Jamie Padden graduated from the University of Memphis in December 2015, obtaining a Bachelor's of Arts. She graduated *summa cum laude* with a major in Psychology and a minor in Business Management, and is a member of Phi Kappa Phi National Honor Society. Jamie has been a research assistant in the Challenging Health Disparities in Adolescents and Nurturing Global Empowerment (CHANGE) lab for the past two years. She enjoys working on innovative research, implementing study protocols on campus and in the Memphis community, analyzing data, writing manuscripts, and presenting her work at national conferences. Her specific research interests include exploration of contributors to health disparities in obesity and HIV, occupational health, and employee wellness. She aims to pursue her doctorate in industrial organizational psychology given her passion for helping people in organizations. Jamie's career objective is to become an occupational health psychologist for a Fortune 500 company in order to promote positive health and wellness in the workplace. Ultimately, Jamie wants to develop and implement successful employee wellness programs in order to improve job satisfaction, employee performance, employee health, and decrease chronic and preventable diseases among employees in the work place.

# Jamie Padden

An Examination of Locus of Control Moderating the Effects of Current Weight Status and Intentions to Lose Weight

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## Abstract

This study investigates the moderating role of locus of control (LOC; degree of perceived control over one's life) on the relationship between weight status and weight loss intent. It was hypothesized that the strength of the relationship between weight status and weight loss intentions would vary as a result of LOC and be more salient for female students. University students (N=286; 18-25 years-old) completed weight intentions and weight LOC measures. Trained researchers obtained height and weight. Logistic regression analyses indicated females (β =-2.80, $p<.0001$), and individuals who were overweight (β=1.77, $p<.05$) or obese (β=2.20, $p<.05$) had greater weight loss intentions than males and students with normal weight. LOC did not moderate this relationship. Findings highlight the need to explore unique motivators for weight loss among male and female students. The non-significant moderating role of LOC indicates future studies should examine other personality constructs and individual characteristics as potential factors influencing weight-related behaviors.

## Introduction

Obesity is a widespread problem, even more so for industrialized countries (Flegal, et al., 2012). According to the 2011–2012 National Health and Nutrition Examination Survey (NHANES), of U.S. adults aged 20 and older, 33.9% are overweight, 35.1% are obese, and 6.4% are morbidly obese (Ojala, et al., 2007). The status of emerging adults (i.e. individuals between the ages of 18-25) is particularly problematic. The prevalence of obesity has increased dramatically among this group (Sheehan, et al., 2003), making it a high-risk population (Mulye, et al., 2009). Previous research has indicated that weight gain among emerging adults is the highest of any age group (Sheehan, et al., 2003).

In 2009, national surveys indicated that over 40% of young adults aged 18-25 in the United States were considered to be overweight or obese (Mulye, et al., 2009), which exposes this age group to chronic diseases early in adulthood such as heart disease and diabetes and various forms of cancer (Mulye, et al., 2009). In addition, emerging adults are at high risk for unhealthy weight-related behaviors like poor eating habits and low rates of physical activity, Young adulthood is a time of significant transition, and involves major life changes such as going to college, joining the military, finding employment, and leaving home while supporting oneself; each of these factors may have a large impact on personal health status and access to care (Mulye, et al., 2009). Financial strain and other new stressors during this transitional period, moreover, increase the risk of poor eating habits, lack of exercise, and other risky behaviors like recreational drug use and binge drinking (Mulye, et al., 2009).

As young people are at high risk for unhealthy behaviors and obesity, exploring the relationship between weight status and intentions to lose weight is important. Ojala and colleagues (2007) conducted a cross-national study to determine important factors that contributed to adolescents' attempts to lose weight. The findings from this sample of adolescents across 30 countries from North America, Europe, and Israel, indicated that adolescents who were overweight or obese were more likely to intend to lose weight and attempt to lose weight compared to their normal weight peers (Ojala, et al., 2007). Gender differences also emerged, with, 80% of girls who were overweight or obese either trying to lose weight or feeling that they needed to lose weight (Ojala, et al., 2007).

