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Difference in Stigma Between Anorexia Nervosa, Bulimia Nervosa, and Binge Eating Disorder, and the  
Effect of Eating Disorder Symptomology on Stigma in College Students

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An Honors College Project Presented to  
the Faculty of the Undergraduate  
College of Health and Behavioral Sciences  
James Madison University

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by Ashley A. Matkins

May 2020

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Accepted by the faculty of the Department of Health Sciences, James Madison University, in partial fulfillment of the requirements for the Honors College.

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## Abstract

**Background:** Eating disorders (ED) are mental illnesses characterized by unhealthy eating and exercise habits. These disorders are common in college students and, like other mental illnesses, eating disorders are highly stigmatized.

**Objectives:** This study evaluated how college students perceived anorexia nervosa, bulimia nervosa, and binge eating disorder, and the effect of eating disorder symptomology on stigma.

**Methods:** Participants were randomized to receive one of three vignettes depicting an ED. The study used the Universal Stigma Survey (USS), the Eating Disorder Examination Questionnaire (EDEQ), and demographic questions to evaluate stigma, symptomology as well as their familiarity with, and diagnosis of eating disorders. The data were analyzed using SPSS and three multiple linear regression models were run to assess the impact of vignette condition and covariates on total stigma, blame/personal responsibility, and distrust/impairment.

**Results:** Sample size of 489 was used. Stigma scores were not significantly different across vignette conditions. Consistent predictors of lower stigma included female gender ( $\beta = -4.0, -2.46, -1.53$ ) and knowing someone with an eating disorder ( $\beta = -2.1, -1.32, -0.78$ ). Receiving the bulimia condition was associated with higher levels of distrust ( $\beta = 1.23$ ).

**Conclusions:** Although there was no difference in stigma between the three main eating disorders, being a female diagnosed with an eating disorder or having familiarity of eating disorders can lower stigma. The results of this study can inform health education curricula focused on eating disorders. Specifically, improving familiarity with ED may be a strategy to reduce stigma, which can extend improving treatment seeking behaviors among individuals with an ED.

## Difference in Stigma Between Anorexia Nervosa, Bulimia Nervosa, and Binge Eating, and the Effect of Eating Disorder Symptomology on Stigma in College Students

Eating disorders are serious mental illnesses that can cause traumatic physical and mental harm. Their cause is unknown, but growing consensus suggests eating disorders are a combination of psychological, psychosocial, and biological causes (National Eating Disorder Association [NEDA], 2018). Eating disorders have a high prevalence rate for anorexia nervosa, bulimia nervosa, and binge eating disorder across the nation. According to the National Association of Anorexia Nervosa and Associated Disorders (2019), 30 million people in the U.S. currently have an eating disorder. More studies also highlight this prevalence rate. A study from 2010 followed 494 adolescent females for 8 years and found that 5.2% of them met criteria for an eating disorder (Stice, Marti, Shaw, & Jaconis, 2010). In 2007, 9,282 Americans were asked about mental illness and 5.5% stated they had been diagnosed with binge eating disorder, while 2.0% had been diagnosed with bulimia nervosa (Hudson, Hiripi, Pope, & Kessler, 2007). These statistics only include official diagnoses, not undiagnosed disordered eating behavior, which is assumed to be much higher. The mortality rates of eating disorders are also high, especially for anorexia nervosa. A 2011 study showed that anorexia nervosa had the highest mortality rate of any psychological disorder, estimated at 10% (Arcelus, Mitchell, Wates & Nielson, 2011).

The three main eating disorders are anorexia nervosa, bulimia nervosa, and binge eating disorder. Although each eating disorder experience varies between individuals, there are some similarities in symptoms and prognosis among the differing eating disorders. Anorexia nervosa is characterized by highly controlled dietary and exercise plans (NEDA, 2018). These individuals are obsessed with their weight but may not necessarily physically look underweight as media would suggest. Bulimia nervosa is characterized by cycles of binge eating, then induced

vomiting or misuse of laxatives in order to compensate for the large food intake the individual consumed (NEDA, 2018). Lastly, binge eating disorder is characterized by a loss of control while consuming large quantities of food, and may present with fluctuations of weight (NEDA, 2018). If left untreated, these eating disorders can cause problems with the cardiovascular, gastrointestinal, and neurological systems. This includes a reduced metabolic rate, muscle deterioration, slowed digestion, constipation, pancreatitis, difficulties concentrating, fainting, and death due to complications (NEDA, 2018). The myriad of health concerns associated with eating disorders showcase their significance.

Eating disorders can affect individuals of all races, genders, and sexualities. This is especially true for college-aged individuals because they are an at-risk population for eating disorders. Specifically, college students experience high amounts of stress with balancing school and work. They also may fear the responsibility of adulthood, which is associated with eating disorders (Holland, Bodell, & Keel, 2013). This means those who are more at-risk for an eating disorder show a rejection for responsibility and a desire to return to childhood. Furthermore, in the same study, another association was found between perfectionism and eating disorders (Holland, Bodell, & Keel, 2013). Many college students are hardworking individuals who strive for a career in their intended professions in a competitive environment. These high stress and high responsibility situations can trigger eating disorders in people who are already psychologically vulnerable.

