

## ABSTRACT

### FACTORS AFFECTING DISORDERED EATING AMONG COLLEGE FRESHMEN UPON ENTERING COLLEGE

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**Purpose:** There is a gap in literature on disordered eating among college freshmen since 2011. Research has shown that disordered eating manifests itself during adolescence and is likely to transcend into adulthood<sup>1,7,8,9,14,15</sup>. The freshmen year in college is likely to be challenging for many students. During this time, they may develop disordered eating or perpetuate an existing condition<sup>3,4,14,15</sup>. This research study investigated the prevalence of disordered eating among college freshmen and factors that may impact this development. A comparison of prior history of disordered eating was also examined.

**Methods:** A cross-sectional survey study was conducted on college freshmen at Northern Illinois University. The Disordered Eating Attitude Scale, the Perceived Stress Scale, and the Perceived Sociocultural Pressure Scale were compiled together to create an overall survey tool for this research study.

**Results:** Questionnaires were completed by 158 females, 47 males, and 2 who prefer to self-describe. The mean age was 20 years old. Students increased their disordered eating behaviors while attending Northern Illinois University compared to their behaviors prior to attending college. Participants' ideas of normalized eating, measured by the Disordered Eating Attitude Scale, were hindered while attending college ( $35.46 \pm 7.75$ ,  $P = 0.000$ ). Most were found to be experiencing moderate levels of perceived stress as measured by the Perceived Stress Scale ( $21.26 \pm 7.18$ ), where females and younger students were more likely to be more stressed.

Gender ( $P = 0.004$ ) and weight ( $P = 0.000$ ) were found to influence individuals' pressures to be thin as well as teasing from family and friends. Females were more likely than males to experience these changes, thus hindering their attitudes and behaviors related to food. Perceived stress ( $P = 0.000$ ) and sociocultural pressures ( $P = 0.000$ ) were found to influence participants' disordered eating behaviors throughout their freshmen year of college.

**Conclusion:** The main goal of this study was to determine if college students developed behaviors of disordered eating throughout their freshmen year. The data analyses found that increased behaviors of disordered eating were seen in students while attending college compared to prior to coming to college. Students' ideas of normal eating, relationship with food and restrictive and compensatory practices were specifically affected. Females and those who prefer to self-describe were also found to be experiencing higher levels of perceived stress and pressures to be thin.















## CHAPTER ONE

### INTRODUCTION

#### **Introduction**

At most universities, there is a widespread belief that the college experience increases the risk of developing disordered eating, or the development of an eating disorder<sup>1,2</sup>. It is currently estimated that the number of college students who exhibit disordered eating behaviors ranges from eight to seventeen percent, while twenty to forty percent of students will admit that they have experienced some form of an eating disorder in their lives<sup>1,2</sup>. This is due to the disordered eating behaviors and body images disturbances that are frequent throughout university campuses<sup>3,4</sup>. Twenty-seven percent of Americans are currently dieting and two-thirds of girls aged 14 to 18 years believe they need to be on a diet, which leads to the conclusion that an essential part of people's lives involves watching their caloric intake<sup>4,5</sup>. Approximately forty percent of adolescent girls partake in unhealthy dieting and exercise behaviors<sup>4</sup>. In today's society, individuals mainly focus on appearance and body weight or shape, due to cultural standards associating beauty with thinness and causing people to partake in disordered eating to maintain these ideals<sup>3,6</sup>. The strongest indicator of an individual developing disordered eating is his or her body dissatisfaction and weight concerns<sup>3,7,8</sup>. Based on the predisposing factors that are associated with disordered eating, there are notably high rates of dieting, problematic eating, and body dissatisfaction that are seen among college students<sup>4,9</sup>.

Men and women are commonly concerned with their bodies<sup>10</sup>. This is a perpetuating factor that has been seen to contribute to the development of disordered eating because it makes the disordered eating endure, causing it to inhibit recovery<sup>9</sup>. The fixation on body image among women may lead to unrealistic ideals which are commonly accepted throughout society. In turn it can lead to disordered eating<sup>10</sup>. Women typically overestimate the number of peers who are dieting, which allows for dieting to create a downward spiral of disordered eating habits and may lead to more serious implications<sup>4,6</sup>. Males tend to develop disordered eating due to the immense stigmas that are portrayed in them and often cause the feeling of shame<sup>4,6,9,10</sup>. Eric Strother and his colleagues discovered that males are often more likely to experience depression and shame, regarding their physical appearances<sup>11</sup>. The intense pressure and stigma that are put upon men to look and act a certain way cause male individuals to associate their minds with negative thoughts about what they can do to obtain these desired features<sup>11</sup>. The 'muscular ideal' that pressures males to conform with cultural body stigmas leads them to engage in behaviors and attempts to reduce their weight<sup>7,8</sup>. Men are known to be concerned with the mind because their behaviors of disordered eating typically come from the negative thoughts and emotions that are related to the underlying factor that is causing this<sup>12</sup>. Overall, these pressures and stigmas that are experienced by males and females cause perpetuating factors to continue adhering the disordered eating patterns<sup>9</sup>.

It is important to address the notion of the development of disordered eating among college students because this is the time that individuals form their adult identity and many channels could influence it<sup>1,7,8</sup>. As seen as a precipitating factor, the age which an individual begins to develop disordered habits contributes to the period of time where disordered eating may begin<sup>9</sup>. Beginning college is the time-period when people, typically aged seventeen to

nineteen years old, start a new chapter of their lives and their health behavior is influenced<sup>13</sup>.

High levels of disordered eating are seen among college students because at this point they are at the peak onset age for symptoms of eating disorders<sup>14</sup>. Studies have shown that within the first six months of college students eating habits change, with most leading towards behaviors of disordered eating<sup>14</sup>. With the changes in their eating habits, students also see a change in their weight as part of their early transition to college<sup>14,15</sup>.

### **Statement of the Problem**

Several research studies<sup>1,4,5,13,16,17,18,19,20,21</sup> on college freshman have elucidated the actions and thoughts of incoming college students who develop disordered eating or eating disorders. Vohs's study showed that there is a strong negative relationship between self-perceptions of attractiveness, popularity, and academic success and body weight in college students, which later showed that those individuals with this negative relationship were more prone to developing disordered eating<sup>4</sup>. When women arrive at college their self-categorization of body weight increases significantly. This causes more women to label themselves as overweight and explains why there is an increased urge to diet upon entering college<sup>4</sup>. A college environment has many social and academic stressors that may increase students risk of developing disordered eating, where stress and symptoms of disordered eating are positively correlated<sup>4,14</sup>.

A desire for weight control is a major factor that leads to the onset of disordered eating<sup>1</sup>. About twenty percent of college students believe that they are overweight, causing about sixteen percent of these individuals to report having lost control over how much they have eaten or not<sup>1,13</sup>. In addition, about forty-six percent of college students have reported trying to lose

weight<sup>13</sup>. Individuals have been seen to make a conscious effort to balance their diets to maintain or lower their weights and avoid gaining the perceived ‘freshmen 15’<sup>13</sup>. However, this conscious effort causes students to engage in unhealthy or poor eating and exercise habits<sup>13</sup>.

There is a gap in the literature on disordered eating among college freshmen since 2011. It is likely that this condition might have increased over the years as people become more aware of the obesity epidemic and related chronic diseases which might have influenced their food choices leading to disordered eating. It was important for further research to be conducted so findings can be more up to date in the present. With many different cultures and factors within society, the factors that influenced society in 2011 may be different compared to the present, 2018. This research study provided updated research on the prevalence of disordered eating in first-year college students and factors that contribute to the development. With this current research, other researchers are able to determine additional and new prevention and education programs regarding disordered eating and eating disorders. With the number of cases of eating disorders continuously on the rise, it was influential to identify other factors that lead to the development of disordered eating, and eventually a clinically diagnosed eating disorder.

### **Background and Significance**

Disordered eating is known as a “wide range of irregular eating behaviors that do not warrant a diagnosis of a specific eating disorder”<sup>22</sup>. Typically, the development and diagnosis of an eating disorder stems from the behaviors of disordered eating<sup>6</sup>. Internal and external factors affect disordered eating behaviors and attitudes, such as social influences and self-esteem<sup>6</sup>.

One’s health and nutrition statuses are important aspects and properties of the body<sup>23,24</sup>. Over the last ten years, there has been a significant increase in the numbers of disordered eating

and eating disorders among college students during their first year in college<sup>17</sup>. Students have several agendas to juggle on their own as well as adapting to taking care of themselves. Going away to college is a monumental step in the life of a young adult, and not everyone can adjust to the lifestyle change accordingly<sup>23,24</sup>. From the change in environment, the increase in schoolwork, and participating in social events, the beginning of the new college lifestyle is not one most have experienced in the past. As things begin to overlap and stress heightens, students tend to use coping mechanisms that place their bodies at risk of developing disordered eating. Subjective experiences begin to compile and lead to habits of disordered eating<sup>23,24</sup>. It has been implied that individuals who feel embarrassed by their bodies are more likely to engage in behaviors that alter their bodies in attempts to gain their idealistic hopes; disordered eating is usually the beginning actions that these individuals take<sup>23,24</sup>.

The development of unhealthy eating practices can be due to a variety of environmental and psychosocial factors<sup>6,16</sup>. College students have proven to be significantly consumed on the thin-ideal in society, and this leads to weight concerns that become psychosocial risks for disordered eating<sup>7,8</sup>. A college environment presents academic factors that contribute to the development of disordered eating. The involvement in campus organizations, residential status, and academic ability can cause individuals to think about partaking in unhealthy eating practices. A lower academic aptitude is possibly due to lack of preparation for college, leading to increased stress and unhealthy eating behaviors<sup>15</sup>. Body image and satisfaction are major psychological predictors of the development of disordered eating<sup>15,25</sup>. Weight gain that is seen in women is more likely to be dissatisfied with their bodies and have a stronger desire to change towards the idealized thinness<sup>15,25</sup>. This dissatisfaction leads to negative attitudes, increased stress and a greater likelihood that these individuals will associate their lifestyles with disordered eating<sup>15</sup>.

Body dissatisfaction is a major factor that influences and predicts the development of unhealthy eating and thoughts in adolescents<sup>3,18,19</sup>. This is referred to as the “negative subjective evaluation of one’s physical body, such as figure, weight, stomach and hips”<sup>26,27</sup>. Also, known as negative body image, it is thought to appear from the sociocultural thin idealization, particularly in Western cultures<sup>26,27</sup>. This factor causes individuals who are unsatisfied with their appearance more likely to partake in counterproductive weight loss behaviors and less likely to eat healthy<sup>3</sup>. Eating disorders in young women are seen to develop as young as eight years old in those with overall body dissatisfaction<sup>6</sup>. A large degree of body dissatisfaction is a central feature of disordered eating and has been identified as a major factor in patterns of dieting and maladaptive eating habits<sup>18,19</sup>. Body dissatisfaction is the first sign of the possible development of disordered eating because it typically leads to increased dieting, which leads to an increased risk for the onset and development of disordered eating pathology<sup>26,27</sup>. Dieting is frequently seen with body dissatisfaction since it is considered as an effective weight loss tool. However, it puts individuals at an increased risk for the onset of disordered eating habits due to reinforcements by others<sup>26,27</sup>. Since appearance is seen as an essential assessment for individuals in Western societies, body dissatisfaction leads to negative moods. Increased amounts of negative attitudes and feelings have been shown to increase the risk of disordered eating in an attempt to compensate for these unfavorable emotions<sup>26,27</sup>.

Self-esteem is also seen as a psychosocial factor that leads to the development of unhealthy eating practices among adolescents<sup>14,18,19</sup>. Individuals’ opinions of themselves are affected by their thoughts of other peoples’ perceptions of themselves<sup>6</sup>. Cooley and Toray discovered that a low level of self-esteem is correlated with the development of eating pathologies<sup>18,19</sup>. Low self-esteem has been seen to be related to depression and poor body image,

causing a negative relationship to be developed with eating behaviors<sup>18,19</sup>. Pamela Keel found in her study that lower scores of self-esteem significantly correlated with higher EAT-9 scores, showing that lower self-esteem leads to an increased display of disordered eating behaviors<sup>7,8</sup>. Individuals' self-esteem may be altered due to general social comparisons and body surveillance<sup>2,7,8</sup>. This relationship has reported leading to a greater number of students displaying disordered eating symptoms because of their appearance-related social comparison<sup>2</sup>.

Increased stress among college freshman might be one of the reasons that disordered eating is frequently seen among new college students, due to not knowing how to manage their stress<sup>5</sup>. Knowing other effects that cause college students to place their bodies at risk can be beneficial to diminish the practice of disordered eating. By examining freshmen's thoughts related to food, stress levels, pressures, and other related factors, we are able to recognize how the risk of disordered eating varies among students, and how these different factors can be targeted to help reduce the risks of disordered eating<sup>1,15</sup>.

## **Research Purpose**

Studies have shown that students entering college have heightened symptoms of disordered eating throughout the course of their first year<sup>3,4,5,13,18,19,28</sup>. In one study, over twenty-five percent of the freshmen students placed themselves on restrictive diets for the first time<sup>5</sup>. The risk is also heightened for freshmen students with divorced parents if they live by themselves, are pursuing a romantic relationship, and are likely to score under their stated educational levels<sup>10</sup>. With some college students meeting the criteria for Other Specified Feeding and Eating Disorders (OSFED), there are greater possibilities of disordered eating and eating disorders on college campuses<sup>29</sup>. The purpose of this survey study was to determine the

prevalence of disordered eating among college freshmen and investigate specific factors that impact this development.

### **Specific Aim**

To help identify the factors influencing the development of disordered eating among college freshmen so that future research can address these factors to help reduce the risks of developing disordered eating which in the long run may become a clinically diagnosed eating disorder.

### **Objectives**

The objectives of this study are to;

1. To determine if incoming freshmen display disordered eating patterns prior to entering college.
2. To measure the prevalence of disordered eating among college freshmen at Northern Illinois University.
3. To identify factors that are likely to lead to disordered eating among college freshmen.

### **Research Questions**

1. Do college freshmen attending Northern Illinois University (NIU) display disordered eating prior to attending college as measured by the Disordered Eating Attitude Scale (DEAS)?
2. To what extent do college freshmen attending Northern Illinois University engage in disordered eating as measured by the Disordered Eating Attitude Scale (DEAS)?



