

CORRELATIONS BETWEEN EMOTIONAL AND BEHAVIORAL
FACTORS AND THE EDI-3 BY SEX

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ABSTRACT

CORRELATIONS BETWEEN EMOTIONAL AND BEHAVIORAL FACTORS AND THE EDI-3 BY SEX

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The Eating Disorder Inventory 3 (EDI-3) is one of the most commonly used measures for assessing symptoms associated with eating disorders. Several studies have examined differences in scores on the EDI-3 constructs based on sex, however; few have examined potential behavioral and/or emotional factors that may be related to scores on the EDI-3.

The purpose of this study was to consider how the domains of the Behavioral Assessment System for Children, Second Edition Self Report of Personality College Form (BASC-2 SRP COL) correlated to the constructs of the EDI-3 by sex in a population of college students. The results revealed significant Pearson's Product-Moment Correlation coefficients in all five of the EDI-3 constructs evaluated and at least one BASC-2 SRP COL scale in females. In addition, significant correlations were observed between four of the five EDI-3 composites considered and at least one BASC-2 SRP COL scales in males. Implications for future research will be discussed within the text.

CHAPTER ONE: INTRODUCTION

In terms of life-long prevalence, it has been estimated that 1.2% of the adult United States population struggles with anorexia nervosa and 2% suffer with bulimia nervosa (Hudson, Hiripi, Pope, & Kessler, 2007). These statistics are troubling when one considers that bulimia nervosa has an estimated mortality rate of 3.9% (Crow, et. al., 2009). Mortality rate estimates of anorexia nervosa may be even higher with some research reporting 4% (Crow, et. al., 2009) and others completing meta-analysis research to surmise a rate of 2.8 % (Keel & Brown, 2010). In addition to elevated mortality rates, eating disorders have also been associated with significant health consequences including electrolyte abnormalities, gastrointestinal problems, decreased bone density, and endocrine problems (Mitchell & Crow, 2006).

Given these associated outcomes, it is important that professionals including school psychologists, clinicians, and counselors are able to identify and treat individuals with eating disorders. One self-report measure commonly used to evaluate the symptoms and psychological features of eating disorders is the Eating Disorder Inventory-3 (EDI-3) (Clausen, Rosenvinge, Friborg, & Rokkedal, 2011; d'Emden et al., 2012; Izydorczyk, 2011; Stanford & Lemberg, 2012). It is intended to be applied as an assessment tool in conjunction with other measures to identify the presence of an eating disorder and/or the symptoms of an eating disorder (Garner, 2004).

The EDI-3 measures eating disorder symptoms within six composite constructs: Eating Disorder Risk, Ineffectiveness, Interpersonal Problems, Affective Problems, Overcontrol, and General Psychological Maladjustment. The General Psychological

Maladjustment Composite is essentially a summary measure of the other five constructs. Scores on these six constructs are generated from ratings obtained on a total of twelve scales: Drive for Thinness, Bulimia, Body Dissatisfaction, Low Self-Esteem, Personal Alienation, Interpersonal Insecurity, Interpersonal Alienation, Interoceptive Deficits, Emotional Dysregulation, Perfectionism, Asceticism, and Maturity Fears.

Though the EDI-3 was normed using a female population, it has been used with both males and females (Fay, Economos, Lerner, Becker, & Sacheck, 2011; Sepulveda, Carrobbles, & Gandarillas, 2010). Research to date has been limited in terms of differences between males and females on the six constructs measured by the EDI-3. It has been suggested that there is no significant difference in how males and females perform on the EDI-3 (Garner, 2004). Others have reported variations on specific scales (Stanford & Lemberg, 2012). Overall, the availability of studies specifically considering potential variations in males and females on the EDI-3 has been scarce.

In addition, limited research has been done on the EDI-3 to identify variables that contribute to or predict scores in the six construct areas measured. Knowing these variables as well as how the predictive strength of these variables may vary between males and females could be beneficial to mental health providers. It may facilitate the early identification and intervention treatment of those at-risk for an eating disorder. Further, knowing the most significant variables for each sex could promote further research and expand the applications of accepted assessment instruments. The following literature review will explore the contributing variables identified in the research to date with an emphasis on variations by sex.

CHAPTER TWO: LITERATURE REVIEW

The following literature review will begin with a consideration of potential theoretical explanations for sex differences within eating disorders. Then available research related to the EDI-3 constructs will be presented including Eating Disorder Risk, Ineffectiveness, Interpersonal Problems, Affective Problems, and Overcontrol. The General Psychology Maladjustment composite will not be included as it is essentially a summary measure of the areas addressed in the five constructs. Each construct will first be discussed in terms of how it is defined by the EDI-3. Next, known differences between how males and females perform on each of the constructs will be presented. Finally, available research relating to contributing factors and or predictors of each construct will be considered.

Theoretical Perspectives

Biological. Some researchers have focused on eating disorders and their symptomologies from a biological perspective. One study in particular used adopted twins with control siblings in the adoptive home to try and better understand both the environmental and biological factors (Klump, Suisman, Burt, McGue, & Iacono, 2009). Their findings indicated a 59% - 82% genetic influence on the display of disordered eating behaviors using only female participants with a mean age of 18.7. This study did not completely discredit environmental contributions, but displayed support for a large genetic basis in females.

Other researchers have also used twins to consider the function of biology in the development of disordered eating by sex. One such study sampled males and females

when they were 16 years old and again when they were 22 to 27 years old (Keski-Rahkonen et al., 2005). The study utilized measures of a desire to be thinner and unhappiness with one's body from the first edition of the Eating Disorder Inventory scales to consider a potential genetic relationship to elevations on these measures. Their findings indicated that hereditary influences were significant in females on both measures, but that a significant genetic influence was not present in males (Keski-Rahkonen et al., 2005). While the need for research using varied measures of eating disorders as they may present differently in males was identified by researchers, this study may suggest that the biological contribution to disordered eating is stronger in females and that environmental factors are more relevant in the male population (Keski-Rahkonen et al., 2005).

Gender socialization. Another theory developed to better understand potential differences in male and female pathologies addresses the societal roles/norms that individuals are exposed to. Specifically it has been presented that gender norms outline expectations for how individuals are supposed to behave, think, and feel based on their sex (Mahalik et al., 2005). One study found that increased emphasis on traditional gender roles (i.e. masculine toughness and feminine thinness) by parents was related to more endorsements of such beliefs in an undergraduate college sample (Epstein & Ward, 2011). This is interesting when considering that research has found that conformity to feminine norms was associated with some symptoms of disordered eating (Green, Davis, Skaggs, Riopel, & Hallengren, 2008; Murnen & Smolak, 1997).

Research investigating male gender roles as they may be related to disordered eating symptomologies has identified that while women are socialized with a thin ideal,

men are exposed to pressures to be muscular (Blashill, 2011; Kimmel & Mahalik, 2004). This may be an important factor to consider when evaluating the presence of disordered eating in males and females as presentation may vary. Other research has found that college males who identify with a more traditionally masculine gender role report fewer symptoms of body dissatisfaction as measured by the first edition of the Eating Disorder Inventory (Pritchard, 2008). This is suggestive that eating disorder presentations in males and females may be influenced by societal gender roles.

Eating Disorder Risk

Definition. On the EDI-3, the Eating Disorder Risk composite is a summation of an individual's scores on three subscales: Drive for Thinness, Bulimia, and Body Dissatisfaction. Individuals with elevations in this area likely suffer from severe fear of weight gain, dissatisfaction with their body, a desire to be thinner, and/or binge eating tendencies (Garner, 2004).

Sex differences. Research has reported that women present more elevations than men on the Drive for Thinness (Fernandez & Pritchard, 2012) and Body Dissatisfaction scales (Fernandez & Pritchard, 2012; Standord & Lemberg, 2012). Further, research utilizing the first edition of the Eating Disorder Inventory and a college age sample found gender to be the primary predictor of scores on the Drive for Thinness and Body dissatisfaction scales (Shea & Pritchard, 2007). Significant differences between males and females on the Bulimia scale have not been found (Shea & Pritchard, 2007; Standord & Lemberg, 2012). Other research working to explain the elevation on the Drive for Thinness measure found that the media and self-esteem are related to elevations for both males and females, with media being a stronger predictor of scores (Fernandez &

Pritchard, 2012). The observed differences may be partially explained by the gender socialization theoretical perspective. Specifically research has shown that exposure to sports media facilitates gender role typing of sports in study utilizing college students (Hardin & Greer, 2009).

Predictors. Research using an eating-disordered female population has shown that scores in this composite are negatively associated with emotional expression (Ioannou & Fox, 2009). Other research found that college age males who self report higher levels of anger, depression, impulsivity, or anxiety are more at risk to also report elevations on an eating disorder measure relating to dissatisfaction with overall life and self scales (Feltman & Ferraro, 2011). This is interesting and potentially related to research that found substance abuse (Calero-Elvira et al., 2009; Pearlstein, 2002) and more specifically alcohol abuse is associated with bulimia nervosa in populations of men and women (Gadalla & Piran, 2007; Sobot, Markovic, Srdanovic-Maras, & Mitrovic, 2010).

