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Investigation into the Comorbidities of Disordered Eating and Social Anxiety Disorder in College Students

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INVESTIGATION INTO THE COMORBIDITIES OF DISORDERED EATING AND SOCIAL ANXIETY DISORDER IN COLLEGE STUDENTS

By
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DEDICATION

This thesis is dedicated to everyone who guided and encouraged me throughout my academic journey, for seeing potential in me when I couldn't always see it myself. It is also dedicated to the healthcare professionals who can use the contents of this research to better the lives of countless individuals who suffer from both of these debilitating disorders.

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ABSTRACT

ALICE MCCRANEY: An Investigation into the Comorbidities of Disordered Eating and Social Anxiety Disorder in College Students

(Under the direction of Dr. Melinda Valliant)

In recent years, psychiatrists have reported a trend that individuals with social anxiety disorders are more likely to also have disordered eating and vice versa. Research into this connection has suggested that risk factors, such as stress reactivity, negative self-esteem, perfectionism and fear of negative evaluation are potential links. This is important because understanding the correlation between the two disorders could help develop better treatments plans for people who suffer from these disorders. This study investigates the relationship between the two. A total of 257 college students between ages 18-22 completed a questionnaire using the Disordered Eating Attitude Scale (DEAS), Severity Measure for Social Anxiety Disorder (Social Phobia) - Adult Scale, Brief Fear of Negative Evaluation Scale (BFNE), Frost Multidimensional Perfectionism Scale (FMPS), Perceived Stress Scale (PSS), and finally, the Rosenberg Self-Esteem Scale. Fear of negative evaluation, perceived stress, and concerns over mistakes and doubts about actions were found in significant levels ($p<.001$) of social anxiety and disordered eating. Self-esteem also appeared to have a relationship with both disorders. The clinical significance of these results can improve treatment for both disorders.

PREFACE

This study is a result of my own observance of the comorbidity in my community and asking the question “Why?”. My hope is that through this research, more will be done to understand why disordered eating and social anxiety are linked, as well as its utilization into more efficient treatment for those who suffer from both disorders.

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LIST OF ABBREVIATIONS

SA	Social Anxiety
SAD	Social Anxiety Disorder
FNE	Fear of Negative Evaluation
PS	Perceived Stress
SE	Self-Esteem
DEAS	Disordered Eating Attitude Scale
BFNE	Brief Fear of Negative Evaluation Scale
FMPS	Frost Multidimensional Perfectionism Scale
PSS	Perceived Stress Scale
ED1	Concern with Food and Weight Gain
ED2	Relationship with Food
IU	Intolerance of Uncertainty
P1	Concerns over Mistakes and Doubts about Actions
P2	High Personal Standards
P3	Concern with Precision, Order and Organization

Introduction

As our world has become more interconnected, societal pressures are present in every aspect of a person's life. Because of this, psychologists are seeing greater prevalence of a myriad of disorders. Two of particular interest are social anxiety and disordered eating. Social anxiety is best defined as a strong desire to be looked at positively by others along with severe apprehensiveness in their ability to do so (Burke & Stephens, 1999). Disordered eating encompasses individuals that have symptomatic behaviors of eating disorders that haven't quite reached a clinical level. These symptomatic behaviors can include compensatory behaviors, include both purging and non-purging behaviors with the purpose to change one's weight or shape, as well as restrictive behaviors.

Undergraduate students are particularly vulnerable because they are interacting with people at a much greater rate than they have ever before. For many, this is also the first time they are completely responsible for themselves which can lead to added stress and uncertainty. All of these changes at once can lead to an increase in psychopathological behavior. Psychologists have noticed a significant percentage of undergraduate students having either social anxiety or disordered eating, with many showing symptoms for both.

This study aimed to investigate the relationship between these two disorders in college students to better understand how they are connected. Potential mediating factors such as stress reactivity, levels of perfectionism, fear of negative evaluation, and self-esteem were considered. Understanding the relationship between these two disorders and

how they present in college students will lead more personalized treatment for both disorders, specifically for individuals who present with both social anxiety and disordered eating.

