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The Impact of Trauma and Attachment on Eating Disorder Symptomology

Julie A. Hewett

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LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Faculty of Graduate Studies

The Impact of Trauma and Attachment on Eating Disorder
Symptomology

by

Julie A. Hewett

A Dissertation submitted in partial satisfaction of
the requirements for the degree
Doctor of Philosophy in Clinical Psychology

September 2014

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Each person whose signature appears below certifies that this dissertation in his/her opinion is adequate, in scope and quality, as a dissertation for the degree Doctor of Philosophy.

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ABBREVIATIONS

ED	Eating Disorder
AN	Anorexia Nervosa
BN	Bulimia Nervosa
PTSD	Post Traumatic Stress Disorder
BSQ-34	Body Shape Questionnaire
MMPI-2	Minnesota Multiphasic Personality Inventory
EDI-3	Eating Disorder Inventory
RAAS	Revised Adult Attachment Scale
ACES	Adverse Childhood Experiences Scale
TSC-40	Trauma Symptom Checklist
SATI	Sexual Abuse Trauma Index

ABSTRACT OF THE THESIS

The Impact of Trauma and Attachment on Eating Disorder Symptomology

by

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Doctor of Philosophy, Graduate Program in Clinical Psychology
Loma Linda University, September 2014
Dr. Sylvia Herbozo, Chairperson

Abstract

Previous research has shown both indirect and direct links between trauma and eating disorders. Those with eating disorder psychopathology have also demonstrated more insecure attachments. To explore relationship between trauma and eating disorder severity, female adults with Anorexia Nervosa (n = 36) and Bulimia Nervosa (n = 47) were compared on measures of attachment, trauma, body image disturbance, and eating disorder psychopathology. Eighty-six percent of participants reported at least one traumatic experience. Trauma, attachment, and body image disturbance independently predicted eating disorder severity. However, there were no mediating or moderating effects of attachment or body image disturbance on eating disorder psychopathology.

CHAPTER ONE

INTRODUCTION

Throughout history, people have been exposed to a variety of potentially traumatic experiences such as war, violence, abuse, neglect, crime, disease, famine, and natural disaster. Responses to trauma range from mild disturbance to the development of chronic psychological conditions such as major depression, post-traumatic stress disorder (PTSD). A substantial amount of research regarding trauma exists, but with limited attention to the specific effects of trauma in the form of physical, sexual, or emotional abuse and neglect. Smyth, Heron, Wonderlich, Crosby, and Thompson (2008) found that over 50% of adults (male or female) report experiencing at least one traumatic event in their lifetime. In the young adult population, these rates are estimated to be somewhere between 43% and 84%. The National Incidence Study-4 conducted from 2005-2006 found that one in fifty-eight children experienced abuse (44%) or neglect (61%)(Sedlak, Mettenburg, Basena, Petta, McPherson, Greene, & Li, 2010). Of those children who experienced abuse, 24% were sexually abused, 27% were emotionally abused, and the remainders were victims of physical abuse. Of those children who were neglected, 47% experienced educational neglect, 38% were physically neglected and 25% were emotionally neglected (Sedlack, Mettenburg, Basena, Petta, McPherson, Greene, & Li, 2010).

Trauma Outcomes

These various types of abuse have been examined both separately and in conjunction to determine possible effects of the trauma on psychological and

physiological functioning. Sexual trauma has specifically been linked to high levels of body dissatisfaction, poor self-regulation, dissociation of affect, a lack of interpersonal trust, and poor self-efficacy (Herzog, Staley, Carmody, Robbins, & Van Der Kolk, 1993). Numerous general studies investigating all forms of abuse have found a strong relationship between abuse and mood disturbance, including depression, anxiety, post-traumatic stress disorder, and a global impairment in affect regulation (Smyth, Heron, Wonderlich, Crosby, & Thompson, 2008; Steiger, Richardson, Schmitz, Israel, Bruce, & Gauvin, 2010; Wonderlich, Crosby, Mitchell, Roberts, Haseltine, Demuth, & Thompson, 2000). Kent and Waller (2000) found that any type of abuse occurring during childhood was linked to the development of low self-esteem, high levels of shame, difficulty with sexual behavior, and interpersonal mistrust. They also suggested that childhood abuse may also be linked to adolescent and adult suicidal ideation. Risky behaviors such as sexual behaviors and substance abuse have also been linked with a history of abuse or neglect. Smyth et al (2008) found that individuals who had experienced at least one traumatic event were more likely to smoke, abuse drugs or alcohol, and engage in risky sexual behavior.

Trauma in Eating Disordered Populations

Throughout the existing literature on the development of eating disorders and body image disturbance, a common theme has emerged that these individuals often have a history of trauma. As with the experience of trauma, having an eating disorder can have lasting detrimental effects on an individual's quality of life and ability to function. It is easy to imagine that the individual may experience disturbance in relation to bodily

sensations and physical security, given that many traumatic experiences involve threat to one's physical well being.

In a review of the literature on trauma, Kent and Waller (2000) found a multitude of studies supporting a significant link between trauma and the development of eating disorder symptoms. Some researchers have examined trauma as a potential risk factor for eating disorders in an attempt to understand the mechanisms involved in the development and recovery from such disorders. However, as with most studies assessing the prevalence of certain experiences or disorders, the percentages reported vary significantly depending on sample demographics, eating disorder diagnosis, and assessment methods.

Rates of abuse in eating disordered populations range from 18% to 90%, depending on type of eating disorder, level of care, and type of traumatic event (Preti, Incani, Camboni, Petretto, & Masala, 2006; Kong & Bernstein, 2009). This discrepancy appears to be the result of inconsistent methodologies across studies. For example, Steiger, Richardson, Schmitz, Israel, Bruce, and Gauvin (2010) investigated only the prevalence of sexual abuse in patients with Bulimia Nervosa and a history physical and sexual abuse. Thirty percent of the patients with Bulimia Nervosa reported sexual abuse while 50% reported physical abuse. Another study comparing only individuals diagnosed with Bulimia Nervosa with their siblings found that 45% had experienced sexual abuse (compared with 35% of siblings) and 53% had experienced physical abuse (compared with 45% of siblings)(Lehoux & Howe, 2007). These studies show fairly high prevalence rates of trauma and Bulimia Nervosa with rates of physical abuse being slightly higher than sexual abuse.

Other investigations have focused specifically on rates of abuse in patients with Anorexia Nervosa or non-clinical populations with non-pathological beliefs and behaviors associated with eating disorders (i.e. body image disturbance, dieting behaviors, etc). Studies assessing individuals with an actual diagnosis of Anorexia Nervosa have reported rates ranging from 90% to 100%, significantly higher than those within bulimic populations (Kong & Bernstein, 2009; Herzog, Staley, Carmody, Robbins, & Van Der Kolk, 1993). These studies also appear to be more broad in assessing types of trauma including sexual physical, and emotional abuse and neglect as well as experiencing loss, car accidents, and other less overt forms of trauma. In a sample of patients with Anorexia Nervosa, Kong and Bernstein (2009) found that 66% reported emotional abuse, 53% reported physical abuse, 30% reported sexual abuse, 47% reported emotional neglect, and 74% reported physical neglect. Many individuals reported experiencing multiple forms of abuse and neglect with 90% reporting at least one type of trauma. Herzog and colleagues (1993) found that 65% of participants with Anorexia Nervosa or Bulimia Nervosa had been victims of sexual abuse. Of those individuals, the majority experienced the abuse before the age of 16 and 92% of them stated that the abuse preceded the onset of their eating disorder symptoms. Surprisingly, every one of the participants in their study who had been diagnosed with Anorexia Nervosa reported a history of abuse, compared with a little under 50% of those with Bulimia Nervosa. These findings are strongly contrary to some opinions of clinicians who have suggested that there may be a stronger association between trauma and Bulimia Nervosa than with Anorexia Nervosa.

Aside from those studies specifically assessing individuals with a clinically diagnosed eating disorder diagnosis, a larger proportion of research examine only the presence of possible eating disorder symptomology (which includes any symptoms of Anorexia Nervosa, Bulimia Nervosa, or Binge Eating Disorder). These studies have yielded rates of trauma ranging from 18% to 32%, somewhat lower than clinical samples (Preti, Incani, Camboni, Petretto, & Masala, 2006; Fischer, Stojek, & Hartzell, 2010). In a sample of 126 women, Preti and colleagues (2006) found that 18% of the women experienced sexual abuse. When the abuse was experienced before the age of 12, the severity of eating disorder symptoms significantly increased, indicating that the effects of the trauma were developmentally sensitive. Fischer, Stojek, and Hartzell (2010) found that 32% of the 489 women they assessed had experienced sexual abuse or assault after the age of 14. Contrary to findings that suggest early traumatic experiences have the most impact on the development of eating disorder symptoms, they found that having experienced a more recent sexual assault was related to a significant increase in the severity of eating disorder symptoms. In general, most researchers agree that the prevalence of trauma is higher in eating disordered populations than non-clinical and general populations; however, some have found no significant differences between the different populations. Favaro, Grave, and Santonastaso (1998) compared individuals with Anorexia Nervosa and Bulimia Nervosa with non-clinical controls and found no significant difference in the rates of abuse amongst these individuals.

As a result of mixed findings, there is little accurate and consistent knowledge of the actual prevalence of trauma in both the general and specific eating disordered populations. Many clinicians base their opinions on personal clinical experiences;

however, those working within clinical populations may have the potential to overestimate prevalence rates due to a general exposure bias. To allow for a better examination of trauma prevalence rates, the current investigation examined the prevalence of all the various types of trauma amongst individuals within each classification of eating disorders.

Eating Disorder Pathology

According to the National Eating Disorder Association (NEDA), approximately ten million females and one million males currently suffer from diagnosable eating disorders (Wade, Keski-Rahkonen, & Hudson, 2011, retrieved from www.nationaleatingdisorders.org). On the non-clinical side, NEDA also estimates that nearly 80% of women are dissatisfied with their physical appearance. Two striking studies in 1991 found that 42% of girls in grades 1-3 have a desire to be thinner and 81% of ten year olds have a strong fear of becoming fat (Collins, 1991; Mellin et al, 1997). In a study by Smolak (1996), it was found that 25% of men and 45% of women in the United States engage in regular dieting. Of those that diet, 35% eventually develop pathological dieting behaviors and 20%-25% go on to develop full-blown eating disorders (Shisslack & Crago, 1995).

For individuals who develop diagnosable eating disorders, mortality rates are alarming. Anorexia Nervosa has the highest mortality rate of any psychological disorder at 10%-15% (Rayworth, Wise, & Harlow, 2004). In 1995, Sullivan reported that the mortality rate for those with Anorexia Nervosa between the ages of 15 and 24 was 12 times higher than all other non-psychiatric causes of death. Arcelus, Mitchell, Wales, and

Nielson (2011) recently conducted a meta analysis of studies reporting mortality rates for all eating disorder types. A mortality rate of 2% was found for those with Bulimia Nervosa and 3% for those with a diagnosis of eating disorder not otherwise specified. In their study examining associated clinical features of eating disorders and their mortality, Conceicao, Crosby, Mitchell, Engel, Wonderlich, Simonich, Peterson, Crow, and Le Grange (2013) found that individuals with Anorexia Nervosa have a significantly lower Body Mass Index than those diagnosed with Bulimia Nervosa which contributes to the high mortality associated with Anorexia Nervosa.