Ineffectiveness

Definition. The Ineffectiveness construct of the EDI-3 is formulated using two scales: Low Self-Esteem and Personal Alienation. It measures an individual's self-understanding and feelings of self-worth. Elevations on this scale may represent feelings of emotional emptiness, aloneness, negative self-evaluation, a lack of self-understanding, and depression (Garner, 2004).

Sex differences. Most research related to this construct has focused on self-esteem as a measure of ineffectiveness. Findings have indicated that self-esteem, or ineffectiveness, may be a stronger predictor of an eating disorder in women than in men

(Eligin & Pritchard, 2006). This is interesting considering that research has reported that women have lower self-esteem than men (Frost & McKelvie, 2004; Tiggemann & Williamson, 2000). In males, but not females, another study identified low social support, and not self-esteem to be a relevant predictor of disordered eating (Ferreiro, Seoane, & Senra, 2012). This may be representative of unique factors associated with female and male elevations on the Ineffectiveness construct of the EDI-3, though more research is required to explore these potential relationships.

Predictors. Using an eating-disordered female population, researchers found that scores on the EDI-3 Low Self-Esteem scale were positively correlated with measures of impulsivity (Mead, Malinowski, & Lattimore, 2012). While no research was found identifying impulsivity as a potential predictor in males, a relationship between poor body image and self-esteem has been observed in males (Blouin & Goldfield, 1995). A study using both males and females positively correlated body satisfaction and maternal and paternal care with higher self-esteem (Sira & White, 2010). The same study identified a negative correlation between higher self-esteem and maternal and paternal control in both females and males (Sira & White, 2010).

Interpersonal Problems

Definition. On the EDI-3, the Interpersonal Problems construct includes the Interpersonal Insecurity and Interpersonal Alienation scales. It measures an individual's emotions and cognitions related to their social interactions including potential feelings that their relationships are unrewarding, stressed, unsatisfying and/or artificial. An individual with elevations in this area may be withdrawn or anxious in social situations,

feel disappointed with their relationships, and struggle with impaired attachment in their relationships (Garner, 2004).

Sex differences. In adolescent males, but not females, research has indicated that self-reported feelings of social-emotional isolation were positively associated with dietary restriction (Zaitsoff, Fehon, & Grilo, 2009). The same study reported that for both males and females, social-emotional isolation was related to more body image disturbance and binge eating. In an effort to further consider the different elements included in this construct, research exploring anxiety as it may pertain to disordered eating was referenced. One study using a female only population reported that cognitive anxiety was positively related and moderately predictive of excessive eating (Davenport, Houston, & Griffiths, 2012). Similar research using a male population was unavailable.

Predictors. Research investigating interpersonal skills, found that negative and persistent self-focus, was associated with perceived impaired interpersonal skills in a population including both males and females (Takano, Sakamoto, & Tanno, 2011). This finding may be further understood by considering research of predictors of negative self-evaluation. One study using a female only population reported that when individuals were led to believe that they had been negatively judged by another, their self-focused attention and self-reported negative beliefs increased (Voncken, Dijk, Jong, & Roelofs, 2010). This may be related to gender socialization theory as the perceived social interaction changed the individual's thoughts. Further research is needed to determine if perceived judgment and related negative self-evaluation impacts scores on the Interpersonal Problems construct.

Affective Problems

Definition. On the EDI-3, the Affective Problems construct is formulated using the Interoceptive Deficits and Emotional Dysregulation scales. It is a representation of one's ability to recognize and control emotional states. Elevations in this area may be representative of an individual who is naive to or misidentifies their emotions. Further, individuals with concerns in this area may be impulsive, reckless, and have unstable moods (Garner, 2004).

Sex differences. Research investigating the emotional experience of an eating disordered versus control group population of females utilizing the Eating Disorder Inventory-2 (EDI-2) found that females with an eating disorder report higher levels of both positive and negative emotions (Overton, Selway, Strongman, & Houston, 2005). The same study also reported that females in the eating disordered group showed more correlations between the EDI-2 subscales and pleasant emotions when compared to negative emotions (Overton et al., 2005). This study suggests that women may report higher levels of emotions overall, though the study had a small sample size and should be replicated prior to generalizing the results. Similar research could not be located addressing a male population, though it was found that males score higher than females on general measures of risk taking behavior (Bradley & Wildman, 2002). Findings may be further understood through the consideration of the socialized gender norms that females are supposed to be sensitive while males are should be active and aggressive. More research exploring the potential implications for male and female performance on the Affective composite is needed.

Predictors. One study, utilizing an eating-disordered population of females, found that elevations in impulsivity were positively related to both the Interoceptive

Deficits and Emotional Dysregulation measures of the EDI-3 (Mead et al., 2012). When considering emotional regulation more generally, one study linked inefficient emotional regulation to persistent self-ruminating in both males and females (Takano et al., 2011). Another potentially influential variable in males but not females may be social desirability (Bradley & Wildman, 2002). Research has observed social desirability to mediate reckless behavior in males (Bradley & Wildman, 2002).

Overcontrol Composite

Definition. On the EDI-3, the Overcontrol construct includes the Perfectionism and Asceticism scales. This is a measure of an individual's beliefs that self-denial and self-sacrifice is virtuous. It also considers self-set standards for achievement constructed by the individual. Elevations in this area may be representative of beliefs that a person must meet very high standards, cannot disappoint others, and is suggestive of interpersonal problems (Garner, 2004).

Sex differences. In female populations, research has shown that engaging in negative self-evaluation is a risk factor for maintaining eating disorders and displaying dieting behaviors (Ackard & Peterson, 2001; Button, Loan, Davies, & Sonuga-Barke, 1997). Some researchers have considered stress to conform to female gender roles in order to better understand females' ratings on this composite. Using the EDI-3 and other measures, researchers found that the Overcontrol composite mediated a correlational relationship between fears of being unattractive and dietary restraint and bingeing and purging measures (Mussap, 2007). Overcontrol was also identified to govern a correlational relationship between a fear of being assertive and eating control measures (Mussap, 2007). While the study used a small convenience sample and has limited

generalizability, it may highlight a relationship between elevations on the Overcontrol composite and limited beliefs relating to control and interpersonal skills in females.

No similar comparative research could be located using a male population. One study found that in males perfectionism was not significantly correlated with known risk factors for the development of an eating disorder (Feltman & Ferraro, 2011). More research is needed specifically considering males on this construct.

Predictors. In research relating specifically to perfectionism using a sample of males and females, perfectionism was found to be correlated to the continuance of depressive symptoms that were carried by negative social interactions and negative views of social support (Dunkley, Sanislow, Grilo, & McGlashan, 2006). Anxiety sensitivity has also been associated with perfectionism through controlled research with a sample of both males and females (Flett, Greene, & Hewitt, 2004). These findings may indicate a relationship between the Overcontrol composite and measures of depression, interpersonal relationships, and anxiety, though more research is needed.

Statement of the Problem

The EDI-3, as a measure of eating disorders, has been widely used with both males and females (Clausen, et al., 2011; d’Emden et al., 2012; Fay et al., 2011; Izydorczyk, 2011; Sepulveda, et al., 2010; Stanford & Lemberg, 2012). While the six constructs measured by this instrument have received some research pertaining to sex differences on each of the constructs, there has been less research on the relationship of emotional and behavioral variables related to the EDI-3 constructs. Further, the research that is available on emotional and behavioral variables related to eating disorders generally does not address sex differences. Having a greater understanding of sex

differences in emotional and behavioral variables that are related to the composites of the EDI-3 could help clinicians better apply information from this commonly used assessment tool. It may also expand the foundational research relating to sex differences in eating disorders and standardized assessment application and/or development.

For this study, the Behavioral Assessment System for Children, Second Edition Self Report of Personality College (BASC-2 SRP COL) form was used to measure self-reported emotional and behavioral functioning in college students. The goal was to determine if there were significant relationships between the emotional and behavioral factors measured on the BASC-2 SRP COL and the EDI-3 composites. Further, this research worked to identify the extent to which these significant relationships varied based on sex. The following hypotheses were predicted based on available research.