Literature Review

Social Anxiety

Social anxiety (SA) is one of the most common psychiatric disorders diagnosed with onset normally occurring in childhood and spanning into adulthood. Social anxiety is defined as a disorder characterized by a strong desire to be looked at positively by others along with severe apprehensiveness in their ability to do so (Burke & Stephens, 1999). In some cases, SA can be very debilitating with chronic cases impairing education, professional and interpersonal success (Stein, Torgrud, & Walker, 2000). This anxiety can result in the safety-seeking behaviors such as practicing what to say next in a conversation, wearing high-necked clothing to hide signs of blushing, or gripping items tightly to avoid dropping **(**Purdon, Antony, Monteiro, & Swinson, 2001**)**. These behaviors can actually make the feared symptoms of their anxiety more noticeable, and it prevents them from realizing that social blunders are very normal and will not ostracize them socially. Individuals with SA are also unlikely to seek help because interacting with a doctor is seen as a social event in which they could be evaluated negatively. Rumination may be the link between intolerance of uncertainty (IU) and SA. Rumination is defined as continuous dwelling on one's own experiences, the emotions these experiences cause and the consequences that come from one's negative coping mechanisms (Nolen-Hoeksema et al., 2008; Pont et al., 2018). It serves as an intermediary between cognitive risk factors, and negative psychological outcomes, which means that individuals with high levels of IU may

ruminate as a way to cope with negative thoughts and feelings (Spasojeviæ & Alloy, 2001).

Due to the social nature of college campuses, SA greatly impacts undergraduate students. One Canadian study of college students found that 8.8% of women and 7.1% of men met criteria for social anxiety with a lifetime prevalence of 9.8% and 9.4% for women and men, respectively (Izgiç, Akyùz, Doğan, & Kuğu, 2004). Another study found that 37% of college students experience anxiety or nervousness when socializing with the opposite sex (Arkowitz, Hinton, Perl, & Himadi, 1978). SA among undergraduate students is concerning because it is often comorbid with other psychological problems and is hard to detect except in times of extreme duress (Schry, Roberson-Nay, & White, 2012). Additionally, undergraduate students with high levels of social phobia have been shown to appear less assertive and more vulnerable than their peers (Creed & Funder, 1998). Intolerance of uncertainty (IU) is one factor that has been examined as a potential factor in the development of SA. The idea that is in the uncertainty of how one will perform in social situations or how others will appraise them causes undue stress and prevents many from entering situations they cannot control at all. One study found that, after controlling for fear of negative evaluation, sensitivity anxiety, and neuroticism, IU accounts for 4% of variance (Boelen and Reijntjes, 2009). IU can greatly inhibit one's daily life. This phenomenon can explain why some people can adapt to new or unfamiliar situations, while others experience excessive stress and anxiety, and even have trouble with cognitive processing in social situations (Flores et al., 2018). Perceived social support has also been suggested as a possible alleviator of SA**.** Without social support, individuals with social anxiety tend to engage in avoidance behavior and have a greater risk of substance abuse

and social isolation. (Wake et al., 2021; Cai et al., 2019; Dryman &Heimberg 2018; Kneeland et al., 2019; Marroquin, 2011). Treatments should look at building greater levels in social support in college students with SA. People with perceived social support tend to experience lessened symptoms of SA, improved mental health, as well as lowered risk for substance abuse and depression (Vyanaharker et al. 2011; Wake et al., 2021).

One of the main reasons that investigating social anxiety in college students is important is that it directly correlates with higher levels of binge drinking. One study found that that over 40% of college students drink to excess and can experience academic, social and legal problems as a result (Burke & Stephens, 1999). In college in particular, individuals are meeting and interacting with people at a greater rate than they have ever experienced before. For undergraduate students with SA, the high social demands along with easy access and promotion of alcohol on college campuses may lead to difficulty regulating alcohol consumption (Burke & Stephens, 1999). Several studies replicated this phenomenon, finding that 16-39% of patients with alcohol abuse also meet criteria for social phobia (Chambless, Cherney, Caouto, & Rheinstein, 1987; Page & Andrews, 1996; Schneier, Martin, Liebowitz, Gorman, & Fyer, 1989). Another study concluded that those with SA are more than twice as likely to abuse alcohol than controls (Kushner, Sher & Beitman, 1990). That is not to say that social anxiety can lead to alcohol consumption; more so that when an individual is exposed to alcohol consumption as a way to reduce anxiety, they become more likely to rely on alcohol as a coping mechanism for their anxiety. More research needs to be done on SA in college students, so treatments for social phobia can be more individualized as well as decreasing the risk of alcoholism in those patients.