Eating disorder prevalence has been growing, which has been a concern for those who treat students and research these diseases. Prevalence on campuses is estimated to be about 13.5% in women and 3.6% in men (Eisenberg, Nicklett, Roeder & Kirz, 2011), and as many as 32% of college women and 25% of college men self-report engaging in disordered exercise or eating



behaviors (NEDA, 2018). A study found that out of nearly 10,000 college students, 11.9% had an elevated risk of eating disorders based on their behaviors and weight/shape perceptions (Lipson & Sonnevile, 2017). Of concern, approximately only 20% of those who screened positive for eating disorders received any mental health treatment for their illness (Eisenberg, Nicklett, Roeder & Kirz, 2011; Hart, Granillo, Jorm & Paxton, 2011). The growing prevalence of eating disorders and low treatment seeking rate could be due to the lack of knowledge about eating disorders, stemming from low mental health literacy.

Mental health literacy is defined as the “knowledge and beliefs about mental disorders that aid their recognition, management or prevention” (Jorm et al. 1997). Two studies conducted by Mond and colleagues assessed identification and mental health literacy, specific to eating disorders, among women. Both studies showed a lack of mental health literacy, with limited knowledge of the severity of the disorder, and misperceptions about treatment seeking (Mond, Hay, Rodgers & Owen, 2008; Mond et al., 2005). In the 2008 study, around 48% of the participants stated the woman in the vignette that depicted bulimia nervosa had “low self-esteem” (Mond, Hay, Rodgers & Owen, 2008). Another study using a similar vignette found the most common perceived issue was a “lack of control” instead of an eating disorder (Mond & Arrighi, 2011). Participants also suggest that the problem “might not be too bad”\_demonstrating lack of knowledge about eating disorders, inability to recognize the eating disorder, and a trend of undermining the severity of the disorder (Mond, Hay, Rodgers & Owen, 2008). Further, many participants indicated they would encourage the young woman depicted in the vignette to seek self-help treatment as opposed to professional help (Mond, Hay, Rodgers & Owen, 2008). This demonstrates the lack of knowledge regarding the severity of eating disorders, as life-threatening complications could occur without professional help and more intensive treatment plans.

Stigma is also part of mental health literacy and refers to public discrimination against individuals based on undesirable characteristics and attributes (Mond, Robertson-Smith, & Vetere 2006). A study measuring the effect of mental health literacy on stigma in anorexia nervosa, showed that while many of the participants could not identify the eating disorder from a vignette, the illness was still heavily stigmatized (Varnado-Sullivan, Parker, & Rohner, 2019). This study highlights that the recognition of eating disorders is low and the stigma is still high, which is heavily influenced by a low mental health literacy rate.

Other studies further explore the severity of stigma toward eating disorders, particularly when compared with stigma toward other mental health conditions. Roehrig and McLean (2010) utilized vignettes depicting anorexia nervosa, bulimia nervosa, and major depressive disorder (MDD), and compared levels of stigma in men and women. The results from this study show that those with eating disorders experienced more stigma compared to those with depression in that they are perceived as more fragile and more responsible for their illness. Similarly, Ebnetter, Psych, and Latner found that when comparing eating disorders to MDD, the targets with eating disorders were blamed more for their condition than the target with MDD (Ebnetter, Psych, & Latner, 2013).

There is also research that explores stigma toward particular eating disorders, as well as studies that compare stigma between different eating disorders. In one study, researchers assessed the level of stigma experienced by women with anorexia nervosa (Mond, Robertson-Smith & Vetere, 2006). The results showed that most respondents sympathized with those with anorexia nervosa but still thought they seek attention and state their condition is “not that bad.” This shows a basic knowledge on what anorexia nervosa is, however, it is still stigmatized without knowledge on how it can be a life-threatening illness. The Ebnetter, Psych, and Latner

(2013) study that compared eating disorders to MDD also compared stigma between anorexia nervosa, bulimia nervosa, and binge eating disorder. Researchers found that higher levels of blame for illness were attributed to those with binge eating disorder, but the targets with binge eating disorder were considered less impaired/distrusted than targets with anorexia or bulimia. These groups of studies all found a high level of stigma associated with eating disorders.

Other research has investigated how eating disorder symptomology influences stigma. The findings of one study highlight how women with higher eating disorder symptomology viewed anorexia nervosa as more acceptable, and those with lower eating disorder symptomology viewed bulimia nervosa as more acceptable (Mond & Arrighi, 2011). Contradicting evidence in a 2015 study showed that those with low levels of eating disorder symptomology view bulimia nervosa as less acceptable than those with higher disordered eating symptoms (Florence Rodgers et al, 2015). Based on these findings, it is unclear how personal experience or familiarity (e.g. symptoms, diagnosis, or knowing someone with an ED) influences stigma.

