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## Students' Dietary Behaviors Related to Their Perception of the College Dining Environment

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Students' Dietary Behaviors Related to Their Perception of  
the College Dining Environment

A Capstone Project Submitted in Partial Fulfillment of the  
Requirements of the Renée Crown University Honors Program at  
Syracuse University

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Science  
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May 2015

Honors Capstone Project in Nutrition

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## Abstract

The objective of this Capstone is to study the healthfulness of the college dining environment and compare students' perceptions of dining hall healthfulness and their behaviors by their dieting status.

The methodology used in this Capstone included the distribution of a healthy campus survey to a convenience sample of students at Syracuse University. This survey assessed health-oriented perceptions of the environment and behaviors, meal intentions, height, weight, desired weight status, and demographics. This capstone focused on the perception of dining halls on campus. The dining hall audit tool assessed the healthfulness of foods and the supportiveness of the environment of the various dining venues on Syracuse University's campus including sit down restaurants, fast food, delivery, and dining halls. Dining halls were the main focus in this study. Statistics used included: ANOVA, t-tests and Chi-squared tests. Significance was set at  $P \leq 0.05$ .

The hypothesis or prediction for this Capstone was that dieters (those trying/desiring to lose weight) would have more healthful eating behaviors and habits compared to non-dieters (those desiring to maintain their current weight). It was also hypothesized that dieters as compared to non-dieters would perceive the dining hall foods, as well as, environment to be healthier.

A sample of 306 students completed the survey. Dieters and non-dieters were significantly different by gender distribution, BMI, desired weight change, intention to be healthier, practicing healthy behaviors, and perception that there are healthy foods available in campus dining halls. Overall, dieters were women, had a higher BMI (3.6 units higher,  $P = 0.001$ ) than non-dieters, and wanted to lose more weight (12.7 pounds more,  $P = 0.000$ ). Dieters as compared to non-dieters practiced less healthy behaviors and did not perceive the dining hall environment as being as healthy. Dining venue audits showed that dining halls were the healthiest dining venue providing healthy food, as well as environmental supports to eat healthy, when compared to the other three dining venues. Dining halls scored on average 14 points higher than the other venues for healthfulness of food, and five points higher for environmental supports.

In conclusion, this study found that while dieters weigh more and wish to lose more weight than non-dieters, they are hindered by the fact that they do not perceive their environment as being conducive to health. This keeps dieters from practicing healthy eating behaviors, as evidenced by the lower meal behavior score. Research pertaining to students' perceptions of their dining environment and how they are affected is important in order to help address ways in which environment can be changed to enable students to consume healthier foods.

## **Executive Summary**

The purpose of this Capstone is to present research related to college students' dietary behaviors and how these behaviors are affected by students' own perceptions of the dining hall environment on a college campus. The importance of this topic lies in the obesity epidemic which has infiltrated almost every country worldwide and affects people of all ages including college students. Chronic diseases related to dietary intake and overall healthfulness are widespread in today's society. These chronic diseases include type 2 diabetes, heart disease, and hypertension, among others. These diseases have the ability to be prevented or reversed through a change in diet away from processed foods high in fat, sodium, and sugar and embracing healthful, whole, nutrient-dense foods. Making these dietary changes may result in weight loss, which directly affects and diminishes many of the previously mentioned diseases.

Unfortunately, the American environment today has becoming more conducive to unhealthful eating behaviors and practices. This is a result of many people embracing the convenience lifestyle. People are moving less, eating more, and choosing to consume the foods that are more unhealthy. This is due to an environment that has a constant focus on eating all of the time and eating to excess. This is reflected in cheap foods such as fast food that are extremely high in calories and low in nutrients. The unhealthy environment that surrounds so many people results in weight gain and often chronic disease, as mentioned before. If the environment can be changed to be more conducive to healthfulness, then the population will be more likely to live healthier, active, and disease free lives due to the potential of the environment's effect on dietary behaviors.

Some research has been completed in the past regarding how environment affects people's diets, but little research has been completed in a college setting. For this reason, this specific research project related to college students is extremely important. The results from this study are meant to contribute to the knowledge of how environment affects diet so that college campuses may work to set up dining halls in a way that enhances the healthfulness of students' choices. It is important to focus on college aged students because college is a time when students form health related habits that last for a lifetime such as dietary choices and eating behaviors. The focus on dieters versus non-dieters is important because many college students choose to diet, which often changes the healthfulness of their dietary intake (sometimes for the better, and other times for the worse). By evaluating how to increase the healthfulness of college students, more young people will have the opportunity and ability to embrace health and form healthful habits that they will have for a lifetime. The small, everyday changes that have the potential to occur as a result of a change in environment may result in lifelong changes that lead the population towards health and away from diseased states resulting from poor dietary choices and behaviors.

A specific focus for this project is the difference between dieters' perceptions and actions compared to those of non-dieters. This project is an analysis of research conducted on the Syracuse University campus during the academic year 2014-2015. The research project focused on studying and analyzing the healthfulness of the college campus for disease prevention and health promotion through environmental audits. This Capstone focuses on data collected using the dining hall audit created for FRUVED, a nationwide study involving healthfulness of college campuses. Results

from a survey titled College Environment and Behavior Perceptions Survey (CEBPS) was used in order to assess perceptions of Syracuse University students regarding the dining hall environment, dieting status, and descriptive factors of subjects. These data collected from this research were then analyzed using various statistical methods, and this analysis resulted in the realization of specific connections regarding dining hall environments and students' dietary behaviors.

Various tools were used in the research gathering process of this project. First, the perceptions and eating behaviors of a group of students was assessed through online consent forms and the College Environment and Behavior Perceptions Survey (CEBPS). The survey was taken by a convenience sample of 306 subjects recruited by flyers, email, and word of mouth. CEBPS included questions and items adapted from previous studies. CEBPS is a 20 minute survey consisting of multiple sections including questions regarding eating behavior, physical activity, and overall healthfulness related to the campus environment. This multidimensional survey assessed participants' overall health (nutritionally, physically, mentally) and how this level of health was related to and affected by the college campus environment. Sections from CEBPS used in this Capstone included the following: Eating Attitudes and Perceptions, Eating Behavior, and Dieting. A second tool used in this study was the Food and Dining Environment Assessment. This audit included questions about healthfulness of 53 cafes, restaurants, and 5 dining halls on or near campus. Questions were related to types of foods offered, the environment of the establishments, and the promotion of green eating practices.