1. For the Eating Disorder Risk Composite the following correlations are predicted:
 - a. Negative correlation with Self-Esteem for both males and females
 - b. Positive correlation with Alcohol Abuse for males only
 - c. Positive correlation with Depression for males only
 - d. Positive correlation with Hyperactivity for males only
 - e. Positive correlation with Anxiety for both males and females
2. For the Ineffective composite the following correlations are predicted:
 - a. Negative correlation with Self-Esteem for both males and females
 - b. Positive correlation with Hyperactivity for females only
 - c. Positive correlation with Depression for both males and females
 - d. Positive correlation with Interpersonal Relations for both males and females

- e. Negative correlation with Locus of Control for both males and females
3. For the Interpersonal Problems composite the following correlations are predicted:
- a. Positive correlation with Anxiety for females only
4. For the Affective Problems composite the following correlation are predicted:
- a. Positive correlation with Hyperactivity for females only
 - b. Negative correlation with Interpersonal Relations for females only
 - c. Positive correlation with Sensation Seeking in both males and females
5. For Overcontrol composite the following correlations are predicted:
- a. Positive correlation with Interpersonal Relations for both males and females
 - b. Positive correlation with Locus of Control for females
 - c. Positive correlation with Depression for both males and females
 - d. Negative correlation with Social Stress for both males and females
 - e. Positive correlation with Anxiety for both males and females

CHAPTER THREE: METHOD

Participants

Participants included 321 students attending one of two universities in the southeastern United States. 42.1% of participants were male and 53.3% were female. There was not a statistically significant difference [$t(299) = .058, p = .954$] between the sexes with regard to age. Given that the sample was consistent by age between the sexes, the mean and standard deviation for the sample in its entirety will be presented rather than considering the sample by sex. The mean age for the sample was 19.15 ($SD = 1.11$). There was also no statistically significant difference ($\chi^2(4) = 1.74, p = .78$) between the sexes with regard to ethnicity. The majority of the sample was comprised of European American (89.5%), with the remainder being African American (3.6%), Native American (4.0%), and Other (3.0%).

Materials

Eating Disorder Inventory-Three (EDI-3). The EDI-3 is a self-report rating scale developed by Garner (2004). It is used in conjunction with other sources of information to diagnose and treat eating disorders or eating disorder symptoms in individuals 13 to 53 years old. It is primarily used with females though it can be used with males and with individuals as young as 11 years old. The EDI-3 was developed as a revision to the original *Eating Disorder Inventory* and *Eating Disorder Inventory-2*, which was developed by Garner, David, Olmstead, Marion, Polivy, and Janet in 1984 and 1991 respectively.

The updated EDI-3 produces composite and scale scores that were described in further detail earlier in this paper. It was normed using females that met *DSM-IV-TR* criteria for an eating disorder. Though the EDI-3 was normed only on females, other researchers have used it for assessing males as well (Arnold, 2006; Kellogg, 2010). The developers of the assessment also compared their norming samples to a male population and found insignificant differences between the genders. When norming the EDI-3, researchers included a United States adult population (N=983), an international adult population (N=662), and a United States adolescent population (N=335). The adult population included individuals 18 years and older while the adolescent population ranged from 11 to 17 years old. Measures of internal reliability of the Eating Disorder Risk Composite scale using coefficient alpha were in the high 0.80 or low 0.90 range indicating strong reliability. The other composites and scales within each construct also showed good internal reliability except for the Bulimia scale for Anorexia Nervosa-restrictive type individuals. This was anticipated as the behaviors in that specific diagnosis would result in a markedly lower B scale. The EDI-3 showed excellent test-retest reliability for its scales with *r* scores ranging from 0.86 to 0.98 (N=34). The scales and composites of the EDI-3 are considered to have strong validity with high correlations between scales except the anticipated differences in measures relating to bingeing and purging behaviors. Scales on the EDI-3 were identified using exploratory and confirmatory factor analysis.

Behavior Assessment System for Children, Second Edition Self Report of Personality College form (BASC-2 SRP-COL). All of the following information was attained using the *Behavioral Assessment System for Children manual, Second Edition*

by, Reynolds and Kamphaus (2004). The BASC-2 SRP-COL is a rating scale used to assess behaviors and self-perceptions' of individuals 18 through 25 years old in research and clinical applications. It was developed as a revision to Reynolds and Kamphaus (1994) *Behavioral Assessment System for Children*. The updated revision produces Clinical, Adaptive, and Validity scales that will be described in further detail below. The assessment was normed using a general population sample of 706 individuals between the ages of 18 and 25. All measures of internal consistency reliability (coefficient alpha) were good with values equal to or greater than 0.71 (M=0.83). The BASC-2 SRP-COL also showed strong test-retest reliability with values on each scale equal to or greater than 0.74 (M=0.84) with a sample size of 59. The BASC-2 SRP-COL presented acceptable validity with moderate predictable positive and negative correlations between its scales. The exception to this was found in the Sensation Seeking scale that showed lower correlations.

The BASC-2 SRP-COL (Reynolds & Kamphaus, 2004) calculates five validity scales to addresses the potential for unusually negative, positive, false, inconsistent or patterned responses. In addition to the validity scales, the BASC-2 SRP-COL produces twelve Clinical Scales (Alcohol Abuse, Anxiety, Attention Problems, Atypicality, Depression, Hyperactivity, Locus of Control, School Maladjustment, Sensation Seeking, Sense of Inadequacy, Social Stress and Somatization) and four Adaptive Scales (Interpersonal Relationships, Relations with Parents, Self-Esteem, and Self-Reliance). While both types of scales calculate T scores that have a mean of 50 and a standard deviation of 10, Clinical scales are considered "at risk" in the 60-69 range and "clinically significant" when at or above 70, while Adaptive scales are interpreted "at risk" when

scores are between 31 and 40 and “clinically significant” when scores are 30 or below. Each of the Clinical and Adaptive Scales will be described in further detail below.

Alcohol Abuse. This scale measures an individual’s behaviors and cognitions relating to alcohol use that may lead to alcohol abuse. It not only includes questions addressing drinking behaviors and related emotions but also the consequences of drinking.

Anxiety. This represents an individual’s feelings of nervousness, being scared and/or worrying as well as the rationality of these emotions. Elevations of this scale could represent disruptive obsessive thoughts, ritualistic behaviors, and impaired decision making.

Attention Problems. One’s inability to sustain focus and distractibility are measured by this scale. It was developed with the intention that it should be used with the Hyperactivity Scale when considering Attention Deficit Hyperactive Disorder.

Atypicality. This scale measures thoughts and behaviors that are unusual. Elevations in this area may represent emotional disturbances, weak ego strength, confused cognitions, or schizophrenic symptoms.

Depression. This measure addresses feelings of sadness, isolation, hopelessness, and dread. Elevations are commonly observed in individuals who are considered to have a hard time expressing their emotions and to be introverted.

Hyperactivity. As previously mentioned, this scale was developed to be used with the Attention Problems scale when considering Attention Deficit Hyperactivity Disorder. It measures overactive behaviors like interrupting, weak impulse control, and rushing projects.

Locus of Control. This scale measures one's feelings of personal control over outcomes. Elevated scores may represent feelings that consequences, positive or negative, are not controlled by themselves; rather, they are mediated by outside people or events. More significant elevations may be associated with mild paranoia, anxiety, and depression.

School Maladjustment. This scale measures cognitions and behaviors that could impact an individual's adjustment to post-secondary education. It addresses feeling like boredom, exasperation, and a lack of motivation relating to school.

Sensation Seeking. This scale measures one's thoughts and behaviors relating to potentially hazardous activities to gain exhilaration. Elevations on this scale may represent a desire to or engagement in delinquent behaviors. Depression scores are commonly elevated with the Sensation Seeking Scale particularly in male population. This is potentially explained with the theory that these individuals are engaging in risky behaviors to cope with their depressed emotions.

Sense of Inadequacy. This scale assesses an individual's perceptions of inabilities to meet their own expectations or the standards of others. Elevations in this area may be representative of weak self-confidence, depressive symptoms, or feelings of weakness.

Social Stress. This is a measure of an individual's feelings of strain, exclusion, and social pressure even in familiar social relationships. Elevations in this area may be associated with individuals who are considered shy, irritable, or anxious. Somatic complaints have also been related to higher scores in this area.

Somatization. This final Clinical Scale relates to an individual's physical complaints as a manifestation of their psychological struggles. Elevations in this scale may represent anxiety or an over-internalization of emotions. The physical ailments being considered in this scale are rather minor, but the individual is still drawing attention to them.

Interpersonal Relations. This is the first Adaptive Scale to be addressed in this review. The Interpersonal Relations scale measures self-perceived success in relating to others. It also considers the individual's pleasure attained from the interactions. Low scores in this area could represent weak social skill development, high levels of guilt related to social interactions, and impaired relations with peers and other adults.

Relations with Parents. This is a measure of an individual's perception of their relationship with their parents and their significance to the family. It also addresses how much the individual feels that their parents trust and are concerned about them. Low scores in this area may represent maladaptive family relationships and could indicate isolation from one's family. Adolescents with low scores in this area commonly act out and display disruptive behaviors.

Self-Esteem. This is a measure of an individual's acceptance of and satisfactions with themselves. It includes, but is not limited to, their physical characteristics. Low scores in this area may be representative of dissatisfaction with one's self and has been related to anxiety, depression, and withdrawal.

Self-Reliance. The Self-Reliance scale measures an individual's adjustment and confidence in their decision making and problem solving skills. Low scores in this area may indicate weaknesses in coping with daily challenges and independence.

