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A Prospective Study of Weight Gain During the College Freshman and Sophomore Years

Elizabeth E. Lloyd-Richardson, PhD¹, Steffani Bailey, PhD^{1,2}, Joseph L. Fava, PhD¹, and Rena Wing, PhD¹ the Tobacco Etiology Research Network (TERN)³

¹ Department of Psychiatry and Human Behavior, Weight Control and Diabetes Research Center, Brown Medical School, The Miriam Hospital, Providence, Rhode Island ² Brown Medical School and Stanford University ³ The Robert Wood Johnson Foundation Tobacco Etiology Research Network, University of Kentucky, Lexington, Kentucky

Abstract

Objective—To assess the prevalence of weight gain among male and female college freshmen.

Methods—Study 1 examined weight change over freshman and sophomore years among 904 students attending a state university in Indiana, from 2002–2004. Study 2 examined weight and BMI change over the freshman year among 382 students attending a private university in Rhode Island, from 2004–2006.

Results—77% of Study 1 participants and 70% of Study 2 participants gained weight during their freshman year, largely during the first semester. In Study 1, weight gain averaged 3.5 kg in females and males; in Study 2, weight gain averaged 1.6 kg for females and 2.5 kg for males. Students continued to gain weight their sophomore year, with females 4.2 kg and males 4.3 kg heavier than at start of college. Overweight/obesity rates increased from baseline to end of freshman year for Study 1 (21.6% to 36%) and Study 2 participants (14.7% to 17.8%).

Conclusion—The first years of college may be a critical developmental window for establishing weight gain prevention efforts.

Keywords

weight gain; young adults; college health; college weight gain

Obesity rates in the United States have more than doubled in the past fifty years, with 32.2% of adults considered obese in 2004 ((Ogden et al., 2006; Flegal et al., 2002). Obesity is directly related to a number of health conditions, such as type II diabetes, heart disease and hypertension (National Heart, Lung, and Blood Institute (NHLBI) Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, 1998). Rates of overweight

Address correspondence and reprint requests to: Elizabeth E. Lloyd-Richardson, Ph.D., Psychology Department, University of Massachusetts Dartmouth, 285 Old Westport Road, North Dartmouth, MA 02747. Tel: 508.910.6954. Fax: 508.999.9169. Email: E-mail: erichardson@umassd.edu.

Conflict of Interest statement

The authors declare that there are no conflicts of interest.

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and obesity appear to be increasing most dramatically among young adults, the 18-to-29-year-old age group (from 7.1% to 12.1% from 1991 to 1998), with those having some college education demonstrating even greater increases in overweight and obesity (from 10.6% to 17.8%) (Mokdad et al., 1999). Young adults gain an average of slightly less than one kilogram (kg) each year, although the majority of this appears to be gained during the early 20s. Furthermore, overweight during adolescence has been found to track into adult years (Guo et al., 2000).

A life course approach to obesity management suggests that risk factors and experiences earlier in one's life may impact long-term health and disease outcomes, with strategies aimed at altering early risk factors of youth leading to possible prevention or attenuation of obesity-related medical complications in later adulthood (Kuh & Ben-Shlomo, 2004). Identification of high risk time periods for weight gain will allow for better understanding of the contributors to weight gain and thus development of more effective prevention efforts. For this reason, it is important to gain a better understanding of critical periods for developing overweight and/or obesity and contributing to the upward weight trajectory of Americans.

One such critical period involves the young adult transition to college. The "Freshman 15" refers to the notion that the first year of college is associated with a fifteen pound (or seven kilogram) weight gain. Studies to date have yielded far smaller average weight gains (i.e., 1–3 kilograms) (Anderson et al., 2003; Butler et al., 2004; Hajhosseini et al., 2006; Hoffman et al., 2006; Levitsky et al., 2006; Levitsky et al., 2004; Matvienko et al., 2001; Megel et al., 1994; Morrow et al., 2006). However, significant gaps exist in extant literature. Importantly, weight change has rarely been investigated beyond the first few months of college, raising the issue of the time course of early college weight gain and whether weight gain at the start of college is a transient phenomenon or continues into the college years (Hovell et al., 1985; Racette et al., 2005). Furthermore, few studies have investigated freshman year weight change in large samples of students, nor have sex differences in weight change been adequately explored (Anderson et al., 2003; Hoffman et al., 2006; Holm-Denoma et al., 2008).

