INTENTIONAL WEIGHT LOSS AMONG HEALTHY WOMEN: BEHAVIOR PATTERNS AND PSYCHOLOGICAL CONCERNS

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by

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ABSTRACT

INTENTIONAL WEIGHT LOSS AMONG HEALTHY WOMEN:
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Although there is an extensive literature on women who are overweight, obese, or suffer from eating disorders, less is known about women who are at a healthy weight yet who are attempting to lose weight. To learn more about the psychological characteristics and behavioral patterns of such women, this study analyzed data from the American College Health Association's National College Health Assessment (ACHA-NCHA-II). We compared these women with two groups of women: (a) those who are at a healthy weight but who are not attempting to lose weight and (b) overweight women who are attempting to lose weight. We employed numerous variables including BMI, depression, anxiety, academic performance, exercise, and diet strategies in these comparisons. In terms of psychological health and weight-related behavior, healthy women attempting weight loss are more similar to overweight women who are attempting weight loss than they are to healthy women who are not attempting to lose weight. We found comparatively high rates of depression, anxiety, and academic difficulty among our target population. Based on our findings and the relevant literature, we recommend that university health officials provide weight-related educational information to female students in an effort to promote psychological well-being and healthy weight practices.

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In the United States and other Western countries, many factors concerning women's bodies are subject to scrutiny and discussion, both in the mass media and scientific literature. Women's weight, body image, diets, and self-esteem are generally well-researched (e.g., Blaine, Rodman, & Newman, 2007; Cafri, Yamamiya, Brannick, & Thompson, 2005; Grabe & Hyde, 2006; Grabe, Ward, & Hyde, 2008; Groesz, Levine, & Murnen, 2002; Miller & Downey, 1999). In particular, the literature is rich with studies focusing on the health problems of overweight and obese women as well as their diets, psychological health, and attempts to lose weight. When data regarding women's weight are gathered, researchers are quick to examine the psychological and physiological causes of obesity and the behaviors and emotions of overweight individuals. Eating disorders are similarly well-documented (Cash & Brown, 1987). Tylka and Subbich (2002) found that a majority of young high school and college-aged women have reported using unhealthy dieting practices (including skipping meals, using laxatives, and eating fewer than 1200 calories per day). Furthermore, statistics from the National Eating Disorders Association (NEDA) website indicate that 20 million women in the United States will suffer from an eating disorder in their lifetime.

Despite the abundance of research on women's weight and dieting practices, there exists a population that has received less attention in the research literature: women at a healthy weight who nonetheless are seeking to lose weight. It should be noted that in this

study we did not use a medical definition of *health*. Rather, we used the term *healthy* to refer to women who reported that their perceived weight is neither underweight nor overweight. That is, these women reported that they believe their weight is healthy (it may or may not be by medical standards such as BMI). This was crucial to our inquiry, and the reasoning for this approach was twofold. First, it would not be unusual for otherwise healthy women who perceive themselves as overweight to attempt weight loss. Second, the literature indicates that *perceived weight* rather than BMI is what is important in terms of predicting body image and its related factors (Roberts & Duong, 2013). In fact, according to Owen and Laurel-Seller (2000), women's reported ideal body weight is typically 13-19% lower than their medically ideal weight.

In a recent report by the American College Health Administration (American College Health Association's National College Health Assessment, 2012), 36% of the females surveyed reported that they believed themselves to be overweight or obese, whereas the majority (56%) described themselves as "about the right weight." These numbers are typical of young adult women in the United States (Gallup poll, Nov. 2011), and, taken alone, they are unremarkable. What is noteworthy, however, is the fact that 58% of female participants also reported current efforts to lose weight. According to these numbers, at least 22% of the females surveyed reported weight loss attempts even though they do not consider themselves to be overweight (58% attempting weight loss – 36% reporting they are overweight). In the present study, we sought to identify factors that might relate to healthy women attempting weight loss.

Although this population is largely understudied, other researchers have noted the occurrence of healthy women trying to lose weight. For example, Kruger, Galuska, Serdula, and Jones (2004) examined data from the 1998 National Health Interview Survey (NHIS) to describe weight loss practices among US adults. During face-to-face interviews, the NHIS asked participants if they were currently trying to do anything about their weight. The researchers showed participants who responded that they were trying to lose weight a list of possible weight loss methods (e.g., counting calories, using diet pills, fasting) and asked them to identify how many of those methods (0-12) they used to control their weight. Self-reported height and weight measures were used to calculate BMI which was then used to categorize participants as normal weight, overweight, or obese. The researchers found that 24% of healthy women in their study were attempting weight loss and, compared to obese women, they were less likely to eat fewer calories and more likely to exercise as a strategy to lose weight. Beyond reporting this finding the authors did not discuss its importance or explore the factors that might drive such behavior.

Because healthy women's weight-loss behaviors are not well researched, the current study was largely exploratory in nature; however, we made directional hypotheses based on psychological theories and past research on overweight women. We suspected that healthy women who attempt weight loss may suffer from body image distortions, as Grieve, Wann, Henson, and Ford (2006) found that women with poor body image are more likely to perform weight loss techniques. As a starting point, we turned to the

research on body image and overweight women to guide our choice of factors to investigate in this study.

The body image literature is vast and expanding. Researchers have extensively examined the causes of poor body image, its negative short- and long-term effects, and methods to overcome it. For the purpose of this study we were interested in the causes of poor body image, because we hypothesized that these factors would help explain why healthy women attempt to lose weight. Current research shows a variety of elements, often interconnected, that affect poor body image, including mental health disorders, relationship status, and life stressors. These factors and their relationships to weight-loss behavior are summarized below.

Theory

There are several competing theories regarding body satisfaction that may be useful in understanding why healthy women attempt weight loss. Self-discrepancy theory, social-comparison theory, and self-objectification theory all seek to explain differences in body satisfaction and how body dissatisfaction comes to exist. Researchers have found correlations between these theories and related phenomena such as fat talk (Arroyo, 2014), body image (Heron & Smyth, 2013), and disordered eating (Craine, 2008). These three prominent theories, in conjunction with past research on weight-loss behavior, helped narrow our selection of factors that may correlate with healthy women attempting weight loss as well as the methods they use to achieve their weight-loss goals.

Self-discrepancy theory posits that individuals have three distinct representations of themselves: the *ideal* self, who represents the person they want to be; the *ought* self, which is the person they think they should be; and the *actual* self, which includes the traits they believe themselves to already possess. Furthermore, if the ideal- or ought-self differ substantially from their actual self, discomfort will arise (Higgins, 1987). Higgins (1987) further speculates that ought-actual and ideal-actual differences will manifest in distinct ways; ought-actual discrepancy will result in anxiety whereas ideal-actual discrepancy will manifest as depressive affect. A second theory that we applied to our sample population is social-comparison theory. This framework suggests that individuals compare themselves to others (Festinger, 1954), and when they fall short in upward comparisons, their mental health may be negatively impacted (Ridolfi, Myers, Crowther, & Ciesla, 2011). Finally, the theory of self-objectification is useful for understanding body satisfaction and weight loss behaviors. Fredrickson and Roberts (1997) explain self-objectification as the act of viewing and valuing oneself from a third-person perspective, with focus on physical appearance and body parts.

Arroyo (2014) sought to identify the relationships between self-discrepancy theory, social comparison theory, self-objectification, and body dissatisfaction that results in "fat talk." Fat talk includes saying negative things about one's own body and weight, such as "I hate my stomach," "I am so much fatter than she is," or "I need to go on a diet." Two hundred one undergraduate women participated in that study by responding to an online survey for extra credit. Weight discrepancy (the difference between participants' reported ideal weights and current weights) was used as a construct of self-

discrepancy theory. The Upward Physical Appearance Comparison Scale (O'Brien et al., 2009) and the Objectified Body Consciousness subscale, Body Surveillance (McKinley & Hyde, 1996), were used to measure social-comparison theory and self-objectification, respectively. A subscale of the Eating Disorders Inventory-3 (Garner, 2004) measured the mediating variable, body dissatisfaction, and finally, the dependent variable, fat talk, was measured via the Negative Body Talk Scale (Engeln-Maddox, Salk, & Miller, 2012). Mediation models showed that when BMI and related predictor variables were controlled for, all three independent variables (self-discrepancy, social comparison, and self-objectification) were predictors of fat talk, and body dissatisfaction significantly mediated all three effects. In other words, self-objectification, social comparison, and self-discrepancy led to body dissatisfaction which in turn manifested in fat talk.

Though we were not specifically interested in fat talk for our current study, these results highlighted the importance of body dissatisfaction when looking at weight-related behavior. Furthermore, the data lend support to the notion that self-discrepancy theory, social comparison theory, and self-objectification lead to body dissatisfaction. These ideas influenced which factors we investigated in our study.

Yamamiya, Cash, Melnyk, Posavac, and Posavac (2005) examined social comparison theory from a different angle. Under the guise of consumer research, Yamamiya et al. studied media-ideal internalization effects on state body image and researched preventative measures to mitigate the harmful effects. The participants were 123 White, young-adult women. The experiment involved exposure to 15 ideal beauty

images (or automobile control images) and educational information which explained how media images are artificially created with makeup, lighting, and Photoshop (or control information about parenting). The women responded to a 30-item Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) which measures the degree to which participants compare themselves to actresses and models (ideal beauty). Responses to the SATAQ-3 allowed participants to be categorized as either high internalization (HI) or low internalization (LI) based on a median split, with HI women being more likely to use media images for upward comparison. Participants also filled out the Body Image States Scale (BISS; Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002), which measures current body satisfaction. Finally, the researchers randomly assigned participants to either summarize the educational information or to write a persuasive piece against the thin-ideal using the educational information provided. Thus, this was a mixed-subject design with HI and LI participants randomly assigned to one of four conditions: (1) control slides/control info, (2) model slides/control info, (3) model slides/media info, or (4) model slides/media info/persuasive argument.

Yamamiya et al.'s (2005) planned comparisons between the control info/control images and control info/media images conditions showed significant differences in state body image for HI participants but not for LI participants. HI participants reported significantly lower state body image when exposed to the ideal-beauty media images than the control images, but LI participants did not. These results suggest that HI participants compared themselves to the model images and suffered negative psychological

consequences. Like the fat talk findings from Arroyo (2014), these data show a form of body dissatisfaction resulting from a social comparison, and thus are in line with social-comparison theory. Further findings from Yamamiya et al. suggest that providing media-specific educational material may prevent the negative effects of exposure to ideal beauty images in HI women; when BISS scores were compared for control info/model slides and media info/model slides as a function of internalization level, only HI individuals in the media info/model group were significantly higher than those in the control info/model slides.