Procedure

Archival data collected in conjunction with a separate more detailed study was made available to this researcher for analysis. No identifying information was attached to the data and the researcher held no knowledge of individual participants' identities. Participants completed the scales willingly and voluntarily with the assurance of anonymity. The scales were completed in college class settings. The ratings scales were administered in a group setting and were counterbalanced to control for order effects. No previous analysis was conducted on the data attained regarding the EDI-3 and BASC-2 SRP-COL scales. The data was analyzed using IBM's Statistical Product and Service Solutions (SPSS) software.

CHAPTER FOUR: RESULTS

Mean and Standard Deviation Analysis

An analysis of the EDI-3 and BASC-2 SR COL means and standard deviations showed that there was little variability in scores for the male and female participants in this study (see Tables 1 and 2). All mean scores on the BASC-2 SPR COL scales clustered in what is considered to be the average range for males and females. On these measures scores ranging from 41 to 59 constitute the average range. Limited variability was also found when considering the EDI-3 composites scores in males and females with all mean values falling in below the average range. Specifically, in males and females, the Ineffective, Interpersonal Problems, Affective Problems, and the Overcontrol composites were all in the low average range. Scores ranging from 31 to 40 formulate the low average range. Means on the Eating Disorder Composite were lower for males and females falling in the well below average range. This range represents scores lower than 30.

Table 1

Means and Standard Deviations for the BASC-2 SRP COL Scales

	Males		Females	
	Mean (Range)	SD	Mean (Range)	SD
BASC-2 SRP COL Scale				
Alcohol Abuse	51.8 (43-79)	9.2	49.1 (24-81)	8.6
Anxiety	46.4 (30-72)	9.8	50.7 (30-81)	10.8
Attention Problems	50.5 (35-75)	9	50.1 (33-79)	9.2
Atypicality	51.3 (42-88)	10.5	49.4 (42-94)	9.7
Depression	48.3 (40-86)	9.2	48.3 (40-87)	8.7
Hyperactivity	49.3 (33-84)	10.4	49.3 (33-84)	10.3
Locus of Control	48.5 (39-70)	7.8	48.7 (39-84)	9
School Maladjustment	51 (36-81)	9.8	51.6 (34-80)	10

Sensation Seeking	52.3 (30-74)	9	46.8 (27-91)	9.4
Sense of Inadequacy	48.9 (35-79)	9.3	48.8 (35-82)	8.9
Social Stress	49.6 (34-96)	10.6	49.2 (34-82)	10.4
Somatization	47.6 (41-72)	7.5	51.9 (41-86)	10.8
Interpersonal Relations	49.5 (16-65)	9.8	51.4 (32-65)	8.4
Relations with Parents	50.8 (17-62)	9.6	51.3 (14-81)	10.1
Self Esteem	52.7 (29-63)	7.7	50 (20-66)	9.2
Self Reliance	49.9 (21-69)	9.6	48.6 (15-69)	9.5

Table 2

Means and Standard Deviations for the EDI-3 Constructs

	Males		Females	
	Mean (Range)	SD	Mean (Range)	SD
Eating Disorder Risk	26.2 (18-56)	8.2	28.8 (12-61)	8.9
Ineffective	33.1 (26-51)	6.6	33.5 (26-60)	7
Interpersonal Problems	39.8 (28-61)	8.3	40.1 (28-62)	7.7
Affective Problems	36.8 (29-65)	7.2	37.4 (29-74)	7.6
Overcontrol	40 (26-64)	7.4	38.9 (25-61)	7.9

Sex Differences Analysis

A one-way MANOVA was conducted initially to determine whether-sex differences existed with regard to the domains measured by the BASC-2. The overall MANOVA [$F(14,282) = 6.14, p < .001, \eta^2 = .24$] was statistically significant suggesting that there are sex differences between males and females on this instrument. For this reason, the additional analyses looking at the relationship between the BASC-2 and EDI-3 were run separately for each sex. The relationship between the domains of the BASC-2 and the composite scales on the EDI-3 were examined using Pearson product-moment

correlation coefficients. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity occurred.

Eating Disorder Risk Composite

When considering the Eating Disorder Risk composite a significant positive small correlations was observed with the Anxiety ($r = .202$, $n = 164$, $p < .01$) scale and a significant negative small correlation was noted with the Self-Esteem ($r = -.173$, $n = 164$, $p < .026$) scale of the BASC-2 SRP COL in the female population. Anxiety explained 4% of the variance in Eating Disorder Risk composite scores and Self-Esteem accounted for about 3% of the variance. No significant correlations were noted in the male population. The findings were partially consistent with hypotheses relating to Self Esteem and Anxiety though only for females. There were no significant correlations for males which was inconsistent with the hypotheses that predicted significant correlations with Self Esteem, Alcohol Abuse, Depression, Hyperactivity, and Anxiety. Please see Table 3 for all Pearson Product-Moment Correlations obtained between the BASC-2 SRP COL scales and the Eating Disorder Risk composite.

Table 3

Pearson Product-Moment Correlations between the Eating Disorder Risk Composite and the BASC-2 SRP COL scales for Males and Females

BASC-2 SRP COL Scale	Male	Female
Alcohol Abuse	-.038	.105
Anxiety	.084	.202**
Attention Problems	-.104	.143
Atypicality	.006	-.013
Depression	-.003	.055
Hyperactivity	-.027	.035
Locus of Control	.041	.002
School Maladjustment	.033	.045

Sensation Seeking	-.014	-.110
Sense of Inadequacy	.066	.133
Social Stress	-.009	.056
Somatization	.042	.018
Interpersonal Relations	.069	.007
Relations with Parents	.035	-.015
Self Esteem	-.049	-.173*
Self Reliance	.014	-.082

*Note. ** represents $p < .01$ (2-tailed) and * represents $p < .05$ (2-tailed).*

Ineffective Composite

When considering correlations between the BASC-2 SRP COL scales and the Ineffective composite, two significant medium correlations were found in females: a positive correlation with Sense of Inadequacy ($r = .336$, $n = 164$, $p < .01$) and a negative correlations with Self Esteem ($r = -.317$, $n = 164$, $p < .01$). Sense of Inadequacy accounted for 11% of the variance in the Ineffective Composite and Self Esteem explained 10% of the variance. In addition the following small positive significant correlations were observed in females: Alcohol Abuse ($r = .198$, $n = 164$, $p < .05$), Anxiety ($r = .299$, $n = 164$, $p < .01$), Attention Problems ($r = .194$, $n = 164$, $p < .05$), Atypicality ($r = .170$, $n = 164$, $p < .05$), Depression ($r = .233$, $n = 164$, $p < .01$), Locus of Control ($r = .171$, $n = 164$, $p < .05$), School Maladjustment ($r = .182$, $n = 164$, $p < .05$), and Social Stress ($r = .263$, $n = 164$, $p < .01$). Further, a small negative correlation was observed with Interpersonal Relations ($r = -.166$, $n = 164$, $p < .05$). The amount of variance explained by each significant BASC-2 SRP COL scale was found to be as follows in females: Alcohol Abuse ~4%, Anxiety ~9%, Attention Problems ~4%, Atypicality ~3%, Depression ~5%, Locus of Control ~3%, School Maladjustment ~3%, Social Stress ~7%, and Interpersonal Relations ~3%. These findings were consistent with hypotheses

relating to Self-Esteem and Depression. The directionality of the correlation between the Interpersonal Relations and Locus of Control scales was surprising as was the lack of a significant correlation with the Hyperactivity scale.

In terms of the male population, significant small positive correlations were found between the Ineffective composite and the following scales: Depression ($r = .201$, $n = 124$, $p < .05$), Sense of Inadequacy ($r = .267$, $n = 124$, $p < .01$), and Social Stress ($r = .204$, $n = 124$, $p < .05$). In addition two small negative correlation was found with Self Esteem ($r = -.240$, $n = 124$, $p < .01$) and Relations with Parents ($r = -.180$, $n = 124$, $p < .05$). The amount of variance accounted for by each of the significant BASC-2 SRP COL scales in males was as follows: Depression ~4%, Sense of Inadequacy ~7%, Social Stress ~4%, Relations with Parents ~3%, and Self Esteem ~6%. These findings were congruent with hypotheses relating to Self Esteem and Depression, but were surprising in terms of the lack of significant correlations observed between Interpersonal Skills and Locus of Control. Please see Table 4 for all Pearson Product-Moment Correlations obtained between the BASC-2 SRP COL scales and the Ineffective composite.

Table 4

Pearson Product-Moment Correlations between the Ineffective Composite and the BASC-2 SRP COL scales for Males and Females

BASC-2 SRP COL Scale	Male	Female
Alcohol Abuse	.011	.198*
Anxiety	.152	.299**
Attention Problems	.073	.194*
Atypicality	-.008	.170*
Depression	.201*	.233**
Hyperactivity	.135	.142
Locus of Control	.149	.171*
School Maladjustment	.052	.182*

Sensation Seeking	-.029	-.001
Sense of Inadequacy	.267**	.336**
Social Stress	.204*	.263**
Somatization	.123	.074
Interpersonal Relations	-.121	-.166*
Relations with Parents	-.180*	-.133
Self Esteem	-.240**	-.317**
Self Reliance	-.162	-.149

Note. ** represents $p < .01$ (2-tailed) and * represents $p < .05$ (2-tailed).