Given the high mortality rate associated with eating disorders, researchers have begun to focus significantly more attention on the possible underlying mechanisms influencing the development of pathological eating behaviors and body image disturbance. As with trauma, the onset of eating disorders has been associated with numerous other psychological difficulties. Individuals with eating disorders have been shown to have significant sleep difficulties, often diagnosed sleep disorders, which may impact the development of depression and other non-eating disordered psychological symptoms, especially when there may be a trauma history present (Lauer & Krieg, 2004; Latzer, Y., Tzischinsky, O., Epstein, R., 2001). Rayworth, Wise, and Harlow (2004) found that 20%-30% of those with Anorexia Nervosa have a comorbid diagnosis of major depression while 50%-60% have experienced a major depressive episode. While it is difficult to determine which condition was present first, they posit that eating disorders may develop as a means to regulate negative affective states. Following this logic, the theoretical link between trauma and eating disorder development seems quite relevant. Speranza, et al (2003) also found a direct link between eating disorder symptoms and

depression; however, several other non-diagnosable psychological characteristics were also present including self-criticism and dependent tendencies. When compared with individuals with Anorexia Nervosa, individuals with Bulimia Nervosa showed significantly higher levels of self-criticism as well as a significantly higher number of adverse childhood experiences. The Adverse Childhood Experience Scale (ACES), which was also used in the current study, examines not only sexual, physical, and emotional abuse and neglect, but also evaluates the number of negative experiences an individual may have had related to familial conflict, exposure to violence, accidents, and death of a loved one (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, Koss, & Marks, 1998). This is a more comprehensive measure of the various experiences that may leave an individual feeling traumatized; however, the measure is highly face-valid and many individuals with a trauma history may be reticent to report these events to avoid the negative emotions associated with them.

The literature on both trauma and the development of eating disorder symptomology shows a significant overlap in terms of psychological correlates. Thus it may be useful to consider an all-encompassing interactional model that addresses the complexity of the problem. The aim of the current investigation was to demonstrate the relationship between trauma and the development of eating disorder symptoms, and then to develop a comprehensive model identifying potential psychological and theoretical mechanisms that may serve to mediate that relationship. The following sections summarize these potential pathways.

Trauma and Eating Disorder Development

Numerous studies have found both indirect and direct links between experiencing trauma and the development of eating disorder symptoms. Studies focusing primarily on sexual abuse and assault have consistently found a strong relationship between sexual trauma and the development of eating disorder symptoms (Holzer, Uppala, Wonderlich Crosby, & Simonich, 2008; Sanci, Coffey, Olsson, Reid, Carlin, & Patton, 2008; Wonderlich, Crosby, Mitchell, Thompson, Redlin, Demuth, Smyth, & Haseltine, 2001). Sanci, Coffey, Olsson, Reid, Carlin, and Patton (2008) went even further to demonstrate the effects of sexual trauma on specific eating disorder symptoms. Specifically, they found that individuals who had experienced childhood sexual abuse were five times more likely to develop bulimic symptoms. Childhood sexual abuse did not significantly predict the development of anorexic symptoms.

Wonderlich and colleagues (2001) conducted a comprehensive study parsing out the different effects of childhood sexual abuse, adult rape, or both in a sample of individuals with diagnoses of either Anorexia Nervosa or Bulimia Nervosa. Several important findings emerged. Weight concerns and restricting behaviors were higher in the childhood sexual abuse/adult rape group than all other groups. Eating and shape concerns were also higher in the childhood sexual abuse and the combined group than controls. The combined group scored significantly higher on measures of eating and shape concerns than the adult rape only group. A significant strength of the study was that researchers also examined binge-eating disorder. Those individuals classified as having binge-eating disorder were more likely to have experienced sexual abuse than controls.

Rayworth, Wise, and Harlow (2004) compared the effects of physical and sexual abuse and found that physical abuse was a stronger predictor of eating disorder symptomology than sexual abuse. However, when the individual had experienced both physical and sexual abuse, they were three times more likely to be diagnosed with an eating disorder. These findings suggest that individuals may react differently to trauma, but that any experience of multiple traumas drowns out those differences and the effects become generalized. In their sample of college students, Smyth, Heron, Wonderlich, Crosby, and Thompson (2008) found that those who had experienced violent trauma were more likely to exhibit restrictive eating behaviors and that the number of traumas the individual was exposed to predicted the severity of the restriction. However, trauma was not found to be predictive of bulimic symptomology. Although these studies further support the significant relationship between sexual abuse and eating disorder symptoms, they lack a sufficient comparison group to determine the magnitude of the effects.

While some researchers argue that certain types of abuse are more detrimental, studies have shown a significant relationship between experiencing any type of abuse or neglect and developing either the physical or psychological symptoms associated with an eating disorder. For example, within an equal sample of males and females, Johnson, Johnson, Cohen, Kasen, and Brook (2002) found that participants who reported experiencing either abuse or neglect were significantly more likely to develop an eating disorder than those who denied such experiences. More recently, Steiger, Richardson, Schmitz, Israel, Bruce, and Gauvin (2010) found that both sexual and physical abuse were associated with an eating disorder diagnosis, but the relationship was stronger amongst those who had experienced sexual abuse. In their unique study of young children

ages 10-15, Wonderlich, Crosby, Mitchell, Roberts, Haseltine, Demuth, and Thompson (2000) found that children in the abuse group reported significantly higher rates of purging and restricting behavior as a means to control their weight than children who had no history of abuse.

Although physical and sexual abuse are the most commonly reported types of abuse, other forms of abuse have been identified. Specifically, emotional abuse has received very little attention in the literature, but is becoming a more widely acknowledged and legitimized form of abuse. In their review of the research surrounding abuse and eating psychopathology, Kent and Waller (2000) argued that emotional abuse is a type of abuse that is severely underestimated because it is poorly defined and rarely reported. Fischer, Stojek, and Hartzell (2010) found that emotional abuse remained a significant predictor of eating disorder symptoms after controlling for physical or sexual abuse indicating a distinct difference between those types of abuse. In their previously cited study, Wonderlich et al (2000) found a significant interaction between emotional abuse and weight dissatisfaction in young children. These effects were not found for either physical or sexual abuse.

Theoretical Framework

Of paramount interest for the current investigation is a theoretical explanation underlying each of the previously presented factors that may impact the relationship between trauma and the development of eating disorders. For decades, attachment research has demonstrated that forming successful attachments in childhood promotes higher quality of life in adulthood as well as an ability to form successful attachments in

adulthood via a healthy concept of the self, the other, and the self and other in relation to each other and the environment (Bowlby, 1977, 1988). The early foundations of attachment theory focused on the importance of early caregiver experiences and the formation of a “secure base” via the mother or other primary caregiver (Ainsworth, Bell, & Stayton, 1971). This theory posits that through patterns developed from seeking solace via proximity to the attachment figure when threatened, the child begins to form cognitive schemas representing core beliefs about the self and about others that are used throughout life to formulate relationships (Wearden, Peters, Berry, Barrowclough, & Liversidge, 2007). Positive cognitive schemas that form a secure attachment style include schemas of high self-esteem, mastery, and self-efficacy. Secure attachment also includes schemas related to others characterized by feelings of trust, safety, and an ability to rely on others (Fraley, 2002), which lead to success in both romantic and platonic relationships in adulthood (Brumbaugh & Fraley, 2006, 2007; Collins & Read, 1990; Overbeek, Vollebergh, Engels, & Meeus, 2003).

The development of self and other schemas are derived from internal working models of attachment representations (Platts, Tyson, & Mason, 2002). Positive attitudes and experiences leading to cognitive schemas regarding the self and others via a secure attachment develop through consistent responsiveness and availability of the attachment figure (typically the parent) to the child. The secure internal working models are then recreated when the individual begins to form new relationships, and foster healthy and satisfying interpersonal relationships across the lifespan (Kobak & Sceery, 1988; Levin, Platt, & Shaver, 1998). Securely attached individuals can successfully negotiate conflicts through utilization of the internal and external sources of support they have learned to

safely rely on. Secure attachment style leads to the expectation that one can depend on others to be available and supportive in times of distress and that one is personally capable of managing distress when faced with challenges (Ainsworth, Blehar, Waters, & Wall, 1978) which ultimately promotes higher self-esteem and more positive attitudes towards others. One's positive psychological well-being can be maintained through a healthy balance between independence and dependence upon others (Beatson & Taryan, 2002; Gilman, Kawachi, Fitzmaurice, & Buka, 2003; Love & Murdock, 2004; Luke, Maio, & Carnelley, 2004; Park, Crocker, & Mickelson, 2004; Scharf, Mayseless, & Kivenson-Baron, 2004).

Definitions of Attachment Styles

While the literature is generally in agreement as to how parental bonds affect attachment schemas, the measurement of attachment styles varies. Initially, attachment styles were defined as secure, anxious, and avoidant in young children (Weinfield, Sroufe, & Egeland, 2000). Secure attachment was characterized by an infant's perception of the primary caregiver as supportive, safe, and available in a strange situation. Insecure attachment was defined as an infant demonstrating an inability to use the primary caregiver or "the secure base" effectively when threatened or distressed. Children with insecure attachments, specifically anxious and avoidant styles were thought to cope differently with the lack of access to a "secure base." The anxious child was described as one who clung to or was overly dependent on the presence of the primary caregiver while the avoidant child ignored or shunned the primary caregiver rather than engaging for soothing. Survey measurement tools as well as projective tests

have been used to classify individuals by attachment style type depending on the age of the individual.

Adult attachment styles have more recently been employed to investigate the stability of attachment style from childhood to adulthood. Bartholomew (1990) classified adult attachment into four categories: secure attachment, anxious/preoccupied attachment, avoidant/dismissive attachment and fearful attachment. Secure adult attachment is characterized by a positive view of the self and of others. Securely attached individuals tend to get along well with others and view themselves and others as dependable and non-threatening. As children, these individuals learn positive self and other evaluations based on positive and satisfying interactions with primary caregivers and then transfer this ability to form secure attachments to adult relationships. These individuals also tend to engage in healthy social support seeking behavior based on feeling worthy of love in close personal relationships.

The remaining three styles defined by Bartholomew (1990) would be considered insecure adult attachment styles. Individuals with anxious/preoccupied attachment often have a strong desire to love and be loved, and tend to ardently pursue unsatisfying and/or ambivalent relationships. They obtain the majority of their self worth from acceptance or rejection by others and therefore are characterized by a negative self-concept and a positive other concept. Individuals classified as having a fearful attachment style display both a negative concept of the self and a negative concept of others. These individuals typically feel that others do not care about them and that, in turn, they are unworthy of anyone's care or affection. They often report having highly authoritarian and often physically and verbally abusive parents who rejected them as children. Individuals

displaying avoidant/dismissive attachment are generally less interested in interpersonal relationships and prefer independence. This particular attachment style is the result of a positive view of the self alongside a negative view of others. Additionally, the avoidant/dismissive individual is independent and has less interest in obtaining satisfaction through interpersonal interactions. However, it is possible that these individuals display a positive view of the self as a defense against further rejection from others given that these individuals often report having parents who were emotionally and physically unavailable and, when present, were harsh and unkind.

