model results for EDE-Q scores are presented in Table 16. Figure 8 displays the least squared means and standard errors for each analysis. Results demonstrated a difference between the Body Project and Waitlist conditions in change over time from baseline to session 2 on EDE-Q Global Scores ($d = -.16$). Specifically, as

demonstrated in Figure 8A, EDE-Q Global Scores decreased more from baseline to session 2 for Body Project compared to Waitlist. However, Body Project and Waitlist did not differ in change over time from baseline to 1-month follow-up on EDE-Q Global Scores.

Results also demonstrated that there was a difference between the Media Psychoeducation and Waitlist conditions in change over time from baseline to session 2 on EDE-Q Global Scores ($d = -.16$). Specifically, as demonstrated in Figure 8A, EDE-Q Global Scores scores decreased more from baseline to session 2 for Media Psychoeducation compared to Waitlist. However, Media Psychoeducation and Waitlist did not differ in change over time from baseline to 1-month follow-up on EDE-Q Global Scores. Also note that the reference (Waitlist) condition demonstrated a decrease in EDE-Q Global Scores from baseline to 1-month follow-up (as seen in Figure 8A).

Upon following up on these group differences by examining the individual EDE-Q subscales, results demonstrated that there was a difference between the Body Project and Waitlist conditions in change over time from baseline to session 2 on the Shape Concern subscale ($d = -.22$). Specifically, as demonstrated in Figure 8D, Shape Concern subscale scores decreased more from baseline to session 2 for Body Project compared to Waitlist. However, Body Project and Waitlist did not differ in change over time from baseline to 1-month follow-up on Shape Concern subscale Scores. Also note that the reference (Waitlist) condition demonstrated a decrease in Shape Concern subscale scores from baseline to 1-month follow-up (as seen in Figure 8D). Additionally, note that the reference (Waitlist) condition demonstrated a decrease in Weight Concern subscale scores from baseline to 1-month follow-up (as seen in Figure 8E). There were no other differences in changes over time between Body Project and Waitlist, or between Media Psychoeducation and Waitlist, on any of the other subscales.

Table 16

Multilevel Model Results for Eating Pathology

EDE-Q Scale	Score of Interest for Eating Pathology			Individual Subscales											
	Global Score			Restraint			Eating Concern			Shape Concern			Weight Concern		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time (2)	-.11	.10	.261	-.05	.14	.716	-.10	.11	.385	-.15	.13	.267	-.14	.12	.247
Time (3)	-.29	.13	.024*	-.24	.17	.156	-.21	.15	.157	-.39	.16	.015*	-.32	.16	.040*
Condition (BP)	-.10	.24	.671	-.24	.27	.387	-.15	.26	.586	-.08	.29	.763	.05	.29	.854
Condition (MP)	-.01	.25	.955	-.13	.27	.634	.00	.27	.993	-.05	.29	.873	.12	.29	.672
BMI	.08	.02	<.001***	.07	.02	.003**	.05	.02	.007**	.09	.02	<.001***	.12	.02	<.001***
Time (2) x Condition (BP)	-.29	.14	.045*	-.23	.21	.259	-.09	.16	.590	-.55	.20	.005**	-.28	.18	.111
Time (3) x Condition (BP)	-.06	.18	.737	-.20	.24	.411	.18	.21	.400	-.09	.23	.698	-.09	.22	.691
Time (2) x Condition (MP)	-.30	.14	.038*	-.29	.21	.154	-.23	.16	.148	-.35	.20	.073	-.31	.18	.081
Time (3) x Condition (MP)	-.16	.18	.382	.01	.25	.978	-.14	.22	.519	-.26	.23	.333	-.26	.23	.260

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media

Psychoeducation condition; EDE-Q = Eating Disorder Examination Questionnaire – 6.0. *Time (2)* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Time (3)* refers to the change from baseline to 1-month follow-up in the reference condition (Waitlist). For *Condition*, each row represents the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline. For *Time (2) x Condition*, each row represents the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). For *Time (3) x Condition*, each row represents the change from baseline to 1-month follow-up in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level. ** Denotes significance at the $p \leq .01$ level. *** Denotes significance at the $p \leq .001$ level.

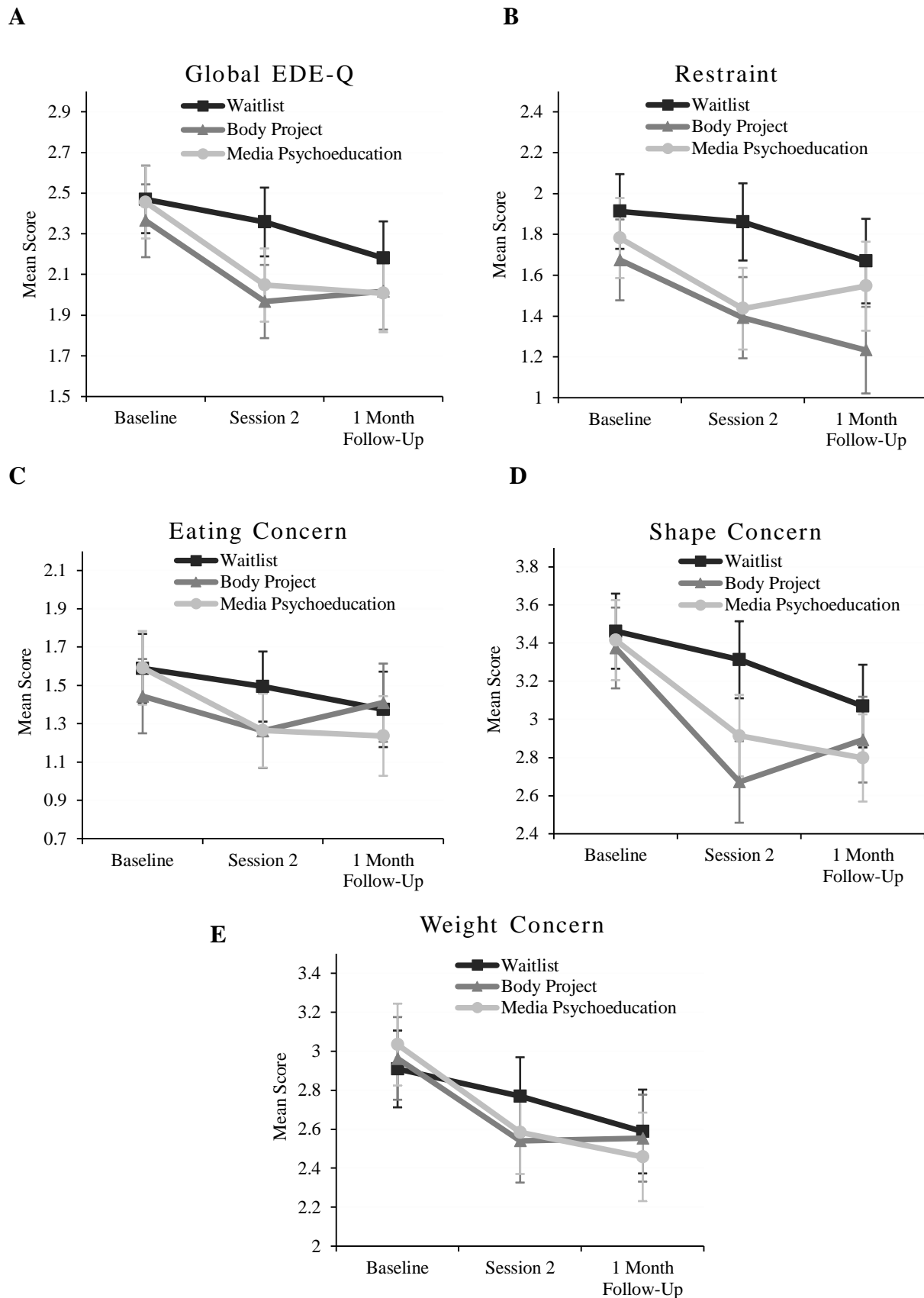


Figure 8. Eating Pathology (Eating Disorder Examination – Questionnaire 6.0) by condition, at baseline, session 2, and 1-month follow-up.

3.8.3 Thin-ideal internalization. Full model results for SATAQ scores are presented in Table 17. Figure 9 displays the least squared means and standard errors for each analysis. Results demonstrated that there was a difference between the Body Project and Waitlist conditions in change over time from baseline to session 2 on the Thin/Low Body Fat scale ($d = -.18$). Specifically, as demonstrated in Figure 9A, Thin/Low Body Fat scale scores decreased more from baseline to session 2 for Body Project compared to Waitlist. There was also a difference between the Body Project and Waitlist conditions in change over time from baseline to session 2 on the General Attractiveness scale ($d = -.18$). Specifically, as demonstrated in Figure 9C, General Attractiveness scale scores decreased more from baseline to session 2 for Body Project compared to Waitlist. However, Body Project and Waitlist did not differ in change over time from baseline to 1-month follow-up on the Thin/Low Body Fat scale or the General Attractiveness scale. The Body Project and Waitlist conditions also did not differ in change over time (either baseline to session 2, or baseline to 1-month follow-up) on the Muscular scale.

Results also demonstrated that there was a difference between the Media Psychoeducation and Waitlist conditions in change over time from baseline to session 2 on the Thin/Low Body Fat scale ($d = -.36$). Specifically, as demonstrated in Figure 9A, Thin/Low Body Fat scale scores decreased more from baseline to session 2 for Media Psychoeducation compared to Waitlist. There was also a difference between the Media Psychoeducation and Waitlist conditions in change over time from baseline to session 2 on the General Attractiveness scale ($d = -.16$). Specifically, as demonstrated in Figure 9C, General Attractiveness scale scores decreased more from baseline to session 2 for Media Psychoeducation compared to Waitlist. However, Media Psychoeducation and Waitlist did not differ in change over time from baseline to 1-month follow-up on the Thin/Low Body Fat scale or the General Attractiveness scale. The

Body Project and Waitlist conditions also did not differ in change over time (either baseline to session 2, or baseline to 1-month follow-up) on the Muscular scale.

Results of the exploratory examination of the Media Pressures scale demonstrated that the Body Project and Waitlist conditions did not differ in change over time (either baseline to session 2, or baseline to 1-month follow-up) on the Media Pressures scale. However, there was a difference between the Media Psychoeducation and Waitlist conditions in change over time from baseline to session 2 ($d = -.16$), as well as from baseline to 1-month follow-up ($d = -.32$), on the Media Pressures scale. Specifically, as demonstrated in Figure 9D, Media Pressures scale scores decreased more from baseline to session 2, and from baseline to 1-month follow-up, for Media Psychoeducation compared to Waitlist. Also note that the Media Pressures scale scores were significantly higher in the Media Psychoeducation condition compared to the reference condition (Waitlist) at Baseline (which was also determined in analyses of baseline characteristic).

Table 17

Multilevel Model Results for Thin-Ideal Internalization

SATAQ Scale	Internalization Scales									Exploratory Scale		
	Thin/Low Body Fat			Muscular			General Attractiveness			Media Pressures		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time (2)	.02	.08	.776	.00	.08	.959	.01	.06	.918	.06	.10	.560
Time (3)	.01	.10	.914	.08	.09	.403	.05	.08	.572	.09	.13	.514
Condition (BP)	-.12	.17	.474	.26	.20	.201	.11	.14	.403	.14	.19	.455
Condition (MP)	.18	.17	.307	.24	.20	.245	.05	.14	.721	.55	.19	.006**
BMI	.00	.01	.839	-.03	.02	.102	.02	.01	.032*	.01	.01	.529
Time (2) x Condition (BP)	-.27	.11	.020*	-.00	.11	.976	-.20	.09	.023*	-.12	.14	.406
Time (3) x Condition (BP)	-.06	.14	.688	-.08	.13	.520	-.12	.11	.310	-.08	.19	.680
Time (2) x Condition (MP)	-.53	.11	<.001***	-.11	.11	.336	-.18	.09	.040*	-.29	.14	.044*
Time (3) x Condition (MP)	-.19	.14	.187	-.21	.13	.109	-.16	.12	.164	-.40	.20	.042*

Note. Where specified, the table corresponds to the category in parentheses. BP = Body Project condition; MP = Media Psychoeducation condition; SATAQ = Sociocultural Attitudes Towards Appearance Questionnaire – 4 Revised; *Time (2)* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Time (3)* refers to the change from baseline to 1-month follow-up in the reference condition (Waitlist). For *Condition*, each row represents the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline. For *Time (2) x Condition*, each row represents the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). For *Time (3) x Condition*, each row represents the change from baseline to 1-month follow-up in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level. ** Denotes significance at the $p \leq .01$ level. *** Denotes significance at the $p \leq .001$ level.

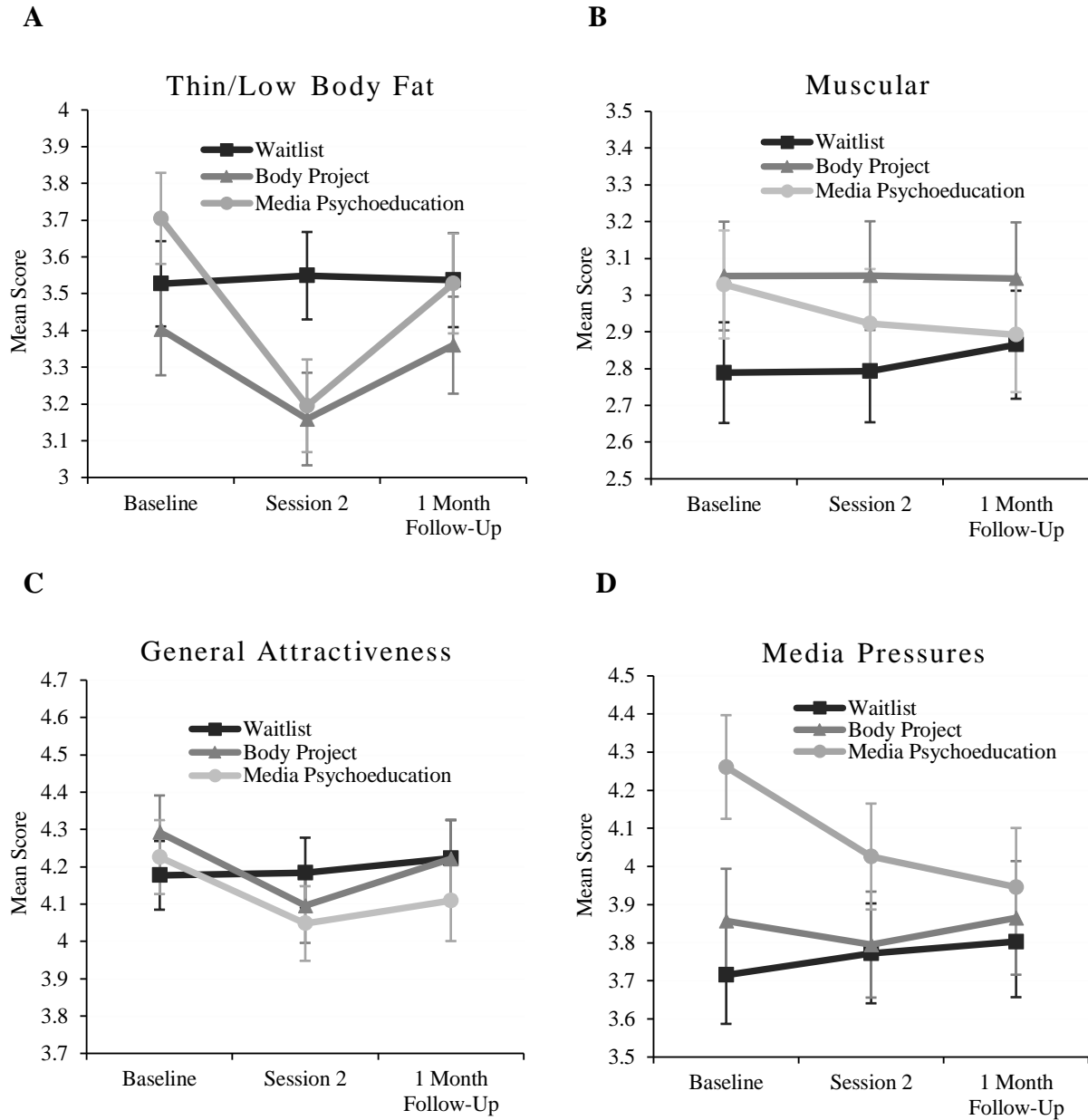


Figure 9. Thin ideal internalization (Sociocultural Attitudes Towards Appearance Questionnaire – 4 Revised subscale scores) by condition, at baseline, session 2, and 1-month follow-up.

3.9 Secondary Aim 3

3.9.1 Replication analyses of Tobin and colleagues (2018).

3.9.1.1 Attentional maintenance biases for words in body-satisfied vs. body-dissatisfied

women. From the 2 (Condition: Body-Satisfied, Waitlist) x 2 (Word Type: Thin-Related, Fat-Related) x 2 (Time: Baseline, Session 2) mixed-model ANOVA of attentional maintenance bias scores for weight-related words, there were no significant interactions (all p values $> .05$). As expected, there was a significant main effect of Condition, with Body-Dissatisfied (Waitlist) women fixating more on both thin- and fat-related words than the Body-Satisfied women ($M = 24.5\%$ vs. 22.3%), $F(1, 105) = 5.91, p = .017$, partial $\eta^2 = .05$. There was also a significant main effect of Word Type, with women overall fixating more on thin-related words than fat-related words ($M = 24.36\%$ vs. 22.43%), $F(1, 105) = 11.54, p = .001$, partial $\eta^2 = .10$. Figure 10 shows the attentional maintenance bias scores for weight-related words as a function of Condition, Image Type, and Time.

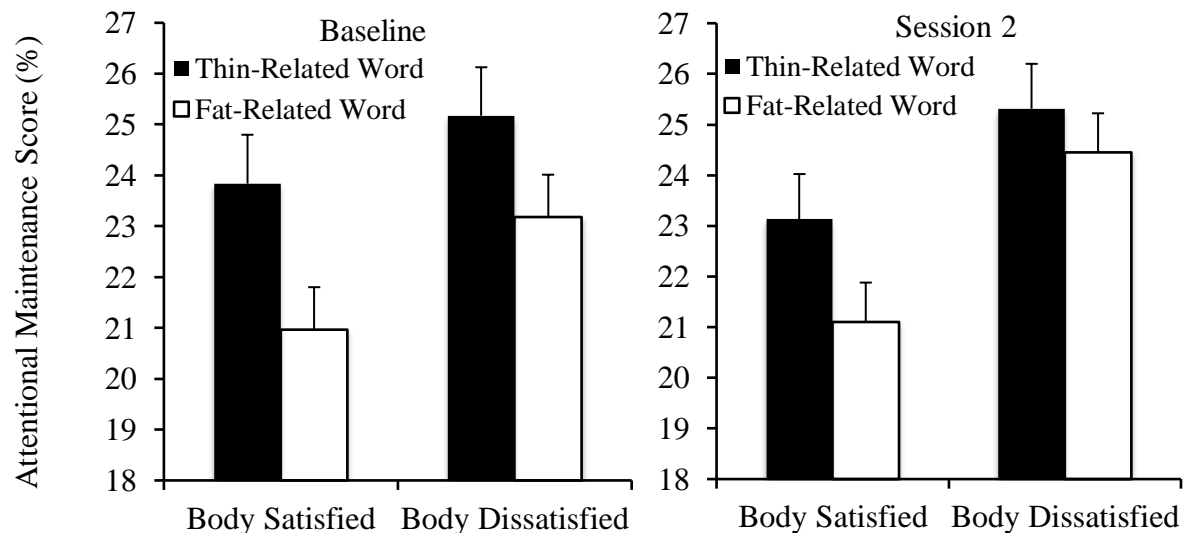


Figure 10. Attentional maintenance scores (average percentage of fixation time on thin- or fat-related words as a proportion of time spent looking at the entire screen during 8-second displays) for Body-Satisfied and Body-Dissatisfied (Waitlist) women at Baseline and Session 2.

