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The connection between CPTSD and eating disorders

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by

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Abstract

Eating Disorders (EDs) are serious mental health conditions proposed to be multifactorial in nature. Post-traumatic stress disorder (PTSD), trauma history, and childhood maltreatment have been noted as possible predictive factors for their development. Research on complex post-traumatic stress disorder (CPTSD) in relation to EDs, however, is limited. The present study aimed to assess the relationship between childhood maltreatment and ED psychopathology, in relation to CPTSD symptomatology as defined by the ICD-11. Relationships between ED symptomatology and the trauma responses associated with the stress or "fight-or-flight" response were analyzed. 167 female participants, aged 18-25, who reported having experienced at least one event on the Life- Events Checklist 5 (LEC-5) were recruited through a research program at a northeast urban university, and Prolific, an online research platform. Participants filled out a series of self-report questionnaires: the shortened Childhood Trauma Questionnaire (CTQ-SF), The International Trauma Questionnaire (ITQ), the Eating Disorder Diagnostic Scale (EDDS), the Fight Flight Freeze Questionnaire (FFFQ) and the Spann-Fischer Codependency Scale (SF-CDS). Childhood trauma was positively correlated with both CPTSD and PTSD symptoms. ED symptoms were not significantly related to childhood trauma scores, apart from small correlations between ED symptoms, emotional abuse, and physical neglect. An indirect relationship between childhood trauma and ED symptoms was mediated by CPTSD symptomatology. ED symptomatology was associated with both the freeze response and codependency. These findings provide support for the relationship between childhood trauma and CPTSD symptoms and highlight the mediational significance of CPTSD symptoms in the relationship between childhood trauma and ED symptomatology.

The Connection Between CPTSD and Eating Disorders

Eating Disorders (EDs) are serious mental health conditions known to be complex in nature. Rather than having one single cause, an assortment of possible factors, biological, environmental, and psychological, are thought to contribute to their development. Due to their ego-syntonic features and resistance to treatments, eating disorders are notoriously challenging to treat. As a result, a considerable number of eating-disordered individuals are often affected by a chronic course of illness, a dire situation that is further compounded by the lack of effective evidence-based treatments and the phenomenon of patient dropout (Fassino & Daga, 2013; Fassino et al., 2009; Keel & Brown, 2010; Klump et al., 2009; Treasure & Russell, 2011). A better understanding of the nature of eating disorders is therefore critical to early intervention and to the implementation of targeted treatment options for individuals suffering from or vulnerable to the development of an eating disorder.

Though the exact etiology of eating disorders remains unclear, in recent years, a major topic of eating disorder research has been the relationship between exposure to trauma and eating disorder psychopathology. The association between the two is one that has been consistently analyzed in research through the implementation of cross-sectional studies, longitudinal studies, and meta-analyses. It has been repeatedly shown that individuals with eating disorders or disordered eating often report a history of trauma. According to a literature review by Trottier, for example, exposure to trauma and other adverse events in both childhood and adulthood have been commonly linked to eating disorders, with such associations seemingly mediated by emotional and behavioral dysregulation, cognitive factors, and also possibly by biological vulnerabilities (Trottier & MacDonald, 2017). A vast amount of research has also demonstrated the association between childhood abuse or maltreatment and eating disorder pathology, as

elevated rates of child abuse are commonly shown in ED samples (Afifi et al., 2017; Ziobrowski et al., 2021). In a case-control study of women participating in the Harvard Study of Mood and Cycles, for instance, researchers found that compared to those with no reported history of abuse, women with a history of both physical and sexual childhood abuse were three times as likely to develop eating disorder symptoms, and nearly four times as likely to meet the then-current criteria for an eating disorder (Rayworth et al., 2004). Additionally, though most of the trauma-oriented research focuses on physical, sexual, and emotional abuse, researchers have also noted similar findings for childhood neglect. Meta-analytic data showed a high prevalence of emotional and physical neglect among individuals with eating disorders, compared to the general population (Pignatelli et al., 2016). Though the association between childhood maltreatment and eating disorder psychopathology has been long hypothesized, the exact nature of the relationship has yet to be established. Upon investigating possible mediating pathways for this relationship, researchers noted emotional dysregulation, reduced self-esteem, dissociation, and depressed mood as possible mediating factors (Groleau et al., 2012; Moulton et al., 2015; Racine & Wildes, 2015; Rodgers et al., 2019). Additionally, because of how extensive the spectrum of traumatic experiences associated with eating disorders is, it has also been suggested that experiences likely to produce post-traumatic stress disorder (PTSD), PTSD-like symptoms, or clinical levels of anxiety may increase the likelihood that an individual will develop an eating disorder (Brewerton, 2007).

