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Disordered Eating Differences Among Male And Female Sorority And Fraternity Members

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DISORDERED EATING DIFFERENCES AMONG MALE AND FEMALE SORORITY AND FRATERNITY MEMBERS

by

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This thesis (or dissertation), submitted by (your name) in partial fulfillment of the requirements for the Degree of Master of Arts (insert appropriate degree) from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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I want to express my sincere appreciation to my family and friends who have stuck with me through my time in higher education. Without their guidance and support I would not have been able to complete this program.

To Bryan,

My personal cheerleader and best friend!

ABSTRACT

The purpose of this study was to gain insight into factors that may affect the rates of disordered eating in undergraduates and to expand the limited research in the area of fraternity/sorority life (FSL) membership and gender. These areas were compared using rates of disordered eating symptoms, anxiety levels, perfectionism, and body image differences, gathered from approximately 451 undergraduates using the EDE-Q, STAI, PSPS, and OBCS and demographic questionnaires. A two-way ANOVA was used to analyze effects of gender and FSL membership on EDE-Q scores. A linear regression was used to investigate associations between PSPS, OBCS, and STAIT scores and EDE-Q scores. It was hypothesized from previous research, that women and sorority/fraternity members would have the highest rates of disordered eating symptoms, as evidenced by higher EDE-Q scores, within each group. The scores of the STAIT, PSPS, and OBCS were compared to ED rates among these dichotomous groups in order to gain more insight into the results. Through analysis, a significant main effect of gender on disordered eating was found. However, no significant effects from FSL on disordered eating were found. Further, there was no significant interaction effect. Regarding the STAIT, PSPS, and OBCS, only the Body Shame and Body Surveillance subscales of the OBCS were found to be significantly correlated with EDE-Q scores. Surprisingly, trait anxiety and different areas of perfectionism were not found to be significantly correlated with EDE-Q scores.

Disordered Eating Differences Among Male and Female Sorority and Fraternity Members

Not only do eating disorders affect a person's mental health, but they have a huge impact on their physical health resulting in elevated mortality rates with low chance for remission (Berman, et. al., 2007; Steinhausen, et al., 2009; Arcelus, Mitchell, Wales & Nielson, p. 724, 2011). Though disordered eating affects people from all walks of life, including all genders, there is little research targeting men. Many studies have investigated the relationship between sororities and disordered eating but googlfew have investigated the relationship between fraternities and disordered eating. As of 2012, over 350,000 undergraduate students were members of the North American Interfraternity Conference (NIC) while the National Panhellenic Conference (NHC) reported that over 300,000 undergraduate women were part of a sorority (Biddix, et. al., 2014).

It was thought for some time that men were unable to be diagnosed with eating disorders, but it is becoming more well known that this is not the case (Anderson & Holman, 1997). With dieting starting earlier (Hill, 2002), continuing presentation of unrealistic body types for men and women in the media and increasing rates of other mental health concerns (Lipson, et. al., 2019), research investigating the prevalence of EDs among overlooked populations or groups is needed. The current study sought to answer several questions. (1) Do women have higher rates of disordered eating than men and (2) do sorority/fraternity members have higher rates of disordered eating than non-members? Further, does membership in either of the above groups (gender, FSL membership) influence scores on the STAI, OBCS, and PSPS measuring anxiety, body-objectification, and perfectionism, respectively?

Regarding the first question, it was hypothesized that women would report more disordered eating symptoms than men, supporting the results of previous studies (Cluskey and Grobe, 2009; Zuckerman, et. al., 1986; Eisenberg, et. al., 2011). Within men, symptoms may look differently than women. For example, in one study by Lewinsohn and colleagues (2002) women were found to have significantly higher scores on all of the factors of the EDI except excessive exercise, for which men had significantly higher scores. The current measures used to identify disordered eating symptoms are not as sensitive to men's presentation as they are to women's presentation. Therefore, men are likely to have lower rates of disordered eating due to truly lower rates and/or differences in symptomology.

Members of sororities and fraternities on campus are hypothesized to express greater rates of disordered eating than nonmembers. Though some research does not show evidence for the following (Guzman, 2003; Hobbs, 2006; Veazey Morris, Parra, and Stender 2011), the majority of studies have found that sororities have increased rates of disordered eating. In addition, FSL overall has increased stress from academic and social commitments and pressure to maintain a desired body type when compared to FSL members (Prouty, et. al., 2002; Hoerr, et. al., 2002; Allison & Park, 2004; Schulken, et. Al., 1997; Alexander, 1995; Cvetovac & Hamar, 2012; Davy, 1960; Zalta & Keel, 2006; Rolnik, et. al., 2010). With greater prevalence of these factors in FSL, greater rates of disordered eating would also be expected to be present to some extent. There have been a number of studies examining the rates of disordered eating within sororities (Basow, Foran, & Bookwala, 2007; Kurtzman, 1989; Averett, Terrizzi, Wang, 2017). However, it is difficult to find studies investigating the relationship between disordered eating and fraternities. This could mean that FSL's influence on men and women's rates of disordered eating may differ. However, there is one such study done by Piquero et. al. (2010) that found fraternity membership was correlated with higher rates of eating disorders while sororities had

no correlation to rates. In this regard, the current study would significantly expand the current pool of research for this subset of the population.

Higher levels of stress have been linked to disordered eating (Cvetovac & Hamar, 2012; Vaz Leal et. al., 2014; Ball & Lee. 2000). There is also a significant positive correlation between body objectification and eating disorder symptomology (Calogero, et. al., 2005; Tiggemann & Kuring, 2004). Finally, self-oriented perfectionism and socially prescribed perfectionism are correlated with eating disorder symptomology (Hewitt, et. al., 1995; McGee et. al., 2005). Therefore, examining differences in these factors between men/women and FSL members/nonmembers gives more insight to disordered eating symptomology.

Gender

Throughout the years eating disorders have been an illness specific to women. A book published in 2001 titled *The Golden Cage,* described anorexia nervosa (AN) as a disorder that "affect(s) young and healthy girls who have been raised in privileged, even luxurious circumstances," and supported the idea that eating disorders (EDs) were almost exclusively experienced by young, upper-class, white, women (Mitchison, et. al., 2014, p. 943; Bruch, 2001, p. xx). Despite references to male patients dating back to 1694, men have been mostly disregarded by health care providers when they sought help (Morton, 1694; Murray et. al., p. 2, 2017). Men have often been stigmatized and stereotyped, and because symptoms can differ in men, they have been met with disbelief (Murray, et. al., p. 414, 2016; Murray et al., 2017, p. 1). Even after the acceptance of EDs affecting men, less than 1% of contemporary peer-reviewed manuscripts have been related to men's presentation of AN (Murray, et. al, 2016, p. 414). Within psychiatric disorders, ED diagnoses have the highest rates of discrepancy between genders as the woman to man ratio is 3:1 (Eisenberg, et. al., (2011). Recently, more research has focused on

better representation for men within studies related to this disorder. Murray and colleagues (2017) found that not only do men's presentation of symptoms often looks different from women's presentation, but because of this, current ED assessment tools are not sufficient for identifying men's presentation of EDs. This may account for such a large discrepancy between men and women's rates of EDs. That being said, differences in the prevalence and adverse consequences of body dissatisfaction between genders are diminishing (Mitchison, et. al., 2014).

Historically, when men have come forward seeking help for an ED, they were often met with skepticism and stigma. These stereotypes had all but prohibited diagnosis and treatment of eating disorders among men until very recently (Morgan, 2008). Despite the removal of amenorrhea criteria from the DSM-5 classification and assessment accuracy for this population is still very limited (APA, 2013; Mitchison et. al., 2017). For example, Currin and colleagues (2007) found that even with the same presentation of symptoms, men were significantly less likely to be diagnosed with an ED than women. This is further exacerbated by the instruments used to assess for EDs, as most have traditionally been normed on women and few address specifically men's symptomology (Darcy et. al, 2012). This relationship between reduced diagnostic accuracy for men and the instruments that are used to diagnose individuals does not help reduce, and may actually increase, the stigma for men and EDs (Wooldridge, 2016). As of 2017, there had not been one neuroimaging study of AN or bulimia nervosa (BN) that has included any men further illustrating that men have been excluded from ED related research that is at the forefront of treatment development (Murray et. al., 2017).

Though Anderson and Holman found that only 10% of ED diagnoses were held by men in 1997, current research suggests that this is likely an underestimation. In Australia, Madden and colleagues (2009) found that men represent one fourth of preadolescent diagnoses of ED,

while Nicholls and colleagues (2011) found British men represent 33% of pre-adolescent ED cases. These rates may still be an underestimation as most of the data collected was from ED specializing centers and did not take into account non-ED settings such as gastroenterology practices (Murray et. Al., 2017). In addition, many studies, including that of Mitchison and colleagues (2013), find that rates of EDs are found to be lower in clinical settings which suggest many men are less likely to seek help for EDs.

Stigmatization of this disorder is likely a problematic barrier to treatment for men. Further, men may be hesitant to seek help for a stereotypically "'female" problem due to perceived damage to their masculinity (Griffiths, et. al., 2014). This stigma is not just socially problematic but impacts physical and psychological health as well. Griffiths and colleagues (2015a) found that the stigma surround EDs is associated with greater ED and depressive symptomology, longer presentation of ED symptoms, lower self-esteem and poorer attitudes about seeking treatment.

With findings like this, it is reasonable to conclude that EDs are not an issue uniquely affecting women. To further support this conclusion, Bently and Mond (2015) reported men and women had similar levels of psychological distress and reduced quality of life when they reported a greater number of ED symptoms. What may be more alarming is the same study found that certain ED behaviors found in men are increasing more rapidly than they are for women (Murray et al., 2017).

As previously stated, ED symptoms in men often look different than those presented by women. Broadly, men with EDs are more likely to report a wider range of psychological comorbidities (e.g., psychosis, substance use), a later age of onset, a history of obesity or being overweight, and more subjection to weight-related teasing or bullying than women (Murray et.

al., 2017). Regarding more specific symptoms, one has to look at each individual disorder to identify discrepancies between men and women.

To be diagnosed with anorexia nervosa a person must persistently restrict their energy intake, must experience intense fear of gaining weight or becoming fat, and exhibit a "disturbance of how one's body is experienced or undue influence of shape and weight on self-evaluation," (APA, 2013; Murray et. al., 2017). In addition, the International Classification of Diseases classification (ICD-10) requires a change in the endocrine system which can be experienced as amenorrhea in women or loss of sexual interest for men (World Health Organization, 1992). These definitions do not take into account the differences in symptomology that men regularly experience. This may influence the difference in lifetime prevalence rates between men (0.3%) and women (0.9%) in the diagnosed cases (Hudson, et. al., 2007). For example, Pope and colleagues (2000) discussed how many men have different goals than women when restricting dietary intake. While many women are focused on thinness, men often are concentrated on leanness in order to showcase their musculature (Murray et al., 2017). Strober and colleagues (2006) found that men and women have similar concern regarding body shape. However, they did differ in body weight concern, where women put more emphasis on weight than men. Finally, excessive exercise may be more prominent in men (Murray, et. al., 2014). In this regard, Murray (2014) found that men tend to utilize the hormonal aspect of exercise to decrease negative affect even though they have more rigid exercise habits than women with AN.

Bulimia Nervosa is characterized by an overvaluation of shape and weight, the presence of recurrent binge episodes, and the use of one or more compensatory mechanisms (e.g., vomiting, excessive exercise etc.; APA, 2013). The lifetime prevalence of BN for men is 0.5% while women were estimated to have a 1.5% lifetime prevalence rate (Hudson, et. al., 2007).