Disordered Eating

Disordered eating as well as eating disorders have appeared to have a higher prevalence among college students. Studies have shown that 7-10% of college women meet the diagnostic criteria for an eating disorder (Dancygyer & Garfinkel, 1995; Mintz & Betz, 1988). In 2006, the National Eating Disorders Association found that 20% of college students reported that they felt they had experienced an eating disorder at some point in their lives (National Eating Disorders Association, 2006). That does not account for the many more individuals who have experienced disordered eating. Disordered eating is a term that encompasses individuals that have symptomatic behavior of eating disorders, but it has not quite reached a clinical level. Despite this, they can still cause severe distress and anxiety, impaired functioning and negative coping mechanisms such as alcohol or drug consumption. (Anderson, Martens, & Cimini, 2005; Dancyger & Garfinkel, 1995; Mansfield & Wade, 2000). One study found that college aged women are more likely than another age group to develop an eating disorder. One reason for this may be because of the increased pressure put on women in this environment (French and Jeffery, 1994). Other factors that have been hypothesized as influencing factors are feelings of ineffectiveness or lack of control in one's life (Garner, 1991) with one study finding that women with disordered eating are more likely to pay attention to their perceived failures (Mansfield & Wade, 2000). Additionally, Dancyger and Garfinkel (1995) found that individuals with disordered eating scored higher than controls on measures of effectiveness. Furthermore, those with a diagnosable eating disorder scored even higher than both groups.

Psychiatrists have noticed that behaviors known as compensatory behaviors have become more prevalent in individuals with eating disorders. Compensatory behaviors can

be defined as either purging (i.e., self-induced vomiting, laxative use) or non-purging behaviors (i.e., fasting, exercising) with the intent to alter one's weight or shape. These behaviors have been consistently associated with greater risk for eating disorder development and general psychopathy compared to controls. (Schaumberg, Anderson, Reilly & Anderson, 2014). Engagement of these behaviors directly relates to greater risk for eating disorder development and the more compensatory behaviors one has the risk increases. Exercise is particularly complicated. Exercise on its own has its own health benefits and many people do not see excessive exercise to be harmful. However, frequent exercise is positively associated with eating disorder symptoms in college students. One study found that female college students reported a 25% prevalence of eating disorders, with many of them endorsing use of exercise over other compensatory behaviors (Greenleaf, Petrie, Carter & Reel, 2009). It also appears to be mostly a problem with women. An examination of college students found that men only associated exercise with positive affect, but for women, exercise led to positive outcomes for those who do not report eating problems, but negative outcomes for those who did report eating problems (De Young & Anderson, 2010). As a whole engagement in compensatory behaviors is associated with faster relapse times and poorer treatment outcomes in those with disordered eating (Dalle, Calugi, & Marchesini, 2009; Olmsted, Kaplan, Rockert, 1994; Støving et al., 2012).

Like SA, eating disorders seem to have a connection to binge drinking in college students. It has been suggested that the relationship between disordered eating and excessive drinking stems from engaging in compensatory behaviors to either prepare or compensate for calories ingested through alcohol (Schaumberg, Anderson, Reilly, &

Anderson, 2014). Exercise is not the only behavior that people engage in to "make up for" drinking. One study found that other compensatory behaviors such as purging or misuse of laxatives were utilized at a higher rate than exercise in regard to binge drinking (Schaumberg, Anderson, Reilly, & Anderson, 2014). A better understanding of eating disorders in college students and what exacerbates one's risk of developing these disorders could help curtail binge drinking on college campuses as well as lead to more effective treatment.

