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## Examining the role of experiential avoidance and valued action in the negative effects of weight self-stigma

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### Abstract

Harmful effects of weight self-stigma on quality of life and health behaviors have been well-established. However, the processes that lead to these negative outcomes are less understood. Psychological inflexibility is defined as a pattern of rigid psychological reactions dominating over values and meaningful actions. A lack in valued action is characterized by the absence of activities that are connected to what is personally meaningful. In this secondary analysis, we aim to extend research by examining two subprocesses of psychological inflexibility, experiential avoidance and lack of valued action, as statistical mediators of the relations between weight self-stigma and quality of life/health behavior outcomes. Baseline data from a clinical trial comparing weight loss maintenance interventions in a sample of 194 adults living with overweight or obesity and seeking treatment is analyzed. Results show that greater experiential avoidance and lower valued action were significantly related to lower quality of life and satisfaction with social roles, as well as greater depression, anxiety, and binge eating. Further, results from a parallel mediation analysis indicated that weight self-stigma is indirectly related to anxiety, disinhibited eating, and hunger through the relationship with experiential avoidance and lack of valued action.

### Keywords

Experiential avoidance; Valued action; Weight-self stigma; Maladaptive eating behaviors

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**Code availability** Available upon reasonable request.

We confirm that the manuscript has been read and approved by all named authors.

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethics approval** This study was approved by the Miriam Hospital IRB in Providence, RI, USA. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

**Consent to participate** All participants provided written consent to participate in the primary study.

## Introduction

Weight stigmatization is widespread in the United States, impacting domains of life including work, healthcare, social relationships, and education (Tomiyama et al., 2018). There is a strong body of research indicating the debilitating effects of weight stigma including decreased quality of life, maladaptive behaviors, and negative health outcomes (Papadopoulos & Brennan, 2015). Weight stigma may be particularly harmful when it exacerbates or reinforces internalized weight stigma (i.e., weight self-stigma; Lillis et al., 2019). For example, individuals experiencing high levels of weight self-stigma are likely to have lower quality of life compared to those with low levels of weight self-stigma (Khodari et al., 2021). Further, weight self-stigma is positively correlated with BMI; therefore, as weight self-stigma increases so will BMI (Prunty et al., 2020). This is harmful given the evidence to support the association between higher BMI and increased levels of self-criticism and devaluation.

There is growing literature indicating Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 2012) can reduce weight self-stigma among adults with overweight/obesity (see review by Griffiths et al., 2018). One component of the ACT framework that has been linked to weight self-stigma is psychological inflexibility, defined as “the rigid dominance of psychological reactions over chosen values and contingencies in guiding action” (Bond et al., 2011, pg. 678). Previous research has shown that psychological inflexibility mediates the relationship between various negative thoughts/emotions and poor psychosocial/behavioral outcomes across a range of domains (Usubini et al., 2022). Levin et al. (2021) found that adults living with overweight/obesity in the ACT program showed statistically significant improvements on uncontrolled eating, emotional eating, weight self-stigma, general mental health and weight-related psychological inflexibility, as compared to a waitlist condition. Further, it was found that weight-related psychological inflexibility mediated the effects of condition on uncontrolled eating, emotional eating, weight self-stigma and general mental health Petersen et al. (2021).

Although the harmful effects of weight self-stigma on quality of life and health behaviors have been well-established, the processes of how they influence these negative outcomes is less understood. Psychological processes tend to be measured by self-report surveys assessing psychological flexibility/inflexibility overall, or individually capturing one of the various mindfulness and acceptance subprocesses (i.e., acceptance, defusion, self as context) or commitment and behavior change subprocesses (i.e., contact with the present moment, values and committed action). For example, the Acceptance and Action Questionnaire for Weight (AAQ-W) measures experiential avoidance with subscales including food as control, weight as a barrier to living, and weight stigma, and the Bullseye Values Survey (BEVS) assesses values, value-action discrepancies and barrier to living toward a valued life. It is important to assess the role of experiential avoidance in weight management populations given that self-stigmatization could theoretically increase the salience of weight-related thoughts and emotions, particularly through motivating avoidance (e.g., avoiding activities that highlight body shape or weight, maladaptive eating behaviors to control weight or in response to stressors). Experiential avoidance refers to the suppression or change of thoughts or behaviors in order to cope with the negative emotions (Hayes et al., 2004). Avoiding

negative weight-related thoughts and emotions may intensify unwanted experiences and/or diminish engagement in activities that trigger the unwanted experiences. Therefore, the reduction of experiential avoidance may improve one's relationship to their weight self-stigmatization thoughts/emotions, resulting in valued action.