Ajzen's (2001) research (which supports the findings of Ojala

and colleagues, 2007) identified an individual's intentions as an important predeterminer of an individual's actions. Further, implementing and promoting positive intentions promotes goal achievement and translates well into specific behavioral action plans (Ajzen, 2001). This link between intentions, and specific desired outcomes, cues the actions and increases the probability of an individual achieving them (Gollwitzer, 1999). Several studies have explored the role of weight intentions in increasing physical activity, healthy food intake, and overall healthy lifestyle choices (Prestwich, Lawton, & Conner, 2003; Verplanken & Faes, 1999; Zieglmann, Lipple, & Schwarzer, 2006). Specifically, Prestwich and colleagues (2003) found that participants enrolled in the positive behavioral intention intervention had the greatest frequency of time spent exercising per week, and displayed the greatest fitness improvements. Also, Verplanken & Faes (1999) found that the intention to implement healthy eating habits was effective in establishing a long-term healthier diet among participants. These studies illustrate the importance of examining the effects of an individual's *intention* on actual behaviors. In addition, these studies highlight the importance of investigating the impact of weight intentions as a proxy for actual weight reduction.

With rates of obesity steadily increasing for emerging adults, treatment programs and interventions for individuals who are overweight and obese have been gradually emerging. However, even with the creation of these programs, participants often drop-out, are unsuccessful at maintaining weight-loss, or are unable to consistently lose weight over time (Elfhag & Rössner, 2005; Kolodziejczyk, et al., 2014). Current weight-loss programs are not tailored to meet the needs of young adults and so are not effective (Elfhag & Rössner, 2005; Kolodziejczyk, et al., 2014). For example, a review of 14 weight loss interventions in 2010 reported non-significant mean weight loss (6.61 pounds) for the young adults enrolled in the different programs (Laska, et al., 2012). In addition, a review of randomized controlled trials in 2013 indicated that the average weight loss for young adult women who were enrolled in a weight reduction program ranged from 0.22 pounds to 4.18 pounds (Hutchesson, Hulst, & Collins, 2013), a similarly non-significant amount of weight loss. Furthermore, out of the eight studies reviewed, 20% of the participants did not stay in the weight loss program (Hutchesson, et al., 2013), indicating high drop-out rates. These reviews illustrate that young adults have lower attendance, retention, and weight loss compared to older adults who are actively en-

rolled in weight reduction programs (Hutchesson, et al., 2013).

Locus of control (LOC) refers to individuals' perceptions about the underlying cause of events and outcomes in their lives (Rotter, 1966). LOC started out as a personality construct created by Rotter in the 1950's, which posited that behaviors were guided by reinforcement, which in turn transforms into rewards and punishments. These rewards and punishments then influence individual beliefs about what causes personal actions (Rotter, 1966). As supported by Rotter's research, these individual beliefs guide an individual's attitude and behavioral choices. Rotter's locus of control theory is comprised of two major parts: internal orientation and external orientation (Rotter, 1966). External LOC orientation refers to outcomes perceived to be outside an individuals' control, often referred to as "fate" and independent of an individuals' decisions and hard work (Rotter, 1966). Internal LOC orientation refers to outcomes over which the individual perceives that s/he has full control and results in outcomes that are determined by hard work, perseverance, and choices (Rotter, 1966). Internal and external LOC orientation have thus been examined together to explain the relationship between personality and behavior change. Building on the idea that personality affects choices and behaviors, LOC was recommended for general treatment adherence in healthcare settings, with an emphasis on applying LOC to weight and other health-related behavior changes (Parcel & Meyer, 1978).

It is possible that current weight loss programs and interventions for emerging adults are not effective because they do not identify predictors of success and match programs to participant strengths and individual needs (Adolfsson, et al., 2005) and, as Kraschnewski, et al. (2010) note, it is important to understand and identify the behavioral strategies that will motivate and be effective for losing weight over the long-term. Individuals who have greater internal LOC orientation achieved more weight loss, and maintained weight loss more consistently over time, compared with individuals who had greater external LOC orientation (Adolfsson, et al., 2005; Elfhag & Rössner, 2005). This research suggests that a valuable dimension for predicting success in weight loss programs and interventions is missing.

One of the first studies that explored LOC and obesity examined the importance of LOC on personal attitudes and social norms related to weight loss (Saltzer, 1978). The findings from this study indicated that

among individuals who put a high value on health and appearance, those with an external LOC orientation rated social norms as highly influential while those with an internal LOC orientation rated personal attitudes as most important. In addition, the researchers found that the Locus of Control scale was an accurate predictor for intent to lose weight (Saltzer, 1978). This study highlighted the importance of health education programs to consider both personal attitudes and social norms when designing programs to alter behavioral intentions about health. Building on this research, Saltzer conducted an additional study in 1982 that assessed the validity of a 4-item Weight Locus of Control (WLOC) scale. This study explored key components of WLOC, using a specific measure of expectancies of LOC with respect to personal weight and was developed for the prediction of behaviors in relation to weight loss. The results of this study support the validity of the WLOC scale and its usefulness in distinguishing individuals who have internal LOC versus external LOC orientation with regard to weight loss (Saltzer, 1978). Furthermore, participants who demonstrated internal LOC orientation on the WLOC scale were only influenced in their behavioral intentions to lose weight by their personal attitude toward weight loss. Participants with an external LOC orientation on the WLOC scale were only influenced by perceived social normative beliefs in predicting their behavioral intentions to lose weight (Saltzer, 1982).