3.9.1.2 Attentional re-engagement biases for words in body-satisfied vs. body-

dissatisfied women. From the 2 (Condition: Body-Satisfied, Waitlist) x 2 (Word Type: Thin-Related, Fat-Related) x 2 (Time: Baseline, Session 2) mixed-model ANOVA of attentional re-engagement bias scores for weight-related words, there were no significant interactions (all p values $> .05$). As expected, there was a significant main effect of Condition, with Body-Dissatisfied (Waitlist) women re-fixating more on both thin- and fat-related words than the Body-Satisfied women ($M = 25.64\%$ vs. 22.28%), $F(1, 105) = 8.64$, $p = .004$, partial $\eta^2 = .08$.

Figure 11 shows the attentional re-engagement bias scores for weight-related words as a function of Condition, Image Type, and Time.

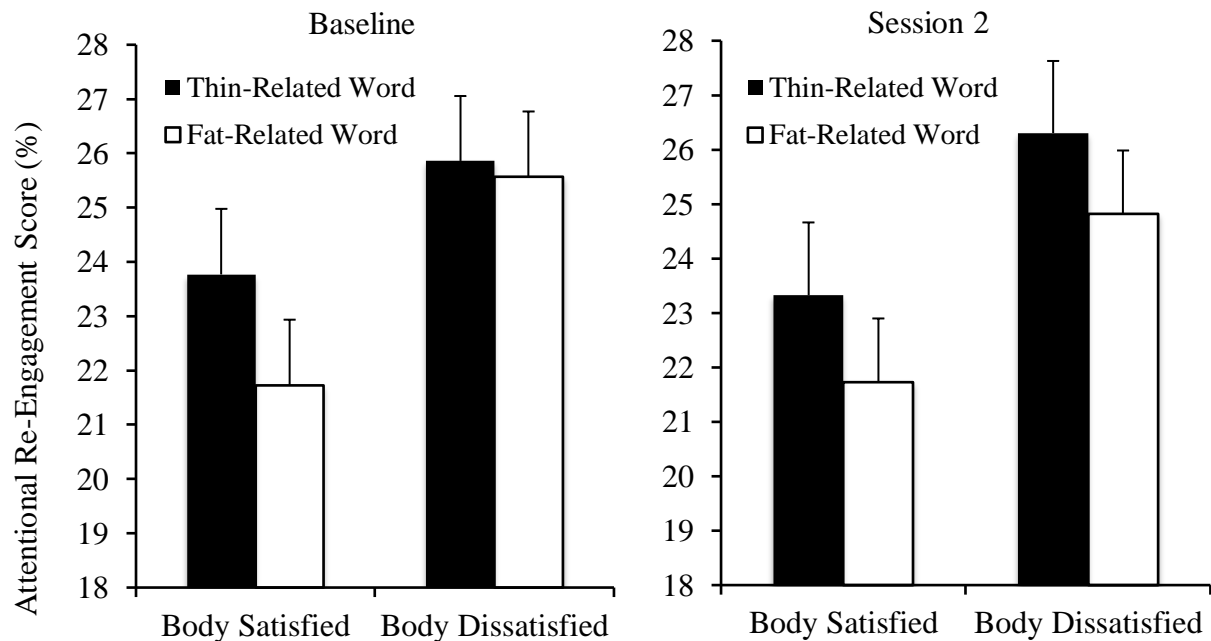


Figure 11. Attentional re-engagement scores (average number of re-fixations on thin- or fat-related words as a proportion of total re-fixations on entire screen during 8-second displays) for Body-Satisfied and Body-Dissatisfied (Waitlist) women at Baseline and Session 2.

3.9.2 Extension of Tobin and colleagues (2018) to images.

3.9.2.1 Attentional maintenance biases for images in body-satisfied vs. body-dissatisfied

women. From the 2 (Condition: Body-Satisfied, Waitlist) x 2 (Image Type: Thin-Related, Fat-Related) x 2 (Time: Baseline, Session 2) mixed-model ANOVA of attentional maintenance bias scores for weight-related images, there were no significant interactions (all p values $> .05$). As expected, there was a significant main effect of Condition, with Body-Dissatisfied (Waitlist) women fixating more on both thin- and fat-related images than the Body-Satisfied women ($M = 32.9\%$ vs. 28.1%), $F(1, 105) = 5.32, p = .023$, partial $\eta^2 = .05$. There was also a significant main effect of Image Type, with women overall fixating more on thin-related images than fat-related images ($M = 31.3\%$ vs. 29.7%), $F(1, 105) = 4.27, p = .041$, partial $\eta^2 = .04$. Additionally, there was a significant main effect of time, with women overall fixating more on weight-related images at Session 2 compared to Baseline ($M = 31.2\%$ vs. 29.8%), $F(1, 105) = 4.45, p = .037$, partial $\eta^2 = .04$. Figure 12 shows the attentional maintenance bias scores for weight-related images as a function of Condition, Image Type, and Time.

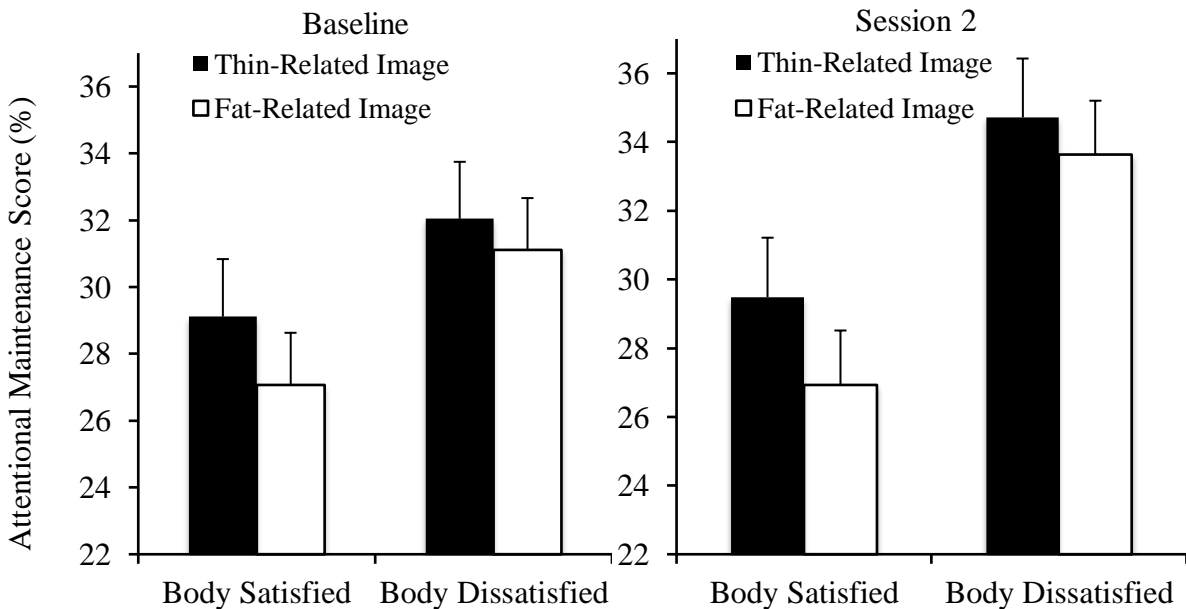


Figure 12. Attentional maintenance scores (average percentage of fixation time on thin- or fat-related images as a proportion of time spent looking at the entire screen during 8-second displays) for Body-Satisfied and Body-Dissatisfied (Waitlist) women at Baseline and Session 2.

3.9.2.2 Attentional re-engagement biases for images in body-satisfied vs. body-dissatisfied women. From the 2 (Condition: Body-Satisfied, Waitlist) x 2 (Image Type: Thin-Related, Fat-Related) x 2 (Time: Baseline, Session 2) mixed-model ANOVA of attentional re-engagement bias scores for weight-related images, there were no significant interactions (all p values $> .05$). The main effect of Condition was also not significant, although it approached significance $F(1, 105) = 3.74, p = .056, \text{partial } \eta^2 = .03$, with a trend of Body-Dissatisfied (Waitlist) women re-fixating more on both thin- and fat-related words than the Body-Satisfied women ($M = 32.82\%$ vs. 27.8%). Figure 13 shows the attentional re-engagement bias scores for weight-related images as a function of Condition, Image Type, and Time.

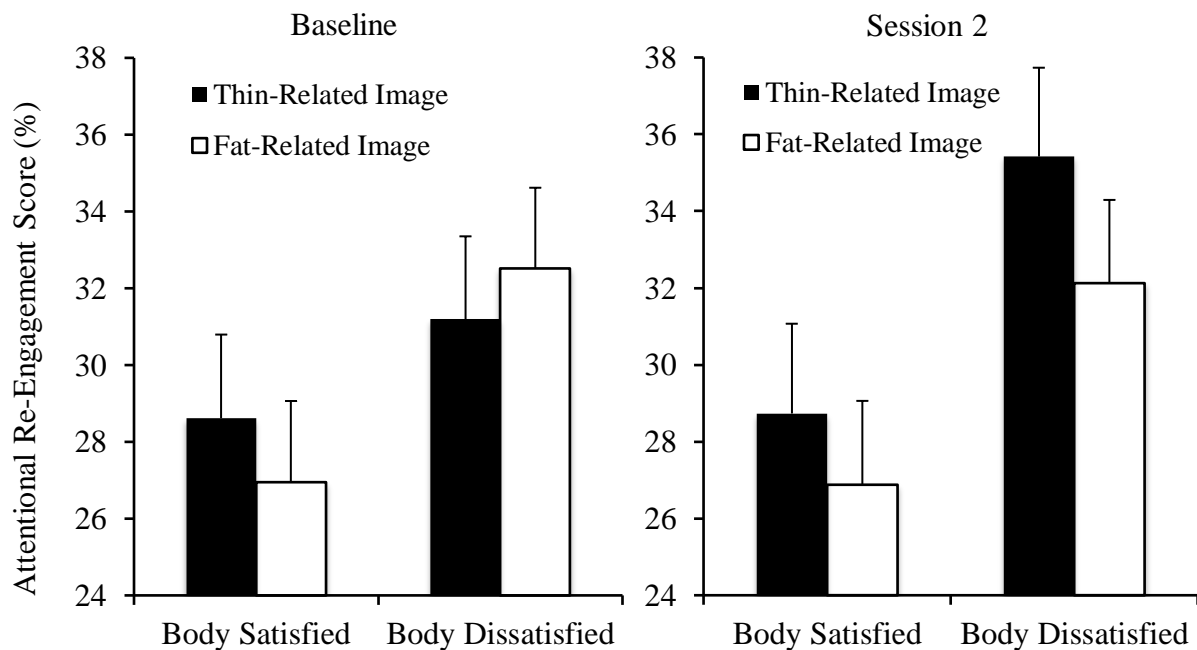


Figure 13. Attentional re-engagement scores (average number of re-fixations on thin- or fat-related images as a proportion of total re-fixations on entire screen during 8-second displays) for Body-Satisfied and Body-Dissatisfied (Waitlist) women at Baseline and Session 2.

3.10 Summary of Results

3.10.1 Primary aim. The primary aim was to examine whether participation in the Body Project reduced attentional biases to weight-related words and images compared to Waitlist, and to explore whether participation in the Media Psychoeducation program reduced attentional biases to weight-related words and images compared to Waitlist. Taken together, results demonstrated that attentional maintenance and attentional re-engagement to thin-related images decreased more from baseline to session 2 for the Body Project condition compared to the Waitlist condition. Also, attentional maintenance to fat-related images and fat-related words decreased more from baseline to session 2 for the Media Psychoeducation condition compared to the Waitlist condition.

3.10.2 Secondary aim 1. Secondary aim 1 was to examine whether participation in the Body Project increased body appreciation by post-intervention and by 1-month follow-up, and whether participation in the Media Psychoeducation program increased body appreciation by post-intervention and by 1-month follow-up compared to Waitlist. Overall, results demonstrated that BAS-2 scores increased more from baseline to session 2 for the Body Project condition compared to the Waitlist condition, but the Body Project and Waitlist conditions did not differ in change over time from baseline to 1-month follow-up on BAS-2 scores. The same pattern of an increase from baseline to session 2 but not from baseline to 1-month follow-up on BAS-2 scores was also found when comparing the Media Psychoeducation and Waitlist conditions.

3.10.3 Secondary aim 2. Secondary aim 2 was to examine whether participation in the Body Project reduced body dissatisfaction, eating disorder psychopathology, and thin-ideal internalization by post-intervention and by 1-month follow-up, and whether participation in the Media Psychoeducation program reduced the same outcomes by post-intervention and by 1-month follow-up compared to Waitlist. Results demonstrated that BSQ scores, EDE-Q Global Scores, and SATAQ Thin/Low Body Fat scores and General Attractiveness scores all demonstrated the same pattern: all decreased more from baseline to session 2 for the Body Project condition compared to the Waitlist condition, but the Body Project and Waitlist conditions did not differ in change over time from baseline to 1-month follow-up on these scores. The same pattern of a decrease from baseline to session 2 but not from baseline to 1-month follow-up on BSQ, EDE-Q Global Scores, and SATAQ Thin/Low Body Fat scores and General Attractiveness scores was also found when comparing the Media Psychoeducation and Waitlist conditions.

3.10.4 Secondary aim 3. Secondary aim 3 was to examine whether body-dissatisfied women exhibited heightened attentional biases to weight-related stimuli compared to body-satisfied women. Taken together, these replication analyses demonstrated that body-dissatisfied women fixated more on both thin- and fat-related words and images, and re-fixated more on thin- and fat-related words, compared to body-satisfied women. Additional findings demonstrated that women overall also fixated more on thin-related stimuli than fat-related stimuli, and fixated more on weight-related images at Session 2 compared to Baseline.

Discussion

4.1 Overview of Current Findings

The core aim of the current study was to determine whether participation in a cognitive dissonance-based prevention intervention for eating disorders, the Body Project program, could reduce maladaptive attentional biases present in body-dissatisfied women compared to a waitlist control condition. These biases are thought to contribute to the development and maintenance of body dissatisfaction and eating disorders (Cash & Labarge, 1996; Vitousek & Hollon, 1990; Williamson et al., 2004). Overall, we found that participation in the Body Project led to reduced attention to images of “thin” models compared to those who did not receive the intervention (waitlist). This study contributes to the attentional bias and body image/eating disorder research fields, as well as the dissonance prevention field of research; it demonstrated that compared to controls, Body Project participation improved implicit cognitive processes (e.g., attention to “thin” model imagery) that are more objective and less susceptible to demand characteristics than self-report measures (Wiers & Stacy, 2006). It also demonstrated a cognitive dissonance-based prevention program as a method to reduce maladaptive attentional biases for weight-related information, for which research has supported play a role in development of body dissatisfaction (Rodgers & DuBois, 2016), and which are theorized to contribute to development and maintenance of eating disorders (Vitousek & Hollon, 1990).

Previous efforts to reduce relevant attentional biases have been largely unsuccessful (Glashouwer et al., 2016; Loughnan et al., 2015; Withnell et al., 2019). Attentional biases to thin-related images in particular are important to target, as media in Western cultures create virtually continuous exposure to thin models (Cash, 1990). We also found that participation in a media psychoeducation-based program led to reduced attention to fat-related information compared to waitlist participants, suggesting a method to target attentional biases to fat-related

information in body-dissatisfied women (Gao et al., 2014; Gao et al., 2013; Tobin et al., 2018; Withnell et al., 2019).

In examining the secondary aims of the study, we found that participation in the Body Project program led to increased body appreciation compared to waitlist participants. These findings are promising for prevention efforts, as university-aged women are particularly at risk for development of eating disorders (Phillips & Pratt, 2005) and body appreciation has been found to protect women from negative effects of media exposure (Andrew et al., 2015). We also found that participation in the Body Project led to reduced self-reported body dissatisfaction, eating disorder psychopathology, and thin-ideal internalization compared to waitlist participants; parallel self-report results were observed for those who participated in the media psychoeducation-based program. However, for all self-report outcomes, effects did not remain at a 1-month follow-up. Finally, we also replicated past findings of attentional biases for weight-related stimuli in body-dissatisfied women (Tobin et al., 2018). After discussing findings organized by each study aim, we discuss post hoc exploratory analyses, strengths and limitations, future directions, and conclusions.

4.2 Attentional Biases and the Body Project Program

Study results demonstrated that participation in the Body Project program resulted in a greater reduction in maladaptive attentional biases towards “thin” model images compared to waitlist participants. Specifically, women who participated in the Body Project program showed a reduced total fixation time on images of “thin” models compared to waitlist. Women who participated in the Body Project program also showed a greater reduction in percentage of re-fixations on images of “thin” models compared to waitlist, demonstrating that this effect extended to both types of attention.

There were no differences between those who participated in the Body Project program and waitlist participants in change in total fixation time over time for any control image stimuli (average-sized images, garden images, household images) or control word stimuli (neutral words), which increases the confidence with which the findings for thin-related images noted above can be interpreted. As expected, there were also no differences between those who participated in the Body Project and waitlist participants in change in percentage of re-fixations over time for garden images, household images, or neutral words. Interestingly, however, those who participated in the Body Project program showed an increase in percentage of re-fixations (but not total fixation time) to images of average-sized women engaged in a real-life activity compared to those who did not receive an intervention. It is possible that as a result of the reduction in re-fixations to images of “thin” women after participation in the Body Project program, their next choice was average-sized women as an alternate image involving a person. Note that rates of attentional maintenance and re-engagement biases for thin-related images were lower for those on the waitlist at baseline; however, as baseline levels of the outcome variable are included in the LMM analyses, this difference was controlled for in the model.

The findings for attentional biases to thin-related images demonstrate that participation in the Body Project program can have an influence on maladaptive and implicit cognitive processes related to body dissatisfaction. These processes are more objective and less susceptible to demand characteristics than self-report measures (Wiers & Stacy, 2006), increasing confidence for the role of Body Project participation on body dissatisfaction. Not only do these results demonstrate the Body Project program’s salutary effects on body dissatisfaction-related implicit cognition, but they also support participation in the body project as a method to reduce maladaptive attentional biases for weight-related information, which has been largely

unsuccessful in past research (Glashouwer et al., 2016; Loughnan et al., 2015; Withnell et al., 2019). Additionally, note that waitlist participants demonstrated an *increase* in attentional biases (both maintenance and re-engagement) to thin-related images, indicating that without any intervention, attention to thin models actually increased over time. It is possible that participants' weight-related schemas were activated during the first presentation of thin-related images, heightening attentional biases to these types of images upon second presentation. Thus, the current findings are encouraging for future research aimed at reducing maladaptive attentional biases and preventing their increase over repeated exposure. Of note, one hypothesis might be that the difference in change in attention to thin images between those who participated in the Body Project compared to waitlist was a result of regression to the mean, given the groups' significant difference in scores at baseline and the increase in attention to these images for waitlist participants. However, remember that baseline levels of the outcome variable were controlled for in the model and the difference in change between these two conditions was still present after controlling for these baseline levels. Given promising results from multiple studies demonstrating the feasibility of and widespread implementation of the Body Project program, and its deliverability by trained peer leaders (Becker & Stice, 2017), the Body Project provides an easily-administered method to reduce attentional bias. These findings also suggest that interventions aimed at shifting one's attitudes or beliefs, core components of our schemas (Beck, 1990), may shift attentional biases associated with these schemas.