Another key aspect of the psychologically inflexibility model states that behaviors occur at the expense of engaging in valued activities in one's life (i.e., intrinsically motivated activities and qualities of action that bring a sense of personal meaning). For example, individuals might avoid engaging in meaningful activities because of the stigmatizing thoughts and feelings it might bring up (Maphis et al., 2013). This may help account for the harmful effects of weight self-stigma as it would be expected that internalizing and inflexibly responding to stigmatizing weight-related attitudes would lead to a loss of valued action, and this loss in valued action would contribute to impaired quality of life and further drive unhealthy behaviors. Yet to our knowledge, the role of loss of valued activities in understanding the negative effects of weight self-stigma are understudied. This study aims to expand on prior research like Petersen et al. (2021) by examining the role of valued action among adults seeking weight loss services. Further, to better understand the relationship between weight self-stigma, experiential avoidance, valued action, weight control strategies, eating behaviors and mental health outcomes, a cross-sectional mediation analysis was conducted. The outcomes used in the original randomized control trial (citation masked) were selected to build on previous findings (Petersen et al., 2021) while indicating the role of psychological processes (i.e., values).

Thus, the current study sought to extend research on weight self-stigma by examining both experiential avoidance and lack of valued action as statistical mediators of the relations between weight self-stigma and quality of life/health behavior outcomes. This secondary analysis examines cross sectional baseline data collected from a weight loss clinical trial [citation masked for peer-review]. Given that evidence suggests weight self-stigma is a better predictor of poor outcomes as compared to experiences of weight stigma (Puhl, et al., 2020), it was predicted that weight self-stigma would be significantly related to quality-of-life satisfaction with social roles, depression, anxiety, disinhibited eating, dietary restraint, hunger, weight control strategies, binge eating episodes. Further, we hypothesized that these relations would be mediated by both weight related experiential avoidance and lack of valued action.

## Methods

### Participants and procedures

This secondary analysis study examines baseline data from a clinical trial comparing different weight loss maintenance interventions after delivery of an online weight loss program (Lillis et al., 2021). A sample of 194 participants completed the baseline assessment. Inclusion criteria were a body mass index (BMI) of 27.5 to 45 kg/m<sup>2</sup>, age of 18–70, English-speaking, and no medical condition contraindicated for participating. The sample was predominantly female (75%) and non-Hispanic, White (90%), with an average age of 54.85 (*SD* = 10.91). The average BMI was 35.02 kg/m<sup>2</sup> (*SD* = 4.57, range = 27.21–47.85).

Participants were recruited through newspaper advertisements and direct mailings. Variables analyzed in this secondary analysis study were all collected through a self-report assessment battery completed in-person during a baseline assessment appointment.

## Measures

**Predictor variable.**—Weight self-stigma was assessed using the 12-item *Weight Self-Stigma Questionnaire* (WSSQ; Lillis et al., 2010). The WSSQ consists of two subscales measuring weight related self-devaluation and fear of enacted stigma. Higher scores on the WSSQ indicate greater internalized weight stigma.

**Mediating variables.**—The 22-item *Acceptance and Action Questionnaire for Weight-Related Difficulties* (AAQ-W; Lillis & Hayes, 2008) assessed experiential avoidance in the domain of weight-related thoughts and feelings. There is a 10-item AAQ-W (Dochat et al., 2020) that has subscales including food as control, weight as a barrier to living, and weight stigma. The *Bull's-Eye Values Survey* (BEVS; Lundgren et al., 2012) assessed valued action by having participants mark on a dartboard figure the degree to which their actions are consistent with personal values in each of four domains of life (health, relationships, work, and leisure). The closer to the center (bull's eye) the more consistent one's behavior is with their values in that domain. These marks are converted into a 7-point scale for each domain and summed into a total score. A systematic review of psychometric tools within Acceptance and Commitment Therapy showed the construct validity of the BEVS, good test and retest validity over three time points, and good discriminative validity with significant difference on values attainment and persistence with barriers (Barrett et al., 2019).