3. What are the factors that influence the development of disordered eating among college freshmen at Northern Illinois University as measured by the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale (PSPS)?

## **CHAPTER TWO**

### **REVIEW OF LITERATURE**

Disordered eating is defined as “a wide range of irregular eating behaviors that do not warrant a diagnosis of a specific eating disorder.”<sup>22</sup>. Throughout the United States, disordered eating appears to be increasing drastically. Between 1996 and 2006 the Healthcare Cost and Utilization Project reported that disordered eating hospitalizations rose by 18% for patients aged 12-19 years old and 19% for patients aged 19-30 years old<sup>29</sup>. This trend of an increase in disordered eating occurrences continued, however, by 2011 the demographics shifted to college students, specifically college freshmen<sup>21</sup>. The increased presence of disordered eating among college freshmen has been linked to behaviors and attitudes that are known to be risk factors<sup>4</sup>.

#### **Disordered Eating Prior to Entering College**

The actions of disordered eating in adolescence are often overlooked. This is an important area of research because disordered eating among adolescents is likely to transcend into the freshmen year at college. According to Lock, Reisel and Steiner’s study in 2001, high school students who display behaviors of disordered eating are more likely to develop greater disordered eating habits throughout their transition to college<sup>31</sup>. The researchers of this study examined the health risks of adolescents with disordered eating compared to adolescents without disordered eating. They theorized that disordered eating was a precursor to eating disorders developed in late adolescence. A sample of 1,769 high school students, ranging from 12-19 years

old participated. The goal of the research was to determine if disordered eating is displayed throughout early adolescence. The Juvenile Wellness and Health Survey-76 was used to screen for health behaviors that were related to mental health problems, eating and eating and dietary problems, and general health. The results indicated that 221 males and 163 females were identified as being at high risk for displaying behaviors of disordered eating. This represents about one-fifth of that study population with more males than females reporting disordered eating. These findings suggest that disordered eating is displayed among high school students and that it is likely to develop an eating disorder in later adolescence<sup>31</sup>.

Further support for the development of disordered eating among adolescent comes from Neumark-Sztainer who found that disordered eating behaviors begin to develop in adolescence and continue to be prevalent throughout young adults<sup>32</sup>. In this longitudinal study, each participant was examined using Project EAT-III for their eating, activity, and weight-related variables for ten years. The sample included 1,030 young men and 1,257 young women, with a third of the participants being around the age of 13 years old at baseline. At baseline, each high-school student at 31 public schools in Minnesota, participated in this survey and had their anthropometric measures reported. Then at the 10-year follow-up online or paper surveys were distributed to the participants to collect their trends in weight control behaviors. Dieting, unhealthy and extreme weight control behaviors, binge eating, sex, age, race/ethnicity, and SES were assessed. The results showed that about half of the female and a fourth of the male participants were dieting. This suggested that the prevalence of dieting while younger remained constant through their transition to young adulthood. A significant increase in extreme weight control behaviors was found from adolescence to young adulthood. Overall, this study concluded that the high occurrence of disordered eating in high-school students continues into college to a

greater extent. These individuals are seen to be at a higher risk for developing disordered eating and eating disorders in the future. There is no indication that all the subjects at follow-up were attending college. However, it may be deducted that if they were, it is likely that this trend of disordered eating would have transcended in their later years<sup>32</sup>.

It was found that one in four girls and one in ten boys have reported at least one symptom of disordered eating or weight control that has been severe enough to authorize greater evaluations by a professional<sup>33</sup>. Austin et al. examined if earlier identification and treatment of disordered eating and weight control behaviors could decrease and limit the risks and health consequences associated with disordered eating<sup>33</sup>. As a part of their cross-sectional study, the National Eating Disorders Screening Program (NEDSP) organized the first national eating disorders screening program for public high schools around the United States in 2000. Program information was sent to the membership list of national school professional organizations to encourage high schools to participate in the program. The participating high schools were provided with the screening questionnaires, educational materials on eating disorders, and technical assistance. The sample included 152 public, private, and parochial high schools from all over the nation, and 5,740 screening forms were collected. The EAT-26 was a significant portion of the screening tool, while it also included questions about vomiting and exercising for eating disorders. Girls were three to five times more likely than boys to score above the EAT-20 threshold, receiving a score of twenty or greater. Girls also reported heightened levels of vomiting to control their weight or to have been treated for an eating disorder in the past. The results showed that twenty-five percent of girls and eleven percent of boys had reported symptoms of weight control and disordered eating high enough to justify clinical evaluation and resources. These results propose that screening for eating disorders in high schools can identify

students who are at risk, students that would benefit from interventions, and students that are seeking help. Overall, this study showed that early interventions might help identify individuals at risk earlier and prevent long-term health consequences of weight control behaviors and disordered eating<sup>33</sup>.

It has recently been seen that attitudes and behaviors of disordered eating in teens and young adolescents are causing the prevalence and onset age of these disorders to change<sup>34</sup>. The prevalence has been seen to increase substantially, whereas the age of onset has become younger. Jones et al.'s cross-sectional study investigated a large school-based population in Ontario, Canada about the disturbed eating attitudes and their prevalence's<sup>34</sup>. Students from eighteen schools, from Hamilton, Ottawa, and the Toronto area, aged 12-18 years, constituted a sample size of 1,739. The subjects completed questionnaires that included three subscales of the Eating Disorder Inventory (EDI), the EAT-26, and the Diagnostic Survey for Eating Disorders (DSED). The EDI was used to assess the drive for thinness, body dissatisfaction, and bulimia. The results found that twenty-three percent of the participants were currently dieting to lose weight, and those who were on a diet were 3.3 times greater to partake in binge eating compared to those who were not dieting. As age increased, it was also found that dieting, binge eating and purging also significantly increased. The criteria from the EAT-26 revealed in that thirteen percent of the 12-14-year-olds and sixteen percent of the 15-18-year-olds obtained scores above the cut-off and were considered to have disordered eating. The overall results of this study show that dieting is associated with a heightened risk of binge eating and purging behaviors, especially in teens and young adults. This significant percentage of individuals displaying attitudes and behaviors of disordered eating suggests that these actions are going to continue to develop and increase throughout their adolescence<sup>34</sup>. Disordered eating is present in some individuals before entering

college. However, it is unsure if college freshmen begin to display the symptoms prior to or after their enrollment in college<sup>34</sup>.

### **Prevalence of Disordered Eating Among College Freshmen**

It is unclear as to who is really at risk for developing disordered eating throughout their freshmen year of college, but women have been known to have the highest risk. A primary focus to health professionals currently was to determine the frequency of eating disturbances among women, especially college students<sup>21</sup>. Approximately 1-3% of the young adult female population has eating disorders, which typically have been developed through the process of disordered eating<sup>35</sup>. The first year of college is a period of high risk for weight change among students<sup>35,36</sup>. College freshmen have been found to show significant changes in BMI, fat mass, weight, and rates of obesity or eating disorders during their first year while attending school. An eleven percent change in weight was seen in a group of female freshmen, compared to a two percent weight change in women not attending college. The greater percentage of weight change among college freshmen women has been associated with the difficult transition from high school to college, resulting in disordered eating throughout college freshmen<sup>36</sup>.

Jacobi et al. investigated subjects who might or might not be at risk for the development of disordered eating and eating disorders<sup>35</sup>. The researchers investigated the potential risk factors for the onset of disordered eating, and examined the interactions between them over three years, with assessments taken at year 1, 2, and 3. Two-hundred-thirty-six college women from San Diego and San Francisco, ages 18-30 years old, were recruited to participate in the study. Among the participants, the mean body mass index was 23.7. To help determine high-risk status, the Weight Concern Scale (WCS) was used. Subjects were asked about their weight and shape, fear

of gaining weight, last time on a diet, importance of weight, and feelings of fatness. A majority of these potential risk factors were taken at baseline, 1-, 2-, 3-year follow-ups. College-aged women, particularly freshmen, were seen as the high-risk population due to their major concerns about weight, height, and shape. The researchers discovered that about twenty-five percent of the women in this study had concerns about weight, height, and shape. These concerns placed them at higher risk for development of disordered eating habits, and ten percent of developing a full-syndrome eating disorder. It was also found that there was an eleven percent onset rate of full eating disorders or disordered eating (subthreshold eating disorders), which was consistent with the ten to twelve percent risk factor rate that has been seen in adolescents<sup>35</sup>.

In another study which examined a diverse sample of college freshmen, West and Barrack evaluated the prevalence of disordered eating among the college freshmen<sup>17</sup>. A sample of 106 male and female was studied. The study subjects completed a survey that focused on sports participation history, dietary patterns, and demographic information. The Eating Disorder Examination Questionnaire was also used to assess weight concern, shape concern, eating concern, and dietary restraint. The results found that students who were trying to lose weight displayed higher scores in the weight, shape, eating concern, and dietary restraint subcategories. The strongest predictor of weight, shape, eating concern and dietary restraint was the desire to lose weight. The findings of this study show that a significant number of college freshmen are currently engaging in disordered eating<sup>17</sup>. Compared to West and Barrack's study, this research study focused more on factors, such as stress and body dissatisfaction, that led to the onset of disordered eating upon freshmen students entering college. By focusing on these factors, it helped determine if there were specific aspects that were relevant to most college freshmen and the extent to which they influence the development of disordered eating upon entering college.

Eric Cooley and Tamina Toray examined the eating behaviors and attitudes of college freshmen at the beginning of the year and later assessed the students to determine if they developed any symptoms of disordered eating<sup>18</sup>. The study began with 225 college freshmen, but only 106 of the original students were assessed seven months later. The participants were recruited from mandatory residence hall meetings at the beginning of the school year, and eighty-six percent of them were 18 years old at the initial assessment. It was believed that only a small amount of the college freshmen would fit the criteria for disordered eating; however, a larger number than expected exhibited behaviors of disordered eating. The Restraint Scale and the Bulimia Scale were used to measure and assess eating pathology. Body mass index (BMI), figure dissatisfaction, Profile of the Mood States, The Situational Appetite Measure, and alcohol use were also assessed. The results showed that the participants had a mean BMI of 22.87, but ninety-four percent of the women wished they were of lower weight or BMI. There was a difference of 14.56 pounds in the actual and ideal weights of the individuals. At the seven-month reassessment, seventy-two percent of the people had either gained or lost weight. Overall, this research showed that the level of eating and diet pathologies in college freshmen women were stable throughout their first year of college. Women who were more interested in losing weight were seen as more dissatisfied with their figure and were more sensitive to others' opinions. This obsession with weight indicated that they were more likely to lose control of their normal eating habits, and lead to habits of disordered eating<sup>18</sup>.

Mintz and Betz looked at the prevalence and correlates of disordered eating behaviors among undergraduate women<sup>21</sup>. A sample of 643 undergraduate women was used to measure weight management habits, body image, self-esteem, and degree of endorsement of sociocultural norms regarding thinness. Groups of subjects were tested for about thirty minutes, presenting the



Weight Management, Eating, and Exercise Habits Questionnaire first, and then the supplemental questionnaires given after. Results showed a high prevalence of dieting and bingeing behaviors among the college women, and sixty-one percent of them were classified as having some form of a disordered eating problem, either chronic dieting, bingeing or purging, or subthreshold bulimia. Only thirty-three percent of the participants showed having normal eating habits. Fifty-four percent of the sample engaged in dieting behaviors every day. As shown in this study, dieting and disordered eating behaviors are very common, leading to over seventy-five percent of the women reporting that they consistently dieted. Overall this showed that college women worry about their weight, and engage in unhealthy disordered eating behaviors to maintain or lower their weight to what they believe it should be<sup>21</sup>.

The changes in eating disorder symptoms in undergraduate women were studied by Berg, Frazier, and Sherr<sup>14</sup>. The purpose of their study was to identify and understand the relationship between changes in eating disorder symptoms and risk factors by assessing changes over time. One-hundred eighty-six participants were recruited from psychology courses to complete questionnaires at two time periods: one within the first month of the semester and a second during the last month of the semester. Two cohorts completed the questionnaires at two different time periods. To identify and understand these relationships, the questionnaires were comprised of a few subscales of the Eating Disorder Inventory (EDI), the Eating Disorder Diagnostic Scale, the Center for Epidemiologic Studies Depression Scale, and the Academic Stress Scale. Throughout the two time periods, the most expressed behaviors were non-purging behaviors of excessive exercising and fasting. The results showed that eating disorder symptoms were seen among forty-nine percent of the sample, where they displayed their behaviors at least once a week. The large percentage of undergraduate females reporting binge eating and compensatory

behaviors in this study proves that there is a high prevalence of these behaviors throughout college campuses and that disordered eating is becoming a more serious issue<sup>14</sup>.

White researched if the use of unhealthy weight control methods and disordered eating by undergraduate college students increased over a thirteen-year period<sup>29</sup>. Three sample surveys from three separate years were collected to develop more information on the trends related to disordered eating. In 1995, a sample of one-thousand students received mailed packets containing a cover letter and three questionnaires that composed of the survey. Two weeks later a reminder postcard was sent out to those who had not responded yet. A total of four hundred and ninety-three undergraduate students completed the survey and had the opportunity to enroll in a drawing to win a \$25 gift card. In 2002, the same procedure was sent out to one-thousand-five-hundred students, resulting in the completion of the survey by two-hundred and seventy-two students. However, no incentive was provided this time. Again in 2008, a sample of three-thousand students was emailed a web-based survey and received reminder emails three weeks later. A total of six hundred forty-one students completed the survey, and all received a \$5 gift certificate to the campus bookstore. The Weight Management Questionnaire (WMQ) composed most the survey. The student data from the three years were all compared to each other, and it was found that significantly greater number of females presented eating disorder behaviors in 2008 compared to those in 1995 and 2002. In both genders, it was seen that overall the number of students displaying disordered eating behaviors had greatly increased throughout the years. These results showed that the significant increase in disordered eating behaviors was followed by an increase in the use of unhealthy weight control methods, specifically adhering to a particular diet for weight loss<sup>29</sup>.