This manuscript aims to quantify weight change and the time course of weight change over the course of the freshman year; to examine whether males and females differ in their weight change patterns; and to explore whether weight stabilizes during the second (sophomore) year of college. To this end, we present data from two separate studies: Study 1 examines weight change among freshman and sophomore students attending a large public university; Study 2 examines freshman year weight change among students attending a private university.

Methods

Study 1

Participants—A total of 904 students from a large university were included in analyses. A complete description of participant selection has been previously reported (Tiffany, Agnew, Maylath, Dierker, Flaherty, Richardson et al., 2008). Briefly, participants were restricted to those admitted as full-time, first-year students to the university for the fall semester of 2002, were 18+ years, and were US citizens. All students lived on campus, as required by the university. Of 6560 incoming freshmen, 31% (N=2001) were invited to participate in a study investigating smoking initiation among college freshmen. Of these, 46% (N=912) signed informed consent and were enrolled into the study. No significant differences on sex, age, or race/ethnicity were noted between the 912 enrolled and 1089 non-enrolled. Complete height, weight, or sex data at baseline was unavailable for eight participants, yielding a final sample of 904. Students were enrolled into a larger study of freshman health behaviors and provided monetary compensation for completing assessments. The study was approved by the university's Institutional Review Board (IRB).

Measures—Body weight was assessed at four points over the first year of college (freshman year) and at the end of the second year of college (sophomore year): Baseline (September 2002); prior to end of 1st semester (December 2002); beginning of 2nd semester (January 2003); end of 2nd semester, freshman year (Mayfreshman 2003); and end of 2nd semester, sophomore year (Maysophomore 2004). Due to an unanticipated delay in receiving IRB approval for measuring students' weights, weight at baseline was self-reported. For all other assessments, weight was measured by study staff to the nearest 0.1 kg using a calibrated digital scale (Tanita BWB-800). Participants were measured wearing light indoor clothing.

A strong correlation between self-reported and measured weights was observed ($r=.98, P<.001$). Students consistently reported a weight 0.5 kg less than measured weight, with no differences noted by sex, measured baseline BMI, or race/ethnicity. Previous research has also found a significant correlation between self-reported and measured weights (Goodman et al., 2000), although studies of older adolescent samples suggest a consistent bias of underreporting of body weight by an average of 0.5 kg (Abraham et al., 2004; McCabe et al., 2001; Elgar et al., 2005). Because Study 1's baseline weights were self-reported, we opted to add 0.5 kg to all Study 1 baseline weights.

As the principal aim of Study 1 was not weight-related, height was self-reported and obtained at baseline only. Body mass index (BMI) was calculated as kilograms per square meter, with standard clinical definitions used for overweight (BMI 25.0–29.9) and obese (BMI \geq 30.0) (NHLBI, 1998). Demographic characteristics of the participants are included in Table 1.

Statistical Analyses—Analyses were performed using SAS for Windows (v9.1; SAS Institute Inc.; Cary, NC) and SPSS for Windows (v14.0; SPSS Inc.; Chicago, IL). The primary outcome variable was weight change. To assess changes over the freshman year, a two (sex) x four (time points: September 2002, December 2002, January 2003, and May 2003) repeated measures analysis of variance (ANOVA) was conducted using Proc MIXED within SAS. To model changes over the freshman and sophomore years, a fifth time point (May-sophomore 2005) was added. The residual maximum likelihood estimation approach was used to model the within-subjects error covariance structure of the repeated measurements. Longitudinal analyses allowed the use of all available data (N=904) under the missing at random assumption (Little & Rubin, 2002).

For those with complete data at baseline (September) and end-of-year (May) (41%; N=372), we conducted a two (sex) x two repeated measures analysis with the Generalized Estimating Equations (GEE) methodology, using Proc GENMOD, to evaluate change in the percent of students considered overweight/obese. All comparisons were bonferroni-adjusted, with confidence intervals presented. McNemar's tests were used to evaluate change in prevalence of overweight/obese students from baseline to end of freshman and sophomore years.

Study 2

Participants—A total of 382 freshmen attending a private university participated in a study of health behaviors. Two cohorts of participants were recruited at the beginning of the fall semester of academic years 2004–2005 and 2005–2006. All students lived on campus. All participants provided informed consent and were compensated for assessments completed. The study was IRB approved.