Some similar methods were used throughout many of the previously mentioned studies. These methods include the use of vignettes, stigma measures, and the EDE-Q in those that gathered information on eating disorder symptomology. These methods were useful in observing stigma; however, a few differences could have contributed to the differing and contradicting results. Some researchers failed to include responses from men. This limited participant pool neglects the voices of men when their perception of eating disorder stigma influences those who have eating disorders just as much as women. The same studies that did not survey men were also based in Australia. Therefore, even fewer studies have assessed stigma of eating disorders in the United States which could show differing results. Lastly, a few studies had small sampling pools which could have led to skewed findings.

Although it is known that stigma exists toward anorexia nervosa, bulimia nervosa, and binge eating disorder, few studies have examined how they differ in a comparison study, and how eating disorder symptomology affects stigma toward different disorders. This study compared stigmatizing attitudes across different EDs, controlling for eating disorder pathology and familiarity with eating disorders (e.g. diagnosis or knowing someone with an ED). The inclusion of these variables provides information on how those who have higher disordered eating behaviors or experience with eating disorders may view these conditions. Based on the results of previous studies, we predicted that higher levels of stigma would be endorsed for BED and BN than AN (Ebnetter, Psych & Latner, 2013), pathology and familiarity would be negatively associated with stigma (Mond & Arrighi, 2011). This comparison will show how stigma differs for various ED presentations, and how factors affecting how laypeople perceive eating disorders, including familiarity with ED, influences stigma. This will allow for a better understanding of how to approach eating disorders, especially in health education.

## **Methods**

### **Participants**

The participants for this study were James Madison University (JMU) college students at least 18 years of age. The participants were recruited to take an electronic survey created using Qualtrics via JMU's email services. The study was approved by the IRB. Since JMU is a majority Caucasian, female, and high socioeconomic status school, this demographic composition is reflected in the participants who responded.

### **Instruments**

**Vignettes.** Participants were randomly assigned to receive one of three vignettes depicting a young woman, Emily, with either anorexia nervosa, bulimia nervosa, or binge eating

disorder (Appendix A). Each participant received a vignette depicting one eating disorder, not all three, to ensure a higher survey completion rate. After reading the vignette participants were asked “Do you think Emily has a problem?” a) definitely yes, b) probably yes, c) probably no, and d) definitely no. This was used as a proxy of knowledge on eating disorder presentation. If a participant selected “probably no” or “definitely no,” they skipped this question and continued with the survey. If they selected yes, they were asked to indicate which problem they believe the target to have from a pre-determined list. The response options were presented in a random order and included: anorexia nervosa, depression, bulimia nervosa, anxiety, low self-esteem, and binge eating disorder. This list and process was adapted from Mond et al. (2006), and responses were coded as correct (1) or incorrect (0).

**Stigma.** After completing the question(s) about their beliefs of the depicted problem, participants were given a brief description of the eating disorder portrayed in the vignette (e.g. *“Emily's primary health problem is anorexia nervosa. Anorexia nervosa is an eating disorder characterized by weight loss (or lack of appropriate weight gain in growing children); difficulties maintaining an appropriate body weight for height, age, and stature; and, in many individuals, distorted body image”*). Information about the disorder portrayed in the vignette was given to all participants (regardless of whether they believed the target to have a problem). Following this description, participants completed the Universal Stigma Scale (USS) (See Appendix B for full survey). The rationale for this was to ensure participants were reflecting their beliefs about anorexia nervosa, bulimia nervosa, or binge eating disorder as they completed the USS.

The USS was developed by Ebner et al. (2013), containing 11 items on a 5-point likert scale. The questionnaire included items from previously developed scales assessing depression

stigma (Griffiths et al., 2008) and ED stigma (Crisp et al., 2000; Roehrig and McLean, 2010; Stewart et al., 2006). Scores ranged from 11-55, with higher scores indicating higher levels of stigma. The USS contains two subscales: blame/personal responsibility (5 items) and impairment/distrust (6 items). The USS has demonstrated reliability for assessing stigma toward anorexia ( $\alpha=0.72$ ),  $\alpha$ bulimia ( $\alpha=0.77$ ), and binge eating disorder ( $\alpha= 0.73$ ).

**Eating disorder psychopathology.** The EDEQ is a widely used measure of self-reported eating disorder features present in the last 28 days. The scale contains 36 items, and a global score can be derived from 22 items assessing attitudinal components of eating disorder psychopathology (Mond, Hay, Rodgers, Owen, & Beumont, 2004; Mond, Robertson-Smith, & Vetere, 2006). Scores for each item range from 0-6, with higher scores indicating greater degrees of psychopathology. The EDE-Q also contains four subscales: dietary restraint, eating concerns, weight concerns, and shape concerns. Higher scores on each subscale indicates greater severity of eating disorder features. The means of the subscales were aggregated and averaged to calculate a global mean. (Mond, Hay, Rodgers, Owen, & Beumont, 2004; Mond, Robertson-Smith, & Vetere, 2006)). The remaining EDE-Q items assess the occurrence frequency of additional behaviors associated with eating disorders such as, overeating (binge eating), subjective overeating, self-induced vomiting, misuse of laxatives or diuretics, and excessive exercise.