Literature Review

PTSD

In an attempt to better understand the etiology of eating disorders and their relationship to traumatic experiences or adverse events, researchers have also conducted a large amount of

research on the relationship between PTSD and eating disorders. Findings in this domain indicate that PTSD is commonly associated with childhood maltreatment and eating disorders or disordered eating (Messman-Moore & Bhuptani, 2017). In a study examining the relationships among trauma, post-traumatic stress, and eating disorder symptoms, for example, researchers found a significant association between PTSD and eating disorder symptomatology, and when PTSD symptoms were included in the regression model, the relationship between trauma and eating disorder symptoms was significantly reduced, indicating the mediational significance of the PTSD construct (Holzer et al., 2008).

Delving deeper into the association between eating disorders and PTSD, it was also shown that mediational findings were most pronounced for two components of PTSD: physiological arousal and avoidance (Holzer et al., 2008). In another study investigating the mechanisms that account for the association between eating disorders and PTSD, researchers also noted that emotional regulation was what mediated the relationship between the two (Mitchell & Wolf, 2016).

In line with such findings, it has been proposed that post-traumatic stress disorder could serve as a psychological maintenance factor of eating disorders, as PTSD and ED behavior may share a bi-directional and functional relationship in that eating disorder behaviors may serve as a means for individuals to escape and avoid trauma-related cognitions and emotions, thereby facilitating the maintenance of both eating disorder and trauma-related symptoms (Trottier & Macdonald, 2017; Trottier et al., 2016). Although more specific mechanisms by which PTSD and EDs could be related have been proposed, the exact relationship is still not entirely understood. It is important to note, however, that elements of PTSD such as emotional dysregulation and arousal, and avoidance have been established as possible maintenance factors,

and in this respect, elements related to PTSD, as opposed to PTSD itself may be what is associated with eating disorder psychopathology (Holzer et al., 2008; Mitchell et al., 2021; Mitchell & Wolf, 2016).

CPTSD

Complex post-traumatic stress disorder, CPTSD, is a formal diagnosis in the eleventh revision of the World Health Organization's ICD (ICD-11), released in 2018. It is a newly labeled disorder that describes the more complex reactions that are present in individuals exposed to chronic, repeated, and prolonged trauma such as childhood sexual abuse or domestic violence. Distinct from post-traumatic stress disorder or PTSD, CPTSD includes the three core elements of PTSD according to the ICD-11 [re-experiencing the traumatic event in the present, avoidance of traumatic reminders, and a sense of current threat] as well as three additional elements falling under the category of disturbances in self-organization. The three additional elements are emotional regulation difficulties, negative self-concept, and relationship difficulties. (Cloitre, 2020).

The term CPTSD was first proposed by Judith Lewis Hermann in her book, *Trauma and Recovery*, in which she summarized her clinical research with female victims of violence and abuse (Herman, 1992; Maercker, 2021). She indicated that the diagnosis of PTSD did not accurately depict the scope of the problems that her patients faced and that the symptom picture of those who suffer from prolonged or repeated trauma is far more complex than the then-current definition of PTSD (Herman, 1992). She proposed a new diagnosis of complex post-traumatic stress disorder, which included individual symptom groups that involved disturbances in affect regulation, self-perception and perceptions of the offender, alterations of consciousness and the individual's value system, and relationship problems (Herman, 1992; Maercker, 2021).

According to Herman, patients who indicated a history of prolonged or repeated trauma such as in cases of child abuse presented with a bewildering array of symptoms, with general levels of distress higher than those of other patients (Herman, 1992). In line with her observations, in a study conducted by Briere & Elliot, researchers found a high prevalence for a wide array of psychological sequelae in individuals with a history of childhood physical and sexual abuse (2003). Reports of childhood sexual abuse were associated with elevations on all 10 scales of the trauma symptom inventory (TSI) including anxious arousal, depression, anger-irritability, intrusive experiences, defensive avoidance, dissociation, sexual concerns, dysfunctional sexual behavior, impaired self-reference, and tension reduction behavior. Reports of physical abuse were also associated with elevations on most scales of the TSI (Briere & Elliot, 2003). Recent literature reviews on the subject have also shown similar findings, indicating that childhood maltreatment at any stage of development can have enduring and devastating consequences on individuals, such as increasing their risk of developing psychiatric disorders, inducing a poorer treatment response to pharmacotherapy, and leaving them vulnerable to several major medical and mental disorders, including but not limited to mood and anxiety disorders, antisocial and borderline personality disorders, substance use disorders, and eating disorders (Lippard & Nemeroff, 2019; Rayworth et al., 2004).