### **Factors that influence the development of disordered eating among college freshmen**

Multiple studies<sup>4,5,16,20</sup> aim to identify the factors that influence the development of disordered eating among college students, especially freshmen. For example, Striegel-Moore's study aimed to identify factors related to the development of disordered eating, or worsening of it, over an academic school year<sup>5</sup>. At baseline, questionnaires were administered to 1,040 students (representing about seventy-five percent of the freshmen class), and 546 males and 403 females at the follow-up. The follow-up group represented about seventy-one percent of the total freshmen class. Body weight, body image, symptoms of disordered eating, perfectionism and ineffectiveness, work and family orientation, and perceived stress were measured using different questionnaires and instruments. The initial questionnaire was provided in a packet to all freshmen at the beginning of the year, and the students were able to drop off their completed surveys in deposit boxes in their dorms. The follow-up survey was provided to the students in their campus mailboxes four weeks before final exams at the end of the school year. A great number of students developed disordered eating throughout the year, and those who already exemplified it also worsened. Worsened behaviors of disordered eating were seen to be associated with increased negative feelings about weight, attractiveness, high stress, and weight dissatisfaction. The results showed that sixty-four percent of the females were significantly more likely than males to have been on a diet, specifically a weight-loss diet, prior to college. Females that didn't have a history of dieting at the beginning of their freshmen year were more likely to report behaviors of disordered eating by the end of the year. About one-fourth of the freshmen class had put themselves on some sort of diet, or dieting trend, by the end of the school year. The worsening of disordered eating was associated with high perceived stress, an increase in sense of ineffectiveness, and an increase in negative feelings about weight. Women who viewed their

freshmen year as more stressful also had a greater increase in the development of disordered eating habits. Individuals that felt they had a great need to control their weight and improve their feelings about their body image were more likely to engage in increased behaviors of disordered eating. The current research study helped fill the gap in knowledge in the understanding of certain factors that lead to the development of disordered eating in college freshmen, and determined that there was a relationship among these variables<sup>5</sup>.

It has been seen that the transition to college is a major risk factor for the development of disordered eating<sup>4</sup>. Vohs et al.'s study showed that this transition was likely to cause college freshmen to engage in disordered eating and increased dieting frequency than in the past<sup>4</sup>. These researchers used a longitudinal study to examine this transition and changes in eating behaviors and related attitudes. A survey was provided to 342 women during the spring of their senior year of high school, and again in their first year at Dartmouth College. They examined the changes in body self-perception, eating related attitudes, and disordered eating classification. Participants increasingly rated their self-categorization after arriving at college, and more of them classified themselves as overweight than average. Most of them seemed to be more dissatisfied with their bodies among their freshmen year. Their dieting frequencies also greatly increased. The results show that the transition to college does cause freshmen to change their eating patterns, which usually lean towards disordered eating. Most experience significant changes in weight, body dissatisfaction, and changes in the EDI Drive for Thinness and Bulimia subscale scores<sup>4</sup>.

LaCaille looked at factors that lead to college students to engage in unhealthy eating patterns and weight change<sup>16</sup>. Forty-nine undergraduate students from a Midwestern university, ranging from age 18 to 22 years old, participated in this study. Six focus groups were conducted, containing three women and three men in each, and were asked in-depth questions related to

their current and past eating patterns; each focus group session was recorded and transcribed.

The factors that influenced individuals' desire to eat disorderly were motivation to eat healthy and exercise, self-control over consumption, self-regulatory processes, and effective time-management skills. The role of personality was also seen as a large contributing factor to the onset of disordered eating. Overall this study concluded that motivations and self-regulatory skills, along with the social and physical environment of college, are factors in which greater characteristics of disordered eating were seen<sup>16</sup>.

Alyson K. Zalta's longitudinal study investigated the influence of peer selection and socialization on the onset of disordered eating symptoms, specifically bulimic symptoms, in college students<sup>20</sup>. There were ninety-eight participants that had bulimic symptoms, self-esteem issues, perfectionism, and impulsivity. Peer influence was assessed by looking at different sets of peers over an extended period of time, and an online survey was conducted. Selected peers were seen to show greater bulimic symptoms due to socialization, self-esteem, and perfectionism<sup>20</sup>.

A study that explored the relationship among parental influence, peer norms, disordered eating intentions, and body esteem found that individuals have heightened intentions of disordered eating if they experience any of these three factors<sup>6</sup>. Giles, Helme, and Krcmar used a sample of 427 incoming college freshmen at a private university to examine this relationship<sup>6</sup>. During freshmen orientations, the study survey was completed by individuals while taking other surveys related to the transition and integration to college and perceptions about body image and beauty ideals. Body esteem, parent norms, and peer norms were the three variables that this study focused on, by including the Body-Esteem Scale for Adolescents and Adults, parent thinness norms, parent encouragement norms, parent communicative norms, and peer acceptability norms, peer thinness norms, and peer norms of prevalence in the study. Each item was measured

using a Likert-scale and all three measures had good reliability and overall consistency. Based on these items, the intentions of disordered eating were measured and analyzed to identify the types of behaviors individuals would engage in to achieve their body image and thinness goals. The results found that body esteem controlled the relationship between the various factors. This was seen to occur due to the relationship between perceived peer acceptability of disordered eating behaviors and disordered eating intentions. When dieting behaviors were encouraged by parents, it was found to lead to significantly more intentions to display disordered eating; this was also seen to be significantly related to body esteem. For those who had low body esteem, the results showed that individuals' parents' values of thinness and high perceived prevalence caused greater intentions of disordered eating<sup>6</sup>.

Gilbert and Meyer's seven-month cross-sectional, longitudinal study investigated the relationship among the fear of negative evaluation and restrictive eating attitudes<sup>37</sup>. The study also included tests to determine if eating attitudes could be predicted due to negative evaluation fears. One-hundred forty-three female students made up the sample that received the study survey during the week one and week thirty-three of the academic year. The questionnaire included the Fear of Negative Evaluation Scale (FNE), Rosenberg Self-Esteem Scale (RSE), Hospital Anxiety and Depression Scale (HADS), and three subscales of the Eating Disorder Inventory (EDI). The scores from the FNE showed that there was not a significant correlation between body dissatisfaction and bulimia. However, the results showed that along with increased depression, increases in bulimic behaviors were predicted with increased negative evaluation fears. Poor body-esteem was seen to predict significant increases in body dissatisfaction over time. It was concluded that there was a link between the level and type of restrictive eating attitudes and increased negative evaluation fears<sup>37</sup>.



## 7DEOHERQWLQXHG□

Jones et al., 2001	Prevalence of disturbed eating attitudes	Cross-sectional study of 1739 teenagers from Canada, aged 12-18 years old, data from EDI, EAT-26, and DSED.	23% currently dieting to lose weight; as age increased, dieting, binge eating and purging significantly increased; 13% of 12-14 year olds and 16% of 15-18 year olds EAT-26 scores were higher than the cut-off; dieting is associated with increased risk of disordered eating behaviors.	Identify additional risk factors for this population.  Develop screening tools for eating behaviors and attitudes for before entering middle school; target primary and secondary interventions.  Identify risk factors of this population.
Jacobi et al, 2011	Individuals at risk for eating disorders	Longitudinal cohort study of 236 women from San Diego and San Francisco, Weight Concern Scale (WCS) used	College-aged women were the high-risk population, 25% of women had concerns about weight and shape, 11% onset rate of full eating disorders, 10-12% risk factor rate in adolescents.	Identify risk factors and negative comments/attitudes about weight and shape.  Identify prevalence of depression in onset of eating disorders.
Cooley and Toray, 2001	Eating behaviors and attitudes of	106 college freshmen, Restraint scale and bulimia scale	94% wished their weight was lower, 72% gained or	Identify causes of poor body image and body dissatisfaction.

(Continued on following page)



Table 1. continued.

	college freshmen		lost weight over the year, women who were interested in losing weight were more dissatisfied with their shape and more sensitive to other's opinions.	
Mintz and Betz, 1988	Prevalence and correlates of disordered eating in undergraduate women	643 undergraduate women; Weight Management, Eating, and Exercise Habits Questionnaire	High prevalence of dieting and bingeing behaviors, 61% classified having some form of disordered eating, 33% showed normal eating habits, 75% reported consistently dieting.	Identify prevalence of normal eating habits in undergraduate women.  Determine if generalizable to all undergraduate students, not specifically freshmen and sophomores.
Stiegel-Moore et al., 1989	Identify factors related to the development of disordered eating.	946 college freshmen; body weight, body image, disordered eating symptoms, perfectionism and ineffectiveness, work and family orientation, perceived stress were measured	64% of females were significantly more likely than males to have been on a diet; about 1/4 of students placed themselves on a diet by the end of the academic year;	Recognize any relationships among these variables that lead to disordered eating.

(Continued on following page)

			high perceived stress, sense of ineffectiveness, increase in negative feelings.	
Vohs et al., 1999	Transition to college and its association with disordered eating.	Longitudinal study of 342 women during senior year of high school and freshmen year of college; body self-perception, eating related attitudes, disordered eating classification.	Most seemed to be more dissatisfied with their bodies during freshmen year, dieting frequencies greatly increased.	Other factors related to the transition to college and how they affect individuals; reasons for changes in eating patterns.
Giles et al., 2007	Relationships among factors related to increased disordered eating.	427 incoming college freshmen; body esteem, parent norms, peer norms; Body-Esteem Scale for Adolescents and Adults.	Body esteem controlled the relationship between the various factors.	Additional information on perceived peer acceptability and its impact on disordered eating.
Gilbert et al., 2005	Negative evaluation and restrictive eating attitudes.	Cross-sectional, longitudinal study of 143 female students; FNE, RSE, HADS, EDI.	Increased depression and negative evaluation fears caused increased bulimic behaviors.	Prevalence of other factors that may cause increased restrictive eating attitudes in college students.

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## CHAPTER THREE

### METHODS

#### Research Design

A cross-sectional study was conducted using three scales—the Disordered Eating Attitude Scale, Perceived Stress Scale and Perceived Sociocultural Pressure Scale. Participants completed the Disordered Eating Attitude Scale twice, where the DEAS-1 was used retrospectively and participants responded based on their eating attitudes and behaviors prior to coming to school. Participants then filled out responses using the same survey without any time lapse, which was labeled DEAS-2. This evaluated their eating attitudes and behaviors currently while attending Northern Illinois University. The DEAS-1 and DEAS-2 were used rather than a pre-DEAS and post-DEAS because there was no intervention or any time lapse between the administration of the two DEAS. Following the DEAS-1 and DEAS-2 the Perceived Stress Scale and the Perceived Sociocultural Pressure Scale were completed.

A survey allowed for students to provide their thoughts and feelings without identifying themselves, as well as permit the generalization from the sample to the wider college population. Many advantages came from using a survey design: the rapid turnaround in data collection, a minimal budget, mass communication, access to unique populations and identification of individuals is not necessary<sup>38,39</sup>. By identifying attributes of a large population from a small group of people, a general conclusion was made to apply it to the larger population. It is challenging and almost impossible to survey the entire population, so samples were taken to

obtain a variety of people represented in the population. Since the incoming freshman class at Northern Illinois University is large, consisting of 1,802 students, it was best to take a sample of the population and examine them to get a more accurate understanding of the data. Permission was obtained from the Institutional Review Board (IRB) at Northern Illinois University (NIU) prior to conducting this survey.

### **Study Population**

The population of this research study was the freshman class at Northern Illinois University, with approximately 2,000 students enrolled as freshmen. Potential respondents were obtained from the Division of Enrollment Management, Marketing and Communications (Appendix A and B). A mass email (Appendix A) was sent to all freshmen at NIU, which provided a sample that is representable to the overall population.

Inclusion and exclusion criteria was applied to the population. Individuals were excluded from the study if they were not a current student at NIU, not of freshmen standing, currently were diagnosed eating disorder or did not provide enough data. Inclusion factors such as being a current student at NIU, of freshmen standing, having perceived normal eating habit and not diagnosed with a clinical eating disorder were applied to the individuals who seek interest in the research study.

### **Recruitment and Sampling**

Recruitment began during the spring semester of 2018. The Division of Enrollment Management, Marketing and Communications was contacted through the Clearinghouse to obtain permission to send out mass emails to the entire freshmen population (Appendix A and

B). Emails were sent out to the freshmen class, asking them to engage in this research survey. In addition to sending emails, academic advisors in all colleges were contacted and met with to obtain the courses that are mainly ‘freshmen’ based (Appendix C). Additional meetings were set up with professors of freshmen courses to explain the study and obtain their permission to advertise this research study to the students (Appendix D). This allowed for the research project to reach out to more freshmen students and have direct communication with their professors and advisors. Professors were also invited to post the link on to their Blackboard pages, and were asked to offer extra credit or additional incentives within the different courses (Appendix C and D). In addition, the survey study was posted in the Monday announcements for multiple weeks (Appendix B). After the initial emails were sent out to the NIU freshmen class, a reminder email was sent out twice; after three and then six weeks’ interval (Appendices E and F), to these individuals to help increase the number of responses.

The sample consisted of a fraction of the population to represent the individuals within the community. Emails were sent to all currently enrolled freshmen at Northern Illinois University (Appendix B). The survey included all ethnic groups and majors of the freshmen class. Of the total freshmen, the expected sample was about six-hundred (Appendix G).

Individuals gave consent to partake in this research study. When they logged onto the survey website, they first saw a homepage with an informed consent form (Appendix G). On this page, it described the study, what they are about to do, any risks, and how their confidentiality will remain throughout the entire process. By proceeding on to the actual survey, the individuals provided their consent to be a part of the research study.

### **Pilot Testing of Instruments**

The survey was first tested on a smaller sample of Northern Illinois University students who were enrolled in the Nutrition and Dietetics Master's Program. These students were given a shortened version of the survey and asked to complete it to their best knowledge. The link to the study survey was also be provided to these students for them to complete it in their own time. By doing this, it showed how many students voluntarily answered the questions provided about stress factors, sociocultural pressures, and disordered eating. These students also provided feedback about their thoughts regarding the questions and formatting of the survey. This model allowed us to determine if the procedure of the questionnaire was successful or if there needed to be some improvement. The surveys that were used are standard validated surveys, which allowed for the overall pilot test to be an effective test for this research study. Testing was necessary to establish the validity of the instrument, which improved results in the future.