**Familiarity with eating disorders and demographics.** Participants were asked if they ever personally dealt with an eating disorder (past or current) and if they know/have known someone with an eating disorder (past or current) as a proxy for familiarity with ED. Demographic information collected included gender, age, and year in school.

## **Data Analysis**

The data were analyzed using SPSS and three multiple linear regression models were run to assess the impact of vignette condition and covariates on total stigma, blame/personal responsibility, and distrust/impairment. Covariates were selected based on a significance of  $p > .25$  in bivariate analyses which included gender, being acquainted with eating disorders, and distrust among those with bulimia nervosa. Final variables included in the model were gender, previous experience with an eating disorder (label: diagnosed), knowing someone with an eating disorder (label: acquaintance), and global EDE-Q score. Vignette condition was dummy coded, and these were included as the independent variables of interest in the regression. A cut-off of  $p < .05$  was used to determine statistical significance.

### **Results**

The study population consisted of JMU undergraduate students with a sample size of  $n=489$  (Table 1). The sample population included 20.2% males ( $n=99$ ) and 78.5% females ( $n=384$ ). The majority of students were freshman ( $n=190$ , 38.9%), with junior as the second most common response ( $n=94$ , 19.2%). The most frequent ethnicity was white/Caucasian ( $n=418$ , 85.5%), with Asian/Pacific Islander as the second most common ethnicity ( $n=20$ , 4.1%). About 68.1% of participants had not been diagnosed with an eating disorder ( $n=333$ ), with the remaining 29.7% reporting a diagnosis with an eating disorder at one point in their life ( $n=145$ ). Furthermore, 78.9% of participants reported they were acquainted with someone who had an eating disorder ( $n=386$ ), while 19.2% of participants did not know anyone with an eating disorder ( $n=94$ ).

Table 1. *Sample Demographics*

Characteristic	N	%
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Gender		
Male	99	20.2
Female	384	78.5
Class Year		
Freshman	190	38.9
Sophomore	75	15.3
Junior	94	19.2
Senior	79	16.2
5 <sup>th</sup> Year Senior	39	8.0
Diagnosed ED		
No	333	68.1
Yes	145	29.7
ED Acquaintance		
No	94	19.2
Yes	386	78.9
Race/Ethnicity		
White/Caucasian	418	85.5
Black/African American	18	3.7
Hispanic/Latino	19	3.9
Asian/Pacific Islander	20	4.1
Middle Eastern	1	0.2
Other	13	2.7

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The EDEQ mean score was 2.56 (SD=1.18), with a minimum score of 1.00 and a maximum score of 5.91. A score of 4 is indicative of a clinical diagnosis. The mean stigma score was 20.24 (SD=7.13) with a minimum score of 11.00 and a maximum score of 50.00. The blame subscale mean score was 8.74 with a minimum score of 5.00 and a maximum score of 25.00. Lastly, the distrust subscale mean score was 11.53 with a minimum score of 6.00 and a maximum score of 29.00.

Table 2. *USS Total and Subscales Means and Standard Deviations*



Item	Stigma <i>M (SD)</i>	Blame <i>M (SD)</i>	Distrust <i>M (SD)</i>
Total	20.24	8.74	11.53
Gender			
Male	24.06 (8.88)	11.06 (4.51)	13.00 (5.42)
Female	19.33 (6.25)	8.17 (3.20)	11.19 (4.10)
Diagnosed ED			
No	20.87 (7.05)	9.08 (3.66)	11.82 (4.44)
Yes	18.92 (6.99)	7.94 (3.49)	11.01 (4.46)
ED Acquaintance			
No	22.78 (7.14)	10.26 (3.91)	12.52 (4.32)
Yes	19.52 (6.91)	8.34 (3.48)	11.20 (4.42)

Table 3. *USS Total and Subscales Means and Standard Deviations by Vignette Condition*

Vignette Condition	Stigma <i>M (SD)</i>	Blame <i>M (SD)</i>	Distrust <i>M (SD)</i>
AN	20.70 (7.61)	8.41 (3.48)	11.61 (4.53)
BN	20.70 (7.61)	8.70 (3.78)	12.01 (4.58)
BED	19.97 (6.64)	9.09 (3.77)	10.93 (4.45)

AN= Anorexia Nervosa, BN= Bulimia Nervosa, BED= Binge Eating Disorder

One-way ANOVA was used to compare means of overall stigma, blame, and distrust between vignette conditions. These measures did not differ significantly between vignette conditions.

A multiple linear regression was conducted to predict stigma from EDEQ score, assigned vignette condition (AN, BN, or BED), diagnosis, acquaintance, and gender (Table 4). The multiple regression model significantly predicted stigma,  $F(6,444)= 7.604, p < 0.001, R^2=0.093$ . The results showed women had lower levels of stigma ( $\beta=-4.007, p < 0.001$ ) as well as individuals who knew someone with an eating disorder (acquaintance;  $\beta=-2.113, p=0.012$ ).