Statement of the Problem

Primary Hypotheses

While there is an extensive amount of research on PTSD, trauma, and adverse childhood experiences, and their predictive relationship to eating disorders, there is limited research on the relationship between CPTSD and disordered eating or eating disorder psychopathology, given that CPTSD was only recently added to the ICD-11 as a formal diagnosis in 2018. Because

CPTSD is distinct from PTSD in that it includes three additional criteria associated with disturbances in self-organization, further research on the subject is presently needed, especially since prior research has shown that eating disorders are associated with emotional dysregulation, negative self-image, and interpersonal difficulties (Hartmann et al., 2010; Monell et al., 2015).

In this regard, the present study aimed to investigate the association between childhood trauma, CPTSD symptoms, and the presence and severity of eating disorder symptomatology. Furthermore, this study aimed to assess the relationship between the three aspects of disturbances in self-organization (affective dysregulation, negative self-concept, and disturbances in relationships) and overall eating disorder symptomatology. The hypotheses were that:

H1) Greater CPTSD symptomatology would be associated with greater instances of childhood trauma.

H2) Greater instances of childhood trauma would be associated with a higher presence of eating disorder symptomatology.

H3) Greater CPTSD symptoms would mediate the relationship between greater instances of childhood trauma and greater eating disorder symptomatology.

Exploratory Hypotheses

Because it has been shown that there is a relationship between childhood trauma and the development of eating disorders is possibly influenced by inflammatory parameters, this study also aimed to examine the associations between the three subtypes of eating disorders (Anorexia, Bulimia, Binge Eating) and the three components of the physiological stress response (Fight, Flight, Freeze) (Rodriguez-Quiroga et al., 2021). Additionally, because codependency has been theorized as an additional trauma response, sometimes referred to as the fawn trauma response,

the exploratory portion of this study also sought to examine the relationship between the aforementioned subtypes of eating disorders and codependency (Walker, 2013).

Presently, there has been a budding interest in investigating the inflammatory response in patients with eating disorders, as researchers have hypothesized that patients with a history of severe and prolonged exposure to stress show an alteration in inflammatory pathways, especially since patients with EDs often present with a history of childhood trauma and childhood maltreatment was found to be associated with a chronic inflammatory state (Coelho et al., 2014; Rodriguez-Quiroga et al., 2021). Such findings are in line with the theoretical hypotheses about CPTSD which indicate that those who are repetitively traumatized in childhood maintain an acute state of arousal and learn to survive by veering toward a particular stress response as an unconscious attempt to cope with constant or perceived danger (Walker, 2013). Additionally, the is data to suggest that it is trauma-related symptoms specifically, rather than general trauma history, that are most strongly associated with eating disorders and it has been proposed that future research should focus on trauma-related symptoms, in order to advance research on risk and maintaining factors for eating disorders and inform treatment direction (Trottier & Macdonald, 2017). Thus, investigating the role of the physiological stress response in relation to ED symptomatology could be of benefit to individuals with a history of childhood trauma.

Method

Participants

A total of 167 participants took part in this study. The study was approved by the university's Institutional Review Board and participants were recruited through two mediums. Participants were recruited both via the Psychology Experience Credit (PEC) program; a program implemented by an urban university in the Northeast in which undergraduate students

receive extra credit for their research participation, and through Prolific, an online research platform. Prolific participants were monetarily compensated for their successful completion of the study protocol. Eligible participants for this study were individuals of female sex, 18 years of age or older, with access to a computer or smartphone. To match the demographic pool of the university, Prolific registration for the study was limited to female users aged 18-25 located in the United States. A screening measure, the *Life Events Checklist (LEC-5)*, was used to narrow the sample to individuals with a history of adverse events, and individuals who selected yes to at least one item on the checklist were eligible to register. The mean age of the sample was 22.30 (*SD* = 2.33) and participant ages ranged from 18 to 36. Of the 167 participants, 91.6% identified as female, 2.4% identified as male, 3.6% identified as transgender, and 1.2% identified as non-binary or gender-queer. In terms of race and ethnicity, 15.0% of the sample identified as Black/African American or Black/African-Caribbean, 8.4% identified as Hispanic or Latinx, 59.9% identified as White/European American, 10.2% identified as East, South, Central or Southeast Asian, 0.6% identified as Middle-Eastern and 4.2% identified as multi-racial. Demographics and age distribution summaries are included in Tables 1 and 2.

Measures

Demographics

A basic demographics questionnaire was administered to participants in order to obtain information about age, gender, race/ethnicity, relationship status, and socioeconomic status.