Bartholomew's adult attachment styles are a continuation of Bowlby's original concepts with the addition of an explanation as to how these initial attachment formations manifest in adulthood. Bowlby's early attachment styles focused primarily on the relationship between the mother and the infant, including feeding behaviors, responses to crying, and the extent to which the mother permits the child to cling to her when distressed (Cassidy, 1999). These very basic styles affect important behaviors such as exploration, emotion regulation, and healthy social interaction with other family members and strangers. The tenets of early attachment are present in adulthood, but as the individual ages, the attachment patterns formed in childhood manifest themselves repeatedly in adult relationships through the same cognitive schemas.

Stability of Attachment

Most researchers argue that attachment styles are stable throughout the lifespan (Brumbaugh & Fraley, 2007; Collins & Read, 1990; Fraley, 2002; Kobak & Sceery, 1988; Luke, Maio, & Carnelley, 2004; Scharfe & Bartholomew, 1994; Sroufe, 2005;

Waters, Weinfield, & Hamilton, 2000). The results of an important meta-analysis by Fraley (2002) assessing attachment stability concluded that early attachment formation had a significant overall influence on adult relationships and that those interactions in early life strongly affected individual's worldviews through the concepts of the self and the self in relation to others. Brumbaugh and Fraley (2007) found that attachment styles play an important role in filtering information and can significantly influence reactions to new individuals. Specifically, individuals with insecure attachment styles reacted to new others apprehensively while individuals with secure attachment styles reacted to new individuals in a healthy and open-minded way. These findings demonstrate that attachment styles are not simply memories from one's childhood, but that they continue to influence attitudes and beliefs about the self and one's social relationships various environments. Overall, attachment styles appear to manifest as consistent social and intrapersonal themes across the lifespan.

However, there is also some argument that significant life-events can alter attachment style. Waters, Weinfield, and Hamilton (2000) assert that attachment may be stable in many individuals, but that secure attachment styles can become insecure after significant negative life events. Traumatic events, for example, can create insecure attachment styles in otherwise securely attached individuals (Weinfield, Sroufe, & Egelund, 2000). The events following the trauma (i.e. personal reactions and/or reactions of others) can significantly alter the effect the trauma has on the individual. For example, maternal depression and a decrease in family functioning following a trauma or significant negative experience can cause an otherwise securely attached individual to shift toward insecure attachment (Weinfield, Sroufe, & Egelund, 2000). The inability to

cope effectively with a trauma using internal resources or external supports may shift belief systems regarding the self and others.

Sroufe (2005) confirmed the original notion that attachment is stable throughout life, but found attachment was a semi-continuum in longitudinal data. Initially, the individual is set on a certain path for attachment. Along the way, events occur which either promote that path or shift the individual onto a different path. Thus, Sroufe argued that attachment should be thought of as an aggregate of experiences across the lifespan. He also acknowledged that the more set the path becomes over time, the more difficult it can be to change course. In his study, he found that in certain individuals, decline in social support and significant life stress (e.g., divorce or parental abuse) was in fact predictive of a change in attachment style from secure to insecure. However, the longer the individual has had to develop an attachment pattern, the more resistant that pattern may be to change.

Parental divorce has been widely focused upon as one of those distinct events that may impact an individual's attachment and psychological well being into adulthood. Woodward, Fergusson, and Belsky (2000) demonstrated a linear relationship between child's age at divorce and the impairment of the parent-child bond such that younger children demonstrated more insecure attachment following parental divorce. In contrast, Chase-Lansdale, Cherlin, and Kiernan (1995) found that children who were older at the time of parental divorce were more negatively affected and showed more insecure attachment styles than children who were younger. However, the literature in general supports the notion that a significantly negative life event at any time in childhood or adolescence can be detrimental to the formation of a secure attachment style. If an event

like parental divorce can have such a significant impact on an individual, it is highly likely that experiencing abuse or neglect has an even greater impact. The aim of the current analysis was to demonstrate that experiencing any physical, sexual, or emotional abuse, or neglect has a significant negative effect on an individual's ability to form a secure attachment bond and can contribute to the formation of eating disorder symptomology.

Attachment and Trauma

Attachment theory has been used to explain the pathways between a number of human experiences and the potential consequences or responses associated with them. A substantial amount of literature supports relationships between trauma, eating disorders, and attachment. Trauma has been linked to a variety of negative psychological outcomes. Kent and Waller (2000) found a strong association between a history of trauma and eating disorder symptoms including a drive for thinness, bulimia, body dissatisfaction, and perfectionism. If the individual suffered from depression as a direct result of the trauma, the likelihood of developing an eating disorder was significantly higher than if there were no depressive symptoms were present. Additionally, Herzog and colleagues (1993) linked sexual trauma with high levels of body dissatisfaction, poor self-regulation skills, a lack of interpersonal trust, and poor self-efficacy. Dissociation of affect was also significantly associated with the experience of childhood traumas, specifically with regards to sexual abuse (Herzog, Staley, Carmody, Robbins, & Van Der Kolk, 1993).

In a review of the existing literature on trauma and eating pathology, Herzog et al (1993) also found that a majority of studies identified attachment relationships as another significant area impacted by traumatic experiences. They reported a general theme throughout the literature in which women with eating disorders reported low levels of parental care and affection and high levels of parental overprotectiveness and control. These parental characteristics directly translate into attachment schemas that may affect both the individual's self-concept as well as their concept of others. Bifulco, Kwon, Jacobs, Moran, Bunn, and Beer (2006) found a significant effect of childhood abuse/neglect on attachment styles in that the more severe the form of abuse, the more insecure the attachment. Stirling and Amaya-Jackson (2008) and Briere and Jordan (2009) assert that caregiver victimization or inappropriate caregiver response to a trauma can especially impair the child's sense of safety and security, thus impairing the attachment bond. If the parent is the abuser, it may confuse the child and threatened their very concept of safety. On the other hand, an inappropriate response to the child's abuse experience may also send a message to the child that they will not be cared for and cannot depend on their caregiver for safety.

Researchers have been able to establish a clear connection between abuse and attachment insecurity but, more recently, the focus has shifted to examining attachment as a mediator between trauma and other psychological outcomes. An individual's attachment style has been found to mediate the relationship between abuse and anxiety, depression, and interpersonal difficulty (Finzi, Ram, Har-Even, Schnit, and Weisman, 2001; Hankin, 2005). While some studies exist that test comprehensive interactive models regarding the complex relationship between trauma, attachment, and various

psychological outcomes, few take into account more specific manifestations of psychopathology. The current investigation examined the effects of trauma on attachment style in a clinical eating disordered population. Attachment was tested as a mediator between the experience of abuse or neglect and the severity and specificity of eating disorder symptoms.

Attachment and Eating Disorders

Throughout the literature, there is a general consensus that the majority of individuals with eating disorders exhibit some form of an insecure attachment style. Some studies only focus on the difference between a secure attachment style and an insecure attachment style, while others tend to be more specific regarding the subtypes of insecure attachment. Nearly all the studies comparing individuals with eating disordered and control groups on measures of either a secure or insecure attachment style have found that those with eating disorders or eating disorder symptomology show more insecure attachments than non-eating disordered controls (Barone & Guiducci, 2009; Broberg, Hjalms, & Nevonen, 2001; Huprich, Stepp, Graham, & Johnson, 2003; Lehoux & Howe, 2007; Ringer, & McKinsey-Crittenden, 2007).

Barone and Guiducci (2009) noted, however, that there is significant discrepancy in how attachment styles are measured. Using the comprehensive Adult Attachment Interview, they found that maternal and paternal relationships impact the individual in very different ways. Specifically, the participant's maternal relationship was the most problematic, characterized by neglect, rejection, and role-reversal. Overall, participants diagnosed with eating disorders showed significantly more insecure attachment patterns

than those in the non-eating disordered control group. Lehouz and Howe (2007) found similar results; however, they explained the insecure attachment styles as characterized by enmeshment, control, hostility, and poor boundaries. A study by Huprich, Stepp, Graham, and Johnson (2003) including both males and females with eating disorders, indicated specific differences regarding the nature of the attachment relationship. Men with eating behavior disturbance showed more interpersonal fear and poorer social skills than women. Men also showed poorer levels of separation and individuation from attachment figures than women. However, both genders differed significantly from controls and generally showed more insecure attachment.

While some studies focus on the more generalized relationship between attachment and eating disorders, a number of strong findings support a more comprehensive model that encompasses each specific attachment pattern alongside each specific manifestation of eating disorder pathology. O’Kearney (1996) reviewed the literature on attachment and eating disorders and found that in general, the majority of individuals with eating disorders exhibit an anxious/preoccupied attachment style. In a nearly equal sample of males and females, Koskina and Giovazolias (2010) found that males with eating disorders were more likely to exhibit an avoidant attachment style while females with eating disorders were more likely to demonstrate an anxious/preoccupied attachment style. This finding could help explain the results shown by O’Kearney (1996) regarding the claim that most individuals with eating disorders have an anxious attachment style. Given cultural norms regarding male behavior and expression of emotion, males may be more likely to remain more guarded in attachment relationships than females.

Bamford and Halliwell (2009) examined both anxious and avoidant attachment styles and found that those with an anxious attachment style had significantly higher levels of eating disordered behaviors and beliefs, more negative experiences in close relationships, higher levels of physical and social comparison, and more negative attitudes towards their appearance than controls. Attachment avoidance was associated with a drive for thinness, body dissatisfaction, and bulimia. In general, it appeared that those with high levels of attachment avoidance tended to avoid certain stimuli that would evoke negative responses whereas anxiously attached individuals actively sought out those stimuli. Another investigation by Bosmans, Goosens, and Braet (2009) examined the four attachment styles in adolescents with binge-eating behaviors. Shape concerns were significantly associated with both a fearful and preoccupied attachment style, while weight concerns were associated with fearful attachment only. There was no relationship between weight and shape concerns and a dismissive attachment style.

Aside from actual attachment style categorization, other researchers have been even more specific, delving into the specific features within each attachment style. In studies with individuals experiencing eating disorders, researchers often focus on parental characteristics to explain the development of the insecure attachment style. Canetti, Kanyas, Klerer, Latzer and Bachar (2008) found that individuals with eating disorders described their mothers as being less caring and their fathers as being both less caring and more controlling. Jones, Leung, and Harris (2006) focused solely on paternal relationships in those with eating disorders and found high levels of paternal rejection, emotional deprivation, abandonment, mistrust, abuse, enmeshment, and unrelenting standards. Levels of paternal warmth were significantly lower in the eating disordered

group than controls. Meyer and Gillings (2003) found that bulimic women showed generally poor levels of parental bonding and high levels of paternal control. Those with overprotective fathers were more likely to develop core beliefs of mistrust and abuse, which contributed further to the development of more severe bulimic symptoms.

Ward, Ramsay, Turnbull, Benedettini, and Treasure (2000) found that individuals diagnosed with an eating disorder showed key features associated with an insecure attachment style, including angry withdrawal, compulsive care seeking, compulsive self-reliance, intense fear of loss, and unhealthy use of an attachment figure. These results further support the notion that eating disorders manifest as a result of an insecure attachment bond evidenced by poor concept of self and an unstable and unhealthy view of others. The messages that an individual receives about himself or herself from others at an early age significantly influence how they treat themselves in the future. Through understanding the pathways involved in the development of an eating disorder, clinicians can develop more tailored interventions with the goal of creating a new experience for the individual with an eating disorder as opposed to the continuous self-fulfilling prophecy often seen as a result of maltreatment in their childhood.