Similar to AN presentation, men's presentation of BN looks slightly different in the majority of cases. For example, while women tend to prefer sweets during binges (e.g., chocolate, ice cream), men tend to prefer foods high in fat and protein (e.g., casseroles, barbeque) which may affect preferences for binges (Wansink, et. al., 2003). Due to the current operational definition of a binge being based on young women, a "binge episode" may not correctly define a binge episode for men. For example, the "size threshold" for what constitutes a binge episode may differ for the sexes, as men are typically less distressed by eating large amounts of food (Murray, et. al., 2017). Finally, differences in frequency and prevalence were reported by Lavender and colleagues (2010). They found that women are more than twice as likely as men to have vomited as a compensatory mechanism (3.7% and 1.5% respectively) and to have participated in body checking (22.5% and 8.9% respectively) or body avoidance (11.3 and 4.4 respectively; Lavender, et. al., 2010). However, men's prevalence (26%) of overeating in the last 3 months was 1.44 times the rate of women (18%; Lavender, et. Al., 2010).

The last ED being compared between the two genders is binge eating disorder (BED). BED is characterized by recurrent episodes of eating a large amount in a discrete period of time, feeling a lack of control while overeating, marked distress, and no compensatory behaviors being present (APA, 2013). While BED is the most prevalent ED, the discrepancy between men and women is still rather large (Hudson, et. al., 2007). Hudson and colleagues (2007) found that the lifetime prevalence for men is 2.0% while it is 3.5% for women. While sampling 6000 adults in South Australia, researchers found that of all BED cases 43% were comprised of men, while men only represented 17% and 31% of all cases of AN and BN respectively (Hay, et. al., 2015). This may be due to similar presentation of BED in men and women (Murray et. al., 2017, p. 4). However, some studies have reported that although presentation looks similar, fewer men report

distress associated with binges which may account for lower rates as part of the criteria for BED is distress (Murray, et. al., 2017).

After looking at the current information regarding the men presentation of EDs, it is clear the research is lacking. However, the studies that have investigated men's presentation of EDs, muscularity-focused disordered eating was found to be common among men. Typically, ED diagnoses and presentation is focused on leanness-focused disordered eating, but most men in Western societies not only desire a lean body, but a well-developed muscular body as well (Griffith, et. al., 2013). While women are typically pressured to maintain a lean body shape through societal norms, men's body ideal in Western countries is usually a more muscular body (Cafri, et. al., 2005; Griffith, et. al., 2013). This changing body ideal can be seen in the media (e.g., movies, tv, video games, action figures) the permeates the Western societies. Similar to women being pressured to reach the ideal body presented by actresses and models, pressure for men to achieve this muscular body type exists as well. Additionally, in line with women's body dissatisfaction and negative affect influenced by society's ideal body, men are equally affected by the pressure to reach the desired body shape (Agliata & Tantleff-Dunn, 2004). Therefore, the focus on thinness-oriented diagnoses of EDs may not be appropriate for the diagnosis of men's muscularity-oriented EDs.

Sorority and Fraternity Membership

Currently, most research supports the idea that sororities have increased rates of disordered eating (Allison & Park, 2004). For example, Prouty and colleagues (2002) found that those women who were members of a sorority were more likely to score at or above 20 on the EAT-26. Hoerr and colleagues (2002) found that the highest percentage of eating disorders among women was found to be in a sorority where all members lived in the house (15%).

However, other sororities on campus had comparable rates to the women living in the dorms (Hoerr, et. al., 2002). Schulken and colleagues (1997) reported that sorority members who lived in the FSL house, had a greater fear of becoming fat, greater body dissatisfaction, as well as a higher concern with dieting than the college women living off campus.

Due to increased stress from academic and social commitments as well as increased pressure to maintain a desired body type, previous research linking these factors to disordered eating suggest that FSL members may have increased rates of disordered eating (Basow, Al., et. al., 2007). For example, Rolnik and colleagues (2010) found that those women who rushed a sorority had higher levels of self-objectification and scored higher on the bulimia and food preoccupation subscale of the EAT. Another study found that not only do sorority members have more risk factors for developing an ED (body objectification, disordered eating attitudes, perceived social pressure) when compared to nonmembers, but women with high levels of those factors were more likely to rush or be attracted to sororities (Basow, et. al., 2007).

There have been several studies however than do not indicate a significant link between sorority membership and an increased disordered eating rate. For example, Alexander (1995) found that though there was a trend of higher risk for eating disordered behavior in sorority members than the control group, the results were not significant. Though some researchers disagree (Guzman, 2003; Hobbs, 2006; Veazey, et. al., 2011), the majority of studies have found that sororities have increased rates of disordered eating.

As discussed previously, men have been found to have overall lower rates of disordered eating than women. However, these numbers may not be entirely accurate based on differing presentation and stigma surrounding help-seeking in men. While there have been several studies examining the rates of disordered eating within sororities (Basow, et. al., 2007; Kurtzman, 1989;

Averett, et. al., 2017), it is difficult to find studies investigating the relationship between disordered eating and fraternities. This could mean that FSL's influence on men and women's rates of disordered eating differ. However, there is one such study done by Piquero and colleagues (2010) that found fraternity membership was correlated with higher rates of eating disorders. In addition, a 2013 study by Ferraro and colleagues found that men living in fraternities differ in several areas including: ideal body size, desired body size and body size most liked. Fraternity men were also found to endorse larger ideal and acceptable body sizes the longer they are in the fraternity (Ferraro, et. al., 2013). The current study helps to expand the existing, limited pool of research for this subset of the population.

Anxiety

There are many risk factors that could influence when person exhibits disordered eating. Some risk factors include increased stress and/or having a comorbid psychiatric disorder such as depression and anxiety (Culbert, et. al., 2015; Rosenbaum, White, 2015; Cvetovac, Hamar, 2012; Davis, et. al., 2000; Rosen, et. al., 1993). The hypothalamic–pituitary–adrenal (HPA) axis is responsible for the release of cortisol, a stress hormone. With altered response to stress, a dysfunctional HPA access may be partially responsible for stress being a risk factor for EDs. A study completed by Vaz Leal and colleagues (2014) found that in patients with eating disorders, dysfunctional functioning of the HPA axis was present supporting their hypothesis. In a literature review done by Swinbourne and Touyz (2007) there was clear evidence that anxiety disorders are significantly more frequent in subjects with EDs than the general community. However, this review also noted that the research provides "strikingly inconsistent findings" regarding the cause-and-effect nature of these disorders' co-morbidity (Swinbourne & Touyz, 2007, pg. 253). Additionally, they stated that despite reasons to believe ED prevalence in those presenting for

anxiety treatments are likely high, there was a lack of research in this area (Swinbourne & Touyz, 2007).

Body Dissatisfaction

Body dissatisfaction has also been identified as a predictor of increased rates of disordered eating (Klemchuk, wt. al., 1990; Tylka, 2004). Therefore, comparisons of this factor between each group should be investigated. Body dissatisfaction was found by to be independently associated with "a 22-fold increased risk for anorexia nervosa," 18-fold and 25-fold risk increase for BN and BED respectively (Lafrano-Prado et. al., 2015). In line with this research, Beiter and colleagues (2015) found that 32.4% of undergraduates were moderately or extremely concerned about their body image and/or their self-esteem. Those with poor body image are significantly more likely to exhibit patterns consistent with disordered eating (Cash and Deagle, 1997). In fact, this correlation is so strong that Polivy and Herman (2002, p. 192) went so far as to describe low body satisfaction as an "essential precursor" to eating disorders. Previously, the body objectification theory, as described by Fredrickson and Roberts (1997), was developed to explain women's experiences and their increased body surveillance/body dissatisfaction due to societal pressures (e.g., movies, actresses, etc.). However, this theory is increasingly becoming applicable to men's experiences as men are beginning to see increased pressure to maintain a certain body shape (Frederick, Forbes, Grigorian, & Jarcho, 2007). Therefore, body objectification and body dissatisfaction should be measured between the different demographic groups.

Perfectionism

Perfectionism has been shown to be correlated with eating disorder presentation (Hewitt, et. al., 1995; McGee et. al., 2005; Davis, et. al., 2000; Lilenfeld et al., 2000; Tyrka, et. al., 2002;

Vohs, et. al., 1999). This is likely due to perfectionistic individuals feeling the need to meet their ideal body/weight standards imposed by either themselves or others. (Hewitt, et. al., 1995). Hewitt and colleagues (1995) found that both the need to present to others a perfectionistic image of oneself and the need to avoid revealing imperfections are related to anorexia and bulimia. Further, in line with Strober's (1991) conception of personality and environmental factors in EDs, excessive harm avoidance is significantly related to eating disorder vulnerability. For example, nondisplay and nondisclosure of imperfection and perfectionistic self-promotion are similar to harm avoidance (Hewitt, et. al., 1995). Sorority members have shown increased perfectionism in the past (Biddix, et. al., 2014). Biddix (2014) posits that this is likely due to the pressures on women to conform to the sorority's expectations, maintain a body shape that is both attractive and able to handle excessive alcohol use, and balance social life with high academic standards. It would seem that similar pressures would be placed on fraternity members, though there is little research regarding this aspect. Ashmore and colleagues (2002) did find however, that fraternity members tend to focus on conforming to the college men archetype which likely creates a desire for perfection as well.

The hypothesis for the current study was that, in line with previous research, women would endorse higher EDE-Q scores than men. Further, FSL members were hypothesized to endorse higher EDE-Q scores than non-FSL members. Finally, anxiety, perfectionism, and body objectification were hypothesized to be positively correlated with EDE-Q scores as measured by the STAIT, PSPS, and OBCS.

Method

After approval from the University of North Dakota's IRB, participants were recruited by posting flyers around campus with a QR code to a Qualtrics survey, placing the research on UND's undergraduate research SONA, and sending emails (see attached) to psychology professors and sorority/fraternity chapter presidents to be shared with students. Data were collected between 2020 and 2022 from undergraduate men and women with variable membership to fraternities or sororities. Initially, a raffle for a $10-25 Amazon gift card was going to be used for compensation for the participants to prevent the use of SONA. However, after a year of attempted recruitment and very few participants having engaged in the study, it was decided to move over the study to SONA in order to collect enough data for the study. Through SONA, participants were given course research credits for participating in the study. The participants were allowed to withdraw from the survey at any time, though they would not receive research credits if they did so. Other studies were available for the participants to earn their required research credits at UND. For those that completed the study before switching to SONA (11/23/2021), a raffle was done with a $10 and $25 gift card being distributed to two random participants chosen from a random number generator. In order to maintain anonymity, after completing the main study, they were redirected to another survey where they could put in their information so they could be contacted should they win the raffle. A total of 44 participants were included in this raffle, with numbers 17 and 37 being chosen.

Participants

A total of 451 responses were recorded with 445 and 446 responses being completed with gender and FSL membership recorded. Of these respondents, 97 were men (21.8%), 345 were women (77.5%), and 3 individuals identified as "other" (<1%). One hundred twelve (25.1%) of

the complete responses indicated they were part of FSL while 334 (74.9%) indicated they were not. Approximately 21.6% of the 112 respondents were part of a fraternity while 78.4% were part of a sorority.

There were 142 items on the survey with most people not answering less than 7 items. Scheffer (2002) suggests that complete cases can be used if no more than 6% of data is missing. With this in mind, 97.3% (438) of cases were included in the analysis. Those that were excluded were missing eight or more data points or identified their gender as "other." Although including all genders is ideal in research, this research question was specifically looking at the differences between men and women. Therefore, those who did not identify as either of these genders were excluded from the present analysis.

Measures

All measures were administered online through Qualtrics Research Suite. Consent was obtained through the survey. Participants were given the informed consent information and at the end of that information they saw "Clicking yes below indicates that you have read the previous information regarding informed consent and consent to completing the survey. If at any time you wish to decline answering a question or finishing the study, simply close the Qualtrics survey and email the principal researcher at sky.gabel@und.edu." If they clicked yes, they were directed to the remainder of the survey. If they clicked no they were directed to the end of the survey.