Adolfsson (2005) also examined LOC to determine success and engagement in weight loss and weight loss treatment programs among adults. In this study, LOC was used to predict attitudes and behaviors related to weight loss (Adolfsson, et al., 2005). Adolfsson and colleagues found that individuals who were obese were more externally oriented than individuals who were categorized as normal weight. Furthermore, those with an internal LOC orientation achieved greater weight loss than participants exhibiting external LOC orientation (Adolfsson, et al., 2005). Similarly, Ali & Lindström (2006) studied LOC as a multidimensional construct: comparing women who were underweight, normal weight, overweight, and obese on the basis of socioeconomic factors, health behaviors, LOC, and psychological health. Findings indicated that individuals who were overweight and obese had lower rates of internal LOC leading to unhealthier behaviors (e.g., smoking and sedentary lifestyle) (Ali & Lindström, 2006). In addition, these authors found that healthy dietary practices and physical activity were associated with individuals who had higher

internal LOC orientation.

Similarly, Holt, Clark & Kreuter (2001) used LOC to predict two outcomes: 1) weight-related behaviors of individuals who were overweight in relation to actual weight loss, and 2) individuals' responses to health education materials regarding weight loss. Findings indicated that individuals with different LOC orientations responded differently to health-related education materials (Holt, Clark, & Kreuter, 2001). An internal LOC orientation was related to the positive ratings of health education materials, confidence, motivation, weight loss intent, and actual weight loss. Individuals with an external LOC orientation, on the other hand, cited an external etiology of being overweight, identified external barriers to physical activity, and had a negative view of social support (Holt, et al., 2001). The results of this study support using LOC as an instrument for predicting weight loss, attitudes, and behaviors of individuals who are overweight. Examining LOC and other constructs, Donovan & Penny (2014) examined LOC as a moderator of the relationship between body dissatisfaction and general self-control and weight-restricting behaviors (e.g., dieting, exercise). The hypothesis of this study was not supported; LOC was not found to moderate the relationship between body dissatisfaction and any of the measures of weight restriction (Donovan & Penny, 2014). However, the results indicated that higher internal LOC orientation was associated with higher levels of dieting and exercise (Donovan & Penny, 2014).

#### The Role of Gender

In addition to age and intentionality as factors in weight loss and LOC, gender differences have also been posited. Sherman and colleagues (1997) reviewed more than 250 studies that examined gender differences within the LOC construct. Results indicated that only 36 (14.3%) of these studies reported no gender differences regarding LOC, while 183 (72.9%) reported significant gender differences (Sherman, Higgs, & Williams, 1997). Sherman concluded that combining LOC data from males and females may skew results or ignore important patterns that actually exist (Sherman, et al., 1997). Dixon, McKee & McRae (1976) conducted one of the first studies that examined gender differences in LOC. Three LOC scales were used: Rotter I-E, James I-E, and ANS I-E, and all three were administered to 221 college students—123 female and 98 male. The results of this study indicated that female students scored higher on ex-

ternal LOC (on all three scales) compared to male students. Further, the gender difference was statistically significant for the Rotter I-E and James I-E scales (Dixon, et al., 1976). Conversely, Tiggemann and Rothblum, (1997) examined gender differences in internal beliefs about weight using the Weight Locus of Control Scale. Findings showed a significant gender difference on the WLOC scale, $p < .05$. (Tiggemann & Rothblum, 1997). Mean scores indicated that women had a higher internal LOC orientation than men (Tiggemann & Rothblum, 1997). The gender differences highlighted in these studies support the examination of LOC separately by gender.

#### Self-efficacy

Finally, LOC has been studied as a mediator of the relationship between self-efficacy and subsequent weight loss (Chambliss & Murray, 1979). Results indicated that individuals with internal LOC orientation were successful in weight reduction programs that were designed to increase self-efficacy. Alternatively, individuals with external LOC orientation were not as successful; they responded better to a program that used medication for weight loss. Further, individuals with internal LOC orientation who received self-efficacy training lost the most weight of all other participant conditions (Chambliss, et al., 1979).