This multi-faceted project began with data collector training prior to the assessment conducted through a Healthy Campus Environmental Audit. Researchers completed audits and were required to have 80% similarity/consistency between answers before being certified as researchers. After training and certification, researchers utilized the audit to collect data for the dining halls on campus. The data from this audit were used to assess the healthfulness of the environment of dining halls on Syracuse University's campus.

The next step in the process for this Capstone was the distribution of the survey. Subjects were recruited to take the CEBPS survey which included questions related to perception of the college campus environment, but for this project the focus was mainly on the questions regarding subjects' perceptions of dining halls, personal characteristics, and subjects' dietary intake. The data from these audits and surveys were then analyzed to determine significant differences between dieters and non-dieters. A specific focus for this Capstone was on dieters versus non-dieters and the differences between their perceptions of dining halls, fruit and vegetable intake, and physical characteristics such as weight, height, and age. Connections were made between students' perceptions of the dining hall environment and their dietary behaviors using the analysis of these data. Some findings were that dieters perceived their environment as less healthy compared to non-dieters, and dieters practiced healthy behaviors less often than non-dieters. These among other findings resulted in the conclusion that there may be barriers for dieters that cause them to not be able to lose their desired amount of weight, and this can be fixed by altering the dining environment in order to promote healthy eating choices.

The significance of this research is reflected in the importance of health in light of the obesity epidemic. If environmental factors are identified that affect people's dietary choices, then food establishments can respond by setting up the dining environment in such a way to help people choose to eat healthier foods. Embracing these simple changes has the potential to result in a healthier population with fewer chronic diseases related to diet.



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## Literature Review

It is evident that obesity has become an epidemic in many developed countries throughout the world today. America is no exception to this recent trend, as studies have shown that about 65% of adults in America are overweight (Flegal et al. 2012, CDC 2014). Many studies have been conducted to determine the reasons for the elevated percentage of Americans who are overweight or obese (Ogden et al. 2010). It is imperative to address the obesity issue immediately to reduce the number of people suffering from obesity and increase the healthfulness and longevity of Americans. This is of the utmost importance because obesity leads to many other chronic diseases such as heart disease and stroke (Wharton 2008). By determining the factors that cause obesity, environmental and educational changes can be made in order to ensure that the population is healthy overall.

The obesity epidemic affects more than just adults. Obesity's scope of influence also includes children, teens, and college aged students (Ogden et al. 2014). In 2010, the American College Health Association reported that about 36% of college students in the US were considered overweight or obese (ACHA 2010). One reason for this high percentage might be the poor eating habits they developed as children, which have continued into early adulthood and could be a risk throughout their lifetime. Also, new college students are faced with pressures that can affect their eating, such as living away from home and making independent decisions for the first time, as well as adjusting to a new academic environment (Garcia et al. 2010).

College students are an important group to study because they are vulnerable due to their exposure to an environment in college that is obesogenic and not always

conducive to healthy eating (Desai et al. 2008). The resulting weight gain for many students is greatest between the ages of 18 and 29 (Racette et. al 2005). College students are making their own dietary decisions for the first time, and typically they are deciding what to eat when they feel hungry as opposed to planning food consumption in advance (Marquis 2005). Their decisions for what to eat could be affected by their dining environment because students choose the foods that look best to them instead of thinking and planning what they will/should eat before entering a dining hall. Many students feel stressed during their college years due to pressure from peers, school work, and lack of time paired with more responsibilities (Huang et al. 2003). Also, health tends to be viewed as the least important of the factors students must deal with on a day to day basis while in college. A mere 26% of college students are motivated by health and weight affecting what foods they choose to consume (Marquis 2005, Betts 1997, Cypel 1993, Horacek 1998). College students' choices regarding food are based on many factors including environment, friends, availability, and price.

It is important to study these factors within this specific group because the health related choices that students make while still in school will have repercussions on their health and eating habits in the future. Studies show that changes in body mass index (BMI) from ages 2 to 25 have more of an effect on adult weight than one's birth weight or lifestyle as an adult (Guo et al. 2000). If students can adapt healthy habits at a young age, then they will hopefully continue these practices into adulthood.

Adverse consequences are the result of students choosing to consume unhealthy foods. A lack of health motivation often results in consumption of healthier foods which most often causes higher fat intakes and lower nutrient intakes (Horacek

1998). This may result in a decrease in students' health status due to increased body weight and a lack of many essential vitamins and minerals. Not only will students who chose to consume more unhealthy foods gain weight and have a higher chance of becoming obese (Guo et al. 2004), they will also be lacking in many essential components of a diet that are found in healthy foods that keep people energized and healthy (Bowman & Vineyard 2004). Diets lacking in these essential nutrients often lead to chronic diseases such as coronary heart disease, hypertension, stroke, diabetes mellitus, and some forms of cancer (Boeing et al. 2012).

There are generally two types of students on opposite ends of a continuum regarding health: those who are indifferent about their health and those who are dieters and carefully plan their food consumption (Marquis 2005). As previously mentioned, the healthfulness of foods is one of the least important factors students consider when deciding what to eat. Studies have shown that the following factors contribute to college students' food choices (from most to least important): availability, accessibility, convenience, price, pleasure, concern about weight, and health (Marquis 2005, Betts 1997, Cypel 1993, Horacek 1998). It is evident that convenience of food is much more important to many students than the effect that their diet may have on their health. While this is true for many college students, a segment of the student population does exist who is more concerned with weight and dieting than others.

Dieting status must be considered when attempting to understand college students, given the differences that would exist between dieters and more typical students who are neither motivated by their health nor have a weight goal. A diet is defined as the restriction of one's consumption of an amount and/or types of foods in order to attain

a certain weight or physical appearance; this is also referred to as weight management (ADA 2009). While both men and women diet, women tend to be more concerned about losing weight than men (Marquis 2005, Lowry 2000). It has been found that the average commencement of a person's first diet is around the age of 16.2 years old, so many dieters enter their college years having dieted in the past (Grunewald 1985). Although it is estimated that about 50% of college women diet, only 28% of these women are overweight or obese and actually need to lose weight to be healthier (Wharton 2008, Lowry 2000). This suggests a disconnect between what many dieters think they should look like and the dieters' actual weight status. There are various negative consequences that stem from chronic dieting including weight cycling and the increased chance of developing an eating disorder later in life (Malinauskas et al. 2006). There is evidence that frequent dieting may also be associated with a poor quality of diet and even weight gain (Nelson 2008). If a dieter should progress to an eating disorder, it has been found that those with anorexia may have up to four times the mortality risk than healthy persons; for bulimia, this statistic is raised to seven times the mortality risk (Zullig 2007). Chronic dieters have also been found to have a poor weight perception and low life satisfaction compared to non-dieters (Zullig 2007).