Another multiple linear regression was conducted to predict blame of people with eating disorders from EDEQ score, assigned vignette condition (AN, BN, or BED), diagnosis, acquaintance, and gender. The multiple regression model significantly predicted blame,  $F(6,446)= 11.029, p < 0.001, R^2=0.129$ . Similarly, to the first model, women had lower blame scores ( $\beta=-2.456, p < 0.001$ ) as did participants who knew someone with an eating disorder (acquaintance;  $\beta=-1.322, p=0.002$ ).

Lastly, another multiple linear regression was conducted to predict distrust of people with eating disorders from EDEQ score, assigned vignette condition (AN, BN, or BED), diagnosis, acquaintance, and gender. The multiple regression model statistically significantly predicted distrust,  $F(6,446)= 3.648, p < 0.01, R^2=0.047$ . Again, women showed lower levels of distrust ( $\beta=-1.529, p= 0.004$ ). Furthermore, receiving the BN vignette condition was associated with higher levels of distrust compared to BED ( $\beta=1.228, p < 0.05$ ).

Table 4. *Multiple linear regression models*

Model	Variables	Unstandardized $\beta$	SD
Total Stigma	BN	1.03	0.78
	AN	0.61	0.79
	BED <sub>0</sub>		
	Female	-4.0	0.82***
	Acquaintance (yes)	-2.1	0.84*
	Diagnosed (yes)	-0.93	0.79
	EDEQ Score	0.02	0.31
Blame	BN	-0.24	0.39
	AN	-0.42	0.41

	BED <sub>0</sub>		
	Female	-2.46	0.42***
	Acquaintance (yes)	-1.32	0.43*
	Diagnosed (yes)	-0.68	0.40
	EDEQ Score	0.10	0.16
Distrust	BN	1.23	0.49*
	AN	0.96	0.51
	BED <sub>0</sub>		
	Female	-1.53	0.53**
	Acquaintance (yes)	-0.78	0.54
	Diagnosed (yes)	-0.28	-.51
	EDEQ Score	-0.05	0.20

0= Referent Group; \*p< .05; \*\*p < .01; \*\*\*p< .001

## Discussion

Overall, this study demonstrated there was no significant difference in the means for stigma among the three main eating disorders of AN, BN, and BED. However, being female and being acquainted or familiar with an eating disorder were associated with lowered stigmatization.

Stigmatization is the public discrimination against individuals based on undesirable characteristics and attributes (Mond, Robertson-Smith, & Vetere 2006). Stigma is extremely prevalent in those with mental health illnesses, specifically eating disorders. Disordered eating and exercise plans are especially prevalent in the vulnerable college-aged population, made more challenging due to low mental health literacy regarding these disorders. Low mental health literacy poses a problem in that it increases the stigma toward mental health disorders, as well as

decreases the treatment seeking rate. Previous studies have assessed the effects of stigma on individuals with anorexia, bulimia, and binge eating disorder. In one study, it was found that anorexia nervosa was seen as more acceptable and normalized by those with eating disorders, and bulimia was seen as more acceptable to people without an eating disorder (Mond & Arrighi, 2011). Furthermore, another study found that those who had lower scores on eating disorder symptomology thought behaviors seen in bulimia were less acceptable compared to participants who had an eating disorder (Florence Rodgers et al, 2015). However, contradicting both of these studies, this study showed that stigma did not differ among the three main eating disorders, and levels were relatively equal among the participants.

Furthermore, a previous study by Ebnetter, Psych, and Latner (2013) found that all three eating disorders were highly stigmatized, but that participants had less distrust toward binge eating disorder compared to anorexia nervosa and bulimia nervosa, but more blame for the illness. This suggests that some constructs of stigma may play a greater role in stigmatization of different disorders. A similar result was found in this study, as participants in the BN scenario demonstrated higher distrust scores compared to the BED scenario. Further, knowing someone with an eating disorder and being a woman were factors associated with lower levels of stigmatization.

Many previous studies have not considered being an acquaintance of someone with an eating disorder and how this affects their attitudes toward people with these illnesses. It was interesting to find that familiarity was a predictor of stigma, suggesting that previous contact with and understanding of eating disorders should be considered. This further points to the importance of increasing understanding of and empathy toward people with eating disorders. One study demonstrated the effects of a contact education intervention to reduce stigma toward anorexia.

The researchers found that that male and female university students who received information about anorexia from a medical professional (education) followed by a person who has recovered from AN presenting her experiences (contact), had significantly lower levels of positive and negative volitional stigma compared to the baseline (Sebatian, Richards, & Bilgin, 2017). This supports that stigma can be affected by contact, or familiarity, with eating disorders.

Furthermore, this study highlighted the gender differences of stigma among men and women regarding eating disorders. Similar findings from past studies were found in that males had higher levels of stigma, distrust, and blame than the female participants. In a past study on the gender differences on the severity and prevalence of ED's, it was found that men had little sympathy for those with eating disorders, and thought it would not be hard to treat someone with an eating disorder as compared to women (Mond & Arrighi, 2011).