Relationship between Disordered Eating and Social Anxiety Disorder

In recent years, psychologists have noticed that individuals who have social anxiety disorders (SAD) are more likely to also have disordered eating and vice versa. Some studies have found that up to 83% individuals with a diagnosed eating disorder met the criteria for an anxiety disorder (Godart, Flament, Lecrubier, & Jeammet, 2000; Pallister & Waller, 2008). Specifically, one study found that out of 672 participants with an eating disorder, approximately 20%, or 135, met the criteria for SAD (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004). Additionally, SAD has the highest occurrence out of all anxiety disorders in individuals with disorder eating (Godart et al., 2000, 2003). This is a problem because SAD can prevent individuals from eating disorders from seeking help (Buckner, Eggleston, & Schmidt, 2006; Goodwin & Fitzgibbon, 2002). Also, the false negative detection rate for eating disorders is as high as 80% in anxiety clinics (Becker, Devita, & Zayfert, 2004). Understanding what causes the comorbidity between these disorders can aid in the treatment and prevention of both disorders.

There are several theories that have been proposed as to why the overlap exists.

First, Emotional Regulation theory suggests that disordered eating is a maladaptive behavioral response that occurs during heightened emotions (Hilt, Hanson & Pollack, 2011; Polivy & Herman, 1993). Seeing as those with SAD experience heightened emotions in social situations, disordered eating could develop as a way to regulate these negative emotions. Similarly, Interpersonal theory states that relationship difficulties cause emotional distress that disordered eating could develop as a coping mechanism as result (Ansell, Grilo, & White, 2012). In some cases, SA has been suggested to precede the onset of eating disorders, meaning it in itself could be a risk factor for developing eating disorders (Brewerton et al., 1995; Bulik, Sullivan, Fear, & & Joyce, 1997). This relationship could be explained be due by the overlap in concerns over fitting in or losing social contacts (Gilbert, 2001). Additionally, Individuals with SA, particularly females, are more likely than controls to be concerned with the "thin ideal" (Utschig, Presnell, Madeley, & Smits, 2010). Virtually, social anxiety and disordered eating both share a pervasive concern for how one appears to others (McLean, Miller, & Hope, 2007).

Fear of Negative Evaluation

Fear of negative evaluation (FNE) has been defined as the fear that one will be judged negatively by others (Levinson et al., 2013). FNE has been widely talked about in social anxiety literature, but not so much so in the realm of disordered eating. However, recently, several studies have reported that FNE may increase one's susceptibility to not only to SA, but disordered eating as FNE specific to weight or food intake, thus providing the link between SA and disordered eating (Bulik, Beidel, Duchmann, Weltzin, Kaye, 1991; Gilbert & Meyer, 2003, 2005). Several studies further support these findings. Levinson et al. (2013) further proves this finding that clinical samples of women with

eating disorders report higher levels of FNE than controls. Additionally, DeBoer et al (2013) found that FNE predicted risk for body dissatisfaction and disordered eating, as well as internalization of the thin ideal among women with a relatively high BMI, defined as one standard deviation (2.17) above their sample mean 21.72.

One model that helps explain this phenomenon is the dual-pathway model**.** This model proposes that one's striving toward the thin ideal along with feeling societal pressure to be thin leads to the body dissatisfaction that leads to disordered eating behaviors and negative affect (Menatti, DoBoer, Weeks, & Heimberg, 2015). Utsching et al (2010) found that FNE was positively related to elements of the dual pathway model, such as internalization of thin ideal, perceived societal pressure to be thin and negative effect. Thus, FNE has significant potential as a shared risk factor connecting disordered eating and social anxiety.