Interpersonal Problems Composite

When considering correlations between the BASC-2 SRP COL scales and the Interpersonal Problems composite one medium positive correlation was observed with Sense of Inadequacy ($r = .359$, $n = 163$, $p < .01$) in females. Sense of Inadequacy accounted for approximately 13% of the variance in the Interpersonal Problems Composite. In addition the following small positive correlations were noted in the female population: Alcohol Abuse ($r = .234$, $n = 163$, $p < .01$), Anxiety ($r = .268$, $n = 163$, $p < .01$), Attention Problems ($r = .198$, $n = 163$, $p < .05$), Depression ($r = .239$, $n = 163$, $p < .01$), Locus of Control ($r = .158$, $n = 163$, $p < .05$), School Maladjustment ($r = .204$, $n = 163$, $p < .01$), Social Stress ($r = .275$, $n = 163$, $p < .01$), and Somatization ($r = .213$, $n = 163$, $p < .01$). Additionally small negative correlations were noted with the Interpersonal Relations ($r = -.156$, $n = 163$, $p < .05$), and Self Esteem ($r = -.294$, $n = 163$, $p < .01$) scales. The amount of variance accounted for by each of the significant BASC-2 SRP COL scales in females was as follows: Alcohol Abuse ~5%, Anxiety ~7%, Attention Problems ~4%, Depression ~6%, Locus of Control ~2%, School Maladjustment ~4%, Social Stress ~8%, Somatization ~5%, Interpersonal Relations ~2%, and Self Esteem ~9%. Findings were consistent with hypotheses relating to Anxiety.

When considering the male population significant small positive correlations were observed between the Interpersonal Problems composite and the following BASC-2 SRP COL scales: Depression ($r = .251$, $n = 124$, $p < .01$), Sense of Inadequacy ($r = .223$, $n = 124$, $p < .05$), and Social Stress ($r = .232$, $n = 124$, $p < .01$). Further, small negative correlations were observed with the Interpersonal Relations ($r = -.208$, $n = 124$, $p < .05$), Relations with Parents ($r = -.201$, $n = 124$, $p < .05$), and Self Esteem ($r = -.185$, $n = 124$, $p < .05$) scales. Depression explained about 6% of the variance in the Interpersonal Problems Composite. The other significantly correlated scales accounted for the variance in the Interpersonal Problems Composite as follows: Sense of Inadequacy ~5%, Social Stress ~5%, Interpersonal Relations ~4%, Relations with Parents ~4%, and Self Esteem ~3%. The observed correlations were not hypothesized. Please see Table 5 for all Pearson Product-Moment Correlations obtained between the BASC-2 SRP COL scales and the Interpersonal Problems composite.

Table 5

Pearson Product-Moment Correlations between the Interpersonal Problems Composite and the BASC-2 SRP COL scales for Males and Females

BASC-2 SRP COL Scale	Male	Female
Alcohol Abuse	-.007	.234**
Anxiety	.136	.268**
Attention Problems	.024	.198*
Atypicality	-.049	.148
Depression	.251**	.239**
Hyperactivity	.050	.134
Locus of Control	.174	.158*
School Maladjustment	.136	.204**
Sensation Seeking	-.032	.066
Sense of Inadequacy	.223*	.359**
Social Stress	.232**	.275**
Somatization	.136	.213**

Interpersonal Relations	-.208*	-.156*
Relations with Parents	-.201*	-.058
Self Esteem	-.185*	-.294**
Self Reliance	-.173	-.147

*Note. ** represents $p < .01$ (2-tailed) and * represents $p < .05$ (2-tailed).*

Affective Problems Composite

When considering the Affective Problems composite nine small positive correlations were observed with the following BASC-2 SRP COL composites in the female population: Alcohol Abuse ($r = .217$, $n = 164$, $p < .01$), Anxiety ($r = .279$, $n = 164$, $p < .01$), Attention Problems ($r = .199$, $n = 164$, $p < .05$), Depression ($r = .178$, $n = 164$, $p < .05$), Hyperactivity ($r = .221$, $n = 164$, $p < .01$), Locus of Control ($r = .171$, $n = 164$, $p < .05$), Sense of Inadequacy ($r = .291$, $n = 164$, $p < .01$), Social Stress ($r = .215$, $n = 164$, $p < .01$), and Somatization ($r = .170$, $n = 164$, $p < .05$). A small negative correlation was also observed with Self Esteem ($r = -.198$, $n = 164$, $p < .05$). The amount of variance accounted for by each of the significant BASC-2 SRP COL scales in females was as follows: Alcohol Abuse ~5%, Anxiety ~8%, Attention Problems ~4%, Depression ~3%, Hyperactivity ~5%, Locus of Control ~3%, Sense of Inadequacy ~8%, Social Stress ~5%, Somatization ~3%, and Self Esteem ~4%. Findings were congruent with hypothesis in terms of the Hyperactivity composite, though predictions relating to Interpersonal Relations and Sensation Seeking were not observed in the female population.

In terms of the male population, significant small positive correlations were noted between the Affective Problems and the following BASC-2 SRP COL scales: Alcohol Abuse ($r = .177$, $n = 124$, $p < .05$), Depression ($r = .206$, $n = 124$, $p < .05$), Hyperactivity ($r = .270$, $n = 124$, $p < .01$), Sense of Inadequacy ($r = .198$, $n = 124$, $p < .05$), Social Stress ($r =$

.224, $n = 124$, $p < .05$), and Somatization ($r = .225$, $n = 124$, $p < .05$). A small negative correlation was also found with the Self Esteem ($r = -.226$, $n = 124$, $p < .05$) scale. The amount of variance in the Affective Problems composite explained by the significantly correlated scales was as follows: Alcohol Abuse ~3%, Depression ~4%, Hyperactivity ~7%, Sense of Inadequacy ~4%, Social Stress ~5%, Somatization ~5%, and Self Esteem ~5%. Findings were consistent with the hypothesized positive correlation with Hyperactivity, but surprising in that significant correlations were not found in the Interpersonal Skills or Sensation Seeking scales in the male population. Please see Table 6 for all Pearson Product-Moment Correlations obtained between the BASC-2 SRP COL scales and the Affective Problems composite.

Table 6

Pearson Product-Moment Correlations between the Affective Problems Composite and the BASC-2 SRP COL scales for Males and Females

BASC-2 SRP COL Scale	Male	Female
Alcohol Abuse	.177*	.217**
Anxiety	.153	.279**
Attention Problems	.149	.199*
Atypicality	.032	.152
Depression	.206*	.178*
Hyperactivity	.270**	.221**
Locus of Control	.135	.171*
School Maladjustment	.084	.129
Sensation Seeking	.044	.104
Sense of Inadequacy	.198*	.291**
Social Stress	.224*	.215**
Somatization	.225*	.170*
Interpersonal Relations	-.149	-.030
Relations with Parents	-.131	-.101
Self Esteem	-.226*	-.198*
Self Reliance	-.177	-.081

Note. ** represents $p < .01$ (2-tailed) and * represents $p < .05$ (2-tailed).

Overcontrol Composite

In the female population significant small positive correlations were found between the Overcontrol Composite and the Anxiety ($r = .289$, $n = 164$, $p < .01$), Depression ($r = .159$, $n = 164$, $p < .05$), Locus of Control ($r = .223$, $n = 164$, $p < .01$), and Social Stress ($r = .217$, $n = 164$, $p < .01$) scales. In addition a small negative correlation was observed with the Self Esteem ($r = -.231$, $n = 164$, $p < .01$) scale. Further consideration of the significantly correlated scales revealed that Anxiety explained ~8%, Depression ~3%, Locus of Control ~5%, Social Stress ~5%, and Self Esteem ~5% of the variance in the Overcontrol composite. Findings were congruent with hypotheses relating to the Depression, Anxiety, and Locus of Control scales, but surprising in the directionality of the correlation found with the Social Stress scale. In addition a significant correlation was not observed between the Interpersonal Relations and Overcontrol Composite as predicted.

In terms of the male population, significant small positive correlations were observed with the Locus of Control ($r = .229$, $n = 124$, $p < .05$) and Sensation Seeking ($r = .195$, $n = 124$, $p < .05$) scales of the BASC-2 SRP COL and Overcontrol Composite. Locus of Control accounted for about 9% of the variation in the Overcontrol composite while Sensations seeking explained about 4%. These findings were not consistent with hypotheses as there was a lack of significant correlations between the Interpersonal Problems, Depression, Social Skills, and Anxiety scales and the Overcontrol composite. Please see Table 7 for all Pearson Product-Moment Correlations obtained between the BASC-2 SRP COL scales and the Overcontrol composite.