The *Life Events Checklist (LEC-5)*

In order to be considered eligible for the study, participants must have indicated yes to having experienced at least one item on The Life Events Checklist (LEC-5; Gray et. al, 2004; Weathers et. al, 2013). A yes or no version of the LEC-5 is included within the SONA system

associated with the PEC program, and the same prescreen format was recreated for Prolific participants. The Life Events Checklist (LEC-5) is a self-report measure used to screen an individual's exposure to traumatic life events known to potentially result in PTSD or distress. It is designed to assess a participant's exposure to 16 traumatic events throughout the entirety of their lifetime (i.e., natural disaster, fire or explosion, etc.) known to be related to the possibility of the development of PTSD. The LEC-5 also includes an additional 17th item (any other stressful life event or experience) to account for any experience not identified in the 16 items on the questionnaire. Respondents are prompted to check the boxes for each event and indicate which situation of the 6-point nominal scale, a through f, applies to them (a= *it happened to you personally*, b= *you witnessed it happen to someone else*, c=*you learned about it happening to a close family member or close friend*; d= *you were exposed to it as part of your job*; e=*you're not sure if it fits*; f= *it doesn't apply to you*). There is no established scoring for this measure. Instead, the measure is intended to gather information about participants regarding potential traumatic experiences they may have encountered in their lifetime and identify whether participants have experienced one or more of the listed experiences.

The *International Trauma Questionnaire (ITQ)*

Eligible participants were also administered the International Trauma Questionnaire (ITQ) (Cloitre et al., 2018). The International Trauma Questionnaire (ITQ) is a self-report measure of the eleventh edition of the International Classification of Diseases (ICD-11), designed to be consistent with the criteria of PTSD and CPTSD, set forth by the World Health Organization. There are three factors associated with PTSD according to this measure (Reexperiencing the here and now, avoidance, sense of current threat) and three factors specifically related to CPTSD (affective dysregulation, negative self-concept, and disturbances in

relationships). The measure focuses on the core features of PTSD and CPTSD related to a troubling event and consists of 18 items that are to be rated on a scale of 0 to 4 (0 = *Not at all*, 1 = *A little bit*, 2 = *Moderately*, 3 = *Quite a bit*, 4 = *Extremely*), regarding how much participants have been bothered by the listed event in the past month. Individuals can receive a diagnosis of either PTSD or CPTSD, but not both. To meet the criteria for PTSD, individuals must endorse at least one of the two of the symptoms of each of the aforementioned PTSD characteristics, as well as at least one indicator of functional impairment according to the questionnaire, exemplified by a score of $\underline{<}$ 2. To meet the criteria for CPTSD, individuals must endorse one of two symptoms from each of the PTSD characteristics, as well as one of two symptoms from each of the CPTSD characteristics. Additionally, for a CPTSD diagnosis, individuals must endorse at least one indicator of functional impairment related to PTSD, as well as one indicator of functional impairment related to CPTSD, once again exemplified by a score of $\underline{<}$ 2. Factor analysis supported the validity of this measure, as did other research studies assessing its validity (Haselgruber et al., 2019; Murphy et al., 2020). The measure was also shown to be reliable and also sensitive to treatment-related changes of PTSD and CPTSD symptoms (Cloitre et al., 2021; Kartazias et al., 2016).

The Eating Disorder Diagnostic Scale (EDDS)

The Eating Disorder Diagnostic Scale (EDDS) (Stice et al., 2000) was another self-report measure administered to participants. The Eating Disorder Diagnostic Scale (EDDS) is a short-report scale that was constructed to assess eating disorder symptomatology and screen for anorexia nervosa, bulimia nervosa, and binge eating disorder. The measure uses a combination of Likert scale items, frequency items, and yes/no responses to a series of 22 questions related to the DSM IV criteria for anorexia nervosa, bulimia nervosa, and binge eating disorder. Data from

its development has shown that the EDDS has demonstrated satisfactory test-retest reliability on all three subscales, acceptable internal consistency, and adequate criterion and convergent validity (Stice, 2000).

Fight Flight Freeze Questionnaire (FFFQ)

Participants were also given the Fight Flight Freeze Questionnaire (FFFQ) (Maack et al., 2015). The Fight Flight Freeze Questionnaire (FFFQ) is a measure designed to assess temperamental and trait-like fear responses. It consists of 21 items, each rated on a 5-point scale describing individual traits in which either fight, flight or freeze are exemplified. Participants are required to read each word from a list and indicate on a scale of 1 to 5 (1 = *Almost Never*, 2 = *Sometimes*, 3 = *About ½ the time*, 4 = *Most of the time*, 5 = *Almost Always*) regarding how they typically respond to threatening situations. Each of the three trait-like fear responses (fight, flight, freeze) include 7 items (e.g., Fight = Argumentative, Flight = Fearful, Freeze = Disengaged), ultimately totaling to 21 questions. The FFFQ demonstrated sufficient overall reliability (alpha = .90), as did the individual subscales: Fight (alpha = .87) Flight (alpha = .89) Freeze (alpha=.85), as well as high test-retest reliability in both the overall assessment and individual subscales. Additionally, in terms of validity, the overall score and subscale scores of Flight and Freeze were positively associated with Carver & White's 1994 Behavioral Inhibition System Scale (BIS) and a negative relation was exemplified between the fight subscale and BIS scores. When results were compared to Spielberger's 1983 State Trait Anxiety Inventory Trait Version (STAI-T) and Watson, Clark & Tellegen's 1988 Positive and Negative Affect Scales (PANAS), results also appeared to be theoretically consistent. Moderate correlations were also noticed between fight, flight and freeze and the STAI-T, and similar correlations appeared between the FFFQ and Negative Affect according to the PANAS (Maack et al., 2015).