4.2.1 Images vs. words. The reduction in attentional biases for those who participated in the Body Project compared to waitlist participants was specific to thin-related images, and did not extend to thin-related words. Examination of both words and images allowed us to gain insight into potential mechanisms involved in attentional biases for word- and image-stimuli.

Word may stimuli resemble an individual's inner discourse, and thus may be interpreted as information that is self-relevant (Rodgers & DuBois, 2016). Images, however, are richer stimuli (Tobin, Barron, Sears, & von Ranson, 2019) and may be more likely to reflect an individual's environment (i.e., they possess ecological validity), which heightens the possibility that social comparison processes are being activated (Tafjel & Turner, 1986).

Social comparison is considered to be an important process through which body dissatisfaction is increased by exposure to thin-ideal media (Thompson, Coovert, & Stormer, 1999). When body-dissatisfied women are shown images of "thin" models, upward social comparisons (i.e., comparison to targets considered more attractive) may be more strongly involved than when they view "thin" words. It is possible that a shift in attitudes or beliefs towards the thin-ideal induced by the cognitive dissonance intervention reduced participants' tendency to engage in upward social comparisons, thus influencing the length of time they attended to and the frequency with which they re-fixated on thin-related images. A version of the Body Project program adapted for men was found to reduce appearance comparisons (i.e., the tendency to compare one's appearance to others) in young British men in per-protocol analyses (Jankowski et al., 2017). Further exploration of social comparison as a mechanism influencing cognitive biases is needed in future research (Rodgers & DuBois, 2016), and future research on this topic may provide important insight into mechanisms involved in the development, maintenance, and reduction of weight-related attentional biases.

It is also possible that the Body Project program, by heightening participants' attitudes towards opposition to the social forces that drive the thin ideal, induced a stronger sense of dislike toward the messages participants are used to seeing in the media (e.g., images of "thin" models), and potentially led to an avoidance of images that represented thin-ideal media. Given

that images more closely resemble the visual messages women continuously receive in the media than words (Tobin et al., 2019), this difference could also explain why the Body Project program reduced attention to “thin” images but not words. Additionally, amongst university women who report very high levels of body appreciation, the usual positive relationship between body dissatisfaction and attention to thin-related words is reversed, such that attention to “thin” words *decreases* with increased body dissatisfaction in this subset of women with high body appreciation (Tobin et al., 2019). In Tobin and colleagues (2019) an interpretation of results was that the women with high body appreciation were avoiding thin-related information, particularly as it became more threatening or feared with increased body dissatisfaction (Rodgers & DuBois, 2016; Vitousek & Hollon, 1990). It is possible that the change in attitude towards opposing or rejecting appearance-ideal media evoked by the Body Project program also increased women’s avoidance of thin-related information, particularly towards images that reflect the media. Finally, the use of words as stimuli also presents the potential confounding factor that many words have alternate meanings, such as the word “lean” (Tobin et al., 2019), which may dilute the effects of a program designed to reduce biases to weight-related words, and so may help explain why Body Project participation did not reduce attention to “thin” words.

4.2.2 Thin-related vs. Fat-related stimuli. A larger reduction in attentional biases to thin-related images for those who participated in the Body Project program compared to waitlist participants was not observed for fat-related images. There has been some debate in the literature regarding whether body-dissatisfied women preferentially process fat-related information and avoid thin-related information, or whether they preferentially process both types of weight-related information (Tobin et al., 2018). However, replication analyses in the current study demonstrated that body-dissatisfied women attended more to both thin- and fat-related images

compared to body-satisfied women (see “Replication Analyses” below). This finding indicates that biases for both types of images were present in the current sample, so the lack of an effect of the Body Project program on attentional biases for fat-related images is not a result of a lack of attentional biases in the sample to begin with. Thus it appears that the process through which the Body Project program affected attention for thin-related images did not extend to fat-related images.

For example, eye-tracking studies suggest body-dissatisfied individuals orient more toward desired (Cho & Lee, 2013; Gao et al., 2014) and feared appearance stimuli (Gao, Deng, et al., 2011; Gao et al., 2014; Gao et al., 2012; Gao, Wang, et al., 2011). Given the media presents thinness as attractive, “desired” stimuli are more likely to be thin-related, and “feared” stimuli more likely to be fat-related. The Body Project program aims to create cognitive dissonance that shifts one’s attitude towards opposition to the thin ideal (Stice, Rohde, & Shaw, 2013), and includes discussion as to why this ideal is not desirable. This shift towards opposing the thin ideal as desirable may also reduce women’s attention toward this desired stimulus. However, shifting one’s attitude toward the desired look may not necessarily influence what an individual “fears” looking like, and a fear of fat was not directly targeted in the Body Project program. A fear of fat, or fear of gaining weight, is considered a facet of anti-fat bias (Crandall, 1994), and is associated with body dissatisfaction (Tremblay et al., 2016). Programs designed specifically to reduce this component of anti-fat bias may also reduce attentional biases for fat-related images.

4.3 Attentional Biases and the Media Psychoeducation Program

Study results demonstrated that participation in the media psychoeducation-based program resulted in a greater reduction in maladaptive attentional maintenance biases towards

“fat” images and words compared to waitlist participants. These findings indicate that participation in the media psychoeducation program resulted in less total fixation duration on “fat” models as well as fat-related words, compared to waitlist. There were no differences between those who participated in the media psychoeducation program and waitlist participants in change in attentional maintenance over time for any control image or word stimuli, supporting the interpretation that the effects on attentional biases were specific to fat-related stimuli only.

The finding of reduced attentional maintenance to fat-related stimuli in the media psychoeducation versus waitlist participants suggests that media psychoeducation may also be a means to reduce maladaptive attentional biases for weight-related information, which has been largely unsuccessful in past research (Glashouwer et al., 2016; Loughnan et al., 2015; Withnell et al., 2019). Additionally, note that the waitlist participants increased their attentional maintenance to fat-related images, indicating that without any intervention, attention to larger-sized models increased over time. Of note, the media psychoeducation program reduced attention to fat-related stimuli but not to thin-related stimuli, as seen for those who engaged in the Body Project program. As noted, “desired” stimuli are more likely to be thin-related and “feared” stimuli more likely to be fat-related. A “fear of fat” was not directly targeted in the Body Project program, but it is possible that participation in the media psychoeducation program led to a reduction in fear of fatness, which then reduced the time spent gazing on fat-related stimuli. Future research is needed to determine whether participation in the media psychoeducation program used in the current study resulted in a reduction of a “fear of fat”, as well as which components of the program were the ingredients leading to the reduced attention to “fat” related stimuli.

4.3.1 Attentional maintenance vs. attentional re-engagement. The finding of a larger reduction in attentional maintenance to fat-related images and words among media

psychoeducation participants compared to waitlist participants did not extend to attentional re-engagement. One possible reason for this difference between findings in attentional maintenance and re-engagement is that attentional maintenance may be a more general measure of attention. For example, attentional re-engagement as measured in the current study only assessed the number of times a participant's gaze returned to the stimulus after leaving it, providing an indication of how often a stimulus drew back a participant's attention. It is thought that re-engagement to a stimulus may reflect greater interest in semantic content as well as higher perceived salience of that stimulus (Henderson, 1992; Rayner, 2009). However, re-fixations would be encompassed within an attentional maintenance score (a greater number of re-fixations would increase one's total fixation time), but attentional maintenance is also influenced by how long an individual looks at the stimulus during each fixation. Thus attentional maintenance is more likely to take into account processes that sustain one's attention. For example, it is possible that body-dissatisfied participants were looking at the "fat" images and words for a longer period of time during each fixation, and perhaps after experiencing a reduced fear of fat from the media psychoeducation program, the length of time of each fixation on a previously "feared" stimulus was reduced.

The difference in findings for attentional maintenance and attentional re-engagement highlights the significant advantage of eye-gaze tracking over response latency-based assessments of attention, such as the dot-probe task (MacLeod, Mathews, & Tata, 1986) or Stroop task (Stroop, 1935), which use participant response speed to make inferences about attention at one point in time. Eye-tracking allows for a direct and continuous measure of attention over time (Soltani et al., 2015), allowing for assessment of changes in attention and a more inclusive measure of attention which encompasses multiple attentional components, such

as attentional maintenance. These details in attention allow for the understanding of possible processes involved in attention, such as salience, semantic content, social comparison, etc.

4.4 Body Appreciation

Participation in the Body Project program resulted in a greater increase in body appreciation from baseline to session 2, compared to the waitlist participants. However, this effect was not seen from baseline to 1-month follow-up. The finding of a greater increase in body appreciation at post-intervention in the Body Project program versus waitlist participants is consistent with past research demonstrating the positive effects of the Body Project program on body appreciation in high school girls, middle-aged women with overweight or obesity, and British men (Halliwell et al., 2015; Jankowski et al., 2017; Olson et al., 2018); the present study extends these findings to a sample of university-aged women. Given that body appreciation has been found to protect women from negative effects of media exposure (Andrew et al., 2015), extension of these results to a sample of university women, a group of individuals particularly at risk for development of eating disorders (Phillips & Pratt, 2005), is promising for eating disorder prevention efforts.

Core elements of body appreciation include accepting, holding favourable opinions toward, and respecting the body, as well as rejecting media-promoted appearance ideals as the only form of beauty (Avalos et al., 2005), and these components are targeted in the Body Project program. For example, the Body Project program provides girls and young women several opportunities to vocalize opposition towards media-promoted appearance ideals (Stice, Rohde, & Shaw, 2013), and involves exercises that aim to help participants increase acceptance of, favourable opinions towards, and respect for the body (e.g., for homework, standing in front of a mirror wearing as little clothing as possible while noting only positive attributes of themselves,

such as “I like my strong legs that allow me to play sports”). Thus the Body Project program promotes body appreciation via multiple tasks. Of note, the Body Project program includes multiple components (Stice, Rohde, & Shaw, 2013), such as psychoeducation, media literacy, and behavioural tasks, to induce cognitive dissonance. Although it is speculated that the components of the Body Project program might have led to the improvement in body appreciation, the current study did not explore which specific components of the program improved body appreciation; component analyses are needed.

The finding that the Body Project program did not differ from the waitlist participants in change in body appreciation from baseline to 1-month follow-up however, was contrary to our initial hypothesis, given that effects of the Body Project program on body appreciation in British men have been sustained at 3 month follow-up in past research (Jankowski et al., 2017), although these effects were not retained for post-intervention or three month follow-up with intention-to-treat analysis. Additionally, the results of the current study did not demonstrate an effect of the Body Project program compared to the waitlist participants at 1-month follow-up for any of the additional self-reported outcomes (body dissatisfaction, eating disorder psychopathology, thin-ideal internalization). Given the limited research on the effects of the Body Project program on body appreciation at follow-up, as well as the lack of findings at follow-up for all self-report variables in the current study, it is difficult to determine whether the body appreciation results at follow-up in the current study are a result of a loss of effect at follow-up for this construct, or specific to the current study design. Below in the section “Study Design Elements that Might Have Contributed to the Lack of Effect at Follow-Up”, we discuss study design elements that may explain this result.

Results demonstrated that participation in the media psychoeducation program also resulted in a greater increase in body appreciation from baseline to session 2, compared to the waitlist participants. Like the Body Project program, this effect was not maintained at 1-month follow-up. These findings indicate that the effects of body appreciation are not specific to the Body Project program, and media literacy as delivered in the current study is an alternative intervention for targeting body appreciation. Past research, for example, has demonstrated that engagement in a Healthy Body Image intervention that included media literacy workshops resulted in a favourable change in positive embodiment in girls (Sundgot-Borgen et al., 2019). Positive embodiment and body appreciation are conceptually related (Tylka & Piran, 2019). For example, both constructs consider appreciation of the body, attuned care, and positive connection to one's body (Tylka & Piran, 2019). Thus, these results provide some additional support for the role of media literacy in the improvement of areas related to body appreciation. However, Sundgot-Borgen and colleagues also included body image workshops in the intervention, making it difficult to determine which effects are specific to the media literacy workshops in their study. Taken together, it appears media literacy is a promising alternative intervention for targeting body appreciation.

4.5 Study Design Elements that Might Have Contributed to the Lack of Effect at Follow-Up

Study results did not replicate past research that has demonstrated sustained effects of the Body Project program at follow-up on body appreciation (Jankowski et al., 2017), body dissatisfaction, eating disorder psychopathology symptoms, and thin-ideal internalization (Becker & Stice, 2017). The lack of effect at 1-month follow-up may be at least partially related to several study design factors: 1. Participants received credit/reward for participation, 2.

statistical analyses may have been underpowered for 1-month follow-up, 3. participants were not blind to condition or purposes of the study at 1-month follow-up.

First, the sample of undergraduate women was provided credit in a psychology course for participating in sessions 1 and 2 of the study, and their names were placed in a draw to win a gift card for participating in the online 1-month follow-up survey (or they were offered an additional 0.5 bonus credit if they needed one). As noted, the core proposed mechanism of the Body Project program is cognitive dissonance, which is purported to occur when there is a discrepancy between individuals' behaviours and beliefs/attitudes, influencing them to shift their attitudes/beliefs (Festinger, 1957). It is possible that by providing individuals credit or a reward for participation in the study, they may attribute their behaviour to be a means to an end for a reward, which could reduce cognitive dissonance. A replication of the current study using volunteer participants who do not receive a reward would help determine if this change would result in more lasting effects at follow-up.

Second, the study may have been underpowered to find an effect if one was present at 1-month follow-up. A power analysis was conducted for the purpose of the primary aims of the study – that is, to determine the effects of the Body Project program on attentional biases. The power analysis determined that the study required 50 participants per group to be adequately powered to detect an effect of the Body Project program on attentional biases, and researchers have suggested a minimum of 30 to 50 participants in Level 2 for multilevel linear modeling (Scherbaum & Ferrerter, 2009). However, the number of participants at 1-month follow-up ranged from 34 to 38. It is possible effects might have been observed if there had been 50 participants per group at follow-up.

Third, participants were not blind to condition at 1-month follow-up. Participants were debriefed on the purposes of the study and which condition they had been assigned to at the end of session 2 because, for logistical reasons, the 1-month follow-up survey was administered as a separate study. The study was not administered as a three-part study to enhance participant recruitment and study feasibility. Thus, it is possible that participants' knowledge of the purposes of the study, whether they had received an intervention, or which intervention they had received, influenced their scores as a result of demand characteristics. However, one might expect this knowledge to *enhance* social desirability, potentially leading those who knew they had received an intervention to report more change in the outcome variables. Regardless, this study design limitation should be considered when interpreting these results. For example, it is possible that knowledge of the purposes of the study led participants not to report based on their "gut" response, potentially influencing scores to demonstrate less of a change from baseline. It is also possible that having filled out the same questionnaires twice already by the 1-month follow-up influenced responses to demonstrate less of a change from baseline (again if participants were thinking about their past responses, and did not go with their "gut" response).

4.6 Additional Self-Report Outcomes

4.6.1 Body dissatisfaction. We found that participation in the Body Project program resulted in a greater reduction in body dissatisfaction by post-intervention compared to the waitlist participants. However, this effect was not maintained at 1-month follow-up. The finding of a greater reduction in body dissatisfaction by post-intervention is consistent with a large body of research that has demonstrated that the Body Project program produced greater decreases in body dissatisfaction than assessment-only/waitlist control conditions, (e.g., Halliwell & Diedrichs, 2014; K. Mitchell et al., 2007; Serdar et al., 2014; Stice, Chase, Stormer, & Appel,

2001; Stice et al., 2008; Stice et al., 2000; Stice et al., 2006; Stice, Trost, & Chase, 2003). Note that body dissatisfaction is a primary target of the Body Project program (Becker & Stice, 2017), in addition to being an avenue through which the program aims to reduce onset of eating disorders. These results provide additional support for a growing body of research demonstrating the Body Project program can reduce this eating disorder risk factor. Findings are also consistent with Becker and colleagues' work (2005): they used the same measure of body dissatisfaction (BSQ) and found a reduction in body dissatisfaction compared to a waitlist condition. However, this finding is not consistent with past research that has shown sustained effects of the Body Project program on body dissatisfaction at 1-month follow-up (Becker et al., 2005), 6 month follow-up (Stice et al., 2001), 7 week and 8 month follow-up (Becker, Smith, & Ciao, 2006), and even up to 1, 2, and 3-year follow-up compared to controls (Stice, Butryn, et al., 2013). Similarly to body appreciation, it is difficult to determine whether the lack of effect at 1-month follow-up is a result of a loss of effect over time, or specific to the current study design.

Note that for the waitlist participants, body dissatisfaction decreased from baseline to 1-month follow-up. It is possible that the lack of an effect of the Body Project program compared to waitlist on body dissatisfaction from baseline to 1-month follow-up was in part because levels of body dissatisfaction in the waitlist participants reduced by that time-point without any intervention. One speculation is that this reduction in the waitlist participants at follow-up could partially result from demand characteristics if participants thought the purpose of the study was to reduce their levels of body dissatisfaction, and social desirability caused them to respond in a consistent manner. Participants were not yet informed of the purpose of the study by the session 2 assessment, as debriefing occurred at the end of this session. However, participants had received debriefing information at 1-month follow-up indicating the study purpose. Given that

the waitlist participants did not show a reduction in body dissatisfaction by the end of session 2, but did at follow-up, this information may have influenced their responses at follow-up. An alternative possibility is that filling out the self-report measures caused participants to think about and reflect about these issues in their life, resulting in an eventual reduction in symptoms.

Another finding was that participation in the media psychoeducation program resulted in a greater reduction in body dissatisfaction compared to the waitlist participants by post-intervention. These findings are consistent with the line of research on which the current media psychoeducation program was based (Becker et al., 2005), which also demonstrated a decrease in body dissatisfaction in the media psychoeducation participants compared to waitlist participants. While a meta-analysis of eating disorder prevention programs (Stice & Shaw, 2004) found didactic programs to be less effective than interactive programs, as Becker and colleagues (2005) note, the media psychoeducation program was not purely didactic and involved some interactive components (e.g., discussing the “appearance ideal” as seen in the media, discussing the videos after watching them). Additionally, while the purpose of the media psychoeducation condition in the current study was to remove the cognitive dissonance components of the Body Project program, some of the exercises in the media psychoeducation program developed (e.g., discussing the media’s influence on the thin ideal and the attainability of the thin ideal) may have produced some cognitive dissonance simply via discussion. Similarly to the Body Project program, those who participated in the media psychoeducation program did not differ from waitlist participants on change in body dissatisfaction from baseline to 1-month follow-up. Similar reasons as those noted for these findings with the Body Project program could also explain this result for those in the media psychoeducation program.