Mediating Factors between Trauma and ED pathology

PTSD

While there is strong evidence that indicates experiencing abuse frequently results in negative psychological and physical outcomes, little is known about the mediating pathways that lead to the development of such negative outcomes. Holzer, Uppala, Wonderlich, Crosby, and Simonich (2008) conducted an important investigation on the

role of post-traumatic stress in the development of later psychopathology following an abuse experience. The findings showed that if an individual developed PTSD as a result of experiencing a trauma, they were significantly more likely to develop future pathology, such as eating disorders, depression, and anxiety than those who did not develop PTSD following the abuse. The more severe the trauma response, the more likely the individual would to struggle significantly with managing affective states and eating behavior. In general, individuals who had experienced abuse showed significantly more PTSD symptoms than those in the control group. The current investigation focused on the specific relationship between trauma and the development of eating disorder symptoms and the possible pathways that explain this relationship.

Depression

As previously mentioned, both abuse and eating disorders have been found to be strongly associated with depression. Kong and Bernstein (2009) sought to test depression as a mediator of abuse and eating disorders in a Korean population of mostly female inpatients with eating disorders. They also included neglect in their study in addition to physical and sexual abuse. Higher levels of trauma predicted higher levels of eating pathology as well as body image disturbance; however, neglect was more predictive of the more psychological aspects of eating disorders (i.e. body dissatisfaction, drive for thinness). When depression was added to the model, it acted as a full mediator between physical neglect and eating disorder symptoms. Depression also fully mediated the relationship between emotional abuse and eating disorder symptoms. Physical and sexual abuse was no longer significant once neglect and emotional abuse were added to the

model. These findings suggest a strong affective component to the development of eating disorders. Often times it is thought that overt forms of abuse such as physical or sexual abuse are more detrimental, but it may be that the subtler and less recognizable forms of abuse and neglect are equally detrimental.

Body Dissatisfaction

In addition to actual clinical diagnoses that might act as mediators between abuse and an eating disorder diagnosis, body dissatisfaction appears to make a significant contribution to the relationship. Body dissatisfaction has been found to relate to both the experience of trauma and an individual's attachment style; however, the exact mechanisms are unclear. Preti, Incani, Camboni, Petretto, and Masala (2006) found that women who had either physical or sexual abuse were three times more likely to develop an eating disorder. However, when added to the model, body dissatisfaction was found to fully mediate the relationship between abuse and the development of an eating disorder. In another study with 73 mostly female participants ages 14-36, Kong and Bernstein (2009) found that only physical neglect predicted higher levels of body dissatisfaction.

Findings regarding the impact of attachment on body image, such as body dissatisfaction, are a bit clearer than studies concerning trauma and its effect on body image. Bamford and Halliwell (2009) argued that women with insecure attachment styles are more likely to idealize images in the media, which in turn, negatively affects body image. In their investigation, attachment avoidance predicted significantly higher levels of body dissatisfaction. Jones, Leung, and Harris (2006) found that paternal rejection, specifically, predicted a more insecure attachment as well as higher levels of body

dissatisfaction. Koskina and Giovazolias (2010) found that body dissatisfaction mediates the relationship between attachment insecurity and dieting behavior in men and attachment insecurity and eating attitudes in women. Again, it appears that the internal processes affected by the traumatic experiences are key in understanding the manifestation of eating disordered thoughts and behaviors. These internal processes may become so intolerable that they manifest themselves in more overt, tangible ways.

Summary

As evidenced by the variety of research presented above, the exact mechanisms underlying the development of eating disorders remain unclear. Some studies assess abuse history and eating disorder symptoms in non-clinical settings while others focus only on those who have developed diagnosable eating disorders. Yet others studies focus on the number of abuse experiences versus the severity of any event. In general, it appears clear that trauma has a direct impact on the development of eating disorders; however, what remains to be explained is why one individual may develop an eating disorder as a trauma response whereas another individual may develop only depression or anxiety. The current study will attempt to demonstrate the relationship between each specific type of abuse/trauma and the development of specific eating disorder symptoms and diagnoses in order to parse out these effects. Other psychological outcomes associated with trauma (depression, PTSD and body image disturbance) will be assessed as mediators to determine the specific pathway between trauma and eating disorders. It is estimated that the nature of these relationships will differ significantly depending on each combination of trauma and outcome.

Hypotheses

Hypothesis I

The prevalence of traumatic experiences amongst participants will be higher than previous research has stated. Specifically, individuals with Anorexia Nervosa will report more traumatic experiences than individuals with Bulimia Nervosa.

Hypothesis II

Participants who report any history of trauma before age 18 will have more insecure attachments, higher levels of body image disturbance, and more severe eating disorder symptomology than those without a history of trauma. Additionally, those who report multiple traumas will show more insecure attachment, higher levels of body image disturbance, and more severe eating disorder symptoms than those who report only one traumatic experience or no history of trauma.

Hypothesis III

It was estimated that trauma symptoms and attachment security may interactively predict the severity of an individual's eating disorder symptomology. Specifically, higher levels of trauma symptomology coupled with a more insecure attachment style will result in an individual experiencing more severe eating disorder symptomology.

Hypothesis IV

Experiencing abuse or neglect will significantly predict a more insecure attachment style as well as eating disorder symptom severity. In turn, a more insecure

attachment style will significantly predict greater eating disorder severity. When attachment is added as a mediator between trauma and eating disorder severity, the relationship between trauma and eating disorder severity will be reduced to non-significance.

Hypothesis V

Experiencing abuse or neglect will significantly predict higher levels of body image disturbance and more severe eating disorder symptoms. In turn, higher levels of body image disturbance will significantly predict more severe eating disorder symptoms. When body image disturbance is added as a mediator between trauma and eating disorder severity, the relationship between trauma and eating disorder pathology will be reduced to non-significance.

CHAPTER TWO

METHOD

Participants

Participants for the current investigation were 83 females between the ages of 18 and 54 (Mean Age = 26, SD = 8.71) who were seeking treatment for an eating disorder at a private clinic for partial hospitalization level of care. Participants in the current study were included if they met Diagnostic and Statistical Manual of Mental Disorders-Fourth Version Text Revised (American Psychological Association, 2000) criteria for Anorexia Nervosa (restricting type N = 19, purging type N = 17) or Bulimia Nervosa (non-purging type N = 7, purging type N = 40) at the time of intake. Exclusion criteria included a diagnosis of Eating Disorder Not Otherwise Specified (EDNOS). Only one participant received a diagnosis of EDNOS and was excluded from the current investigation. The average Body Mass Index (BMI) for participants was 20.41 (SD = 4.3). The ethnic breakdown of the population was as follows: 75% Caucasian, 15% Latina, 1% African American, 1% Asian, and 7% were classified as “Other” ethnicity.

Procedure

Upon admission, individuals were given a battery of psychodiagnostic and clinical instruments by either a licensed clinician (i.e., Licensed Clinical Social Worker, Licensed Marriage and Family Therapist) or psychology trainee to determine their current level of distress as well as of a variety of symptoms including those associated with depression, anxiety, body image disturbance, post-traumatic stress disorder, and eating disorders. Information regarding height, weight, and dietary intake was gathered

by a registered dietician as well. Any participants with missing data on five or more test items utilized in the current investigation were excluded from analyses. All participants consented to the assessment and treatment and agreed to allow their assessment data to be used for research purposes.

Measures

Demographic Information

Information regarding participant's age, body mass index, ethnicity, and gender was obtained during the initial screening portion of the intake.

Trauma

The presence of trauma in the individual's history was assessed through three separate self-report measures. The Adverse Childhood Experiences Scale (ACES; Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, Koss, & Marks, 1998) assesses the occurrence of adverse life events and includes ten questions regarding psychological abuse, physical abuse, sexual abuse, and other adverse experiences (i.e. parental divorce, death, parent in prison) in an individual's life prior to the age of 18. A score of "1" is given for a response of "yes" and a score of "0" is given for a negative response. Items can be assessed individually and in combination by summing items. The ACES demonstrates strong reliability for identifying emotional abuse ($\kappa = 0.66$), physical abuse ($\kappa = 0.55$), and sexual abuse ($\kappa = 0.69$) as well as appropriate discrimination between those who have and have not experienced any form of abuse or neglect (Dube, Williamson, Thompson, Felitti, & Anda, 2004).

The Trauma Symptom Checklist (TSC-40) assesses a wide range of trauma-related symptoms. It is divided into the following six subscales: level of dissociation, anxiety, depression, sexual trauma, sexual problems, and sleep disturbance. Each item is measured on a 4-point Likert scale with responses ranging from *never* to *often*. Items are summed and a higher score indicates more severe symptomology. The TSC-40 has demonstrated adequate internal consistency for TSC-40 subscales (Chronbach's alpha = 0.71) and for the entire measure (Chronbach's alpha = 0.89)(Elliott and Briere, 1992). TSC-40 has strong concurrent validity when compared with the Courage to Heal Checklist (Brandyberry & MacNair-Semands, 1998). The TSC-40 shows convergent validity with the Civilian Mississippi Scale for PTSD (CM-PTSD; Keane, Caddell, & Taylor, 1988) and the Response to Childhood Incest Questionnaire (RCIQ; Gold and Cardena, 1998), and successfully discriminates between individuals who have and have not experienced any form of trauma or abuse.

The Keane PTSD scale on the MMPI-II is a commonly used and well-validated measure to diagnose PTSD (Keane, Malloy, and Fairbank, 1984). The original scale was composed of 49 cross-validated items assessing the presence of both traumatic events and typical trauma symptoms (i.e. sleep disturbance, hypervigilance, flashbacks, etc). The scale consists of 46 true-false items. The internal consistency of the scale has ranged from Chronbach's alpha of 0.75-0.88 and demonstrates strong convergent validity and discriminant validity (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008; Wolf, Miller, Orazem, Weierich, Castillo, Milford, Kaloupek, & Keane, 2008; Watson, Plemel, DeMotts, Howard, Tuorila, Moog, Thomas, & Anderson, 1994).

Attachment

The Revised Adult Attachment Scale (RAAS; Collins, 1996) measures different levels of attachment with lower scores indicating more attachment security and comfort being close with others and higher scores indicating a more insecure attachment style. Individuals were asked to rate how much each statement reflects themselves. Items are on a 5-point Likert scale with a score of 1 being “*not at all characteristic of me*” and a score of 5 being “*very characteristic of me.*” Scores are classified into three subscales: comfort with emotional closeness, comfort with trusting or depending on others, and anxious concern over being abandoned or rejected. The RAAS has shown fair internal consistency (Chronbach’s alpha = 0.58) and test-retest reliability (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010). The subscales of the RAAS have also been significantly correlated with similar constructs such as self-esteem, social behavior, openness, relationship satisfaction, depression, anxiety, and negative affect.

Eating Disorder Symptoms

The Eating Disorder Inventory (EDI-3; Garner, 2004) examines both the severity and type of eating disorder symptoms. The EDI includes the following eight subscales: drive for thinness, bulimia, body dissatisfaction, maturity fears, interoceptive awareness, interpersonal distrust, ineffectiveness, and perfectionism. Participants are asked to rate the frequency of each symptom on a six point likert scale ranging from *never* to *once a day or more*. Internal consistency for the EDI-3 subscales range from Chronbach’s alpha of 0.90 to 0.97. The EDI-3 has been found to consistently discriminate between clinical and non-clinical patients and has shown appropriate convergent and divergent validity

with appropriate constructs (Clausen, Rosevinge, Friberg, and Rokkedal, 2010). The strong psychometric properties of the EDI-3 have resulted in it becoming one of the most widely used effective measures of eating disorder pathology.