Finally, Yamamiya et al. (2005) showed that for HI women, the media info/model images/persuasive argument condition resulted in significantly higher BISS scores compared to control info/media images, but not more so than the media-education information alone (i.e., BISS scores for the media info/model images/persuasive argument condition did not differ significantly from the media info/model images condition). This suggests that adding the dissonance factor (the persuasive speech) on top of the educational media information was superfluous in terms of protecting HI women from the negative effects of exposure to ideal beauty images. In sum, the results from Yamamiya et al. (2005) suggest that even brief exposure to images of ideal beauty can negatively impact young women's state body image, particularly so for women with high media-ideal internalization levels and those prone to social comparison. In addition, the provision of educational information prior to the media exposure mitigated the negative state body image effects.

Social comparison may negatively impact mood and mental health as well. A study about the ideal of female beauty and its effect on mood showed that exposure to female fashion models caused an immediate negative effect; females who viewed images of thin models were angrier and more depressed than a control group who viewed images without thin models (Pinhas, Toner, Ali, Garfinkel, & Stuckless, 1999). It is important to note that Pinhas et al.'s study lacked adequate control conditions, as the non-model group did not contain any humans, but nevertheless it supports the theory that social comparison can lead to diminished mental health.

Mental Health

As discussed above, researchers (Heron & Smyth, 2013; Yamamiya et al., 2005) have suggested that self-discrepancy theory and social comparison theory may explain in part why we would expect to find increased mental health concerns within a population of healthy women attempting weight loss. Moreover, mental health factors such as depression, anxiety, and stress are key components of body image and are positively correlated with body dissatisfaction and obesity (Economos, Hildebrandt, & Hyatt, 2008; Sides-Moore & Tochkov, 2011; Simon et al., 2010). Studies suggest that poor body image and body dissatisfaction are the links between obesity and psychological disorders (Crow, Eisenberg, Story, & Neumark-Sztainer, 2006; Holsen, Kraft, & Røysamb, 2001). If it is in fact body dissatisfaction, rather than obesity, that causes individuals to attempt weight loss, then this may explain the behavior of the healthy women in our study. Because these women are behaving in ways that we would expect from overweight and

obese women (i.e., attempting weight loss), we expected them to share other behavioral and psychological characteristics. Therefore, we hypothesized that the healthy women attempting weight loss would report more severe mental health problems (mood and anxiety disorders) than healthy women who are not attempting to lose weight.

Roberts and Duong (2013) examined the relationships between perceived weight, obesity, and depression in adolescents between the ages of 11 and 17. The participants answered questions about their perceived weight and body satisfaction and completed the Diagnostic Interview Schedule for Children, Version 4 (DISC-IV), a survey that measures psychiatric disorders (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). Researchers compared these data with actual BMI values obtained from participants' weight and height measurements. Roberts and Duong found that even though males were more likely to be overweight, females were more likely to perceive themselves as overweight and show dissatisfaction with their bodies. When covariates known to correlate with obesity and depression (age, gender, SES, diet, and exercise) were controlled, obesity was positively correlated with an increased risk for major depression. Body dissatisfaction was not a significant predictor of depression unless an individual was obese. The most remarkable finding was that perceived body weight was a significant predictor of depression whether or not the individual was clinically overweight. Other studies have also demonstrated that something other than BMI may be affecting weight-driven behaviors, but the results are inconsistent. For example, Bittencourt, Lucena-Santos, Moraes, and Oliveira (2012) found that binge eating was correlated with depression and anxiety, but not with BMI for women enrolled in a weight

loss program. However, in a study of overweight men and women's eating behaviors, Ostrovsky, Swencionis, Wylie-Rosett, and Isasi (2013) found that BMI was positively correlated with binge eating, but not with emotional eating. Additionally they found that social anxiety had a significant positive correlation to both emotional and binge eating.

It is possible that sample selection caused the conflicting results between the Bittencourt et al. (2012) and Ostrovsky et al. (2013) studies; research has shown that factors affecting weight-change differ for men and women. For example, Economos et al. (2008) performed multiple regression analyses to determine which factors would impact weight change among college-aged men and women. They found that alcohol consumption and lack of academic confidence were reliable predictors of weight change among male college freshman while workload increases predicted weight gain for female participants. This suggests that females may be particularly sensitive to stress-related weight gain. The positive correlation between stress and weight gain in college females shaped our hypothesis that healthy women attempting weight loss would report more stress and anxiety than healthy women who are not attempting weight loss.

Heron and Smyth (2013) delved into the relationship between body image-discrepancy and affect. Heron and Smyth tested Higgins' (1987) self-discrepancy theory in an applied setting by assessing body image discrepancy and depressed and anxious affect in young adult women. Sixty-three college-aged women (M = 19.04) participated in a week-long study. The researchers employed a stratified random sampling schedule to electronically record participants' state body image and affect five times daily. When

prompted, participants used a portable computer to record their responses about their current actual-self, ideal-self, and ought-self on the Contour Drawing Rating Scale (CDRS; Thompson & Gray, 1995). The CDRS has a range of body silhouettes from very thin to very thick and participants were instructed to identify which of those body types matched their current ideal-, ought-, and actual-self. These responses provided two discrepancy scores: the ideal-actual discrepancy and the ought-actual discrepancy. To measure affect, participants responded to several Likert-scale measures from the Depression, Anxiety, Stress Scale (DASS; Lovibond & Lovibond, 1995), which includes both psychological and physical symptoms of depressed and anxious affect (e.g., dysphoria, autonomic arousal, and situational anxiety).

Heron and Smyth (2013) found that participants almost always experienced body image-discrepancy; in fact, 98% of the time participants selected ideal- and ought-selves that were smaller than their actual-self. Moreover, on average their ideal- and ought-bodies were two CDRS-figures smaller than their actual body size. Ought- and ideal-selves were moderately correlated ($r = 0.57$). The majority of the time (over 60%), depressive and anxious symptoms were absent, so the depressed and anxious affect variables were re-coded from Likert scale to the dichotomous present or absent. Anxious and depressed affect were moderately correlated ($r = 0.44$). In accordance with Higgins' (1987) theory, the data showed that actual-ideal discrepancy was associated with increased depressed affect but not increased anxious affect while the opposite was true for actual-ought discrepancy. These findings are important because they demonstrate

real-world occurrence of self-discrepancy theory and suggest that body discrepancy and negative affect are positively correlated.

Relationships

Weight and body composition are key components of physical attraction (Martins, Pliner, & Lee, 2004; Swami & Tovée, 2008; Swami & Tovée, 2009), which in turn is intricately involved in romantic relationships (Poulsen, Holman, Busby, & Carroll, 2013). Thus it stands to reason that differences in body types, body image, and body satisfaction might influence or be influenced by the existence and strength of a relationship. Sheets and Ajmere (2005) examined the link between relationship status and weight concerns among college men and women. The results showed significant differences in dating behaviors between BMI ranges. Single women had significantly higher BMI (M = 24.21) than did casual (M = 22.54) or exclusive daters (M = 22.48). Ostrovsky et al. (2013) reported differences in social anxiety and social physique anxiety between married and single overweight participants. In a sample of 231 overweight and obese men and women, married participants reported significantly less anxiety. Based on the premise that healthy women attempting weight loss are psychologically similar to overweight individuals, we hypothesized that they would be more likely to be single than would healthy women not attempting weight loss.

Academic Achievement

Although limited in number, there have been influential studies that identify causal relationships between body image and academic performance. In this research,

factors such as obesity, anxiety, and depression have been directly linked to diminished academic performance, particularly in females. For example, Fredrickson, Roberts, Noll, Quinn, and Twenge (1998) approached body image and academic performance from the perspective of self-objectification. The Fredrickson and Roberts (1997) model of self-objectification refers to viewing and valuing yourself from a third-person perspective, with focus on the observable body rather than internal thoughts, feelings, and desires. It is important to note that self-objectification does not comment on body-image; rather, it emphasizes a preoccupation with one's own body and appearance, regardless of satisfaction. Fredrickson et al. believed that self-objectification in conjunction with pervasive, unrealistic societal beauty standards would cause women to allocate attentional resources to thinking about their bodies and to feel shame which would cause restrained eating and hinder performance on a math task.

In two experiments, Fredrickson et al. (1998) studied 72 female college students (Experiment 1) and 40 male and 42 female students (Experiment 2). They presented the study to participants as consumer research in which they evaluated various products such as cologne, food and drinks, and clothing (a bathing suit or sweater). The researchers measured trait self-objectification, state-self objectification, body shame, BMI, amount of food consumed, and math performance. State self-objectification was manipulated by randomly assigning participants to try on either a bathing suit or a sweater (alone, in a dressing room with a full-length mirror). While wearing one of the two garments, participants answered surveys which measured body shame. The dependent variables were amount of food consumed and math performance. The results were consistent with

prior research on self-objectification but also exposed consequences of self-objectification that had not been previously researched. As expected, there was no significant correlation between self-objectification and BMI for women in either experiment. For men, there was a positive trend between BMI and self-objectification. In the first experiment, body shame (measured by self-report ratings of the emotional and motivational components of shame as well as desire to change physical traits) was correlated with BMI such that heavier women exhibited higher rates of body shame. Furthermore, women who scored highly on the trait self-objectification scale felt increased shame in the bathing suit condition whereas women who scored relatively lower on self-objectification did not. Because the women in the bathing suit condition performed worse on the math test than did women in the sweater condition, it appears that heightened emphasis on a female's body diminishes cognitive performance. The researchers acknowledged that this finding warrants replication, but they interpreted these results as evidence that self-objectification is cognitively taxing and depletes attentional resources which may lead to diminished academic performance.