Also note that the effects of the Body Project and media psychoeducation programs on body dissatisfaction did not extend to state body dissatisfaction (assessed via the BD-VAS). The BSQ used to assess body dissatisfaction is a 34-item measure (Cooper et al., 1987) that has demonstrated good reliability in past research as well as in the current study, with an internal consistency of .97 in this sample. Given the BD-VAS is only one item, a valid internal consistency cannot be calculated, and its initial development (Heinberg & Thompson, 1995) involved only examining its associations with the Eating Disorders Inventory-Body Dissatisfaction Subscale (Garner, Olmstead, & Polivy, 1983). Additionally, the BD-VAS is a measure of current state body dissatisfaction, whereas the BSQ asks the respondent to rate the 34 items over the past four weeks, making the BD-VAS more sensitive to ongoing fluctuations in body dissatisfaction. Also note that the Pearson correlation between the BD-VAS and BSQ at baseline was in the small to medium range ($r = .24, p = .002$) (Cohen, 1992). Thus, measurement of potential effects of the Body Project or media psychoeducation programs on state body dissatisfaction may have been mitigated by measurement error and ongoing fluctuations in state body dissatisfaction.

4.6.2 Eating disorder psychopathology. Study results demonstrated that participation in the Body Project program resulted in a greater reduction in eating disorder psychopathology (as measured by the Global Score of the EDE-Q) compared to the waitlist participants by post-intervention. However, this effect was not seen at 1-month follow-up. The finding of a greater decrease in eating disorder psychopathology by post-intervention in the Body Project program is consistent with several randomized controlled or randomized effectiveness trials, which have shown the Body Project program to produce greater decreases in eating disorder symptoms than control conditions (e.g., Becker et al., 2010; Linville et al., 2015; Matusek et al., 2004; K.

Mitchell et al., 2007; Rohde et al., 2014; Stice, Butryn, et al., 2013; Stice, Durant, Rohde, & Shaw, 2014; Stice et al., 2012). These results provide additional support for this growing body of research demonstrating the Body Project program can reduce eating disorder psychopathology.

The absence of an effect at 1-month follow-up, however, is not consistent with past research that has shown sustained effects of the Body Project program on eating disorder symptoms at 1-month follow-up (Becker et al., 2005), 3 month follow-up (Linville et al., 2015), 5 month follow-up (Greif, Becker, & Hildebrandt, 2015), and up to 1, 2, and 3-year follow-up (Stice, Butryn, et al., 2013). However, not all studies have found a sustained effect on eating disorder symptoms at follow-up (e.g., Becker et al., 2010; Rohde et al., 2014). As noted, it is difficult to hypothesize whether the lack of effect at 1-month follow-up in the current study is a result of a loss of effect on this construct over time or is specific to the current study design. Analyses of individual EDE-Q subscales showed a similar pattern for shape concern, but not for eating concern, dietary restraint, or weight concern.

Study results also demonstrated that participation in the media psychoeducation program resulted in a greater reduction in eating disorder psychopathology compared to the waitlist participants by post-intervention. Similarly to body dissatisfaction, these findings are consistent with previous research (Becker et al., 2005). However, again this effect was not seen at 1-month follow-up, which is inconsistent with past research (Becker et al., 2005). Additionally, eating disorder psychopathology, shape concern, and weight concern all showed a similar pattern as body dissatisfaction, with the waitlist participants showing reduced eating disorder psychopathology, shape concern, and weight concern from baseline to 1-month follow-up. Similar reasons may account for this reduction in eating disorder psychopathology symptoms in the waitlist participants at follow-up as described for body dissatisfaction, including knowledge

of the study purposes and no longer being blind to condition, or the possibility that filling out the self-report measures led to increased self-reflection and eventual reduction in symptoms (although this reduction was not seen at post-intervention).

4.6.3 Thin-ideal internalization. Participation in the Body Project program resulted in a greater reduction in thin-ideal internalization compared to the waitlist participants by post-intervention. Specifically, these effects were seen for internalization of thin/low body fat (a desire to attain a thin figure with low body fat), and for internalization of general attractiveness (a general desire for physical attractiveness), but were not seen for internalization of the muscular physique (a desire to attain a muscular physique). The lack of an effect for internalization of the muscular physique follows the rationale that body image concerns in females are usually centered more around weight and a desire for thinness (Brown & Slaughter, 2011), and in males tend to center more around a desire for muscularity and lower body fat percentage (Cafri, Strauss, & Thompson, 2002; Thompson & Cafri, 2007). Additionally, the exercises in the Body Project program tend to focus largely on the thin ideal for women. The greater decrease in thin-ideal internalization by post-intervention for participants in the current study's Body Project program is consistent with randomized control trials and randomized effectiveness trials in the literature, (e.g., Becker et al., 2010; Linville et al., 2015; Matussek et al., 2004; K. Mitchell et al., 2007; Rohde et al., 2014; Stice, Butryn, et al., 2013; Stice et al., 2001; Stice et al., 2014; Stice et al., 2012; Stice, Rohde, Durant, Shaw, & Wade, 2013; Stice et al., 2003). These results provide additional support for the body of research demonstrating the Body Project program can reduce this eating disorder risk factor.

The noted effects for thin-ideal internalization were not seen at 1-month follow-up. This absence of an effect at 1-month follow-up is inconsistent with past research that has

demonstrated sustained effects of the Body Project program on thin-ideal internalization at 1-month follow-up (Becker et al., 2005), 3-month follow-up (Linville et al., 2015), 5-month follow-up (Greif et al., 2015), and up to 1-, 2-, and 3-year follow-up (Stice, Butryn, et al., 2013). Not all studies have found a sustained effect on thin-ideal internalization symptoms at follow-up, however (e.g., Becker et al., 2010; Rohde et al., 2014).

Participation in the media psychoeducation program also resulted in a greater reduction in thin-ideal internalization (specifically internalization of thin/low body fat and internalization of general attractiveness) compared to the waitlist participants by post-intervention. This result was unexpected based on past research demonstrating that the media psychoeducation program did not result in reduced thin-ideal internalization (Becker et al., 2005). Additional research by this team, however, has also found no difference between the dissonance-based intervention and a media psychoeducation program on thin-ideal internalization, in both low- and high-risk sorority members (Becker, Bull, Schaumberg, Cauble, & Franco, 2008). The current results provide further evidence to support the media psychoeducation program as a viable alternative for the reduction of thin-ideal internalization, as well as body dissatisfaction and eating disorder psychopathology symptoms, at least by post-intervention. However, although both the cognitive dissonance and media psychoeducation interventions have resulted in reductions of various eating disorder risk factors by post-intervention, the cognitive dissonance intervention has been generally superior to the media psychoeducation intervention at eight-month follow-up (Becker et al., 2006). Additionally, the effects of the media psychoeducation program on thin-ideal internalization were also not seen at 1-month follow-up, but again these results may have been related to the current study design, as previously discussed.

Interestingly, exploratory results demonstrated that participation in the media psychoeducation program, but not the Body Project program, resulted in a greater reduction in appearance pressures emanating from the media (Schaefer et al., 2017) compared to the waitlist participants by post-intervention, and by 1-month follow-up. Although women in the media psychoeducation program had higher scores than those in the waitlist participants on the pressures from the media subscale at baseline, this difference does not negate the noted effect, because baseline levels of the pressures from media subscale were controlled in the model. Remember that the main components of the media psychoeducation program that were not included in the Body Project program were: watching and discussing a psychoeducational video focused on the influence of advertisements on body image and perpetuating the thin ideal; watching and discussing a video on eating disorders, their long-term effects, and stories from individuals who have stopped trying to pursue the thin ideal; and a homework exercise that involved finding images of models participants believe have been altered. These media psychoeducational exercises are particularly focused on appearance pressures emanating from the media, and may have largely contributed to the greater reduction in appearance pressures in the media psychoeducation participants compared to waitlist.

4.7 Replication Analyses

The aim of the replication analyses of attentional bias was to examine how consistent attentional biases to weight-related stimuli were in the current sample compared to previous findings (Rodgers & DuBois, 2016; Tobin et al., 2018; Withnell et al., 2019), to demonstrate whether biases were present in the current sample and thus amenable to change. Overall, almost all analyses successfully replicated previous research. Specifically, results demonstrated that body-dissatisfied university women showed larger attentional maintenance and attentional re-

engagement biases to both thin- and fat-related words than body-satisfied university women, replicating previous findings (Tobin et al., 2018). This pattern also extended to attentional maintenance to both thin- and fat-related images in the current sample, similar to past research (Gao et al., 2014; Withnell et al., 2019), but did not extend to attentional re-engagement for images. However, the attentional re-engagement results for images approached significance, suggesting a possible trend toward body-dissatisfied women re-fixating more on both thin-and fat-related words. As discussed, attentional maintenance may be a more general measure of attention, which could partially explain why these findings were not significant for attentional re-engagement for images. Together, these findings suggest that compared to body-satisfied women, body-dissatisfied women fixate more overall to weight-related words and images, and return their gaze more frequently towards weight-related words. These findings suggest that maladaptive schemas in women with body dissatisfaction can lead these women to preferentially process both thin- and fat-related information (Gao et al., 2014; Gao et al., 2013; Rodgers & DuBois, 2016; Tobin et al., 2018; Withnell et al., 2019), one interpretation of Vitousek and Hollon's (1990) cognitive theory of eating disorders.

Replication of attentional bias findings for both thin- and fat-related stimuli in body-dissatisfied women is important, as it increases confidence with which these findings can be interpreted, and many findings in the social sciences, including psychology, have failed to replicate (Ioannidis, Munafo, Fusar-Poli, Nosek, & David, 2014). Additionally, given the current study used a different method to screen for body dissatisfaction than that used in past research, which used a tertile split on BSQ scores (Tobin et al., 2018; Withnell et al., 2019), it was possible that the current sample might not have demonstrated a significant attentional biases similar to previous research. By demonstrating an attentional bias in the current sample, these

findings decrease the likelihood that any absence of an effect of the Body Project program on attention was an artifact of a lack of attentional bias in the current sample.

As the purpose of these replication analyses was to directly replicate past research (Tobin et al., 2018), we used mixed-model ANOVAs instead of the LMM approach that was used for all other study aims. As noted, in cluster-randomized designs, randomized clusters may impact outcome scores, as characteristics of a treatment group, such as the therapist's interpersonal style or group cohesion, may influence scores, and multilevel modeling accounts for this correlation among individuals' scores within the clusters (Finch et al., 2014). However, given that neither the waitlist nor the Body-Satisfied participants received any form of intervention, and were both assessment-only conditions, there was less of a concern of characteristics such as group cohesion or therapist style influencing their scores. These two assessment-only conditions simply ran more than one participant at a time, but participants were taken to the eye-tracking room individually, completed self-report assessments at separate computers, and were provided the same instructions for assessments, mitigating the potential influence of clusters. Additionally, LMM has the advantage of incorporating all available data using maximum likelihood estimation, thereby not restricting analyses to only fully completed cases, which increases statistical power (West et al., 2014). However, in the current study, there was sufficient power to detect an effect in attentional biases between groups at both time points, based on past eye-tracking studies which suggest those with high levels of body dissatisfaction orient more to feared (e.g., "fat") and desired (e.g., "thin") appearance stimuli compared to controls, with medium to large effect sizes (Rodgers & DuBois, 2016). Table 5 presents the total number of participants with adequate eye-tracking data that was used in analyses for each attentional bias variable at baseline and session 2.

Additional findings from the replication analyses included that women overall (across both conditions) attended more to thin-related words and images than fat-related words and images. Given that media in Western cultures create virtually continuous exposure to thin models (Cash, 1990), it is possible that images of “thin” models are more familiar to participants in general, and so tend to draw their attention. Additionally, women overall (across Body-Satisfied and Body-Dissatisfied conditions) attended more to weight-related images at session 2 compared to baseline. Given that different sets of images were presented in the baseline assessment and session 2, and the order of presentation of sets was counterbalanced between participants, familiarity with specific images at session 2 cannot account for this increased attentional maintenance. One possibility is that weight-related images in general became more familiar to participants the second time viewing them. This finding in the waitlist participants allowed us to examine women’s natural shifts in attention over time and compare those shifts with those who received the intervention.

4.8 Exploratory Analyses in Body-Dissatisfied vs. Body-Satisfied Women

We conducted post hoc exploratory analyses on the self-report outcomes of the Body-Dissatisfied and Body-Satisfied conditions. These results can be seen in Appendix F. While the self-report measures were initially only included for the Body-Satisfied condition to ensure consistency in procedure to the Body-Dissatisfied condition it was being compared to (waitlist), we conducted post hoc analyses to explore whether self-reported outcomes (body appreciation, body dissatisfaction, eating disorder psychopathology, and thin-ideal internalization) differed between body-satisfied and body-dissatisfied women at baseline, and whether changes on self-report outcomes from baseline to post-intervention varied between these two groups. As neither of these group received an intervention, they were not expected to vary in changes over time.

Results of the exploratory analyses demonstrated that body-satisfied women had higher levels of body appreciation at baseline than body-dissatisfied women. They also had lower levels of body dissatisfaction over the past month (but not state body dissatisfaction) and eating disorder psychopathology symptoms (except dietary restraint). Body-dissatisfied and body-satisfied women did not differ on thin-ideal internalization. Additionally, there was no difference in change from baseline to post-intervention between the two groups on any of the self-report outcomes, which was expected given neither of these groups received an intervention, and provides support that both groups responded similarly over time when returning for assessments that involved no intervention.

The lower levels of body appreciation observed in body-dissatisfied versus body-satisfied women is consistent with research that has demonstrated a strong inverse association (Cohen, 1992) between body dissatisfaction and body appreciation in college students ($r = -.64$) (Tylka & Wood-Barcalow, 2015). Note that while body appreciation and dissatisfaction are related constructs, body appreciation is considered distinct from body satisfaction (Avalos et al., 2005). The difference between body-dissatisfied and body-satisfied women in self-reported body dissatisfaction is expected, given these two groups were initially created based on level of body satisfaction/dissatisfaction. This result provides support for the distinctness of the two groups on this construct. The fact that these two groups did not differ on *state* body dissatisfaction, however, is unexpected, and is likely related to ongoing fluctuations in state body dissatisfaction and associated measurement error, as previously discussed. The results for eating disorder psychopathology are consistent with research that has demonstrated a large association (Cohen, 1992) between body dissatisfaction (assessed via the BSQ) and eating concern, shape concern, and weight concern ($r = .72$, $r = .82$, and $r = .71$, respectively), but only a small to medium

correlation between body dissatisfaction and dietary restraint ($r = .28$) (Grilo, Henderson, Bell, & Crosby, 2013), indicating restraint is less strongly associated with body dissatisfaction.

The results for thin-ideal internalization, however, are not consistent with previous research (Schaefer et al., 2017) that has demonstrated moderate to large associations between body dissatisfaction, as measured by the Body Dissatisfaction subscale of the Eating Disorder Inventory-3 (EDI-3)(Garner, 2004), and internalization of general attractiveness, internalization of thin/low body fat, and appearance pressures emanating from the media (as measured by the = Sociocultural Attitudes Towards Appearance Questionnaire – 4 Revised), with correlations of $r = .43$, $r = .53$, and $r = .58$, respectively. Note that internalization of the muscular physique was not associated with body dissatisfaction in this study. Results of the current study demonstrated, however, that body-dissatisfied and body-satisfied women did not differ on any of the thin-ideal internalization scales, and given the noted association between these constructs, one might expect a difference in thin-ideal internalization between the two groups. However, Schaefer and colleagues (2017) examined adolescent girls, and assessed body dissatisfaction with the EDI Body Dissatisfaction subscale. It is possible these differences in sample and assessment measure may help explain this difference in the current findings. Additionally, while there is an association between body dissatisfaction and thin-ideal internalization (Schaefer et al., 2017), participants' scores on thin-ideal internalization in the current study may simply not have been polarized enough to result in a significant difference between Body-Dissatisfied and Body-Satisfied conditions.

4.9 Strengths and Limitations

Strengths of this study include: the use of an active control condition; a follow-up assessment; an a priori power analysis; previously-validated stimuli in the measurement of

attentional biases; eye-tracking to measure attention, a method considered to have significant advantages over response latency-based measurements of attention; and statistical methods that considered cluster randomization of data and ability to flexibly handle missing data (West et al., 2014). Another strength is that we assessed treatment fidelity to ensure the Body Project program was adequately delivered and was sufficiently distinct from the media psychoeducation program. Interrater agreement on fidelity was high, and the average facilitator adherence score for the Body Project sessions (91.23%) was comparable to previous research (Jankowski et al., 2017; Kilpela et al., 2016). The average facilitator adherence score for the media psychoeducation program to the Body Project facilitator adherence measure (47.10%) was substantially below that of the Body Project facilitator adherence scores. Like past research (Becker et al., 2005), the current media psychoeducation program was designed to be similar to the Body Project program, but with the cognitive dissonance activities replaced with media psychoeducational videos and media literacy. Thus, the difference in facilitator adherence measures suggests that even though there was some overlap between the two programs, there was distinction between them.

Limitations of or practical problems with the study include a short-term follow-up for self-report outcomes of only one month, which was selected to be consistent with Becker et al. (2005) as well as to provide an initial short-term assessment of follow-up results for the Body Project program's effects on body appreciation in university women; lack of follow-up for attentional bias outcomes; reliance on self-report data for multiple outcome measures, which may be subject to social desirability and memory recall biases and thus may be less reliable indicators as more objective or detailed measurements of these variables; that the researchers administering the assessments as well as the Body Project and media psychoeducation programs were not blind to condition, though attempts to mitigate potential bias include use of objective

primary outcome measures (i.e., attentional bias), specific instructions during delivery of assessments, and manualized interventions; and that participants were not blind to condition at 1-month follow-up. Additionally, while participants were blind to condition at baseline and session 2, they were told they would be engaging in “thin-ideal media discussions” and it was apparent by the content of the Body Project and media psychoeducation programs that they were participating in a group designed to discuss the media-perpetuated thin-ideal. Thus, there was still some possibility of demand characteristics in responding. It would be helpful in future research to administer a “study credibility check” form which asks participants at the end of session 2, as well as at the beginning of the 1-month follow-up survey, to describe what they thought the purposes of the study were. This form could then be coded and used to determine whether those who knew about or remembered the purposes of the study responded differently than those who did not.

We also did not screen for BMI prior to the study to exclude participants with possible anorexia nervosa. However, as per guidelines for Body Project program recruitment (Stice, Rohde, & Shaw, 2013), any participants who appeared to be extremely thin and demonstrated a strong resistance to discussion around costs of pursuing the thin ideal were to be taken aside discreetly and told she is unlikely to benefit from the group, and provided a list of on-campus and community mental health resources. Note that during participant testing this instance did not occur. Additionally, all participants were provided the list of on campus and community mental health resources at the end of the study, for both general mental health and eating disorders.