Measures—Height and weight were measured by trained research staff at each assessment: Baseline (September 2004/2005); beginning of 2nd semester (January 2005/2006); and end-of-year assessments (May 2004/2005). A subset of students were invited to provide measured height and weight in December 2005, prior to the winter holiday break (N=148; 80% of those contacted). Body weight was measured to the nearest 0.1 kg using a calibrated digital scale

(Tanita, HD-351). Participants were measured wearing light indoor clothing without shoes. Standing height was measured to the nearest half centimeter using a portable stadiometer (Invicta Plastics Ltd.).

Statistical Analyses—Initial analyses parallel those in Study 1. In addition, weight change categories were created in order to explore subgroups of weight change during the freshman year. Based on weight change during the 1st semester (September 2004/2005 to January 2005/2006) and 2nd semester (January 2005/2006 to May 2005/2006), participants were divided into five groups: (1) *Gain-Gain*: Weight gain both the 1st and 2nd semesters; (2) *Gain-Loss*: weight gain 1st semester and lost/maintained weight 2nd semester; (3) *Loss-Gain*: lost/maintained weight 1st semester and weight gain in the 2nd semester; (4) *Loss-Loss*: lost weight both the 1st and 2nd semesters; and (5) *Maintain*: weight remained within +/- 1 kg during the 1st and 2nd semesters. Chi-square analysis and ANOVA were used to evaluate differences between these categories on sex, baseline BMI, and weight/BMI change.

Results

Study 1

Description of the Study Sample—Sample sizes varied at each assessment point: September 2002 N=904; December 2002 N=588; January 2003 N=419; May-freshman 2003 N=374; May-sophomore 2004 N=494. Those with data at the May-freshman or May-sophomore final assessments did not differ from those with missing data at these time points in terms of sex, race/ethnicity, age, parent education level (a proxy measure of socioeconomic status), baseline body weight or BMI, or May-freshman body weight.

Change in Weight over the Freshman Year—Freshman year weight change analyses indicated significant effects for gender ($P<.001$), time ($P<.001$), and the sex x time interaction ($P<.001$). The mean weight change over the freshman year (September 2002 to May 2003) was a gain of 3.5 kg in both males (95% CI, 2.8–4.2) and females (95% CI, 2.8–4.3).

The pattern of weight change over the freshman year is shown in Figure 1. Males had significant weight gains from September 2002 to December 2002 (3.2 kg; 95% CI, 2.7–3.7), as well as from December 2002 to January 2003 (0.6 kg; 95% CI, 0.3–0.9). Females had significant weight gain from September 2002 to December 2002 (3.4 kg; 95% CI, 2.8–3.9).

Change in Weight over the Sophomore Year—Analyses investigating five time points (September 2002, December 2002, January 2003, May-freshman 2003, and May-sophomore 2004) indicated significant effects for sex ($P<.001$), time ($P<.001$), and the sex x time interaction ($P<.001$). Males gained an average of 4.3 kg (95% CI, 3.3–5.2) and females an average of 4.2 kg (95% CI, 3.2–5.1) from the beginning of freshman year (September 2002) to end of sophomore year (May-sophomore 2004) (see Figure 1).

Distribution of Weight Changes—Figure 2 shows the distribution of weight changes in Study 1. Of those with complete data at baseline (September 2002) and May-freshman year 2003 (N=372; 41%), 77% (N=288) gained weight their freshman year, and 40% (N=149) gained 4 kg or more. Of those with May-sophomore 2004 year data available (N=492; 54%), 83% (N=406) gained weight from baseline, and 46% (N= 227) gained 4 kg or more. Moreover, 61% (N= 301) gained weight from May-freshman year 2003 to May-sophomore year 2004.

Prevalence of Overweight and Obesity—While Study 1 allowed only one height assessment, prevalence of overweight and obesity is presented in order to demonstrate the general magnitude of changes taking place during the freshman and sophomore years. Of those

with complete data ($N = 372$; 41%), 16.9% were overweight and 4.7% obese at the start of college, but 28.5% were overweight and 7.5% obese by the end of freshman year (McNemar's test, $\chi^2 = 47.93$, $P < .001$). Of those with May-sophomore 2004 data ($N = 492$; 54%), 16% were overweight and 4.3% obese at the start of college, with 25.9% overweight and 9.2% obese by the end of sophomore year (McNemar's test, $\chi^2 = 66.88$, $P < .001$).

Study 2

Description of the Study Sample—Sample sizes at each assessment were: September 2004/2005 $N = 382$; December 2005 subset $N = 148$; January 2005/2006 $N = 338$; May 2005/2006 $N = 351$. Of the 382 participants included in the longitudinal analyses, 326 (85%) had complete BMI data across three assessments (September, January, May).