Kiefer, Sekaquaptewa, and Barczyk (2006) followed up on the Fredrickson et al. (1998) paper by assessing whether experimenter-induced low body image would decrease academic performance, particularly in a solo status condition. This study employed healthy weight women (by BMI standards) in a 2 x 2 factorial design in which body image and solo status were manipulated and academic performance was measured. Body image was manipulated by digitally altering a photo of the participant to make them appear heavier (stigmatized condition) or leaving it as is (neutral). Solo status was

manipulated by showing photos of either all males or all females in an online group discussion. The data showed an interaction between the two conditions such that stigmatized women experiencing solo status performed worse than solo-status neutral women, but there were no differences between neutral and stigmatized women in the non-solo condition. Additionally, stigmatized women performed worse in the solo condition than in the non-solo condition, but there were no differences for neutral women between the solo and non-solo conditions. The results show that women who believe their male counterparts perceive a stigmatized (overweight) version of themselves are hindered in their academic performance. This has negative implications for women with low body image or those who suffer from body dysmorphic disorder. Since we believe the women in our study suffer from poor body image, these findings, in conjunction with Fredrickson et al.'s (1998) results, predict they will experience diminished academic performance compared to their healthy counterparts who are not trying to lose weight. Thus we hypothesized that the healthy women who are trying to lose weight would report lower GPA as well as more factors that negatively impact their academic performance than healthy women not attempting weight loss.

Weight Loss Methods

Grieve et al. (2006) investigated exercise frequency and weight loss behaviors of men and women who were either satisfied or dissatisfied with their bodies. The investigators employed a between subjects, 2 X 2 (gender X body satisfaction) factorial design. The data showed that individuals who are dissatisfied with their bodies perform

more healthy (e.g., increased fruit and vegetable consumption) and unhealthy (e.g., laxative use) weight loss behaviors and exercise less than individuals who are satisfied with their bodies. Additionally, women who were dissatisfied with their bodies showed more current unhealthy weight loss behavior than any of the other groups. These results parallel the data reported by Kruger et al. (2004), which showed that obese women were more likely to cut calories and less likely to exercise to lose weight when compared to healthy women.

These reported differences in weight loss behaviors between individuals who are satisfied and dissatisfied with their bodies led us to question whether there would be similar differences between the women in our sample who are trying to lose weight. Specifically we were curious whether weight loss techniques would differ between healthy and overweight women. Since women in both groups are attempting to lose weight we assume that they are all in some way dissatisfied with their bodies. However, we imagine that differences in body satisfaction exist between these two groups since they described their weight very differently. Many reports agree that perceived weight is the most important factor in predicting body satisfaction (Roberts & Duong, 2013), so we speculate that the women who reported that their weight is healthy are more satisfied with their bodies than the women who reported that they are overweight. Therefore, based on the findings by Grieve et al. (2006) and Kruger et al. (2004) we predicted that overweight women attempting weight loss would perform more weight loss behaviors (both healthy and unhealthy) and exercise less than their healthy counterparts.

Hypotheses

The research discussed above led us to a series of hypotheses regarding healthy women who are trying to lose weight. We hypothesized that compared to healthy women who are not attempting weight loss, healthy women who are attempting to lose weight:

1. Will have reported higher instances of appearance dissatisfaction
2. Will have a higher BMI
3. Will have higher rates of depression and anxiety
4. Will report more feelings of hopelessness and being overwhelmed
5. Will be more likely to be single
6. Will have a lower GPA and report more academic difficulty
7. Will have reported a higher incidence of factors that negatively impacted their academic performance

Compared to overweight women who are attempting weight loss, healthy women who are trying to lose weight:

8. Will consume fewer fruits and vegetables and will diet less
9. Will exercise more
10. Will be less likely to use unhealthy weight loss techniques

Method

Participants

The participants were 1,065 female undergraduate students attending San José State University (SJSU) in San José, California. The sample included healthy women (for operational definition, see "Perceived weight and BMI" under Procedure) attempting weight loss (n = 320), healthy women not attempting weight loss (n = 318), and overweight women attempting weight loss (n = 427). This is a subset of the random sample of students surveyed in Fall 2012. The SJSU Student Health Center (SHC) contacted participants via email and were asked to complete an online survey for a chance to win one of several prizes (e.g., an iTunes gift card). Participation was voluntary and confidential. Two thousand two hundred sixty students responded to the survey. The complete sample was ethnically diverse (36% White, 3.5% African American, 17.2% Hispanic, 43.5% Asian or Pacific Islander, 1.3% American Indian, 5.7% Biracial, and 4.3% Other) and ranged in age from 18-30 (M = 23.78, SD = 6.19). SJSU's Registrar Office and the Human Subjects Institutional Review Board (HSIRB) approved the original data collection as well as the current archival study.

Descriptive statistics for all participants are displayed in Table 1. Figure 1 shows the percentage of healthy and overweight women who are attempting to lose weight or maintain their current weight. Of the 638 women who report they are a healthy weight, just over half (50.16%, n = 320) reported that they were attempting to lose weight. In contrast, 86.79% of overweight women reported current efforts to lose weight.

Table 1

Descriptive Statistics for All Participants

	Healthy Maintain (n = 318)		Healthy Weight Loss (n = 320)		Overweight Weight Loss (n = 427)	
	Mean	SD	Mean	SD	Mean	SD
Age (years)	23.96	6.53	22.78	5.28	25.34	7.45
Height (inches)	63.94	2.80	64.18	2.82	63.98	2.91
Weight (pounds)	122.55	14.96	130.46	17.06	164.33	34.65

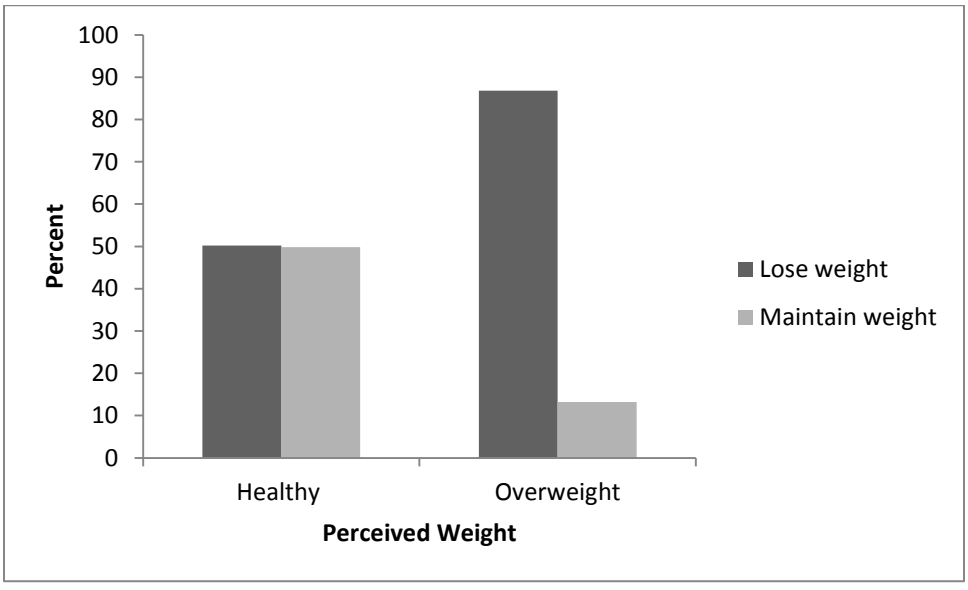

Figure 1. Healthy and overweight women's weight goals.

Materials

Data were obtained from the confidential American College Health Administration's National College Health Assessment II (ACHA-NCHA II) administered in Fall 2012. This is an updated version of the ACHA-NCHA which was developed in 2000 and has been used nationwide by university health officials to track health trends and to identify student health concerns for targeted wellness and safety campaigns. The updated version includes additional criteria to obtain a more complete understanding of student health. The survey is comprised of more than 300 questions (Likert scale, multiple choice, and yes/no responses) and takes approximately 20-30 minutes to complete.

Procedure

In the current study, data from dozens of questions from the ACHA-NCHA-II were analyzed. Many of the data were transformed into formats that were relevant to our hypotheses. Below is a summary of how each variable was transformed as well as the corresponding operational definitions.

Perceived Health and BMI. After filtering the data to include only female participants, the first factor we considered was an individual's perceived weight. The question posed was, "How would you describe your weight?" and there were five multiple choice options: 1) Very underweight, 2) Slightly underweight, 3) About the right weight, 4) Slightly overweight, or 5) Very overweight. Women who reported to be very or slightly underweight were excluded from the sample. Because we were interested in

the dichotomous variable, healthy or overweight, the responses "slightly overweight" and "very overweight" were combined and will be referred to simply as "overweight" from this point forward. Healthy women are those who reported they are "about the right weight." In contrast, BMI was estimated using self-reported height and weight measures. This transformed variable was already calculated and provided in the ACHA-NCHA-II dataset.

Weight Goals. Subsequent to reporting their current weight, participants answered the question, "Are you trying to do any of the following about your weight?" Possible responses were, 1) I am not trying to do anything, 2) I am trying to stay the same weight, 3) I am trying to lose weight, or 4) I am trying to gain weight. We transformed the data to combine "stay the same weight" and "nothing" into a new category termed, "not attempting weight loss." This is because both responses indicate that they are not attempting weight loss which is the response we are interested in for our inquiry. Very few participants reported efforts to gain weight, and because those individuals were not relevant to our study, excluded their data for all analyses.

Relationship Status. Possible responses to the question, "What is your relationship status?" included "Not in a relationship," "In a relationship and living together," and "In a relationship and not living together;" since our hypothesis only addressed relationship status and not living arrangements, the latter two responses were combined. Thus, relationship status was converted into a dichotomous variable: single or in a relationship.

Mental Health. We transformed responses to the question, "Have you ever felt so depressed that it was difficult to function?" into two responses: no (not within the last 12 months or not ever) or yes (within the last 12 months). Original responses included, 1) Never, 2) Not in the last 12 months, 3) In the last 2 weeks, 4) In the last 30 days, or 5) In the last 12 months. The first two responses were grouped together as "no, not in the last 12 months" and the latter three were combined to create the response "yes, within the last 12 months" since the last 2 weeks and last 30 days are included within the last 12 months. The same method was employed for the questions, "Have you ever felt overwhelming anxiety?" "Have you ever felt things were hopeless?" and "Have you ever felt overwhelmed by all you had to do?"