Table 7

Pearson Product-Moment Correlations between the Overcontrol Composite and the BASC-2 SRP COL scales for Males and Females

BASC-2 SRP COL Scale	Male	Female
Alcohol Abuse	.052	.020
Anxiety	.134	.289**
Attention Problems	.094	.045
Atypicality	.109	.093
Depression	.026	.159*
Hyperactivity	.100	.023
Locus of Control	.229*	.223**
School Maladjustment	.165	.143
Sensation Seeking	.195*	.045
Sense of Inadequacy	.163	.153
Social Stress	.100	.217**
Somatization	.108	.122
Interpersonal Relations	-.026	-.043
Relations with Parents	-.049	-.018
Self Esteem	-.099	-.231**
Self Reliance	.065	.016

Note. ** represents $p < .01$ (2-tailed) and * represents $p < .05$ (2-tailed).

CHAPTER 5: DISCUSSION

The primary purpose of this research was to examine behavioral and emotional factors related to composite scores on the EDI-3 with a consideration of how these factors vary between males and females. There is limited research available regarding the relationship between behavioral and emotional factors and eating disorders. In addition, specific research addressing discrepancies between males and females is largely unavailable. The correlations obtained in this study were limited in strength and presence due to the suppressed variability observed in the participant responses. This was likely related to the fact that participants were typical students attending college. More variability and potentially more robust correlations would possibly have been found in a sample that included individuals presenting some atypical behavioral and emotional symptoms. Significant associations observed will be discussed in the following EDI-3 constructs.

Eating Disorder Risk Composite

Findings indicated that females' ratings on the Eating Disorder Risk Composite increased as scores on the Anxiety scale of the BASC-2 SPR COL increased. While the correlation observed was small, findings may indicate that in females anxiety is related to being at-risk for an eating disorder as measured by this composite. Self-Esteem was also significantly correlated with the Eating Disorder Risk Composite of the EDI-3 in females. As the self-reported measures of self-esteem decreased, ratings on the Eating Disorder Risk Composite increased. This is consistent with previous research that showed a relationship between eating disorders and self-esteem (Fernandez & Prichard, 2012) and

emotional expression (Ioannou & Fox, 2009). In the male population, no significant correlations were found. This was surprising considering research pertaining to bulimia and alcohol abuse (Gadalla & Piran, 2007; Sobot, et al., 2010). Further, previous research has shown a relationship between self-esteem (Fernandez & Prichard, 2012), depression, impulsivity, and or anxiety to elevations on an eating disorder measure (Feltman & Ferraro, 2011). The lack of significant findings in this research may be partially explained by the previously mentioned small variability found in descriptive statistics of this sample. Namely scores on this composite were well below average.

Ineffective Composite

Analysis revealed that female ratings on the Ineffective Composite increased as scores on the Sense of Inadequacy scale increased. This relationship was found to be moderately strong and suggests that these two ratings measure similar constructs.

Another moderate correlation was found in the females though with opposite directionality. As ratings on the Ineffective Composite increased, scores on the Self Esteem scale of the BASC-2 SRP COL decreased. This relationship was anticipated based on previous research pertaining to self-esteem (Eligin & Pritchard, 2006). Findings suggested a predictive relationship between measures of self-esteem and limited feelings of self-understanding and isolation which are related to eating disorders.

In addition it was observed that self-reported measures of Alcohol Abuse, Anxiety, Attention Problems, Atypicality, Depression, Locus of Control, School Maladjustment, and Social Stress all increased individually as ratings on the Ineffective Composite elevated. This may represent a predictive relationship between these factors and one's sense of ineffectiveness as it is related to eating disorders. Another small

relationship was found with opposite directionality. As ratings on the Interpersonal Relationships scale increased, scores on the Ineffective Composite decreased. Given the nature of the measure, this means that as self-reported feelings of success in social interactions increase, there is a decrease in the sense of ineffectiveness which is related to eating disorders. This may be predictive of the role of self-perception of social skills as a potential protective factor for this construct.

When considering males, it was found that, like females, measures of Depression, Sense of Inadequacy, and Social Stress increased with ratings on the Ineffective Composite. Further, another relationship was identified that was not significant for females. As the Relations to Parents scale went down, the Ineffective Composite increased. This may indicate a positive perception of one's relationship with their parents to be a protective factor against feelings of worthlessness and low self-understanding which have been related to eating disorders. In addition, it was found that as scores on Self-Esteem decreased, ratings on the Ineffective Composite increased. This means that as self-reported endorsements of self-worth decreased, there was an increase in feelings of ineffectiveness related to eating disorders. These findings are consistent with previous research on self-esteem (Blouin & Goldfield, 1995) and parent relations (Sira & White, 2010). Finally, in males the anticipated relationships between this composite, and the Interpersonal Skills, and the Locus of Control scales were not found. This may represent the lack of an association, or be representational of the average to low scores attained in this study missing the true relationships.

Interpersonal Problems Composite

Findings revealed that the strongest relationship found in females was that as the Sense of Inadequacy scale increased, so did ratings on the Interpersonal Problems Composite. Findings may represent that as feelings of self-disappointment or not being adequate increase, so do feelings of dissatisfaction in social relationships. This may highlight feelings of self-disapproval as a risk factor for an eating disorder as measured by this construct. This relationship was not predicted through a review of previous research.

Small associations were also found between the Alcohol Abuse, Anxiety, Attention Problems, Depression, Locus of Control, School Maladjustment, Social Stress, and Somatization scales and the Interpersonal Problems Composite in females. This may represent a predictive relationship between these factors and dissatisfaction with social relationships as it is related to eating disorders. Associations holding the opposite directionality were also observed. Specifically, as scores on the Interpersonal Skills and Self-Esteem measures decreased, ratings on the Interpersonal Problems Composite increased. Findings may indicate strong self-esteem or social skills as protective factors for the development of interpersonal struggles that are related to eating disorders. Results related to anxiety were anticipated through a review of previous research (Davenport & Griffiths, 2012); however, the additional relationships found were not predicted.

Like females, males showed a positive association between the Sense of Inadequacy and the Interpersonal Problems composites, though this relationship was small in males as compared to the moderate finding observed in females. Congruent with the female sample, a small positive relationship was also observed between the Depression and Social Stress scales and this composite. As feelings of an inability to

meet self set standards, sadness, or discomfort in social relationships increased, so did dissatisfaction with social relationships as this is related to eating disorders. Also consistent with females, males' scores on the Interpersonal Relations and Self-Esteem were negatively correlated with this construct. This means that feelings of success in social relationships or positive self-perception may be protective factors for the development of eating disorders in males. An additional significant small relationship was also observed in the male population that was not present in the female sample. Scores on the Relations to Parents scale was found to hold the opposite directionality with this construct. This means that a negative perception of one's relationship with their parents may be a risk factor for social dissatisfaction as it is related to eating disorders. Additional research pertaining to this construct was unavailable for comparison.

Affective Problems Composite

Analysis revealed that in females Alcohol Abuse, Anxiety, Attention Problems, Depression, Hyperactivity, Locus of Control, Sense of Inadequacy, Social Stress, Somatization, and Self Esteem held a small positive relationship with the Affective Problems Composite. This may represent a predictive relationship between these factors and weaknesses in emotional regulation as related to eating disorders. One other significant association holding the opposite directionality was found with the Self-Esteem scale in females. As endorsements of self-acceptance and appreciation increased, rating on the Affective Problems composite went down. Findings may highlight these elements as protective factors for the development of maladaptive emotional regulation as related to eating disorders. Previous research anticipated the relationship with the measure of hyperactivity (Mead et al., 2012), though research pertaining to the other observed

associations was unavailable. Further, the predicted relationships between Interpersonal Relations and Sensation Seeking were not found. This may be due to a lack of a significant association or the limited variability within this sample.

Males displayed a similar pattern of significant relationships as the female population. The difference was observed in that while the Anxiety, Attention Problems, and Locus of Control scales were significantly related to the Affective Problems composite in females, they were not in males. Males showed small associations between the Alcohol Abuse, Depression, Hyperactivity, Sense of Inadequacy, Social Stress, and Somatization scales and the Affective Problems composite. This may highlight a predictive relationship between these factors and the development of an eating disorder as anticipated through the misidentification and regulation of emotions. Further, a relationship of opposite directionality was observed with the Self-Esteem scale. Findings suggest that self-esteem may be a protective factor for the development of maladaptive emotion identification and control as they are associated with eating disorders. Findings were not predicted through a review of previous research. Further, the hypothesized relationship between Sensation Seeking scale and the Affective Problems composite was not found in males. This may represent that there is not a significant association between these measures, or that the lack of variability within the data used did not identify the relationship.