Body Image Disturbance

The Body Shape Questionnaire-34 (Probst, Pieters, & Vanderlinden, 2008) assesses the degree of body image concerns amongst individuals. It has demonstrated high internal consistency (Chronbach's alpha = 0.97) and test-retest reliability (Chronbach's alpha = 0.88). The BSQ has shown convergent validity with the body image disturbance subscale of the EDI-3 and the Body Dysmorphic Disorder Evaluation as well as strong concurrent validity amongst other measures between clinical and non-clinical populations (Rosen, Jones, Ramirez & Waxman, 1996).

Design

The current study utilized correlation analyses to determine directional relationships amongst variables and to parse out confounding variables that needed to be controlled for in future analyses. A series of hierarchical multiple regressions were run to test for mediation and moderation effects. The primary objective of the study was to determine the impact of traumatic experiences on both attachment formation and the development of eating disorder pathology. The secondary aim of the study was to determine possible mediation effects of attachment and body image disturbance that may influence the impact of traumatic experiences.

Statistical Analyses

Bivariate correlations were run between demographics and variables of interest to determine directionality of significant relationships as well as identify potential variables to control for. In order to assess prevalence rates of abuse amongst the three eating disorder categories, a chi square analysis was performed. A Multivariate Analysis of Covariance (MANCOVA) was also run to examine whether individuals with a higher level of trauma symptoms would show more insecure attachments as well as more severe eating disorder pathology and higher levels of body image disturbance than those with few to no trauma symptoms. Additionally, in order to examine the possible interaction between trauma and attachment on the development of different eating disorder diagnoses, a series of hierarchical regressions were run.

Baron and Kenny's (1986) mediation plan for analysis was also used. Based on previous literature, attachment, and body image disturbance were tested as mediators for the current analysis. To demonstrate a mediation effect, four criteria must be met. First, the independent variable must significantly relate to the dependent variable. Second, the mediator must significantly relate to the dependent variable. Third, the independent variable must significantly relate to the mediator. Finally, when the mediator is added to the analysis after entering the independent variable to predict the dependent variable, the relationship between the independent and dependent variable must be reduced significantly as demonstrated by a Sobel test. A series of hierarchical linear regressions were run to test the previously proposed models.

CHAPTER THREE

RESULTS

Data Screening

All variables were screened for normality, linearity, outliers, and missing data. No outliers more than 4.5 standard deviations from the mean were identified. Participants with any missing data were excluded from analyses. The significance value for each analysis was set at 0.05. Table 1 shows descriptive statistics for demographics and variables of interest in the current study. Age was positively skewed (skew = 1.91) and leptokurtic (kurtosis = 3.12) with the majority of patients falling between the ages of 18-32 (Mean Age = 25.6, SD = 8.69). BMI was also positively skewed (skew = 1.48) and leptokurtic (kurtosis = 3.94) with a mean of 20.41 and a standard deviation of 4.30. Each of the Revised Adult Attachment Scale subscales as well as the total attachment score fell within the normal distribution range. All Trauma Symptom Checklist subscales and the total trauma score fell within the normal distribution range as well. Body Image Disturbance and Eating Disorder Symptom Severity was normally distributed with no kurtosis problems.

Table 1

Descriptive Statistics for Demographics and Variables of Interest

	Mean	SD	Min	Max
Age	25.64	8.69	18	54
BMI	20.41	4.30	14	36
RAAS Dependent	18.90	2.55	12	24
RAAS Anxious	13.92	4.11	6	22
RAAS Close	18.44	3.03	12	25
RAAS Total	51.26	6.63	36	65
TSC Dissociation	7.90	3.39	0	16
TSC Anxiety	11.42	4.42	3	21
TSC Depression	13.49	4.86	3	23
TSC SATI	7.32	3.64	0	15
TSC Sleep Disturbance	10.04	4.27	1	17
TSC Sexual Problems	5.35	4.73	0	19
TSC Total	48.52	16.03	8	79
ACES	2.98	2.50	0	9
MMPI-II PTSD	76.15	12.98	46	96
BSQ-34	144.94	40.02	57	247
EDI Total	895.27	113.96	600	1132

Note. BMI = Body Mass Index, RAAS = Revised Adult Attachment Scale, TSC = Trauma Symptoms Checklist, SATI = Sexual Abuse Trauma Index, ACES = Adverse Childhood Experiences Scale, MMPI-II PTSD = Post Traumatic Stress Disorder, BSQ = Body Shape Questionnaire, EDI = Eating Disorder Inventory

The demographics (Age and BMI) were compared across eating disorder diagnosis groups to determine necessary covariates for further analyses (see Table 2). A one-way ANOVA showed no significant difference in participant Age across ED diagnosis groups, $F(3,72) = 0.41, p > 0.05$. There were significant differences in BMI across ED diagnosis groups, $F(3, 72) = 10.42, p < 0.001$. Post hoc Bonferoni analyses revealed that participants diagnosed with Anorexia Nervosa restricting-type (Mean BMI = 16.99) had a significantly lower BMI than those in the Bulimia Nervosa purging-type

group (Mean BMI = 23.62). A Chi Square analysis compared ethnicity across eating disorder groups and showed no significant differences in the ethnic makeup between groups ($\chi^2 = 7.43, p > 0.05$).

Group Differences

Analyses of the attachment and trauma scales showed no significant differences in scores across ED diagnosis groups with the exception of the TSC-40 Sleep Disturbance subscale on the TSC-40, $F(3, 68) = 4.29, p < 0.01$, revealing that participants diagnosed with Anorexia Nervosa purging-type (Mean Sleep Disturbance = 12.87) reporting significantly higher levels of sleep disturbance than those in both the Bulimia Nervosa purging-type (Mean Sleep Disturbance = 9.00) and Bulimia Nervosa non-purging-type group (Mean Sleep Disturbance = 7.17). Reports of traumatic experiences measured by the Adverse Childhood Experiences Scale (ACES) showed that 14% of participants denied the presence of any adverse life experiences, 40% reported between one and two adverse experiences, 30% reported between three and five adverse experiences, and 16% reported between six and ten adverse experiences (86% of total population). There were no significant difference amongst eating disorder subtypes but those diagnosed with either form of Anorexia Nervosa did report slightly lower numbers of adverse life experiences than those diagnosed with Bulimia Nervosa.

Significant differences across ED diagnosis groups were also found on levels of body image disturbance, $F(3, 69) = 7.25, p < 0.01$ with participants in the Anorexia Nervosa restricting-type group reporting significantly lower levels of body image disturbance (Mean Disturbance = 110.94) than those in all other ED diagnosis groups

(Mean AN purging-type = 155.27, Mean BN purging-type = 153.10, & Mean BN non purging-type = 168.17). There were no significant differences in body image disturbance between Bulimia Nervosa subtypes. Finally, ED diagnosis groups differed significantly on the severity of their eating disorder symptoms, $F(3, 68) = 3.325, p < 0.05$. Specifically, those in the Anorexia Nervosa purging-type group (Mean disturbance = 973.79) showed more severe eating disorder symptoms than those in the Anorexia Nervosa restricting-type group (Mean Disturbance = 857.88). Individuals classified as having Anorexia Nervosa purging-type showed the highest level of eating disorder symptomology compared to other ED diagnosis groups, but the remaining group differences were insignificant.

Table 2

Demographics and Variables of Interest by Eating Disorder Diagnosis

	Mean (SD)				Sig
	AN Restrict	AN Purge	BN Non-Purge	BN Purge	
Age	26.89 (10.18)	26.87 (9.55)	23.86 (5.24)	24.79 (8.29)	n.s.
BMI	16.99 (1.36)	18.75 (3.79)	21.85 (0.07)	23.62 (3.97)	< 0.001
RAAS Depend	18.72 (3.44)	19.80 (2.08)	18.83 (2.93)	18.65 (2.14)	n.s.
RAAS Anxious	13.83 (4.33)	13.53 (3.82)	15.67 (4.84)	13.35 (3.78)	n.s.
RAAS Close	18.44 (2.53)	17.60 (3.60)	18.67 (2.34)	18.58 (3.04)	n.s.
RAAS Total	51.00 (6.64)	50.93 (5.99)	53.17 (8.95)	50.58 (6.37)	n.s.
TSC	6.78 (3.89)	8.93 (1.91)	7.00 (2.00)	8.23 (3.82)	n.s.
Dissoc TSC	10.89 (5.10)	11.80 (3.78)	9.50 (2.43)	11.60 (4.58)	n.s.
Anxiety TSC	12.89 (5.39)	14.60 (4.76)	13.50 (3.02)	12.73 (4.57)	n.s.
Depress TSC	6.83 (4.00)	8.33 (3.27)	4.17 (1.60)	7.53 (3.57)	n.s.
SATI TSC	9.83 (4.52)	12.87 (2.92)	7.17 (3.76)	9.00 (4.97)	< 0.01
Sleep TSC	6.28 (5.30)	5.33 (5.19)	5.50 (5.39)	4.27 (3.70)	n.s.
Sexual Prob TSC	46.17 (17.90)	53.00 (14.69)	45.67 (10.76)	46.63 (15.73)	n.s.
ACES	1.73 (2.05)	3.00 (2.12)	2.00 (2.00)	3.86 (2.78)	n.s.
MMPI- II PTSD	69.67 (12.51)	82.80 (7.02)	78.40 (7.54)	76.55 (14.17)	n.s.
BSQ-34	110.94 (36.67)	155.27 (41.20)	168.17 (24.94)	153.10 (33.73)	< 0.001
EDI Total	857.88 (134.55)	973.79 (88.86)	872.17 (120.83)	882.69 (99.22)	< 0.05

Note. AN = Anorexia Nervosa, BN = Bulimia Nervosa, BMI = Body Mass Index, RAAS = Revised Adult Attachment Scale, TSC = Trauma Symptoms Checklist, SATI = Sexual Abuse Trauma Index, ACES = Adverse Childhood Experiences Scale, MMPI-II PTSD = Post Traumatic Stress Disorder, BSQ-34 = Body Shape Questionnaire, EDI = Eating Disorder Inventory

Correlations

Bivariate correlations were run between variables of interest and demographic variables (see Table 3). Age was positively correlated with both the Sexual Abuse Trauma Index and the Sexual Problems subscales of the Trauma Symptoms Checklist. As expected, participant BMI was positively correlated with body image disturbance. Significant positive correlations were also found between trauma symptoms severity, attachment dependence, and attachment anxiety as well as body image disturbance and eating disorder symptom severity. ED severity was positively correlated with attachment dependence, trauma symptom severity, and body image disturbance.