The Childhood Trauma Questionnaire-Short Form (CTQ-SF)

Participants were also administered the Childhood Trauma Questionnaire-Short Form (CTQ-SF) (Bernstein et al., 2003). The Childhood Trauma Questionnaire-Short Form (CTQ-SF) is the shortened version of the Childhood Trauma Questionnaire, designed to provide a valid and reliable assessment of child abuse and neglect. It is composed of five clinical subscales (Emotional Abuse, Physical Abuse, Sexual Abuse, Emotional Neglect, Physical Neglect) with 5 items related to each subscale, totaling to 25 items in the entire assessment. Participants are required to rank each item on a scale of 1 to 5 on a scale from never true to very often true (1=*Never True*, 2=*Rarely True*, 3=*Sometimes True*, 4=*Often True*, 5=*Very Often True*). The measure has been shown to be reliable, demonstrating internal consistency for all five subscales, and has also indicated good evidence of criterion-related validity (Bernstein, 2003).

The *Spann-Fischer Codependency Scale (SF CDS)*

Participants were lastly administered the Spann-Fischer Codependency Scale (SF-CDS) (Fischer et al., 1991). The Spann-Fischer Codependency Scale (SF CDS) is a is a 16 item self-report measure designed to measure codependency, defined by Fischer, Spann, and Crawford as a dysfunctional interpersonal pattern in which codependent individuals place extreme focus outside themselves, display a lack of expression of feelings and derive personal meaning from their relationships with others (1991). The measure consists of 16 statements, each rated on a 6-point Likert scale describing features and behaviors associated with codependency. Participants are required to read each statement and indicate on a scale of 1 to 6 (1 = *Strongly Disagree*, 2 = *Moderately Disagree*, 3 = *Slightly Disagree*, 4 = *Slightly Agree*, 5 = *Moderately Agree*, 6=*Strongly Agree*) to what degree each statement describes them. The measure has been shown to be valid and reliable by researchers in a multitude of ways, demonstrating content validity,

construct validity, convergent validity, and discriminative validity upon analysis (Fischer et al., 1991). A study conducted by Lindley, Giordano, and Hammer was also able to demonstrate the measure's convergent validity. (Lindley et al., 1999).

Procedure

Participants were recruited via the Psychological Education Credit (PEC) Program associated with an urban northeastern University and via Prolific, an online research platform. For the PEC participants, eligible individuals (females, 18 years of age or older, who answered yes to at least one item on the *LEC-5* prescreen) that wished to partake in the study were screened and surveyed through SONA, the online system used by the aforementioned university to manage subject pools. For the Prolific participants, because the study utilizes a prescreening measure, Prolific's procedure for recruiting a custom sample was used for recruitment. In this respect, two separate studies were run via Prolific to recruit participants. The first study consisted of a short survey, administered online via a Qualtrics link, with a screening measure designed to filter participants of interest, and the second was the full study for data collection, also administered online via Qualtrics. The prescreening measure was shown to individuals of female sex, aged 18-25 who were located in the USA. Eligible participants who replied "yes" to the measure were given a unique code to enter into Prolific upon completion. These participants were then eligible and invited to the follow-up full-length study via Prolific's "custom allowlist" screening feature. The undergraduate students recruited through the PEC program were compensated with extra credit and Prolific participants were monetarily compensated. All Prolific participants who completed the screening measure were compensated $0.27, regardless of their response, but only participants who met the pre-screening criteria and completed the full-length study were compensated an additional $2.00 for their participation. For all participants,

basic demographics were collected and the following psychological assessments were administered in the following sequence: the shortened version of the Childhood Trauma Questionnaire (CTQ-SF), The International Trauma Questionnaire (ITQ), the Eating Disorder Diagnostic Scale (EDDS), the Fight Flight Freeze Questionnaire (FFFQ) and the Spann-Fischer Codependency Scale (SF-CDS). Informed consent was requested prior to the beginning of the study and participants were notified that they are permitted to leave the study at any time. Upon completion of the study or upon exit, individuals were directed to a debriefing form, explaining the study in more detail, and were provided with a list of resources to ensure that they were referred to adequate psychological support if needed, as well as with the contact information of the private investigators if they had any additional questions or needed further assistance.