While eating disorders are one category of many mental illnesses, they are some of the most misunderstood conditions. In previous studies, it was shown that individuals with eating disorders were blamed more for their disorder than those who had other conditions (Roehrig and McLean, 2010; Ebnetter, Psych, & Latner, 2013), demonstrating people view eating disorders as a more controllable disease that the affected person can address more easily, compared to another mental illnesses. This and previous studies (Mond & Arrighi, 2011; Mond, Robertson-Smith, & Vetere, 2006; Mond, Rodgers, & Owen, 2008) have shown the lack of knowledge on the severity of eating disorders, and the need for better education on mental illness. These results support contact education to increase familiarity with ED, and hopefully empathy towards those with ED.

### **Limitations**

After collecting and analyzing the data, the researchers noted several limitations to the study. A mass email was sent out to the entire JMU population that stated the researchers were looking for survey participants in a study on “eating and exercise habits” to receive reliable attitudes regarding eating disorders. Therefore, those who took the survey may have been more interested in the topic, yielding questionable generalizability of the survey. Furthermore, around 80% of the participants stated they know someone who has an eating disorder, which is an extremely high proportion. These results bring into question the severity of eating disorders on campus or the reliability of that demographic question in the survey. Lastly, since eating disorders are stereotyped and high stigmatized illnesses, some participants may have answered in a socially desirable way, yielding skewed results. Though we did control for social desirability in the analysis, it likely affected the results.

### **Conclusions**

The current study adds to the existing literature on stigmatization toward eating disorders, including the under researched binge eating disorder, by highlighting the role of familiarity with eating disorders (e.g. previous diagnosis or knowing someone with an eating disorder). These three variables significantly contributed to lower universal stigma, blame, and distrust. Furthermore, bulimia nervosa was shown to have more distrust associated with it when compared to anorexia nervosa and binge eating disorder. These results suggest it is important to note the differences in stigma between the different eating disorders, as each illness is unique, and to increase the mental health literacy among the college-aged population in order to decrease stigma. This can be done by increasing education and contact with eating disorder information and awareness. Efforts to decrease stigma can be introduced in the school system to prevent its widespread occurrence and detrimental effects. Specifically, if schools introduced the concept of

mental illnesses and eating disorders by showing educational movies and documentaries as well as providing facts and statistics regarding these disorders, it could increase the students' mental health literacy, which will in turn decrease stigma.

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## **Appendix A: vignettes**

### **Bulimia Nervosa Vignette**

Emily is 20-year-old student at James Madison University. Emily is the first of her two younger siblings to attend a university. Emily feels a lot of pressure to fit in at her college, particularly at her sorority, where she feels like she must work twice as hard to look like and perform as well as the other sorority members.

Friday:

Emily missed her alarm on Friday and woke up too late to go to the gym, as she had planned. Emily rushed to class and made a sandwich with lettuce, a slice of salami, and a slice of cheddar cheese. Emily returned home to an empty apartment. She felt tense and had a stomach ache. She thought she ruined her chance to work out. Emily ate two bags of her roommate's jumbo-sized popcorn and put on reality television while she completed her homework. Emily's headache got stronger while she worked on her homework, so she made a third bag of popcorn and focused on TV. She felt tense so she got up to use the bathroom. Emily noticed how big her arms and stomach looked while she stared in the mirror. Emily decided to leave her homework and go to the gym, where she ran a mile. Emily noticed her stomach ache had gone away so she picked up a pizza for herself and her roommates after the gym. Emily continued watching TV and noticed that her stomach hurt again and that she had eaten the whole pizza. Emily felt bloated, so she vomited before her roommates returned home. She sprayed the bathroom with air freshener to cover the scent so her roommates wouldn't ask her questions. Emily and her roommates watched reality television and then went out to a party, where Emily drank several canned beers and blacked out.

Saturday:

Emily woke up with a headache and general discomfort. Emily thought about being bloated and still looking big, so she didn't want to see anyone. Emily's roommate made two eggs, pancakes, and bacon for each of the roommates. Emily tried to refuse the food, but her roommates were all sharing the same meal and told her that breakfast would help her feel better. Emily felt uncomfortably full after she finished eating. She told her roommates that she had a different body type from them, so she had to watch what she ate. Emily tried to complete her homework but decided to wait until her roommates weren't home. Emily's mother called her while she was waiting for her roommates to leave and asked her about whether she was taking care of herself. Emily was tense after the call, so she decided to drive to the gym. Another driver almost hit Emily's car on the way to the gym. Emily was upset and wondered about how she could have driven more safely. Emily tried to work out at 3pm, but she still felt uncomfortably full and upset from the drive. Emily ran 8 miles to make up for breakfast, drinking, and to pass the time before the plans she and her friends had made for later in the night. At night, Emily drank three shots and a few beers. Emily was afraid that she was going to black out again, so she made herself vomit and then ate a burrito with her friends.

Sunday:

Emily woke up with a headache and light-headedness but didn't think that she looked bloated. Emily was upset that she had not yet completed her homework and planned her day to make up for missed work during the last two days. Emily refused the breakfast her roommates had made

to share and instead ate a sip of a yogurt drink. Emily didn't want to be feel bloated or overfull. Emily decided to go to the library so her roommates wouldn't see her work. Emily's roommates insisted that Emily bring breakfast with her. Emily took an apple to stop their requests but left it in her room. Emily worked on her homework until her lightheadedness was distracting, and then she went to the gym and ran a mile. Emily sipped on a 32-ounce coffee slushie to deal with her headache, fill her stomach, and keep her focused on her work. Emily was exhausted after finishing her work and fell asleep as soon as she got home.