### **Procedure**

Once the approval from the International Review Board at Northern Illinois University was obtained, a pilot test of the instruments was conducted prior to the study in March of 2018 (Appendix H). In the middle of March of 2018, mass emails were sent out to the entire freshmen class at Norther Illinois University. Professors teaching freshmen classes were also contacted and met with to provide the link to the study survey to their courses and students. The Monday announcements were contacted to go through the necessary steps to advertise the research study on this platform.

The form of data collection was via internet surveys on Qualtrics. Two reminder emails were sent out the students, in three-week and six-week intervals. The survey was accessible on

any form of technology; cell phones, laptops, etcetera, which made it easier for students to fill it out whenever and wherever they are. The data was collected in the middle of the spring 2018 semester to get a more accurate generalization of students' eating habits and thoughts. The data collection took place for eight weeks. Approximately 1,000 surveys were sent out. From this, six-hundred survey responses were expected to have a response rate of at least sixty-percent. However, 263 responses were received resulting in a response rate of 26%.

### **Data Collection and Description of Instruments**

The survey instrument was a questionnaire to be administered online via Qualtrics to the freshmen students on factors that may lead to disordered eating in college freshmen. Qualtrics allowed for the results to be reported back to the researcher and descriptive statistics to be provided for further analysis. The Disordered Eating Attitude Scale (DEAS), the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale were used to compile one survey (Appendix G).

The Disordered Eating Attitude Scale (DEAS) was included in the survey. This instrumentation evaluates disordered eating attitudes in both clinical and nonclinical populations. This scale has twenty-five questions, and five subscales ranked on a Likert scale. It helped show the broad ranges of eating attitudes while including beliefs, thoughts, feelings, behaviors, and relationships with food<sup>40,41,42</sup>. These are measured through the DEAS subscales of relationship with food, concerns about food and weight gain, restrictive and compensatory practices, feelings towards eating, and idea of normal eating. The DEAS scale has the adequate internal consistent reliability, with  $r=0.87$ , that showed that this scale was great to use in this study because of its strong concordance<sup>40, 41,42</sup>. The scale has favorable internal consistency and known-groups

validities, allowing it to cover a large area of eating attitudes, and would be a useful addition to this study along with the other two instruments. Different aspects of eating attitudes are incorporated to allow for these points to be measured by the validated questionnaire<sup>40,41,42</sup>. Striegel-Moore used this scale in his research study to help identify factors that are related to the developed or worsening of disordered eating<sup>5</sup>. It helped incorporate critical behavior habits that were associated with disordered eating and attitudes associated with it<sup>5</sup>.

In addition to the DEAS, the Perceived Stress Scale (PSS) was used in the survey. The PSS is composed of ten questions, and the scores are obtained by reversing responses to the four positively stated items and summing up all the scale items scores<sup>43,44,45</sup>. Each question is rated on a five-point scale, from never to almost always, and the results are totaled to show that higher scores indicate more perceived stress<sup>43,44</sup>. This scale is widely used to measure the perception of stress, and to what degree certain situations in individuals' lives are estimated as stressful. The items within this scale are easy to understand, and the response options are easy to grasp, allowing for the questions to ask about feelings and thoughts throughout the past month<sup>43</sup>. Evidence for the validity of this scale was seen in these studies through higher PSS scores being associated with greater vulnerability to stressful life event-elicited depressive symptoms and diminished health status<sup>43,44</sup>. Excellent test-retest reliability is seen from this scale by having an  $r=0.84$ <sup>43</sup>. Bekker et al. included this scale in their research study to determine the relationship between eating disorders, gender role stress, and other causes of stress<sup>44</sup>. The results of their study, based off the PSS, reported that women with eating disorders had significantly higher scores of general stress due to recent experiences<sup>44</sup>. The use of the PSS was also seen in Baer's study looking at the relationship between mindfulness practice and stress reduction<sup>45</sup>. Findings showed that increased rates of overwhelming, uncontrollable events were associated



with more perceived stress. The addition of mindful meditation practices allowed for a decrease in perceived stress to be seen, based on the results from the PSS<sup>45</sup>. This scale provided insight to this research project by allowing us to see how stress-related events impacted one's health and eating behaviors.

The Perceived Sociocultural Pressure Scale (PSPS) was the final scale used to measure the pressures that college students receive from society. There is a total of ten items, where the first eight questions are related to the pressures to be thin from family, friends, and media, and the last two questions focus on weight or body shape and the teasing that is related to it. These statements are each rated along a Likert scale, ranging from one (none, strongly disagree) to five (a lot, strongly agree). Each statement is averaged to produce a total score. The higher the score, the higher the correlation with a greater perceived pressure to be thin. This scale has shown good test-retest reliability, with a reliability score of  $r=0.93$  and  $\alpha=0.88$ , and good predictive validity has also been seen<sup>23,24,26,27,46</sup>. Stice and Whitenton's study investigating the risk factors associated with body dissatisfaction in adolescent girls included this scale into their study<sup>27</sup>. It allowed for the researchers to determine that the pressure to be thin was the most influential factor that leads to the onset of body dissatisfaction in their sample. There was a statistical significance in the risk for onset of body dissatisfaction differences and a large effect size to be seen<sup>27</sup>. By using this scale, the pressure that is put on individuals from society, family, and friends were able to be measured and applied to the results of the study.

## **Measures and Outcomes**

To assess the factors that may lead to the onset of disordered eating, several items were measured. The survey questionnaire included: disordered eating behaviors and attitudes,

perceived stress, and perceived sociocultural pressures. Students were asked for their height, weight, age, gender, major, and ethnicity.

The DEAS was used to assess disordered eating habits amongst the college freshmen. This is a twenty-five-item questionnaire with subscales ranked on a Likert scale of one to five (Appendix G). The total scores of the questions range from thirty-seven to one-hundred-ninety, where students with higher scores indicate more disordered eating attitudes<sup>40,41,42</sup>. The subscales of the DEAS have established validity and reliability and were included in the results and data analyses<sup>41</sup>.

Individuals' perceived stress is measured by a scale (PSS) that is consisted of a ten-item questionnaire, focusing on recently experienced stress within the past two months<sup>43,44</sup>. The validity and reliability of this scale have been noted as good. Participants were asked to answer items by rating one of four categories: always/all the time to never<sup>43,44</sup>. Each question is totaled, where scores can range from zero to forty points<sup>47</sup>. The sum score indicates the amount of perceived stress; the higher the score, the more perceived stress<sup>43</sup>. A score of zero to thirteen indicates low stress, and a score of fourteen to twenty-six indicates moderate perceived stress. Whereas a total score between twenty-seven and forty is high perceived stress<sup>43,47</sup>. Scores around a total of thirteen points are seen as an average score<sup>43</sup>.

The Perceived Sociocultural Pressure Scale (PSPS) was used to measure societal pressures that are placed on college freshmen. This ten-item questionnaire focuses on the pressures to be thin, weight and body shape<sup>23,24,46</sup>. Eight items that target 'thin body' and 'weight loss,' while the last two items target family and friends teasing<sup>46</sup>. This measure proves good reliability and predictive validity<sup>46</sup>. Response scores are averaged to form a total score, ranging from one to five. The students with higher scores are seen to have an increased perceived

pressure to be thin<sup>23,24,27,46</sup>. Overall, the survey questionnaire were composed of seventy questions from the three survey instruments—DEAS, PSS, PSPS—in addition to questions related to age, gender, ethnicity, major, height, and weight.

### Data Analyses

To interpret the results of the study, the surveys provided to freshmen students at the middle of the year were analyzed. Data was exported from Qualtrics and was analyzed using SPSS version 24.0.0.0. Descriptive statistics, paired samples t-tests, multivariate regressions, chi squared, and Pearson's and Spearman's Correlations were administered. Paired samples t-test were used to determine if students experienced disordered eating before coming to college or if they developed it during their college experience during their freshman year. Perceived stress while attending college was also measured and analyzed using a multivariate regressions and correlations. Multivariate regressions were used to analyze which factors influenced the development of disordered eating among freshmen students at Northern Illinois University.

**Table 2**

**Summary of Research Questions and Variables**

<b>Research Questions</b>	<b>Types of Variables</b>	<b>Statistics</b>
1. Do college freshmen attending Northern Illinois University display disordered eating prior to attending college as measured by the Disordered Eating Attitude Scale.	Exposure: Eating Disorder Symptoms, Risk of Disordered Eating Development  Outcomes: Categorical variables; Gender, Age, Major	Paired samples <i>t</i> -test, Descriptive statistics, ANOVA

(Continued on following page)

Table 2. continued.

	Continuous variables: Height, Weight, BMI	
2. To what extent do college freshmen attending Northern Illinois University engage in disordered eating as measured by the Disordered Eating Attitude Scale (DEAS).	Exposure: Relationship with Food, Concerns About Food and Weight Gain, Restrictive and Compensatory Practices, Feeling Towards Eating, Idea of Normal Eating  Outcomes: Categorical Variables; Gender, Age, Major  Continuous Variables; Height, Weight, BMI	Paired samples <i>t</i> -test, Descriptive statistics, ANOVA
3. What are the factors that influence the development of disordered eating among college freshmen at Northern Illinois University as measured by the Perceived Stress Scale (PSS) and the Perceived Sociocultural Pressure Scale.	Exposure: Stress, Sociocultural Pressures, Perceived Stress  Outcomes: Categorical Variables; Pressures to Be Thin, Weight Loss, Perceived Sociocultural Stress, Family and Friends Teasing  Continuous Variables; Height, Weight, BMI	Descriptive statistics, Multivariate Regression, Pearson's Correlations, Spearman's Correlations, Crosstabs, Chi Square

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**Data Safety and Monitoring**

To ensure anonymity and confidentiality of the data, the data obtained was kept in a locked cabinet that is only accessible by the researcher. Group data was used, meaning that there was not be any individual results. Students did not have to provide any personal information throughout the survey. To enter the drawing, participants were guided to a new survey link to provide their emailed addresses. This ensured that the students personal email addresses were not linked to their survey responses. Those who did not wish to enter the gift card drawing did not provide any information. The data from this research study will be kept for five years post research and publication of the survey study.

**Risks and Benefits**

There are no risks that are involved with this research study, rather it provided benefits to the participants and the population. This survey study identified those who are at risk for disordered eating and can allow for preventative help to be developed and applied to these students. Individuals were able to recognize behaviors of disordered eating and know when they or someone else needs to receive help. Research continues to show how certain actions and events influence college freshmen from developing stress factors and how their behaviors change as they adapt to a new lifestyle on college campuses. This study also provided specific stress factors that influenced college freshmen to change their eating behaviors, as well as their thoughts on eating. College students, specifically freshmen, benefit from the results of this study since individuals who are at risk for developing disordered eating can be identified, which allows for preventative help to be developed and applied. The extended results also provided a source of assistance and guidance for a better adjustment to college throughout their freshmen year.

Awareness and knowledge about disordered eating can be increased throughout campus, allowing students to have a greater understanding of the prevalence of disordered eating amongst their college campus. Some participants might have felt uncomfortable answering some of the questions throughout the research study, but they had the option to not complete the study if they did not feel comfortable doing so.

All participants who completed the survey and study were also entered into a raffle to win gift cards as an incentive of participating in this research. At the end of the survey, the participants were guided to another link to provide an email address if they wish to enter the drawing. Ten twenty-five-dollar American Express gift cards were raffled off to the participants who completed the entire research study and surveys. These cards were chosen since they can be used almost anywhere by the raffle winners.

### **Summary of Chapter Three**

This cross-sectional survey study used the Disordered Eating Attitude Scale (DEAS), the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale (PSPS) to measure factors that lead to the onset of disordered eating among college freshmen. An online survey was distributed throughout the freshmen class at Northern Illinois University during the spring semester of 2018. The Disordered Eating Attitude Scale was used to assess individual's eating attitudes about disordered eating. Five subscales were included to measure individuals' responses—relationship with food, concern with food and weight gain, restrictive and compensatory behaviors, feeling towards eating and the idea of normal eating<sup>40,41,42</sup>. The Perceived Stress Scale was used to measure the degree of stress the freshmen students experience in certain environments and situations and how they respond to this pressure<sup>43,44,45</sup>. In addition,

the Perceived Sociocultural Pressure Scale was used to determine the pressures that college freshmen experience due to society and cultures. The first part of the scale focused on the pressure to be thin, while the end of the scale looked at concerns with body weight and shape<sup>23,24,26,27,46</sup>.

### **Budget**

\$25 American Express gift card for participant winners (10)	\$250.00
Use of NIU computer labs	Free
Total	\$250.00

### **Budget Justification**

Research materials: One NIU computer lab was needed to receive the results, analyze the data, and compute the findings. This computer lab was obtainable in any of the buildings on campus.

Incentives: Incentives were provided to those who complete the study. Participants who completed the whole survey and study were entered in a drawing to win a \$25 American Express gift card. American Express gift cards were used since they can be used anywhere, allowing the participants to have a choice as to how they want to spend it. Ten \$25 gift cards (\$250.00) provided five participants a reward for completing the study, and gave all participants a greater desire to partake in the whole.

## **CHAPTER FOUR**

### **RESULTS**

The research study examined whether college students at Northern Illinois University developed disordered eating during their freshmen year or perpetuated an existing pattern of disordered eating prior to attending college. The study examined any changes that occurred based on their eating attitudes and habits prior to coming to college and during college. In addition, specific factors, like stress and sociocultural factors, were examined to determine the impact of the development of disordered eating among college freshmen. The following research questions were addressed:

1. Do college freshmen attending Northern Illinois University display disordered eating prior to attending college as measured by the Disordered Eating Attitude Scale (DEAS)?
2. To what extent do college freshmen attending Northern Illinois University engage in disordered eating as measured by the Disordered Eating Attitude Scale (DEAS)?
3. What are the factors that influence the development of disordered eating among college freshmen at Northern Illinois University as measured by the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale (PSPS)?