Data Analysis

All three hypotheses were tested using SPSS, version 29.0.1.0 (171). Hypotheses 1 and 2 were tested using correlational analysis via the Pearson product-moment correlation coefficient, *r*. Hypothesis 3 was tested using mediation analysis, utilizing model 4 of PROCESS. For the exploratory portion, correlational analysis via the Pearson product-moment correlation coefficient was used to assess correlations between the designated variables.

Results

To test hypothesis 1, SPSS was used to perform a bivariate correlational analysis using the Pearson product-moment coefficient to assess the linear relationship between CPTSD symptoms represented by disorganization of self (DSO) scores and childhood trauma. In support of the first hypothesis, a positive correlation was found between DSO and childhood trauma ($r(163) = .49, p < .001$). A positive correlation was also found between PTSD symptoms and childhood trauma ($r(163) = .51, p < .001$). Results are shown in Table 3. To examine hypothesis

2, the Pearson product-moment coefficient was used to assess the linear relationship between childhood trauma and eating disorder symptoms.

Contrary to our second hypothesis, there was no significant relationship found between childhood trauma and eating disorder symptomatology ($r(165) = .15, p = .055$). Small correlations were found, however, between eating disorder symptomatology and two sub-scales of childhood trauma. Positive correlations were found between eating disorder symptomatology and emotional abuse ($r(165) = .22, p = .01$), as well as between eating disorder symptomatology and physical neglect ($r(165) = .18, p = .02$). Results of these findings are shown in Table 4.

Mediation Analysis

To examine hypothesis 3, model 4 of the PROCESS macro was used to conduct a mediation analysis. The sample was bootstrapped 5000 times. We sought to assess the mediating role of CPTSD symptoms/ DSO sum on the relationship between childhood trauma and eating disorder symptomatology. While there was no direct relationship found between childhood trauma and eating disorder symptomatology ($b = 0.98, t(162) = 0.64, p = .52$), there was an effect shown between childhood trauma and DSO sum ($b = 4.36, t(162) = 7.10, p < .001$), as well as between DSO sum and eating disorder symptoms ($b = 0.47, t(162) = 2.71, p < .001$). There was a significant indirect effect of DSO on the relationship between childhood trauma and eating disorder symptoms ($b = 2.03, SE = 0.97$, LLCI = 0.36, ULCI = 4.15) in support of Hypothesis 3. A mediation analysis summary is included in Table 5 and a depiction of the findings is presented in Figure 1.

Exploratory Findings

Correlational analysis was used to assess the relationship between overall eating disorder symptomatology and sum PTSD scores, as well as with overall eating disorder symptomatology

and each of the characteristics associated with PTSD: Re-experience, Avoidance, and Sense of Current Threat. A small positive correlation was found between ED sum and PTSD sum ($r(163) = .26, p < .001$). Small positive correlations were also found between ED sum and re-experience ($r(164) = 0.23, p = .002$), ED sum and avoidance ($r(163) = .26, p < .001$), and ED sum and sense of current threat ($r(165) = .20, p = .01$). Additionally, correlational analysis was used to assess the relationship between overall eating disorder symptomatology and sum DSO scores, as well as with overall eating disorder symptomatology and each of the characteristics associated with CPTSD: affective dysregulation, negative self-concept, and difficulties with interpersonal relationships. A small positive correlation was found between ED sum and DSO sum ($r(163) = .26, p < .001$). Small positive correlations were also found between ED sum and affective dysregulation ($r(165) = .25, p = .001$), ED sum and negative self-concept ($r(164) = 0.22, p = .01$), and ED sum and difficulties in interpersonal relationships ($r(163) = .20, p = .01$). A summary of these findings is provided in Table 6.

Positive correlations were found between eating disorder symptomatology and all three of the trauma responses according to the fight, flight, freeze questionnaire (FFFQ). Small correlations were found between eating disorder symptoms and the fight trauma response ($r(165) = .20, p = .01$), eating disorder symptoms and the flight trauma response ($r(165) = .16, p = .04$), and eating disorders and the freeze trauma response ($r(165) = .29, p < .001$). Additionally, a small positive correlational relationship was found between codependency and eating disorder symptomatology ($r(164) = .30, p < .001$). A summary of these findings is provided in Table 7.

In participants who met the criteria for Bulimia Nervosa according to the EDDS (n=24), correlational analysis was used to assess the relationship between ED sum and each of the trauma responses according to the FFFQ, as well as between ED sum and codependency. No

significant relationships were found between ED sum and the fight response ($r(22) = .36$, $p = 0.08$), ED sum and the flight response ($r(22) = 0.01$, $p = .95$), or ED sum and codependency ($r(22) = .40$, $p = .052$). A positive correlation of moderate strength was found between ED sum and the freeze response ($r(22) = .48$, $p = .02$). A summary of these findings is provided in Table 8.