The recruitment method used also had potential for selection bias, as a convenience sample of female psychology students was recruited, which may not fully capture the range of female university students with body dissatisfaction, potentially affecting generalizability of

results. Additionally, we did not recruit male university students, so results cannot be generalized to this under-studied population in the literature on interventions for body image (Jankowski et al., 2017; Jarry & Ip, 2005; Yager & O'Dea, 2008). Female students were chosen specifically because of their elevated risk for eating pathology, and because prevention programs tend to have larger effects on young women with elevated risk (Stice, Shaw, et al., 2007), and we wanted to increase our chances of finding a shift in attentional bias related to Body Project participation, if one was present. It is also important to note that the Body Project was being delivered to students at the University of Calgary to promote positive body image on campus, at the time of participant testing for the current study. Thus, it is possible there may have been a community level effect on the environment in which recruitment took place. Additionally, as groups were the unit of randomization, we recognize the possibility that group cohesiveness or other characteristics could have contributed to treatment efficacy. It was for this reason that we used a three-level LMM design that accounted for clustering in all analyses comparing randomized conditions, and adjusted for clustering in our power analysis. Finally, we recognize the possibility that students may have discussed the study with other students in the groups or with other students in the university. To mitigate this issue, we asked all participants to help preserve the integrity of our research by not discussing their experiences with other students, and this message was reiterated in the debriefing form. However, we could not guarantee students did not discuss the study with other students and potential participants.

Another study limitation was that individuals who completed session 1 and 2 of the study scored higher than treatment dropouts on attention re-engagement for thin- and fat-related images, and dropouts scored higher than completers on attention to household images. Results for those outcomes should be interpreted with these noted differences in mind. Finally, the Body

Shape Questionnaire (Cooper et al., 1987) and the Eating Disorder Examination Questionnaire (Fairburn & Beglin, 2008) asked participants to respond in regard to the past four weeks.

However, only one week had passed by session 2, when participants completed these measures a second time. While research has adapted this measure to assess the specific time frame elapsed in the study (e.g., Becker et al., 2005), the measures were not changed for the current study, given that these measures were developed and validated using the four-week time frame. Additionally, these two measures were still sensitive to changes over the one-week timeframe between baseline and session 2, as differences over time were found for both measures.

4.10 Future Directions

The Body Project program is a multifaceted intervention with multiple components aimed at inducing cognitive dissonance (Stice, Rohde, & Shaw, 2013). As the evidence base continues to grow for this prevention intervention, aside from a few studies demonstrating the difference between low and high dissonance versions of the program (Green et al., 2005; McMillan et al., 2011), most studies tend to examine various outcomes resulting from administration of the full program. Components analyses of the Body Project program are needed to determine which components have the strongest effects on the various desired outcomes. For example, it is possible that discussion of the costs of pursuing the thin ideal alone is enough to warrant change in maladaptive attentional biases, and the full two-session version of the intervention may not be needed. Examination of the active ingredients of this program for desired outcomes could result in shorter, more easily administered avenues to reduce attentional bias and other outcomes.

Future research could also examine social comparison as a potential mechanism through which the Body Project program reduces maladaptive attentional biases for “thin” images

compared to waitlist, as social comparison is considered an important process through which exposure to thin-ideal media increases body dissatisfaction (Thompson et al., 1999).

Additionally, future research could examine whether a “fear of fat” is a potential mechanism through which participation in the media psychoeducation program reduced attentional biases for fat-related information compared to waitlist. Future research could examine this construct using a scale such as the Fear of Fat subscale of the Body Image Attitudes and Beliefs Scale (Levitt, 2004).

Additional areas for future research include comparisons of the Body Project program with cognitive-behavioural therapy-based prevention programs for eating disorders, for which there is also a large evidence base (Becker & Stice, 2017). Additionally, longer-term follow-ups are needed across research teams. Given the current study only assessed changes in attention immediately post-intervention, future research is needed to examine whether the changes in attention are sustained at follow-up.

4.11 Summary and Conclusions

The current study demonstrated that participation in the Body Project program reduced maladaptive attentional biases for images of “thin” models in body-dissatisfied university women, compared to waitlist participants. Given the promising results from multiple studies demonstrating the feasibility of and widespread implementation of the Body Project program, and its deliverability by trained peer leaders (Becker & Stice, 2017), this cognitive dissonance prevention intervention provides an easily-administered alternative to improve attentional bias for thin-related images. This study also demonstrated that engagement in a media psychoeducation program improved maladaptive attentional biases for fat-related information

compared to controls, suggesting a method to target this second type of weight-related attentional bias (Gao et al., 2014; Gao et al., 2013; Tobin et al., 2018; Withnell et al., 2019).

The current study also demonstrated that participation in the Body Project program improved body appreciation in a sample of university women, compared to waitlist participants. Given that this population is at risk for development of an eating disorder (Phillips & Pratt, 2005) and the protective role of body appreciation (Andrew et al., 2015), these results are promising for eating disorder prevention efforts. Additionally, the study demonstrated that participation in the media psychoeducation program improved body appreciation compared to waitlist participants, suggesting media psychoeducation may be a useful alternative intervention for targeting body appreciation.

The current study also replicated previous research, demonstrating improved body dissatisfaction, eating disorder psychopathology symptoms, and thin-ideal internalization after participation in the Body Project program (Becker & Stice, 2017), as well as the media psychoeducation program (Becker et al., 2005) compared to waitlist, providing further support for these findings. However, the study did not replicate the numerous studies that have demonstrated a sustained effect on these outcomes at follow-up (Becker & Stice, 2017), possibility due to study characteristics such as the reward given for participation, or being underpowered at 1-month follow-up.

Taken together, while there is a large and growing evidence base for the effects of the Body Project program – with results from more than 35 trials by independent research teams that have shown the Body Project program and its adaptations reduce several eating disorder risk factors in female populations (Becker et al., 2015; Becker & Stice, 2017; Stice, Becker, et al., 2013) – there are still many avenues for future research to explore in this area, including effects

of this program of cognitive, biological, and additional self-report outcomes, mechanisms explaining its effects, as well as components analyses for various outcomes. By examining the effects of this preventive intervention on a cognitive outcome, this study was the first to demonstrate that Body Project participation could modify maladaptive attentional biases to thin models seen in body-dissatisfied women.

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Appendix A

SPIRIT Checklist

SPIRIT 2013 Checklist: Recommended items to address in a clinical trial protocol and related documents*

Section/item	Item No	Description	Addressed on page number
Administrative information			
Title	1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	Page i
Trial registration	2a	Trial identifier and registry name. If not yet registered, name of intended registry	Page 22
	2b	All items from the World Health Organization Trial Registration Data Set	<i>Clinical Trials.gov Registry</i>
Protocol version	3	Date and version identifier	Page 22
Funding	4	Sources and types of financial, material, and other support	Page v
Roles and responsibilities	5a	Names, affiliations, and roles of protocol contributors	Not applicable
	5b	Name and contact information for the trial sponsor	Not applicable
	5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	Page v

5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	Not applicable
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Introduction

Background and rationale	6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	Pages 1-11
	6b	Explanation for choice of comparators	Pages 11-12
Objectives	7	Specific objectives or hypotheses	Pages 10-12
Trial design	8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, noninferiority, exploratory)	Pages 13-15

Methods: Participants, interventions, and outcomes

Study setting	9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	Page 13
Eligibility criteria	10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will perform the interventions (eg, surgeons, psychotherapists)	Pages 17-18
Interventions	11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	Pages 22-25, 34-35

	11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving/worsening disease)	Page 22
	11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return, laboratory tests)	Pages 23-25
	11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	Page 17
Outcomes	12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	Pages 26-36
Participant timeline	13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	Pages 13-14, 34-36
Sample size	14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	Pages 15-16
Recruitment	15	Strategies for achieving adequate participant enrolment to reach target sample size	Pages 16, 22

Methods: Assignment of interventions (for controlled trials)

Allocation:

Sequence generation	16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	Page 20
Allocation concealment mechanism	16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	Page 20
Implementation	16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	Page 20
Blinding (masking)	17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	Page 21
	17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	Not applicable

Methods: Data collection, management, and analysis

Data collection methods	18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	Pages 13-15, 21, 26-36
	18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	Page 22

Data management	19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	Pages 22, 36
Statistical methods	20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	Pages 36-39
	20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	Pages 38
	20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	Page 36-37

Methods: Monitoring

Data monitoring	21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	None
	21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	None
Harms	22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	Pages 90
Auditing	23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	None

Ethics and dissemination

Research ethics approval	24	Plans for seeking research ethics committee/institutional review board (REC/IRB) approval	Pages iv, 22
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Protocol amendments	25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC/IRBs, trial participants, trial registries, journals, regulators)	Not applicable
Consent or assent	26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	Pages 22, 30, 34
	26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	Not applicable
Confidentiality	27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to protect confidentiality before, during, and after the trial	Page 22
Declaration of interests	28	Financial and other competing interests for principal investigators for the overall trial and each study site	None
Access to data	29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	None
Ancillary and post-trial care	30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	None
Dissemination policy	31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	Not applicable
	31b	Authorship eligibility guidelines and any intended use of professional writers	Not applicable
	31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	Not applicable

Appendices

Informed consent materials	32	Model consent form and other related documentation given to participants and authorised surrogates	On request
Biological specimens	33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	Not applicable

*It is strongly recommended that this checklist be read in conjunction with the SPIRIT 2013 Explanation & Elaboration for important clarification on the items. Amendments to the protocol should be tracked and dated. The SPIRIT checklist is copyrighted by the SPIRIT Group under the Creative Commons [“Attribution-NonCommercial-NoDerivs 3.0 Unported”](https://creativecommons.org/licenses/by-nc-nd/3.0/) license

Appendix B

Informed Consent and Debriefing Forms

Informed Consent for Body Project, Media Psychoeducation, and Waitlist Conditions

Name of Researcher, Faculty, Department, Telephone & Email:

Leah Tobin, PhD Student
Department of Psychology
403 210-9438
ltobin@ucalgary.ca

Supervisor:

Dr. Kristin von Ranson
Department of Psychology
kvonrans@ucalgary.ca

Title of Project:

Thin Ideal Media Discussions and Eye-Tracking Study

This consent form is only part of the process of informed consent. If you want more details about something mentioned here, or information not included here, you should feel free to email the researchers. Please take the time to read this carefully and to understand any accompanying information.

The University of Calgary Conjoint Faculties Research Ethics Board has approved this research study.

Purpose of the Study

The purpose of this study is to understand how individuals differ in their attention to different words and images, as well as to discuss the thin ideal as portrayed in the media. In particular, it is to understand how both individual difference factors and knowledge of this information can influence attention.

What Was/Will I Be Asked To Do?

You will perform several tasks for this study. You will be asked to fill out self-report questionnaires throughout the study, which will ask you about certain thoughts and behaviours. Some of the questions on the self-report questionnaires may be personal and sensitive, such as: "Has thinking about your shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?" You will also be asked to provide your current weight and height. You will be asked to participate in two eye-tracking tasks where you will view some words and images on a computer screen (once today, and once next week). Finally, you will be involved in a group discussion around the thin ideal as portrayed in the media.

Participation will take approximately 4 hours, completed over two 2-hour sessions (2 hours today, and 2 hours next week). You will receive 4.0 participation bonus credits in a Psychology course for your participation. Please note

that no more than 2 bonus credits may be assigned to any Psychology course.

There is a second part to this study that will be conducted approximately one month from your second session next week. This second part is an online follow up assessment, which will involve filling out the same questionnaires that you fill out today on an online Qualtrics.com survey. If you would like to participate in the second part of the study, you will receive an additional 0.5 participation bonus credit in a Psychology course OR if you do not need anymore bonus credits, you can have your name entered in a draw to win a \$75 gift certificate.

Your participation in this study is completely voluntary, and you may refuse to participate or withdraw without penalty up until the time that you submit your questionnaire data. Your responses up until the point of withdrawal will be erased. Once you submit your questionnaire, your data cannot be removed as it will be impossible to connect your name to your data. Specifically, your data cannot be withdrawn after the survey is submitted due to anonymity. If you withdraw from the study at any point you will still be awarded the previously agreed upon credit. You also may refuse to participate in parts of the study or decline to answer particular questions if you so choose.

What Type of Personal Information Was/Will Be Collected?

In agreeing to participate, you will be asked to provide your gender, age, education, academic major, occupation, ethnicity, weight, and height. This information, along with your responses to the questionnaires and tasks, will be kept separate from your name and will be identified only by code number.

Are there Risks or Benefits in Participating?

There are a few questions in the self-report questionnaires that have the potential to make some people feel momentarily embarrassed to answer. Additionally, the self-report questionnaires have the possibility of identifying distressed individuals. If you are interested in seeking help after participation in this study, please see the attached list of mental health treatment and information resources. The potential benefits of participation in this study are the possibility of increased awareness about yourself, as well as to contribute to research on attention and information on the thin ideal portrayed in the media.

What Happens to the Information I Provide

All of the information you provide will be kept private and confidential. Any information you provide will be encrypted and stored on a password protected computer. You will be given an identification number on all information collected. Only Leah Tobin, Kristin von Ranson, and research assistants working under their direct supervision will have access to the information. Study personnel have taken confidentiality training and will be required to keep information confidential.

There are no names on the questionnaires. Only group information will be summarized for any presentation or publication of results. Only anonymous data will be used in reporting research findings. The questionnaires will be kept in a locked cabinet only accessible by the researcher and her supervisor. The anonymized physical (paper and pencil) data will eventually be confidentially shredded by the Psychology Department at the University of Calgary. De-identified electronic data will be retained indefinitely.

Participation is completely voluntary and confidential. You are free to discontinue participation at any time during the study. If you chose to withdraw from the study, all of your data up to the point of withdraw will be destroyed.

Please indicate below whether or not you would like to participate in the second part of this study in approximately five week's time for an additional 0.5 participation bonus credit OR to have your name placed in a draw for a \$75 gift card. Again, it will involve completing an online survey that includes the same questionnaires that you will fill out today. You will still receive the

4.0 participation bonus credits for your participation in the current part of the study if you choose not to participate in the second part.

- Yes, I would like to participate in the second part of the study.
- No, I would not like to participate in the second part of the study.

Signatures

Your signature on this form indicates that 1) you understand to your satisfaction the information provided to you about your participation in this research project, and 2) you agree to participate in the research project.

In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this research project at any time. You should feel free to ask for clarification or new information throughout your participation.

Participant's Name: (please print) _____

Participant's Signature: _____

Date: _____

Researcher's Name: (please print) _____

Researcher's Signature: _____

Date: _____

Questions/Concerns

If you have any further questions or want clarification regarding this research and/or your participation, please contact:

Ms. Leah Tobin, PhD Student
Department of Psychology
403 210-9438, ltobin@ucalgary.ca
or
Dr. Kristin von Ranson
Department of Psychology
403 220-7085, kvonrans@ucalgary.ca

If you have any concerns about the way you've been treated as a participant, please contact the Research Ethics Analyst, Research Services Office, University of Calgary at (403) 210-9863; email cfreb@ucalgary.ca.

A copy of this consent form has been given to you to keep for your records and reference. The investigator has kept a copy of the consent form

Informed Consent for Body-Satisfied Assessment-Only Condition

Name of Researcher, Faculty, Department, Telephone & Email:

Leah Tobin, PhD Student
Department of Psychology
403 210-9438
ltobin@ucalgary.ca

Supervisor:

Dr. Kristin von Ranson
Department of Psychology
kvonrans@ucalgary.ca

Title of Project:

Individual Differences in Attention

This consent form is only part of the process of informed consent. If you want more details about something mentioned here, or information not included here, you should feel free to email the researchers. Please take the time to read this carefully and to understand any accompanying information.

The University of Calgary Conjoint Faculties Research Ethics Board has approved this research study.

Purpose of the Study

The purpose of this study is to understand how individuals differ in their attention to different words and images. In particular, it is to understand how individual difference factors can influence attention.

What Was/Will I Be Asked To Do?

You will perform several tasks for this study. You will be asked to fill out self-report questionnaires throughout the study, which will ask you about certain thoughts and behaviours. Some of the questions on the self-report questionnaires may be personal and sensitive, such as: "Has thinking about your shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?" You will also be asked to provide your current weight and height. You will be asked to participate in two eye-tracking tasks where you will view some words and images on a computer screen (once today, and once next

week).

Participation will take approximately 2 hours, completed over two 1 hour sessions (1 hour today, and 1 hour next week). You will receive 2.0 participation bonus credits in a Psychology course for your participation. Please note that no more than 2 bonus credits may be assigned to any Psychology course.

Your participation in this study is completely voluntary, and you may refuse to participate or withdraw without penalty up until the time that you submit your questionnaire data. Your responses up until the point of withdrawal will be erased. Once you submit your questionnaire, your data cannot be removed as it will be impossible to connect your name to your data. Specifically, your data cannot be withdrawn after the survey is submitted due to anonymity. If you withdraw from the study at any point you will still be awarded the previously agreed upon credit. You also may refuse to participate in parts of the study or decline to answer particular questions if you so choose.

What Type of Personal Information Was/Will Be Collected?

In agreeing to participate, you will be asked to provide your gender, age, education, academic major, occupation, ethnicity, weight, and height. This information, along with your responses to the questionnaires and tasks, will be kept separate from your name and will be identified only by code number.

Are there Risks or Benefits in Participating?

There are a few questions in the self-report questionnaires that have the potential to make some people feel momentarily embarrassed to answer. Additionally, the self-report questionnaires have the possibility of identifying distressed individuals. If you are interested in seeking help after participation in this study, please see the attached list of mental health treatment and information resources. The potential benefits of participation in this study are the possibility of increased awareness about yourself, as well as to contribute to research on attention and individual differences.

What Happens to the Information I Provide

All of the information you provide will be kept private and confidential. Any information you provide will be encrypted and stored on a password protected computer. You will be given an identification number on all information collected. Only Leah Tobin, Kristin von Ranson, and research assistants working under their direct supervision will have access to the information. Study personnel have taken confidentiality training and will be required to keep information confidential.

There are no names on the questionnaires. Only group information will be summarized for any presentation or publication of results. Only anonymous data will be used in reporting research findings. The questionnaires will be kept in a locked cabinet only accessible by the researcher and her supervisor. The anonymized physical (paper and pencil) data will eventually be confidentially shredded by the Psychology Department at the University of Calgary. De-identified electronic data will be retained indefinitely.

Participation is completely voluntary and confidential. You are free to discontinue participation at any time during the study. If you chose to withdraw from the study, all of your data up to the point of withdraw will be destroyed.

Signatures

Your signature on this form indicates that 1) you understand to your satisfaction the information provided to you about your participation in this research project, and 2) you agree to participate in the research project.

In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this research project at any time. You should feel free to ask for clarification or new information throughout your participation.

Participant's Name: (please print) _____

Participant's Signature: _____

Date: _____

Researcher's Name: (please print) _____

Researcher's Signature: _____

Date: _____

Questions/Concerns

If you have any further questions or want clarification regarding this research and/or your participation, please contact:

Ms. Leah Tobin, PhD Student
Department of Psychology
403 210-9438, ltobin@ucalgary.ca
or
Dr. Kristin von Ranson
Department of Psychology
403 220-7085, kvonrans@ucalgary.ca

If you have any concerns about the way you've been treated as a participant, please contact the Research Ethics Analyst, Research Services Office, University of Calgary at (403) 210-9863; email cfreb@ucalgary.ca.

A copy of this consent form has been given to you to keep for your records and reference. The investigator has kept a copy of the consent form.

Informed Consent for One-Month Follow-Up Survey

Name of Researcher, Faculty, Department, Telephone & Email:

Leah Tobin, PhD Student
Department of Psychology
403 210-9438
ltobin@ucalgary.ca

Supervisor:

Dr. Kristin von Ranson
Department of Psychology
kvonrans@ucalgary.ca

Title of Project:

Follow-Up Survey for Thin Ideal Media Discussions and Eye-Tracking Study

This consent form is only part of the process of informed consent. If you want more details about something mentioned here, or information not included here, you should feel free to email the researchers. Please take the time to read this carefully and to understand any accompanying information.