It is important to distinguish between college students unconcerned with their health (non-dieters) and dieters because it stands to reason that their health attitudes would also affect their perceptions and behaviors in their dining hall environment. Intuitively, a chronic dieter would desire and utilize a salad bar in a dining hall very differently than a college student who is unmotivated by his/her health. While 26% of college

students consume  $\geq 5$  servings of fruits and vegetables per day, the majority do not reach this number of servings (and this would include some dieters) (Adams & Colner 2008, Lowry 2000). Despite students' health motivations, young adults in general tend to have diverse eating habits and misconceptions regarding nutrition (Cypel 1993). With this in mind, no matter how concerned college students are with their health, they may not always understand or want to choose the foods that would contribute positively to their health.

Much research has been conducted regarding the effect that the density of stores and restaurants (number of establishments per square mile) have on the health of adults (Cole et al. 2010, Cummins et al. 2009, Ball et al. 2009, Cerin et al. 2011). However, very few studies have focused on the quality or perceptions of the food environment and the effect of these factors on food behaviors and choices. Likewise, there is limited research focusing specifically on college students' dining environment and food behaviors (Freedman et al. 2010, Casey 2008, Kapinos 2011, Kapinos 2013). Despite these studies, additional research is necessary to determine the specific effects the dining hall environment has on college students' decisions and behaviors regarding food choices.

Many college dining environments are considered obesogenic, meaning environmentally contributing to the obesity epidemic (Casey 2008). This rise of the obesogenic environment in colleges is due to many factors. This is partially because of the unique food environment often seen on college campuses: dining halls. Many dining halls function as single meal-swipe all-you-can-eat buffet, and many cafeterias on college campuses are self-serve, allowing students to take larger portions which may con



tribute to poor nutrition and overeating (Horacek et al. 2013, Levitsky et al. 2004, Laska et al. 2010). Also, there are numerous food options for students in dining halls (both healthy and unhealthy), but many students choose to consume the unhealthy foods before the healthy foods for various reasons (Garcia et al. 2010, Lyle 2006). Studies have shown a link between dormitories with easier access to dining halls and weight gain in college students. Students residing in dormitories with dining halls that are adjacent to dorms, are open longer hours, and are open on the weekends have been found to gain more weight over time than students who don't have as easy and constant access to dining halls (Kapinos 2011, Kapinos 2013). Students who are overweight tend to be more affected by their perceptions of their food environment, meaning they allow outside factors to affect their food choices rather than their own thoughts and beliefs on healthfulness of foods. However, students of a healthy weight are more affected by personal beliefs such as their self-efficacy regarding nutritious eating (Boyle et al. 2008). Additionally, the way foods are marketed in dining halls affects students' perceptions and decision making. It has been determined that when unhealthy foods in dining halls are marketed and advertised favorably, students are more likely to consume these foods which acts as a barrier towards the consumption of more nutritious foods (Garcia et al. 2010).

The accessibility and expansiveness of college dining halls results in the potential for college food services to increase the healthfulness of students' diets. Dining halls have been found to contain more healthful options than other cafes and snack bars on college campuses (Horacek et al. 2013). It has been found that fruit and vegetable consumption is positively correlated with accessibility and availability (Caldwell

2008). Similarly, other studies have found that if students are provided with healthy, affordable, and appealing food choices, the students are healthier and are more likely to consume more fruits and vegetables (Lytle 2006). These are positive findings for college students who have consistent access to fresh produce and other healthy foods through dining hall services. However, at the end of the day, college food service is a business that must make money. The amount and types of foods offered in college dining halls are dictated by students' preferences, behaviors, and habits. While the aforementioned studies provide evidence that offering healthy food will result in students consuming more of these foods, the manner in which the food is presented is also important. This persuasive effect is found in all aspects of dining halls, including the point of sale or where the food is purchased. Studies have shown that using monetary incentives (such as coupons, vouchers, etc.) at the point of sale has an effect on students purchasing healthier foods (Liberato et al. 2014). The dining environment as a whole affects students' choices, so simply offering healthy foods is not enough to evoke a change in eating behavior in this population.

Studying dieters as well as those who consume an unhealthy diet is important because nutrition has the potential to affect people for years in the future. As previously mentioned, the influence of positive food habits have been found to be vital for the health of young adults (Betts 1997, Biediger-Friedman 2010, Carter 2004). The development of eating habits at a young age have been found to potentially have "nutritional, health, and physiological consequences" later in life (Betts 1997). In other words, students' health choices in their formative college years have the potential to become habits for the rest of their lives. By knowing and understanding why students make cer

tain food choices, health professionals are able to alter the dining environment in order to encourage healthier eating habits for students in these formative years.

In conclusion, there are many factors that affect a college student's choices when consuming a meal in a dining hall. It is important to study the dining environment, the students' perception of the dining environment, and the students' eating behaviors in order to determine how to optimize dining halls to make them more conducive to promoting healthy foods that students will choose to eat. In order to improve the diet of college students and change the obesogenic college environment, schools must find a way to encourage the consumption of healthy foods offered at dining halls so that students may gain the health benefits of nutritious foods. From reviewing the literature, it is evident that parts of this overall topic have been widely studied in the past. The purpose of this specific research and Capstone is to broaden the focus to include college students and how the food environment (namely, dining halls) as well as health motivation and dieting status of students affects perceptions of food as well as food choices.

## **Methods**

This Capstone project is based on the pilot-testing and survey administration for a healthfulness intervention study titled FRUVED. The Dining and Restaurant audit of the Healthy Campus Environmental Audit was also used in this Capstone to assess the healthfulness of the dining venues on and near the Syracuse University campus. Dining venues were chosen by a research team based on proximity to campus and popularity with students. The perceptions, behaviors and attitudes were assessed through a convenience sample of students at Syracuse University.

### ***Instrument: Exercise and Dietary Habits Survey***

The perceptions and eating behaviors of a group of students was assessed through a 20 minute survey consisting of multiple sections including questions regarding subjects' anthropometric and demographic data, eating behavior, physical activity, and perception of overall healthfulness of the campus environment. This multidimensional survey assessed participants' overall health (nutritionally, physically, mentally) and how this level of health was related to and affected by the subjects' environment. This sample was recruited to take the online survey through word of mouth, email, and flyers. Informed consent was secured at the start of the online survey.