**Outcome variables.**—The *Patient-Reported Outcome Measurement Information System* (PROMIS; version PROMIS-29 Profile v2.1) was used to yield scores on quality of life, satisfaction with social roles (SWSR), depression, and anxiety. The evidence-based PROMIS measures show excellent reliability and validity (Hays et al., 2018). The 51-item *Three-Factor Eating Questionnaire* (TFEQ; Stunkard & Messick, 1985) assessed three subscales for disinhibited eating (i.e., habitual susceptibility, emotional susceptibility, and situational susceptibility), dietary restraint (i.e., strategic dieting behavior, attitude to self-regulation, avoidance of fattening foods), and hunger (i.e., internal locus and external locus for hunger). The 30-item *Weight Control Strategies Scale* (WCSS; Pinto et al., 2013) total score was used to assess use of adaptive weight management behaviors related to physical activity, dietary choice, self-monitoring, and psychological coping. Finally, the number of binge eating episodes in the past 28 days was assessed with a single item (i.e., objective bulimic episodes item 15) from the *Eating Disorders Examination Questionnaire* (EDE-Q; Fairburn & Beglin, 2008).

Multi-item scales had adequate to excellent internal consistency in the current sample (WSSQ  $\alpha = 0.90$ ; AAQW  $\alpha = 0.88$ ; BEVS  $\alpha = 0.72$ ; QOL  $\alpha = 0.88$ ; SWSR  $\alpha = 0.91$ ; Depression  $\alpha = 0.92$ ; Anxiety  $\alpha = 0.87$ ; TFEQ-Disinhibition  $\alpha = 0.77$ ; TFEQ -Restraint  $\alpha = 0.80$ ; TFEQ -Hunger  $\alpha = 0.81$ ; WCSS  $\alpha = 0.91$ ).

## Data analysis plan

Multiple parallel mediation models were conducted using PROCESS (Hayes, 2012), Model 4 in SPSS. These models included both the AAQ-W and BEVS as mediators of the relation between weight self-stigma and each outcome (see Fig. 1 for path diagrams). The significance of indirect effects was tested using the cross product of coefficients test with bias corrected 95% confidence intervals.

Bivariate correlations were conducted to show the relationships between variables (see Table 1 for correlation matrix). To examine construct redundancy of weight stigma, correlations of the AAQ-W between the 22-item, 10-item, and 10-item minus the weight stigma scale (i.e., 6-item) were reviewed.

## Results

All data was available at baseline for participants, except for missing data on the BEVS for one participant. The depression and binge eating scales were non-normally distributed, which was corrected using a square root transformation for binge eating and a logarithmic transformation for depression.

Results for each parallel mediator model are included in Table 2. Total effects (*c* paths without the mediators) for weight self-stigma were significant for each outcome including quality of life, satisfaction with social roles, depression, anxiety, binge eating, disinhibited eating, dietary restraint, hunger, and weight control strategies. All relations were in the expected direction with greater weight self-stigma relating to poorer outcomes. Greater weight self-stigma was also significantly related to both greater experiential avoidance and lower valued action (*a* paths).

In models including both mediators and weight self-stigma (*b* paths), greater experiential avoidance and lower valued action both significantly related to poorer outcomes including lower quality of life, lower satisfaction with social roles, greater depression, greater anxiety, and greater binge eating. Only the AAQ-W was significantly related to greater disinhibited eating and only the BEVS was related to greater dietary restraint. Neither mediator was significantly related to hunger or weight control strategies.

The pattern of indirect effects paralleled *b* path findings between mediators and individual outcomes. Indirect effects for the total parallel mediator model, as well as each mediating pathway independently, were significant for binge eating and quality of life variables, with only AAQ-W mediating disinhibited eating and BEVS mediating dietary restraint. There was only a significant total indirect effect for weight control strategies and no indirect effects were found for hunger. Proportion of variance accounted for in the weight self-stigma/outcome relations by significant mediating pathways varied from 53 to 98%.

To explore construct redundancy for weight self-stigma, we conducted Pearson's bivariate correlation analyses between AAQ-W and WSSQ. Correlation between the WSSQ and the 22-item AAQ-W was 0.80 ( $p < .001$ ), with the 10-item AAQ-W was 0.78 ( $p < .001$ ). and the 6-item AAQ-W (i.e., without the weight self-stigma subscale) was 0.77 ( $p < .001$ ).