The University of Calgary Conjoint Faculties Research Ethics Board has approved this research study.

Purpose of the Study

The purpose of this study is to understand how individuals differ in their attention to different words and images, as well as to discuss the thin ideal as portrayed in the media. In particular, it is to understand how both individual difference factors and knowledge of this information can influence attention.

What Was/Will I Be Asked To Do?

You will complete the same questionnaires that you filled out during the study titled “Thin Ideal Media Discussions and Eye-Tracking Study” on this online survey, which will again ask you about certain thoughts and behaviours related to body dissatisfaction and satisfaction, perceptions about weight, and various dieting behaviours. Again, some of the questions on them may be personal and sensitive, such as: “Has thinking about your shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?”

Participation will take approximately 0.5 hours and you will receive 0.5 participation bonus credits in a Psychology course for your participation OR you will have your name placed in a draw to receive a \$75 gift certificate if you do not need a bonus credit.

Your participation in this study is completely voluntary, and you may refuse to participate or withdraw without penalty up until the time that you submit your questionnaire data. Your responses up until the point of withdrawal will be erased. Once you submit your questionnaire, your data cannot be removed as it will be impossible to connect your name to your data. Specifically, your data cannot be withdrawn after the survey is submitted due to anonymity. If you withdraw from the study at any point you will still be awarded the previously agreed upon credit. You also may refuse to participate in parts of the study or decline to answer particular questions if you so choose.

What Type of Personal Information Was/Will Be Collected?

If you would like to have your name included in a draw to win a \$75 gift certificate: you will be asked to provide your first name and the email address linked to your RPS account. This information is required to link your responses on the current survey with your data from the previous study in which you participated, and for us to contact you if you are the gift certificate winner. You will be identified only by a code number; all information, including your responses to the questionnaires and tasks, will be kept separate from your name after it is extracted from the survey.

If you are completing this survey for 0.5 bonus credit: no additional personal information will be required for the current survey, as you have already provided this information in the previous study. Your responses to the questionnaires on this survey will be kept separate from your name and will be identified only by a code number.

Are there Risks or Benefits in Participating?

There are a few questions in the self-report questionnaires that have the potential to make some people feel momentarily embarrassed to answer. Additionally, the self-report questionnaires have the possibility of identifying distressed individuals. If you are interested in seeking help after participation in this study, please refer to the list of mental health treatment and information resources at the end of this survey. The potential benefits of participation in this study are the possibility of increased awareness about yourself, as well as to contribute to research on attention and information on the thin-ideal portrayed in the media.

What Happens to the Information I Provide

All of the information you provide will be kept private and confidential. Any information you provide will be encrypted and stored on a password protected computer. You will be given an identification number on all information collected. Only Leah Tobin and Kristin von Ranson, and others working under their direct supervision will have access to the information. Study personnel have taken confidentiality training and will be required to keep information confidential.

If you would like to have your name included in a draw to win a \$75 gift certificate, the name and email address you will be asked to provide on the survey will be saved in an electronic file that is separate from the results you provide on the survey, and your online survey data will be deleted.

If you are completing this survey for 0.5 bonus credit, there are no names on the questionnaires.

Only group information will be summarized for any presentation or publication of results. Only anonymous data will be used in reporting research findings. De-identified electronic data will be retained indefinitely.

Participation is completely voluntary and confidential. You are free to discontinue participation at any time during the study. If you chose to withdraw from the study, all of your data up to the point of withdraw will be destroyed.

By clicking on the link below to continue and completing the survey, this indicates that 1) you understand to your satisfaction the information provided to you about your participation in this research project, and 2) you agree to participate in the research project.

In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this research project at any time. You should feel free to ask for clarification or new information throughout your participation.

If you would not like to participate in this project, please close your internet browser.

Please indicate below whether or not you would like 0.5 participation bonus credit for your participation OR have your name placed in a draw for a \$75 gift certificate.

- I would like to receive 0.5 participation bonus credit for my participation.
- I would like my name placed in a draw for a \$75 gift certificate.

Questions/Concerns

If you have any further questions or want clarification regarding this research and/or your participation, please contact:

Ms. Leah Tobin, PhD Student
Department of Psychology
403 210-9438, ltobin@ucalgary.ca

or

Dr. Kristin von Ranson
Department of Psychology
403 220-7085, kvonrans@ucalgary.ca

If you have any concerns about the way you've been treated as a participant, please contact the Research Ethics Analyst, Research Services Office, University of Calgary at (403) 210-9863; email cfreb@ucalgary.ca.

A copy of this consent form has been given to you to keep for your records and reference. The investigator has kept a copy of the consent form.

Debriefing Form for Body Project Condition

DEBRIEFING FORM: Cognitive Dissonance Condition

Project Short Title: **Thin Ideal Media Discussions and Eye-Tracking Study**
Project Full Title: **Does a Cognitive Dissonance-Based Eating Disorder Prevention Intervention Reduce Attentional Biases in Body-Dissatisfied Women?**

Thank you very much for your participation in this study. We ask that you help us preserve the integrity of our research by not discussing your experiences with other students. Thank you for your understanding and consideration of this request.

Recently, researchers have started to apply the methods of cognitive science to the study of body image. The essence of the cognitive perspective is that an individual's attitude towards his or her physical attributes will bias the manner in which stimuli related to body shape are processed. In other words, people who are preoccupied with body dissatisfaction may attend to, encode, store, and retrieve body shape stimuli differently than neutral stimuli. For example, individuals may process information pertaining to negative body image more extensively than they process information associated with positive body image, which in turn would reinforce their negative beliefs about their own body. Such information processing biases serve to maintain negative body shape and weight attitudes and may explain the persistence of body dissatisfaction in some individuals. Information processing biases can be seen through an individual's attention; for example, individuals with body dissatisfaction have been shown to display attentional biases towards weight words and images when compared to neutral words and images.

Additionally, cognitive dissonance prevention interventions are growing in the body image literature, and have shown to improve self-reported body dissatisfaction, thin-ideal internalization, dietary restraint, body appreciation, and eating pathology. However, the influence of these interventions on attentional biases has never been tested.

For the current study, you engaged in a cognitive dissonance body dissatisfaction prevention intervention called The Body Project, and we measured your attention for weight-related words and images before and after the intervention, as well as your self-report responses to various thoughts related to body satisfaction/dissatisfaction, weight stigma, and thin-ideal internalization. With the eye-tracking, we were specifically interested in the proportion of time gazing at weight words and images compared to the proportion of time gazing at neutral words and images, to see if the cognitive dissonance intervention had an effect on your attention to them. We were also interested if the cognitive dissonance intervention had an effect on your responses to self-report questionnaires, to see if the results from this university are similar to past research on this intervention.

The results of this study have the potential to fill a current gap in the literature on cognitive dissonance prevention interventions (Stice, Rohde, et al., 2013) regarding mechanisms of change, specifically whether these interventions have an effect on attentional biases in body-dissatisfied women, an assessment method less affected by self-reporting biases. The study may provide further support for the utility of this prevention intervention in undergraduate women

and its effects on change body dissatisfaction, body appreciation, thin-ideal internalization, and eating pathology (Becker et al., 2005). Also, if the cognitive dissonance program has an influence on weight bias, this information would be useful for stigma prevention/reduction programs, as weight stigma is pervasive in today's society. For example, anti-stigma programs could use similar cognitive dissonance mechanisms to help reduce weight stigma.

It is important to note that some of the images of thin models you viewed while participating in eye-tracking portion of this study are, in fact, very atypical. Not only are these models of extremely below average weight, these types of images are often digitally altered to make the models appear thinner and more flawless than in real life. Additionally, viewing the bodies seen in these images as cultural ideals can lead to negative consequences, such as increases in body dissatisfaction. Dissatisfaction with one's body image can have negative health implications. Therefore, one must keep in mind the negative impact that these thin, atypical, digitally altered images of models can have on his or her body image while being exposed to them.

If you have any concerns about body image or other issues and would like to speak to a trained counselor, we suggest contacting the Student Counseling Centre, room 375, MacEwan Student Centre. Their office hours are Monday to Friday 9:00 am to 4:00 pm and they can be reached at 403 210-9355, #2 for counseling. They are also online at www.ucalgary.ca/counselling/. Initial consultation sessions are free of charge. See the attached Mental Health Resources Information sheet for other contact information. Once again, thank you for your participation in this study. This research would not be possible without your contribution of time and energy. If you have any questions or concerns about this study or issues that arose during the study, please feel free to ask them now or contact me at a later time. Please contact me at ltobin@ucalgary.ca or 403 210-8249 if you would like me to email you the study results upon completion.

Below is a list of readings if you are interested in research in this area:

- Becker, C. B., Smith, L. M., & Ciao, A. C. (2005). Reducing eating disorder risk factors in sorority members: A randomized trial. *Behavior Therapy, 36*, 245-253.
doi:10.1016/S0005-7894(05)80073-5
- Stice, E., Rohde, P., & Shaw, H. (2013). The Body Project: A dissonance-based eating disorder prevention intervention (Updated ed.). *Facilitator guide*.
- Gao, X., Wang, Q., Jackson, T., Zhao, G., Liang, Y., & Chen, H. (2011). Biases in orienting and maintenance of attention among weight dissatisfied women: An eye-movement study. *Behaviour Research and Therapy, 49*(4), 252-259.
doi:http://dx.doi.org/10.1016/j.brat.2011.01.009
- Markis, T. A., & McLennan, C. T. (2011). The effect of priming a thin ideal on the subsequent perception of conceptually related body image words. *Body Image, 8*(4), 423-426.
doi:http://dx.doi.org/10.1016/j.bodyim.2011.05.001

Debriefing Form for Media Psychoeducation Condition

DEBRIEFING FORM: Media Psychoeducation Condition

Project Short Title: **Thin Ideal Media Discussions and Eye-Tracking Study**
Project Full Title: **Does a Cognitive Dissonance-Based Eating Disorder Prevention Intervention Reduce Attentional Biases in Body-Dissatisfied Women?**

Thank you very much for your participation in this study. We ask that you help us preserve the integrity of our research by not discussing your experiences with other students. Thank you for your understanding and consideration of this request.

Recently, researchers have started to apply the methods of cognitive science to the study of body image. The essence of the cognitive perspective is that an individual's attitude towards his or her physical attributes will bias the manner in which stimuli related to body shape are processed. In other words, people who are preoccupied with body dissatisfaction may attend to, encode, store, and retrieve body shape stimuli differently than neutral stimuli. For example, individuals may process information pertaining to negative body image more extensively than they process information associated with positive body image, which in turn would reinforce their negative beliefs about their own body. Such information processing biases serve to maintain negative body shape and weight attitudes and may explain the persistence of body dissatisfaction in some individuals. Information processing biases can be seen through an individual's attention; for example, individuals with body dissatisfaction have been shown to display attentional biases towards weight words and images when compared to neutral words and images.

Additionally, cognitive dissonance prevention interventions are growing in the body image literature, and have shown to improve self-reported body dissatisfaction, thin-ideal internalization, dietary restraint, body appreciation, and eating pathology. However, the influence of these interventions on attentional biases has never been tested.

For the current study, you engaged in a media psychoeducation body dissatisfaction prevention intervention, and we measured your attention for weight-related words and images before and after the intervention, as well as your self-report responses to various thoughts related to body satisfaction/dissatisfaction, weight stigma, and thin-ideal internalization. You participated in the media psychoeducation intervention as an alternative intervention to the main intervention of interest for this study, a cognitive dissonance prevention intervention called The Body Project. The media psychoeducation intervention you participated in was similar to the Body Project, but did not include some exercises that are used to create cognitive dissonance. However, media psychoeducation has also been shown to reduce body dissatisfaction in at risk individuals.

With the eye-tracking, we were specifically interested in the proportion of time gazing at weight words and images compared to the proportion of time gazing at neutral words and images, to see if the media psychoeducation intervention had an effect on your attention to them. We were also interested if the media psychoeducation intervention had an effect on your responses to self-report questionnaires, to see if the results from this university are similar to past research on this intervention.

The results of this study have the potential to fill a current gap in the literature on cognitive dissonance and media psychoeducation prevention interventions (Stice, Rohde, et al., 2013) regarding mechanisms of change, specifically whether these interventions have an effect on attentional biases in body-dissatisfied women, an assessment method less affected by self-reporting biases. The study may provide further support for the utility of this prevention intervention in undergraduate women and its effects on change body dissatisfaction, body appreciation, thin-ideal internalization, and eating pathology (Becker et al., 2005). Also, if the cognitive dissonance program has an influence on weight bias, this information would be useful for stigma prevention/reduction programs, as weight stigma is pervasive in today's society. For example, anti-stigma programs could use similar cognitive dissonance mechanisms to help reduce weight stigma.

It is important to note that some of the images of thin models you viewed while participating in eye-tracking portion of this study are, in fact, very atypical. Not only are these models of extremely below average weight, these types of images are often digitally altered to make the models appear thinner and more flawless than in real life. Additionally, viewing the bodies seen in these images as cultural ideals can lead to negative consequences, such as increases in body dissatisfaction. Dissatisfaction with one's body image can have negative health implications. Therefore, one must keep in mind the negative impact that these thin, atypical, digitally altered images of models can have on his or her body image while being exposed to them.

If you have any concerns about body image or other issues and would like to speak to a trained counselor, we suggest contacting the Student Counseling Centre, room 375, MacEwan Student Centre. Their office hours are Monday to Friday 9:00 am to 4:00 pm and they can be reached at 403 210-9355, #2 for counseling. They are also online at www.ucalgary.ca/counselling/. Initial consultation sessions are free of charge. See the attached Mental Health Resources Information sheet for other contact information. Once again, thank you for your participation in this study. This research would not be possible without your contribution of time and energy. If you have any questions or concerns about this study or issues that arose during the study, please feel free to ask them now or contact me at a later time. Please contact me at ltobin@ucalgary.ca or 403 210-8249 if you would like me to email you the study results upon completion.

Below is a list of readings if you are interested in research in this area:

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doi:http://dx.doi.org/10.1016/j.bodyim.2011.05.001

Debriefing Form for Waitlist Condition

DEBRIEFING FORM: Waitlist Control Condition

Project Title: **Thin Ideal Media Discussions and Eye-Tracking Study**

Thank you very much for your participation in this study. We ask that you help us preserve the integrity of our research by not discussing your experiences with other students. Thank you for your understanding and consideration of this request.

Recently, researchers have started to apply the methods of cognitive science to the study of body image. The essence of the cognitive perspective is that an individual's attitude towards his or her physical attributes will bias the manner in which stimuli related to body shape are processed. In other words, people who are preoccupied with body dissatisfaction may attend to, encode, store, and retrieve body shape stimuli differently than neutral stimuli. For example, individuals may process information pertaining to negative body image more extensively than they process information associated with positive body image, which in turn would reinforce their negative beliefs about their own body. Such information processing biases serve to maintain negative body shape and weight attitudes and may explain the persistence of body dissatisfaction in some individuals. Information processing biases can be seen through an individual's attention; for example, individuals with body dissatisfaction have been shown to display attentional biases towards weight words and images when compared to neutral words and images.

Additionally, cognitive dissonance prevention interventions are growing in the body image literature, and have shown to improve self-reported body dissatisfaction, thin-ideal internalization, dietary restraint, body appreciation, and eating pathology. However, the influence of these interventions on attentional biases has never been tested.

For the current study, we are having participants engage in a cognitive dissonance body dissatisfaction prevention intervention called The Body Project, and are measuring their attention for weight-related words and images before and after the intervention, as well as their self-report responses to various thoughts related to body satisfaction/dissatisfaction, weight stigma, and thin-ideal internalization. With the eye-tracking, we are specifically interested in the proportion of time gazing at weight words and images compared to the proportion of time gazing at neutral words and images, to see if the cognitive dissonance intervention has an effect on attention to them. We are also interested if the cognitive dissonance intervention has an effect on responses to self-report questionnaires, to see if the results from this university are similar to past research on this intervention.

For this study, you were a part of the "waitlist control" condition, meaning that we measured your attention for weight words and images with the eye-tracker, as well as your self-report responses to the questionnaires, but we did not give you the cognitive-dissonance prevention intervention. As a control condition, your results will be compared to those who were given the intervention, so see if there were differences in your attention and self-report responses. As the cognitive dissonance prevention intervention has been shown to effectively reduce body dissatisfaction and related symptoms in university aged women, **we would still like to offer you the intervention if you are interested.** It will involve two 2-hour sessions in which you and a

group of women engage in discussions about the thin-ideal perpetuated in the media, as well as discuss some of your own experiences being pressured to conform to the thin-ideal, and practice battling “fat talk.” You will not be offered course credit for participating in this intervention, thus you would be participating voluntarily because of your own interest. **If you are interested in participating in this cognitive dissonance prevention intervention for body dissatisfaction, please let the researchers know verbally before you leave this session and we will sign you up for the next intervention you are available for.**

The results of this study have the potential to fill a current gap in the literature on cognitive dissonance prevention interventions (Stice, Rohde, et al., 2013) regarding mechanisms of change, specifically whether these interventions have an effect on attentional biases in body-dissatisfied women, an assessment method less affected by self-reporting biases. The study may provide further support for the utility of this prevention intervention in undergraduate women and its effects on change body dissatisfaction, body appreciation, thin-ideal internalization, and eating pathology (Becker et al., 2005). Also, if the cognitive dissonance program has an influence on weight bias, this information would be useful for stigma prevention/reduction programs, as weight stigma is pervasive in today’s society. For example, anti-stigma programs could use similar cognitive dissonance mechanisms to help reduce weight stigma.

It is important to note that some of the images of thin models you viewed while participating in eye-tracking portion of this study are, in fact, very atypical. Not only are these models of extremely below average weight, these types of images are often digitally altered to make the models appear thinner and more flawless than in real life. Additionally, viewing the bodies seen in these images as cultural ideals can lead to negative consequences, such as increases in body dissatisfaction. Dissatisfaction with one’s body image can have negative health implications. Therefore, one must keep in mind the negative impact that these thin, atypical, digitally altered images of models can have on his or her body image while being exposed to them.

If you have any concerns about body image or other issues and would like to speak to a trained counselor, we suggest contacting the Student Counseling Centre, room 375, MacEwan Student Centre. Their office hours are Monday to Friday 9:00 am to 4:00 pm and they can be reached at 403 210-9355, #2, for counselling. They are also online at www.ucalgary.ca/counselling/. Initial consultation sessions are free of charge. See the attached Mental Health Resources Information sheet for other contact information. Once again, thank you for your participation in this study. This research would not be possible without your contribution of time and energy. If you have any questions or concerns about this study or issues that arose during the study, please feel free to ask them now or contact me at a later time. Please contact me at ltobin@ucalgary.ca or 403 210-8249 if you would like me to email you the study results upon completion.

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doi:<http://dx.doi.org/10.1016/j.bodyim.2011.05.001>

Debriefing Form for Body-Satisfied Assessment-Only Condition

DEBRIEFING FORM: Body Satisfied Assessment-Only Condition

Project Title: **Individual Differences in Attention**

Thank you very much for your participation in this study. We ask that you help us preserve the integrity of our research by not discussing your experiences with other students. Thank you for your understanding and consideration of this request.