Academic Performance. Three variables relating to academic performance were measured: GPA, Academic Stressors, and Academic Difficulty. GPA was measured from responses to the question, "What is your approximate cumulative grade point average?" The multiple choice responses included: 4.0 (A), 3.0 (B), 2.0 (C), 1.0 (D/F) or N/A. Very few participants chose 1.0 (n = 2) so their data, as well as those who chose N/A, were not included in the GPA analyses. We assessed Academic Stressors from 31 related questions, each asking, "Within the last 12 months has the following affected your academic performance?" with stressors including a wide range of events and emotions such as work, STDs, roommate difficulties, pregnancy, drug abuse, illness, finances, and depression. If a particular stressor had negatively affected them (resulting in a lower grade on an exam or in a course, an incomplete or dropped course, or a significant thesis disruption) within the last 12 months, that was scored as a "1" and if they had not

experienced a particular stressor, or if they had experienced it but were not negatively impacted, that was scored as "0." We measured Academic Stressors by summing each participant's scores on all 31 questions (possible range 0-31) and then calculating the average score for participants in both weight groups. Finally, Academic Difficulty was measured via responses to the question, "Within the last 12 months have academics been traumatic or very difficult for you to handle?" For this variable only two responses were possible: yes or no.

Weight Loss Methods. One construct of healthy weight loss behavior is the consumption of fruits and vegetables (adapted from Grieve et al., 2006). To compare healthy and overweight women on this variable, we transformed fruit and vegetable consumption into a dichotomous variable: (a) no fruit and vegetables or (b) at least 1 serving per day. This variable was created from the question, "How many servings of fruits and vegetables do you usually have per day?" with options including, 1) 0 servings per day, 2) 1-2 servings per day, 3) 3-4 servings per day, or 4) 5 or more servings per day. Thus, responses 2-4 were grouped to create the response "at least one serving per day."

Additional healthy and unhealthy weight loss techniques were measured and analyzed as well. Participants answered the following four questions, "Within the last 30 days did you do any of the following to lose weight: (a) exercise, (b) diet, (c) vomit or take laxatives, or (d) take diet pills? Participants could answer yes or no to each of those factors. Our final hypothesis was that healthy women attempting weight loss would be

less likely to use unhealthy strategies compared to their overweight counterparts, and more likely to exercise. Unhealthy methods include: (a) vomiting or using laxatives, and (b) taking diet pills. These methods were analyzed separately.

Results

A significance level of .05 was used for all analyses. Because each of our hypotheses were directional in nature, one-sided p-values were used for all 2 X 2 chi square analyses.

Hypothesis 1: Perceived Weight and Body Dissatisfaction

To test Hypothesis 1, we compared healthy women who are attempting weight loss and healthy women who are not attempting weight loss with respect to whether they have had difficulty dealing with their appearance in the last twelve months. The frequency of healthy women whose appearance caused difficulty as a function of weight goals is displayed in Figure 2. The relationship between weight goals and reported difficulties resulting from appearance was significant, $\chi^2(1, n = 633) = 61.84, p < .001, \phi = .31$, odds ratio = 5.45 (95% CI = 3.47, 8.56). Healthy women who were attempting to lose weight were over five times more likely to report experiencing difficulties with their appearance than were healthy women who were not attempting to lose weight. These data provide support for this hypothesis.

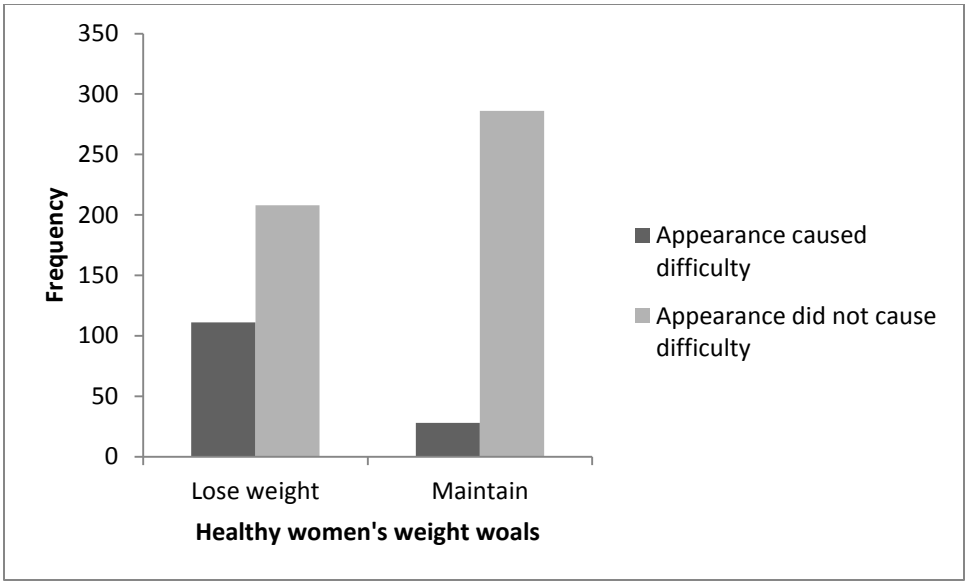

Figure 2. Healthy women's difficulty with appearance.

Hypothesis 2: BMI

As predicted, healthy women attempting weight loss had significantly higher BMI ($M = 22.27$, $SD = 2.33$) than did healthy women not trying to lose weight ($M = 21.06$, $SD = 1.90$), $t(629) = 7.15$, $p < .001$, two-tailed, $d = 0.57$. These data support Hypothesis 2. Figure 3 depicts BMI as a function of weight goals for healthy women.

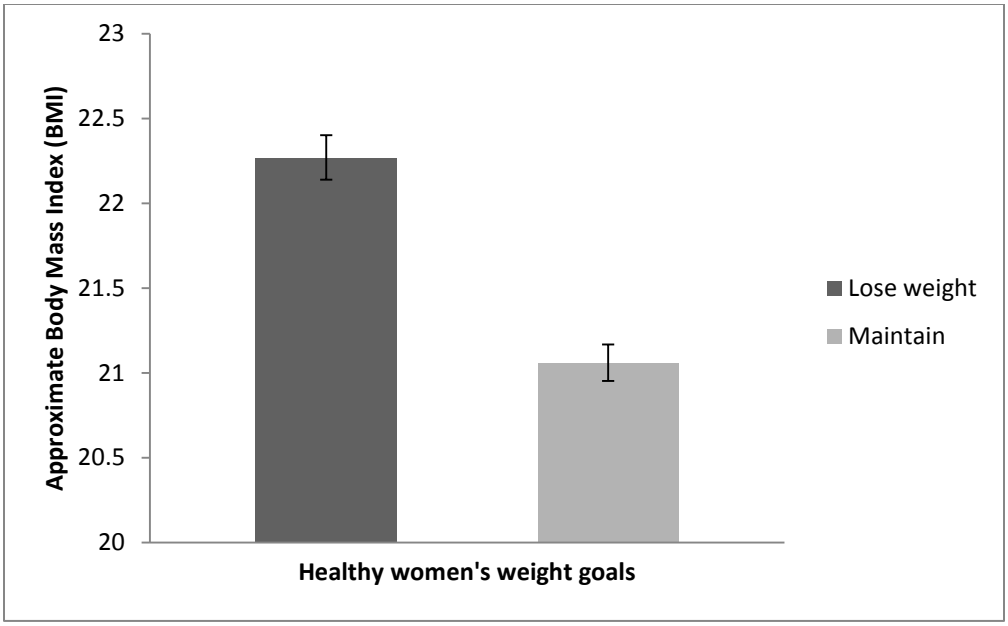

Figure 3. Healthy women's mean BMI (± 1 *SEM*) as a function of weight goals.

Hypothesis 3: Mental Health

Depression. The results support our hypothesis such that healthy women attempting weight loss experienced severe depression at a higher rate (32.6%) than healthy women not attempting weight loss (25.6%), $\chi^2(1, n = 632) = 3.80$, $p < 0.05$, $\phi = .08$, odds ratio = 1.41 (95% CI = 0.10, 1.99). That is, healthy women attempting weight loss were over 40% more likely to report depression than healthy women not attempting weight loss. Frequency distributions for depression among healthy women are shown in Figure 4.

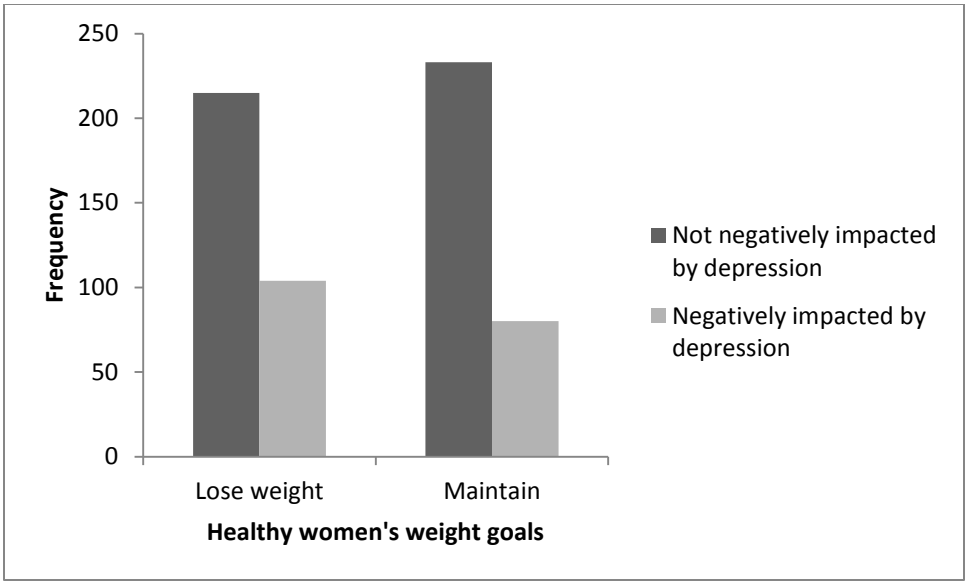

Figure 4. Healthy women affected by depression as a function of weight goals.

Anxiety. As shown in Figure 5, healthy women attempting weight loss experienced overwhelming anxiety within the past 12 months at a higher rate (54.5%) than healthy women not attempting to lose weight (43.9%) and the difference was significant, $\chi^2(1, n = 633) = 7.11, p < 0.01, \phi = 0.11$, odds ratio = 1.53 (95% CI = 1.12, 2.09). Among healthy women, anxiety was reported 50% more often for those attempting weight loss and those not attempting to lose weight. These data further support our hypothesis.