Participants were administered a questionnaire online to assess age, gender, race/ethnicity, sexual orientation, school year, collegiate sport scholarship/membership, current FSL membership, current weight and height, highest weight as an adult, and lowest weight as an adult. Body Mass Index (BMI) was calculated by utilizing the following formula provided by the

Center for Disease Control (2017): divide weight in pounds (lbs) by height in inches (in) squared and multiply by a conversion factor of 703.

Eating Disorder Examination Questionnaire (EDE-Q)

The EDE-Q is a self-report measure used to measure ED psychopathology. The published internal consistency of this measure is $\alpha = .90$ and this study's was .92 (Gideon, et. al., 2016). The EDE-Q has 28 questions that assess frequency (No Days to Every Day) of disordered attitudes, beliefs, and behaviors over the past 28 days within participants. The EDE-Q offers four subscale scores that display different areas of ED pathology including: restraint, eating concern, shape concern, and weight concern. For example, an item from the eating concern subscale is "On how many of the past 28 days has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?" An example of an item from the restraint subscale is "On how many of the past 28 days have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?" For the shape concern subscale, a sample question is "On how many of the past 28 days have you had a definite desire to have a totally flat stomach." Finally, an example item from the weight concern subscale is "On how many of the past 28 days Has your weight influenced how you think about (judge) yourself as a person?" To calculate the global score, all items on the EDE-Q are averaged. The EDE-Q has acceptable internal consistency and test-retest reliability indicated from previous studies (Peterson, et al., 2007; Luce & Crowther, 1999). This questionnaire is also one of the few ED measures that have norms available for both men and women in clinical and non-clinical populations within this study's age group (Aardoom, et. al., 2012; Lavender, et. al., 2010; Luce, et. al., 2008; Fairburn, et. al., 1993.)

The EDE-Q collects both frequency data on disordered eating behaviors and subscale scores reflecting the severity of those behaviors. To obtain the subscale scores the ratings for the relevant items are added together and then the sum is divided by the total number of items forming the scale. For the global score, the four subscales are summed then divided by four (Fairburn, et. al., 2012).

The State Trait Anxiety Inventory (STAI)

The STAI is a 20-item state (α=.95) and 20-item trait (α=.93) anxiety self-report measure (Gros, et. al., 2007). For the purposes of this study, only the trait items were be assessed as trait similarities between participants is the area of interest. The published internal consistency of this measure was α = .93 and this study's was .71. Participants rated items on a four-point scale from 1 ("Almost Never") to 4 ("Almost Always). Higher scores indicate greater levels of anxiety. Additionally, this scale has internal consistency coefficients ranging from .86 to .95 and many studies have shown the construct and concurrent validity of the scale as well (Spielberger, et. al., 1983). The trait form of this measure has also been shown to assess depressive traits in addition to anxiety traits (Bieling, et. al., 1998).

STAIT consists of 20 items that are rated on a 4-point scale based on there general feelings of anxiety. To calculate the STAIT score, the items are simply summed then compared to normed values for interpretation. Scores range from "no or low anxiety" (20-37), "moderate anxiety" (38-44), and "high anxiety" (45-80; Kayikcioglu, 2017)

Perfectionistic Self-Presentation Scale (PSPS)

The Perfectionistic Self-Presentation Scale (PSPS) is a 27-item self-report questionnaire, which uses a 7-Point Likert-scale to assess the interpersonal expression of perfectionistic

behavior that includes non-display of imperfection, perfectionistic self-promotion, and the nondisclosure of imperfection. Internal consistency among the subscales ranges from .78 to .86 while this study's internal consistency was .95 (Hewitt et. al., 2003). Many studies, including multiple completed by Hewitt and their colleagues, have found links to eating disorders and specifically anorexia nervosa (Hewitt, et. al., 2003). Acceptable construct and convergent validity, and test-retest reliability, were shown in Hewitt and colleagues' study in combination with a diverse sample (2003). As perfectionistic attitudes and behaviors are often seen in eating disordered samples it was be important to include this measure.

The PSPS is a 27-item measure that creates three subscales (Perfectionistic Self-Promotion, Nondisplay of Imperfection and Nondisclosure of Imperfection). These subscales are a sum of items throughout the assessment, with some being reversed. For example, a score of 1 would become 7 if the item was reversed.

Objectified Body Consciousness Scale (OBCS)

The Objectified Body Consciousness Scale (OBCS; McKinley and Hyde 1996) is a 24-item measure ($\alpha = .75$) with three subscales including: body shame, body surveillance, and appearance control beliefs (McKinley & Hyde, 1996). Participants rate each item on a scale of 1 (strongly disagree) to 7 (strongly agree). Higher scores on the body shame subscale indicate beliefs consistent with feelings of inadequacy regarding cultural expectations and appearances (e.g., "I feel ashamed of myself when I haven't made my best effort to look my best."; McKinley & Hyde, 1996). On the body surveillance subscale, participants' tendency to view their bodies how other people would is measured. For example, one item is "I rarely worry about how I look to other people"; McKinley & Hyde, 1996). Finally, the appearance control subscale measures how often behaviors that influence the participants' appearances occur (e.g., "How often do you

restrict what you eat to control or maintain your weight?"; McKinley & Hyde, 1996). Internal consistencies for the surveillance scale (α = .89), body shame scale (α = .75) and control beliefs scale (α = .72) were moderate to high (McKinley & Hyde, 1996). The published overall consistency of this measure was α = .75 and this study's was .69. Including this measure improves our understanding of body image's role in disordered eating among this sample.

The OBCS is a 24-item measure with three subscales including: body shame, body surveillance, and appearance control beliefs. These scales are created by summing the indicated score for each item, with some items having to be reverse scored, then dividing that sum by the number of items in each scale.

Additional Items

Included in the survey for future analyses were several questions related to compensatory mechanisms, ideal body types for men and women, mindset when working out, alcohol consumption, and stress levels. Please see Appendix A for full survey. These questions were included so the researcher may create and validate a measure in the future that targets men's ED presentation. These items were not included in the analyses of the present study.

Results

This study aimed to predict the outcome of one, continuous, outcome of interest (EDE-Q Global) by measuring multiple, categorical, independent variables (gender and FSL membership). A factorial ANOVA was used to analyze effects of gender and FSL membership on EDE-Q scores. A linear regression was used to investigate associations between PSPS subscales, OBCS subscales, and STAIT scores and EDE-Q scores.

The two-way or factorial ANOVA was chosen to determine whether there is an interaction effect between the two independent variables (gender and FSL membership) in terms of a continuous dependent variable (EDE-Q scores). The researcher wanted to know: (a) whether the gender impacted EDE-Q scores; and (b) whether EDE-Q scores differed depending on whether the participant was part of a FSL or not (is there a statistically significant two-way interaction effect).

Before running the ANOVA to examine the main effects and interactions between the two independent variables, the data was analyzed to determine if assumptions for an ANOVA would be met. First, data was tested for normality. Here, the skewness (0.597) and kurtosis (-0.416) were within acceptable limits, but the Shapiro-Wilk test was significant (Shapiro-Wilk=0.946; $p<0.001$) indicating the distribution is significantly different from a normal distribution. Figure 1 shows the histogram plot for the EDE-Q global data. When the nature of this data is reviewed, this lack of normality can be explained. The EDE-Q is an assessment that measures disordered eating symptoms, which, by definition, are not normally distributed, as most people do not meet diagnostic criteria for an ED. Therefore, this data is expected to not be normally distributed.

To combat the skewed data, the global EDE-Q score was log transformed resulting in a more normal distribution as seen in Figure 2. However, the Shapiro-Wilk test still indicated non-normal distribution (Shapiro-Wilk=0.966; $p<0.001$). Normality tests like Shapiro-Wilk has limitations including a bias by sample size. The larger the sample, the more likely results will be statistically significant result. Ghasemi and Zahedias (2012) indicated that with "large enough sample sizes (> 30 or 40), the violation of the normality assumption should not cause major problems." Specifically, in large samples, the sampling distribution tends to be normal,

regardless of the shape of the data based on the central limit theorem. Therefore, though the log transformed data does not meet normality assumptions based on the Shapiro-Wilk test, its data is more normally distributed than indicated by the test results.

When looking at the data of PSPS, OBCS, and STAIT, the data appear normally distributed based on their histograms, despite the Shapiro-Wilk test being significant for STAIT (p = .004) and PSPS (p = .036). OBCS's Shapiro-Wilk's test indicated normality (p = .095). Skewness and kurtosis were within appropriate limits for each of these data sets. As discussed above, tests of normality become more biased as sample sizes grow and these covariates appear to be generally normally distributed based on their histograms. Therefore, they were not transformed as EDE-Q data were when completing the linear regressions.

Figure 1

EDE-Q Global Histogram Plot

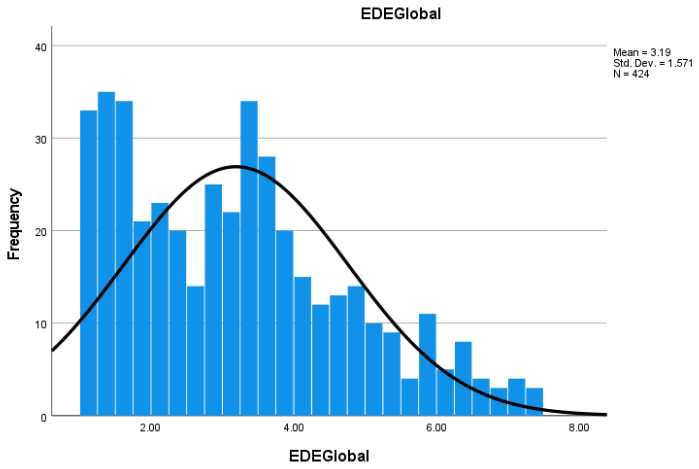
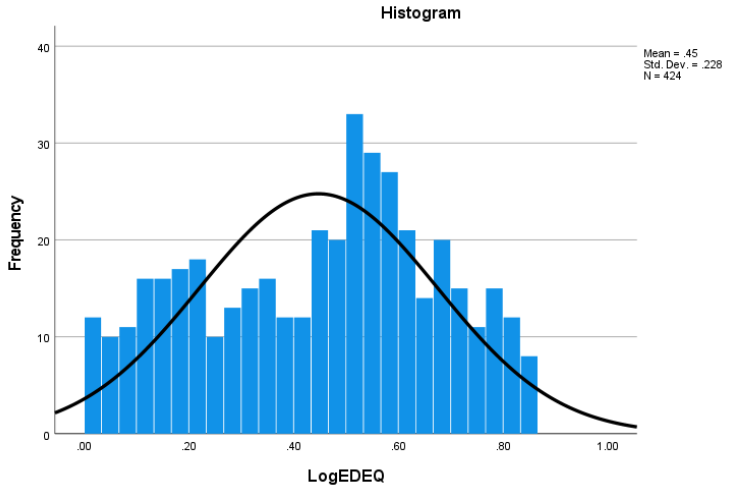


Figure 2

EDE-Q Log Transformed Histogram Plot



Next, homogeneity of variance for EDE-Q was investigated using Levene's Test with the transformed data. Based on this test (Levene's Statistic = 0.110; p = 0.954) the assumption of equal variances can be kept. Further, there were no outliers within the data set. With the necessary assumptions being met, an ANOVA was completed.

A 2x2 ANOVA was completed and based on this data, there was a main effect for gender $F(1, 424) = 13.586$, $p < .001$, $\eta p^2 = .031$, but not for FSL membership $F(1, 424) = 1.162$, $p = .282$, $\eta p^2 = .003$. No interaction effect was found between the two independent variables $F(1, 424) = 0.085$, $p = .771$, $\eta p^2 = .000$. With these data, if there was no main effect in the larger population, the probability of finding the sample main effects of gender is less than 0.01%. The adjusted r squared indicates that 4.7% of variance in EDE-Q scores is attributable to gender and FSL membership. Gender was found to be a significant predictor of EDE-Q scores and when looking at the differences between men and women, women were found to have higher scores compared to men (see Table 2). FSL membership however, was not found to be a significant predictor of EDE-Q scores (see Table 2).