### **Anorexia nervosa Vignette**

Emily is 20-year-old student at James Madison University. Emily is the first of her two younger siblings to attend university. Emily feels a lot of pressure to fit in at her college, particularly at her sorority, where she feels like she must work twice as hard to look like and perform as well as the other sorority members.

Friday:

Emily missed her alarm on Friday and woke up too late to go to the gym, as she had planned. Emily rushed to class and made a sandwich with lettuce, a slice of salami, and a slice of cheddar cheese. Emily returned home to an empty apartment. She felt tense and had a stomach ache. She thought she ruined her chance to work out. Emily ate two bags of her roommate's jumbo-sized popcorn and put on reality television while she completed her homework. Emily's headache got stronger while she worked on her homework so she made a third bag of popcorn and focused on TV. She felt tense so she got up to use the bathroom. Emily noticed how big her arms and stomach looked while she stared in the mirror. Emily decided to leave her homework and go to the gym, where she ran a mile. Emily noticed she her stomach ache had gone away so she picked up a pizza for herself and her roommates after the gym. Emily continued watching TV and noticed that her stomach hurt again. Emily noticed that she overate by having two slices of pizza rather than one. Emily and her roommates watched reality television and then went out to a party, where Emily drank several canned beers and blacked out.

Saturday:

Emily woke up with a headache and general discomfort. Emily thought about being bloated and still looking big so she didn't want to see anyone. Emily's roommate made two eggs, pancakes, and bacon for each of the roommates. Emily tried to refuse the food, but her roommates were all sharing the same meal and told her that breakfast would help her feel better. Emily felt uncomfortably full after she finished eating. She told her roommates that she had a different body type from them, so she had to watch what she ate. Emily tried to complete her homework but decided to wait until her roommates weren't home. Emily's mother called her while she was waiting for her roommates to leave and asked her about whether she was taking care of herself. Emily was tense after the call, so she decided to drive to the gym. Another driver almost hit Emily's car on the way to the gym. Emily was upset and wondered about how she could have driven more safely. Emily tried to work out at 3pm, but she still felt uncomfortably full and upset from the drive. Emily ran 8 miles to make up for breakfast, drinking, and to pass the time before the plans she and her friends had made for later in the night. At night, Emily drank three shots and a few beers.

Sunday:

Emily woke up with a headache and light-headedness but didn't think that she looked bloated. Emily was upset that she had not yet completed her homework and planned her day to make up for missed work during the last two days. Emily refused the breakfast her roommates had made to share and instead had a sip of a yogurt drink. Emily didn't want to be feel bloated or overfull. Emily decided to go to the library so her roommates wouldn't see her work. Emily's roommates insisted that Emily bring breakfast with her. Emily took an apple to stop their requests but left it in her room. Emily worked on her homework until her lightheadedness was distracting, and then she went to the gym and ran a mile. Emily sipped on a 32-ounce coffee slushie to deal with her headache, fill her stomach, and keep her focused on her work. Emily was exhausted after finishing her work and fell asleep as soon as she got home.

### **Binge eating disorder Vignette**

Emily is 20-year-old student at James Madison University. Emily is the first of her two younger siblings to attend university. Emily feels a lot of pressure to fit in at her college, particularly at her sorority, where she feels like may never look like or perform as well as the other sorority members.

Friday:

Emily missed her alarm on Friday and woke up too late to go to the gym, as she had planned. Emily rushed to class and made a sandwich with lettuce, a slice of salami, and a slice of cheddar cheese. Emily returned home to an empty apartment. She felt tense and had a stomach ache. She thought she ruined her chance to work out. Emily ate two bags of her roommate's jumbo-sized popcorn and put on reality television while she completed her homework. Emily's headache got stronger while she worked on her homework so she made a third bag of popcorn and focused on TV. She felt tense so she got up to use the bathroom. Emily noticed how big her arms and stomach looked while she stared in the mirror. Emily decided to leave her homework and go to the gym, where she ran a mile. Emily noticed her stomach ache had gone away so she picked up a pizza for herself and her roommates after the gym. Emily continued watching TV and noticed that her stomach hurt again. Emily noticed that she overate by having two slices of pizza rather than one. Emily and her roommates watched reality television and then went out to a party, where Emily drank several beers and blacked out.

Saturday:

Emily woke up with a headache and general discomfort. Emily thought about being bloated and still looking big, so she didn't want to see anyone. Emily's roommate made two eggs, pancakes, and bacon for each of the roommates. Emily tried to refuse the food, but her roommates were all sharing the same meal and told her that breakfast would help her feel better. Emily felt uncomfortably full after she finished eating. She told her roommates that she had a different body type from them, so she had to watch what she ate. Emily tried to complete her homework but decided to wait until her roommates weren't home. Emily's mother called her while she was waiting for her roommates to leave and asked her about whether she was taking care of herself. Emily was tense after the call, so she decided to go for a drive. Another driver almost hit Emily's car. Emily was upset and wondered about how she could have driven more safely. Emily still felt upset from the drive and the phone call when she returned home so went to her room to be alone.