Overcontrol Composite

Findings showed a small positive relationship with measures of self-reported levels of nervousness, unhappiness, lack of control over outcome manifestation, and personal unease in social relationships and the Overcontrol composite score. This may

indicate a predicative relationship between these factors and one's feelings that they must reach high self-set standards or that self-denial is positive as these feelings are linked to eating disorders. In addition, the Self-Esteem scale of the BASC-2 SRP COL was also significantly related, but with the opposite directionality. This may indicate positive self-perception as a protective factor for the development of beliefs that one has to succeed. Findings were partially anticipated based on research relating to depression (Dunkley, et al., 2006), and anxiety (Flett, et al., 2004), and personal control (Mussap, 2007); however, the anticipated relationship between the Interpersonal Relations and the Overcontrol composite was not observed. Again, this may be a manifestation of the limited variability amount of the sample.

When considering the male population, they, like females, presented a small positive relationship between the Locus of Control scale and the Overcontrol composite. This may indicate a predictive relationship between feelings of weak control over personal consequences and the establishment of high self-established standards for achievement. Unlike females, males also presented a weak positive relationship between the Sensation Seeking and Overcontrol composite. This may indicate another predictive association between thoughts about or engagement in risk taking behaviors and high self-expectations or high valuing of self-sacrifice. The lack of significant correlations between Interpersonal Relations, Depression, Social Stress, and Anxiety scales was not anticipated. This may be attributed to the limited variability in scores and/or males presenting different symptomologies in disordered eating behaviors that were not measured by this composite of the EDI-3 as it was designed using a female population.

General

In the female population it was found that measure of anxiety and self-esteem were significantly correlated to all five of the EDI-3 composites considered. This may be suggestive that these constructs are predominant predictors of eating disorder symptomology. In addition, measures of feelings of control over one's outcomes, depression, and social stress were significantly related to all the measures EDI-3 composites apart from the Eating Disorder Risk composite. These findings may be applied to identify that when females present with a BASC-SRP COL profile that indicates elevations on the anxiety, depression, social stress, and locus of control scales and low endorsements of self-esteem that they may be at-risk for having or developing eating disordered symptomologies. These findings should be replicated as the implications are such that prevention efforts and targeted treatments could be developed to address eating disordered symptomologies in the female population.

A different profile emerged in the male population. It was found that the sense of inadequacy, depression, social stress, and self-esteem scales of the BASC-SRP COL were all significantly associated all of the EDI-3 composites considered in this research apart from the Eating Disorder Risk and the Overcontrol composites. This may be suggestive that these factors are more relevant to consider as predictors of disorder eating symptoms in males. Specifically findings may suggest that when males present with a profile on the BASC-COL SRP that is elevated in measures of feelings of being inadequate, sadness, and discomfort in social relationships and low self-esteem, that they are at risk for having or developing symptoms of disordered eating. Findings need to be replicated to further support such claims.

Variations between female and male profiles of concern may be explained through either the biological or gender socialization theories. A biological perspective would likely purport that the link to genetic influences is stronger in females and that disordered eating symptomologies in males may be more influenced by environmental factors. It could be reasoned that the differences in associated behavioral and emotional concerns is due to discrepancies in influential causal factors. A gender socialization theory would likely consider the discrepant gender roles to explain the variation in profiles. Namely, it may be indicated that while females are socialized to conform to a thin, compliant ideal, men are exposed to pressure to be more muscular and assertive. The nature of the gender norms could explain that males and females would have discrepant presentations and related associations in disordered eating.

While some of the found relationships were consistent with previous research, many of the observed findings need to be replicated. The potentially predictive relationships found in this research could be highly influential on assessment application and development. As the body of research pertaining to behavioral and emotional factors related to elevations on measures of eating disorders increases, there is the potential for more efficient identification and treatment of these disorders. Additional research is required to validate these potential predictive relationships and profiles as they may facilitate better understanding of the behavioral and emotional influences on these composites of the EDI-3 in females and males.

Limitations and Future Research

The primary limitation of this research was in the lack of variability in mean scores and standard deviation of ratings provided by the participants. This likely

occurred because participants consisted of typical college students. In order to attain a more comprehensive measure of the behavioral and emotional dysfunctions addressed through this research, it would have been beneficial to include a disordered sample to capture the extreme ends of the measures implemented. This limitation was potentially exacerbated by the fact that the EDI-3 was normed using a disordered population. In order to attain a wide range of scores on this measure, participants would have needed to endorse behaviors and cognitions at a level of intensity that would likely meet diagnostic criteria for an eating disorder. Future research should include a disordered comparison sample to evaluate the strength of the observed predictive relationships in this population.

Another potential limitation was that the norms for the EDI-3 are based on a female population. While other researchers have applied the measure to a male population (Fay, et al., 2011; Sepulveda, et al., 2010) and the assessment developer reported no significant differences between male and female performance (Garner, 2004), this may have impacted results in the male sample. Future research may benefit from including a comparative measure of eating disordered cognitions and behaviors specifically designed for males.

In addition, findings may be limited in their generalizability as the sample consisted primarily of European American participants. Further all participants were attending one of two universities. In order to broaden the generalizability and application of findings, future research should consider expanding the population to include more ethnic diversity, and include participants not enrolled in post-secondary education. Such research could have applications that would enhance empirically-based practices in eating disorder prevention and treatment.

REFERENCES

- Ackward, D. M. & Peterson, C. B. (2001). Association between puberty and disordered eating, body image, and other psychological variables. *International Journal of Disordered Eating*, 29, 187-194. doi:10.1002/1098-108X(200103)29:2<187::AID-EAT1008>3.0.CO;2-R
- Arnold, M. N. (2006). Validating a model of risk factors associated with eating disorder risk in adolescents. *Dissertation Abstracts International*, 67(6-B), 3437. Accession No. 2006-99024-127.
- Blashill, A. J. (2011). Gender roles, eating pathology, and body dissatisfaction in men: A meta-analysis. *Body Image*, 8(1), 1-11. doi:10.1016/j.bodyim.2010.09.002
- Blouin, A. G. & Goldfield, G. S. (1995). Body image and steroid use in male body builders. *International Journal of Eating Disorders*, 18, 159-165. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/7581418>
- Bradley, G. & Wildman, K. (2002). Psychosocial predictors of emerging adults' risk and reckless behaviors. *Journal of Youth & Adolescence*, 31(4), 253. Accession No. 000175502600002
- Button, E., Loan, P., Davies, J., & Sonuga-Barke, E. (1997). Self-esteem, eating problems, and psychological well-being in a cohort of schoolgirls aged 15-16: A questionnaire and interview study. *The International Journal of Eating Disorders*, 21(1), 39-47. [http://dx.doi.org/10.1002/\(SICI\)1098-108X\(199701\)21:1<39::AID-EAT5>3.3.CO;2-X](http://dx.doi.org/10.1002/(SICI)1098-108X(199701)21:1<39::AID-EAT5>3.3.CO;2-X)

- Calero-Elvira, A., Krug, I., Davis, K., López, C., Fernández-Aranda, F., & Treasure, J. (2009). Meta-analysis on drugs in people with eating disorders. *European Eating Disorders Review*, *17*(4), 243-259. <http://dx.doi.org/10.1002/erv.936>
- Clausen, L., Rosenvinge, J. H., Friborg, O., & Rokkedal, K. (2011). Validating the Eating Disorder Inventory-3 (EDI-3): A Comparison between 561 female eating disorders patients and 878 females from the general population. *Journal of Psychopathology & Behavioral Assessment*, *33*(1), 101-110. doi:10.1007/s10862-010-9207-4
- Crow, S. J., Peterson, C. B., Swanson, S. A., Raymond, N. C., Specker, S., Eckert, E. D., Mitchell, J. E. (2009). Increased mortality in bulimia nervosa and other eating disorders. *American Journal of Psychiatry*, *166*(12), 1342-1346. doi: 10.1176/appi.ajp.2009.090202 47
- Davenport, K., Houston, J. E., & Griffiths, M. D. (2012). Excessive eating and compulsive buying behaviours in women: An empirical pilot study examining reward sensitivity, anxiety, impulsivity, self-esteem and social desirability. *International Journal of Mental Health and Addiction*, *10*(4), 474-489. <http://dx.doi.org/10.1007/s11469-011-9332-7>
- d'Emden, H., Holden, L., McDermott, B., Harris, M., Gibbons, K., Gledhill, A., & Cotterill, A. (2012). Concurrent validity of self-report measures of eating disorders in adolescents with type 1 diabetes. *Acta Paediatrica*, *101*(9), 973-978. doi:10.1111/j.1651-2227.2012.02738.x
- Dunkley, D. M., Sanislow, C. A., Grilo, C. M., & McGlashan, T. H. (2006). Perfectionism and depressive symptoms 3 years later: Negative social

interactions, avoidant coping, and perceived social support as mediators.

Comprehensive Psychiatry, 47(2), 106-115.

doi:doi.org/10.1016/j.comppsy.2005.06.003

Elgin, J., & Pritchard, M. (2006). Gender differences in disordered eating and its correlates. *Eating and Weight Disorders*, 11(3), 96-101. PMID: 17075236

Epstein, M., & Ward, L. (2011). Exploring parent-adolescent communication about gender: Results from adolescent and emerging adult samples. *Sex Roles*, 65(1-2), 108-118.