Table 3

Correlations Amongst Variables of Interest

	Age	BMI	RAAS Dep	RAAS Anx	RAAS Close	RAAS Tot	TSC Diss.	TSC Anx	TSC Dep	TSC SATI	TSC Sleep	TSC Sex	TSC Tot	ACES	MMPI-II PTSD	BSQ -34
Age	1															
BMI	ns	1														
RAAS Dependent	ns	Ns	1													
RAAS Anxious	ns	Ns	ns	1												
RAAS Close	ns	Ns	.35**	ns	1											
RAAS Total	ns	Ns	.64**	.73**	.66**	1										
TSC Dissociation	ns	Ns	ns	ns	ns	ns	1									
TSC Anxiety	ns	Ns	.40**	ns	.29*	.42**	.60**	1								
TSC Depression	ns	Ns	ns	ns	ns	.27*	.36**	.56**	1							
TSC SATI	.29*	Ns	ns	ns	ns	.26*	.72**	.68**	.57**	1						
TSC Sleep Disturbance	ns	Ns	ns	ns	ns	ns	.34**	.55**	.66**	.59**	1					
TSC Sexual Problems	.45**	Ns	ns	.24*	ns	.28*	.24*	.33**	.59**	.57**	.32**	1				
TSC Total	ns	Ns	.29*	.33**	ns	.40**	.62**	.79**	.86**	.80**	.73**	.68**	1			
ACES	.45**	Ns	ns	ns	ns	ns	Ns	.29*	.35*	.37*	.29*	.20*	.38**	1		
MMPI-II PTSD	ns	Ns	.52**	ns	ns	.49**	.41**	.53**	.40**	.42**	.34*	ns	.59**	ns	1	
BSQ-34	ns	.34*	ns	ns	ns	ns	Ns	.26*	.43**	.33**	ns	.40**	.45**	.45**	.30*	1
EDI Total	ns	Ns	.31*	ns	ns	.29*	.29*	.39**	.49**	.45**	.36**	.56**	.61**	ns	.56**	.62*

Note. BMI = Body Mass Index, RAAS = Revised Adult Attachment Scale, TSC = Trauma Symptoms Checklist, SATI = Sexual Abuse Trauma Index, ACES = Adverse Childhood Experiences Scale, MMPI-II PTSD = Post Traumatic Stress Disorder, BSQ = Body Shape Questionnaire, EDI = Eating Disorder Inventory

* Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at 0.01 level.

Main Analyses

Hypothesis I

A univariate analysis of variance (ANOVA) was run to identify differences in trauma symptom severity across ED diagnosis groups utilizing the TSC-40 (Table 4). No significant differences across groups were found. The same analysis was run utilizing the MMPI-II's Keane PTSD scale as well as the Adverse Childhood Experiences Scale to determine whether more overt diagnostic measures of PTSD would yield a more accurate depiction of potential group differences. Discrete traumatic events were similar across ED diagnosis groups indicating that individuals from each diagnostic category experienced similar levels of trauma. There were also no significant group differences on the MMPI-II PTSD scale.

Table 4

Univariate Analysis of Variance Results with Eating Disorder Diagnosis Predicting Trauma Symptoms

	Mean	SE	F	Df	p
TSC-40					
ED Diagnosis			0.55	1, 69	n.s.
Anorexia	49.27	2.74			
Bulimia	46.47	2.62			
ACES					
ED Diagnosis			1.14	1, 29	n.s.
Anorexia	3.00	0.80			
Bulimia	4.12	0.67			
MMPI-II PTSD (Keane)					
ED Diagnosis			0.51	1, 45	n.s.
Anorexia	76.58	2.90			
Bulimia	73.85	2.48			

Note. TSC = Trauma Symptoms Checklist, ACES = Adverse Childhood Experiences Scale, MMPI-II PTSD = Minnesota Multiphasic Personality Inventory-II Post Traumatic Stress Disorder Scale.

Hypothesis II

The second hypothesis was tested using a Multivariate Analysis of Variance (MANOVA) to determine whether the severity of participant's trauma symptoms predicted levels of attachment security, body image disturbance, and eating disorder symptomology (See Table 5). Again, three separate analyses were performed to determine the efficacy of the three aforementioned trauma variables (TSC-40, ACES, & MMPI-II Kean PTSD). The ACES trauma scale did not significantly predict the set of variables. However, there was a significant main effect for both the TSC-40 Wilks' $\lambda =$

1.615, $p < .01$, $\eta^2 = 0.58$ and for the MMPI-II Keane PTSD Scale Wilks' $\lambda = 2.104$, $p < .01$, $\eta^2 = 0.74$.

Table 5

Multivariate Analysis of Variance Results with Trauma Variables Predicting Attachment, Body Image Disturbance, and Eating Disorder Symptomology

	Mean	SE	F	Df	p	η^2
RAAS						
TSC-40	48.43	0.78	2.08	1, 54	**0.002	0.63
MMPI-II PTSD	41.85	0.83	2.53	1,84	*0.01	0.76
BSQ-34						
TSC-40	126.98	4.30	2.05	1, 54	**0.0003	0.63
MMPI-II PTSD	144.64	4.72	2.68	1,84	*0.01	0.77
EDI-III						
TSC-40	889.42	10.46	2.05	1, 54	**0.003	0.63
MMPI-II PTSD	901.09	11.06	3.67	1,84	**0.001	0.82

Note. * $p < 0.05$, ** $p < 0.01$. RAAS = Revised Adult Attachment Scale, BSQ = Body Shape Questionnaire, EDI = Eating Disorder Inventory, TSC = Trauma Symptoms Checklist, MMPI-II PTSD = Minnesota Multiphasic Personality Inventory Post Traumatic Stress Disorder

Hypothesis III

In order to test whether trauma symptoms and attachment security interactively predicted the severity of an individual's eating disorder symptomology, a series of hierarchical regressions were run (See Table 6). Each variable was centered and an interaction term for each measure of trauma was calculated. In the model utilizing the TSC-40, attachment was not a significant predictor of eating disorder symptomology ($\beta = 0.12$), but the TSC-40 was a significant predictor ($\beta = 0.60$, $p < 0.001$). However, there was no significant interaction between attachment and trauma symptoms measured via the TSC-40. In the second model utilizing the ACES, the number of adverse childhood

experiences did not significantly predict eating disorder symptomology. The interaction between attachment and the ACES was also not significant. In the third and final model utilizing the MMPI-II Keane PTSD scale, there was a significant main effect of PTSD symptoms on eating disorder symptomology ($\beta = 0.48, p < 0.01$); however, the interaction between attachment and PTSD symptoms was not significant.

Table 6

Eating Disorder Symptomology Regressed on Attachment and Trauma Measures

Independent Variables	Eating Disorder Symptoms		
	Model 1	Model 2	Model 3
RAAS	n.s.		
TSC-40	0.60**		
RAAS*TSC-40	n.s.		
RAAS		n.s.	
ACES		n.s.	
RAAS*ACES		n.s.	
RAAS			n.s.
MMPI-II PTSD			0.48*
RAAS*MMPI-II PTSD			n.s.
Total R ²	0.42	0.12	0.29

Note. * $p < .01$, ** $p < .001$; RAAS = Revised Adult Attachment Scale, TSC = Trauma Symptoms Checklist, MMPI-II PTSD = Minnesota Multiphasic Personality Inventory-II Post Traumatic Stress Disorder Scale

Hypothesis IV

The fourth hypothesis was tested using Baron and Kenny's (1986) mediation and moderation plan for analysis. To test for mediation, four criteria must be met. First, the independent variable must significantly relate to the dependent variable. Second, the mediator must significantly relate to the dependent variable. Third, the independent variable must significantly relate to the mediator. Finally, when the mediator is controlled in the analysis after entering the independent variable to predict the dependent variable, the relationship between the independent and dependent variable must be reduced significantly as tested with the Sobel test.

Table 7 shows the results of the series of regression analyses utilized to test the mediation hypothesis with attachment as the potential mediator. In step one of the analyses, trauma symptoms (as measured by the TSC-40) significantly predicted the severity of participant's eating disorder symptomology ($\beta = 0.63, p < 0.001$). In step two, trauma symptoms significantly predicted attachment insecurity ($\beta = 0.38, p < 0.01$). In step three, attachment was a significant predictor of eating disorder symptomology ($\beta = 0.31, p < 0.05$). Finally, to examine whether attachment served as a mediator in the relationship between trauma symptoms and eating disorder symptomology, a hierarchical regression was performed. Results showed that the relationship between trauma and eating disorder symptomology remained significant and attachment did not mediate the relationship. In fact, when attachment was entered into the model with trauma symptoms, the relationship between attachment and eating disorder symptomology was no longer significant.

Table 7

Results of TSC-40 Mediation Analyses Utilizing Attachment as the Mediator

IV	DV	Eating Disorder Symptoms			
		Step 1	Step 2	Step 3	Step 4
TSC-40	ED Symptoms	0.63**			
TSC-40	RAAS		0.38*		
RAAS	ED Symptoms			0.31*	
TSC-40	ED Symptoms				0.60**
RAAS	ED Symptoms				n.s.
Total R ²		0.40	0.14	0.10	0.42

Note. * $p < .05$, ** $p < .001$. TSC-40 = Trauma Symptom Checklist, RAAS = Revised Adult Attachment Scale, ED = Eating Disorder.

The same analysis was run utilizing the MMPI-II Keane PTSD scale. Results were similar in that trauma symptoms significantly predicted the severity of participant's eating disorder symptomology ($\beta = 0.49, p < 0.001$). In step two, trauma symptoms significantly predicted attachment insecurity ($\beta = 0.41, p < 0.05$). In step three, attachment was a significant predictor of eating disorder symptomology ($\beta = 0.31, p < 0.05$). Finally, to examine whether attachment served as a mediator in the relationship between trauma symptoms and eating disorder symptomology, a hierarchical regression was performed. Results showed that the relationship between trauma and eating disorder symptomology remained significant and attachment did not mediate the relationship. In fact, when attachment was entered into the model with trauma symptoms, the relationship between attachment and eating disorder symptomology was no longer significant indicating that the majority of the variance in eating disorder severity was accounted for by trauma symptoms.

Table 8

Results of MMPI-II PTSD Mediation Analyses Utilizing Attachment as the Mediator

IV	DV	Eating Disorder Symptoms			
		Step 1	Step 2	Step 3	Step 4
MMPI-II PTSD	ED Symptoms	0.49**			
MMPI-II PTSD	Attachment		0.41*		
Attachment	ED Symptoms			0.31*	
MMPI-II PTSD	ED Symptoms				0.42*
Attachment					n.s.
Total R ²		0.24	0.17	0.10	0.26

* $p < .05$, ** $p < .01$ ***Hypothesis V***

Table 9 shows the results of mediation analyses utilizing body image disturbance as a potential mediator in the relationship between trauma symptoms and eating disorder symptomology. In step one of the analyses, trauma symptoms (as measured by the TSC-40) significantly predicted the severity of participant's eating disorder symptomology ($\beta = 0.63, p < 0.001$). In step two, trauma symptoms significantly predicted participant's degree of body image disturbance as measured by the BSQ-34 (Body Shape Questionnaire-34) ($\beta = 0.44, p < 0.001$). In step three, body image disturbance was a significant predictor of eating disorder symptomology ($\beta = 0.63, p < 0.001$). When body image disturbance was included as a mediator in the analyses, the relationship between trauma and eating disorder symptomology remained significant, but was slightly reduced. A Sobel's test was performed to determine whether body image disturbance served as a partial mediator in the relationship, yielding a coefficient of 1.03, $p > 0.05$. Therefore,

body image disturbance does not mediate the relationship between trauma and eating disorder symptomology.