## Discussion

This secondary analysis examined weight-related experiential avoidance and lack of valued action as mediators of the cross-sectional relations between weight self-stigma and quality of life/health behavior outcomes in a sample of adults with overweight/obesity seeking weight loss treatment. Weight self-stigma was found to relate in expected ways with various facets of quality of life and mental health as well as maladaptive eating behaviors and less use of effective weight control strategies. Quality of life outcomes (i.e., satisfaction with social roles), mental health outcome (i.e., depression and anxiety) and binge eating episodes were mediated by both weight related experiential avoidance and valued action. In contrast, relations were mixed or non-significant for disinhibited eating, dietary restraint, hunger and weight control strategies. The eating behavior findings of this study are contrary to recent research (Levin et al., 2021; Petersen et al., 2021). This inconsistency may be due to an overlap of these variables given the cross-sectional, parallel mediation models. Alternatively, there may be other factors that are contributing to the control-related strategies beyond experiential avoidance and valued action. These results provide preliminary indications of the roles of weight-related experiential avoidance and lack of valued psychosocial and behavioral outcomes for adults living with action in how weight self-stigma might contribute to poorer overweight or obesity.

Results of this study are consistent with past research that has shown an association between weight self-stigma and negative effects across a range of domains (Pearl & Puhl, 2018). Our results suggest that weight self-stigma may be implicated in the avoidance of weight related thoughts and feelings (i.e., weight related experiential avoidance), leading to behaviors that function as avoidance (e.g., binge eating and disinhibited eating). Palmeira and colleagues (2018) found similar mediation effects for experiential avoidance related to weight self-stigma and unhealthy eating behaviors (e.g. binge eating, uncontrolled eating, skipping meals) among women with overweight and obesity. Our results contributes to a growing number of studies showing the negative effects of weight self-stigma in samples engaging in weight loss programs (Lillis et al., 2019; Lillis et al., 2020; Mensinger et al., 2016).

This study extends prior research on the role of experiential avoidance in weight self-stigma by integrating valued action as an additional salient mediator. Experiential avoidance in response to stigmatizing thoughts and feelings could contribute to a lack of engagement in valued activities, and both processes could lead to impaired quality of life and various maladaptive behavior patterns such as binge eating. To our knowledge, this is the first study showing that weight self-stigma is related to valued action which may account for some of the negative effects of weight self-stigma on key outcomes. Theoretically, weight self-stigma could act as a significant barrier to engaging in meaningful activities, and it's this effect in particular that drives impaired quality of life and maladaptive eating behaviors. This is consistent with Sarno's (2020) findings that individuals with lower binge eating related valued living (Valued Living Questionnaire for Eating Behaviors, VLQ-E) were likely to report more binge eating behavior, and psychological flexibility mediated this relationship. Since greater valued action leads to improved quality of life, then future weight self-stigma interventions may consider targeting quality of life broadly to improve specific



healthy eating behaviors. The presence of these patterns in a treatment seeking sample suggests weight self-stigma could be an important factor to address among adults seeking to participate in behavioral weight loss programs.

Pilot trials have found that ACT is effective at improving quality of life and health behaviors among adults reporting high weight self-stigma (Potts et al., 2022; Levin et al., 2017; Lillis et al., 2009). This is especially critical given there are very few empirically tested treatments for reducing weight self-stigma. Our findings may be important because experiential avoidance and lack of valued action, as well as weight self-stigma, are modifiable features that can be improved using ACT. The clinical implications of these findings show that the relationship between weight self-stigma and mental health/health behavior outcomes could be mediated by an individual's level of avoidance and their lack of engagement in valued actions. One recommendation would be for clinicians to consider assessing weight-self stigma, experiential avoidance, and how often the patient is engaging in valued action to determine treatment targets among those living with overweight or obesity. These preliminary results can contribute to future studies with more rigorous methods for better understanding the mechanisms driving the weight stigma-health relations.

The most notable limitation in this study was the cross-sectional design, which reduces the rigor in determining whether the proposed mediators have a causal role or just covary with weight self-stigma and outcomes. Ideally, the data would have been analyzed longitudinally but due to all variables being assessed at the same single time point, causal relations could not be tested. However, it is worthwhile to examine the data cross-sectionally as a preliminary test of mediation because it can provide preliminary results of the theorized relations between variables. The results from this cross-sectional mediation can only provide a preliminary test of the theorized relations between weight self-stigma, experiential avoidance, valued action, eating behaviors, weight control strategies and mental health outcomes. For transparency, these findings are exploratory and have not been controlled for multiple comparisons as each model had the predictor, two mediators and one outcome. Additionally, it should be noted that recent research suggests that the 10-item AAQ-W measuring experiential avoidance has a weight self-stigma subscale (Dochat et al., 2020; Romano et al., 2022). Therefore, the likelihood of construct redundancy between the WSSQ and items in the AAQ-W is possible. Our exploratory bivariate correlation analyses indicate that they are highly correlated which aligns with the recent suggestions of overlap. This is a broader problem in cross sectional mediation and self-report surveys on psychological processes. However, the finding that the AAQ-W better accounts for WSSQ effects is still an important finding in suggesting its experiential avoidance with weight self-stigma that accounts for effects.