Change in Weight and BMI over the Freshman Year—Analyses of weight change over the freshman year indicated significant effects for sex ($P < .001$), time ($P < .001$), and the sex \times time interaction ($P = .008$). For males, the mean weight gain was 2.5 kg (95% CI, 1.8–3.3) and for females 1.6 kg (95% CI, 1.0–2.2). Among males, there were significant changes from September 2004/2005 to December 2004/2005 (1.8 kg; 95% CI, 1.2–2.5) and from December 2004/2005 to January 2005/2006 (0.6 kg; 95% CI, 0.1–1.2). Females also gained a significant amount of weight from September 2004/2005 to December 2004/2005 (1.6 kg; 95% CI, 1.0–2.1) (see Figure 1).

There were no significant changes in height over the year for males ($P = .99+$) or females ($P = .3$). Thus, the changes in BMI parallel those observed for weight. For males, the mean BMI increased from 22.9 ± 3.4 to 23.6 ± 3.3 , and among females from 21.9 ± 3.0 to 22.5 ± 3.0 .

Distribution of Weight Changes and Prevalence of Overweight and Obesity—Of those with complete data, 70% ($N = 241$) gained weight over the year and 23% gained 4 kg or more. Eleven percent of students ($N = 38$) were overweight and 3.7% ($N = 12$) obese at the start of college. By the end of the year, 13.5% ($N = 47$) were overweight and 4.3% ($N = 15$) obese. This combined percent change to overweight/obese (BMI ≥ 25) versus the percent change to normal weight (BMI < 25) was significant (McNemar's test, $\chi^2 = 5.2$, $P = .02$).

Evaluation of Weight Change Group Patterns—The large majority of students (82%; $N = 267$) gained weight their 1st semester. Half of these gained additional weight during the 2nd semester ($N = 125$) and half lost some of this weight during the 2nd semester ($N = 122$). Eight percent ($N = 26$) of students lost weight in both the 1st and 2nd semesters. This Loss-Loss group was the only group to have a mean weight loss (-5.0 kg) over the year, and the Gain-Gain group had the largest weight gain ($+4.5$ kg). The Gain-Loss and Loss-Gain groups both gained a similar amount of weight over the year (1.2 kg & 0.9 kg, respectively). Only 10% ($N = 32$) of participants maintained (± 1 kg) their weight over the freshman year. The Gain-Gain and Maintain groups had a lower BMI at baseline than the other groups.

Discussion

This study examined weight gain during the early years of college in a large sample of males and females. During the first (freshman) year of college, Study 1 participants gained an average of 3.5 kg (both females and males); among Study 2 participants, weight gain averaged 1.6 kg for females and 2.5 kg for males. These observed weight gains are comparable to that found in earlier studies of the "Freshman 15" (Anderson et al., 2003; Hajhosseini et al., 2006; Levitsky et al., 2006; Levitsky et al., 2004; Matvienko et al., 2001), as is the extent of our sample affected by weight gain (77% of Study 1 participants and 70% of Study 2 participants). Freshman year weight gain was found to occur largely during the first semester. This amount of weight gain

during a three month period is substantial, particularly when compared to observed weight gain rates of slightly less than 1 kg per year among national samples of young adults (Lewis et al., 2000). However, on a conservative note, it is also worth noting that the majority of students remained within a normal BMI range. Overweight/obesity rates increased from 22% to 36% in Study 1 and 15% to 18% in Study 2.

Results from these two studies add to our knowledge of freshman weight gain in several ways. First, they show that *both* males and females gain weight, with similar patterns observed over the freshman year and the greatest weight changes for both sexes occurring during the first semester. Second, our data suggest that students may not lose this weight over time. Rather, students, particularly males, continue to gain weight during their sophomore year, leaving over one quarter of them 7 kg heavier than when they began college. These results are consistent with Hovell and colleagues (Hovell et al., 1985), who found a mean rate of weight gain in females of 3 kg, declining to 0.5 kg during the sophomore year. Third, Study 2 found neither males nor females increased in height over the course of the freshman year. Thus, changes in BMI are likely reflective of weight gain.

Finally, Study 2 participants were most likely to fall into one of two categories: those who gained weight both the 1st and 2nd semesters of college and those who gained weight 1st semester and lost weight 2nd semester. Only 10% of students maintained their weight over the year. Identification of weight gain patterns may help to inform studies that aim to prevent weight gain.