### ***Eating Attitudes and Perceptions***

One section of the survey included in the 28 item College Environment Perception Survey (CEPS) (Colby S University of TN). For this study, the specific focus was based upon the items related to eating/food attitudes and perceptions. Each question

was assessed on a five- point Likert scale assessing the degree of agreement/disagreement regarding the subjects' perceived healthfulness of the environment regarding availability of healthful foods in dining halls and on campus in general. The specific CEPS questions that were analyzed in this study include the following: "There are healthy foods available where I usually eat in dining halls on campus" and "There are healthy foods available on campus."

### ***Eating Behavior***

The sections included on the survey specifically related to eating behavior were: the College Environmental Behavioral Survey (CEBS) (Colby S University of TN) and the NCI Dietary Screener (Thompson et al. 2004, 2007). The CEBS section asked questions focused on measuring the frequency of a subject utilizing healthful opportunities on campus including choosing healthy food options. Each question was rated on a five-point Likert Scale from Never to Always. The NCI Dietary Screener focused on the frequency of consumption as well as types of foods including: cereals, milk, sugar sweetened beverages, juice, fruit, vegetables, beans, pizza, cheese, meat, grains, and desserts. In this study, the focus is on fruit and vegetable consumption. The Dietary Guidelines set by the USDA for consuming 9 half cup servings of fruits and vegetables per day was used to measure whether or not subjects reached an adequate, recommended daily fruit and vegetable intake (Millen et. al 2015). The following question from CEBS was included in the analysis: "I look for healthy food options when I shop and eat (including grocery stores, vending machines, dining halls, restaurants, convenience stores, and food courts/snack bars)."

### ***Meal Intentions and Behaviors***

Healthful meal Intentions and Behaviors were measured through certain questions in the CEBPS survey that were adapted from previous studies (Kattelman et al. 2014, Strong et al. 2008). In order to determine subjects' Meal Intentions, or subjects' plan to implement healthful behaviors into their daily diet, participants were asked to indicate how often (on a five point scale from never to always) in the past three months they had: "(1) reminded themselves that planning quick and simple meals is important, (2) told themselves that healthy meals do not require a lot of work, (3) reminded themselves to eat in moderation, (4) told themselves to allow room for an occasional treat food or dessert for just plain enjoyment, (5) reminded themselves to think about their beverage choices, (6) told themselves that fruits and vegetables should be included in every meal." In order to determine subjects' Meal Behaviors, or whether or not they were currently implementing healthful practices into their daily dietary behaviors, participants were asked to indicate how often (on a five point scale from never to always) in the past three months they had: "(1) planned quick, easy, and healthy snacks, (2) selected beverages with their health in mind, (3) purposely added vegetables to their meals and snacks, (4) been flexible and sensible with their food choices."

### ***Dieting***

Sections included in the survey that were related to dieting are body weight as well as demographics. These weight status and desire to lose weight questions were

adapted from the Youth Risk Behavior Surveillance System Questionnaire (YRBSS 2015). Body weight and height were self-reported, and BMI continuous score and category was calculated from this information. Questions also assessed self-description of categorical weight (very underweight to very overweight), as well as if the subject was trying to lose, gain, or maintain weight (in order to determine whether a subject was or was not dieting) and the amount of weight change the subject would like to see (BRFSS 2013). Dieters were defined as those wanting to lose weight, and non-dieters were defined as those wanting to do nothing or maintain their current weight status. Student's wanting to gain weight were eliminated from this analysis. Questions involving demographics included age, gender, ethnicity, grade point average, and current type of residence.

### ***FRUVED Survey Procedures***

A convenience sample of subjects were recruited to take the survey through word of mouth, flyers, email list-serves, and other forms of social media including Facebook. Incentives for taking the survey included a 1 in 20 chance to win 2 Movie Passes, and in order to enter the drawing participants were asked to give their name and email at the end of the survey. This information was removed from the data set in order to protect confidentiality. Syracuse University's Institutional Review Board approved the study protocol for FRUVED and the survey used in this cross sectional study.

### ***Instrument: Food/Dining Environment Assessment***

Throughout the 2014-2015 academic year, the campus environment at Syracuse University was assessed using the Full Restaurant Evaluation Supporting a Healthy (FRESH) Dining Environment Audit (Matthews et al. 2014). This audit evaluates the nutrition environment of dining establishments including restaurants (fast food, sit down, cafes), dining halls, cafeterias, buffets and food courts. The audit evaluates the food and preparation descriptions to determine healthfulness of menu items, rather than a nutrient analysis perspective, and the availability/extensiveness of other supports for making healthy dining decisions (Matthews et al. 2014). This audit included questions about healthfulness of 5 dining halls and 53 cafes and restaurants on or near campus. Questions were related to types of foods offered, the environment of the establishments, pricing, and the promotion of green eating and green practices. Each question was ranked on five-point scale or not applicable, with criterion semantic-differential rankings ranging from limited to extensive healthfulness or environmental support/evidence. Based upon factor analysis (Horacek et al., 2015), this audit is composed of two factors: the healthfulness of the foods (food) and supportiveness of the environment for making healthy choices (supports). Scores for food were calculated from the questions related only to the types of foods at the dining facility. Scores for supports were related to the supporting healthful environmental factors of the dining facility such as the menu, nutrition information, and signage. While many types of dining facilities were analyzed (including sit down restaurants, fast food, dining hall/cafeteria/buffet and delivery), this Capstone focuses only on the dining hall data.

### ***Data collector training***



Prior to the implementation of the Healthy Campus Environmental Audit, a group of college students assisted with the pilot-testing and refining of the audit. The research team completed 1) CITI (Collaborative Institutional Training Initiative) training, 2) online videos for how to properly complete the Healthy Campus Environmental Audit, 3) practice rounds of data collection, and 4) inter-rater reliability (IRR). Nearby restaurants, stores, and dining halls that are frequented by members of the Syracuse University student body were chosen to be audited by members of this research group, and audits were completed on the 50+ sites multiple times. Suggestions and changes were made to the tools and protocol to improve clarity and comprehensiveness. A minimum of 80% Inter Class Correlations was acceptable for IRR. All data surveys were entered onto Qualtrics. Once the audit was completed, it was used in the research study to once again assess all dining venues near the university for healthfulness of food and environment.