Future research using longitudinal designs are needed. Given the likely interactional nature between these variables (e.g., greater weight self-stigma leading to avoidance of stigmatizing situations and reduced valued action that feeds into more self-stigmatization), more fine-grained examination using intensive longitudinal methods such as Ecological Momentary Assessment (EMA) is particularly indicated. EMA methods may be more appropriate when compared to daily diary logs due to the multiple daily prompts that allow for assessment of more acute temporal relations between variables. Further, the study

sample was primarily composed of White women. Although these demographics are typical in weight loss treatment studies, it is unclear how these findings might generalize or vary in samples with greater demographic diversity and non treatment seeking samples, a critical direction for future work.

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## Data availability

Available upon reasonable request.

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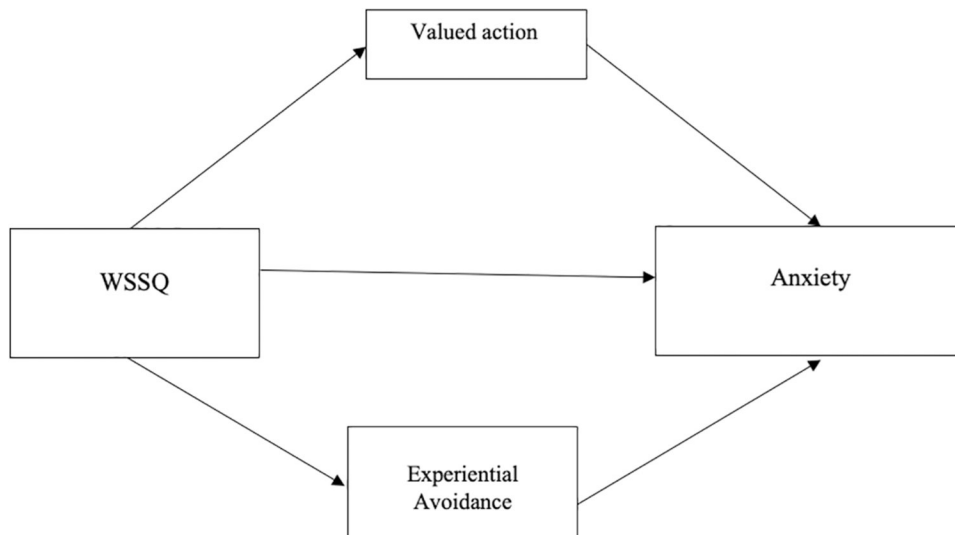
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**Fig. 1.** Parallel mediation model with weight self-stigma (X), valued action (M1), psychological inflexibility (M2), and outcome of anxiety (Y). (We examined the mediating effects of valued action and experiential avoidance in the association between weight self-stigma and anxiety (model 1), depression (model 2), satisfaction with social roles (model 3), quality of life (model 4), disinhibited eating behaviors (model 5), restrained eating behaviors (model 6), hunger (model 7), binge eating episodes (model 8) and weight control strategies (model 9)).

**Table 1**

Zero order correlations for independent and dependent variables

Variables	1	2	3	4	5	6	7	8	9	10	11
1.Anxiety	1.00										
2.Depression	0.759**	1.00									
3.Satisfaction with social roles	-0.496**	-0.591**	1.00								
4.Weight self-stigma	0.551**	0.509**	-0.463**	1.00							
5.Quality of Life	-0.492**	-0.587**	0.658**	-0.374**	1.00						
6.Valued living	-0.427**	-0.443**	0.525**	-0.375**	0.518**	1.00					
7.Experimental avoidance	0.555**	0.566**	-0.551**	0.801**	-0.453**	-0.403**	1.00				
8.Disinhibited eating	0.398**	0.314**	-0.321**	0.571**	-0.294**	-0.347**	0.623**	1.00			
9.Restrained eating	0.068	-0.083	0.103	-0.146*	0.123	0.197*	-0.152*	-0.144*	1.00		
10.Hunger	0.331**	0.246**	-0.264**	0.484**	-0.164*	-0.265**	0.456**	0.592**	-0.295**	1.00	
11.Weight control strategies	0.001	-0.093	0.213*	-0.150*	0.251**	0.185*	-0.203*	-0.090	0.619**	-0.158	1.00