The transition to college brings tremendous life change, including stresses related to increased academic pressures, changes in peer and family social supports, and opportunities to participate in risky behaviors, such as alcohol and drug use (Lightfoot, 2001). Many of these may play a role in college weight gain. For instance, academic stress has been shown to lead to decreased exercise, poor nutrition and increased drug use among college undergraduates (Weidner et al., 1996). Yet, it is possible that weight gain is unrelated to the college environment, perhaps instead marking the beginning of a larger trend for weight gain through the young and middle adulthood years (Lewis et al., 1997). However, there is evidence suggesting college students are prone to experience greater weight gain than their non-college-attending peers, with college women gaining weight at a rate 36 times greater than age-matched community women (Hovell et al., 1985).

Our research has several limitations. First, these two studies investigated weight change in two large samples of students from two very different universities. Our intent of this research is not to directly compare the samples presented in these two studies. While the overall amounts of weight gained across participants in the studies differed, it is interesting to note that a similar pattern of weight gain was observed, despite the two samples differing on baseline BMI and parent education level. Future research involving nationally representative samples is required to make generalizations to all college student populations. Second, Study 1 loss to follow-up was high and, thus, estimates of changes in BMI could be biased. Only 55% of Study 1 participants were available at the end of the sophomore year. In order to handle this missing data, we utilized likelihood-estimated models that systematically take into account missing data using the missing at random assumption. While our analysis of dropouts suggests that students who dropped out did not differ from completers on baseline weight or BMI, it is possible that dropouts differ from completers in some key way, such as a greater likelihood to make poor health behavior choices and, thus, affect weight change over time.

Finally, Study 1 was also limited by use of self-reported weight at baseline and a single baseline assessment of height. Therefore, results from Study 1, in particular the first semester, should be interpreted with caution. While this is not ideal, the pattern of weight change is consistent

across the two studies- and consistent with recent research reports (e.g., Holm-Denoma et al., 2008)- providing new knowledge on the patterning of college weight gain. A final limitation involves lack of body composition measurements (e.g., DEXA), which would have allowed for quantifying the extent changes in BMI were reflective of changes in adiposity relative to lean body mass (Hoffman et al., 2006).

Conclusions

Despite its unique challenges, the college environment offers abundant opportunity to positively impact physical activity, nutrition, and healthy weight management practices (Lowry et al., 2000). Consideration of these factors is critical for the development of effective weight gain prevention strategies, during the college freshman year. The current findings indicate that the first year of college is a time period associated with significant weight gain for many male and female young adults, with many students, particularly males, continuing to gain weight during their second year. Future studies are needed to explore the contributing factors to weight gain over the course of the college years, whether these be concurrent (e.g., junk food consumption, all-you-can-eat dining, alcohol consumption) or patterns that transcend throughout the developmental course. Research is also needed investigating the role of college weight gain on development of obesity in later adult years, taking a life course approach to obesity management and thus shifting the focus to obesity prevention interventions earlier in the life course.