### ***Data Analysis***

Statistics were run on the data using SPSS to analyze the research gathered. Types of statistics utilized include descriptive statistics of the environment mean, standard deviation, frequency, and Chi-square tests. T-test and ANOVA were used to compare between groups based on dieting status, eating behaviors, and eating attitudes and perceptions. Significance was set at  $P \leq 0.05$ . Where ANOVA showed significance, a post-hoc Tukey B test was run to determine where this significance was found. These statistics were used to compare environmental scores and intake to perceptions and to compare the healthfulness of the types of dining facilities that were audited.

## Results

### **CEBPS**

A sample of 306 members of the Syracuse University student body over the age of 18 completed the survey fully. At the time of the delivery of the cross sectional survey, the population sample had the following characteristics: 87.2% aged between 18 and 21, 83.3% female, 78.3% white, 30.2% first year, 24.6% second year, and 15.7% third year students, and the majority (62.7%) lived in university housing that required students to purchase a meal plan with the university dining halls (table 1). Most (95.6%) of the sample did not meet the USDA recommendation of consuming  $\geq 9$  half cup servings of fruits and vegetables every day (Millen et. al 2015). Although 69.2% of subjects fell in the normal BMI range of 18.5 - 24.9 (Obesity, CDC 2014), 181 respondents (59.5%) desired to lose weight (Table 1).

### **Dieters vs. Non-Dieters**

There was no significant difference between dieters by age, year in school, race, residence location, and overall GPA. The desired amount of weight change (loss or gain) for dieters versus non-dieters was significantly different. Dieters wished to change their weight by  $16.4 \pm 14.1$  lbs, while non-dieters wished to change their current weight by  $3.7 \pm 5.3$  lbs, a difference of approximately 12.7 lbs (Table 2).

The mean BMI for dieters was  $25.2 \pm 4.1$ , and for non-dieters it was  $21.6 \pm 2.3$  ( $P = 0.001$ ). There was a significant difference in BMI category (underweight, normal weight, overweight, obese) between dieters and non-dieters. More dieters were over

weight (29.2%) and obese (12.4%) as compared to non-dieters (7.6% and 0%, respectively) ( $P = 0.000$ ) (Table 1).

### **Fruit and Vegetable Intake**

There was no significant difference between dieters and non-dieters regarding daily amount of fruit and vegetable intake. Amount of vegetable intake in servings was almost the same between dieters and non-dieters ( $1.9 \pm 1.5$  and  $2 \pm 2$ , respectively) as well as fruit intake ( $1.1 \pm 1.1$  and  $1.3 \pm 1.1$ , respectively). However, for daily total fruit *and* vegetable intake, dieters had a slightly lower intake than non-dieters ( $3.7 \pm 2.4$  and  $4 \pm 3.3$ , respectively). The vast majority of dieters (96%) as well as non-dieters (95%) failed to reach the guideline for  $\geq 9$  servings per day of fruits and vegetables (Table 1).

### **Health Perceptions and Behaviors**

Three CEBPS questions were assessed to determine subjects' perception of the healthfulness of campus and whether or not participants practiced healthy eating habits. The first question asked the subjects' agreement with the statement that there are healthy foods available in the dining halls on campus. There was a significant difference in answers between dieters and non-dieters. Dieters scored lower ( $2.5 \pm 1.6$ ) than non-dieters ( $2.9 \pm 1.6$ ), meaning that dieters agreed less with this statement than non-dieters ( $p$  value 0.045). The second question asked the subjects' agreement with the statement that there are healthy foods available on campus in general. There was no significant difference found between groups. The third question asked about the fre

quency that subjects seek out healthy food options on campus. No significance was found between the two groups.

### **Meal Intention and Behavior**

The higher the score for Meal Intentions, the more the subject was likely to intend on beginning healthy dietary behaviors. Meal intentions between dieters and non-dieters was found to be significantly different; dieters scored higher ( $25.7 \pm 5.8$ ) than non-dieters ( $24.2 \pm 6.8$ ) ( $p$  value 0.042). Meal Behavior measured the healthfulness of participants' current eating behaviors. Meal Behaviors between the two groups was also significantly different; dieters scored lower ( $13.9 \pm 3.2$ ) than non-dieters ( $14.9 \pm 3.2$ ) ( $p$  value 0.009) (Table 2).

### ***Healthy Campus Environmental Audit***

Data were analyzed from the Healthy Campus Environmental Audit to determine overall healthfulness scores for food subscore, as well as the supportiveness sub-score data for various dining facilities on campus including delivery, fast food, sit down restaurants, and dining halls/cafeterias/buffets. Statistics were also run to determine the significance between the scores for the various dining facilities on campus.

### **Scores**

Food scores from the audit resulted in dining halls scoring highest ( $37.56 \pm 12$ ), followed by sit down restaurants, fast food, and delivery ( $23.76 \pm 4.21$ ,  $23.53 \pm 8.71$ , and  $20.86 \pm 3.02$ , respectively). For supportiveness scores, dining halls again scored

highest ( $25.33 \pm 5.9$ ), followed again by sit down restaurants, fast food, and delivery ( $20.2 \pm 3.04$ ,  $19.89 \pm 4.69$ , and  $15.86 \pm 1.57$ , respectively) (Table 4).

### **Comparison**

Through statistics, it was determined with a p value of 0.000 that there was a significant difference between food and supportiveness scores between the four types of dining facilities. Post-Hoc Tukey B tests were then run to determine where the differences were significant. Dining hall food scores were significantly higher than the other three types of restaurant venues (delivery, fast food, and sit down restaurants). For supportiveness scores, there were also significant differences; dining halls scored the highest, sit down and fast food restaurants scores in the middle, and delivery scored the lowest (Table 4).

## Discussion

A number of studies have investigated the effect of restaurant density on adults' health parameters (Cole et al. 2010, Cummins et al. 2009, Cerin et al. 2011) or the relationship between perceptions and environment and the effect on subjects' dietary behaviors (Freedman et al. 2010, Casey 2008, Kapinos 2011, Kapinos 2013). Few studies have focused on college students, but one did find that the environment of college aged students, particularly women, is significantly related to weight status (Kapinos 2013). This Capstone project went one step further and focused on dieters (defined as those who wanted to lose weight) compared to non-dieters (those who wanted to maintain weight) and how dieting behavior was distinguished between their perceptions, behaviors and the effect of the environment. This is an important target population due to findings that many college aged dieters, regardless of weight status, are misinformed about healthful dieting and would benefit from nutrition education (Malinauskas et al. 2006). Surprisingly, there were very little differences between the two groups regarding their perceptions and behaviors. Although no significant difference was found between the groups for place of residence, fruit and vegetable intake, and demographics (besides gender), there were a few items were significantly different. These include gender, BMI, BMI category, desired amount of weight change, and perception of healthy foods in dining halls.