Table 9

Results of TSC-40 Mediation Analyses Utilizing Body Image Disturbance as the Mediator

IV	DV	Eating Disorder Symptoms			
		Step 1	Step 2	Step 3	Step 4
TSC-40	ED Symptoms	0.63**			
TSC-40	BSQ-34		0.44**		
BSQ-34	ED Symptoms			0.63**	
BSQ-34	ED Symptoms				0.44**
TSC-40	ED Symptoms				0.41**
Total R ²		0.40	0.20	0.40	0.53

Note. * $p < .01$, ** $p < .001$. TSC = Trauma Symptom Checklist, ED = Eating Disorder, BSQ = Body Shape Questionnaire

Table 10 shows the results of mediation analyses utilizing body image disturbance as a potential mediator in the relationship between trauma symptoms and eating disorder symptomology. In step one of the analyses, trauma symptoms (as measured by the MMPI-II Keane PTSD Scale) significantly predicted the severity of participant's eating disorder symptomology ($\beta = 0.49, p < 0.01$). In step two, trauma symptoms did not predict participant's degree of body image disturbance as measured by the BSQ-34 (Body Shape Questionnaire-34) ($\beta = 0.23, p > 0.05$). Because criteria for mediation analysis were not met, the remaining analyses were not conducted.

Table 10

Results of MMPI-II PTSD Mediation Analyses Utilizing Body Image Disturbance as the Mediator

IV	DV	Eating Disorder Symptoms			
		Step 1	Step 2	Step 3	Step 4
MMPI-II PTSD	ED Symptoms	0.49**			
MMPI-II PTSD	Body Image		n.s.		
Body Image	ED Symptoms			Not Run	
MMPI-II PTSD	ED Symptoms				Not Run
Body Image	ED Symptoms				Not Run
Total R ²		0.24	0.06		

* $p < .05$, ** $p < .01$

CHAPTER FOUR

DISCUSSION

Research in the area of the effects of trauma has historically been limited to studying the effects of combat and extreme violence but there is a growing body of literature that has begun to highlight more subjective experiences of trauma including but not limited to physical and sexual abuse/neglect and other emotionally traumatizing experiences (e.g. death of loved ones, poverty, abandonment etc.). The current study was developed as an extension of the strong body of literature linking traumatic experiences to the development of psychological disorders, specifically the development of eating disorders and eating disorder symptomology. In attempting to learn the underlying mechanisms involved in the development of posttraumatic stress disorder and the development of other clinical diagnoses, the notion of attachment (to oneself, others, and the world at large) has stood out as a plausible explanation for the sometimes lifelong effects of traumatic experiences. There has also been a substantial amount of research investigating attachment insecurities in those who develop eating disorders. With each of these separate bodies of literature in mind, the current study sought to create a model linking traumatic experiences to both the development of eating disorders and an overall insecure attachment style. Understanding the complex and diffuse effects of traumatic experiences is imperative in enhancing our understanding of how to both prevent and treat the development of severe psychopathology in response to traumatic events.

Summary of Study Findings

Results regarding demographic variables were as expected given previous

research on common characteristics of individuals with both Anorexia Nervosa and Bulimia Nervosa. As with a large majority of previous research, the current study population consisted of mainly Caucasian participants. Previous studies have shown that prevalence rates of eating disorders are consistent across different ethnicities with few to no differences (Smith & Krejci, 1991). However, more recent literature suggests that this is changing with specific differences between ethnicities as well as between eating disorder diagnoses being found (Marques, Alegria, Becker, Chen, Fang, Chosak, & Diniz, 2011; Swanson, Crow, Le Grance, Swendson, Merikangas, 2011; Pike Dunne, and Addai 2013). The mean age of participants in the sample was 25.6 (SD = 8.69) placing participants mostly between the ages of 18 and 34. Although prevalence rates of eating disorders are particularly high among adolescent populations, the majority of individuals seeking treatment for eating disorders are young adult Caucasian females (Pike, Dunne, & Addai, 2013). Therefore, the current population represents a common presentation of research in the area but may not, in fact, represent the population at large. Participants with Anorexia Nervosa had significantly lower Body Mass Index values than those diagnosed with Bulimia Nervosa, which supports past findings in this area (Conceicao, Crosby, Mitchell, Engel, Wonderlich, Simonich, Peterson, Crow, & Le Grange, 2013).

Approximately 86% of participants in the current study reported having at least one traumatic experience; however no differences amongst eating disorder diagnosis groups were found. This finding is consistent with previous research, which has found elevated rates of traumatic experiences in similar populations (Wonderlich et al, 2000; Wonderlich, Crosby, Mitchell, Thompson, Redlin, Demuth, Smyth, & Haseltine, 2001; Johnson, Cohen, Kasen, and Brook, 2002; Sanci, Coffey, Olsson, Reid, Carlin, & Patton,

2008; Holzer, Uppala, Wonderlich Crosby, & Simonich, 2008; Steiger, Richardson, Schmitz, Israel, Bruce, and Gauvin, 2010). A recent study by Tasca et al. (2013) showed similar findings with 73% of eating disordered participants reported at least one traumatic experience. The study utilized a scale similar to the ACES used in the current investigation but had a significantly larger number of participants which may explain the variance. In general, it appears that rates of traumatic experiences are quite high amongst eating disordered populations and merit significant attention in both clinical and research settings.

Of note, for the current study, however, there were no significant differences between the eating disorder groups on any of the trauma measures utilized with the exception of the TSC-40 Sleep Disturbances subscale. Those diagnosed with Anorexia Nervosa, Purging subtype reported significantly higher levels of sleep disturbance than those diagnosed with Bulimia Nervosa or the Anorexia Nervosa, Restricting subtype. Studies investigating sleep disturbances amongst eating disordered populations have shown a strong relationship between eating disorders and sleep difficulties with inconsistent results as to the contributing mechanisms and potential differences in sleep difficulties across eating disorder subtypes (Lauer & Krieg, 2004; Latzer, Y., Tzischinsky, O., Epstein, R., 2001). Kim, Jung, Shin, Namkoong, Kim and Lee (2010) found significant differences in sleep disturbances between participants diagnosed with Anorexia Nervosa or Bulimia Nervosa. Interestingly, more severe sleep difficulties were also directly associated with eating disorder severity. The current study supports these findings in that participants with Anorexia Nervosa reported both higher levels of sleep disturbance and more severe eating disorder symptomology. These findings may indicate

an important area to target in treatment that focuses on more than only overt eating-related symptoms.

Participants diagnosed with Anorexia Nervosa, Purging Type scored significantly higher than those diagnosed with Bulimia Nervosa on the Eating Disorder Inventory-3 indicating a higher level of eating disorder severity in this group. Of particular note, however, is that while these individuals reported significantly lower body image disturbance, they reported higher overall severity of eating disorder symptomology. These differences may be due to the fact that the BSQ-34 solely focuses on body image disturbance while the EDI-III includes body image as well as a number of other measures of eating disorder symptoms and behaviors. Research has also shown that individuals diagnosed with Anorexia Nervosa tend to underreport both the severity and the presence of eating disorder symptoms, specifically those related to body image concerns (Guardia, Conversy, Jardri, Lafargue, Thomas, Dodin, Cottencin, & Luyat, 2012; Vitousek, Daily, & Heiser, 1991), which may explain the variance in reports among participants in both Anorexia Nervosa groups. Therefore, individual characteristics in conjunction with differences in construct measurement may account for the discrepancy in these findings.

A number of studies have reported significant qualitative and quantitative differences between individuals diagnosed with Anorexia Nervosa versus Bulimia Nervosa with regards to trauma histories and relational problems. However, the findings of these studies are highly inconsistent due to mixed methodologies regarding eating disorder diagnoses, trauma subtypes, and use of a variety of instruments intended to measure the same constructs across studies (i.e. PTSD scales, attachment measures, clinical interviews) (Preti, Incani, Camboni, Petretto, & Masala, 2006; Kong & Bernstein,

2009). In contrast to previous research, the current investigation did not detect overall differences between groups on reports of traumatic events or trauma-related symptoms. When trauma variables were examined individually, eating disorder groups were significantly different in the area of sleep disturbance. Specifically, participant with Anorexia reported significantly higher levels of sleep disturbances compared with other diagnostic groups. Little research has been conducted in the area of sleep disturbance in individuals diagnosed with eating disorders and results thus far have been mixed (Kim, Jung, Shin, Namkoong, Kim, & Lee (2010). Additionally, the majority of participants were classified as having an insecure attachment style, which is consistent with previous research (Barone & Guiducci, 2009; Broberg, Hjalmer, & Nevonen, 2001; Huprich, Stepp, Graham, & Johnson, 2003; Lehoux & Howe, 2007; Ringer, & McKinsey-Crittenden, 2007; Dakanalis, Timco, Zanetti, Rinadi, Prunas, Carra, Riva, and Clerici, 2013). Future research utilizing larger samples sizes may be able to detect differences across eating disorder groups and allow for an examination of more specific types of attachment styles (i.e. fearful, anxious, avoidant, dismissive).

The most important findings of the current study were that higher levels of trauma-related symptoms did significantly predict a more insecure attachment style, a substantially higher level of body image disturbance, and an overall higher level of eating disorder symptom severity. Attachment insecurity was also found to be a strong predictor of eating disorder symptom severity but there was no significant interaction between trauma and attachment in the prediction of eating disorder severity or body image disturbance. These findings are in line with a recently published study based on a similar theoretical framework. Tasca et al. (2013) found that attachment avoidance and

attachment anxiety specifically mediated the relationship between trauma and eating disorder pathology utilizing the Experiences in Close Relationships Scale. Furthermore, as Tasca et al (2013) has reported, the ECRS is more empirically supported instrument as a measure of attachment compared with other measures. The instrument used in the current investigation may not have been sufficient to accurately classify the attachment styles of participants as it yielded a smaller reliability coefficient ($\text{Alpha} = 0.58$) and may not have been able to detect individual differences. Nunnally and Bernstein (1994) assert that a reliability coefficient of 0.70 or higher is necessary in order to obtain adequate power to detect individual and group differences. Also, due to the small sample size and unequal variances amongst attachment groups in the current study, comparisons between each category of attachment could not be conducted. It is possible that with a larger sample size, the model may have received empirical support in conceptualizing the development of eating disorder pathology in relation to trauma.

Both attachment and body image disturbance have been found in previous literature to significantly predict the severity of eating disorder symptoms and be strongly related to having a history of traumatic experiences (Preti, Incani, Camboni, Petretto, & Masala, 2006; Bamford and Halliwell, 2009). The current study sought to extend previous research by examining whether attachment insecurity or strong levels of body image disturbance might explain the trajectory from traumatic experience to the development of clinically significant eating disorder symptoms. Neither factor was found to serve as significant mediators in the relationship between trauma and eating disorder severity.

Body image disturbance was found to account for a portion of the variance but upon conducting the Sobel's test, it was determined that the effect was not strong enough to be classified as even a partial mediator. Of interest, when attachment was added as a mediator between trauma and eating disorder severity, the relationship between attachment and eating disorder severity became insignificant. These findings indicate that trauma seems to be the strongest predictor for the development of eating disorders. As supported by previous research (Tasca et al, 2013), there was a significant main effect of trauma symptomology predicting greater eating disorder severity. A large number of previous studies have linked trauma symptomology to both the development and severity of eating disorders (Holzer, Uppala, Wonderlich Crosby, & Simonich, 2008; Sanci, Coffey, Olsson, Reid, Carlin, & Patton, 2008; Wonderlich, Crosby, Mitchell, Thompson, Redlin, Demuth, Smyth, & Haseltine, 2001).