Discussion

The present study assessed the relationship between childhood trauma, CPTSD symptoms, PTSD symptoms, and the presence and severity of eating disorder symptomatology. In support of Hypothesis 1, childhood trauma was shown to be moderately correlated with CPTSD symptomatology, as anticipated based on literature indicating that individuals with a history of prolonged or chronic trauma, as in cases of childhood trauma, often present with more complex symptoms and psychological sequelae distinct from PTSD (Briere & Elliot, 2003; Herman, 1992). This study also found that childhood trauma was significantly associated with overall PTSD symptoms, consistent with past studies that have demonstrated that PTSD is commonly associated with childhood maltreatment (Messman-Moore & Bhuptani, 2017). Additionally, the results of the correlational analysis between childhood trauma and the core elements of PTSD and CPTSD, indicated that significant relationships existed between childhood trauma and all elements of PTSD: re-experience, avoidance, and sense of current threat; as well as with all three elements of DSO associated with CPTSD: negative self-concept and relationship difficulties, and emotional dysregulation. Based on the findings of past research and literature on the subject, this data suggests that greater instances of childhood trauma are associated with greater symptoms of both PTSD and CPTSD. Because, according to Cloitre, individuals can receive either a diagnosis of PTSD or CPTSD, but not both, further research

would be needed to differentiate between the two formal diagnoses as they relate to childhood trauma (Cloitre, 2020; Cloitre et al., 2021; Cloitre et al., 2018). This study, was, however, able to demonstrate a relationship between childhood trauma and CPTSD-related symptoms, as represented by DSO scores, as well as with PTSD symptoms.

In regards to Hypothesis 2, childhood trauma was not shown to be significantly related to overall eating disorder symptomatology. Such results are contrary to research that has demonstrated associations between the two and has shown elevated rates of childhood maltreatment in patients with eating disorders (Afifi et al., 2017; Rayworth et al., 2004; Ziobrowski et al., 2021). Small positive correlations were found, however, between eating disorder symptomatology and two sub-scales of childhood trauma: emotional abuse and physical neglect. Given that past metanalytic research has shown the relationship between child abuse and eating disorders to be positive and consistent, such results were not anticipated but could be explained by the moderate heterogeneity found among the evaluated studies where results differed based on the type of childhood trauma experienced and on the eating disorder subtype (Caslini et al., 2015). Additionally, though the correlation was small, the relationship between physical neglect and eating disorder symptoms is consistent with research that has shown a high prevalence of physical neglect among individuals with eating disorders, compared to the general population (Pignatelli et al., 2016). Taking everything into account, and based on the findings and given the study's limitations, the results of correlational analysis of childhood trauma and eating disorder symptoms suggest that the relationship between the two remains unclear, but does highlight the notion that the relationship between childhood trauma and eating disorders could be reliant on the type of child abuse or eating disorder subtype. Additionally, the relationship between the two could possibly be related to other variables, as indicated by past

findings highlighting the mediational significance of trauma-related variables in relation to eating disorder symptomatology (Groleau et al., 2012; Holzet et al., 2008; Moulton et al., 2015; Racine & Wildes, 2015; Rodgers et al., 2019; Trottier & MacDonald, 2017).

The results of the mediation analysis indicated that there was no direct relationship found between childhood trauma and eating disorder symptoms, contrary to past research demonstrating a positive relationship between the two (Afifi et al., 2017; Rayworth et al., 2004; Ziobrowski et al., 2021). An indirect effect, however, was shown to exist between the childhood trauma and overall eating disorder symptomatology mediated by DSO sum representative of symptoms unique to CPTSD. Such a finding is similar to those of past studies in which researchers found that the relationship between childhood trauma and eating disorder is often mediated by other variables, such as PTSD or other trauma-related variables such as emotional dysregulation, reduced self-esteem, dissociation, and depressed mood, some of which overlap with components of the DSO sum (Groleau et al., 2012; Holzet et al., 2008; Moulton et al., 2015; Racine & Wildes, 2015; Rodgers et al., 2019). Based on the present findings, and past literature illustrating the mediational significance of PTSD and its components and how they may relate to trauma history and eating disorder symptomatology, this data could suggest a similar relationship exists between childhood trauma, CPTSD-associated symptoms, and eating disorder symptomatology. It is important to note however that because diagnostically speaking, CPTSD and PTSD are distinct from one another, in that meeting the criteria for CPTSD includes both meeting a proportion of PTSD-related criteria and meeting a proportion of DSO-related criteria unique to only a CPTSD diagnosis such that individuals cannot be diagnosed with both disorders according to the ITQ, it is possible that there are distinctions between the two diagnoses as they relate to both childhood trauma and eating disorder symptoms not addressed in this present

study. While the present data show a significant indirect relationship existing between childhood trauma and eating disorder symptoms mediated by CPTSD symptoms, further research would be needed to understand the distinction between CPTSD and PTSD diagnoses as risk factors for eating disorder symptomatology and to clarify the nature of the relationship demonstrated between DSO sum and eating disorder symptomatology.