Perfectionism

Perfectionism has been linked to both SA and eating disorders. Studies have shown that compared to controls, socially anxious individuals and those with disordered eating experience higher levels of perfectionism (Antony, Purdon, Huta, & Swinson, 1998; Bardone-Cone et al., 2007; Bastiani, Rao, Weltzin, & Kaye, 1995). Specifically, perfectionism works to maintain social anxiety as it primes individuals with SA to believe all their social interactions will not meet a certain standard (Heimburg, Juster, Hope, & Mattia, 1995). It is also considered a maintenance factor for disordered eating and has been found to be higher in individuals with both bulimia and anorexia nervosa compared to controls (Bardone-Cone et. al 2017). Similarly, perfectionism has been found to coincide with moderators such as body dissatisfaction that can predict susceptibility to disordered

eating (Brannon & Petrie, 2008). Perfectionism has also been proposed as a potential vulnerability factor, meaning that having high levels of perfectionism could make you more susceptible to psychopathology, specifically disordered eating and SA or both (Bardone-Cone, Lin, & Butler, 2016).

Perfectionism can be further broken down into adaptive perfectionism and maladaptive perfectionism. Adaptive perfectionism is related to healthy functioning whereas maladaptive functioning is considered to be disordered. Maladaptive perfectionism emphasizes self-criticism and being excessively concerned with making mistakes (Blankstein & Dunkley, 2002). Both forms of perfectionism are seen in disordered eating behaviors, but only maladaptive perfectionism has a direct positive relationship with SA (Shumaker & Rodebaugh, 2009). Thus, understanding perfectionism in both the context of SA and eating disorders can aid in better treatment for both disorders especially in cases in which they are comorbid.

Perceived Stress

Perceived stress has been a factor that has been investigated in both disordered eating and SA literature. Stress reactivity can be defined as the extent to which a person interprets what they experience in daily life as overwhelming or harmful (Schlotz, Yim, Zoccola, Jansen & Schultz, 2011). In the context of social anxiety, there is evidence that individuals with clinical levels of SAD experience stress more often than controls (Beidel, Turner, & Morris, 1999; Farmer & Kashdan, 2015). According to Schlotz et al. (2011), stress reactivity in social situations can result from lack of social confidence in social

situations as well as perceived negative evaluations from others. Both of these are characteristic of SA.

Stress has also been associated with disordered eating. It is well documented that disordered eating is exacerbated in stressful situations. Stress can explain why disordered eating is seen in greater numbers in adolescence, college students, and those who have experienced trauma. Those who struggle coping with their stress are at particular risk (Barker & Galambos, 2007; Delinsky & Wilson, 2008; Klump, Perkins, Burt, McGue, & Iacono, 2007; Lieberman, Gauvin, Bukowski, & White, 2001). Stress could explain the comorbidity between the two disorders. Hinrichsen et al. (2003) proposed that disordered eating can be used to regulate the negative emotions associated with SA, making stress reactivity the mediating factor. Research has shown that if you induce stress by exposing subjects to loneliness and rejection, characteristics of SA, subjects show a greater increase in disordered eating symptoms (Tuschen-Caffier & Vögele, 1999). This means that if psychiatrists could alleviate stress in their patients, they could see better results in social anxiety and disordered eating treatments.

Self Esteem

Self-esteem (SE) refers to an individual's level of self-acceptance, in realms such as self-worth, attractiveness, intelligence, ability to reach one's goals (Robson, 1988). Many studies have investigated SE in connection to both disordered eating and SA. Studies have shown that SE is consistently lower in individuals with eating disorders than controls (Fairburn et al., 2003). Similarly, several studies found negative relationships between disordered eating and reported SE, in both community and clinical samples (Lampard,

Byrne, McLean & Fursland, 2011; Lampard, Tasca, Balfour, & Bissada, 2013; Shea & Pritchard, 2007). Eating disorder psychopathology explains this phenomenon by stating that it seems to exacerbate weight and shape concerns as well as dietary restraint (Fairburn et al., 2003) SE has also been examined in social anxiety literature. Clark and Wells proposed that SE is flawed in individuals with significant levels of social anxiety (1995). In the same study, researchers state that according to the SAD cognitive model, a persistent negative self-view explains why socially anxious individuals could interpret social situations as threatening. This makes sense as those with greater self-confidence tend to find joy in interacting with others, at the very least it is not a traumatic experience. SE could possibly explain the comorbidity between the two disorders. Obeid, Bucholz, Henderson, and Horris (2013) found that in a sample of 344 females with diagnosed eating disorders, SA had a direct negative relationship with perceived self-worth. These findings suggest that prioritizing SE in clinical treatment settings could strengthen the effectiveness of alleviating both disorders separately and concurrently.