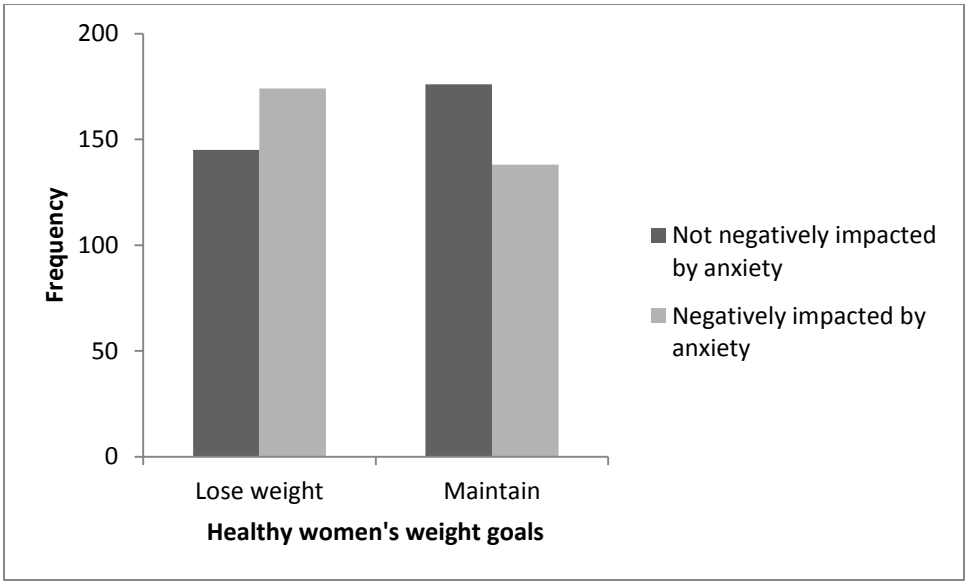

Figure 5. Healthy women affected by anxiety as a function of weight goals.

Hypothesis 4: Mental Health

Hopeless feelings. Healthy women attempting weight loss reported feelings of hopelessness at a higher rate (52.2%) than healthy women not attempting weight loss (41.7%) and the difference was significant, $\chi^2(1, n = 632) = 6.97, p < 0.01, \phi = 0.11$, odds ratio = 1.53 (95% CI = 1.11, 2.09). Healthy women attempting weight loss reported feelings of hopelessness 1.53 times more often than their healthy counterparts who are not attempting weight loss. These data support our forth hypothesis. Figure 6 provides a summary of the data.

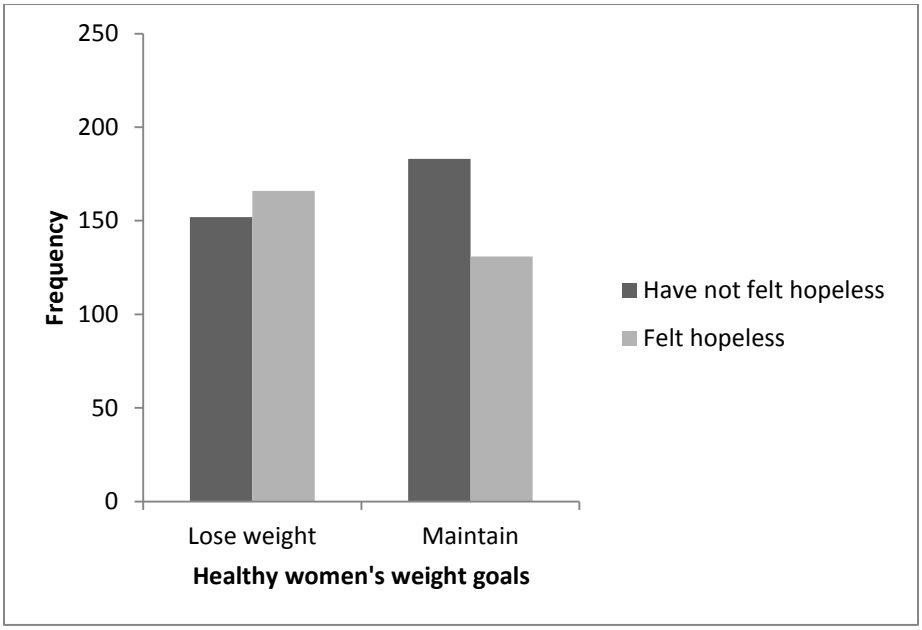

Figure 6. Feelings of hopelessness among healthy women.

Feeling overwhelmed. Reported sense of overwhelm did not differ between healthy women attempting weight loss (87.5%) and healthy women not attempting weight loss (84%) (see Figure 7), $\chi^2(1, n = 632) = 1.53$, $p = 0.131$, $\phi = 0.05$, odds ratio = 1.33 (95% CI = 0.85, 2.08). The data do not support our hypothesis that healthy women attempting weight loss would feel overwhelmed more than healthy women not attempting weight loss.

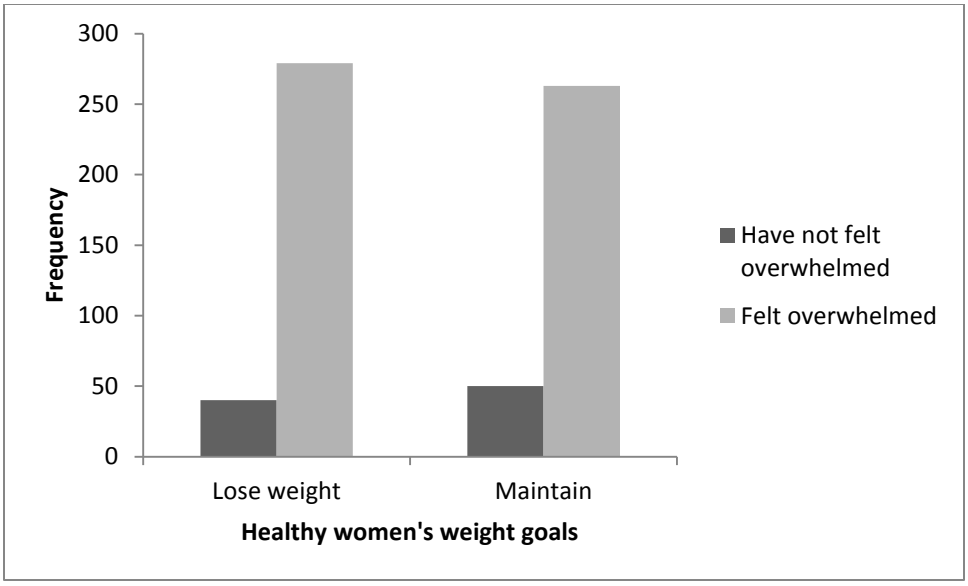

Figure 7. Healthy women's sense of overwhelm as a function of weight goals.

Hypothesis 5: Relationship Status

Though the data trended in the direction we predicted (38.1% of healthy women attempting weight loss were single versus 32% of healthy women not attempting weight loss) the difference was not significant, $\chi^2(1, n = 636) = 2.65, p = 0.061, \phi = .06$, odds ratio = 0.76 (95% CI = 0.55, 1.06). Figure 8 shows the relationship status of healthy women as a function of weight goals. In sum, the data do not support our hypothesis.

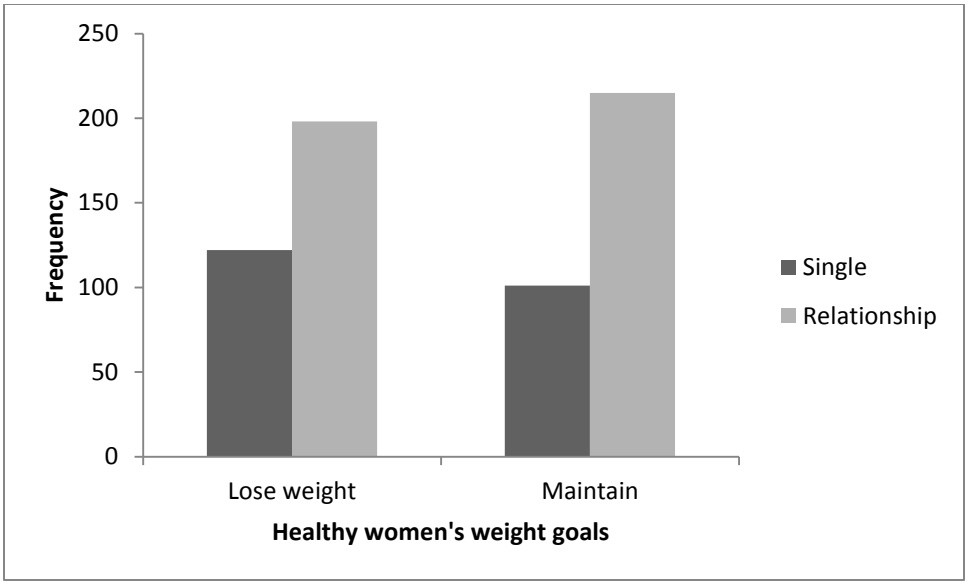

Figure 8. Healthy women's relationship status as a function of weight goals.

Hypothesis 6: Academic Performance

We did not find any significant differences in GPA between healthy women attempting weight loss and healthy women not attempting weight loss (see Figure 9), χ^2 (2, n = 616) = 0.76, p = .684, λ = .03, (95% CI: 0, 0.14). However, the two groups did significantly differ on Academic Difficulty, with 52.4% of healthy women attempting weight loss reporting academics being traumatic or difficult to handle versus only 38.2% of healthy women not attempting weight loss, χ^2(1, n = 633) = 12.76, p < 0.001, ϕ = .14, odds ratio = 1.78 (95% CI = 1.29, 2.44). Thus, healthy women attempting weight loss were nearly twice as likely to report Academic Difficulty than healthy women who are not attempting to lose weight. In contrast to the GPA data, these Academic Difficulty data support our hypothesis. Figure 10 shows the interaction between academic difficulty and healthy women's weight goals.