Data were analyzed using SPSS version 24.0 for Windows Statistical Software (SPSS Inc., Chicago, IL, USA). Paired samples *t*-tests were used to determine if there were significant differences in disordered eating behaviors and attitudes in college freshmen prior to and while attending Northern Illinois University. One-way ANOVAs were used to assess if there was a



significant difference between the DEAS scores and gender. Spearman's Correlations were used for categorical variables—gender, age, and major (health versus non-health majors)—to determine the relationship perceived stress and sociocultural pressures students were experiencing. Pearson's Correlations were used for continuous variables; height and weight to determine if they influenced the scores related to perceived stress and sociocultural pressures. Chi-square and multivariate regression analyses were used to determine how specific variables predicted perceived stress and sociocultural factors. Descriptive statistics such as means, standard deviations, frequencies and percentages for demographic characteristics of the population were determined. The significance level adopted was 0.05 for all tests.

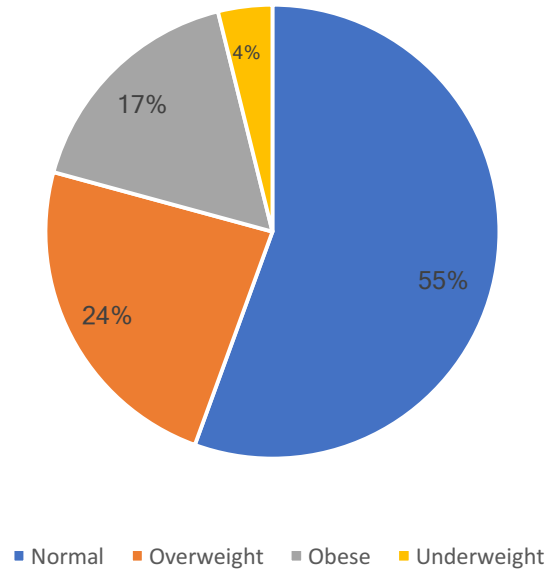
### **Demographic Characteristics**

All the participants were in their first year of college, being of freshmen standing. The original sample consisted of 263 subjects. Data was omitted based on the inclusion and exclusion criteria which were provided in chapter three. In addition, there were missing data from 30 subjects. This led to an overall sample size of 207 participants. The DEAS contained seven more participants compared to the second two scales, due to participants not completing the full survey.

Table 3 shows the demographic characteristics of the sample. There were 63 (27%) health majors and 140 (60.1%) non-health majors. Information for freshmen students major was missing for 30 (12.9%). A health major was classified as anyone majoring in audiology, communicative disorders, physical therapy, speech language pathology, deafness, family-child development, fashion, hospitality, human development and family sciences, medical laboratory sciences, nutrition and dietetics, public health, health sciences, rehabilitation and disability

services, nursing, biological sciences, and psychology. The students were divided into age groups, where 144 (61.8%) were ages 18-19 and 62 (26.6%) were 20 years or older; 27 (11.6%) did not report their age. The mean age of the study population was  $20.19 \pm 4.53$  years old, and 158 (67.8%) were female, 47 (20.2%) were male, and 2 (0.9%) preferred to self-describe. Twenty-six (11.1%) of the participants omitted specifying their data for gender. The average weight of the study population was  $157.96 \pm 40.01$  pounds and the average height was  $65.97 \pm 4.19$  inches. Height and weight were used to determine Body Mass Index, which was measured by weight in kilograms divided by height in meters squared. The average BMI of the study population was  $25.30 \pm 0.89$ , which indicates overweight, however the majority ( $n = 115$ ) were classified as normal weight. Figure 1 shows the BMI distribution of the participants. BMI was classified by weight category to allow for further data analyses. It provided further discussion for the results relate to the Perceived Sociocultural Pressure Scale, specifically in relation to thinness. The figure below shows that most of the students were classified as a normal BMI of 18.5-25.

### BMI Classifications of Study Participants



**Figure 1: BMI Classifications of Study Participants**

**Table 3**  
**Demographic Characteristics**

Variables	n (%)	Mean $\pm$ SD
Gender		
Male	47 (22.7)	
Female	158 (76.3)	
Prefer to Self-Describe	2 (1.0)	
Ethnicity		
White/Caucasian	122 (52.4)	
African American	27 (11.2)	
Hispanic	36 (15.5)	
Asian American	12 (5.2)	
Native American	1 (0.4)	
Other	11 (4.7)	
Age		20.19 $\pm$ 4.53
18-19	144 (61.8)	
$\geq$ 20	62 (26.6)	
Majors		
Health	63 (27)	
Non-Health	140 (60.1)	
Height (in)	207 (100)	65.97 $\pm$ 4.19
Weight (lbs)	207 (100)	157.96 $\pm$ 40.01

## Research Questions

*Research question 1: Do college freshmen attending Northern Illinois University display disordered eating prior to attending college as measured by the Disordered Eating Attitude Scale (DEAS)?*

*Research question 2: To what extent do college freshmen attending Northern Illinois University engage in disordered eating as measured by the Disordered Eating Attitude Scale (DEAS)?*

Table 4 indicates the results for the DEAS-1 and DEAS-2 for both research questions one and two. The DEAS has a minimum possible score of 37 and a maximum possible score of 190, where an individual's score correlates with their eating attitude. The higher the score, the worse the eating attitude<sup>40,41,42</sup>.

The overall DEAS scores are shown in Table 4. A total of 214 responses were found for the DEAS-1 and DEAS-2, unlike the other two scales. Seven participants were found to complete both the DEAS-1 and DEAS-2, however did not complete the rest of the scales. Cronbach's alpha was found to be 0.82 for the DEAS-1 and 0.80 for the DEAS-2. Both Cronbach's alphas show that the DEAS-1 and DEAS-2 have high reliability in the current study. A paired samples t-test was conducted to evaluate whether the mean of the difference between the DEAS-1 and DEAS-2 scores was significantly different from zero. This would evaluate whether college freshmen at Northern Illinois University displayed disordered eating prior to and while attending college. The results showed that the Disordered Eating Attitude Scale (DEAS) prior to coming to college ( $M = 80.08$ ,  $SD = 18.65$ ) was similar to the results of the DEAS while attending college ( $M = 81.18$ ,  $SD = 20.14$ ) as measured by the DEAS-2. This was further

supported by paired samples t-test which indicated that DEAS scores prior to coming to college and while attending college were significantly related ( $r = 0.802, p = 0.000$ ).

**Table 4**  
**Disordered Eating Attitude Scale Paired Samples T-Test**

	Mean $\pm$ SD	n	Correlation	Significance
DEAS-1	80.08 $\pm$ 18.65	214		
DEAS-2	81.18 $\pm$ 20.14	214		
DEAS-1 & DEAS-2		214	0.802	0.000***

P <0.001\*\*\*

Table 5 shows the DEAS subscale scores for the DEAS-1 and DEAS-2. Subscale 1 examined the relationship with food, by evaluating individuals' attitudes towards food, how they deal with food in terms of food control, food refusal, guilt, anger, desire and shame. Subscale 2 examined the concerns about eating and body weight gain. This was evaluated by individuals' concerns about calories, intake control, obsessive thoughts and weight gain. Subscale 3 examined restrictive and compensatory practices by evaluating the restriction of food and calories and attitudes where individuals could compensate large or uncontrolled food intakes. Subscale 4 was related to feelings towards foods, where the feelings concerning pleasure and food memories and normalized eating to individuals were evaluated. Subscale 5 was related to the idea of normal eating, and was evaluated by any rigid nutrition concepts and beliefs individuals may have<sup>42</sup>.

A paired samples t-test was also conducted on the sub-scales of the DEAS to evaluate college freshmen's eating habits prior to and while attending college (Table 5). The results indicated that the mean DEAS-1 subscale 1, relationship with food, ( $M = 24.88, SD = 9.51$ ) was slightly higher than the mean for the DEAS-2 subscale 1 ( $M = 23.01, SD = 9.84$ ),  $P < 0.001$ . They

also indicated that the mean of the DEAS-1 subscale idea of normal eating ( $M = 33.56$ ,  $SD = 7.78$ ) was lower than the DEAS-2 subscale ( $M = 35.46$ ,  $SD = 7.75$ ),  $P < 0.001$ . The mean of the DEAS-1 subscale restrictive and compensatory practices ( $M = 8.52$ ,  $SD = 4.97$ ) was higher than the mean of the DEAS-2 subscale ( $M = 8.09$ ,  $SD = 4.62$ ),  $P < 0.05$ . There was a statistical difference among the relationship with food, restrictive and compensatory practices and idea of normal eating.

**Table 5**  
**Disordered Eating Attitude Scale Subscales**

<b>Subscales</b>	<b>Item Number</b>	<b>DEAS-1 Mean <math>\pm</math> SD</b>	<b>DEAS-2 Mean <math>\pm</math> SD</b>	<b>Correlations</b>	<b>P-value</b>
Relationship with food	8, 10, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25	24.88 $\pm$ 9.51	23.01 $\pm$ 9.84	0.853	0.000***
Concerns about food and weight gain	5, 14, 15, 16	8.38 $\pm$ 3.78	8.67 $\pm$ 4.14	0.759	0.126
Restrictive and compensatory practices	4, 6, 7, 12	8.52 $\pm$ 4.97	8.09 $\pm$ 4.62	0.833	0.028*
Feeling toward eating	2, 3, 9	4.62 $\pm$ 2.48	4.50 $\pm$ 2.75	0.518	0.489
Idea of normal eating	1a, b, c and 11	33.56 $\pm$ 7.78	35.46 $\pm$ 7.75	0.715	0.000***

$P < 0.05^*$ ,  $P < 0.01^{**}$ ,  $P < 0.001^{***}$

Further analyses of the DEAS results were conducted to determine if there were significant differences between the DEAS-1 and DEAS-2 scores based on gender. A one-way ANOVA was performed to assess whether the means of the DEAS-1 and DEAS-2 scores were significantly different among the genders. Table 6 below shows the comparison of the DEAS

scores to gender. The independent variable, gender, included three categories: male, female, and prefer to self-describe. The dependent variable was the DEAS scores from prior to and during college. The ANOVA for the DEAS-1 scores were significant,  $F(47, 158, 2) = 2.89, P = 0.05$ .

**Table 6**  
**Comparison of DEAS Scores to Gender**

Variable	n (%)	M ± SD	F-value	P-value
DEAS-1			2.89	0.05*
Male	47 (22.7)	74.60 ± 16.01		
Female	158 (76.3)	81.35 ± 19.04		
Prefer to Self-Describe	2 (1.0)	92.50 ± 33.23		
DEAS-2			0.92	0.40
Male	47 (22.7)	78.26 ± 18.69		
Female	158 (76.3)	82.80 ± 20.16		
Prefer to Self-Describe	2 (1.0)	81.50 ± 17.67		

P < 0.05\*

*Research question 3: What are the factors that influence the development of disordered eating among college freshmen at Northern Illinois University as measured by the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale (PSPS)?*

Table 7 indicates the results for the Perceived Stress Scale (PSS). The PSS has a minimum possible score of 0 and a possible maximum score of 40. The higher the score, the increased stress an individual was experiencing. Stress scores are broken up into three categories: low stress (score of 0-13), moderate stress (score 14-26), and high stress (27-40)<sup>43,44,45</sup>. A Cronbach's alpha of 0.87 was found for the PSS, indicating that the items have high internal consistency.



Of the 207 participants, the mean PSS score was  $21.26 \pm 7.18$ , with a minimum score of 5.00 and a maximum score of 39.00. The overall PSS scores and the subscale scores are shown in Table 7 below. Results indicated that 31 participants (14.9%) were classified to display low perceived stress, 126 participants (60.6%) in the moderate category, and 51 participants (24.5%) in the high category. The data suggest that a majority (126, 60.6%) of the study population was experiencing levels of moderate stress.

**Table 7**

**Perceived Stress Scale Categories**

<b>Category</b>	<b>Related Score</b>	<b>n (%)</b>	<b>Mean <math>\pm</math> SD</b>
<b>Overall PSS</b>		207 (89%)	$21.26 \pm 7.18$
<b>Low PSS</b>	0-13	31 (14.9%)	$10.10 \pm 1.97$
<b>Moderate PSS</b>	14-26	126 (60.6%)	$20.26 \pm 3.66$
<b>High PSS</b>	27-40	51 (24.5%)	$30.51 \pm 3.22$
<b>Missing Data</b>		26 (11%)	

Further analyses using Spearman's correlations between PSS scores and gender, PSS and age, PSS and major for categorical variables, and Pearson's correlations for continuous variables, PSS and height, and PSS and weight were performed, see Table 8 below. Statistical significances were found for gender ( $P = 0.020$ ), age ( $P = 0.019$ ), and height ( $P = 0.023$ ). Results indicate that gender, age, and height are useful predictors of perceived stress. Female students scored higher on the PSS ( $21.97 \pm 6.97$ ) when compared to their male counterparts ( $18.69 \pm 7.42$ ) indicating that females were more likely to be stressed than males. Younger students (18-19 years) scored higher on the PSS ( $21.63 \pm 7.07$ ) compared to the older students ( $20.37 \pm 7.20$ ). Statistical significance was also found for height ( $65.98 \pm 4.19$ , 0.023), indicating that taller

students displayed more stress with the majority of students ( $n = 68$ ) falling in the 75th percentile.

**Table 8**

**Correlations of Perceived Stress Scale Scores with Gender, Age, Major, Height, and Weight**

<b>Variable</b>	<b>n</b>	<b>M ± SD</b>	<b>P-Value</b>
<b>Overall PSS</b>	203	21.27 ± 7.25	
<b>Gender</b>			0.020*
<b>Male</b>	47	18.69 ± 7.41	
<b>Female</b>	158	21.97 ± 6.97	
<b>Prefer to Self-Describe</b>	2	28.00 ± 2.82	
<b>Age</b>			0.019**
<b>18-19</b>	144	21.63 ± 7.07	
<b>≥ 20</b>	62	20.37 ± 7.20	
<b>Major</b>			0.271
<b>Health</b>	63	21.73 ± 7.64	
<b>Non-Health</b>	140	21.06 ± 7.09	
<b>Height (in)</b>	206	65.98 ± 4.19	0.023*
<b>Weight (lbs)</b>	206	157.96 ± 40.01	0.212

P <0.05\*, P <0.01\*\*, P <0.001\*\*\*

A multivariate regression analysis was conducted to determine how well different factors predicted perceived stress scores. The factors were gender, age, and major, while the criterion variable was the overall PSS score. The linear combination of gender, age, and major was significantly related to PSS scores,  $F(3, 199) = 2.80, P = 0.04$ . The sample multiple correlation coefficient was 0.20, indicating that approximately 4.0% of the variance of the PSS scores can be accounted for the linear combination of major, age, and gender. As previously found in Table 8, gender and age was seen to correlate with the PSS scores.