The various studies reviewed found associations between LOC and health-related attitudes, behaviors and outcomes, and thus suggest that the construct has value in predicting health-related behaviors. The applied value of such a construct is that it may be useful in health intervention programs to: (1) predict the success of participants, and (2) frame and tailor program features to the LOC orientation of the participants to maximize intervention effects. The current study aimed to build upon this literature by investigating the relationship between weight status and intentions to lose weight and explored whether LOC served as a moderator, explaining the strength of the relationship between the current weight and intentions to lose weight. Given that research supports gender differences regarding LOC (Dixon, et al., 1976), the present study also aimed to examine the impact of gender for male and female emerging adults.

#### Hypotheses

Building on this previous research, the specific aims and hypotheses of this study were as follows:

1) **Investigate the relationship between current weight and the intent to lose weight, including the potential moderating effects of gender.** Based on previous research, it was hypothesized that individuals categorized as normal weight would have fewer intentions to change their weight compared to those categorized as overweight or obese (Ojala, et al., 2007). Further, it was hypothesized that gender would moderate the relationship between current weight and intention to lose weight (Ojala, et al., 2007). Specifically, we expected that the strength of the relationship between current weight and intent to lose weight will be weakened for male participants.

2) **Investigate the relationship between current weight and the LOC, including the potential moderating effects of gender.** Based on previous research (Tiggemann & Rothblum, 1997), it was hypothesized that individuals categorized as normal weight would be more likely to have an internal LOC orientation than individuals who were overweight or obese. Further, it was hypothesized that gender would moderate the relationship between current weight and LOC orientation (Hankins & Hopkins, 1978). Specifically, we expected that the strength of the relationship between current weight and LOC would be weakened for male participants.

3) **Investigate the relationship between LOC and intentions to lose weight, including the potential moderating effects of gender.** Based on previous research (Holt, et al., 2001), it was hypothesized that individuals with an internal LOC would report higher intentions to lose weight than those with an external LOC orientation. Further, it was hypothesized that gender would moderate the relationship between LOC orientation and intentions to lose weight (Schifter & Ajzen, 1985). Specifically, we expected that the strength of the relationship between LOC and intentions to lose weight would be weakened for male participants.

4) **Investigate the potential moderating effects of LOC on the relationship between current weight and the intent to lose weight.** Based on previous research (Adolfsson, et al., 2005), it was hypothesized that LOC would moderate the relationship between current weight status and intentions to lose weight. Specifically, we expected that the strength of the relationship between current weight and intent

to lose weight would be weakened among those with external LOC.

## Method

### Participants

A total of 346 university students were enrolled through a participant subject pool as part of a larger study on weight perception and reporting. Underweight individuals (n= 17) were excluded from the analysis sample due to small sample size. Participants were also limited to those ranging in age from 18 to 25 years, consistent with the emerging adult age range. Thus the final analysis sample included 286 emerging adults. Participants were compensated for their time by receiving mandatory participation points or extra credit points toward their overall grade in the psychology course they were enrolled in from February 2014-July 2015. A total of 1.5 points were given to each participant.

### Procedures

Participants sat at a desktop computer in a private room while trained research assistants reviewed the informed consent document, including exclusionary criteria. Specifically, participants who were under age 18, pregnant, or taking medication that would affect their weight or appetite were not eligible to participate in the study. After providing electronic consent, the participants completed questionnaires and recorded demographic information on the computer. Participants could only participate once and the study lasted approximately one hour. Upon completion of the questionnaires, participants' height and weight were measured. Weight was recorded in kilograms using a Tanita BWB 800S Doctor's Scale. Tanita is a portable scale capable of withstanding frequent use and measures up to 150 kilograms / 330 pounds. Height was measured in centimeters using a standard model PE-WM-BASE stadiometer. The stadiometer is comprised of a standing ruler mounted on a wall, with a movable head plate allowing for accurate and consistent height measurements as the plate stops at the top of the participants head. To ensure accurate data collection, two height and two weight measurements were recorded for all participants. If there was a discrepancy of .5cm or more across the two height measurements and/or a discrepancy of 1kg or more across the two weight measurements, a third measurement was collected for the relevant discrepant measurement.

Following weight and height measurement, participants were debriefed about the study by research assistants who emphasized the confidentiality of the study and instructed participants not to share details about the nature of the study to decrease pre-existing biases in future participants.

### Measures

*Demographics questionnaire.* The demographics questionnaire included questions about participant's age, ethnicity, race, socioeconomic status (based on family income), and gender.