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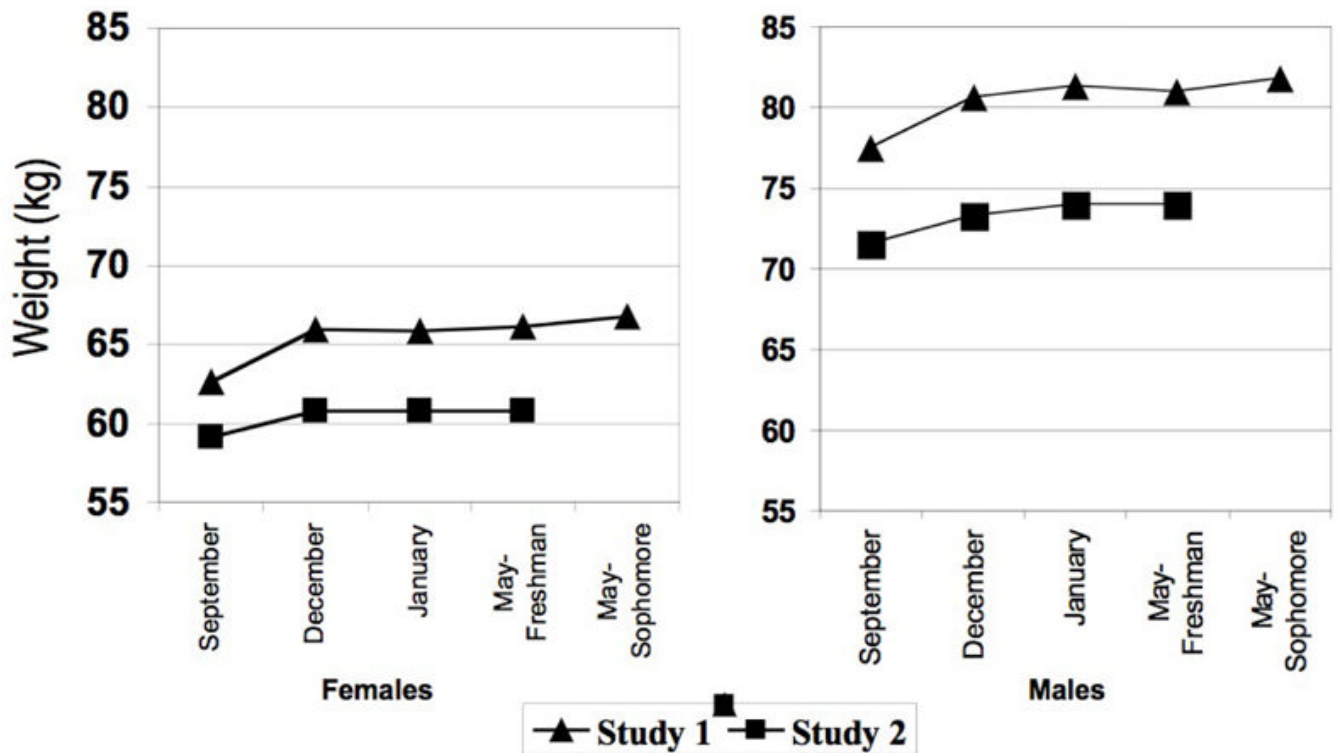
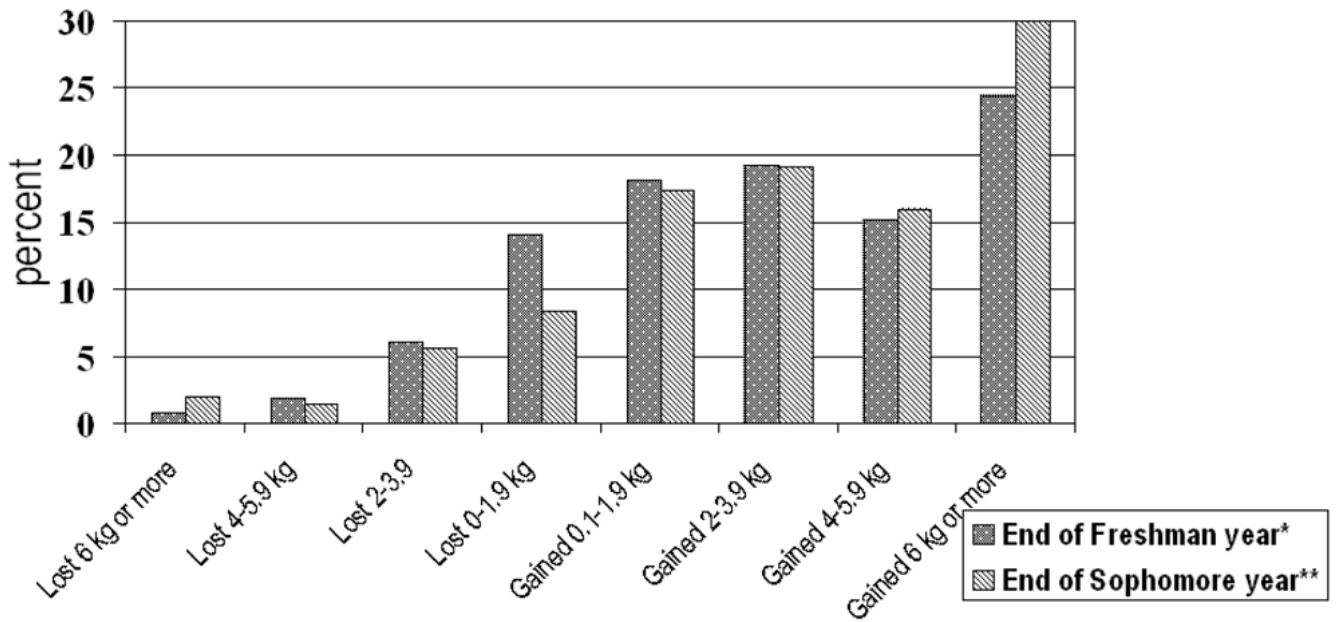


Figure 1.