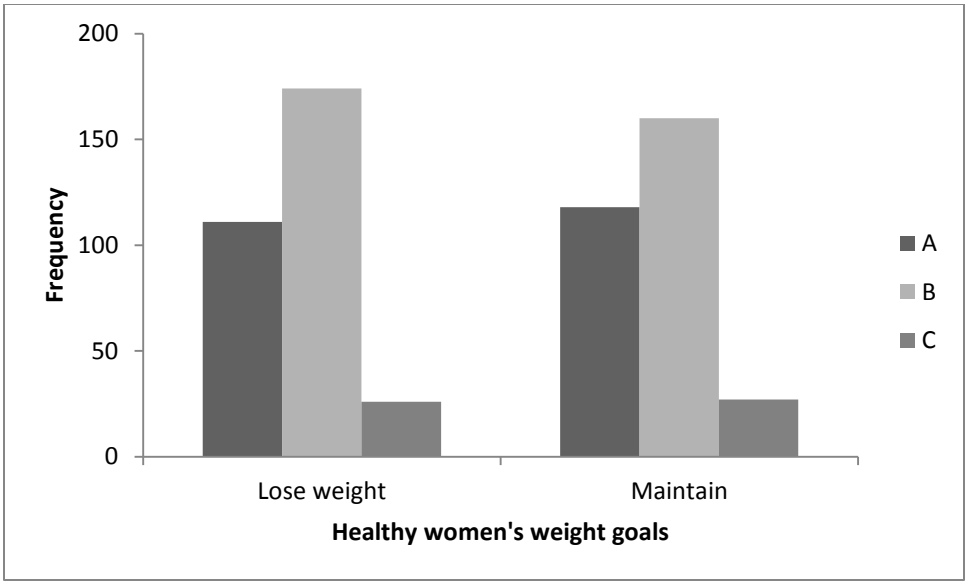

Figure 9. GPA as a function of weight goals among healthy women.

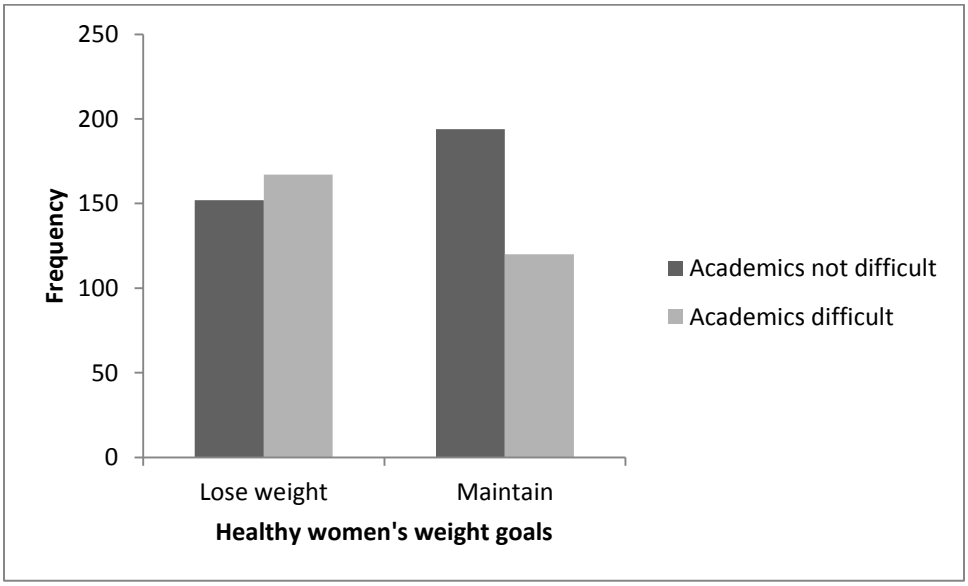

Figure 10. Healthy women and academic difficulty as a function of weight goals.

Hypothesis 7: Academic Performance

As predicted, healthy women attempting weight loss reported more instances of stressors negatively impacting their academics ($M = 2.37$, $SD = 3.11$) than healthy women not attempting weight loss ($M = 1.71$, $SD = 2.89$), $t(632) = 2.77$, $p < .01$, two-tailed, $d = 0.23$. Levene's test indicated unequal variances ($F = 14.74$, $p < .001$) so degrees of freedom were adjusted from 635 to 632. These data further support our hypothesis that healthy women attempting weight loss struggle with academics more than healthy women who are not trying to lose weight. These findings are depicted in Figure 11.

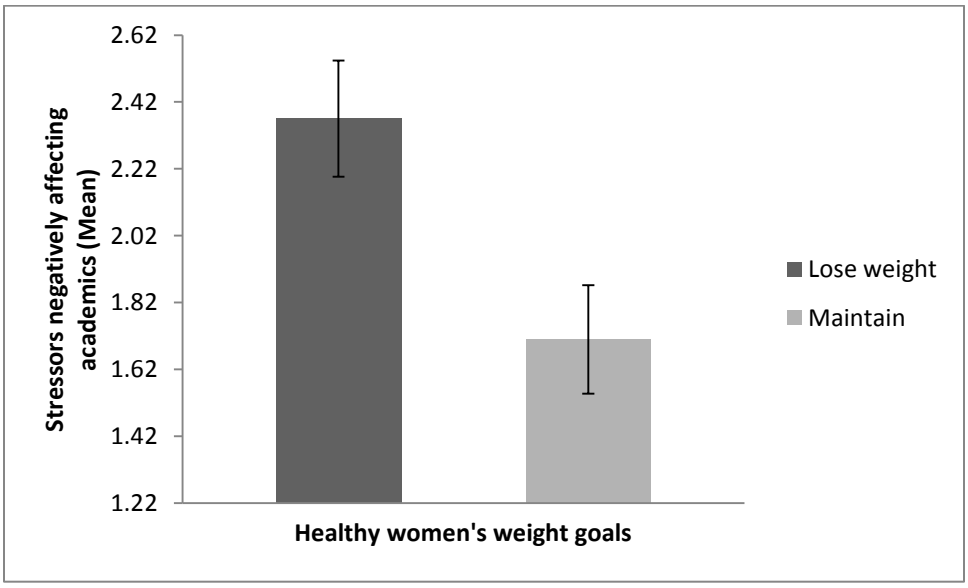

Figure 11. Mean number (± 1 SEM) of healthy women's academic stressors as a function of weight goals.

Hypothesis 8: Weight Loss Methods

As hypothesized, the data showed a significant difference between the two groups such that overweight women were more likely (96%) to consume fruits and vegetables than healthy women (92.2%), $\chi^2(1, n = 745) = 4.99, p < 0.05, \phi = .08$, odds ratio = 0.49 (95% CI = 0.26, 0.93). That is, compared to healthy women, overweight women were half as likely to forego fruits and vegetables. Figure 12 depicts these differences. As a second construct of healthy weight loss strategies, we examined whether dieting to lose weight differed between the two groups. As seen in Figure 13, the results were significant in the predicted direction; of the overweight women, a higher percentage (68.4%) reported dieting while only 55.9% of healthy women reported such practices, $\chi^2(1, n = 739) = 12.17, p < 0.001, \phi = .13$, odds ratio = 0.59 (95% CI = 0.43, 0.79). In other words, overweight women attempting weight loss were nearly 60% more likely to diet than healthy women attempting weight loss. The results from both analyses support our hypothesis.

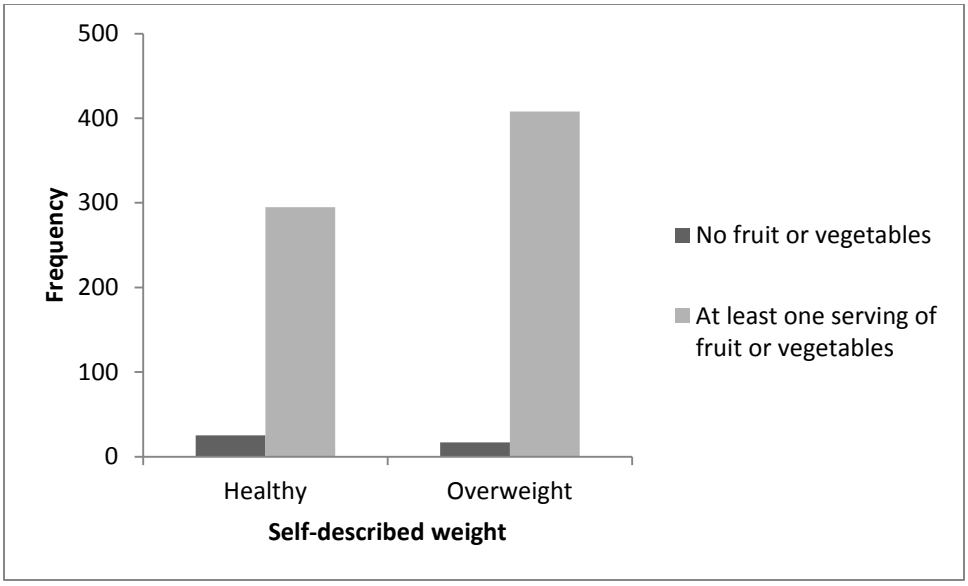

Figure 12. Fruit and vegetable consumption as a function of weight.

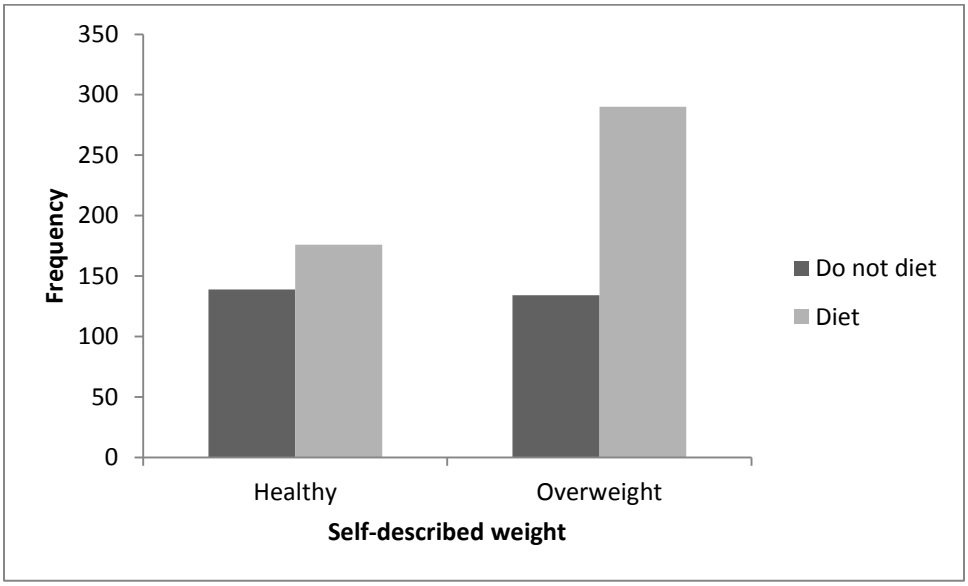

Figure 13. Dieting to lose weight (within last 30 days) among healthy and overweight women.