Methods

Participants

Participants in this study included a randomized pool of students from the University of Mississippi between the ages of 18-22 that was polled by the Office of Institutional Research, Effectiveness, and Planning.

Procedure

The students were sent the survey to their university email addresses, asking them to complete the survey. Before they could continue, they had to confirm they were at least 18 years of age. This research was approved as exempt by the Institutional Review Board exempt number 21x-240. No identifying data was collected in order guarantee anonymity.

Disordered Eating Attitude Scale (DEAS)

The Disorder Eating Attitude Scale was created by Alvarenga, Scagliusi, and Phillipi in 2010 and it measures 5 subtypes of disordered eating: relationship with food, concerns about food and weight gain, restrictive and compensatory practices, feeling toward eating, and idea of normal eating. In an effort to condense the total length of my questionnaire to retain attention, only relationships with food and concerns about food and weight gain were evaluated. The participants were given 13 questions and asked to use response scale from 1 (rarely/never) to 5 (always). The questions were then separated by

subset and then averaged to get a score. The classification was 1 (none), 2 (mild), 3 (moderate), 4 (severe) and 5 (extreme). This survey reveals where participants fit in two different subtypes of disordered eating.

Severity Measure for Social Anxiety Disorder (Social Phobia)- Adult Scale

The Severity Measure for Social Anxiety Disorder (Social Phobia) - Adult was created by the American Psychiatric Association, and it allows one to measure an individual's thoughts and behaviors in different social situations. The participants were given ten questions and asked to respond from 1 (rarely/never) to 5 (always). The answers to all ten questions were averaged to give one score. From there, the individuals were classified the same as the DEAS with 1 (none), 2 (mild), 3 (moderate), 4 (severe), and 5 (extreme).

Brief Fear of Negative Evaluation Scale (BFNE)

The Brief Fear of Negative Evaluation Scale is a scaled down version of the Fear of Negative Evaluation Scale developed by Leary in 1983. It measures anxiety produced for anticipated negative evaluation from peers. The participants were given twelve questions and asked to respond from 1 (rarely/never) to 5 (always). Questions 2, 4, 7 10 were reversely scored. The answers to all twelve questions were added together and evaluated based on a range from 12-60. The closer an individual was to 12 the lower level of fear of negative evaluation they experience. The closer and individual was to 60 the higher level of fear of negative evaluation they experience.

Frost Multidimensional Perfectionism Scale (FMPS)

The Frost Multidimensional Perfectionism Scale was created by Frost in 1990. It measures four subscales of perfectionism: concern over mistakes and doubts about

actions (subscale 1), excessive concern with parent's expectation and evaluation (subscale 2), excessively high personal standards (subscale 3), and concern with precision, order and organization. (subscale 4). For the purpose of this study, the questions regarding parental expectation, subscale 2, were not included. The participants were given 20 questions and asked to respond from 1 (rarely/never) to 5 (always).

The questions were separated by subscale and added to get an individual score. Subscales 1(P1) and 3 (P2) were added together to get a total score ranging from 17-85. The closer to 17 the lower levels of perfectionism an individual has. The closer to 85 the higher levels of perfectionism an individual has. Subscale 4 (P3) regarding organization is not included in the total but high numbers in this category can exacerbate the levels of perfectionism experienced.

Perceived Stress Scale (PSS)

The Perceived Stress Scale was created by Cohen, Kamarck, and Mermelstein in 1983. It is used to measure one's feelings and stress experienced in different situations one experienced in the last month. Participants were asked ten questions and asked to respond 1 (rarely/never) to 5 (always). Questions 5, 6, 7, and 9 are reversely scored. The answers to all ten questions are added together to give a total score. Scores ranging from 0-13 are classified as low stress. Scores ranging from 14-26 are considered moderate stress. Scores ranging from 27-40 would be considered high stress.