*Weight Locus of Control Scale.* An adapted version of Saltzer's 1982 WLOC scale was used. Saltzer (1982) version included four items: two assessing internal LOC orientation and two assessing external LOC orientation with a Cronbach's alpha of .58. This scale was adapted, and 11 additional items were added to further explore the concept of LOC. Specifically, we explored how quantity of food, quality of food, amount of exercise, amount of sleep, and stress might contribute to weight-related LOC. These additions resulted in a 15-item scale with a Cronbach's alpha of .59. Response items were on a 6 point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). The possible range for the scale was 15 to 90. Overall, the range of scores for all participants enrolled within the study was 24-63. Specifically, the range of scores for the subset of participants used for the current analyses was 24-62. A median split was used to categorize LOC orientation such that scores above the median were classified as externally LOC oriented, and scores at or below the median were classified as internally LOC oriented. This procedure is consistent with previous research (Saltzer, 1978).

*Body Mass Index (BMI).* BMI was calculated using measured height (cm) and weight (kg) by dividing each participant's weight in kilograms by their body height in centimeters squared and expressed in units of $kg/m^2$ ("Centers for Disease Control and Prevention," 2015). Weight categories were calculated using BMI measurements and participants were classified as follows: underweight–BMI <18.4, normal weight–BMI between 18.5-24.9, overweight–BMI between 25.0-29.9, very overweight/obese–BMI ≥30 ("Centers for Disease Control and Prevention," 2015).

*Intention to Lose or Gain Weight.* Participants were asked a question regarding their intent to lose or gain weight: "Are you trying to lose

weight, gain weight or stay the same?" For the purposes of these analyses, participants reporting a desire to gain weight or stay the same were collapsed into one group because this research was focused on individuals wanting to lose weight.

### Data Analysis

Tests of assumptions for binary logistic regressions were conducted and explored to test for linearity, independence of errors, and multicollinearity (A. P. Field, 2005). In order to ensure the data had linearity, the log (or logit) of the data was tested. The interaction terms of weight status x gender by intent to lose weight, weight status x gender by LOC orientation, weight intent x gender by LOC orientation, and weight status x LOC by intentions to lose weight were each tested by log transformation. Each interaction term and its associated log transformation was significant ($p < .05$) indicating that the assumption of linearity was validated (A. Field, 2009). The independence of errors assumption was supported because participants were measured at one time point and were not included in more than one group. The multicollinearity assumption was also supported because predictor variables were not highly correlated. This assumption was evaluated using the condition indexes and the variance of proportions of the predictor variables. The assumption tests indicated that the variables in this study were linear, errors were independent, and there were no difficulties with multicollinearity (A. Field, 2009).

Hypothesis 1 was tested using a binary logistic regression to examine the moderating effects of gender on the relationship between weight status (based on the categorical variables of normal weight, overweight, and obese) and intent to lose weight. Weight status was the independent variable, intent to lose weight was the dependent variable, and gender was the moderator. To explore whether the relationship between weight status and intent to lose weight varied as a function of the gender (moderator), the interaction between weight status and gender was examined as a predictor of intent to lose weight.

Hypothesis 2 was tested using a binary logistic regression, which was used to examine the moderating effects of gender on the relationship between weight status (normal weight, overweight, and obese) and participants' LOC orientation (internal and external). Weight status was the independent variable, LOC was the dependent variable, and gender was the moderator. To explore whether the relationship between weight status

and intent to lose weight varied as a function of gender, the interaction between weight status and gender was examined as a predictor of LOC orientation.

To examine the relationship between LOC orientation (internal and external) and intent to lose weight, hypothesis 3 was tested using a binary logistic regression. Intention to lose weight was the independent variable, LOC orientation was the dependent variable, and gender was the moderator. To explore whether the relationship between intentions to lose weight and LOC varied as a function of gender, the interaction between weight intent and gender was examined as a predictor of LOC orientation.

Finally, hypothesis 4 was tested with two binary logistic regressions (stratified by gender), which were used to examine the moderating effects of LOC on the relationship between weight status and intentions to lose weight. Current weight status was the independent variable, intent to lose weight was the dependent variable, and LOC was the moderator. To explore whether the relationship between weight status and intent to lose weight varied as a function of the LOC (moderator), the interaction between weight status and LOC was examined as a predictor of intent to lose weight.