Recently, researchers have started to apply the methods of cognitive science to the study of body image. The essence of the cognitive perspective is that an individual's attitude towards his or her physical attributes will bias the manner in which stimuli related to body shape are processed. In other words, people who are preoccupied with body dissatisfaction may attend to, encode, store, and retrieve body shape stimuli differently than neutral stimuli. For example, individuals may process information pertaining to negative body image more extensively than they process information associated with positive body image, which in turn would reinforce their negative beliefs about their own body. Such information processing biases serve to maintain negative body shape and weight attitudes and may explain the persistence of body dissatisfaction in some individuals.

Information processing biases can be seen through an individual's attention; for example, individuals with body dissatisfaction have been shown to display attentional biases towards weight words and images when compared to body satisfied women, who typically do not show these biases. The current study uses an eye-tracking paradigm as a continuous measure of attention for weight words and images in body-satisfied women. Specifically, we are interested in the proportion of time gazing at weight words and images compared to the proportion of time gazing at neutral words and images.

This study is part of a larger study that is looking at whether a body dissatisfaction prevention intervention can reduce attentional biases for weight-related words and images in body dissatisfied women. As a participant in the body satisfied condition (based on your response to a question on the RPS prescreen asking you to rate your current level of body satisfaction/dissatisfaction), your data will be compared to the data for the women in the body-dissatisfied condition.

The results of this study have the potential to fill a current gap in the literature on cognitive dissonance prevention interventions (Stice, Rohde, et al., 2013) regarding mechanisms of change, specifically whether these interventions have an effect on attentional biases in body-dissatisfied women, an assessment method less affected by self-reporting biases. The study may provide further support for the utility of this prevention intervention in undergraduate women and its effects on change body dissatisfaction, body appreciation, thin-ideal internalization, and eating pathology (Becker et al., 2005). Also, if the cognitive dissonance program has an influence on weight bias, this information would be useful for stigma prevention/reduction programs, as weight stigma is pervasive in today's society. For example, anti-stigma programs could use similar cognitive dissonance mechanisms to help reduce weight stigma.

It is important to note that some of the images of thin models you viewed while participating in eye-tracking portion of this study are, in fact, very atypical. Not only are these models of extremely below average weight, these types of images are often digitally altered to make the models appear thinner and more flawless than in real life. Additionally, viewing the bodies seen in these images as cultural ideals can lead to negative consequences, such as increases in body dissatisfaction. Dissatisfaction with one's body image can have negative health implications. Therefore, one must keep in mind the negative impact that these thin, atypical, digitally altered images of models can have on his or her body image while being exposed to them.

If you have any concerns about body image or other issues and would like to speak to a trained counselor, we suggest contacting the Student Counseling Centre, room 375, MacEwan Student Centre. Their office hours are Monday to Friday 9:00 am to 4:00 pm and they can be reached at 403 210-9355, #2, for counselling. They are also online at www.ucalgary.ca/counselling/. Initial consultation sessions are free of charge. See the attached Mental Health Resources Information sheet for other contact information. Once again, thank you for your participation in this study. This research would not be possible without your contribution of time and energy. If you have any questions or concerns about this study or issues that arose during the study, please feel free to ask them now or contact me at a later time. Please contact me at ltobin@ucalgary.ca or 403 210-8249 if you would like me to email you the study results upon completion.

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doi:http://dx.doi.org/10.1016/j.bodyim.2011.05.001

Debriefing Form for One-Month Follow-Up Survey

DEBRIEFING FORM: One-Month Follow-Up

Project Title: **Follow-Up Survey for Thin Ideal Media Discussions and Eye-Tracking Study**

Thank you very much for your participation in this study. We ask that you help us preserve the integrity of our research by not discussing your experiences with other students. Thank you for your understanding and consideration of this request.

Recently, researchers have started to apply the methods of cognitive science to the study of body image. The essence of the cognitive perspective is that an individual's attitude towards his or her physical attributes will bias the manner in which stimuli related to body shape are processed. In other words, people who are preoccupied with body dissatisfaction may attend to, encode, store, and retrieve body shape stimuli differently than neutral stimuli. For example, individuals may process information pertaining to negative body image more extensively than they process information associated with positive body image, which in turn would reinforce their negative beliefs about their own body. Such information processing biases serve to maintain negative body shape and weight attitudes and may explain the persistence of body dissatisfaction in some individuals. Information processing biases can be seen through an individual's attention; for example, individuals with body dissatisfaction have been shown to display attentional biases towards weight words and images when compared to neutral words and images.

Additionally, cognitive dissonance prevention interventions are growing in the body image literature, and have shown to improve self-reported body dissatisfaction, thin-ideal internalization, dietary restraint, body appreciation, and eating pathology. However, the influence of these interventions on attentional biases has never been tested.

Approximately one month ago, you participated in a cognitive dissonance intervention, a media psychoeducation intervention, or an assessment-only waitlist control group. After your respective intervention (or no intervention if you were in the waitlist control group), we measured your attention via eye-tracker for weight-related words and images before and after the intervention, as well as your self-report responses to various thoughts related to body satisfaction/dissatisfaction, weight stigma, and thin-ideal internalization. We were interested if the intervention had an effect on your attention for weight words and images, as well as whether the intervention had an effect on your responses to the self-report questionnaires. The survey you just completed included the same self-report questionnaires that you had filled out approximately one month ago during your participation in this study. Specifically, we will look to see if there are any changes to the constructs these questionnaires are measuring for you over the past month, to determine if the effect of the intervention have lasted.

The results of this study have to potential to fill a current gap in the literature on cognitive dissonance prevention interventions (Stice, Rohde, et al., 2013) regarding mechanisms of change, specifically whether these interventions have an effect on attentional biases in body-dissatisfied women, an assessment method less affected by self-reporting biases. The study may provide further support for the utility of this prevention intervention in undergraduate women and its effects on change body dissatisfaction, body appreciation, thin-ideal internalization, and

eating pathology (Becker et al., 2005). Also, if the cognitive dissonance program has an influence on weight bias, this information would be useful for stigma prevention/reduction programs, as weight stigma is pervasive in today's society. For example, anti-stigma programs could use similar cognitive dissonance mechanisms to help reduce weight stigma.

If you have any concerns about body image or other issues and would like to speak to a trained counselor, we suggest contacting the Student Counseling Centre, room 375, MacEwan Student Centre. Their office hours are Monday to Friday 9:00 am to 4:00 pm and they can be reached at 403 210-9355, #2, for counselling. They are also online at www.ucalgary.ca/counselling/. Initial consultation sessions are free of charge. See the attached Mental Health Resources Information sheet for other contact information. Once again, thank you for your participation in this study. This research would not be possible without your contribution of time and energy. If you have any questions or concerns about this study or issues that arose during the study, please feel free to ask them now or contact me at a later time. Please contact me at ltobin@ucalgary.ca or 403 210-8249 if you would like me to email you the study results upon completion.

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Appendix C

Pearson Correlations between Attentional Bias Scores and Self-Report Outcomes

Table C1

Pearson Correlations for Body Project Condition

Measure	Pearson's Correlations						
	<i>BSQ</i>	<i>BD-VAS</i>	BAS	Global EDE-Q	SATAQ Thin/Low	SATAQ Muscular	SATAQ General Attractiveness
Baseline							
Thin Image Maintenance	.25	.39**	-.36**	.18	.25	-.03	.41**
Fat Image Maintenance	.25	.23	-.21	.15	.19	-.10	.30*
Thin Word Maintenance	-.07	.16	-.06	.02	-.09	-.10	-.01
Fat Word Maintenance	.30*	.33*	-.29*	.32*	.21	-.17	.21
Thin Image Re-Engagement	.16	.28*	-.20	.14	.31*	.11	.43**
Fat Image Re-Engagement	.10	.18	-.18	.04	.29*	-.11	.25
Thin-Word Re-Engagement	-.04	.09	-.14	.01	-.17	-.12	-.08

Fat-Word Re-Engagement	.35*	.36**	-.39**	.34	.16	-.05	.20
Session 2							
Thin Image Maintenance	.26	.11	-.26	.27	.21	.08	.44**
Fat Image Maintenance	.20	.03	-.11	.15	.18	.09	.40**
Thin Word Maintenance	.23	-.10	-.12	.26	.16	-.05	.26
Fat Word Maintenance	.22	.09	-.30*	.14	.25	.13	.32*
Thin Image Re-Engagement	.23	.13	-.24	.22	.19	.11	.32*
Fat Image Re-Engagement	.36*	-.14	-.18	.31*	.24	.09	.37**
Thin-Word Re-Engagement	.24	.03	-.18	.24	.17	-.11	.17
Fat-Word Re-Engagement	.16	.07	-.20	.11	.14	.16	.25

* $p \leq .05$, ** $p \leq .01$.

Table C2

Pearson Correlations for Media Psychoeducation Condition

Measure	Pearson's Correlations						
	<i>BSQ</i>	<i>BD-VAS</i>	BAS	Global EDE-Q	SATAQ Thin/Low	SATAQ Muscular	SATAQ General Attractiveness
Baseline							
Thin Image Maintenance	.15	-.17	-.32*	.11	.30*	.32*	.30*
Fat Image Maintenance	.19	-.34*	-.18	.18	.14	.23	.17
Thin Word Maintenance	.19	.19	-.22	.09	.31*	.24	.33*
Fat Word Maintenance	.35*	-.18	-.27*	.27	.35**	.23	.36**
Thin Image Re-Engagement	.14	-.16	-.30*	.09	.38**	.30*	.31*
Fat Image Re-Engagement	.30*	-.40**	-.24	.25	.28*	.32*	.27*
Thin-Word Re-Engagement	.15	.16	-.19	.01	.18	.28*	.29*
Fat-Word Re-Engagement	.37**	-.15	-.21	.29*	.37**	.21	.33*
Session 2							
Thin Image Maintenance	.01	-.12	-.09	.00	.25	.29*	.34*

Fat Image Maintenance	-.10	.02	.07	-.06	.01	.17	.29*
Thin Word Maintenance	.14	.02	-.23	.20	.12	.20	.26
Fat Word Maintenance	.18	-.10	-.15	.14	-.01	.08	.35*
Thin Image Re-Engagement	.07	-.20	-.09	.07	.21	.14	.29*
Fat Image Re-Engagement	.01	-.07	.04	.02	.01	.14	.30*
Thin-Word Re-Engagement	.18	-.07	-.16	.20	.10	.18	.32*
Fat-Word Re-Engagement	.17	-.21	.02	.11	-.08	-.21	.00

* $p \leq .05$, ** $p \leq .01$.

Table C3

Pearson Correlations for Waitlist Condition

Measure	Pearson's Correlations						
	<i>BSQ</i>	<i>BD-VAS</i>	BAS	Global EDE-Q	SATAQ Thin/Low	SATAQ Muscular	SATAQ General Attractiveness
Baseline							
Thin Image Maintenance	.48**	.22	-.35**	.43**	.50**	.08	.13
Fat Image Maintenance	.41**	.07	-.24	.44**	.43**	.19	.07
Thin Word Maintenance	.35**	.13	-.42**	.30*	.14	-.07	.08
Fat Word Maintenance	.31*	-.06	-.11	.31*	.09	-.09	-.08
Thin Image Re-Engagement	.33**	.11	-.19	.30*	.44**	.07	.19
Fat Image Re-Engagement	.40**	.06	-.24	.45**	.42**	.14	.13
Thin-Word Re-Engagement	.25*	-.01	-.26*	.17	.07	.05	-.10
Fat-Word Re-Engagement	.36**	-.07	-.13	.33**	.18	-.13	.00
Session 2							
Thin Image Maintenance	.39**	.20	-.31*	.34*	.31*	.08	-.04

Fat Image Maintenance	.30*	.04	-.15	.25	.24	-.04	.05
Thin Word Maintenance	.12	-.01	-.06	.20	-.07	.16	-.14
Fat Word Maintenance	.20	.00	.05	.23	.09	.01	-.18
Thin Image Re-Engagement	.07	-.20	-.09	.07	.21	.14	.29*
Fat Image Re-Engagement	.01	-.07	.04	.02	.01	.14	.30*
Thin-Word Re-Engagement	.18	-.07	-.16	.20	.10	.18	.32*
Fat-Word Re-Engagement	.17	-.21	.02	.11	-.08	-.21	.00

* $p \leq .05$, ** $p \leq .01$.

Appendix D

Number of Participants Who Completed Outcome Variables at each Time Point

Outcome Measure	Baseline				Session 2				1-Month Follow-Up			
	BP	MP	WL	BS	BP	MP	WL	BS	BP	MP	WL	BS
Attentional Maintenance Biases	52	54	62	64	50	50	55	56	-	-	-	-
Attentional Re-Engagement Biases	52	54	62	64	50	50	55	56	-	-	-	-
BAS-2	52	54	62	64	50	50	55	56	38	35	38	
BSQ	52	54	62	64	50	50	55	56	38	35	38	-
BD-VAS	52	54	62	64	49	50	54	56	38	35	37	-
SATAQ-4R	52	54	62	64	50	50	55	56	38	34	38	-
EDE-Q 6.0	52	54	62	64	50	50	55	56	38	35	38	-

Note. BP = Body Project condition; MP = Media Psychoeducation condition; WL = Waitlist condition; BS = Body-Satisfied condition; BAS-2 = Body Appreciation Scale - 2; BSQ = Body Shape Questionnaire; SATAQ-4R = Sociocultural Attitudes Towards Appearance Questionnaire – 4 revised; EDE-Q 6.0 = Eating Disorder Examination Questionnaire 6.0; a dash (-) indicates there was no assessment for the variable at that time point

Appendix E

Facilitator Adherence Measure

Prevention Intervention Facilitator Adherence Measure

Adapted from adherence measure (Kilpela et al., 2016), provided to us by C. Becker, via personal communication, on May 10, 2018.

Please Rate on a Scale of 1 to 4 (1= “did not complete at all” 2= “somewhat completed” 3= “mostly completed” 4= “fully completed”)

Group: _____

Session 1:

Introduction:

NA				Peer Leader introductions (completed prior to turning on audio)
1	2	3	4	Group Introductions—everyone participates
1	2	3	4	Icebreakers (Body Image Pet Peeve)—everyone participates
1	2	3	4	Verbal agreement to participate
1	2	3	4	Overview of session
1	2	3	4	Importance of attendance

Identifying the Appearance Ideal:

1	2	3	4	Listed characteristics of the “perfect” woman
1	2	3	4	Re-read “perfect” woman list
1	2	3	4	Stated that this woman is the “appearance-ideal”
1	2	3	4	Clarify contrast between appearance-ideal and healthy-ideal
1	2	3	4	Asked has this always been the ideal?
1	2	3	4	Discussed the origin and perpetuation of the appearance ideal and elicited such sources as media, fashion magazines, weight loss/supplement industry (must have 2 sources for mostly complete)

Impact of Media:

1	2	3	4	Asked about negative messages from peers, dating partners, family and how feels (must say 2 for mostly completed)
1	2	3	4	Media messages impact how feel; go around the room
1	2	3	4	Discussed retouching

- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | Asked if graphic editors meet the appearance-ideal standard |
| 1 | 2 | 3 | 4 | What does culture tells us will happen if you achieve appearance ideal? |
| 1 | 2 | 3 | 4 | Will achieving the appearance ideal really make this happen? |

Costs:

- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | Introduced and passed out costs sheet in workbook |
| 1 | 2 | 3 | 4 | Gave time to write lists |
| 1 | 2 | 3 | 4 | Everyone shared two costs (go around the room) |
| 1 | 2 | 3 | 4 | Other ideas for costs for individual women or collectively as a group |
| 1 | 2 | 3 | 4 | Cost for society |
| 1 | 2 | 3 | 4 | Asked if anyone/who benefits from the appearance ideal |
| 1 | 2 | 3 | 4 | Made connection that participants are not the people who benefit (e.g, founder of a diet program, a supermodel, etc.) |
| 1 | 2 | 3 | 4 | Does it make sense to pursue the appearance ideal? |
| 1 | 2 | 3 | 4 | Each participant stated a reason not to pursue the appearance-ideal |

Verbal Challenge:

- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | Introduced verbal challenge and gave example of situation and the challenge (e.g. mom comment on friend gaining weight) |
| 1 | 2 | 3 | 4 | Gave time to write examples |
| 1 | 2 | 3 | 4 | Everyone gave example |
| 1 | 2 | 3 | 4 | Elicited good verbal challenges (the majority of the examples were good verbal challenges) |

Challenging Body Talk:

- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | Introduced challenging body talk and asked if group can think of some ways they or others might promote the appearance-ideal without even knowing it? |
| 1 | 2 | 3 | 4 | Hand out Body Talk list and allow time for participants to read |
| 1 | 2 | 3 | 4 | Asked how statements keep appearance-ideal going? |
| 1 | 2 | 3 | 4 | Asked how feelings towards own body and others around you |

would change if you stopped saying statements on Body Talk list
1 2 3 4 Body Talk mini-role-play game and went around the room twice

Behavioral Challenge:

1 2 3 4 Asked if there are things participants do not do because of body image concerns (go around room)

1 2 3 4 Asked if they are willing to do an experiment to feel better about their bodies

1 2 3 4 Give behavioral challenge examples (read examples from list)

1 2 3 4 Give time to write personal examples

1 2 3 4 Each participant share which activity they plan on doing

Exit/Home exercises:

1 2 3 4 Introduced and handed out letter to a younger body conscious girl. Also explained that think of as many costs as possible

1 2 3 4 Introduced and handed out mirror exercise. Also explained that they could use physical, emotional, intellectual, and social qualities, but one had to be physical. (must include these clarifications for fully complete)

1 2 3 4 Peer leader shared personal experience (When I did this...)

Wrap Up:

1 2 3 4 Final Thought (if time permitting)

Session 2:

Introduction:

1 2 3 4 Go around the group and get verbal commitment to actively participate

Letter Recording and Debriefing:

1 2 3 4 Each participant reads their letter

Mirror Exercise Debriefing:

- | | | | | |
|---|---|---|---|--|
| 1 | 2 | 3 | 4 | How did you feel when doing exercise? Go around group |
| 1 | 2 | 3 | 4 | Why do we find it so difficult to compliment ourselves? |
| 1 | 2 | 3 | 4 | Asked how we can teach young girls that there is a difference between confidence and arrogance, and being confident is good? |
| 1 | 2 | 3 | 4 | Everyone shared physical aspect they liked about self (went around room a second time for physical quality from those who shared an emotional quality first) |

Behavioral Challenge Debriefing:

- | | | | | |
|---|---|---|---|--|
| 1 | 2 | 3 | 4 | Each participant describes what they did and how it turned out |
| 1 | 2 | 3 | 4 | Each participant says what they learned from this exercise |

Role Plays:

- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | Introduced role plays and split into groups |
| 1 | 2 | 3 | 4 | Conducted role plays (focusing on need conform to appearance ideal) |
| 1 | 2 | 3 | 4 | Asked for reactions to role plays:
How did you feel? |
| 1 | 2 | 3 | 4 | Asked how it might be beneficial to challenge people making these types of statements |

Body Activism:

- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | Introduced list and had participants make list individually |
| 1 | 2 | 3 | 4 | Everyone shared two ideas |
| 1 | 2 | 3 | 4 | Read other body activism examples |
| 1 | 2 | 3 | 4 | Each participant shares two activities they intend to do over next week |

Future Pressures to Conform to Appearance-Ideal:

- | | | | | |
|---|---|---|---|--|
| 1 | 2 | 3 | 4 | Each participant give future pressures to conform to appearance-ideal |
| 1 | 2 | 3 | 4 | Each participant identifies <u>two</u> examples of personally relevant |

1 2 3 4 future pressures
Each participant offers a way to resist each of two pressures

Quick Comebacks Role Play:

1 2 3 4 Introduce activity (goal is to derail or end fat talk altogether)

1 2 3 4 Give example

1 2 3 4 Each participant gets two statements (go around group twice – 4 statements each)

1 2 3 4 Asked how they plan to challenge friends and family in the future

Self-affirmation exercise:

1 2 3 4 Read all six self-affirmation exercises

- 1. Discuss things you like about yourself
- 2. Positive body journal
- 3. Pact to avoid negative body talk
- 4. Pledge to end complaints
- 5. Accept compliments
- 6. Pledge to mirror exercise once per week

1 2 3 4 Participants stated which self-affirmation exercise they planned to Complete

Home exercise:

1 2 3 4 Asked whether participants willing to write another letter

1 2 3 4 Explained second letter (e.g. using information they had learned to help her develop positive body image)

Benefits of group and closure:

1 2 3 4 Go over benefits of body acceptance

1 2 3 4 Asked if any particular activity stood out as helpful

1 2 3 4 Asked: How group has changed how feel about own body

1 2 3 4 Asked: How promote body acceptance in the future?