The second aim of this study was to investigate whether the PSPS subscale scores, OBCS subscale scores, and STAIT scores significantly predict EDE-Q scores using a multiple linear regression. The fitted regression model was: EDE-Q = -0.300 + 0.068*(Surveillence) + 0.100*(Body Shame) - 0.003*(Body Control) + 0.001*(STAIT) + 0.001*(Perfectionistic Self-Promotion) - 0.002*(Nondisplay of Imperfection) + 0.000*(Nondisclosure of Imperfection). The overall regression was statistically significant (R^2 =0.637, $F(7, 331)=82.810$, $p<0.001$). It was found that of the variables OBCS' body surveillance subscale scores ($\beta=0.068$, $p<0.001$) significantly predicted EDE-Q scores as did body shame subscale scores ($\beta=0.100$, $p<0.001$). All other variables were not significant (See Table 1).

Table 1

Linear Regression of PSPS, OBCS, and STAIT Scores

Variable	Unstandardized B	t	Significance
OBCS Body Surveillance	.068	7.27	<.001
OBCS Body Shame	.100	11.410	<.001
OBCS Control	-.003	-.395	.693
STAIT	.001	.860	.391
PSPS Perfectionistic Self-Promotion	.001	.981	.327
PSPS Nondisplay of Imperfection	.002	-1.354	.177
PSPS Nondisclosure of Imperfection	7.342E-5	.053	.958

Table 2

Descriptive Statistics

Sample	n	Mean EDE-Q Score	SD
Men	90	2.55	1.25
Women	334	3.36	1.61
FSL	107	3.34	1.61
Non-FSL	317	3.14	1.55
Male FSL	23	2.69	1.12
Male Non-FSL	67	2.51	1.30
Female FSL	84	3.52	1.70
Female Non-FSL	250	3.31	1.57

Discussion

With this study, it was found that there was a significant main effect of gender on disordered eating symptomology measured by the EDE-Q. This outcome supports previous research completed throughout the years that indicate greater rates of eating disorders among women than men (Currin et. al., 2007; Nicholls et. al., 2011; Madden et. al., 2009; Hudson et. al., 2007; Lavender et. al., 2010).

No main effects or interactions were detected for FSL membership on ED symptom rates nor between gender and FSL membership on EDE-Q scores. No interaction effect means that the effect of gender or FSL members does not depend on the value of the other variable. Past research generally indicated an increased risk for disordered eating behaviors in sorority populations than those in nonmember populations (Allison & Park, 2004; Rolnik et. al., 2010),

Averett, et. al., 2017) though there were several studies that did not find a significant effect (Guzman, 2003; Hobbs, 2006; Veazey, et. al., 2011). For men, there were fewer studies to investigate but at least one showed a significant relationship between fraternity membership and disordered eating symptoms (Piquero, et. al., 2010). The current study rejected the hypothesis that there was a significant effect of sorority/fraternity membership on EDE-Q scores nor is there a significant interaction effect.

This study also collected data related to perfectionistic tendencies, body objectification, and trait anxiety of the participants. These data were interpreted using a linear regression investigating the relationship between each of the scales/subscales and EDE-Q scores. It was hypothesized that there would be a significant correlation between these scales and EDE-Q scores, with greater levels of body objectification, trait anxiety, and perfectionism being related to larger EDE-Q scores. The results were partially supportive of this hypothesis.

Body Shame and Body Surveillance subscales of OBCS were found to be significantly, positively correlated with EDE-Q scores. This result falls in line with other studies (Klemchuk, 1990; Tylka, 2004; Cash & Deagle, 1997; Polivy & Herman, 2002) and makes logical sense as a large component of most eating disorder criteria comes from a disturbance in or overvaluation of body weight/shape. However, the Control Beliefs subscale of OBCS was not significantly correlated with EDE-Q scores. Previous research has produced mixed results related to the relation of eating disorder symptomology and control beliefs. Several studies indicate that women who believe they can and should control their weight are more likely to have higher rates of ED symptoms (Furnham & Atkins, 1997; Laliberte, et. al., 2007). However, other studies have found no connection between these two variables (Basow, et. al., 2007; McKinley, 1999; Tylka,

2004; Fitzsimmons, et. al., 2011). With historically mixed results, the current study adds to the available data pool for further investigation by future researchers.

STAIT scores were found to not be significantly correlated with EDE-Q scores. This was a surprising finding as most research has found there is a large co-morbidity with anxiety and eating disorders (Swinbourne & Touyz, 2007). The Trait subscale of the STAI has scores ranging from 20-80 with higher scores being indicative of more anxiety. A cut-off of around 40 has been suggested to detect clinically significant symptoms for the State subscale. The mean score for the Trait subscale in this data set was 46.52 which falls above the cut-off. With this in mind, perhaps the reason for the nonsignificant relationship between STAIT and EDE-Q scores is due to the fact that this sample is made of students who have higher levels of anxiety than the general population. For example, students in college tend to be under a great deal of stress and university counseling centers see students who meet criteria for anxiety disorders frequently. With such a high base level of anxiety in this sample population, anxiety's interaction with ED symptoms may not have been as robust as in a population that had a greater range of anxiety scores.

Different areas of perfectionism were also investigated with this study and how they related to disordered eating. Previous research has found that there is a positive relationship between perfectionism and ED presentation (Hewitt, et. al., 1995; McGee et. al., 2005; Davis, et. al., 2000; Lilenfeld etl a., 2000; Tylka, et. al., 2002; Vohs et. al., 1999). The present study, however, found no significant correlation between EDE-Q scores and any of the three subscales of the PSPS (Perfectionistic Self-Promotion, Nondisplay of Imperfection, Nondisclosure of Imperfection). It is unclear why this data was not supportive of previous studies' conclusions. Perhaps students who are more perfectionistic were more likely to choose different studies to participate in, as this study directly asks about behaviors and attitudes that can be seen as signs of

imperfection. If a person would have had higher PSPS scores, they may be less likely to engage in self-report measures that ask for data showing they are not perfect.

The current study has added to the somewhat limited pool of research surrounding eating disorders and its relationship to FSL membership. Further, the data provides information about several other variables that have been shown to have a relationship with disordered eating that contradicts some research. Though some results do not support other previous research, the data nonetheless provides needed information in the field related to eating disorders.

There were several limitations of this study that should be noted for future research. One limitation was the exclusion of participants who did not identify as either a man or woman. Although including all genders is ideal in research, this research question was specifically looking at the differences between men and women. Therefore, those who did not identify as either of these genders were excluded from the present analysis.

Another limitation of this study was based on having the survey completed over electronic means. The survey was done online to reach the greatest number of people with the greatest of ease. Qualtrics is not always a user-friendly platform with those who have a visual impairment, however. Therefore, there may have been individuals who found the presentation of the survey too difficult to navigate on Qualtrics and were unable to complete the study.

SONA is the participant pooling resource for UND's psychology department and its use was another limitation. Students who take a psychology course while in their undergraduate studies are required or receive extra credit for participating in research through SONA. Most of the courses that require this research are level 100 or 200 level course while those that have it as extra credit are often 300 or 400 level courses. With these requirements, a large portion of the

respondents were freshmen (41.8%) or sophomores (33.5%), with only 17.6% being juniors and 7.2% being seniors or "super-seniors." Additionally, the data indicates that 78.9% of the respondents were under the age of 21. Therefore, the data may be biased towards age.

Further limitations to this study include the characteristics of the sample. Specifically, the pool of potential subjects was drawn from UND whose students are mainly white. When looking at the demographics of this study, 87.3% of students identified as white, 3.0% as Native American/Alaskan Native, 1.4% as black, 2.3 as Asian, 3.5% as more than one race, and 1.2% as another race other than those listed. Historically, eating disorders have been thought to be a predominantly white, woman's disorder and presentations in minority populations have been ignored. Recent studies are now finding that in North America, 12-month, and lifetime prevalence of EDs in ethnic/racial minorities is comparable to that reported for non-Latino whites (Pike, et. al., 2013). Further, some data suggests that rates of BN are significantly higher in Latino and Black men as compared to non-Latino white men (Marques, et al., 2011). Black women consistently report lower levels of body dissatisfaction as compared to white women (Gordon, et. al., 2010). With this in mind, the data may be biased based on the small percentage of minority populations being included in this study.

Also related to the sample, there was an unequal sample size of men versus women, and unequal sample sizes based on FSL membership. Though a two-way ANOVA can be done with unequal cells, there are some potential issues that arise. Specifically, statistical power and robustness to unequal variances can be reduced. Statistical power refers to the probability that a test will detect some sort of effect when there is one, and this power becomes lower when there are greater differences in sample sizes between the groups. The other problem is robustness to violations of equal variances. When the sample sizes for each group are the same, this is not a

problem. However, when there are unequal sample sizes and unequal variances between the groups, then the results of the ANOVA are less reliable. The effect of the unequal sample sizes can be seen in the reduced observed power calculated post-hoc for FSL (.189) and the interaction of FSL and gender (.06) compared to that of gender (.957).

Clinical Implications

This study produced mixed results when compared to past research in the same area. Therefore, further investigation into the area of sorority/fraternity membership, anxiety, perfectionism, and body objectification as it relates to disordered eating would be beneficial. Additionally, taking steps to continue including equal number of men and women in studies surrounding these topics can reduce the bias of future eating disorder diagnosis and treatment. As researchers and clinicians are starting to acknowledge, men can present with EDs differently and at different rates. Unfortunately, not as much is known for this population and even less is known about disordered eating in fraternities. Therefore, adding to the research database can greatly impact the health and wellness of future college students.

References

Aardoom, J. J., Dingemans, A. E., Op't Landt, M. C. S., & Van Furth, E. F. (2012). Norms and discriminative validity of the Eating Disorder Examination Questionnaire (EDE-Q). *Eating behaviors, 13*(4), 305-309. 10.1016/j.eatbeh.2012.09.002

Agliata, D., & Tantleff-Dunn, S. (2004). The impact of media exposure on males' body image. *Journal of Social and Clinical Psychology, 23*, 7–22. https://doi.org/10.1521/jscp.23.1.7.26988

Alexander, L. A. (1995). The prevalence of eating disorders and eating disordered behaviors in sororities. Masters Theses 1911 - February 2014. 2292. https://scholarworks.umass.edu/theses/2292

Allison, K. C., & Park, C. L. (2004). A prospective study of disordered eating among sorority and nonsorority women. *International Journal of Eating Disorders, 35*(3), 354-358. 10.1002/eat.10255

American Psychiatric Association (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: American Psychiatric Association.

Andersen, A. E., & Holman, J. E. (1997). Males with eating disorders: Challenges for treatment and research. *Psychopharmacology bulletin, 33*(3), 391.

Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2011). Mortality rates in patients with anorexia nervosa and other eating disorders: a meta-analysis of 36 studies. *Archives of general psychiatry, 68*(7), 724-731. 10.1001/archgenpsychiatry.2011.74

Ashmore, R. D., Del Boca, F. K., & Beebe, M. (2002). "Alkie," "Frat Brother," and "Jock": Perceived types of college students and stereotypes about drinking. *Journal of Applied Social Psychology, 32*(5), 885–907. 10.15241/kbr.5.3.354

Averett, S., Terrizzi, S., & Wang, Y. (2017). The effect of sorority membership on eating disorders, body weight, and disordered-eating behaviors. *Health economics*, *26*(7), 875-891. 10.1002/hec.3360

Ball, K., & Lee, C. (2000). Relationships between psychological stress, coping and disordered eating: A review. *Psychology & Health*, *14*(6), 1007-1035. 10.1080/08870440008407364

Basow, S. A., Foran, K. A., & Bookwala, J. (2007). Body objectification, social pressure, and disordered eating behavior in college women: The role of sorority membership. *Psychology of Women Quarterly*, *31*(4), 394-400. https://doi.org/10.1111/j.1471-6402.2007.00388.x

Becker, C. B., Smith, L. M., & Ciao, A. C. (2005). Reducing eating disorder risk factors in sorority members: A randomized trial. *Behavior Therapy*, *36*(3), 245-253. https://doi.org/10.1016/S0005-7894(05)80073-5

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of affective disorders*, *173*, 90-96. 10.1016/j.jad.2014.10.054

Benson, E. S. (2003, November). The many faces of perfectionism. *Monitor on Psychology*, *34*(10), 18. https://www.apa.org/monitor/nov03/manyfaces

Bentley, C., & Mond, J. M. (2015). Sex differences in psycho-social impairment associated with eating-disordered behavior in a population-based sample of adolescents. *International Journal of Eating Disorders, 48*, 633–640. 10.1016/j.eatbeh.2014.08.015

Berg, K. C., Frazier, P., & Sherr, L. (2009). Change in eating disorder attitudes and behavior in college women: Prevalence and predictors. *Eating behaviors*, *10*(3), 137-142. 10.1016/j.eatbeh.2009.03.003

Berkman, N. D., Lohr, K. N., & Bulik, C. M. (2007). Outcomes of eating disorders: a systematic review of the literature. *International Journal of Eating Disorders, 40*(4), 293-309. 10.1002/eat.20369

Biddix, J. P., Matney, M. M., Norman, E. M., & Martin, G. L. (Eds.). (2014). The Influence of Fraternity and Sorority Involvement: A Critical Analysis of Research (1996-2013): *AEHE 39*(6), 1-159. https://doi.org/10.1002/aehe.20012

Bieling, Peter J, Martin M Antony, and Richard P Swinson. (1998). The State--Trait Anxiety Inventory, Trait Version: Structure and Content Re-examined. *Behaviour Research and Therapy 36*(7-8), 777-788. 10.1016/s0005-7967(98)00023-0

Bruch, H. (1978). The Golden Cage: The enigma of anorexia nervosa. Harvard University Press.

Cafri, G., Thompson, J. K., Ricciardelli, L., McCabe, M., Smolak, L., & Yesalis, C. (2005). Pursuit of the muscular ideal: Physical and psychological consequences and putative risk factors. *Clinical Psychology Review, 25*(2), 215–239. 10.1016/j.cpr.2004.09.003

Cash, T. F., & Deagle, E. A. (1997). The nature and extent of body-image disturbances in anorexia nervosa and bulimia nervosa: A meta-analysis. *International Journal of Eating Disorders, 22*(2), 107–125

Celio, A. A., Wilfley, D. E., Crow, S. J., Mitchell, J. and Walsh, B. T. (2004), A comparison of the binge eating scale, questionnaire for eating and weight patterns-revised, and eating disorder examination questionnaire with instructions with the eating disorder examination in the assessment of binge eating disorder and its symptoms. *Int. J. Eat. Disord., 36*(4)*:* 434-444. doi:10.1002/eat.20057

Center for Disease Control. (2017, August 29). About Adult BMI. Retrieved October 22, 2019, from https://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html

Cluskey, M., & Grobe, D. (2009). College weight gain and behavior transitions: male and female differences. *Journal of the American Dietetic Association*, *109*(2), 325-329. 10.1016/j.jada.2008.10.045

Calogero, R. M., Davis, W. N., & Thompson, J. K. (2005). The role of self-objectification in the experience of women with eating disorders. *Sex Roles 52*(1-2), 43-50. https://doi.org/10.1007/s11199-005-1192-9

Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A, Sallis, J., & Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine & science in sports & exercise*, *35*(8), 1381-1395. 10.1249/01.MSS.0000078924.61453.FB

Culbert, K. M., Racine, S. E., & Klump, K. L. (2015). Research Review: What we have learned about the causes of eating disorders–a synthesis of sociocultural, psychological, and biological research. *Journal of Child Psychology and Psychiatry, 56*(11), 1141-1164.v https://doi.org/10.1111/jcpp.12441

Currin, L., Schmidt, U., & Waller, G. (2007). Variables that influence diagnosis and treatment of the eating disorders within primary care settings: A vignette study. *International Journal of Eating Disorders, 40*(3), 257–262. 10.1002/eat.20355

Cvetovac, M., & Hamar, S. (2012). Stress and Unhealthy Eating in a College Sample. *2012 NCUR*.

Darcy, A. M., Doyle, A. C., Lock, J., Peebles, R., Doyle, P., & Le Grange, D. (2012). The eating disorders examination in adolescent males with anorexia nervosa: How does it compare to adolescent females? *International Journal of Eating Disorders, 45*(1), 110–114. 10.1002/eat.20896

Davis, C., Claridge, G., & Fox, J. (2000). Not just a pretty face: physical attractiveness and perfectionism in the risk for eating disorders. *International Journal of Eating Disorders, 27*(1), 67-73. 10.1002/(sici)1098-108x(200001)27:1<67::aid-eat7>3.0.co;2-f

Davy, B. W. (1960). The sources and prevention of mental ill-health in university students. *Proceedings of the Royal Society of Medicine, 53*(9), 764–769.

Dobmeier, R. J., Hernandez, T. J., Barrell, R. J., Burke, D. J., Hanna, C. J., Luce, D. J., ... & Siclare, M. (2011). Student knowledge of signs, risk factors, and resources for depression, anxiety, sleep disorders, and other mental health problems on campus. *New York Journal of Student Affairs, 11*(1), 103-122.

Eisenberg, D., Nicklett, E. J., Roeder, K., & Kirz, N. E. (2011). Eating disorder symptoms among college students: Prevalence, persistence, correlates, and treatment-seeking. *Journal of American College Health, 59*(8), 700-707. doi:10.1080/07448481.2010.546461

Fairburn, C. G., Cooper, Z., & O'Connor, M. (1993). The eating disorder examination. *International Journal of Eating Disorders, 6*, 1-8.

Fairburn, C.G., & Beglin, S.J. (1994). Assessment of eating disorders: interview or self-report questionnaire? *International Journal of Eating Disorders, 16*, 363-370. https://doi.org/10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-%23

Fairburn, C, Cooper, Z. & O'Connor, M. (2008). Eating Disorder Examination (16.0D). in Fairburn, C.G. *Cognitive Behaviour Therapy and Eating Disorders*. Guildford Press, New York, 2008.

Fitzsimmons-Craft, E. E., Bardone-Cone, A. M., & Kelly, K. A. (2011). Objectified body consciousness in relation to recovery from an eating disorder. *Eating behaviors, 12*(4), 302–308. https://doi.org/10.1016/j.eatbeh.2011.09.001

Ferraro, F. R., Crawford, B., & Adamson, N. (2013). Ideal and acceptable body size in college fraternity men. *Advances in Psychology Research. 98,* 117-122.

Frederick, D. A., Forbes, G. B., Grigorian, K. E., & Jarcho, J. M. (2007). The UCLA Body Project I: Gender and ethnic differences in self-objectification and body satisfaction among 2,206 undergraduates. *Sex Roles, 57*(5-6), 317-327. https://doi.org/10.1007/s11199-007-9251-z

Furnham A, Atkins L. (1997). Dieting control beliefs and disordered eating. *European Eating Disorders Review*. 5, 278–296. doi:10.1002/(SICI)1099-0968(199712)5:4<278::AID-ERV171>3.0.CO;2-G.

Ghasemi, A., & Zahediasl, S. (2012). Normality tests for statistical analysis: a guide for non-statisticians. *International journal of endocrinology and metabolism*, *10*(2), 486–489. https://doi.org/10.1007/s11199-007-9251-z

Gideon N, Hawkes N, Mond J, Saunders R, Tchanturia K, et al. (2016) Development and Psychometric Validation of the EDE-QS, a 12 Item Short Form of the Eating Disorder Examination Questionnaire (EDE-Q). *PLOS ONE 11*(5): e0152744. https://doi.org/10.1371/journal.pone.0152744.

Gordon KH, Castro Y, Sitnikov L, Holm-Denoma JM. (2010). Cultural body shape ideals and eating disorder symptoms among White, Latina, and Black college women. *Cult Divers Ethn Minor Psychol*. *16*(2):135–143. 10.1037/a0018671

Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive behaviors*, *7*(1), 47-55. 10.1016/0306-4603(82)90024-7

Griffiths, S., Mond, J. M., Li, Z., Gunatilake, S., Murray, S. B., Sheffield, J., & Touyz, S. (2015a). Self-stigma of seeking help and being male predicts an increased likelihood of

having an undiagnosed eating disorder. *International Journal of Eating Disorders, 48*(6), 775–778. 10.1002/eat.22413

Griffiths, S., Mond, J., Murray, S. B., & Touyz, S. (2014). Young peoples' stigmatizing attitudes and beliefs about anorexia nervosa and muscle dysmorphia. *International Journal of Eating Disorders, 47*, 189–195. 10.1002/eat.22220

Griffiths, S., Murray, S. B., & Touyz, S. W. (2013). Disordered eating and the muscular ideal. *Journal of Eating Disorders, 1*(15). doi:10.1186/2050-2974-1-15.

Grös, D. F., Antony, M. M., Simms, L. J., & McCabe, R. E. (2007). Psychometric properties of the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA): comparison to the State-Trait Anxiety Inventory (STAI). *Psychological assessment, 19*(4), 369–381. https://doi.org/10.1037/1040-3590.19.4.369

Hay, P., Girosi, F., & Mond, J. M. (2015). Prevalence and sociodemographic correlates ofDSM-5 eating disorders in the Australian population. *Journal of Eating Disorders 3*(19). 10.1186/s40337-015-0056-0

Hewitt, P. L., Flett, G. L., & Ediger, E. (1995). Perfectionism traits and perfectionistic self-presentation in eating disorder attitudes, characteristics, and symptoms. *International Journal of Eating Disorders, 18*(4), 317–326. https://doi.org/10.1002/1098-108X(199512)18:4<317::AID-EAT2260180404>3.0.CO;2-2

Hewitt, P. L., Flett, G. L., Sherry, S. B., Habke, M., Parkin, M., et al. (2003). The interpersonal expression of perfection: Perfectionistic self-presentation and psychological distress. *Journal of Personality and Social Psychology, 84*(6), 1303-1325: doi: 10.1037/0022-3514.84.6.1303

Hill, Andrew J. "Prevalence and demographics of dieting." Eating disorders and obesity: A comprehensive handbook 2 (2002): 80-83.