Rosenberg Self-Esteem Scale

The Rosenburg Self-Esteem Scale was created by Rosenberg in 1965. It is used to measure one's self worth, both positive and negative. The participants were asked 10 questions and asked to respond 1 (rarely/never) to 5 (always). Questions 3, 5, 8, 9, and

10 were reversely scored. The total of all ten questions was calculated with a range of 10-50. Scores under 25 were classified as having low self-esteem.

Statistical Analysis

Results

There was a total of 257 respondents. All of them were over the age of 18, but no other identifiers were recorded to maintain anonymity. A one-way ANOVA was conducted to explore the differences between the Social Anxiety (SA) and eating disorder (ED1, ED2) groups. ED1 is a subcategory defined a concern with food & weight gain. ED2 analyzes one's relationship with food. A one-way ANOVA was conducted to explore the difference between these three groups in levels of BFNE, PS, SE, and P1, P2, and P3. An alpha level of $p<.05$ was utilized. All groups were normally distributed. Variances were homogenous with the exception of PS. Statistically significant differences were found among the groups. A Bonferroni multiple comparisons test was also utilized to better visualize the relationships between the groups.

Fear of Negative Evaluation: BFNE

Fear of negative evaluation was found statistically significant in all 3 groups. In the SA group, $F=34.687$, $p<.001$, $n2=.355$. In the ED1 group, $F=9.798$, $p<.001$, $n2=.135$. In the ED2 group, $F=18.235$, $p<.001$, $n2=.224$. According to the Bonferroni multiple comparisons test, there is a significant positive relationship between FNE and SA as SA progresses from mild to moderate as well as moderate to severe. There was also a positive relationship between FNE and ED1 as ED1 progresses from mild to moderate. ED2

followed a similar trend with a positive relationship with FNE from none to mild and mild to moderate.

Self Esteem: SE

Negative self-esteem was found to be significant in both SA and ED2. In the SA group, F=11.572, p<.001, n2=.155 In the ED1 group, F=1.659, p=.160, n2=.026 In the ED2 group, F=5.103, p<.001, n2=.075. According to the Bonferroni multiple comparisons test, there is a significant negative relationship between SE and SA, as SA progresses from none to mild and mild to moderate. ED2 showed a significant negative relationship with SE as ED2 progresses from mild to severe. No significant relationship was shown between SE and ED1.

Perceived Stress: PS

Perceived stress was not homogenous, so Welch's test had to be utilized. It was found to be significant in both the SA and ED2 groups. In the SA group, F=36.067, p<.001, n2=.315 In the ED1 group, F=4.367, p=.003, n2=.073. In the ED2 group, F=13.340, p<.001, n2=.014. According to the Bonferroni multiple comparisons test, a significant positive relationship was found between PS and SA as SA progresses from none to mild, mild to severe, and moderate to extreme. ED1 had a significant positive relationship with PS from mild to severe. A similar response was seen in ED2 with a significant positive relationship from none to moderate and mild to severe.

Concerns over Mistakes and Doubts about Actions: P1

Perfectionism subset, P1, was found to be statistically significant across all three groups In the SA group, F=19.211, p<.001, n2=.155. In the ED1 group, F=8.997, p<.001,

n2=.125. In the ED2 group, F=17.471, p<.001, n2=.21. According to the Bonferroni multiple comparisons test, a significant positive relationship between P1 and SA was seen as SA progresses from none to moderate and mild to severe. The same trend appeared in ED2. ED1 had a significant positive relationship with P1 as ED1 progresses from mild to severe and moderate to extreme.

Personal Standards: P2

Perfectionism subset, P2, was not found to be significant in any of the groups. In the SA group, F=1.902, p=.111, n2= .024. In the ED1 group, F=1.636, p=.166 n2=.025. In ED2 group, F=1.462, p=1.463, n2=.023. No significant relationship was found in the Bonferroni test.