Hypothesis 9: Weight Loss Methods

We hypothesized that of the women attempting to lose weight, healthy women would exercise more than overweight women. The data do not support this prediction as both groups reported similar levels of moderate cardio activity within the past week, $\chi^2(2, n = 744) = 1.26$, $p = 0.533$, Cramer's V = 0.04. In addition, the percent of women in each group who reported that they had exercised to lose weight in the past 30 days did not differ (78.1% for healthy and 76.3% for overweight). Among women attempting weight loss, healthy and overweight women were equally likely to exercise, $\chi^2(1, n = 746) = 0.35$, $p = 0.309$, $\phi = .02$, odds ratio = 1.11 (95% CI = 0.78, 1.57). These results do not support our hypothesis.

Hypothesis 10: Weight Loss Methods

Our final hypothesis was that healthy women attempting weight loss would be less likely to use unhealthy strategies compared to their overweight counterparts. Unhealthy methods include: (a) vomiting or using laxatives, and (b) taking diet pills. These methods were analyzed separately. The data on vomiting and laxative use do not support our hypothesis, $\chi^2(1, n = 739) = 0.10$, $p = 0.445$, $\phi = .01$, odds ratio = 0.89 (95% CI = 0.45, 1.78). The data suggest that vomiting and laxative-use are independent of perceived weight. However, the use of diet pills did follow the predicted pattern (see Figure 14) with overweight women using them at a significantly higher rate (5.6%) than healthy women (1.9%) within the last 30 days, $\chi^2(1, n = 741) = 6.56$, $p < 0.05$, $\phi = .09$,

odds ratio = 0.32 (95% CI = 0.13, 0.80). Thus, overweight women used diet pills 30% more often than overweight women. These data do support our hypothesis.

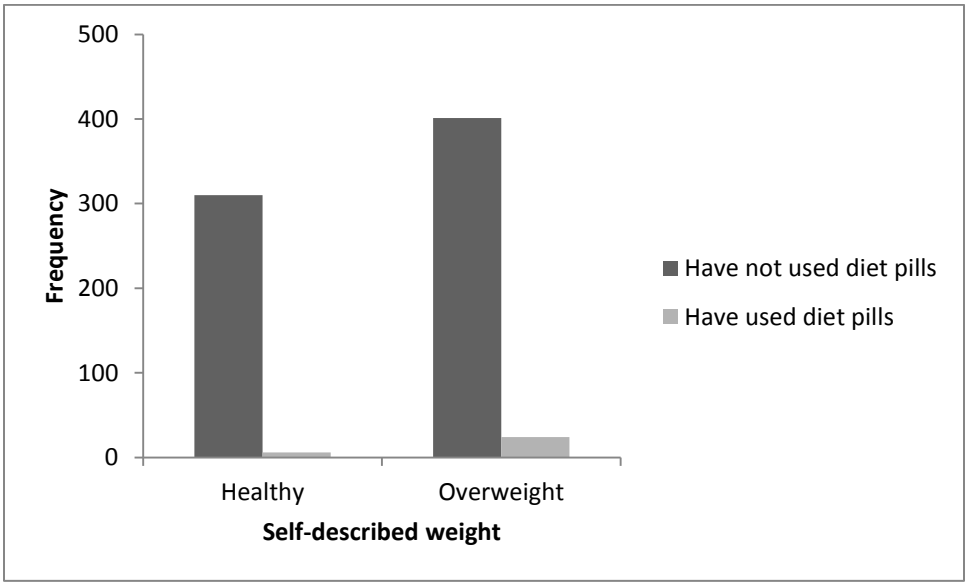

Figure 14. Use of diet pills (within last 30 days) among healthy and overweight women attempting weight loss.

Discussion

This study explored the behaviors and psychological characteristics of healthy women who attempt weight loss. Little information was previously reported on this population, but the ample studies on overweight and obese women indicated which factors may be worth considering, and allowed us to make several directional predictions. Within our data we found much support for our hypotheses. Particularly when we contrasted healthy women attempting weight loss with healthy women not attempting weight loss, we found significant statistical relationships in mental health, body

composition, and academics. The general trend was that healthy women attempting weight loss are more dissatisfied with their bodies, are more anxious and depressed, and struggle with academia. Conversely, hypotheses that differentiated healthy and overweight women attempting weight loss yielded less support. Many of the weight loss behaviors were independent of perceived weight (healthy or overweight) among women attempting weight loss.

Arguably the two most important variables of this study derive from the questions, "How would you describe your weight?" and "Are you trying to do anything about your weight?" Though it is of course possible for women who are not overweight to believe that they are, and, conversely, for overweight women to believe that they are not, for the purpose of this study it is more important to consider what the participants perceive about their bodies rather than their actual weight. The discrepancy of interest is the women who believe themselves to be of a healthy weight while still attempting to lose weight. The literature is rich with data on overweight women and women attempting weight loss, but there has not been adequate research on healthy women attempting weight loss. The purpose of this study was to bridge said gap.

Nearly all of our hypotheses that predicted differences between healthy women attempting weight loss and healthy women not attempting weight loss were supported. The data showed that mental health factors such as depression, anxiety, feelings of hopelessness as well as life stressors contributing to academic difficulties were not

independent of weight goals, with the healthy women attempting weight loss more likely to be negatively impacted on all counts.

Because the women in our population were attempting weight loss, we reasoned that they would possess characteristics similar to overweight women and women with poor body image. Supporting our first hypothesis, data indicated that difficulty with appearance was not independent of weight loss goals for healthy women. This hypothesis was based, in part, on findings by Arroyo (2014), Economos et al. (2008), Sides-Moore and Tochkov (2011) and Simon et al. (2010), which highlighted the pivotal role that body dissatisfaction plays in negative weight-related behavior (e.g., fat talk). The effect size was very large for this relationship, with healthy women attempting weight loss reporting Difficulty with Appearance more than five times as often as healthy women not attempting to lose weight. We approach these findings cautiously because we do not know that Difficulty with Appearance adequately measures body dissatisfaction. Because these women report to be healthy but are also trying to lose weight, we suspect that they are experiencing body dissatisfaction and self-discrepancy, but our correlational data alone cannot prove that. The results are in line with our hypothesis, however.

We hypothesized that healthy women attempting weight loss would have higher BMIs than healthy women not attempting weight loss and the data supported our prediction. The results showed that BMI was not independent of weight goals. This is an important finding because it is evidence of a physiological difference between the two groups and suggests that healthy women attempting weight loss may fall on some

continuum between healthy and overweight women. That is, categorically they identify with healthy women, but behaviorally (attempting weight loss) and physically (higher BMI) they are different and seem to resemble overweight women. This is interesting in and of itself, but there is a caveat to these data: BMI was calculated from self-reported height and weight. Thus, it is conceivable that healthy women attempting weight loss statistically have the same BMI as healthy women not attempting weight loss, but that they think they weigh more or perhaps knowingly report a higher weight to justify their weight loss goals. Devoid of objective weight measures, we cannot know with certainty that women attempting weight loss have a higher BMI, only that they report a higher BMI. This may seem trivial, but the distinction is a difference in physiological or psychological makeup. If they in fact have a higher BMI, then the difference is physical. If, however, the difference is rooted in *reported* weight, this suggests a psychological difference. Our results show that a difference exists, but additional research is needed to say what exactly that difference is.

Excluding feeling overwhelmed, the data supported all of our mental health hypotheses. Rates of depression, anxiety, and feeling hopeless were more prevalent in healthy women attempting weight loss than healthy women not attempting weight loss. These results compliment Heron and Smyth's (2013) findings that momentary self-discrepancy is positively correlated with depressed and anxious affect. Again, though we are unable to claim that healthy women attempting to lose weight necessarily experience self-discrepancy, the data are what we would expect to find if our participants were experiencing self-discrepancy. The data are in line with our expectations, but we require

controlled follow up studies and better self-discrepancy measures (e.g., CDRS, Heron & Smyth, 2013) to draw such conclusions.

Contrary to expectation, healthy women attempting to lose weight did not report greater instances of feeling overwhelmed than healthy women who are not attempting to lose weight. We speculate that feelings of being overwhelmed may not be an accurate construct of poor mental health among college students. It is possible that typical college stressors cause women to feel overwhelmed, which seems likely since 85.8% of all healthy women reported feeling overwhelmed within the past 12 months. It is also possible that our time frame was too long; it is conceivable that most people will feel overwhelmed at least once over the course of one year.

The data did not support our hypothesis that healthy women attempting weight loss would be single at a greater rate than healthy women who are not trying to lose weight. In fact, data showed that relationship status was independent of weight goals for healthy women. It is not clear why our data did not follow the trends of Ostrovsky et al. (2013) and Sheets and Ajmere (2005), but we propose that sampling differences may explain why our data deviate from the established literature. Unlike our sample, Ostrovsky et al. and Sheets and Ajmere included men in their analyses. In addition, by restricting our sample to healthy women, we have a smaller range of BMI scores to analyze than did Sheets and Ajmere.

GPA was one of the few variables that were independent of weight loss goals among healthy women. We believe that participants' reported GPAs were not precise

enough to properly test for significant differences. Participants were asked to provide their approximate GPA and five responses were possible: 4.0 (A), 3.0 (B), 2.0 (C), 1.0 (D/F) or N/A. These responses are very rough estimates and do not convey the gradations that are critical to distinctions in GPA. Thus, even though our hypothesis that healthy women attempting weight loss would have lower GPAs than healthy women attempting to maintain was not supported, we speculate that in reality differences may exist between the two groups. This idea is supported by the follow-up analyses which compared the occurrence of life stressors that negatively impacted participants' academics as well as reported Academic Difficulty. Healthy women attempting weight loss reported significantly more Academic Stressors and Academic Difficulty than healthy women not attempting weight loss. One must exercise caution when interpreting these findings. Though this hypothesis was driven in large part by self-objectification theory, the available data did not provide an adequate construct of the theory. It could be argued that self-objectification was weakly measured by academic achievement. While it is true that our predictions regarding academic achievement were formed based on the results of studies that manipulated self-objectification, it is not accurate to say that academic achievement measures self-objectification, nor should the differences we found be interpreted as evidence of self-objectification differences between the two groups. Instead, we purport that academic difficulty is not independent of weight loss goals among healthy women and further investigation is required to determine the cause.