Hobbs, Marissa, "Sorority Eating Patterns: A Longitudinal Investigation" (2006). Masters Theses & Specialist Projects. Paper 279. Retrieved from: https://digitalcommons.wku.edu/theses/279

Hodgman, Christopher. (1978). The Golden Cage: The Enigma of Anorexia Nervosa. *Am J Dis Child. 132*(7):728. doi:10.1001/archpedi.1978.02120320088033

Hoerr, S. L., Bokram, R., Lugo, B., Bivins, T., & Keast, D. R. (2002). Risk for disordered eating relates to both gender and ethnicity for college students. *Journal of the American College of Nutrition*, *21*(4), 307-314. 10.1080/07315724.2002.10719228

Hudson, J. I., Hiripi, E., Pope, H. G., & Kessler, R. (2007). The prevalence and correlates of eating disorders in the national comorbidity survey replication. *Biological Psychiatry*, 61, 348–358. 10.1016/j.biopsych.2006.03.040

Kayikcioglu, O., Bilgin, S., Seymenoglu, G., & Deveci, A. (2017). State and Trait Anxiety Scores of Patients Receiving Intravitreal Injections. *Biomedicine hub*, *2*(2), 1–5. https://doi.org/10.1159/000478993

Klemchuk, H. P., Hutchinson, C. B., & Frank, R. I. (1990). Body dissatisfaction and eating-related problems on the college campus: Usefulness of the Eating Disorder Inventory with a nonclinical population. *Journal of Counseling Psychology*, *37*(3), 297-305. https://doi.org/10.1037/0022-0167.37.3.297

Kurtzman, F. D., Yager, J., Landsverk, J., Wiesmeier, E., & Bodurka, D. C. (1989). Eating disorders among selected female student populations at UCLA. *Journal of the American Dietetic Association*, *89*(1), 45-53. https://doi.org/10.1016/S0002-8223(21)02058-7

Lavender, J. M., De Young, K. P., & Anderson, D. W. (2010). Eating Disorder Examination Questionnaire (EDE-Q): Norms for undergraduate men. *Eating Behaviors, 11*, 119-121. 10.1016/j.eatbeh.2009.09.005

Laliberte M, Newton M, McCabe R, Mills J. (2007). Controlling your weight versus controlling your lifestyle: How beliefs about weight control affect risk for disordered eating, body dissatisfaction and self-esteem. *Cognitive Therapy and Research*. *31*(6), 853–869. doi:10.1007/s10608-006-9104-z.

Lewinsohn, P. M., Seeley, J. R., Moerk, K. C., & Striegel-Moore, R. H. (2002). Gender differences in eating disorder symptoms in young adults. *International Journal of Eating Disorders, 32*(4), 426-440. 10.1002/eat.10103

Lipson, S. K., Lattie, E. G., & Eisenberg, D. (2019). Increased rates of mental health service utilization by US college students: 10-year population-level trends (2007–2017). *Psychiatric services, 70*(1), 60-63. https://doi.org/10.1176/appi.ps.201800332

Lofrano-Prado, Mara Cristina & Prado, Wagner & Barros, Mauro & Souza, Sandra. (2015). Eating disorders and body image dissatisfaction among college students. *ConScientiae Saúde. 14*(3), 355. 10.5585/ConsSaude.v14n3.5487.

Luce, K. H., Crowther, J. H., & Pole, M. (2008). Eating disorder examination questionnaire (EDE-Q): Norms for undergraduate women. *International Journal of Eating Disorders, 41*(3), 273-276. 10.1002/eat.20504

Madden, S., Morris, A., Zurynski, Y. A., Kohn, M., & Elliot, E. J. (2009). The burden of eating disorders in 5–13-year-old children in Australia. *Medical Journal of Australia, 190*(8), 410–414. 10.5694/j.1326-5377.2009.tb02487.x

Marques, L., Alegria, M., Becker, A. E., Chen, C. N., Fang, A., Chosak, A., & Diniz, J. B. (2011). Comparative prevalence, correlates of impairment, and service utilization for eating disorders across US ethnic groups: Implications for reducing ethnic disparities in health care access for eating disorders. *International Journal of Eating Disorders, 44*(5), 412-420. 10.1002/eat.20787

McGee, B. J., Hewitt, P. L., Sherry, S. B., Parkin, M., & Flett, G. L. (2005). Perfectionistic self-presentation, body image, and eating disorder symptoms. *Body Image, 2*(1), 29-40. 10.1016/j.bodyim.2005.01.002

McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale: Development and validation. *Psychology of Women Quarterly, 20*, 181-215. https://doi.org/10.1111/j.1471-6402.1996.tb00467.x

Mitchison, D., Hay, P., Slewa-Younan, S., & Mond, J. (2014). The changing demographic profile of eating disorder behaviors in the community. *BMC Public Health, 14*(1), 943. https://doi.org/10.1186/1471-2458-14-943

Mitchison, D., Mond, J. M., Slewa-Younan, S., & Hay, P. (2013). Sex difference in health-related quality of life impairment associated with eating disorder features: A general population study. *International Journal of Eating Disorders, 46*, 375–380. 10.1002/eat.22097

Morgan, J. (2008). *The invisible man: A self-help guide for men with eating disorders, compulsive exercise, and bigorexia*, New York, NY: Routledge.

Morris, K. D. V., Parra, G. R., & Stender, S. R. (2011). Eating attitudes and behaviors among female college students. *Journal of College Counseling, 14*(1), 21-33. 10.1002/j.2161-1882.2011.tb00061.x

Morton, R. (1694). *Phthisiologia, or, A treatise of consumptions.* London: Princess Arms Press

Murray, S. B., Griffiths, S., & Mond, J. M. (2016). Evolving eating disorder psychopathology: Conceptualizing muscularity-oriented disordered eating. *The British Journal of Psychiatry, 208*(5), 414-415. doi:10.1192/bjp.bp.115.168427

Murray, S. B., Nagata, J. M., Griffiths, S., Calzo, J. P., Brown, T. A., Mitchison, D., ... & Mond, J. M. (2017). The enigma of male eating disorders: A critical review and

synthesis. *Clinical Psychology Review*, *57*, 1-11. https://doi.org/10.1016/j.cpr.2017.08.001

Murray, S. B., Griffiths, S., Rieger, E., & Touyz, S. W. (2014). A comparison of compulsive exercise in male and female presentations of anorexia nervosa: What's the difference? *Advances in Eating Disorders: Theory, Research and Practice*, 2(1), 65–70. https://doi.org/10.1080/21662630.2013.839189

Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders, 173,* 90-96. https://doi.org/10.1016/j.jad.2014.10.054

National Collaborating Centre for Mental Health (UK. (2004). *Eating disorders: Core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders*. British Psychological Society (UK).

Neumark-Sztainer, D., Levine, M. P., Paxton, S. J., Smolak, L., Piran, N., & Wertheim, E. H. (2006). Prevention of body dissatisfaction and disordered eating: What next? *Eating disorders*, *14*(4), 265-285. https://doi.org/10.1080/10640260600796184

Nicholls, D. E., Lynn, R., & Viner, R. M. (2011). Childhood eating disorders: British national surveillance study. *British Journal of Psychiatry, 198*(4), 295–30. https://doi.org/10.1192/bjp.bp.110.081356

Papadopoulos, F. C., Ekbom, A., Brandt, L., & Ekselius, L. (2009). Excess mortality, causes of death and prognostic factors in anorexia nervosa. *The British Journal of Psychiatry*, *194*(1), 10-17. https://doi.org/10.1192/bjp.bp.108.054742

Parent, M. C. (2013). Handling Item-Level Missing Data: Simpler Is Just as Good. The Counseling Psychologist, 41(4), 568–600. https://doi.org/10.1177/0011000012445176

Pfeiffer, D. (2001). *Academic and environmental stress among undergraduate and graduate college students: A literature review*. http://digital.library.wisc.edu/1793/40121

Pike, K.M., Dunne, P.E. & Addai, E. (2013). Expanding the Boundaries: Reconfiguring the Demographics of the "Typical" Eating Disordered Patient. *Curr Psychiatry Rep 15*(411). https://doi.org/10.1007/s11920-013-0411-2

Pitt, A., Oprescu, F., Tapia, G., & Gray, M. (2018). An exploratory study of students' weekly stress levels and sources of stress during the semester. *Active Learning in Higher Education*, *19*(1), 61-75. https://doi.org/10.1177/1469787417731194

Piquero, N. L., Fox, K., Piquero, A. R., Capowich, G., & Mazerolle, P. (2010). Gender, general strain theory, negative emotions, and disordered eating. *Journal of Youth and Adolescence*, *39*(4), 380-392. 10.1007/s10964-009-9466-0

Prochnow, T., Patterson, M. S., & Umstattd Meyer, M. R. (2021). A social network approach to analyzing body dissatisfaction among sorority members using two network generators. *Journal of American College Health*, 69(2), 159-167. 10.1080/07448481.2019.1657121

Polivy, J., & Herman, C. P. (2002). Causes of eating disorders. *Annual review of psychology*, *53*(1), 187-213. https://doi.org/10.1146/annurev.psych.53.100901.135103

Pope, H. G., Phillips, K. A., & Olivardia, R. (2000). *The Adonis complex: The secret crisis of male body obsession.* New York: The Free Press.

Prouty, A. M., Protinsky, H. O., & Canady, D. (2002). College women: Eating behaviors and help-seeking preferences. *Adolescence-San Diego-*, *37*(146), 353-364.

Rawson, H. E., Bloomer, K., & Kendall, A. (1994). Stress, anxiety, depression, and physical illness in college students. *The Journal of Genetic Psychology*, *155*(3), 321-330. 10.1080/00221325.1994.9914782

Ridgway, R., Tang, C., & Lester, D. (2014). Membership in fraternities and sororities, depression, and suicidal ideation. *Psychological reports, 114*(3), 966-970. 10.2466/17.12.PR0.114k28w4

Rolnik, A. M., Engeln-Maddox, R., & Miller, S. A. (2010). Here's looking at you: Self-objectification, body image disturbance, and sorority rush. *Sex Roles, 63*(1-2), 6-17. https://doi.org/10.1007/s11199-010-9745-y

Rosen, J. C., Compas, B. E., & Tacy, B. (1993). The relation among stress, psychological symptoms, and eating disorder symptoms: A prospective analysis. *International Journal of Eating Disorders, 14*(2), 153-162. 10.1002/1098-108x(199309)14:2<153::aid-eat2260140205>3.0.co;2-3

Rosenbaum, D. L., & White, K. S. (2015). The relation of anxiety, depression, and stress to binge eating behavior. *Journal of Health Psychology, 20*(6), 887-898. 10.1177/1359105315580212

Ross, S. E., Niebling, B. C., & Heckert, T. M. (1999). Sources of stress among college students. *Social psychology, 61*(5), 841-846.

Schulken, E. D., Pinciaro, P. J., Sawyer, R. G., Jensen, J. G., & Hoban, M. T. (1997). Sorority women's body size perceptions and their weight-related attitudes and behaviors. *Journal of American College Health, 46*(2), 69-74. 10.1080/07448489709595590

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press

Steinhausen H. C. (2009). Outcome of eating disorders. *Child and adolescent psychiatric clinics of North America*, 18(1), 225–242. https://doi.org/10.1016/j.chc.2008.07.013

Striegel-Moore, R. H., Dohm, F. A., Kraemer, H. C., Taylor, C. B., Daniels, S., Crawford, P. B., & Schreiber, G. B. (2003). Eating disorders in white and black women. *American Journal of Psychiatry, 160*(7), 1326-1331 https://doi.org/10.1176/appi.ajp.160.7.1326

Strober, M., Freeman, R., Lampert, C., Diamond, J., Teplinsky, C., & DeAntonio, M. (2006). Are there gender differences in core symptoms, temperament, and short-term prospective outcome in anorexia nervosa? *International Journal of Eating Disorders, 39,* 570–575. 10.1002/eat.20293

Storrie, K., Ahern, K., & Tuckett, A. (2010). A systematic review: students with mental health problems—a growing problem. *International journal of nursing practice, 16*(1), 1-6. https://doi.org/10.1111/j.1440-172X.2009.01813.x

Strother, E., Lemberg, R., Stanford, S. C., & Turberville, D. (2012). Eating disorders in men: underdiagnosed, undertreated, and misunderstood. *Eating disorders, 20*(5), 346-355. 10.1080/10640266.2012.715512

Tylka, T. L. (2004). The Relation Between Body Dissatisfaction and Eating Disorder Symptomatology: An Analysis of Moderating Variables. *Journal of Counseling Psychology, 51*(2), 178. https://doi.org/10.1037/0022-0167.51.2.178

Tyrka, A. R., Waldron, I., Graber, J. A., & Brooks-Gunn, J. (2002). Prospective predictors of the onset of anorexic and bulimic syndromes. *International Journal of Eating Disorders,* 32(3), 282-290. 10.1002/eat.10094