Fay, K. K., Economos, C. C., Lerner, R. M., Becker, A. E., & Sacheck, J. J. (2011). The association between sports participation and athletic identity with eating pathology among college-aged males and females. *Eating and Weight Disorders*, 16(2), e102-e112. (Accession No. 2011-22253-005)

Feltman, K., & Ferraro, F. F. (2011). Preliminary data on risk factors and disordered eating in male college students. *Current Psychology*, 30(2), 194-202.

doi:10.1007/s12144-011-9109-y

Fernandez, S., & Pritchard, M. (2012). Relationships between self-esteem, media influence and drive for thinness. *Eating Behaviors*, 13(4), 321-325.

doi:10.1016/j.eatbeh.2012.05.004

Ferreiro, F., Seoane, G., & Senra, C. (2012). Gender-related risk and protective factors for depressive symptoms and disordered eating in adolescence: A 4-year longitudinal study. *Journal Of Youth And Adolescence*, 41(5), 607-622. [http://0-dx.doi.org.wncln.wncln.org/10.1007/s10964-011-9718-7](http://dx.doi.org.wncln.wncln.org/10.1007/s10964-011-9718-7)

- Flett, G. L., Greene, A., & Hewitt, P. L. (2004). Dimensions of perfectionism and anxiety sensitivity. *Journal of Rational - Emotive & Cognitive - Behavior Therapy*, 22(1), 37-37. 10.1023/B:JORE.0000011576.18538.8e
- Frost, J. and McKelvie, S. (2004). Self esteem and body satisfaction in male and female elementary school, high school, and university students. *Sex Roles* 51(1-2), 45-54. <http://dx.doi.org/10.1023/B:SERS.0000032308.90104.c6>
- Gadalla, T., Piran, N. (2007). Co-occurrence of eating disorders and alcohol use disorders in women: A meta analysis. *Arch Womens Mental Health*, 10, 133–40. <http://dx.doi.org/10.1007/s00737-007-0184-x>
- Garner, (2004). *Eating disorder inventory-3 professional manual*. Lutz, Florida: Psychological Assessment Resources Incorporated.
- Green, M. A., Davis, C. M., Skaggs, A. K., Riopel, C. M., & Hallengren, J. J. (2008). Femininity and eating disorders. *Eating Disorder*, 16(4), 283-293. doi:10.1080/10640260802115829
- Hardin, M., & Greer, J. D. (2009). The influence of gender-role socialization, media use and sports participation on perceptions of gender-appropriate sports. *Journal of Sport Behavior*, 32(2), 207-226.
- Hudson, J. I., Hiripi, E., Pope, H. G., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the national comorbidity survey replication. *Biological Psychiatry*, 61(3), 348–358. <http://dx.doi.org/10.1016/j.biopsych.2006.03.040>

- Ioannou, K., & Fox, J. E. (2009). Perception of threat from emotions and its role in poor emotional expression within eating pathology. *Clinical Psychology & Psychotherapy*, *16*(4), 336-347. <http://dx.doi.org/10.1002/cpp.632>
- Izydorczyk, B. (2011). A psychological diagnosis of the structure of the body self in a group of selected young Polish females without eating or other mental disorders. *Archives of psychiatry and psychotherapy*, *2*, 21-30.
- Keel, P. K., & Brown, T. A. (2010). Update on course and outcomes in eating disorders. *International Journal of Eating Disorders*, *43*(3), 195-204. doi:10.1002/eat.20810
- Kellogg, S. (2010). Personality characteristics in males associated with weight loss maintenance: An exploratory study. *Dissertation Abstracts International*, *71*(1-B), 660. (Accession No. 2010-99140-354)
- Keski-Rahkonen, A., Bulik, C. M., Neale, B. M., Rose, R. J., Rissanen, A., & Kaprio, J. (2005). Body dissatisfaction and drive for thinness in young adult twins. *International Journal of Eating Disorders*, *37*(3), 188-199.
- Kimmel, S. B., & Mahalik, J. R. (2004). Measuring masculine body ideal distress: Development of a measure. *International Journal of Men's Health*, *3*(1), 1-10. doi:10.3149/jmh/.03011
- Klump, K., Suisman, J., Burt, S., McGue, M., & Iacono, W. (2009). Genetic and environmental influences on disordered eating: An adoption study. *Journal of Abnormal Psychology*, *118*(4), 797-805. doi:10.1037/a0017204
- Mahalik, J. R., Morray, E., Coonery-Femiano, A., Ludlow, L. H., Slattery, S. M., & Smiler, A., (2005). Development of the conformity to feminine norms inventory. *Sex Roles*, *52*, 317-335. doi:10.1007/s11199-005-3709-7

- Mead, B. R., Malinowski, P., & Lattimore, P. (2012). Relationships between impulsivity, mindfulness and scores on the Eating Disorder Inventory (EDI-3) in an eating disorder sample. *Appetite*, 59(2), 632. doi:10.1016/j.appet.2012.05.088
- Mitchell, J. E., & Crow, S. (2006). Medical complications of anorexia nervosa and bulimia nervosa. *Current Opinion in Psychiatry*, 19(4), 438-443.
<http://dx.doi.org/10.1097/01.yco.0000228768.79097.3e>
- Murnen, C. E., & Smolak, L. (1997). Femininity, masculinity, and disordered eating: A meta-analytic review. *International Journal of Eating Disorders*, 22(3), 231-242.
doi:10.1002/(SICI)1098-108X(199711)22:3<231::AID-EAT2>3.0.CO;2-O
- Mussap, A. J. (2007). The relationship between feminine gender role stress and disordered eating symptomatology in women. *Stress & Health: Journal Of The International Society For The Investigation Of Stress*, 23(5), 343-348.
<http://dx.doi.org/10.1002/smi.1152>
- Overton, A., Selway, S., Strongman, K., & Houston, M. (2005). Eating Disorders-The Regulation of Positive as well as Negative Emotion Experience. *Journal Of Clinical Psychology In Medical Settings*, 12(1), 39-56. doi:10.1007/s10880-005-0911-2
- Pearlstein, T. (2002). Eating disorders and comorbidity. *Archives of Women's Mental Health*, 4(3), 67-78. doi: 687270031
- Pritchard, M. (2008). Disordered eating in undergraduates: Does gender role orientation influence men and women the same way?. *Sex Roles*, 59(3/4), 282.
doi:10.1007/s11199-008-9449-8

- Reynolds, C. R. & Kamphaus, R. W. (2004). *Behavioral assessment system for children manual, second edition*. San Antonio, Texas: Pearson Cooperation.
- Sepulveda, A., Carrobes, J., & Gandarillas, A. (2010). Associated factors of unhealthy eating patterns among Spanish university students by gender. *Spanish Journal of Psychology, 13*(1), 364-375. (Accession No. 000277637600029)
- Shea, M., & Pritchard, M. E. (2007). Is self-esteem the primary predictor of disordered eating? *Personality and Individual Differences, 42*(8), 1527-1537. doi:
<http://dx.doi.org/10.1016/j.paid.2006.10.026>
- Sira, N. & White, C. P. (2010). Individual and familial correlates of body satisfaction in male and female college students. *Journal of American College Health, 58*(6), 507-514. doi:<http://dx.doi.org/10.1080/07448481003621742>
- Sobot, V., Markovic, J., Srdanovic-Maras, J., & Mitrovic, D. (2010). Personality traits of adolescent girls with eating disorders. *Current topics in neurological psychiatry and related disciplines, 18*(3), 54-59.
- Stanford, S., & Lemberg, R. (2012). A clinical comparison of men and women on the Eating Disorder Inventory-3 (EDI-3) and the Eating Disorder Assessment for Men (EDAM). *Eating Disorders, 20*(5), 379-394. doi:10.1080/10640266.2012.715516
- Takano, K., Sakamoto, S., & Tanno, Y. (2011). Ruminative and reflective forms of self-focus: Their relationships with interpersonal skills and emotional reactivity under interpersonal stress. *Personality and Individual Differences, 51*, 515-520.
doi:10.1016/j.paid.2011.05.010

- Tiggemann, M., & Williamson, S. (2000). The effect of exercise on body satisfaction and self-esteem as a function of gender and age. *Sex Roles, 43*(1/2), 119-127.
<http://dx.doi.org/10.1023/A:1007095830095>
- Voncken, M. J., Dijk, C., de Jong, P. J., & Roelofs, J. (2010). Not self-focused attention but negative beliefs affect poor social performance in social anxiety: An investigation of pathways in the social anxiety–social rejection relationship. *Behavior Research and Therapy, 48*, 984-991. doi:10.1016/j.brat.2010.06.004
- Zaitsoff, S. L., Fehon, D. C., and Grilo, C. M. (2009). Social competence and social-emotional isolation and eating disorder psychopathology in females and male adolescent psychiatric inpatients. *International Journal of Clinical and Health Psychology, 9*(2), 219-228. (Accession No. 39235672)