1 2 3 4 Asked: How it has changed how they will interact with others

1 2 3 4 Go around group for everyone to state one thing they learned or liked

Appendix F

Post Hoc Exploratory Analyses in Body-Dissatisfied vs. Body-Satisfied Women

The same procedure for LMM analyses as used for secondary hypotheses 1 and 2 (comparing self-report outcomes among Body Project, Media Psychoeducation, and Waitlist condition) was used to compare self-report outcomes between the Body-Dissatisfied and Body-Satisfied conditions that did not receive an intervention (see “Analyses”).

Body Appreciation in Body-Satisfied vs. Body-Dissatisfied Women.

Full model results for BAS scores are presented in Table F1. Figure F1 displays the least squared means and standard errors for each analysis. Results demonstrated that BAS scores differed between the Body-Satisfied and Body-Dissatisfied women at baseline. Figure F1 demonstrates that Body-Satisfied women had higher BAS scores at baseline than Body-Dissatisfied women. Body-Satisfied and Body-Dissatisfied women did not differ in change over time in BAS scores.

Table F1

Multilevel Model Results for Body Appreciation

	BAS		
	<i>b</i>	SE	<i>p</i>
Time	.04	.04	.390
Condition (BS)	.73	.18	<.001*
BMI	-.04	.02	.097
Time x Condition (BS)	-.01	.06	.840

Note. Where specified, the table corresponds to the category in parentheses. BS = Body-Satisfied assessment only condition; BAS = Body Appreciation Scale – 2. *Time* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Condition* refers to the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline.

Time x Condition refers to the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .001$ level.

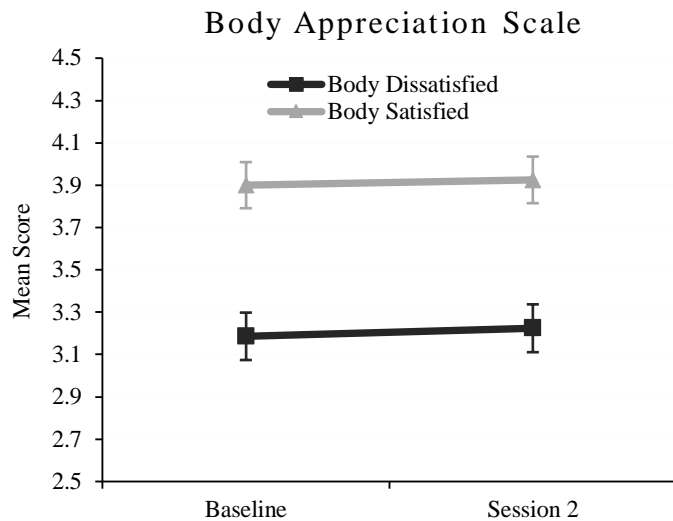


Figure F1. Body appreciation scores by condition, at baseline and session 2.

Body Dissatisfaction in Body-Satisfied vs. Body-Dissatisfied Women

Full model results for BSQ scores and BD-VAS scores are presented in Table F2. Figure F2 displays the least squared means and standard errors for each analysis. Results demonstrated that BSQ scores (body dissatisfaction) differed between the Body-Satisfied and Body-Dissatisfied women at baseline. Figure F2A demonstrates that Body-Satisfied women had lower BSQ scores at baseline than Body-Dissatisfied women. Body-Satisfied and Body-Dissatisfied women did not differ in change over time on BSQ scores.

Results demonstrated that BD-VAS scores (state body dissatisfaction) did not differ between the Body-Satisfied and Body-Dissatisfied women at baseline. Body-Satisfied and Body-Dissatisfied women also did not differ in change over time on BD-VAS scores.

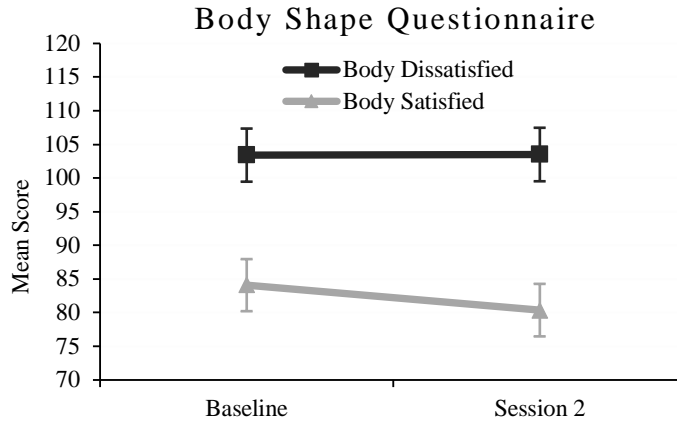
Table F2

Multilevel Model Results for Body Dissatisfaction Measures

	BSQ			BD-VAS		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time	.09	1.45	.949	1.05	2.10	.619
Condition (BS)	-15.51	6.24	.015*	-4.10	6.47	.528
BMI	4.66	.87	<.001*	1.61	.80	.048*
Time x Condition (BS)	-3.80	2.03	.064	-5.30	2.94	.074

Note. Where specified, the table corresponds to the category in parentheses. BS = Body-Satisfied assessment only condition; BSQ = Body Shape Questionnaire; BD-VAS = Body Dissatisfaction Visual Analogue Scale. *Time* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Condition* refers to the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline. *Time x Condition* refers to the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level.

A



B

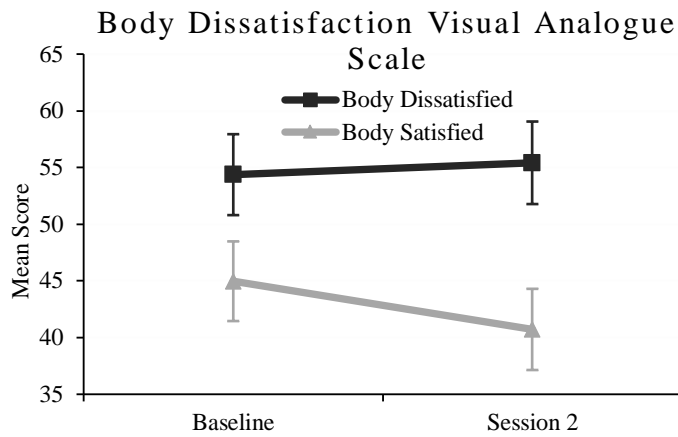


Figure F2. Body dissatisfaction scores by condition, at baseline and session 2.

Eating Disorder Psychopathology in Body-Satisfied vs. Body-Dissatisfied Women

Full model results for EDE-Q scores are presented in Table F3. Figure F3 displays the least squared means and standard errors for each analysis. Results demonstrated that EDE-Q Global Scores (Eating Disorder Psychopathology) differed between the Body-Satisfied and Body-Dissatisfied women at baseline. Figure F3A demonstrates that Body-Satisfied women had

lower EDE-Q Global Scores at baseline than Body-Dissatisfied women. Body-Satisfied and Body-Dissatisfied women did not differ in change over time on EDE-Q Global Scores.

Similar results were found for the Eating Concern, Shape Concern, and Weight Concern scales, with Body-Satisfied and Body-Dissatisfied women differing on these scales at baseline. Figures F3C, F3D, and F3E demonstrate that Body-Satisfied women had lower scale scores on each of these respective subscales at baseline than Body-Dissatisfied women. These two conditions did not differ on the Restraint scale at baseline. Additionally, these two conditions did not differ on change over time on any of the four EDE-Q subscales.

Table F3

Multilevel Model Results for Eating Pathology

EDE-Q Scale	Global Score			Restraint			Eating Concern			Shape Concern			Weight Concern		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
Time	-.11	.07	.103	-.04	.12	.715	-.09	.09	.279	-.16	.09	.076	-.14	.08	.094
Condition (BS)	-.78	.27	.005**	-.29	.34	.397	-.62	.29	.036*	-1.32	.34	<.001***	-.85	.32	.011*
BMI	.15	.03	<.001***	.15	.04	<.001***	.12	.03	<.001***	.15	.04	<.001***	.18	.04	<.001***
Time x Condition (BS)	.02	.09	.822	-.05	.17	.768	.08	.12	.522	.07	.12	.568	-.01	.12	.937

Note. Where specified, the table corresponds to the category in parentheses. BS = Body-Satisfied assessment only condition. EDE-Q = Eating Disorder Examination Questionnaire – 6.0. *Time* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Condition* refers to the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline. *Time x Condition* refers to the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level. ** Denotes significance at the $p \leq .01$ level. *** Denotes significance at the $p \leq .001$ level.

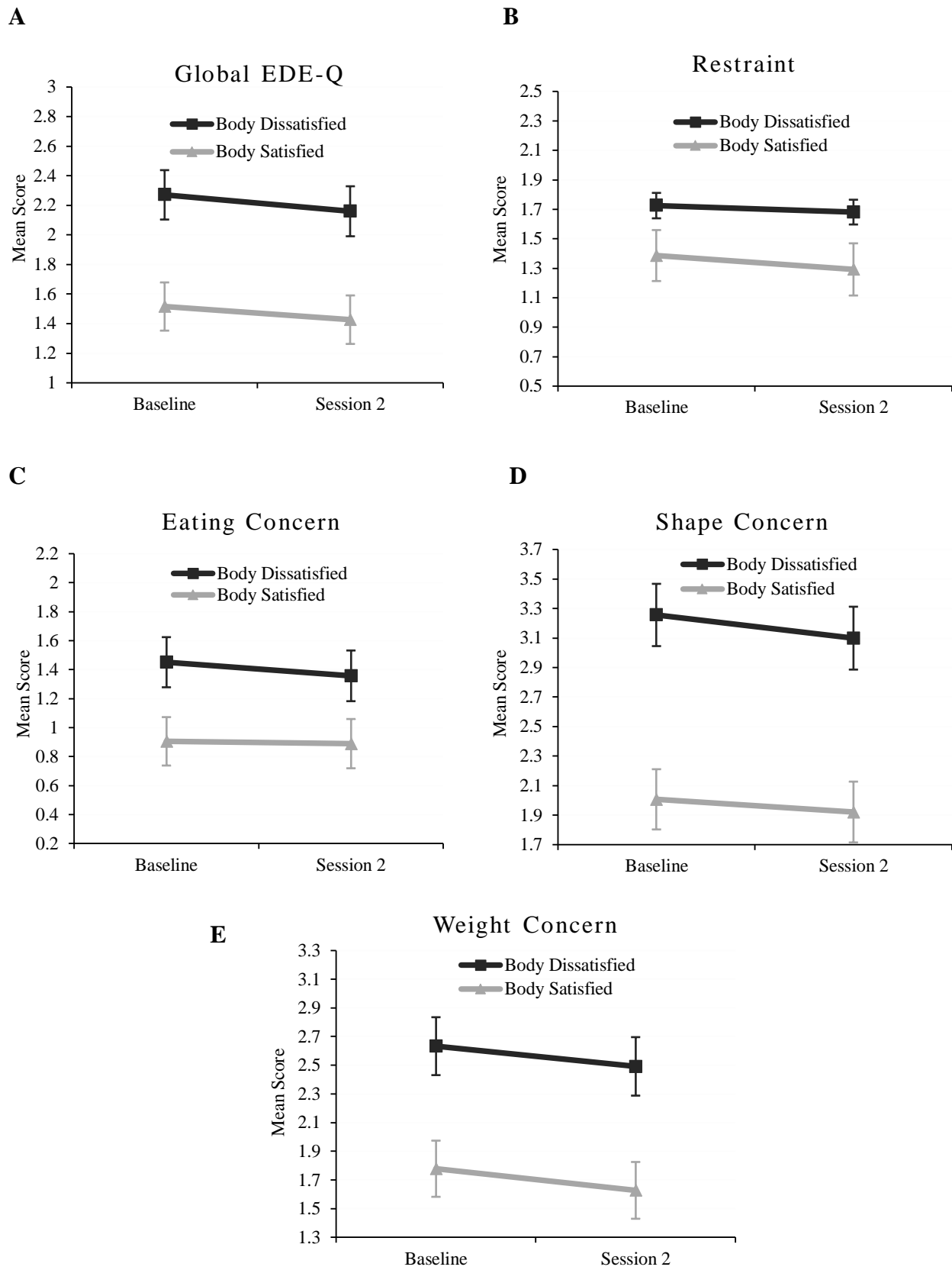


Figure F3. Eating pathology scores by condition, at baseline and session 2.

Thin-Ideal Internalization in Body-Satisfied vs. Body-Dissatisfied Women

Full model results for SATAQ scores are presented in Table F4. Figure F4 displays the least squared means and standard errors for each analysis. Results demonstrated that SATAQ Thin/Low Body Fat, Muscular, General Attractiveness, and Media Pressures subscale scores did not significantly differ between the Body-Satisfied and Body-Dissatisfied women at Baseline. Additionally, Body-Satisfied and Body-Dissatisfied women did not differ in change over time on any of these four SATAQ subscales.

Table F4

Multilevel Model Results for Thin-Ideal Internalization

SATAQ Scale	Thin/Low Body Fat			Muscular			General Attractiveness			Media Pressures		
	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>	<i>b</i>	SE	<i>p</i>
	Time	.02	.07	.764	.01	.08	.920	.01	.05	.902	.06	.08
Condition (BS)	-.28	.21	.186	.12	.23	.600	-.13	.18	.463	-.08	.25	.747
BMI	.05	.25	.064	.01	.03	.657	.03	.02	.101	.07	.03	.016*
Time x Condition (BS)	-.06	.10	.533	-.04	.11	.684	-.02	.07	.717	-.08	.12	.522

Note. Where specified, the table corresponds to the category in parentheses. BS = Body-Satisfied assessment only condition; SATAQ = Sociocultural Attitudes Towards Appearance Questionnaire – 4 Revised. *Time* refers to the change from baseline to session 2 in the reference condition (Waitlist). *Condition* refers to the difference between the condition denoted in parentheses and the reference condition (Waitlist) at baseline. *Time x Condition* refers to the change from baseline to session 2 in the condition denoted in parentheses compared to the reference condition (Waitlist). * Denotes significance at the $p \leq .05$ level.

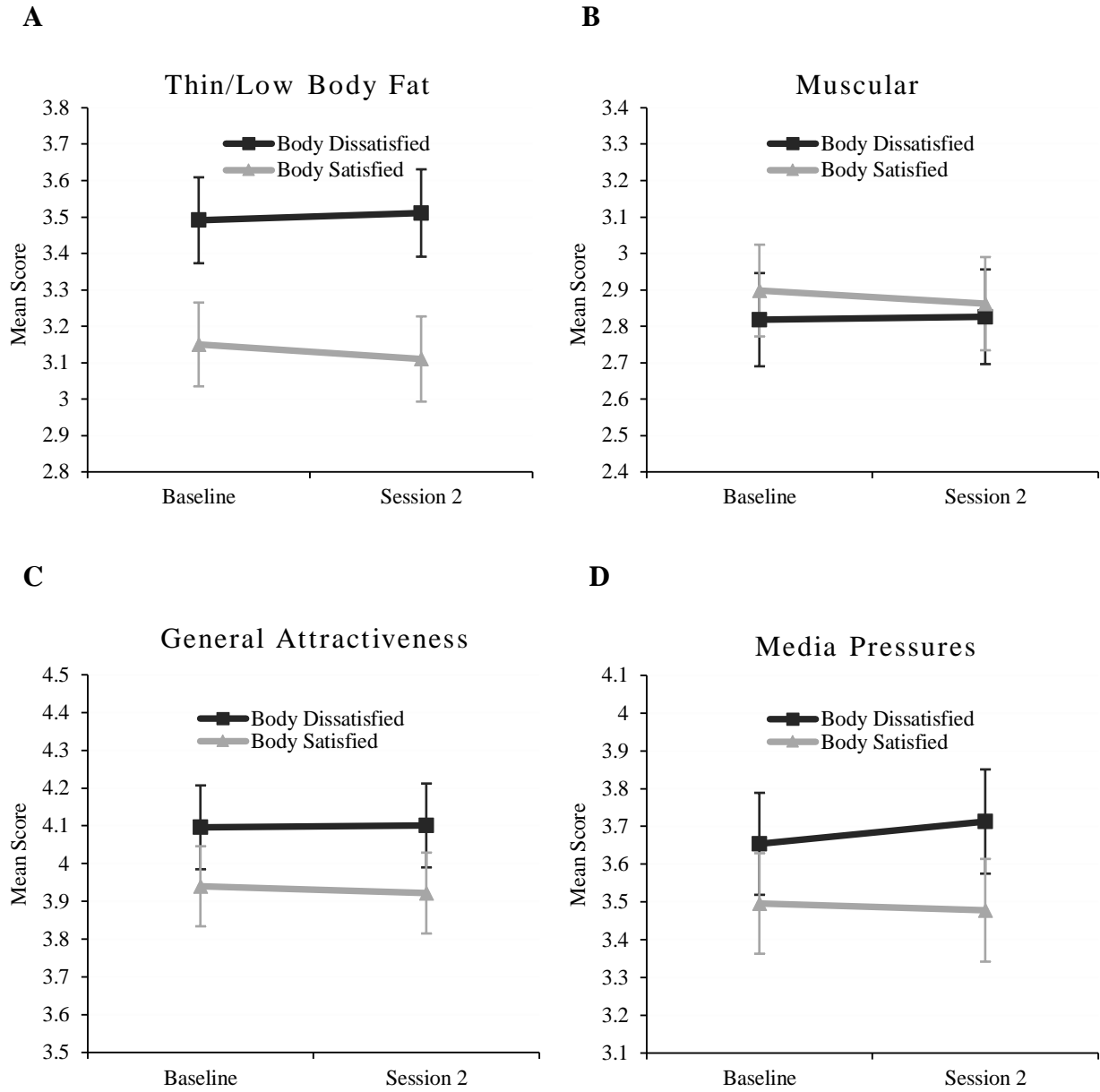


Figure F4. Thin ideal internalization by condition, at baseline and session 2.