Concern with Precision, Order and Organization: P3

Perfectionism subset, P3, was not found to be significant in any of the groups. In the SA group, F= 1.962, p=.101, n2=.030. In the ED1 group, F=1.720, p=0.146, n2=0.027. In the ED2 group, F=0.741, p=0.565, n2=0.012. No significant relationship was found in the Bonferroni Test.

Table 1: Correlations Between Measures

	BFNE	SE	PS	P1	P2	P3
SA	p<.001*	p<.001*	p<.001*	p<.001*	p=.111	p=.101
ED1	p<.001*	p=.160	p=.003*	p<.001*	p=.166	p=.146
ED2	p<.001*	p<.001*	p<.001*	p<.001*	p=1.463	p=.565

*Significant at the p<0.05 level

SA= Social Anxiety, ED1= Concerns with Food and Weight Gain, ED2= Relationship with food BFNE= Fear of Negative Evaluation, SE= Self Esteem, PS= Perceived Stress, P1= Concerns with Mistakes and Doubts about Actions, P2= High Personal Standards, P3= Concerns with Precision, Order, and Organization

Discussion

This study looked at potential links between social anxiety and disordered eating in college students. There were significant levels of fear of negative evaluation, perceived stress, negative self-esteem, and concerns over mistakes and doubts about actions (P1) in both the SA and ED2 groups. There was only a significant level of fear of negative evaluation, perceived stress and concerns over mistakes and doubts about actions (P1) in the ED1 group. There was not a significant level of personal standards (P2) or organization (P3) in any of the groups.

There is still a lot more that needs to be examined. Literature on these topics is either scarce or outdated. There seems to be a trend that new literature comes out on the subject every 10-15 years. Because of this, more modern articles are citing articles written 40-50 years prior. This begs the question if old studies should be replicated to make sure their use in current studies are rendering accurate findings. Despite these gaps, the results in this study largely echo past findings. Specifically, one study examining the roles of stress reactivity and self-esteem, found that both disordered eating and social anxiety were negatively related to self-esteem and positively related to stress reactivity (Ciarma & Mathew, 2017). Levinson et al. (2013) found that fear of negative evaluation was positively associated with social anxiety and some aspects of eating disorders, depend on how it was tested. However, in the same study, they found that perfectionism had no connection between social anxiety and eating disorders. They believe the connection found in previous studies is dependent on how researchers measured perfectionism. This actually reflects our

study findings one aspect of perfectionism had a positive connection, concerns over mistakes and doubts about actions, other aspects we looked at, personal standards and organization, showed no relationship to either social anxiety or disordered eating.

No identifying characteristics other than age were obtained in this study to maintain anonymity as a way to generate the most responses. It could be beneficial to see if the responses change when gender is specified, as well as different age groups. Because of the vulnerable nature of undergraduate years, the focus on this study was college students. The mediating factors could change as an individual develops. Another factor to note is that this research did not include clinical populations of these disorders. To further solidify the results in this study, a clinical sample of both disorders to confirm validity.

The need of further research into these disorders is only exacerbated by the current pandemic where we have seen rapid increase in psychopathy across the board. Old literature needs to be replicated to ensure that the information still holds factual today. These results further indicate a need for more research on if more specialized treatment for social anxiety and eating disorders by taking into considerations the links that exacerbate the presence of the two could lead to better results and faster recoveries. Also, further research could investigate if social anxiety and/or eating disorder symptomology are lessened when mediating factors are identified and treated themselves through intervention.

Clinical Significance

Psychologists and registered dietitian nutritionists need to have a greater understanding between the underlying causes of these disorders and why they are often seen concurrently in college students. Part of that understanding is identifying what

factors could link the two disorders. Based on the results in this study, a greater focus should be placed on a patients' fear of negative evaluation, perceived stress level, and perfectionism. This could lead to more effective treatment outcomes and as well as better patient livelihoods. Self-esteem also seems to play a role in social anxiety and some subsets of disordered eating. Understanding that self-esteem plays a role in disordered eating, specifically in relationship to food, will prevent psychologist from looking at self-esteem in realms of disordered eating where there is not a strong relationship. By identifying and alleviating known mediating factors of these disorders, symptomology and recovery time could both be diminished.

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