An additional multivariate regression analysis was conducted to determine how height and weight predicted perceived stress scores. The linear combination of height and weight was significantly related to PSS score,  $F(2, 203) = 3.43, P = 0.034$ . The sample multiple correlation coefficient was 0.18, indicating that approximately 3.3% of the variance of the PSS scores can be accounted for the linear combination of height and weight (Appendix I). As seen below, Table 9 shows the results of the multiple regression analyses.

**Table 9**

**Multivariate Regression Analysis for Perceived Stress Scale Scores with Gender, Age, Major, Height, and Weight**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>F Change</b>	<b>DF1</b>	<b>F</b>	<b>Sig</b>
<b>PSS- Gender, Age, Major</b>	0.201	0.040	2.80	3	2.80	0.041*
<b>PSS- Height, Weight</b>	0.181	0.033	3.44	2	3.44	0.034*

P < 0.05\*, P < 0.01\*\*, P < 0.001\*\*\*

Table 10 indicates the results for the Perceived Sociocultural Pressure Scale (PSPS). The PSPS has a minimum possible score of 1 and a possible maximum score of 5. The higher the score, the greater the perceived pressure to be thin for an individual. Perceived Sociocultural Pressure scores are broken up into two categories: pressure to be thin and weight loss (questions 1-8) and teasing from family and friends (questions 9-10)<sup>23,24,26,27,46</sup>. A Cronbach's alpha of 0.88 was found for the PSPS, indicating that the items together have high reliability. Of the 207 participants, the mean PSPS score was  $2.00 \pm 0.94$ , with a minimum score of 1.00 and a

maximum score of 4.80. The overall PSPS scores and the subscale scores are shown in Table 9 below.

**Table 10**  
**Perceived Sociocultural Pressure Scale**

<b>Category</b>	<b>Item Numbers</b>	<b>n (%)</b>	<b>Mean ± SD</b>
Overall PSPS		207 (88.8)	2.00 ± 0.94
Thin Body and Weight Loss	1-8	207 (88.8)	2.11 ± 1.06
Family and Friends Teasing	9-10	207 (88.8)	1.70 ± 1.04
Missing data		26 (11.2)	

Further analyses using Spearman's correlations for categorical variables between PSPS scores and gender, PSPS and age, PSPS and major, and Pearson's correlations for continuous variables, height and weight, were performed. These results are seen in Table 11 below. Statistical significances were found for gender ( $P = 0.004$ ) and weight ( $P = 0.000$ ). This indicates that gender and weight are useful predictors of the Perceived Sociocultural Pressure Scale scores. Female students scored higher on the PSPS ( $2.09 \pm 0.99$ ) when compared to their male counterparts ( $1.64 \pm 0.65$ ) indicating that females were more likely to be experiencing perceived pressure to be thin than males. The majority of students ( $n = 178$ ) were in the 75<sup>th</sup> percentile for weight indicating that these students do experience pressures to be thin. Similar to the results on BMI in Figure 1, the majority of students were in the normal weight category, but appears to experience pressure to be thin. No significant differences were found for age, major and height.

Table 11

**Correlations of Perceived Sociocultural Pressure Scale Scores with Gender, Age, Major, Height, and Weight**

<b>Variable</b>	<b>n</b>	<b>M ± SD</b>	<b>P-Value</b>
Overall PSPS	206	2.00 ± 0.94	
Gender			0.004**
Male	47	1.64 ± 0.65	
Female	158	2.09 ± 0.99	
Prefer to Self-Describe	2	2.15 ± 1.06	
Age			0.165
18-19	144	2.04 ± 0.96	
≥ 20	62	1.83 ± 0.84	
Major			0.368
Health	63	2.01 ± 1.04	
Non-Health	140	1.98 ± 0.93	
Height (in)	206	65.98 ± 4.19	0.315
Weight (lbs)	206	157.96 ± 40.01	0.000***

P < 0.05\*, P < 0.01\*\*, P < 0.001\*\*\*

A multivariate regression analysis was conducted to determine how well different factors predicted Perceived Sociocultural Pressures Scores. The factors were gender, age, and major, while the criterion variable was the overall PSPS score. The linear combination of gender, age, and major was significantly related to PSPS scores,  $F(3, 199) = 2.65$ ,  $P = 0.05$ . The sample multiple correlation coefficient was 0.20, indicating that approximately 3.8% of the variance of the PSPS scores can be accounted for the linear combination of major, age, and gender (Appendix J).

An additional multivariate regression analysis was conducted to determine how height and weight predicted perceived sociocultural pressures. The linear combination of height and gender was significantly related to PSPS score,  $F(2, 203) = 18.97$ ,  $P = 0.000$ . The sample

multiple correlation coefficient was 0.40, indicating that approximately 4.0% of the variance of the PSPS scores can be accounted for the linear combination of height and weight. As seen below, Table 12 shows the results of the multiple regression analyses.

**Table 12**

**Multivariate Regression Analysis for Perceived Sociocultural Pressure Scale Scores with Gender, Age, Major, Height, and Weight**

	<b>R</b>	<b>R<sup>2</sup></b>	<b>F Change</b>	<b>DF1</b>	<b>F</b>	<b>Sig</b>
<b>PSPS- Gender, Age, Major</b>	0.196	0.038	2.649	3	2.649	0.050*
<b>PSPS- Height, Weight</b>	0.397	0.157	18.97	2	18.97	0.000***

P <0.05\*, P <0.01\*\*, P <0.001\*\*\*

Additional analyses were conducted on DEAS-2 scores and PSS and PSPS scores. As seen in Table 13, the results from the Pearson's Correlations show a significant relationship between the DEAS-2 and PSS and DEAS-2 and PSPS. This indicates that those who are experiencing higher stress and increased pressures to be thin scored higher on the DEAS-2. The results suggest that the college freshmen are influenced by their stress and sociocultural pressures, which leads to increased disordered eating behaviors.

**Table 13****Correlations for the Disordered Eating Attitude Scale with the Perceived Stress Scale and the Perceived Sociocultural Pressures Scale**

<b>Variable</b>	<b>M ± SD</b>	<b>P-Value</b>	<b>R-Value</b>
DEAS-2	81.18 ± 20.14		
PSS	21.27 ± 7.25	0.000***	0.376
PSPS	2.00 ± 0.94	0.000***	0.568

P <0.05\*, P <0.01\*\*, P <0.001\*\*\*

Additional one-way ANOVAs were conducted to evaluate if participant's ethnicities were related to the scores from the DEAS-2, PSS, and PSPS. Table 14 below shows the comparison of the ethnicities to the DEAS-2, PSS, and PSPS scores and the related results. The independent variable, ethnicity, included three categories: African American, White, and Other. The dependent variables were the DEAS scores while attending college (DEAS-2), the PSS scores, and the PSPS scores. The data analyses found that there were no significant differences between the ethnicities and related scale scores.

Table 14

## Comparison of Ethnicity to DEAS-2 Scores, PSS Scores, and PSPS Scores

Variable	n (%)	M ± SD	F-value	P-value
DEAS-2			0.78	0.46
African American	27 (13)	85.96 ± 18.30		
White	121 (58)	81.53 ± 19.91		
Other	59 (29)	80.31 ± 20.17		
PSS			0.36	0.70
African American	27 (13)	20.41 ± 6.42		
White	121 (58)	21.19 ± 7.88		
Other	59 (29)	21.80 ± 5.93		
PSPS			0.43	0.65
African American	27 (13)	2.06 ± 1.01		
White	121 (58)	1.94 ± 0.91		
Other	59 (29)	2.07 ± 0.99		

## Summary of Research Findings

The results from the data analyses show that college freshmen display increased behaviors of disordered eating while attending Northern Illinois University compared to prior going to school. A significant relationship was seen between the DEAS-1 and DEAS-2 scores. Results showed that participants improved their relationship with food during their transition to college, which was seen by the higher DEAS-1 subscale 1 ( $24.88 \pm 9.51$ ,  $P = 0.000$ ). However, participants' idea of normalized eating was hindered since attending college ( $35.46 \pm 7.75$ ,  $P = 0.000$ ). Participations also showed higher restrictive and compensatory behaviors prior to attending college.

Most of the study participants were experiencing levels of moderate stress, which was evidenced by the results from the PSS scores. Gender, age, and height were found to be useful predictors in participants' perceived stress, where females and younger students were more likely to be more stressed. Gender and weight were found to influence and predict the outcomes of the



PSPS scores. Females were more likely than males to experience pressures to be thin and teasing from family and friends. Although most of the participants were in the normal BMI category, they still appeared to be struggling from sociocultural pressures to be thin. Further analyses found that there was a significant relationship between the DEAS-2 scores and the PSS and PSPS. This shows that individuals' who are experiencing Perceived Stress and Perceived Sociocultural Pressures are more likely to score higher on the DEAS-2. In addition, ethnicity was not found to be significant amongst the DEAS-2 scores.

## CHAPTER FIVE

### DISCUSSION

#### **General Description of Study Subjects**

The population of study subjects that participated in this research study were college students of freshmen standing at Northern Illinois University. Freshmen standing was classified as any student who is attending Northern Illinois University for their first year. The sample consisted of all genders, ethnicities, ages and majors.

Findings from this study agree with previous research<sup>3,4,6,16,17,18,19,28,31</sup>, which examined the development of disordered eating in college-aged populations. This study found that there was a difference between participants disordered eating behaviors as measured by the DEAS prior to coming to and while attending Northern Illinois University. The results showed that those who exhibited disordered eating behaviors prior to arriving at college increased these behaviors throughout their freshmen year. The analysis evidenced that the DEAS-2 scores were higher than the DEAS-1 scores. The difference in the means for the DEAS-1 and DEAS-2 scores was small, however by accounting for the standard deviation the changes in eating attitudes and behaviors that occur as a student attends college can be seen. This data showed that as a student transitions to their freshmen year of college, he or she developed more inadequate eating attitudes and behaviors. A significant relationship was found between gender and DEAS-1 scores. Females and participants who self-describe were seen to have higher DEAS-1 scores. There was no significant relationship found between gender and DEAS-2 scores, which was unexpected.

Striegel-Moore's study in 1989 found that most of their participants developed disordered eating throughout their freshmen year of college, and those who already showed signs of disordered eating worsened throughout the year<sup>5</sup>. Participants with worsened behaviors were seen to be associated with increased negative feelings about weight, attractiveness, high stress, and weight dissatisfaction<sup>5</sup>. As seen in this study, there was a significant difference seen between the DEAS-1 and DEAS-2 subscales of feelings towards eating, idea of normal eating, and restriction and compensatory practices. As students spend more time away from home, their concerns about food and weight gain increase. Their ideas of normalized eating also changed. Based on the results of this study, students better their relationship with food once they attend college. This was different than expected because it was thought that it would be the opposite; where students' relationships with food would worsen during their freshmen year of college. The higher DEAS-2 subscale 5 scores indicated that these participants believed that the act of eating is not normal for people. It is likely that college freshmen have rigid nutrition beliefs that are influencing their eating behaviors. This is related to individuals' relationships with food and eating behaviors changing once immersed in a college environment.

Eric Cooley and Tamina Toray found through their study that only a small percentage of college freshmen engage in behaviors that fit the criteria for disordered eating, however more students than expected exhibit disordered eating behaviors<sup>18,19</sup>. The results from this study show similar findings due to there being a 26% response rate of the NIU freshmen class. The other 74% of the population is likely exhibiting behaviors of disordered eating, however they did not participate in the survey. In addition, those who did participate in the survey may not fully fit the criteria for disordered eating. This could be the case with the results from this research study

since only 26% of the NIU freshmen class responded to the survey. It is likely that a significant number of the students are engaging in behaviors of disordered eating since arriving at college.

Striegel-Moore found that increased perceived stress during one's freshman year was related to worsening disordered eating behaviors<sup>5</sup>. Similar to the results of this study, women in Striegel-Moore's study were seen to have experienced more stressful freshman years, which may have led to a greater increase in their sense of ineffectiveness<sup>5</sup>. Most of the participants in the current research study were experiencing moderate levels of perceived stress. This indicates that the amount of stress one believes one is experiencing increases throughout their freshman year. Gender, age and height were found to be significantly related to the amount of perceived stress one experiences. Females and those who prefer to self-describe were more likely be stressed compared to males.

In addition, younger students, those aged 18-19, were found to be more stressed compared to students that were aged 20 years and older. This is likely due to the older students being 'non-traditional students' and having more experience in how to manage their stress. It is also likely this was the younger students first time away from home. The younger students do not have the same coping skills for stress that the older students may have. Height was found to play a significant role on the perceived stress scores, which was unexpected. It was expected that weight would play a significant role in individuals' perceived stress since 40% of the population was overweight or obese. It is unclear why taller students would have experienced higher stress levels.

Similar to Stice and Whitenton's study on risk factors associated with body dissatisfaction, the current study found that perceived pressure to be thin was shown to be a potent predictor in one's eating behaviors<sup>27</sup>. Data suggest that most participants were

experiencing moderate levels of perceived sociocultural pressures, mainly related to a thin body and weight loss. West also found similar results where the desire to lose weight was the strongest predictor in weight, shape, and eating concerns<sup>17</sup>. Females and those self-describing were found to have pressures to be thin due to societal pressures and teasing from family and friends. It is understandable why females were seen to have higher perceived pressures due to the weight stigmas that are seen throughout society. Weight was also found to be a significant predictor in participants' PSPS scores. Most of the students were categorized as having a normal BMI, however were still experiencing pressures to be thin from society, family, and friends.

Together, perceived stress and sociocultural pressures lead to the development of disordered eating throughout one's freshman year of college. The data showed a significant relationship, which indicates that increased disordered eating is seen due to higher stress and pressures to be thin. The perceived pressure and sociocultural pressures are likely contributed from the college environment. As the physical environment of college is very different than one's home environment, it takes some time to transition and adjust. The differences between environments led to unrealistic expectations from society, family, and friends. Due to these changes, freshmen students tend to change their attitudes and thoughts regarding food. Whether it be intentionally or unintentionally, data shows that individuals develop disordered eating throughout their freshmen year. Ethnicity was not found to be a predictor in the outcomes of the DEAS-2 scores. This indicates that not one ethnicity is experiencing increased pressures that influence their eating behaviors and attitudes. The findings in this study lend support to those of previous studies for adolescents where the prevalence of disordered eating has been found to be comparable to that found in college student samples.