Vaz Leal, Vaz Leal, F., Rodrìguez Santos, L., Ramos Fuentes, M. I., Chimpèn Lûpez, C. A., Casado Blanco, M., ... Fernández-Sánchez, N. F. (2014). EPA-0427 – Specific cortisol response to stress in patients with eating disorders: a sign of disturbed hypothalamic-pituitary-adrenal axis activity? *European psychiatry, 29*(S1), 1-1. https://doi.org/10.1016/S0924-9338(14)77849-6

Vohs, K. D., Bardone, A. M., Joiner Jr, T. E., & Abramson, L. Y. (1999). Perfectionism, perceived weight status, and self-esteem interact to predict bulimic symptoms: A model of bulimic symptom development. *Journal of Abnormal Psychology*, 108(4), 695. 10.1037//0021-843x.108.4.695

Vohs, K. D., Heatherton, T. F., & Herrin, M. (2001). Disordered eating and the transition to college: A prospective study. *International Journal of Eating Disorders*, *29*(3), 280-288. 10.1002/eat.1019

Wansink, B., Cheney, M. M., & Chan, N. (2003). Exploring comfort food preferences across age and gender. *Physiology & Behavior, 79*, 739–747. 10.1016/s0031-9384(03)00203-8

Wiechmann, J. (2007). Longitudinal course of body dissatisfaction in undergraduate females at Brigham Young University. *Thesis and Dissertations.* 1155. https://scholarsarchive.byu.edu/etd/1155

Winer, J. A., Dorus, W., & Moretti, R. J. (1974). Sex and college year differences in students' presenting psychiatric complaints. *Archives of general psychiatry*, *30*(4), 478-483. https://doi.org/10.1001/archpsyc.1974.01760100046008

Winters, E. B. (2005). Longitudinal course of eating disorder risk among undergraduate females at Brigham Young University. *Thesis and Dissertations.* 700. https://scholarsarchive.byu.edu/etd/700

Wooldridge, T. (2016). *Understanding anorexia nervosa in males: An integrative approach*. New York: Routledge.

World Health Organization (1992). *The ICD-10 classification of mental and behavioural disorders: Clinical description and diagnostic guidelines.* Geneva: World Health Organization

Yumba, W. (2010). Academic stress: A case of the undergraduate students. (Dissertation). Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:liu:diva-81902

Zalta, A. K., & Keel, P. K. (2006). Peer influence on bulimic symptoms in college students. *Journal of Abnormal Psychology, 115*(1), 185. 10.1037/0021-843X.115.1.185

Zuckerman, D. M., Colby, A., Ware, N. C., & Lazerson, J. S. (1986). The prevalence of bulimia among college students. *American Journal of Public Health, 76*(9), 1135-1137. 10.2105/ajph.76.9.1135

Appendix A

Qualtrics Survey

INFORMED CONSENT DOCUMENT IC-701B

The University of North Dakota
Consent to Participate in Research

Project Title: Disordered Eating Differences for Freshmen and Senior Sorority and Fraternity Members

Principal Investigator: **Sky Gabel**

Phone/Email Address: sky.gabel@und.edu

Department: **Psychology**

Research Advisor: *Richard Ferraro*

Research Advisor
Phone/Email Address: **f.ferraro@und.edu**

What should I know about this research?

Someone will explain this research to you. Taking part in this research is voluntary. Whether you take part is up to you. If you don't take part, it won't be held against you. You can take part now and later drop out, and it won't be held against you. If you don't understand, ask questions. Ask all the questions you want before you decide.

How long will I be in this research?
We expect that your taking part in this research will last 20-30 minutes.

Why is this research being done?
The purpose of this research is to look at disordered eating rates among Freshmen and Seniors involved in Greek life and not involved in Greek life. Additionally, the study will gain more information on disordered eating for both males and females.

What happens to me if I agree to take part in this research?
The study consists of a 28-question Eating Disorder Examination-Questionnaire (EDE-Q), a 20-item State-Trait Anxiety Assessment (STAI), a 27-item Perfectionistic Self-Presentation Scale (PSPS), and a 24-item Objectified Body Consciousness Scale (OBCS) a as well as a short demographic survey. After you have completed the study you will be shown a screen that gives you more information regarding resources for eating disorders and mental health. You will be in either the experimental group (sorority or fraternity) or the control group (non-greek life group) based on your participation in Greek life. You will be asked to complete only one survey at one time point in your academic career. You are free to skip any questions that you would prefer not to answer and are free to exit the survey at any time without fear of consequences.

Could being in this research hurt me?
The most important risks or discomforts that you may expect from taking part in this research include feeling uneasy/vulnerable answering the survey questions due to their nature. Although we do not expect any harm to come upon any participants due to electronic malfunction of the computer, it is possible though extremely rare and uncommon.

Will being in this research benefit me?
You will not benefit from participation in this study.

Possible benefits to others include researchers learning more about disordered eating during different times in a college student's career and risk factors for disordered eating. In learning this information, future college students may benefit from improved resources for eating disorder treatment.

How many people will participate in this research?
Approximately 200 people (100 Greek Life involved and 100 undergraduates) will take part in this study at the University of North Dakota.

What other choices do I have besides taking part in this research?
Instead of being in this research, your choices may include being involved in another research study. Please ask your instructor who will provide you with comparable assignments that you may choose to complete.

Will it cost me money to take part in this research?
You will not have any costs for being in this research study.

Will I be paid for taking part in this research?
You will be placed into a drawing for one Amazon gift card ($25 or $10). Please contact the principle researcher (sky.gabel@und.edu) if you have questions

Who is funding this research?
The University of North Dakota and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

Q54
What happens to information collected for this research?
Your private information may be shared with individuals and organizations that conduct or watch over this research, including:

- The Institutional Review Board (IRB) that reviewed this research
- Richard Ferraro (research advisor)

We may publish the results of this research. However, we will keep your name and other identifying information confidential. We protect your information from disclosure to others to the extent required by law. We cannot promise complete secrecy.

Data or specimens collected in this research might be de-identified and used for future research or distributed to another investigator for future research without your consent.

You should know, however, that there are some circumstances in which we may have to show your information to other people. For example, the law may require us to show your information to a court or to tell authorities if we believe you have abused a child, or you pose a danger to yourself or someone else.

What if I agree to be in the research and then change my mind?
If you decide to leave the study early, we ask that you email the principle investigator. There will be no consequences for withdrawing from the study. However, you will not be entered into the drawing should you withdraw.

You will be informed by the research investigator of this study, of any significant new findings that develop during the study which may influence your willingness to continue to participate in the study.

Who can answer my questions about this research?
If you have questions, concerns, or complaints, or think this research has hurt you or made you sick, talk to the research team at the phone number listed above on the first page.

This research is being overseen by an Institutional Review Board ("IRB"). An IRB is a group of people who perform independent review of research studies. You may talk to them at 701.777.4279 or UND.irb@UND.edu if: You have questions, concerns, or complaints that are not being answered by the research team. You are not getting answers from the research team. You cannot reach the research team. You want to talk to someone else about the research. You have questions about your rights as a research subject. You may also visit the UND IRB website for more information about being a research subject: http://und.edu/research/resources/human-subjects/research-participants.html

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Q1.3 Clicking yes below indicates that you have read the previous information regarding informed consent and consent to completing the survey. If at any time you wish to decline answering a question or finishing the study simply close the qualtrics survey and email the principle researcher at sky.gabel@und.edu. Clicking no will end the survey.

- ○ Yes
- ○ No

End of Block: Consent Form

Start of Block: Demographics

Q2.1 What is your gender?

- ○ Male
- ○ Female
- ○ Other

Q2.2 Are you part of a Fraternity or Sorority

- ○ Yes
- ○ No

Q2.3 Did you receive a scholarship to attend your university?

- ○ Yes (athletic scholarship)
- ○ Yes (academic scholarhsip)
- ○ Yes (other)
- ○ No

Q2.4 What year of school are you in college?

- Freshman
- Sophomore
- Junior
- Senior
- Super-Senior

Q2.5 How old are you? (years in whole numbers only)

_____

Q2.6 What race/ethnicity do you identify as?

- African American/ Black
- Asian
- Hispanic
- Native American/Alaskan Native
- Caucasian/White
- Hawaiian Native
- Two or more races
- Other
- Prefer not to Answer

Q2.7 Do you compete in any collegiate sport?

- Yes
- No

Q2.8 How many hours do you work out at a high intensity (feel out of breath, can't say more than a few words without having to take a breath) each day on average?

- 1 hour
- 2 hours
- 3 hours
- 4+ hours

Q2.9 How many hours are you active at a low intensity (you aren't sweating or breathing heavily) each day on average?

- 1 hour
- 2 hours
- 3 hours
- 4+ hours

Q47 Are you currently attending a University as a student?

- Yes
- No

End of Block: Demographics

Start of Block: EDE-Q

Q3.1 On how many of the past 28 days....

	No days	1-5 Days	6-12 days	13-15 Days	16-22 Days	23-27 Days	Every day
1.Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	○	○	○	○	○	○	○
2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	○	○	○	○	○	○	○
3. Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	○	○	○	○	○	○	○
4. Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	○	○	○	○	○	○	○
5.Have you had a definite desire to have an empty stomach with the aim of influencing your shape or	○	○	○	○	○	○	○

weight?							
6. Have you had a definite desire to have a totally flat stomach?	○	○	○	○	○	○	○
7. Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	○	○	○	○	○	○	○
8. Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	○	○	○	○	○	○	○
9.Have you had a definite fear of losing control over eating?	○	○	○	○	○	○	○
10.Have you had a definite fear you might gain weight?	○	○	○	○	○	○	○
11.Have you felt fat?	○	○	○	○	○	○	○
12.Have you had a strong desire to lose weight?	○	○	○	○	○	○	○

Q3.2

13. Over the past 28 days, how many TIMES have you eaten what other people would regard as an unusually large amount of food (given the circumstances)? Whole numbers only

_____

Q3.3 14. On how many of these did you have a sense of having lost control over your eating (at the time that you were eating)? Whole numbers only

_____

Q3.4 15. Over the past 28 days, on how many DAYS have such episodes of overeating occurred (i.e. you have eaten an unusually large amount of food AND have had a sense of loss of control at the time? Whole numbers only

_____

Q3.5 16. Over the past 28 days, how many TIMES have you made yourself sick (vomit) as a means of controlling your shape or weight? Whole numbers only

_____

Q3.6 17. Over the past 28 days, how many TIMES have you taken laxatives as a means of controlling your shape or weight? Whole numbers only

_____

Q3.7 18. Over the past 28 days, how many TIMES have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape, or amount of fat, or to burn off calories? Whole numbers only

_____

Q3.8 Please note that for these questions the term "binge eating" means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

Q3.9 19 Over the past 28 days, not counting episodes of binge eating...

	No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every day
On how many days have you eaten in secret (ie. furtively)?	○	○	○	○	○	○	○

Q3.10 20 Over the past 28 days, not counting episodes of binge eating...

	None of the times	a few of the times	less than half	half of the times	more than half	most of the time	every time
On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight?	○	○	○	○	○	○	○

Q3.11 21 Over the past 28 days, not counting episodes of binge eating....

	Not at all	Slightly	Some	Moderately	More	A lot	Markedly
How concerned have you been about other people seeing you eat?	○	○	○	○	○	○	○

Q3.12 Over the past 28 days....

	Not at all	Slightly	Some	Moderately	More	A lot	Markedly
22. Has your weight influenced how you think (judge) yourself as a person	○	○	○	○	○	○	○
23. Has your shape influenced how you think about (judge) yourself as a person	○	○	○	○	○	○	○
24. How much would it have upset you if you had been asked to weigh yourself once a week (no more, no less) for the next four weeks	○	○	○	○	○	○	○
25. How dissatisfied have you been with your weight	○	○	○	○	○	○	○
26. How dissatisfied have you been with your shape	○	○	○	○	○	○	○
27. How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)	○	○	○	○	○	○	○
28. How uncomfortable have you felt about others seeing your shape or figure	○	○	○	○	○	○	○

(for example, in communal changing rooms, when swimming, or wearing tight clothes)

Page Break

Q3.13 What is your weight at present (lbs)? Please give your best estimate.