Of the participants attempting weight loss, we predicted that healthy women would consume fewer fruits and vegetables, diet less, and exercise more than overweight

women. The reasoning was based on previous findings that individuals dissatisfied with their bodies performed more healthy weight loss behaviors (e.g., consuming fruits and vegetables) and exercised less than individuals who are satisfied with their bodies (Grieve et al., 2006; Kruger et al., 2004). Though both groups are attempting weight loss, one group said they are healthy while the other said they are overweight, so we assumed that the former were comparatively more satisfied with their bodies. However, the data only partially supported this hypothesis. Healthy women were less likely to regularly consume fruits and vegetables, but, unexpectedly, their exercise habits did not differ from overweight women. There are multiple plausible explanations for this finding. Procedurally, the order of the survey questions may have affected participants' responses. The questions about fruit and vegetable consumption and exercise habits were immediately preceded by the question asking about participants' weight goals (e.g., current efforts to lose weight or maintain). Because all of these women said they are attempting to lose weight, it is possible that they felt impelled to report higher instances of exercise in order to be consistent and reduce discomfort. Festinger's (1962) cognitive dissonance theory might predict this behavior, and it would support our self-discrepancy theory framework.

It is also possible that our sample differed significantly from the Grieve et al. (2006) sample and as such their findings do not relate to our sample; that is, perhaps exercise is more common among college-aged women in California than young men and women living in the South. Improbable though that sounds, data from a 2013 Gallup and Healthways survey (Gallup and Healthways report, 2013) show that among large

metropolitan regions (one million residents or more), San José leads the nation in Well-Being (a composite score that includes "physical health," "healthy behaviors," and other wellness indicators), while several southern cities (Louisville, Kentucky; Jacksonville, Florida; and Tampa, Florida) have the lowest Well-Being scores. In addition, recent surveys showed that Americans in the west region exercised the most (58.6%) while those in the south exercised less (53.7%; Gallup poll, 2014). Thus, exercise routines and overall health may differ between our sample and the participants that Grieve et al. studied.

Based on findings by Grieve et al. (2006) and Kruger et al. (2004), we expected that, among women attempting weight loss, overweight women would be more likely to vomit and use laxatives than healthy women, but the data did not support this hypothesis. Instead, these maladaptive weight loss techniques were used independently of perceived weight. In contrast, data on diet pill use did follow the predicted pattern: overweight women were more likely to ingest diet pills than healthy women. Diet pill use is often lumped with laxative use and vomiting in terms of unhealthy weight loss techniques, so we were surprised to find that their use deviated from one another. Laxative use and vomiting was limited across the board (4.7% of participants reported using this technique), but so was use of diet pills (4.0%). The difference appears to lie with healthy women. Healthy women used diet pills at very low rate (1.9%) which was even lower than their use of laxatives and vomiting (4.4%). This finding is unexpected and not easily explained by the current literature.

Perhaps more telling than any given result is the broader trend of our hypotheses; those that assumed healthy women attempting weight loss would be similar in behavior to overweight women (i.e., hypotheses 1-7) were generally supported by the data, while our hypotheses that predicted behavioral differences between the two groups (i.e., hypotheses 8-10) were only partially supported. In that regard, it appears that healthy women attempting weight loss are more similar to overweight women in terms of psychological experiences and outward behavior than they are to healthy women who are maintaining. This is an interesting finding, and to our knowledge, this has not been previously reported. This is important because it gives insight into the diminished psychological wellbeing of a population who is largely ignored in the literature because they are, by their own evaluation, healthy.

Finally, because the theories of self-discrepancy, self-objectification, and social comparison governed our hypotheses, we seek to apply them to our sample. Though we were unable to directly test each theory, we recognize that these perspectives are useful for understanding our findings. Moreover, our data are in line with what would be expected if the theories were valid and applicable to this population. If the women in our sample were experiencing body self-discrepancy, the theory would predict relatively higher instances of depression, anxiety, and body dissatisfaction, all of which we found in our data. Similarly, if these women self-objectify, we might expect them to experience academic difficulty; the data suggest that they do in fact struggle with academic performance. Lastly, the fact that our sample of healthy women attempting weight loss are (a) a healthy weight, (b) dissatisfied with their bodies, and (c) attempting to reduce

the discomfort by losing weight could be evidence of social comparison. In sum, the patterns in our data support the relevant theories, particularly self-discrepancy, which serves as a useful perspective for understanding the women in our targeted sample.

Limitations

The ACHA-NCHA-II dataset is very large, containing nearly 800,000 data points, many of which can be transformed into new variables of interest. As is often the case with datasets of this magnitude, the sample size provided large statistical power. In addition, the diverse sample promotes our results' generalizability to other young adult women. These are two important benefits of working with an extensive self-report survey. As a tool to track health patterns, the ACHA-NCHA-II is quite powerful. From a research standpoint, however, it is limited in that variables cannot be manipulated and participants cannot be randomly assigned to conditions.

Self-reported measures are generally seen as a weakness, and we acknowledge that this methodology is limiting in some regards. However, for the purposes of our study, several variables either warranted self-report or could not conceivably be measured in an alternative fashion. Question 27, which asks about current efforts to lose weight, is a good example. Of course, behaviors such as exercise and food consumption can easily be measured objectively, but the motives behind those behaviors cannot. An individual may consume less food because they cannot afford groceries, or might exercise regularly for the happiness of their dog, rather than for their own weight loss goals. In the same vein, individuals may employ weight loss methods that were not included in this survey,

such as calorie counting or drinking one less soda per day than is typical for them. To paraphrase, only the individual can say if they are currently making efforts to change their weight, whatever those efforts may be. To that effect, many of the self-reported measures were beneficial to our study.

In contrast, there were instances when a more objective measure would have been ideal. For example, questions pertaining to mental health may have weak internal validity when compared to other studies which used more rigorous methods such as DISC-IV and DASS. Additionally, objective, accurate, and precise height and weight measures are imperative for a study whose core focus is weight concerns.

Similarly, construct validity is a recurring limitation of our study. Though recognized psychological theories drove our hypotheses, the available data did not allow for careful measure of their constructs. That is, we do not have direct measures of social-comparison theory or self-objectification within our data. Self-discrepancy theory is measured indirectly via mental health concerns, but it does not merit conclusive, causal interpretations of our data. In sum, our study created a strong foundation for future research which should aim to build upon our findings and connect the pieces to develop a clearer understanding of healthy women who attempt weight loss.

Future Research

Our study has provided a wide range of information on healthy women who are attempting weight loss, but controlled experiments are warranted to better understand this population. We showed statistical relationships between physical, psychological, and

behavioral factors and weight loss goals, and between weight loss techniques and perceived weight. Because we did not randomly assign participants to groups or manipulate variables, we are unable to draw causal conclusions from our data. This means we cannot comment on *why* healthy women are attempting to lose weight or why healthy women and overweight women differ in their weight loss techniques. Identifying causal relationships between the variables we found to be important in this study would be an excellent goal for future research. Prospective studies should employ more objective measures of the factors we used, such as precise BMI, Anxiety, and GPA. For example, cumulative GPA should be obtained from transcript records, physiological measures of anxiety (e.g., cortisol) should be used, and height and weight should be measured by researchers blind to the experiment. Future research should also incorporate mental health scales such as DASS (see Heron & Smyth, 2013) or DISC-IV (see Roberts & Duong, 2013). Moreover, variables should include valid constructs of all three competing theories. Self-objectification scales, measures of self-discrepancy (see Heron & Smyth, 2013), and social comparison should be at least be included, and, if possible, manipulated (see Kiefer et al., 2006). Factors that should be researched but whose data were not available in the current study include media exposure and perceived weight of peers. The latter could be used as a construct of social comparison theory.

Researchers could also approach from a different angle and seek to understand why women in this population label themselves the way they do. It is unclear why they report that they are "about the right weight" while simultaneously admitting to efforts to change their weight. In contrast to researching what causes healthy women to attempt

weight loss, this perspective accepts that weight loss is the goal and questions instead why the healthy label is chosen. Because we have not identified causal relationships between our variables, which approach would be the most fruitful remains a mystery. If the identified BMI differences are physical rather than psychological, then perhaps the latter approach would be more appropriate. That is, if their BMI is objectively higher and they are attempting to lose weight, the focus should be on why they label themselves as healthy rather than why they are trying to lose weight.

Alternatively, one might view our target sample from a personality perspective. Rather than depressive and anxious affect, academic difficulty, and body dissatisfaction resulting from self-discrepancy and social comparison, it could be argued that these women are neurotic by nature or have a general dissatisfaction with their life. This interpretation would suggest that self-discrepancy is merely another symptom of their overall dissatisfaction. This idea that our sample population's behavior could be better explained from a personality framework could be addressed in future work as well.

Implications

The original study was meant to track health patterns and identify areas of concern. By recognizing a gap in the literature and carefully analyzing the available data, we believe we have identified a health topic worth addressing. It is conceivable that health officials would disregard the women in our study because they report to be healthy. But closer inspection reveals psychological and physical concerns that warrant attention. Depression, Anxiety, Academic Stressors, and Difficulty with Appearance

were rampant among this population. Based on Yamamiya et al.'s (2005) results which showed that educational information on body image and media manipulation mitigated the negative effects of exposure to ideal beauty, we recommend that university health officials preemptively provide educational information to female students.

To conclude, our analysis of the ACHA-NCHA-II data provided information on healthy women who are attempting to lose weight that was not previously available in the literature. We now know that compared to healthy women who are not attempting to lose weight, women who are attempting weight loss report higher BMIs, more mood and anxiety disorders, more academic difficulty, and increased appearance problems. These data are important for understanding the psychological health and behaviors of healthy women struggling with body dissatisfaction, but there is still much to be learned about this population. As research continues, college health personnel should provide their students with educational information pertaining to body image and ideal beauty.

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