Emily was upset and drank a quart of her favorite soda that she kept in her room. She also ate two large bags of food that she kept in her room, even though she had planned to save them for next week. At night, Emily drank three shots and a few beers. She ate a burrito with her friends to avoid a hangover.

Sunday:

Emily woke up with a headache. Emily was upset that she had not yet completed her homework and planned her day to make up for missed work during the last two days. Emily refused the breakfast her roommates had made to share and instead had a sip of a yogurt drink. Emily didn't want to be feel bloated or overfull. Emily decided to go to the library so her roommates wouldn't see her work. Emily's roommates insisted that Emily bring breakfast with her. Emily took an apple to stop their requests but left it in her room. Emily worked on her homework until her headache was distracting. Emily ordered two breakfasts, pancakes and an omelet, to help her headache, fill her stomach, and keep her focused on her work. Emily was exhausted after finishing her work and fell asleep as soon as she got home.

## **Appendix B: Survey**

### **Universal Stigma Scale**

1 strongly disagree 2 disagree 3 neither agree nor disagree 4 agree 5 strongly agree

1. Emily is to blame for her condition
2. Emily should be able to snap out of it
3. Emily's problem is a sign of personal weakness
4. Emily could pull herself together if she wanted to
5. Emily's problem is not a real medical condition
6. People with Emily's problem are dangerous
7. I would not employ someone if I knew they had Emily's problem
8. I would not vote for a politician if I knew they had Emily's problem
9. Emily would be hard to talk to
10. People with Emily's problem are unpredictable
11. Emily is less competent than her peers

### **Eating Disorder Examination Questionnaire (EDEQ)**

Instructions: The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all of the questions. Please only choose one

answer for each question. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

<b>On how many of the past 28 days .....</b>	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1 Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
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?	0	1	2	3	4	5	6
3 Have you <u>tried</u> to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4 Have you <u>tried</u> 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)?	0	1	2	3	4	5	6
5 Have you had a definite desire to have an <u>empty</u> stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6 Have you had a definite desire to have a <u>totally flat</u> stomach?	0	1	2	3	4	5	6
7 Has thinking about <u>food, eating or calories</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8 Has thinking about <u>shape or weight</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9 Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10 Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11 Have you felt fat?	0	1	2	3	4	5	6
12 Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days). Over the past four weeks (28 days)

.....



- 
- 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)? .....
- 
- 14 ....On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)? .....
- 
- 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)? .....
- 
- 16 Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight? .....
- 
- 17 Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight? .....
- 
- 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? .....
- 

Questions 19-21: Please circle the appropriate number. 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.

19	Over the past 28 days, on how many days have you eaten in secret (ie, furtively)?.....Do not count episodes of binge eating	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
		0	1	2	3	4	5	6
20	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? .....Do not count 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
		0	1	2	3	4	5	6
21	Over the past 28 days, how concerned have you been about other people seeing you eat? .....Do not count episodes of binge eating	Not at all	Slightly		Moderately		Markedly	
		0	1	2	3	4	5	6

Questions 22-28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days)

On how many of the past 28 days .....		Not at all	Slightly	Moderately	Markedly			
22	Has your <u>weight</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23	Has your <u>shape</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24	How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25	How dissatisfied have you been with your <u>weight</u> ?	0	1	2	3	4	5	6
26	How dissatisfied have you been with your <u>shape</u> ?	0	1	2	3	4	5	6
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)?	0	1	2	3	4	5	6
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)?	0	1	2	3	4	5	6

### Social Desirability Scale (SDS-5)

1 Definitely True, 2 Mostly True, 3 Don't Know, 4 Mostly False, 5 Definitely False

1. I am always courteous to people even who are disagreeable.
2. There have been occasions where I took advantage of someone.
3. I sometimes try to get even rather than forgive and forget.
4. I sometimes feel resentful when I don't get my way.
5. No matter who I'm talking to, I'm always a good listener.

### Demographic Questions

With which gender do you identify?

- Male
- Female

- Other
- Prefer not to answer

What is your age in years?

Which best describes your academic class?

- Freshman
- Sophomore
- Junior
- Senior
- 5<sup>th</sup> year senior

What is your race/ethnicity?

- White/Caucasian
- African American/Black
- Hispanic/Latino
- Asian/Pacific Islander
- Middle Eastern
- Other

Have you ever been diagnosed or suspected that you had/have an eating disorder?

- Definitely yes
- Probably yes
- Probably not
- Definitely not
- Prefer not to answer

Which eating disorders have you dealt with? Check all that apply

- Anorexia nervosa
- Bulimia nervosa
- Binge eating disorder
- Eating disorder not otherwise specified (EDNOS)
- Not sure
- Other
- Prefer not to answer

Do/did you know someone that has/had an eating disorder?

- Definitely yes
- Probably yes
- Probably not
- Definitely not
- Prefer not to answer