**Table 2**

Multiple mediator model results for the relation between weight self-stigma and quality of life/health behavior outcomes

Outcome	Mediator	a paths	b paths	Product of coefficients (95% CI)	c path	c' path	Proportion mediated (1-c'/c)
Quality of Life	AAQW	1.565***	-0.097**	-0.152 (-0.246, -0.066)			
	BEVS	-0.201***	0.456***	-0.092 (-0.147, -0.053)			
	Total			-0.244 (-0.357, -0.145)	-0.226***	0.018	92%
Satisfaction with Social Roles	AAQW	1.565***	-0.075***	-0.117 (-0.166, -0.066)			
	BEVS	-0.201***	0.246***	-0.050 (-0.078, -0.024)			
	Total			-0.166 (-0.222, -0.111)	-0.170***	-0.003	98%
Depression	AAQW	1.565***	0.003**	0.004 (0.001, 0.007)			
	BEVS	-0.201***	-0.008***	0.002 (0.001, 0.003)			
	Total			0.006 (0.003, 0.009)	0.008***	0.003	63%
Anxiety	AAQW	1.565***	0.041*	0.064 (0.017, 0.121)			
	BEVS	-0.201***	-0.134***	0.027 (0.012, 0.049)			
	Total			0.091 (0.041, 0.153)	0.17***	0.083**	51%
Binge Eating	AAQW	1.565***	0.022*	0.034 (0.008, 0.068)			
	BEVS	-0.201***	-0.049*	0.010 (0.002, 0.021)			
	Total			0.044 (0.017, 0.078)	0.064***	0.020	69%
Disinhibited Eating	AAQW	1.565***	0.079***	0.124 (0.070, 0.185)			
	BEVS	-0.201***	-0.070	0.014 (0.000, 0.033)			
	Total			0.138 (0.085, 0.197)	0.205***	0.067*	67%
Dietary restraint	AAQW	1.565***	0.079***	0.124 (0.070, 0.185)			
	BEVS	-0.201***	-0.070	0.014 (0.000, 0.033)			
	Total			0.138 (0.085, 0.197)	0.205***	0.067*	67%

Outcome	Mediator	a paths	b paths	Product of coefficients (95% CI)	c path	c' path	Proportion mediated (1-c'/c)
Hunger	AAQW	1.565 <sup>***</sup>	-0.012	-0.018 (-0.112, 0.086)			
	BEVS	-0.201 <sup>***</sup>	0.132 <sup>*</sup>	-0.027 (-0.060, -0.001)	-0.068 <sup>*</sup>	-0.024	65%
	Total			-0.045 (-0.144, 0.057)			
Weight Control Strategies	AAQW	1.565 <sup>***</sup>	0.032	0.051 (-0.011, 0.115)			
	BEVS	-0.201 <sup>***</sup>	-0.055	0.011 (-0.009, 0.035)	0.181 <sup>***</sup>	0.120 <sup>**</sup>	34%
	Total			0.062 (-0.001, 0.130)			
	AAQW	1.565 <sup>***</sup>	-0.182	-0.284 (-0.666, 0.074)			
	BEVS	-0.201 <sup>***</sup>	0.428	-0.086 (-0.215, 0.021)	-0.272 <sup>*</sup>	0.098	64%
	Total			-0.370 (-0.738, -0.018)			

\*  $p < .05$ ;

\*\*  $p < .01$ ;

\*\*\*  $p < .001$ .

Results for each multiple mediator model by outcome include coefficients for stigma predicting mediator (a path), mediator predicting outcome controlling for stigma and other mediator (b path), indirect effect using product of coefficients and 95% bias corrected confidence intervals for each mediator and the total model, total effect for weight self-stigma on each outcome without mediator (c path) as well as direct effect when controlling for multiple mediators (c' path). Proportion of effect mediated calculated for significant mediation models. AAQW = Acceptance and Action Questionnaire for Weight-Related Difficulties; BEVS = Bullseye Values Scale. Effect sizes were not calculated for non-significant mediation paths