Study Implications

An important, yet unintentional, finding of the current study was that among three separate trauma measures, the MMPI-II Keane PTSD Scale and the Trauma Symptom Checklist significantly predicted scores on both attachment and eating disorder symptomology while the ACES did not. As noted earlier, the ACES assesses overt experiences of trauma, whereas the MMPI-II Keane PTSD Scale and the Trauma Symptom Checklist measure symptomology commonly associated with traumatic experiences. The Keane PTSD scale has been shown to be an accurate predictor of the diagnosis of PTSD and discriminate accurately between those who have and have not experienced trauma (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008; Wolf,

Miller, Orazem, Weierich, Castillo, Milford, Kaloupek, & Keane, 2008; Watson, Plemel, DeMotts, Howard, Tuorila, Moog, Thomas, & Anderson, 1994). The TSC-40 has performed similarly demonstrating a strong reliability coefficient (Chronbach's alpha = 0.89) and the ability to accurately discriminate between those who have and have not experienced traumatic events (Elliott & Briere, 1992; Brandyberry & MacNair-Semands, 1998; Keane, Caddell, & Taylor, 1988; Gold & Cardena, 1998). It may initially appear that the subjective trauma experience may have a greater impact than the objective report of actual traumas that one has encountered. However, there may also be other traumatic life experiences that are not identified on the ACES that may have caused individuals to score higher on measures of psychological symptoms related to trauma rather than actual reports of traumatic events. The ACES is also a direct and face-valid measure, which may influence the elicited responses. Many individuals may be reticent to endorse specific traumatic experiences in order to avoid the discomfort associated with acknowledging them.

Furthermore, there were significant main effects of trauma symptomology, body image disturbance, and attachment security in predicting the severity of eating disorder symptomology. When placed in singular models, each variable was a strong predictor of eating disorder severity ($p < 0.001$), and when examined as independent predictors of each other (i.e. trauma predicting attachment, attachment predicting body image disturbance), each variable was shown to be a strong predictor. These findings provide initial evidence suggesting that targeting eating disorder symptoms alone (i.e. eating behaviors and body image disturbance) may not be sufficient in addressing the complex nature of eating disorder pathology and highlight other areas to consider in the treatment

of eating disorders. Kraemer, Stice, Kazdin, Offord, and Kupfer (2001) argue that psychological outcomes are the result of a complex system of mediators, moderators, and related influences that must be understood and explained through the creation of complex statistical models. They emphasize the importance of using such models to develop comprehensive multidimensional treatment approaches that address each facet of a presenting clinical problem (i.e. eating disorders). When combined into models of mediation and moderation in the current investigation, trauma, attachment, and body image disturbance were unable to successfully predict eating disorder severity. However, given stipulations regarding the importance of appropriate sample size in utilizing such models, the current investigation was likely unable to create a statistically significant model due to insufficient sample size (Fritz & MacKinnon (2007)). This issue is explored further in the limitations section.

Attachment patterns, specifically, have been shown to impact therapeutic outcomes among individuals with eating disorders. Dakanalis, Timco, Zanetti, Rinadi, Prunas, Carra, Riva, and Clerici (2013) found that specific insecure attachment patterns (i.e. anxious, avoidant, dismissive) are related to levels of perfectionism which, in turn, strongly predicted both the onset and maintenance of eating disorder pathology (Barone & Guiducci, 2009; Broberg, Hjalmer, & Nevenon, 2001; Huprich, Stepp, Graham, & Johnson, 2003; Lehoux & Howe, 2007; Ringer, & McKinsey-Crittenden, 2007). Murphy, Straebler, Basden, Cooper, and Fairburn (2012) found that utilizing an interpersonal treatment approach with individuals experiencing eating disorders can specifically target insecure attachment patterns which successfully contribute to the alleviation of eating disorder symptoms and severity. These findings support further investigation into the

underlying complexities of attachment patterns and their relationship with specific characteristics of eating disorders to create a comprehensive model of the development and maintenance of eating disorders.

Similar to previous literature, rates of trauma were quite high among the study population, with 86% reported at least one objective traumatic experience. Previous research has shown that there are both psychological as well as physical consequences of experiencing trauma and given the high comorbidity and mortality rate associated with eating disorders, addressing trauma in the treatment of eating disorders is imperative when indicated (Rayworth, Wise, & Harlow, 2004; Hendrickson, Neylan, Na, Regan, Zhang, and Cohen 2013). Also, given the strong empirical support for the relationship between trauma and attachment, future research should focus on how these two construct may interact to influence the development and maintenance of eating disorder pathology.

Study Limitations

The current investigation has a number of limitations that are important to note. First, the sample size was small and consisted mostly of Caucasian females. Therefore, results should be interpreted with caution with regards to generalizability. According to Fritz & MacKinnon (2007), a study must have four hundred or more participants in order to achieve enough power (0.8) to accurately detect mediation effects. A recent study similar to the current investigation found that attachment did significantly mediate the relationship between trauma and eating disorder pathology using structural equation modeling and a larger sample size (N = 308) (Tasca et al 2013). It is possible that increasing the number of participants as well as refining the statistical methods for

examining these effects may yield more accurate and significant results in future research. Additionally, although increasing, further research examining ethnic differences in eating disorder prevalence and severity is needed. Prevalence rates of eating disorders among ethnic minorities have been inconsistent across studies, with some studies reporting higher rates and others reporting lower rates compared to Caucasian populations (Smith & Krejci, 1991). Recent research has also reported that Latinos and African Americans had higher rates of Bulimia Nervosa than Caucasians (Marques, Alegria, Becker, Chen, Fang, Chosak, & Diniz, 2011; Swanson, Crow, Le Grange, Swendson, Merikangas, 2011). Marques et al (2011) found these ethnic differences in both males and females but such differences in males were slightly smaller between Caucasians and non-Caucasians for males compared to females. Specifically, it was found that non-white individuals (i.e. African American, Asian, Latino/a) had higher rates of Bulimia Nervosa and its subtypes than Caucasian individuals. Conversely, the study found that Caucasian participants had significantly higher rates of Anorexia Nervosa. Pike Dunne, and Addai (2013) suggest that as levels of Westernization in other countries and acculturation in North American countries has increased, the prevalence rates of eating disorders in minority populations have also increased. They also suggest that exposure to media and technology as well as an increase in child obesity rates has contributed to the changing prevalence rates of eating disorders among diverse populations. Mixed findings in this area of research warrant future examination of ethnic differences in eating disorder development and symptomology.

Second, the current study was conducted using self-report measures and retrospective accounts of traumatic experiences. Therefore, some accounts may be

unreliable and generalizing findings should be approached with caution. However, research has shown that individuals with eating disorder diagnoses have a strong tendency to under-report both the presence and the severity of eating disorder symptoms so the presence of a floor effect may have had an impact on the current results (Guardia, Conversy, Jardri, Lafargue, Thomas, Dodin, Cottencin, & Luyat, 2012; Vitousek, Daily, & Heiser, 1991). Based on current and past findings supporting the notion of attachment difficulties in eating disordered individuals, participants may have been reluctant to disclose out of fear as to how they might be perceived by others. Future research may help illuminate the possibility that denial of both the existence and severity of psychological distress and insecurity may be an associated clinical feature of eating disorder pathology.

Third, the Adverse Childhood Experiences Scale was unable to predict any other variables of interest in the current study while more sensitive trauma measures (MMPI-II Keane PTSD Scale & TSC-40) were significantly related to nearly all variables included in the current investigation. This may be due to clinical overlap, but that is less likely given previous findings that these measures demonstrate strong discriminant validity with other measures of psychopathology (i.e. depression, anxiety, between individuals who have and have not experienced traumatic events) (Keane, Caddell, & Taylor, 1988; Gold and Cardena, 1998; Brandyberry & MacNair-Semands, 1998; Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008; Wolf, Miller, Orazem, Weierich, Castillo, Milford, Kaloupek, & Keane, 2008; Watson, Plemel, DeMotts, Howard, Tuorila, Moog, Thomas, & Anderson, 1994). The ACES is also a highly face-valid measure of actual experiences without assessing related symptomology. It possible that individual responses to trauma

are highly varied with some being more significantly impacted by the trauma than others. Another potential explanation is that participants experienced subjectively traumatic events that are not included in the scale. For example, items only address abuse, neglect experiences with someone living in the individual's household, leaving out the possibility of the abuse by an acquaintance or stranger. Also, the scale does not include events such as the death of a loved one, natural disasters, or physical health issues. Therefore, focusing more on the subjective experience of the trauma as opposed to the actual event may be an additional area to examine in understanding and treating trauma.

Fourth, due to an unequal sample sizes for attachment groups, the current investigation was unable to evaluate specific differences between individuals related to the different attachment styles available within the Revised Adult Attachment Scale (anxious, dependent, secure). However, the imbalance between groups may be explained as an inherent characteristic of individuals with eating disorders as the majority of literature has shown that these individuals tend to have significantly more insecure attachments than those without an eating disorder (Barone & Guiducci, 2009; Broberg, Hjalms, & Nevonen, 2001; Huprich, Stepp, Graham, & Johnson, 2003; Lehoux & Howe, 2007; Ringer, & McKinsey-Crittenden, 2007).

Future Directions

As previously mentioned, research amongst eating disordered populations has shown high levels of underreporting, inaccuracy, and denial of symptoms. The ACES also addresses very specific forms of trauma and may not accurately encompass the wide spectrum of traumatic experiences that participants have had. Reasons for the discrepancy

amongst overt vs subtle trauma measures may be a point of interest for further research amongst eating disordered individuals to determine whether the discrepancy is due to the individuals or the measures themselves. Vitousek, Daly, and Heiser (1991) suggested that the best way to obtain more accurate reports is to rely on clinician observations or collecting data later into treatment. The data collected for the current investigation was gathered upon admission to a partial hospital level of care facility within the first week of attending the program. This may be another explanation for the possible under-reporting of traumatic experiences. Highlighting potential differences in levels of disclosure between admission and release may be an important area for future investigation.

A large body of research exists comparing and contrasting measures of attachment. Refining the methods by which attachment styles are studied would also significantly improve the quality of the research. Specifically, the use of a standardized measure of attachment examining all four attachment styles could tease out more specific differences amongst individuals who experience trauma. The current study found that attachment insecurity did predict eating disorder severity but further research is needed to parse out differences in specific attachment styles between individuals diagnosed with Anorexia Nervosa or Bulimia Nervosa.

Finally, as the most important finding from this study suggests that trauma, attachment, and the development of eating disorders are independently related to one another, future research focusing on more direct specific data may be able to highlight the specific features of each of these constructs that are related. Continued study of the effects of trauma is necessary to understand prevention and treatment of the development of eating disorders. Individuals with eating disorders often have comorbid symptomology

as well as difficulty with relationships both with themselves and with others as evidenced by the current study and previous others highlighting attachment difficulties in these individuals. Understanding the wide array of interpersonal and psychological problems characteristic of eating disordered individuals can aid in developing evidence-based conceptualization and treatment. Of most importance, this research can be utilized to inform identification of at-risk individuals and create prevention-based interventions that may assist in positively altering the onset, duration, and severity of eating disorder symptomology.

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