



Gender differences in freshmen weight gain



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ABSTRACT

Objective: Predictors of first semester and year weight change by gender were examined.

Participants: The participants were 304 freshmen recruited over three years (September 2010, 2011, & 2012).

Methods: Psychosocial and lifestyle variables and weight were assessed at the beginning and end of the Fall semester and end of the Spring semester.

Results: The average weight gain over the year was 6.38 lbs for males versus 4.38 lbs for females. In the first semester, alcohol use was associated with weight gain among males. For females, higher levels of physical activity and lower BMI were associated with weight gain. At the end of the year, happiness was negatively associated with weight gain among males and physical activity positively associated with weight gain in females.

Conclusions: Alcohol consumption in males and physical activity in females produced positive associations with weight gain with most of the weight gained during the first semester. This implies that efforts to prevent weight gain in college freshmen need to be tailored by gender and focus on first semester.

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1. Introduction

Weight gain over the first year of college (Gropper et al., 2011; Levitsky, Halbmaier, & Mrdjenovic, 2004; Lloyd-Richardson, Bailey, Fava, & Wing, 2009; Kasperek, Corwin, Valois, Sargent, & Morris, 2008; Mihalopoulos, Auinger, & Klein, 2008; Jung, Bray, & Martin Ginis, 2008; Hoffman, Policastro, Quick, & Lee, 2006; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005; Morrow et al., 2006; Economos, Hildebrandt, & Hyatt, 2008; Holm-Denoma, Joiner, Vohs, & Heatherton, 2008; Smith-Jackson & Reel, 2012; Finlayson, Cecil, Higgs, Hill, & Hetherington, 2012; Webb, Butler-Ajibade, Robinson, & Lee, 2013; Wengreen & Moncur, 2009; Zagorsky & Smith, 2011) varies quite a bit but studies suggest it is between 2.2 and 9 pounds (Gropper et al., 2011; Lloyd-Richardson et al., 2009; Mihalopoulos et al., 2008; Jung et al., 2008; Hoffman et al., 2006; Economos et al., 2008; Zagorsky & Smith, 2011; Pope & Harvey-Berino, 2013). Understanding how weight gain occurs and what predicts weight gain in freshmen is the first step towards prevention. Studies examining freshmen weight gain patterns have been inconsistent as to when weight change was measured with some studies only measuring first semester weight gain and other studies only looking at weight gained over entire year (Kasperek et al., 2008; Mihalopoulos et al., 2008; Jung et al., 2008; Hoffman et al., 2006; Racette et al., 2005; Morrow et al., 2006; Economos et al., 2008; Delinsky & Wilson, 2008).

Patterns of weight gain in college freshmen can be further understood by examining variations between gender, as males and females have different rates of obesity and body fat distribution (Lovejoy, Seattle, & Sainsbury, 2009). Of the studies that explored weight gain in the first year of college by gender, inconsistencies in patterns and predictors of weight change have been observed for both males and females. For instance, in some studies weight gain was higher in males compared to females (Zagorsky & Smith, 2011; Kasperek et al., 2008; Jung et al., 2008) and some found that females gained more weight than males. (Holm-Denoma et al., 2008; Smith-Jackson & Reel, 2012; Zagorsky & Smith, 2011). Economos et al. (2008) found alcohol consumption to be positively associated with weight gain among males, while increased workload led to weight gain for females. Holm-Denoma et al. (2008) reported that troublesome relationships with parents were a predictor of weight gain for males, however for females a positive relationship with parents was associated with weight gain. This data suggests that looking at gender differences in freshmen weight gain patterns is important as factors associated with weight gain vary.

The current study addresses gaps in the literature on college freshmen weight gain. As previous studies have noted, weight gained typically occurs during the first semester (Holm-Denoma et al., 2008; Finlayson et al., 2012; Wengreen & Moncur, 2009) so it is important to understand which variables are associated with weight gain during this time period. Further, previous studies have been limited in that few look at predictors of weight gain separately by gender, and none, to our knowledge, looked at predictors of weight gain by gender for both the first semester and the full year. Lastly, as several studies relied on self-report weight as their outcome variable (Lloyd-Richardson et al., 2009; Kasperek et al., 2008; Mihalopoulos et al., 2008; Economos et al.,

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2008; Holm-Denoma et al., 2008; Smith-Jackson & Reel, 2012; Webb et al., 2013), our study builds off of this work by using objective weight measures.

2. Methods

After IRB approval, participants ($N = 304$) were recruited during the first few weeks of their freshmen year. There were three cohorts of participants recruited over three consecutive years (Fall 2010, 2011, & 2012). Data collection occurred at three time points: start and end of the fall semester, and end of the year. The average age of participants was 18.08 years ($SD = 0.54$). The majority of the sample was Caucasian (86%) and female (70%). At baseline, the average body mass index (BMI) for females was 23.08 ($SD = 3.38$) and for males was 23.93 ($SD = 4.11$).

Participants filled out a consent form and questionnaires. Upon completion of the questionnaires research assistants measured participants' height and weight. After each time point, participants had a choice between a \$5 gift card and a small gift (e.g., sunglasses, water bottle or bag with school logo on it).

2.1. Measures

2.1.1. Anthropometric data

Height and weight were taken by research assistants using a Seca scale. BMI was calculated using the standard formula (weight in kilograms/height in meters squared).