_____

Q3.14 What is your height (in inches)? For example 5 foot 8 inches would be 68. Please give your best whole number estimate. (There are 12 inches in a foot)

_____

Q3.15 If female: Over the past three-to-four months have you missed any menstrual periods?

- Yes
- No

Q3.16 If so, how many menstrual periods have you missed?

- 1
- 2
- 3
- 4+

Q3.17 Have you been taking birth control?

- ○ yes
- ○ no

Q4.1 Choose the number that corresponds to how much you agree with each of the statements on the following pages.

Choose N/A only if the statement does not apply to you. Do not click NA if you don't agree with a statement.

For example, if the statement says "When I am happy, I feel like singing" and you don't feel like singing when you are happy, then you would choose one of the disagree choices.

You would only choose NA if you were never happy

	Strongly Disagree	-	-	Neither Agree nor Disagree	-	-	Strongly Agree	N/A
1. I rarely think about how I look…	○	○	○	○	○	○	○	○
2. When I can't control my weight, I feel like something must be wrong with me…	○	○	○	○	○	○	○	○
3. I think it is more important that my clothes are comfortable than whether they look good on me...	○	○	○	○	○	○	○	○
4. I think a person is pretty much stuck with the looks they are born with…	○	○	○	○	○	○	○	○
5. I feel ashamed of myself when I haven't made the effort to look my best…	○	○	○	○	○	○	○	○

6. A large part of being in shape is having that kind of body in the first place……	○	○	○	○	○	○	○	○
7. I think more about how my body feels than how my body looks…	○	○	○	○	○	○	○	○
8. I feel like I must be a bad person when I don't look as good as I could...	○	○	○	○	○	○	○	○

Q5.1 Choose the number that corresponds to how much you agree with each of the statements on the following pages.
Choose N/A only if the statement does not apply to you. Do not click NA if you don't agree with a statement.
For example, if the statement says "When I am happy, I feel like singing" and you don't feel like singing when you are happy, then you would choose one of the disagree choices.
You would only choose NA if you were never happy

	Strongly Disagree	-	-	Neither Agree nor Disagree	-	-	Strongly Agree	N/A
9. I rarely compare how I look with how other people look...	○	○	○	○	○	○	○	○
10. I think a person can look pretty much how they want to if they are willing to work at it...	○	○	○	○	○	○	○	○
11. I would be ashamed for people to know what I really weigh...	○	○	○	○	○	○	○	○
12. I really don't think I have much control over how my body looks…	○	○	○	○	○	○	○	○
13. Even when I can't control my weight, I think I'm an okay person …	○	○	○	○	○	○	○	○
14. During the day, I think about how I look many times	○	○	○	○	○	○	○	○
15. I never worry that something is wrong with me when I am not exercising as much as I should...	○	○	○	○	○	○	○	○

16. I often worry about whether clothes I am wearing make me look good…	○	○	○	○	○	○	○	○

Q6.1 Choose the number that corresponds to how much you agree with each of the statements on the following pages.

Choose N/A only if the statement does not apply to you. Do not click NA if you don't agree with a statement.

For example, if the statement says "When I am happy, I feel like singing" and you don't feel like singing when you are happy, then you would choose one of the disagree choices.

You would only choose NA if you were never happy

	Strongly Disagree	-	-	Neither Agree nor Disagree	-	-	Strongly Agree	N/A
17. When I'm not exercising enough, I question whether I am a good enough person...	○	○	○	○	○	○	○	○
18. I rarely worry about how I look to other people...	○	○	○	○	○	○	○	○
19. I think a person's weight is mostly determined by the genes they are born with…	○	○	○	○	○	○	○	○
20. I am more concerned with what my body can do than how it looks...	○	○	○	○	○	○	○	○
21. It doesn't matter how hard I try to change my weight, it's probably always going to be about the same...	○	○	○	○	○	○	○	○
22. When I'm not the size I think I should be, I feel ashamed...	○	○	○	○	○	○	○	○
23. I can weigh what I'm supposed to when I try hard enough...	○	○	○	○	○	○	○	○
24. The shape you are in depends mostly on your genes...	○	○	○	○	○	○	○	○

Q7.1 Listed below are a group of statements. Please rate your agreement with each of the statements using the following scale. If you strongly agree, click 7; if you disagree, click 1; if you feel somewhere in between, click any one of the choices between 1 and 7. If you feel neutral or undecided the midpoint is 4.

	Disagree Strongly	-	-	Neutral	-	-	Agree Strongly
1. It is okay to show others that I am not perfect	○	○	○	○	○	○	○
2. I judge myself based on the mistakes I make in front of other people	○	○	○	○	○	○	○
3. I will do almost anything to cover up a mistake	○	○	○	○	○	○	○
4. Errors are much worse if they are made in public rather than in private	○	○	○	○	○	○	○
5. I try always to present a picture of perfection	○	○	○	○	○	○	○
6. It would be awful if I made a fool of myself in front of others	○	○	○	○	○	○	○
7. If I seem perfect, others will see me more positively	○	○	○	○	○	○	○
8. I brood over mistakes that I have made in front of others	○	○	○	○	○	○	○

9. I never let others know how hard I work on things	○	○	○	○	○	○	○
10. I would like to appear more competent than I really am	○	○	○	○	○	○	○
11. It doesn't matter if there is a flaw in my looks	○	○	○	○	○	○	○
12. I do not want people to see me do something unless I am very good at it	○	○	○	○	○	○	○
13. I should always keep my problems to myself	○	○	○	○	○	○	○
14. I should solve my own problems rather than admit them to others	○	○	○	○	○	○	○
15. I must appear to be in control of my actions at all times	○	○	○	○	○	○	○
16. It is okay to admit mistakes to others	○	○	○	○	○	○	○
17. It is important to act perfectly in social situations	○	○	○	○	○	○	○

18. I don't really care about being perfectly groomed	○	○	○	○	○	○	○
19. Admitting failure to others is the worst possible thing	○	○	○	○	○	○	○
20. I hate to make errors in public	○	○	○	○	○	○	○
21. I try to keep my faults to myself	○	○	○	○	○	○	○
22. I do not care about making mistakes in public	○	○	○	○	○	○	○
23. I need to be seen as perfectly capable in everything I do	○	○	○	○	○	○	○
24. Failing at something is awful if other people know about it	○	○	○	○	○	○	○
25. It is very important that I always appear to be "on top of things"	○	○	○	○	○	○	○
26. I must always appear to be perfect	○	○	○	○	○	○	○
27. I strive to look perfect to others	○	○	○	○	○	○	○

End of Block: PSPS

Start of Block: STAI State

Q8.1 A number of statements which people have used to describe themselves are given below. Read each statement and then blacken the appropriate circle to the right of the statement to indicate **how you feel right now,** that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your **present feelings** best

	Not at all	Somewhat	Moderately so	Very much so
1. I feel calm….	○	○	○	○
2. I feel secure……	○	○	○	○
3. I am tense …..	○	○	○	○
4. I feel strained …..	○	○	○	○
5. I feel at ease ……	○	○	○	○
6. I feel upset……	○	○	○	○
7. I am presently worrying over possible misfortunes…	○	○	○	○
8. I feel satisfied…….	○	○	○	○
9. I feel frightened….	○	○	○	○
10. I feel comfortable……	○	○	○	○
11. I feel self-confident……..	○	○	○	○
12. I feel nervous ……	○	○	○	○
13. I am jittery……	○	○	○	○
14. I feel indecisive…..	○	○	○	○
15. I am relaxed…….	○	○	○	○

16. I feel content	○	○	○	○
17. I am worried….	○	○	○	○
18. I feel confused…	○	○	○	○
19. I feel steady…..	○	○	○	○
20. I feel pleasant…	○	○	○	○

Q9.1 A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate you **generally** feel.

	Almost Never	Sometimes	Often	Almost Always
21. I feel pleasant……	○	○	○	○
22. I feel nervous and restless…	○	○	○	○
23. I feel satisfied with myself…	○	○	○	○
24. I wish I could be as happy as others seem to be ….	○	○	○	○
25. I feel like a failure……..	○	○	○	○
26. I feel rested….....	○	○	○	○
27. I am "calm, cool, and collected" …..	○	○	○	○
28. I feel that difficulties are piling up so that I cannot overcome them…	○	○	○	○
29. I worry too much over something that really doesn't matter……..	○	○	○	○

30. I am happy……	○	○	○	○
31. I have disturbing thoughts……	○	○	○	○
32. I lack self-confidence……	○	○	○	○
33. I feel secure……	○	○	○	○
34. I make decisions easily ……	○	○	○	○
35. I feel inadequate…….	○	○	○	○
36. I am content…….	○	○	○	○
37. Some unimportant thought runs through my mind and bothers me……	○	○	○	○
38. I take disappointments so keenly that I can't put them out of my mind …….	○	○	○	○
39. I am a steady person…….	○	○	○	○
40. I get in a state of tension or turmoil as I think over my recent concerns and interests…..	○	○	○	○

Q10.1 In choosing to workout or lose weight, it is most important for me to

- ○ Building lean muscle mass (i.e. bulking up, low body fat percentage)
- ○ Be thin (i.e. burn calories, lower weight)
- ○ Increase overall fitness

Q10.2 When I overeat I am more likely to

- ○ Hit the gym
- ○ Restrict my calories the next day(s)
- ○ Vomit
- ○ Use laxatives
- ○ I do not feel the urge to compensate if I overeat

Q10.3 If I was to "watch what I ate" I would be more focused on

- ○ Calories
- ○ Macronutrients (i.e. carbs vs fats vs protein)
- ○ Portion Control
- ○ Increasing Protein Consumption
- ○ I would not focus on any one area but would eat "healthier"

Q10.4 The ideal male body is

- ○ Thin/skinny
- ○ Muscular/athletic
- ○ Lean/low body fat percentage compared to muscle mass
- ○ Average body weight and fat percentage
- ○ Overweight

Q10.5 The ideal female body is

- Thin/skinny
- Muscular/athletic
- Lean/low body fat percentage compared to muscle mass
- Average body weight and fat percentage
- Curvy
- Overweight

Q10.6 Compared to other college students I am

- More stressed
- Slightly more stressed
- Equally stressed
- Slightly less stressed
- Less stressed

Q10.7 The National Institute on Alcohol Abuse and Alcoholism defines binge drinking as a pattern of drinking that brinds a person's blood alcohol concentration (BAC) to 0.08 grams percent or above. This typically happens when men consume 5+ drinks or women consume 4+ drinks in about two hours. A person does not have to be dependent on alcohol to binge drink.External
During the last month, how many times would you say you have engaged in binge drinking?

- None
- 1-4 times
- 5+ times

Q11.1 If you believe that you may have an eating disorder or would like more information, please contact the principle investigator at sky.gabel@ndus.edu. The principle investigator can provide more information on the effects and hazards of disordered eating. They can provide contact information for help in treating this disorder. Additionally, you can contact UND's Student Health Services at (701) 777-4500 for

additional support.

Q11.2 If you feel like you are in crises and cannot keep yourself safe please contact UND police at (701.777.3491) If you would like to talk with a counselor about any mental health problems you are experiencing please contact the University Counseling Center to schedule an appointment (701.777.2127). If you would like a low-cost option for therapy or assessment please contact the Northern Prairie Community Clinic located in Columbia Hall at (701-777-3745). If you would like more information about eating disorders or disordered eating please contact the principle investigator at sky.gabel@und.edu

Q11.3 Thank you for completing this survey. If you would like to receive credit for participation in this research for a course, please email the principle researcher at sky.gabel@und.edu.