## **Conclusion**

The main goal of this study was to determine if college students developed behaviors of disordered eating throughout their freshmen year. Information from this study can be useful in closing the gap of knowledge related to disordered eating among college students. Previous studies years ago, found that there were limited changes in freshmen students eating behaviors during their transition from home to college. However, the current data analyses show that higher Disordered Eating Attitude Scale scores were found while attending college compared to prior being at college. When the DEAS was broken down by subscales, it was found that participants' ideas of normal eating, relationship with food and restrictive and compensatory practices were significantly different once emerged in a college environment. It was important to breakdown the DEAS by subscale to determine what factors were changed to influence the participants eating behaviors and attitudes. Females and those who prefer to self-describe exhibited increased disordered eating prior to coming to college, however no significant difference was seen while being at school.

Females were also found to be experiencing higher levels of stress and pressures from society to be thin. In turn, these pressures led to increased behaviors of disordered eating throughout their freshmen years. Most of the pressure from society was related to a thin body and weight loss, but teasing from family and friends also played a role. Unlike gender and age, ethnicity did not play a role in the development of disordered eating while attending Northern Illinois University. The weight stigmas that are placed on individuals are seen to be negatively influencing their eating behaviors. Although most of the students had a normal BMI, they still experienced pressures to be thin. This shows that although one may be of a healthy weight, it doesn't mean that they are engaging in healthy behaviors or thoughts related to food and weight.

All the findings from this research study suggest that there is an increased need for prevention programs on college campuses, specifically those for first-year students. These programs should address the changes and pressures that one may experience as they transition to college. This would bring increased attention to the problems of disordered eating, high stress, and sociocultural pressures and help decrease the amount of disordered eating attitudes and behaviors that are seen among college freshmen.

### **Strengths and Limitations**

The strengths of the study were the timing, method of data collection, sample size, and budget. Since this study took place during a transitional period of adolescence, it could discover if college stress factors have a relationship with the onset of disordered eating. The use of an online survey supported this research project because it reaches out to all the freshmen at Northern Illinois University. It also allowed for the participants' responses to be anonymous, providing that individuals' felt comfortable sharing their information knowing that it was kept confidential. A reasonable sample size could be achieved with the online survey due to each freshman having the opportunity to participate. Personal emails were sent to all the NIU freshmen asking their participation in the study. By posting the research study on the weekly announcements it provided students with continuous exposure to the study and online survey. Lastly, the survey study provided a minimal budget, so there was no need for grants and assistantships to allow the study to proceed.

There are a few limitations that were associated with this research study. Since it is a cross-sectional survey with no randomization of study subjects, the results can only be generalizable to the study population. Also, due to it being a survey study, the data was self-

reported. This could mean that individuals may not have been truthful on all the statements/questions, and might have reported false information. Lastly, there is no personal interaction with the subjects due to the research and survey being conducted online.

### **Recommendations**

Upon arrival to Northern Illinois University, freshmen students should be introduced to prevention programs that focus on eating attitudes, stress, and societal pressures. This will help students in transitioning to the new college environment.

The Counseling and Consultation Services on campus provides a variety of mental health crisis services, consultations, therapy and support to Northern Illinois University students. An Eating Concerns Assessment can be conducted to identify significant eating and body image concerns. From this assessment and additional appointments, appropriate treatment options and nutrition resources can be determined to address an individual's concerns<sup>48</sup>. As evidenced in the current research, stress is related to disordered eating therefore programs that address stress among this study population should be offered. All genders should be targeted on how to reduce stress due to them exemplifying the greatest amount of perceived stress. The Counseling and Consultation services currently offers group therapies that work to help students support other students. A variety of drop-in groups, like mindful meditation, and stress management groups are provided each month. The marketing for these groups should be increased to reach a greater number of students. It is likely that a most new students are unaware of these programs<sup>48</sup>.

Despite the results showing that the majority of students were in the normal BMI category, there is concern about what normal weight signifies. Most students also displayed that they were under pressure to be thin and lose weight. It is likely that these pressures are related to



societal influences. To address the weight issue, intuitive eating and the Healthy at Every Size (HAES) paradigm should be introduced. Healthy at Every Size includes a variety of components to support individuals of all sizes<sup>49</sup>. It encompasses respect to celebrate body diversity, critical awareness to challenge scientific and cultural assumptions, and compassionate self-care to find joy in moving one's body. This movement is inclusive where it recognizes that one's social characteristics— size, race, national origin, sexuality, gender, disability status—are assets while challenging the systemic and structural forces that influence one from living well<sup>49</sup>.

### **Implications to Dietetic Practice**

Since currently there is a gap in knowledge about these risk factors and to what extent they influence the development of disordered eating in college freshmen, these findings can be used in future research to discover more information on other factors leading to this onset and development.

The results from this study can be applied to the dietetic practice because it will provide updated knowledge about this population. Resources can then be developed, or contributed to existing services, to help resist further development of disordered eating. These resources should be multicomponent and include topics of media literacy, body satisfaction, healthy lifestyles, and healthy weight management<sup>26,27</sup>. Looking at it from a health perspective, the data from this study can contribute to establishing and implementing resources for programs to help diminish these risk factors from further developing into habits of disordered eating<sup>28</sup>. Based on the results of this study and future studies, prevention and treatment programs can be developed to halter individuals' disordered eating from developing into a clinically diagnosed eating disorder. It

would be important to work with other organizations on college campuses, such as counseling and athletics, to implement these prevention programs.

### **Suggestions for Future Studies**

Numerous individuals in this research study reported disordered eating behaviors prior to and during their freshmen year of college at Northern Illinois University. It would be relevant to explore whether freshmen students at other universities, in the Midwest and other locations, exhibited similar behaviors. Since a significant difference was seen between eating attitudes and behaviors prior to and while attending this university, it is important to determine if other universities freshmen are experiencing similar outcomes. Collecting data from additional universities and campuses would provide for a variety of data and larger sample sizes. Future studies could also follow college freshmen throughout their freshmen year to track how their eating behaviors and attitudes change. It would also be beneficial to address specific subgroups of freshmen, such as athletes.

This study's results suggest that it might be particularly helpful to focus on specific factors that lead to teasing from family and friends, stress levels, and societal pressures to be thin. This would provide additional information how disordered eating is stimulated among college freshmen. By isolating the risk factors for disordered eating, professionals would have a better understanding of what leads to this development. It would additionally provide more data to develop and implement prevention programs at college orientations to help combat the increasing development of disordered eating throughout the students first year.

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**APPENDIX A**

**MASS EMAIL TO A CUSTOM MAILING LIST- NORTHERN ILLINOIS**

**UNIVERSITY CLEARING HOUSE**



**Mass Email Draft – to all current NIU freshmen**

Subject Line- Volunteers Needed for a Research Study

Welcome,

Current students of freshmen standing are needed for a graduate thesis study on the topic of disordered eating. Participation involves taking a 10-15 minute online survey. Participants will be eligible to enter a drawing to win one of ten \$25 American Express gift cards!

To participate, follow this link: [https://niu.az1.qualtrics.com/jfe/form/SV\\_9zYm4KCxkoBU2vb](https://niu.az1.qualtrics.com/jfe/form/SV_9zYm4KCxkoBU2vb)

Thank you!

Libby Moser  
Northern Illinois University  
M.S. Nutrition and Dietetics Candidate  
Dietetic Intern, Graduate Assistant  
[lmoser@niu.edu](mailto:lmoser@niu.edu)

**APPENDIX B**

**NORTHERN ILLINOIS UNIVERSITY CLEARINGHOUSE- PROMOTING A NOTICE  
AND SHARING INFORMATION TO CAMPUS**

Audience = Current Students

**Subject Line- Volunteers Needed for a Research Study**

Are you an undergraduate freshmen student at NIU? If so, you are invited to participate in a graduate thesis project. By participating in this research study, you will be contributing to the knowledge of disordered eating that is seen in college freshmen.

Participants must be willing to complete a 10-15 minute anonymous online questionnaire, and will be eligible to enter a raffle to win one of ten \$25 American Express gift cards! To learn more about this research study and qualifications, please proceed to this link:

[https://niu.az1.qualtrics.com/jfe/form/SV\\_9zYm4KCxkoBU2vb](https://niu.az1.qualtrics.com/jfe/form/SV_9zYm4KCxkoBU2vb)

Please contact Libby Moser at [lmoser@niu.edu](mailto:lmoser@niu.edu) with any questions or concerns. Feel free to share this survey with other individuals who are current students at NIU as well.

Additional information that is helpful in the fulfillment of this request

This is a graduate thesis project that is investigating factors that affect disordered eating among college freshmen. The purpose of this research study is to investigate specific factors that impact the development of disordered eating among undergraduate freshmen. It is comprised of a questionnaire that includes three scales—the Disordered Eating Attitude Scale (DEAS), the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale (PSPS). The results of this study will allow for future research to be conducted on the etiology of disordered eating and how to reduce the risks associated with the development of a clinical eating disorder.

The researcher, Libby Moser, is a graduate student and dietetic intern in the Nutrition and Dietetics program at NIU, and is a part of the Eating Disorders and Obesity Certificate (EDOC) program.

**APPENDIX C**

**EMAIL TO ACADEMIC ADVISORS FOR PERMISSION TO HELP  
WITH RECRUITMENT**

Dear \_\_\_\_\_,

I am seeking your help with recruiting students for my study.

My name is Libby Moser and I am a graduate student and dietetic intern in the Nutrition and Dietetics program here at NIU. As a part of my graduate studies, I am conducting a thesis project on the factors that lead to the development of disordered eating in college freshmen.

It is comprised of an online questionnaire that includes three scales and demographic information—the Disordered Eating Attitude Scale (DEAS), the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale (PSPS). The survey will take approximately 10-15 minutes and can be completed outside of your class time. The results of this study will allow for future research to be conducted on the etiology of disordered eating and how to reduce the risks associated with the development of a clinical eating disorder. Participants will be eligible to enter a raffle to win one of ten \$25 American Express gift cards.

I would like to set up a time to meet to determine the courses that are offered within your college that are mainly freshmen based. In addition, I want to discuss other possible routes for recruitment of freshmen students within your college and departments.

Please let me know any times that work best with your schedule. I look forward to hearing from you!

Thanks,  
Libby Moser

**APPENDIX D**

**EMAIL TO PROFESSORS ASKING FOR PERMISSION TO HELP**

**WITH RECRUITMENT**

Dear \_\_\_\_\_,

I am seeking your help with recruiting students for my study.

My name is Libby Moser and I am a graduate student and dietetic intern in the Nutrition and Dietetics program here at NIU. As a part of my graduate studies, I am conducting a thesis project on the factors that lead to the development of disordered eating in college freshmen.

It is comprised of an online questionnaire that includes three scales and demographic information—the Disordered Eating Attitude Scale (DEAS), the Perceived Stress Scale (PSS), and the Perceived Sociocultural Pressure Scale (PSPS). The survey will take approximately 10-15 minutes and can be completed outside of your class time. The results of this study will allow for future research to be conducted on the etiology of disordered eating and how to reduce the risks associated with the development of a clinical eating disorder. Participants will be eligible to enter a raffle to win one of ten \$25 American Express gift cards.

I would like to set up a meeting to talk more about my research study and to obtain permission to market this study to your students. Please let me know any times or days that works best for you. I look forward to hearing from you!

Thanks,

Libby Moser

**APPENDIX E**

**THREE-WEEK REMINDER EMAIL TO THE NORTHERN ILLINOIS**

**UNIVERSITY FRESHMEN**



Dear \_\_\_\_\_,

Three weeks ago you received an e-mail asking you to assist us in assessing the development of disordered eating among college freshmen by filling out a web-based survey. If you have filled out the survey, thank you and you may disregard this email!

If you have not had a chance to take the survey yet, I would appreciate your reading the message below and completing the survey. This survey should take no more than ten to fifteen minutes to complete.

This message has gone to everyone in the selected sample population. Since no personal data is retained with the surveys for reasons of confidentiality, we are unable to identify whether or not you have already completed the survey.

\* To take the web-based survey, click on:

[https://niu.az1.qualtrics.com/jfe/form/SV\\_9zYm4KCxkoBU2vb](https://niu.az1.qualtrics.com/jfe/form/SV_9zYm4KCxkoBU2vb)

Thank you for your time!

Best,

Libby Moser

**APPENDIX F**

**SIX-WEEK REMINDER EMAIL TO THE NORTHERN ILLINOIS**

**UNIVERSITY FRESHMEN**

Dear \_\_\_\_\_,

Six weeks ago you received an e-mail asking you to assist us in assessing the development of disordered eating among college freshmen by filling out a web-based survey. If you have filled out the survey, thank you and you may disregard this email!

If you have not had a chance to take the survey yet, I would appreciate your reading the message below and completing the survey. This survey should take no more than ten to fifteen minutes to complete.

This message has gone to everyone in the selected sample population. Since no personal data is retained with the surveys for reasons of confidentiality, we are unable to identify whether or not you have already completed the survey.

\* To take the web-based survey, click on:

[https://niu.az1.qualtrics.com/jfe/form/SV\\_9zYm4KCxkoBU2vb](https://niu.az1.qualtrics.com/jfe/form/SV_9zYm4KCxkoBU2vb)

Thank you for your time!

Best,

Libby Moser

**APPENDIX G**  
**RESEARCH STUDY SURVEY**

Dear Participant,

My name is Libby Moser and I am a Nutrition and Dietetics graduate student at Northern Illinois University. I would like to thank you for taking the time to assist me with my graduate thesis.

Your participation in this research project is completely voluntary, and may be withdrawn at any time without penalty. If you agree to participate in the study, you will be asked to complete a questionnaire on the eating habits of college freshmen. The survey will take about 10-15 minutes to complete.