## Results

### Sample description

Our sample consisted of 286 18-25-year-old ($M$ = 19.51, $SD$ = 1.69) college students with body mass index (BMI) ranging from 18.63-52.78 ($M$ = 25.50, $SD$ = 5.86) and 58% of participants in normal weight category, 26% with overweight, and 16% with obesity. Specifically, 52% of male participants were of normal weight, 29% overweight, and 17% obese. Conversely, 54% of female participants were of normal weight, 24% overweight, and 17% obese. The majority of participants were female (70%). Further, the sample was racially diverse with 46% of participants self-identifying as Black, 41% as White, 3% as Hispanic, 4% Multiracial, and 7% Other (see Table 1). Regarding LOC ($M$ = 42.71, $SD$ = 7.00), 53.8% of participants were internally oriented, and 46.2% were external oriented. In addition, the average family income of the participants was between $60,000 and $90,000. Overall, 44% of participants reported a desire to stay the same or gain weight, and 56% reported a desire to lose weight.

**Preliminary analyses**

Due to the research supporting gender differences, preliminary analyses were conducted to examine whether male and female participants in this sample varied with respect to their LOC and intentions to lose weight. A chi-square test was used to examine the association between gender and intentions to lose weight. The findings were significant ($X^2(1) = 33.48$, $p < .001$) indicating that males and females differed in their intentions to lose weight. Specifically, the majority of female participants (67%) reported a desire to lose weight compared to 30% of male participants. Additionally, 70% of male participants reported a desire to stay the same or gain weight compared to 33% of female participants. A chi-square test was used to examine the association between gender and LOC. Male and female participants significantly differed on LOC orientation ($X^2(1) = 5.57$, $p = .02$). Among female participants, 49% had an internal LOC orientation and 51% had an external LOC. Conversely, 64% of male participants had an internal LOC orientation, while only 36% had an external LOC orientation. Given these gender differences in intentions to lose weight and LOC, hypothesis 4 was stratified by gender.

**Hypothesis 1:**

A binary logistic regression was performed to investigate the relationship between current weight and intentions to lose weight, as well as the potential moderating role of gender. Results indicated that the main effects of weight status on intentions to lose weight was statistically significant. Specifically, individuals categorized as normal weight were less likely to report a desire to lose weight compared to individuals categorized as overweight ($\beta = 1.77$, Wald $x^2(1) = 15.64$, $p < .0001$) or obese ($\beta = 2.20$, Wald $x^2(1) = 12.03$, $p = .001$). In addition, the main effect of gender on intentions to lose weight was statistically significant, ($\beta = -2.80$, Wald $x^2(1) = 20.11$, $p < .0001$), indicating male participants were less likely to report a desire to lose weight compared to female participants. However, the interaction effect of gender and weight status on intent to lose weight was non-significant for overweight ($\beta = .87$, Wald $x^2(1) = 1.05$, $p = .31$), or obese ($\beta = 1.92$, Wald $x^2(1) = 3.13$, $p = .08$) emerging adults. This suggests that participants' gender did not affect the relationship between weight status and intentions to lose weight.

**Hypothesis 2:**

A binary logistic regression was performed to investigate the relationship between current weight and LOC orientation, as well as the potential moderating role of gender. Results indicated that the main effect of weight status on LOC was not statistically significant. Individuals categorized as normal weight did not differ on internal LOC orientation from individuals categorized as overweight ($\beta = -.20$, Wald $x^2(1) = .34$, $p = .56$), or obese ($\beta = .51$, Wald $x^2(1) = 1.56$, $p = .21$). Further, the main effect of gender on LOC was also not statistically significant ($\beta = -.63$, Wald $x^2(1) = 3.21$, $p = .07$). Similarly, the interaction effect of gender and weight status on LOC was non-significant (overweight ($\beta = .003$, Wald $x^2(1) < .0001$, $p = 1.0$; obese ($\beta = -.01$, Wald $x^2(1) = .0003$, $p = .99$). This suggests that participants' gender did not have an effect on the relationship between weight status and LOC orientation.

**Hypothesis 3:**

A binary logistic regression was performed to investigate the relationship between LOC and intentions to lose weight, as well as the potential moderating role of gender. Results indicated the main effect of LOC on intentions to lose weight was not statistically significant ($\beta = .41$, Wald $x^2(1) = 1.83$, $p = .18$), indicating that LOC did not significantly impact participants' intentions to lose weight. However, the main effect of gender on intentions to lose weight was statistically significantly ($\beta = -1.40$, Wald $x^2(1) = 9.85$, $p = .002$), indicating male participants were less likely to report a desire to lose weight than female participants. The interaction effect of gender and LOC on intentions to lose weight was non-significant ($\beta = -.35$, Wald $x^2(1) = .36$, $p = .55$), suggesting that male and female participants did not differ with respect to the relationship between LOC and weight intent.