Study 1 and Study 2 mean weights (kg) students over their college freshman year, by sex. All Study 1 time points are based on measured weight data, with the exception of baseline (September), which was self-reported (and adjusted by 0.5 kg). All Study 2 points are based upon measured weight data.

Study 1 conducted in West Lafayette, Indiana, USA from September 2002 through May 2004; Study 2 conducted in Providence, Rhode Island, USA from September 2004 through May 2006.

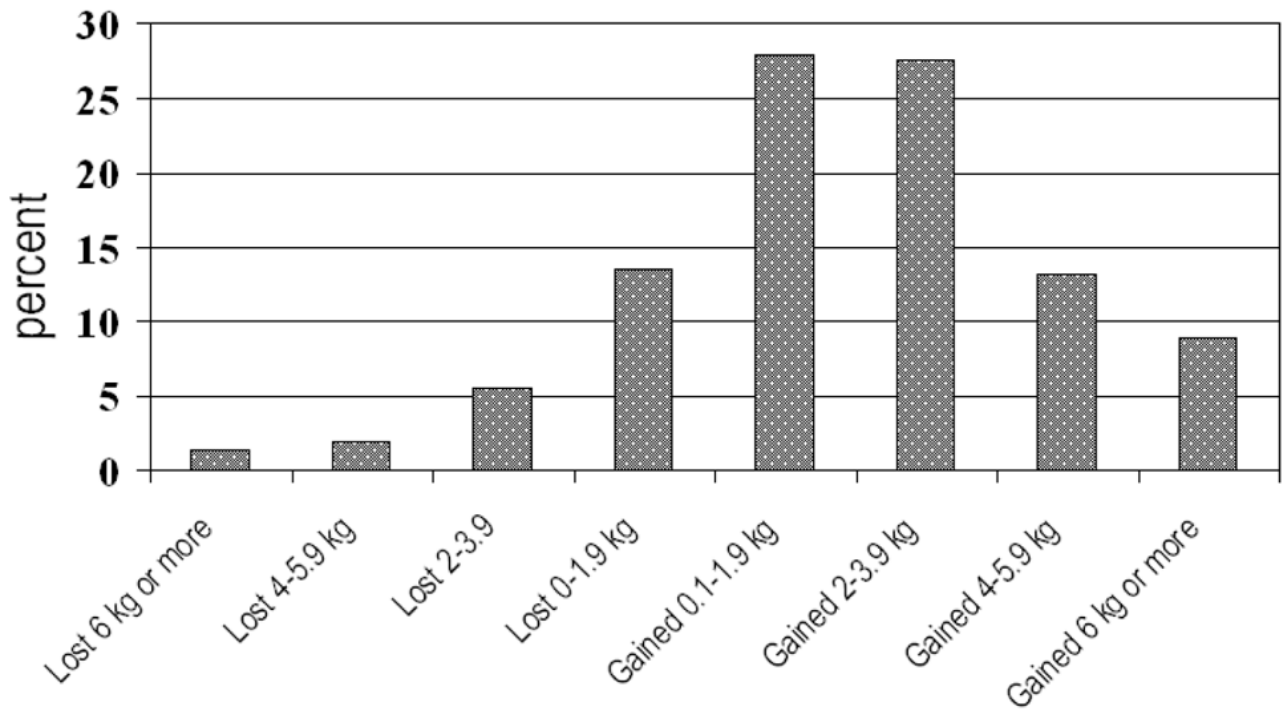


* Results of those with complete data at baseline (September) and end-of-freshman-year (May-freshman) (n = 372)

** Results of those with complete data at baseline (September) and end-of-sophomore-year (May-sophomore) (n = 490)

Figure 2.

Study 1 “Public University” - Distribution of student weight changes from beginning to end of freshman and sophomore years. *Results of those with complete data at baseline (September) and end-of-freshman-year (May-freshman) (n = 372). **Results of those with complete data at baseline (September) and end-of-sophomore-year (May-sophomore) (n = 490). Study 1 conducted in West Lafayette, Indiana, USA from September 2002 through May 2004.



Note: Results of those with complete data at baseline (September) and end-of-freshman-year (May) (n = 346)

Figure 3.

Study 2 “Private University” - Distribution of student weight changes from beginning to end of freshman year. Results of those with complete data at baseline (September) and end-of-freshman-year (May) (n = 346). Study 2 conducted in Providence, Rhode Island, USA from September 2004 through May 2006.