If you have any questions regarding the study please contact Libby Moser ([lmoser@niu.edu](mailto:lmoser@niu.edu), 847-420-0232), Dr. Barrett ([sbarrett1@niu.edu](mailto:sbarrett1@niu.edu)), or the Office of Research Compliance. Information on the rights of research participants is available through the Northern Illinois Institutional Review Board (815-753-8588).

There are no foreseeable risk and/or discomforts when participating in this study. All information that is gathered during this study will be used exclusively for this research study and will be kept confidential.

Upon completing the questionnaire, you have the option to be entered into a drawing for a \$25 American Express gift card. **If you are interested, please provide your preferred contact information in the last question of the survey.**

If you can certify the following, please begin the questionnaire:

- I am a student enrolled at Northern Illinois University.
- I am a student with freshman standing.
- I am at least 18 years old.
- I currently am not diagnosed with a clinical eating disorder.
- I agree to participate in this study.

Thank you very much for your assistance in this important work,

Libby Moser  
Graduate Student  
Northern Illinois University

## Disordered Eating Attitude Scale (DEAS)

**Please respond to items 1-25 in relation to your experiences, attitudes, and beliefs PRIOR**

**TO coming to Northern Illinois University.**

### **PART I**

**1) Mark an X how healthy and necessary you consider consumption of each kind of food below:**

**A) Sugar**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**French Fries**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Oil**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**B) Breads**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Rice**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Beans**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Pasta**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Red Meat**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Whole Milk**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Cheese**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**C) Vegetables**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Fruits**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**White Meat**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

2) Do you feel pleasure when you eat?

- Yes.                       No.

3) Does eating ever feel unnatural to you?

- Yes.                       No.

4) Have you ever spent one or more days without eating or having only liquids because you believed you could lose weight?

- Yes.                       No.

5) Do you count the calories of everything you eat?

- Yes.                       No.

- 6) Do you enjoy the feeling of an empty stomach?  
 Yes.  No.
- 7) Do you “skip” meals to avoid putting on weight?  
 Yes.  No.
- 8) Does eating make you feel “dirty”?  
 Yes.  No.
- 9) Do you have good memories related to food?  
 Yes.  No.
- 10) Would you like to not need to eat?  
 Yes.  No.
- 11) Do you believe that it is normal to eat sometimes because you are sad, upset or bored?  
 Yes.  No.
- 12) When you eat more than usual, what is your behavior afterwards?  
 Restart eating as usual/  
 Assume you have lost control and keep eating even more.  
 Decide to go on a diet to compensate.  
 Use some kind of compensation such as physical activity, vomiting, laxatives and diuretics.

**PART II – Please select the answer that best relates to your feelings **PRIOR** to college.**

- 13) I feel guilty when I eat something that I thought I should not eat for some reason  
 Always  Usually  Often  Sometimes  Rarely/Never
- 14) I quit eating a kind of food if I find out it has more calories than I thought.  
 Always  Usually  Often  Sometimes  Rarely/Never
- 15) I worry all the time about what I am going to eat, how much to eat, how to prepare food and whether I should eat.  
 Always  Usually  Often  Sometimes  Rarely/Never
- 16) I worry about how much a certain kind of food or meal will make me gain weight.  
 Always  Usually  Often  Sometimes  Rarely/Never
- 17) I am angry when I feel hungry.



Always     Usually     Often     Sometimes     Rarely/Never

18) It is hard to choose what to eat, because I always think I should eat less or choose the option with fewer calories.

Always     Usually     Often     Sometimes     Rarely/Never

19) When I desire a specific kind of food, I know I won't stop eating it until I have finished with it.

Always     Usually     Often     Sometimes     Rarely/Never

20) I would like to have my appetite and eating behavior under total control.

Always     Usually     Often     Sometimes     Rarely/Never

21) I try eating less in front of others in order to overeat when I am alone.

Always     Usually     Often     Sometimes     Rarely/Never

22) I am afraid to start eating and not be able to stop.

Always     Usually     Often     Sometimes     Rarely/Never

23) I dream of a pill that would replace food.

Always     Usually     Often     Sometimes     Rarely/Never

24) I get nervous and/or lose my self-control at parties and buffets, due to a great amount of foods available.

Always     Usually     Often     Sometimes     Rarely/Never

25) My relationship with food messes up my life as a whole.

Always     Usually     Often     Sometimes     Rarely/Never

### **Disordered Eating Attitude Scale (DEAS)**

**The following items are identical to the previously answered statements, however please respond to these items (1-25) in relation to your experiences, attitudes, and beliefs WHILE CURRENTLY ATTENDING Northern Illinois University.**

#### **PART I**

1) Mark an X how healthy and necessary you consider consumption of each kind of food below:

##### **A) Sugar**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary

- Not* eating this food is healthy and necessary

**French Fries**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Oil**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**B) Breads**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Rice**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Beans**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Pasta**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Red Meat**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Whole Milk**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Cheese**

- Eating this food *often* is healthy and necessary

- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**C) Vegetables**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**Fruits**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

**White Meat**

- Eating this food *often* is healthy and necessary
- Eating this food *occasionally* is healthy and necessary
- Not* eating this food is healthy and necessary

2) Do you feel pleasure when you eat?

- Yes.                       No.

3) Does eating ever feel unnatural to you?

- Yes.                       No.

4) Have you ever spent one or more days without eating or having only liquids because you believed you could lose weight?

- Yes.                       No.

5) Do you count the calories of everything you eat?

- Yes.                       No.

6) Do you enjoy the feeling of an empty stomach?

- Yes.                       No.

7) Do you “skip” meals to avoid putting on weight?

- Yes.                       No.

8) Does eating make you feel “dirty”?

- Yes.                       No.

9) Do you have good memories related to food?

- Yes.                       No.

10) Would you like to not need to eat?

Yes.  No.

11) Do you believe that it is normal to eat sometimes because you are sad, upset or bored?

Yes.  No.

12) When you eat more than usual, what is your behavior afterwards?

- Restart eating as usual/
- Assume you have lost control and keep eating even more.
- Decide to go on a diet to compensate.
- Use some kind of compensation such as physical activity, vomiting, laxatives and diuretics.

**PART II– Please select the answer that best relates to your feelings **CURRENTLY**.**

13) I feel guilty when I eat something that I thought I should not eat for some reason

Always  Usually  Often  Sometimes  Rarely/Never

14) I quit eating a kind of food if I find out it has more calories than I thought.

Always  Usually  Often  Sometimes  Rarely/Never

15) I worry all the time about what I am going to eat, how much to eat, how to prepare food and whether I should eat.

Always  Usually  Often  Sometimes  Rarely/Never

16) I worry about how much a certain kind of food or meal will make me gain weight.

Always  Usually  Often  Sometimes  Rarely/Never

17) I am angry when I feel hungry.

Always  Usually  Often  Sometimes  Rarely/Never

18) It is hard to choose what to eat, because I always think I should eat less or choose the option with fewer calories.

Always  Usually  Often  Sometimes  Rarely/Never

19) When I desire a specific kind of food, I know I won't stop eating it until I have finished with it.

Always  Usually  Often  Sometimes  Rarely/Never

20) I would like to have my appetite and eating behavior under total control.

Always  Usually  Often  Sometimes  Rarely/Never

21) I try eating less in front of others in order to overeat when I am alone.

Always     Usually     Often     Sometimes     Rarely/Never

22) I am afraid to start eating and not be able to stop.

Always     Usually     Often     Sometimes     Rarely/Never

23) I dream of a pill that would replace food.

Always     Usually     Often     Sometimes     Rarely/Never

24) I get nervous and/or lose my self-control at parties and buffets, due to a great amount of foods available.

Always     Usually     Often     Sometimes     Rarely/Never

25) My relationship with food messes up my life as a whole.

Always     Usually     Often     Sometimes     Rarely/Never

### Perceived Stress Scale (PSS)

Please identify the response that best relates to your **CURRENT** experiences.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
B.1. In the past month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
B.2. In the past month, how often have you felt unable to control the important things in your life?	0	1	2	3	4
B.3. In the past month, how often have you felt nervous or stressed?	0	1	2	3	4
B.4. In the past month, how often have you felt confident about your ability to handle personal problems?	0	1	2	3	4
B.5. In the past month, how often have you felt that things were going your way?	0	1	2	3	4
B.6. In the past month, how often have you found that you could not cope with all the things you had to do?	0	1	2	3	4
B.7. In the past month, how often have you been able to control irritations in your life?	0	1	2	3	4

8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

### Perceived Sociocultural Pressure Scale

Please select the response that best captures your own experiences **CURRENTLY**.

**Please circle the response that best captures your own experience:**

	none	some	a lot		
1. I've felt pressure from my friends to lose weight. . . . .	1	2	3	4	5
2. I've noticed a strong message from my friends to have a thin body. . . . .	1	2	3	4	5
3. I've felt pressure from my family to lose weight . . . . .	1	2	3	4	5
4. I've noticed a strong message from my family to have a thin body. . . . .	1	2	3	4	5
5. I've felt pressure from people I've dated to lose weight. . . . .	1	2	3	4	5
6. I've noticed a strong message from people I've dated to have a thin body. . .	1	2	3	4	5
7. I've felt pressure from the media (e.g., TV, magazines) to lose weight . . . .	1	2	3	4	5
8. I've noticed a strong message from the media to have a thin body. . . . .	1	2	3	4	5
9. Family members tease me about my weight or body shape . . . . .	1	2	3	4	5
10. Kids at school tease me about my weight or body shape. . . . .	1	2	3	4	5

### Demographic Information

What is your gender?

- Female                       Male                       Prefer to self-describe \_\_\_\_\_

What is your race/ethnicity?

- African American     Asian American  
 Hispanic                       Native American  
 White/Caucasian     Other \_\_\_\_\_

What is your age? \_\_\_\_\_

What is your major? \_\_\_\_\_

What is your height? (feet and inches please) \_\_\_\_\_

What is your weight **in pounds**? \_\_\_\_\_

**Additional Comments/Concerns:**

Thank you for participating in this survey!

**Contact Information:**

To be entered into the drawing to win one of ten \$25 American Express gift cards, please provide  
your email address in the area below.

Email: \_\_\_\_\_

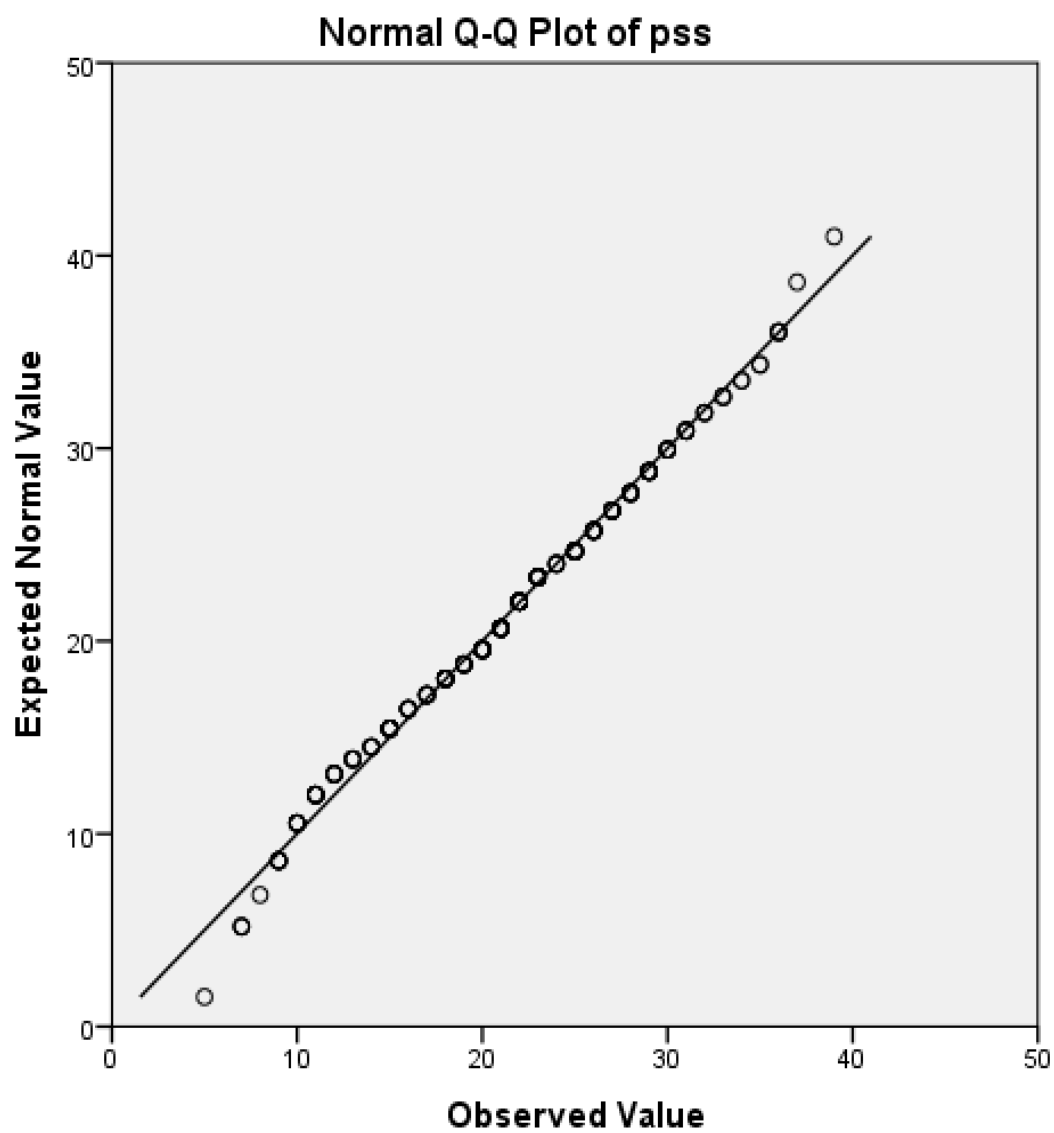
**APPENDIX H**  
**RESEARCH TIMLINE**





**APPENDIX I**

**Q-Q PLOT OF PERCEIVED STRESS SCALE (PSS) SCORES**



**APPENDIX J**

**Q-Q PLOT OF PERCEIVED SOCIOCULTURAL PRESSURE SCALE (PSPS) SCORES**