**Hypothesis 4:**

Gender-stratified binary logistic regressions were performed to examine the moderating effects of LOC on the relationship between weight status and intentions to lose weight. For male emerging adults, results indicated the main effect of weight status on intentions to lose weight was significant (obesity $\beta = 2.19$, Wald $x^2(1) = 5.14$, $p = .02$). Specifically, male participants categorized as obese were more likely to report intentions to lose weight compared to male participants categorized as normal weight

(see Figure 1). However, there was a non-significant interaction of LOC and weight status on intentions to lose weight (overweight [β = 20.09, Wald $x^2(1) < .0007$, $p = 1.0$] and obese [β = 40.22, Wald $x^2(1) < .0006$, $p = 1.0$]). This suggests that there was no effect of LOC on the relationship between current weight and weight intent for male participants.

For female emerging adults, results revealed the main effect of weight status on intentions to lose weight was significant, indicating female participants categorized as overweight (β = 1.89, Wald $x^2(1) = 7.41$, $p = .006$), or obesity (β = 1.82, Wald $x^2(1) = 6.81$, $p = .009$) were more likely to report intentions to lose weight compared to female participants categorized as normal weight (see Figure 2). However, there was a non-significant interaction of LOC and weight status on intention to lose weight (overweight [β = -.25, Wald $x^2(1) = .07$, $p = .79$], and obesity [β = 19.04, Wald $x^2(1) < .0003$, $p = 1.0$]), suggesting there was no effect of LOC on the relationship between current weight and weight intent for female participants.

## Discussion

The aim of this study was to investigate relationships between weight status and intentions to lose weight, weight status and LOC, and LOC and intentions to lose weight, while exploring gender as a potential moderator of each of these relationships. Another aim of this study was to explore the moderating effect of LOC on the relationship between weight status and intentions to lose weight.

Consistent with the first hypothesis, we found an association between weight status and intention to lose weight. This finding was in line with previous research (Ojala, et al., 2007), where male and female emerging adults categorized as normal weight reported fewer intentions to lose weight than individuals categorized as overweight or obese. However, there was a non-significant interaction effect of gender on the relationship between weight status and intentions to lose weight; a finding that does not align with previous research (Ojala, et al., 2007) where gender affected the strength of the relationship between weight status and intentions to lose weight. Specifically, Ojala and colleagues (2007) found that male participants with normal weight reported fewer intentions to lose weight than female participants.

Inconsistent with previous research (Tiggemann & Rothblum,

1997), the second hypothesis, which predicted an association between weight status and LOC orientation was not confirmed. In our sample, individuals categorized as normal weight did not differ on LOC orientation from individuals categorized as overweight or obese. Further, the non-significant interaction effect of gender on the relationship between weight status and LOC did not align with previous research (Hankins & Hopkins, 1978) where gender affected the strength of the relationship between weight status and LOC orientation. Specifically, Hankins and Hopkins found that female participants categorized as overweight or obese were more likely to be internally LOC oriented than male participants who were more likely to be externally LOC oriented. These null findings indicate other factors like self-efficacy and self-esteem may influence an individual's LOC orientation and the perceived control they have over their weight and weight-related intentions.

In hypothesis 3, associations between LOC and intentions to lose weight were not confirmed. Inconsistent with previous research (Holt, et al., 2001), LOC orientation did not significantly impact participants' intentions to lose weight. Further, the moderating effect of gender was not significant, such that the strength of the relationship between LOC and intention to lose weight was not impacted by participant's gender. These findings add to a new area of research where gender is examined as a moderator to explore how the association between perceived control and intentions to lose weight differ between male and female emerging adults. Overall, these null findings may allude to the possibility that LOC does not independently reflect an individual's desire to change his or her weight status.

The fourth hypothesis, which examined modification of LOC on the relationship between weight status and intentions to lose weight was not confirmed for male or female participants. This non-significant interaction effect of LOC on the relationship between weight status and intentions to lose weight adds new insight into the study of locus of control affecting weight-related behaviors. Specifically, previous research had not examined the effect of locus of control on weight intentions, but rather weight reduction. This study hoped to highlight the importance of examining locus of control affecting weight intentions because research shows that weight intentions can be a proxy for why male and female emerging adults enroll in weight loss programs. Further, recent research has indicat-

ed the importance of correlating locus of control with weight intentions because male and female emerging adults who perceive control over their weight and/or their behaviors are more successful when they actually engage in weight reduction behaviors (Anastasiou, et al., 2015). Ultimately, these null findings indicate the importance of determining what specific underlying factors are valid predictors of weight intentions among emerging adults.