In this study, more women than men desired to lose weight (although it should be noted that the sample in this study was mostly women). This disparity between genders has been found in previous studies, because in society today it is seen as desirable for women to be thin and for men to be larger and stronger (Marquis 2005, Lowry 2000).

While for this study a dieter was defined as one who desired to lose weight, it should be noted that some may consider a person who is eating a certain way in order to gain weight a “dieter” as well. It should also be noted that this study defined non-dieters as those who wished to maintain weight, but it is plausible that some individuals are on a “diet” in order to maintain weight.

BMI as well as BMI category was different between dieters and non-dieters. BMI for dieters was 3.6 units higher than non-dieters ( $25.2 \pm 4.1$  and  $21.6 \pm 2.3$ , respectively). While many dieters fell into the overweight or obese categories (a total of 41.6%), very few non-dieters belonged to these categories (7.6%). None of the non-dieters were obese, which means that all obese subjects in this study were self reported “dieters.” This is understandable, as dieters (as defined in this study) would want to lose weight if they were overweight or obese, and those who did not fall under these categories would be content with maintaining their current “normal” weight. However, these findings may not have been evident if this study had included those who desired to gain weight, as BMI is often not an accurate indicator of true obesity for individuals who have or wish to gain muscle mass. BMI in general is not a predictor of body composition (that is, lean mass versus fat mass). Despite the amount of overweight and obese dieters wishing to lose weight, 57.8% of dieters were found to be at a normal BMI category (compared to 84.7% of non-dieters). This indicates that a majority of persons who choose to diet and want to lose weight are already at a healthy, normal weight category. This is similar to findings in other studies that show that while approximately

50% of women diet, only about 28% of college aged women are actually obese (Whar-  
ton 2008, Lowry 2000). This brings up some issues regarding self-image, dietary be-  
haviors, and



societal pressure to look a certain way. Studies show that chronic dieters are often found to have poor weight perception paired with low life satisfaction (Zullig 2007). There are certain factors that affect today's college aged individual (especially women) to look a certain way. This would explain the large number of healthy individuals who wish to lose weight and are considered dieters in this and other studies. Finally, related to weight status, dieters wished to change their weight by  $16.4 \pm 14.1$  pounds, which is 12.7 lbs more of a change than than non-dieters ( $3.7 \pm 5.3$  lbs). This is understandable, especially considering the definitions of dieters and non-dieters in this study.

Meal Intention in this study focused on whether or not subjects had plans to implement healthy behaviors regarding diet into their daily lives. It was found that dieters responded with a higher value for meal intention than their non-dieter counterparts. This is interesting because this data can be interpreted as dieters having a plan to make changes towards healthier diets in the future, but they have not implemented these behaviors yet. However, actual current behaviors must also be studied, and this is the focus of Meal Behaviors. In the case of Meal Behavior, the results were opposite. Dieters scored lower than non-dieters, indicating that although dieters had intentions of making their diets healthier, non-dieters were more likely to actually implement these behaviors and to be currently practicing behaviors related to a healthy lifestyle. These are interesting findings, especially when studying dieters. This intention versus behavior change may explain why dieters are more likely to be overweight and obese than non-dieters. Dieters have not yet implemented their plans and intentions to make their dietary behaviors more healthy, while non-dieters' diets are already slightly healthier.

Other studies have found this to be true, especially in the realm of skipping breakfast.

For example,

dieters are more likely to practice the unhealthy behavior of skipping breakfast than non-dieters (Bellisle 1995). This is important because the implementation of consistent mealtime behaviors has been attributed to weight management (Kattleman et al. 2014). Strong et al. found that college students who planned their meals practiced healthier eating behaviors including consuming more fruits and vegetables (2008). Still other studies have attributed the lack of college students' ability to implement healthful dining behaviors to stress related to lack of finances and poor time management (Greaney et al. 2009).

Regarding environmental perception, only one measure was found to be significantly different, and this was the following question: "There are healthy foods available where I usually eat in dining halls on campus." In this case, dieters responded with agreeing less with this statement than non-dieters. This is important because it shows that the group who wants to lose weight may find it more difficult to implement healthful behaviors related to their diet due to their perceived "unhealthy" surroundings. This may be the cause for the disparity mentioned before between Meal Intention and Meal Behavior, as dieters perceive a barrier to consuming healthy foods in the dining hall which may be hindering them from moving from intention to behavior. The dieters' lack of agreement that there are healthy foods available on campus may stem from a lack of knowledge about what is considered a healthy food. College dieters' perceptions of low-calorie foods has been found to limit their overall food choices, which makes them less likely to practice healthful eating behaviors due to these restrictions (Haberman & Luffey 1998). This could also be a reason for the decreased healthful behaviors in this

group, because if they do not know that the healthy foods are there then there is less of a chance that they are going to consume healthy foods.

Other studies have shown that many dining halls on college campuses contain more healthful options than other cafes and snack bars on campuses, so this is good news for college students wishing to make healthier choices (Horacek et al. 2013). Despite the healthfulness of foods in the dining halls, studies have shown that the all-you-can-eat dining halls (such as the ones found on Syracuse University's campus) contribute to excessive eating and large portions which decreases the healthfulness of meals (Laska et al. 2010, Levitsky et al. 2004, Horacek et al. 2013). Similar findings were presented in this study, as those who want to lose weight (dieters) were found to not perceive that there were many healthy options available where they usually eat.

While all of the above factors were found to be significantly different between dieters and non-dieters, a few of the non-significant factors are important to the study findings and should be discussed. An important finding is that a majority (67.2%) of subjects lived in university housing. It is a rule at Syracuse University that any student choosing to live in university housing must purchase some form of a meal plan, ranging from 5 meals per week up to unlimited amounts of dining hall swipes per week. While all university housing students may not utilize the dining halls, the fact that they have already paid for the meal plan is a large positive motivator for them to eat in the dining halls and use up their meals (especially since each meal swipe costs \$17). While 67.2% is a majority of the respondents, there is still 32.8% of subjects who do not utilize the dining hall because they do not live in university housing. However, all students at one point in time were required to purchase a meal plan, as it is required for students to

live in university housing for two full academic years. It must be taken into account that while almost all respondents had been inside a dining hall at one time in their college career, it may have been years since some subjects ate a meal at a dining hall. This should be taken into account when viewing the results of this study, as some of the respondents' perceptions may be out of date.