2.1.2. Demographics form

A demographics form was created for the purpose of the study. Data collected on the form included variables such as: gender, age, race/ethnicity, number of all-nighters, fast food consumption (weekly), and fruit and vegetable consumption (daily). Number of alcoholic beverages consumed per week and frequency of consuming 5 or more drinks in one sitting (i.e., binge drinking) were measured.

2.1.3. International Physical Activity Questionnaire

The IPAQ is a 4-item questionnaire assessing physical activity within the last 7 days. This measure has been validated within college populations (Craig, Marshall, Sjostrom, et al., 2003). The measure assessed vigorous, moderate and low physical activity levels in minutes per day during the 7 days prior to data collection. Other studies utilizing college samples have used the IPAQ and found it to be reliable (Finlayson et al., 2012).

2.1.4. Dutch Eating Behavior Questionnaire

The DEBQ is a 33 item self-report scale assessing eating behaviors across the following three domains: restrained eating, emotional eating and external eating. In both obese and overweight populations, Cronbach's alpha ranged from .80 to .95 across the three factors, indicating high internal consistency (Van Strien, Frijters, Bergers, & Defares, 1986). This measure has been shown to be valid in college populations (Van Strien et al., 1986).

2.1.5. Perceived Stress Scale—14

The PSS-14 is a 14 item self-report questionnaire assessing the subjective stress caused by situations experienced within the past month. The PSS-14 was found to be reliable in two different college populations as coefficient alpha values were equal to .84 and .85 (Cohen, Kamarck, & Mermelstein, 1983).

2.1.6. Center for Epidemiological Studies—Depression Scale

The CES-D is a 20 item self-report scale used to assess depressive symptoms that have occurred in the past week. The CES-D was shown to have high internal consistency, as the alpha coefficient was equal to .85 in the general population and .90 in a patient sample (Radloff,

1977). The CES-D was shown to be valid as the coefficient between scores on the scale and nurse-clinician ratings of depression was .56 (Radloff, 1977).

2.1.7. Subjective Happiness Scale

The SHS is a 4-item questionnaire assessing participant's subjective happiness and where they consider their happiness level in relation to their peers. The 4 items are rated on a 7-point Likert scale, with higher scores indicating greater happiness (Lyubomirsky & Lepper, 1999). The scale was shown to have high internal reliability as Cronbach's alpha was equal to .86 (Lyubomirsky & Lepper, 1999).

2.1.8. UCLA Loneliness

The UCLA Loneliness Scale is a 10-item scale designed to measure subjective feelings of loneliness. This measure has been shown to be reliable, as alpha coefficients ranged from .89 to .94 across various samples. This scale also has high test-retest reliability, as the correlation coefficient between baseline and twelve month data was .73 (Russell, 1996).

2.2. Statistical analyses

Statistical analyses were performed using PASW Statistics 18. Repeated measures ANOVA were used to compare weight change over each time point and by sex. Paired sample t-tests were used to examine the relationships between weight gain over the first semester versus the first year by sex. Separate multiple hierarchical regression analyses were used to examine psychosocial and lifestyle variables from baseline that predicted weight gain over the first semester and the first year for males and females. Lifestyle variables (fast food and fruit/vegetable intake, physical activity, weekly alcohol use, BMI, and frequency of all-nighters) were entered into the first block followed by psychosocial variables (stress, depression, loneliness, happiness, and eating behaviors) in the second block to account for variance separately. Statistical significance was set at $\alpha < 0.05$.

3. Results

At the end of the first semester, we had a response rate of 73% ($N = 221$) and by the end of the year our response rate was 51% ($N = 154$). Females returned for more visits compared to males, $X(2, N = 304) = 11.50, p = 0.00$. There were significant differences between those who attended one visit or both on emotional eating and amount of alcohol consumed per week. Participants who attended one follow-up visit had higher emotional eating scores ($M = 33.1$) than those who never returned ($M = 27.41; F(2, 301) = 4.98, p = 0.00$). Those attending both follow-up sessions reported significantly less alcoholic drinks per week ($M = 4.80$) than those who never returned ($M = 7.96; F(2, 293) = 5.10, p = 0.00$). Participants did not differ on other variables.

For the entire sample, the average weight gain over the first semester was 4.12 lbs ($SD = 5.16$, range -10 to $+18$ lbs) and over the entire first year was 4.89 lbs ($SD = 6.94$, range -13 to $+29$ lbs). Males gained on average 5.10 lbs ($SD = 4.70$) over the first semester and 6.38 lbs ($SD = 8.82$) over the entire first year ($t(38) = -1.37, p = .18$). Females gained 3.80 lbs ($SD = 5.27$) over the first semester and 4.38 lbs over the entire year ($SD = 6.14, t(114) = -.80, p = 0.42$). There were no significant gender differences for weight gain by semester or year ($F(2, 152) = 1.69, p = 0.19$).

Separate linear hierarchical regressions were conducted for males and females to determine psychosocial and lifestyle factors at baseline that related to weight gain in first semester and year of college (see Tables 1–2). In the first semester, alcohol use ($B = .64, p = .00$) was positively associated with weight gain among males. For females, self-reported physical activity ($B = .53, p = .00$) and BMI ($B = -.18$,

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