### Study Limitations

When interpreting results from this study, several limitations should be considered. Due to the limited sample size of males (30%), they may have been underpowered to examine gender differences across study variables. Thus it is possible that null findings were related to power issues rather than the specific variables themselves. Accordingly, future work should consider oversampling for male participants to ensure sufficient power. The sample for this study was comprised of subject pool participants (i.e., college students enrolled in psychology classes), thus some members of the emerging adult community were less likely to be included than others. Due to this, a sampling bias may have occurred because participants were not randomly selected. An entire-college based sample could still be problematic because it can impact the generalizability of the results to a broader emerging adult population. Research suggests that education can be a confounding factor that differentiates obesity rates (Yu, 2012). Additionally, previous research has shown a relationship between educational achievement/success and higher internal LOC orientation (Majzub, et al., 2011). Thus, future research should examine weight LOC in non-college students to determine whether findings are generalizabale beyond the population of highly educated emerging adults.

The title of the study, "Weight Reporting from Adolescents' Perspectives," may have also resulted in participant bias. Specifically, it is possible that individuals who signed up for the study were less concerned about their weight and so were comfortable signing up for a study on weight. Finally, the cross-sectional design of this study did not allow for the examination of actual weight loss over time. The inability to match intent with actual weight-loss did not allow us to examine which participants followed through with their weight-loss goals, and which ones did not.

### Future Directions

Subsequent investigations should consider administering a follow-up assessment to test long-term effects of the study which would allow for the examination of actual weight loss among male and female emerging adults (Anastasiou, et al., 2015). This addition would extend previous research by examining the impact of LOC on weight-loss intent, and actual weight loss (Anastasiou, et al., 2015). Few studies have looked at LOC as a potential factor that influences weight loss intent, and actual measured weight loss over time (Kraschnewski, et al., 2010). Future research should also explore the malleability of LOC and determine whether individuals are more likely to have an internal LOC during certain times in their lives. Specifically, if LOC is related to weight loss, interventions could be targeted for time periods when LOC is most likely to be internal (which may boost intervention effects).

Finally, since this study included an adapted LOC scale that has not been subjected to rigorous psychometric evaluation, future investigations should test the reliability of this adapted LOC measure. A Cronbach's alpha of .59 indicates this adapted LOC scale has poor internal consistency, thus supporting the creation of a new LOC measure or further investigation of this measure. In addition, factor analyses should be conducted to assess the strength of the relationship among each item within the measure to ensure they contribute to the overall reliability of the measure. For example, future research could examine internally oriented items separately from externally oriented items. If a factor analysis supported subscales, examining the internal consistency of those subscales separately may yield better internal consistency than the scale as a whole (A. P. Field, 2005). In addition, future investigations could replicate the current study using the original WLOC scale; perhaps including it would yield different results. The original scale published by Saltzer in 1982 has not been frequently used, so including the WLOC could be helpful for furthering the reliability of the measure. However, given that the published LOC measure only had an alpha of .58, future studies could also use better measures of LOC, such as the health locus of control scale (HLC) (Anastasiou, et al., 2015; Wallston, et al., 1976) which has a Cronbach's alpha of .72. Furthermore, future studies could examine other possible variables that may impact the relationship between current weight status and intentions to lose weight (e.g., self-efficacy, body satisfaction) (Donovan & Penny, 2014).

### Clinical Significance

This study provides helpful information for clinicians regarding the role LOC has on weight-related intentions for male and female emerging adults. The null findings of this study indicate the need for examination of other personality constructs and individual characteristics, instead of solely examining LOC as a potential factor influencing weight-related behaviors (Abusabha & Achterberg, 1997). Furthermore, gender differences in intentions to lose weight highlight the importance of understanding the unique motivators that influence male and female emerging adults and how they might impact treatment (Kraschnewski, et al., 2010).

## Conclusion

The findings of the present study highlight the complexity of understanding factors that predict intentions to lose weight. The results suggest that other important personality constructs and individual characteristics may be more important than LOC orientation in determining intentions to lose weight (Donovan & Penny, 2014). Specifically, this study alludes to the importance of exploring other potential theories impacting weight-related intentions. Future interventions targeting weight-intentions and actual weight-related behaviors could yield impactful results to further combat the growing obesity epidemic for male and female emerging adults (Anastasiou, et al., 2015). Although, most of the hypotheses were not supported, the results that were highlight the importance of examining weight-related intentions among male and female emerging adults separately to better understand their fundamental differences (Sherman, et al., 1997). Determining factors that may be influencing or impacting obesity differently for male and female emerging adults, can be helpful for motivating individuals to live healthier lives (Anastasiou, et al., 2015).

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