When comparing fruit and vegetable intake for the two groups, the non-dieter group had slightly higher numbers than the dieter group ( $4 \pm 3.3$  and  $3.7 \pm 2.4$ , respectively). This information should be viewed along with whether or not the subjects met the USDA guidelines of consuming  $\geq 9$  half cup servings of fruits and vegetables per day. In this study almost all dieters as well as non-dieters (96% and 95%, respectively) failed to reach these guidelines. The finding that many college students do not consume adequate amounts of fruits and vegetables has been published before. Other studies have found that only about 26% of college students consume  $\geq 5$  servings of fruits and vegetables per day, which is much lower than the recommended  $\geq 9$  (Kattelman et al. 2014, Lowry 2000, Haberman & Luffey 1998). It may be difficult for many subjects to change their diet and consume this amount of fruits and vegetables, especially when taking into account the current Standard American Diet (SAD). However, it would behoove dieters to consume more fruits and vegetables, as consumption of these foods results in lower caloric intake which has been linked to weight loss (AWM 2014).

Regarding perceptions of health environment, non-dieters agreed more than dieters that healthy food can be found on campus (not just in dining halls). While not significant, this contributes to the findings mentioned previously that dieters do not always perceive their environment as healthy compared to their non-dieter counterparts. This

has the potential to have a large effect on dieters' eating behaviors, as it is difficult to be healthy when one does not feel as if they are in an environment that is conducive to healthy eating. However, the two groups' responses were almost identical for the frequency with which they actively look for healthy food options when they eat. Intuitively, it would seem as if dieters would be looking for healthy foods more often than non-dieters, but this goes back to the definition of dieters in this study as well as the findings for dieters' Meal Behaviors. Non-dieters are defined as those who wish to maintain weight, but this does not mean that they completely disregard health. Also, while dieters have intentions to be healthier, they have not completely embraced the healthful behaviors yet. This may be why dieters and non-dieters responded similarly to the amount of times they seek out healthy foods on campus.

Regarding perception of food environment related to dietary behaviors, results of this study indicate that a perception of a less healthy environment may have the effect of reducing one's participation in healthful behaviors. Regarding dieting status, the findings of this study indicate that while many overweight and obese persons wish to lose weight, so do many healthy weight patients. In this study, most subjects were women. This points to the fact that today's society pushes for young, college aged women to look a certain way, and women are embracing this view and actively attempting to have what is deemed today as the "ideally beautiful" body. The importance of this relates to the findings that habits formed at a young age have been found to have nutrition and health consequences later in life (Betts 1997). Efforts should be made to push the idea of the importance of health over appearance, as college aged women are extremely susceptible to outside pressures. College aged students' thoughts and actions today

form lifelong habits that may result in unhealthy practices throughout their adult lives unless a change is made now.

Results from the Healthy Campus Environmental Audit compared the healthfulness scores (food and supportiveness for four types of dining facilities on or near Syracuse University's campus: delivery, fast food, sit down restaurant, and dining hall/cafeteria/buffet). Dining halls scored highest for food as well as supportiveness compared to the other three dining types. This is due to the wide variety of foods available to students in the dining halls. While there are many healthy food choices, many unhealthy food choices are also available to students. Despite the high audit score, it must be taken into account that students need to make their own decisions to choose the healthier options in order for the dining halls to have an effect on enhancing the healthfulness of the students' diets. The dining halls did score highest for supportiveness as well (including nutrition information, signage, etc.), and this would have an effect on the healthfulness of the environment which would positively influence students' choices. This is relevant because other studies show that the environment has a large effect on students' dietary choices. Where unhealthy foods in dining halls are marketed and advertised favorably, students are more likely to consume these foods over the more nutritious foods (Garcia et al. 2010). Similarly, studies have found that if students are provided with healthful foods, then they are more likely to consume more fruits and vegetables (Lytle 2006).

Other studies have focused on the healthfulness of dining venues on college campuses across the nation. When the data from this study is compared to others, it is evident that the dining options at Syracuse University are similar to other college cam

puses. Studies have shown that while minimal differences in healthfulness of dining halls are found between various sized colleges, medium-sized institutions (5,000 - 15,000 students) tend to have healthier side dish and salad bar options when compared to smaller colleges (Horacek et al. 2013). Syracuse fits into the category of a medium sized school. This same study also showed that dining halls had the healthiest food offerings compared to other dining venues such as fast food and cafes (Horacek 2013), which is similar to the findings in the study at Syracuse University.

This study does have limitations. First, it is based on a cross-sectional survey that focuses on one point in time rather than a prospective, retrospective, or longitudinal study that would be able to gather how changes have occurred in subjects over time. The sample in this study was a convenience sample of subjects with similar demographics and characteristics. The sample was also somewhat small (306 subjects), and consisted of mostly females (83.3%). However, the nature of this study was that it aimed to study college aged students, so this accounts for much of the similarity between subjects (besides gender). Although the sample was collected solely from Syracuse University, studies in the future should combine information from college aged students across the nation in order to obtain a sample that is indicative of this age group. Finally, the survey was based on self reporting of anthropometric measures and dietary intake. This leaves much room for error, as many subjects may have simply guessed at their height, weight, and BMI. Also, many college aged students are unaware of their fruit and vegetable serving intake. They might not know what a serving is, or they may have forgotten what they ate on a given day. Because of this, dietary intake of fruits and vegetables reported in the survey may not be completely accurate.



### **Implications for Research and Practice**

The findings of this study can be used by health professionals to provide information regarding what affects a dieters' or a non-dieters' choices related to health, diet, and perception of the dining environment. Despite the findings of this study, there is much still to be researched regarding dieters' and non-dieters' perceptions and the effect that these have on dietary behaviors, especially in the college population.