Table 1
Demographic and descriptive characteristics of participants in two studies of freshman year college weight change

| | Study 1 – “Public University” (N = 904) | Study 2 – “Private University” (N = 382) |
|------------------------------------|---|--|
| Sex (%) | | |
| Male | 54.6 | 39.3 |
| Female | 45.4 | 60.7 |
| Hispanic Race (%) | 3.2 | 11.2 |
| Ethnicity (%) | | |
| European-American | 91.3 | 63.5 |
| African-American | 1.4 | 3.1 |
| Asian-American | 3.3 | 18.5 |
| Other/Multiracial | 3.7 | 14.9 |
| Age (yr.) | | |
| Mean ± SD | 18.66 ± 36 | 18.51 ± 60 |
| Highest Parent Education Level (%) | | |
| High school or less | 14.5 | 6.4 |
| Some college | 13.2 | 5.3 |
| College graduate | 42.4 | 24.1 |
| Professional degree | 30.0 | 64.2 |
| Initial weight (kg) | | |
| Mean ± SD | 70.7 ± 14.6 | 64.0 ± 12.1 |
| Median | 68.5 | 62.1 |
| Range | 39.0 – 154.7 | 38.3 – 112.1 |
| Initial BMI (kg/m ²) | | |
| Mean ± SD | 23.24 ± 3.79 | 22.32 ± 3.23 |
| Median | 22.32 | 21.97 |
| Range | 15.23 – 51.84 | 15.94 – 38.71 |
| Initial BMI category (%) | | |
| Underweight (< 18.5) | 5.1 | 7.4 |
| Normal (18.5 to 24.9) | 73.3 | 77.8 |
| Overweight (25.0 to 29.9) | 16.9 | 11.1 |
| Obese (≥ 30.0) | 4.7 | 3.7 |

BMI = Body Mass Index. Study 1 conducted in West Lafayette, Indiana, USA from September, 2002 through May, 2004; Study 2 conducted in Providence, Rhode Island, USA from September 2004 through May, 2006.

Table 2
Differences in Study 2 participants' freshman year weight change patterns by weight and BMI.

| | Gain/Gain | Gain/Loss | Loss/Gain | Loss/Loss | Maintain | Significance- level |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|
| N (% of sample) | 125 (38%) | 122 (37%) | 26 (8%) | 21 (6%) | 32 (10%) | |
| Percent (%) female | 55.2 | 59.0 | 69.2 | 81.0 | 75.0 | $P=.06$ |
| Weight change 1 st semester (kg) ^d | 2.9 ^a | 2.9 ^a | -1.6 ^b | -2.7 ^b | 0.2 ^c | $P<.001$ |
| Weight change 2 nd semester (kg) ^e | 1.6 ^a | -1.7 ^b | 2.6 ^c | -2.4 ^c | 0.01 ^d | $P<.001$ |
| Overall weight change (kg) ^f | 4.5 ^a | 1.2 ^b | 0.9 ^b | -5.0 ^c | 0.2 ^b | $P<.001$ |
| Baseline BMI | 21.6 ^a | 22.8 ^b | 22.6 ^b | 24.0 ^b | 21.6 ^a | $P<.01$ |
| BMI change 1 st semester ^d | 1.0 ^a | 0.9 ^a | -0.5 ^b | -0.8 ^b | 0.01 ^c | $P<.001$ |
| BMI change 2 nd semester ^e | 0.6 ^a | -0.5 ^b | 0.8 ^a | -0.8 ^b | 0.1 ^c | $P<.001$ |
| Overall BMI change ^f | 1.5 ^a | 0.4 ^b | 0.3 ^b | -1.7 ^c | 0.07 ^b | $P<.001$ |

BMI = Body Mass Index. *Gain-Gain*: Weight gain both the 1st and 2nd semesters; *Gain-Loss*: weight gain 1st semester and either lost or maintained weight 2nd semester; *Loss-Gain*: lost or maintained weight 1st semester and weight gain in the 2nd semester; *Loss-Loss*: lost weight both the 1st and 2nd semesters; *Maintain*: maintained weight within +/- 1 kg during the 1st and 2nd semesters. Study 2 conducted in Providence, Rhode Island, USA from September 2004 through May, 2006.

^{a b c} different superscripts indicate significant ($p<.05$) group differences based on the Tukey HSD post hoc procedure;

^d 1st semester weight and BMI change indicate change in weight from September to January;

^e 2nd semester weight and BMI change indicate change in weight from January to May;

^f overall weight change indicates change in weight from September to May, freshman year.