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### **Table 1: Subjects' Characteristics and Anthropometrics**

Characteristic		Desire to Lose Weight (n = 181)	Desire to Maintain Weight (n = 124)	Total (n = 306)	P value
<b><u>Demographics</u></b>					
<b>Age (%)</b>					
	18	28	20	25	0.279
	19	18	23	20	
	20	17	23	19	
	21	23	23	23	
	22	4	5	4	
	23	1	0	0.5	
	24	1	2	1	
	>24 years old	9	4	7	
<b>Year in school (%)</b>					
	Freshman	31	29	30	0.498
	Sophomore	23	27	25	
	Junior	18	13	16	
	Senior	20	26	22	
	Graduate	8	6	7	
<b>Gender</b>					
	Female (%)	87.8	76.6	83.3	0.01 (*)
	Male (%)	12.1	23.3	16.7	
<b>Race (%)</b>					
					0.207

Characteristic		Desire to Lose Weight (n = 181)	Desire to Maintain Weight (n = 124)	Total (n = 306)	P value
	White	74	84	78	
	Black or African American	7	3	5	
	Asian	11	5	8	
	American Indian or Alaska Native	1	2	1	
	Other	7	6	7	
<b>Residence (%)</b>					0.575
	Campus Residence hall	50	47	49	
	Sorority or fraternity	3	2	3	
	Other university/ college housing	14	13	14	
	Off campus housing	25	34	29	
	Parent/guardian's house	6	2	4	
	Own Residence	2	2	2	
<b>Overall GPA (%)</b>					0.675
	3.5-4.0	75	74	74	
	3.0-3.49	20	21	20	



Characteristic		Desire to Lose Weight (n = 181)	Desire to Maintain Weight (n = 124)	Total (n = 306)	P value
	2.5-2.9	3	2	3	
	2.0-2.49	0	1	0.5	
	Prefer not to answer	2	2	2	
<b>Meet guidelines: <math>\geq</math> 9 servings fruit and vegetable daily</b>					0.677
	No	96	95	95.6	
	Yes	4	5	4.4	
<u>Anthropometric measurements</u>		Desire to Lose Weight n = 181	Desire to Maintain Weight n = 124	Total n = 306	P value
<b>Body mass index, kg/m<sup>2</sup> (mean <math>\pm</math> SD)</b>		25.2 $\pm$ 4.1	21.6 $\pm$ 2.3	23.7 $\pm$ 3.9	0.001 (*)
<b>Body mass index category (%)</b>					0.000 (*)
	Underweight	1	8	4	
	Normal weight	58	85	70	
	Overweight	29	8	20	
	Obese	12	0	7	

**Footnote:**

P value significance <0.05 marked with \*

**Table 2: Subjects' Perceptions, Meal Intention and Behavior, and Fruit and Vegetable Intake**

<b>Perceptions: CEBPS</b>	<b>Desire to Lose Weight n = 181</b>	<b>Desire to Maintain Weight n = 124</b>	<b>Total n = 306</b>
<b>Desired Weight Change (lbs) (absolute value)</b>			
Mean $\pm$ SD	16.4 $\pm$ 14.1	3.7 $\pm$ 5.3	11.5 $\pm$ 13.0
Range			0-80
P value			0.000 (*)
<b>MEAL INTENTION</b>			
Mean $\pm$ SD	25.7 $\pm$ 5.8	24.2 $\pm$ 6.8	25.1 $\pm$ 6.3
Range			6-36
P value			0.042 (*)
<b>MEAL BEHAVIOR</b>			
Mean $\pm$ SD	13.9 $\pm$ 3.2	14.9 $\pm$ 3.2	14.3 $\pm$ 3.2
Range			4-20
P value			0.009 (*)
<b>Total Daily Vegetable Intake (servings)</b>			
Mean $\pm$ SD	1.9 $\pm$ 1.5	2 $\pm$ 2	2 $\pm$ 1.7
Range			0.08 - 8.70
P value			0.59

Perceptions: CEBPS	Desire to Lose Weight n = 181	Desire to Maintain Weight n = 124	Total n = 306
<b>Total Daily Fruit Intake (servings)</b>			
	Mean $\pm$ SD	1.1 $\pm$ 1.1	1.2 $\pm$ 1.1
Range			0 - 7.75
	P value		0.341
<b>Total Daily Fruit And Vegetable Intake (servings)</b>			
	Mean $\pm$ SD	3.7 $\pm$ 2.4	4 $\pm$ 3.3
Range			0.11 - 14.09
P value			0.387

**Footnote:**

P value <0.05 significance marked with \*

**Table 3: Health Perceptions and Behaviors**

Health Perceptions and Behaviors: CEBPS Questions	Desire to Lose Weight n = 181	Desire to Maintain Weight n = 124	Total n = 306
There are healthy foods available where I usually eat in dining halls on campus.			
Mean $\pm$ SD	2.5 $\pm$ 1.6	2.9 $\pm$ 1.6	2.4 $\pm$ 1.5

Range			0-5
P value			0.045 (*)
<b>There are healthy foods available on campus.</b>			
Mean $\pm$ SD	3.5 $\pm$ 0.98	3.6 $\pm$ 0.98	3.4 $\pm$ 0.94
Range			0-5
P value			0.099
<b>I look for healthy food options when I shop and eat (including in grocery stores, vending machines, dining halls, restaurants, convenience stores, and food courts/snack bars).</b>			
Mean $\pm$ SD	4.16 $\pm$ 0.9	4.26 $\pm$ 0.9	4.2 $\pm$ 0.92
Range			1-5
P value			0.442

**Footnote:**

P value <0.05 significance marked with \*

**Table 4: Healthy Campus Environmental Data**

<b>Audit Data</b>				
<b>Food</b>	<b>Type of Restaurant</b>	<b>Mean ± SD</b>	<b>Minimum</b>	<b>Maximum</b>
	<b>Delivery</b>	20.86 ± 3.02 a	17	25
	<b>Fast Food</b>	23.53 ± 8.71 a	9	42
	<b>Sit Down Restaurant</b>	23.76 ± 4.21 a	17	31
	<b>Dining Hall Cafeteria/Buffer</b>	37.56 ± 12 b	13	49
<b>Supportiveness</b>	<b>Type of Restaurant</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>
	<b>Delivery</b>	15.86 ± 1.57 x	13	18
	<b>Fast Food</b>	19.89 ± 4.69 y	10	31
	<b>Sit Down Restaurant</b>	20.2 ± 3.04 y	15	25
	<b>Dining Hall/ Cafeteria/Buffer</b>	25.33 ± 5.9 z	14	36

**Footnote:**

Higher scores indicate healthier food options and environmental supports.

Significant differences between restaurant types determined by ANOVA with Turkey B Post-Hoc.

A-C Similar subscripts are not significantly different.

X-Z Similar subscripts are not significantly different.