Exploratory

The results of the correlational analysis assessing the relationship between overall eating disorder symptomatology and sum DSO scores, as well as between eating disorder symptomatology and sum PTSD scores demonstrated statistical significance in both cases. Overall eating disorder symptomatology was associated with both DSO sum and PTSD sum. Additionally, upon using correlational analysis to assess the relationship between overall eating disorder symptomatology each of the characteristics associated with PTSD (reexperience, avoidance, sense of current threat), and eating disorder symptomatology and each of the characteristics associated with CPTSD (affective dysregulation, negative self-concept, and difficulties with interpersonal relationships), positive associations were found in each case. In the PTSD domain, such findings are in alignment with research that has demonstrated the association between PTSD and eating disorder symptoms, as well as eating disorder symptoms with components of PTSD, specifically physiological arousal and avoidance (Bhuptani, 2017; Holzer et al., 2008). In regard to CPTSD, illustrated by the components of DSO sum, such findings are consistent with research that has demonstrated relationships between eating disorder symptoms and emotional dysregulation, negative self-image, and interpersonal difficulties (Hartmann et al., 2010; Monell et al., 2015). Based on past research and in congruence with the results of the mediational analysis conducted to evaluate Hypothesis 3, this data alludes to a

relationship between CPTSD and eating disorder symptomatology that warrants future research and further emphasizes the need for clarification between CPTSD and PTSD comorbidities when identifying at risk-populations.

The results of the correlational analysis assessing the relationship between overall ED sum, the trauma responses according to the fight, flight, and freeze questionnaire, and codependency showed small positive associations between eating disorder symptoms and each of the trauma responses, as well as between eating disorder symptomatology and codependency. Significant relationships were found between overall eating disorder symptomatology and the fight response, as well as ED symptoms and the flight response. Highly significant relationships were found between overall eating disorder symptomatology and the freeze response, as well as overall eating disorder symptomatology and codependency. While there is minimal research on the three aforementioned trauma responses specifically and eating disorder symptomatology, such findings are in alignment with similar research that has demonstrated associations between eating disorder psychopathology and characteristics associated with the trauma responses, as outlined by Pete Walker, such as dissociation, perfectionism, avoidance, anger and aggression (Walker, 2013).

For example, a fair number of previous studies have demonstrated the relationships between eating disorder symptoms and dissociation, associated with the freeze response, in which according to Walker, individuals with this response tend to veer toward a defense developed around classical or right brain dissociation, allowing them to disconnect from their pain in efforts avoid re-traumatization (Kent & Dagnan, 1999; McShane & Zirkel, 2008; Moulton et al., 2015; Vanderlinden et al., 1993; Walker, 2013). It has been shown that dissociation is common in individuals with eating disorders, especially in Bulimia Nervosa, and

is often associated with binge eating and purging behaviors (McShane & Zirkel, 2008). Its mediational significance in the relation of childhood trauma to eating disorder symptoms has also been outlined, in which dissociation has been found to be a significant mediator between childhood trauma and unhealthy eating behaviors (Kent & Dagnan, 1999; Moulton et al., 2015).

Eating disorder symptomatology has also been studied in relation to perfectionism, a trait common to individuals with the flight response (Walker, 2013). Walker explains that individuals with a defensive flight response are driven by the belief that perfection will make them safe and loveable, utilizing constant thinking and busyness as a means to unconsciously distract themselves from their emotional pain (Walker, 2013). Past research analyzing ED symptoms and perfectionism has demonstrated that perfectionism and its associated features are often co-occurring with eating disorder symptomatology (Bardone-Cone et al., 2007; Fairburn et al., 1999; Livet et al., 2023; Wonderlich, 2002). According to past literature, perfectionism is a likely maintenance factor for eating disorders, with various mechanisms proposed by researchers for the nature of this relationship (Bardone-Cone et al., 2007; Fairburn et al., 2003; Stice, 2002). Specific components of perfectionism, maladaptive and achievement-striving, have also been shown to be elevated in eating disorder populations, with a pattern most consistent in individuals with Anorexia Nervosa (Bardone-Cone et al., 2007). Maladaptive perfectionism has also been connected to trauma history, with research demonstrating the predictive role of childhood trauma and its associated features in individuals presenting with maladaptive perfectionism (Dobos et al., 2021).

Past research has also addressed the relationship between eating disorder symptoms and avoidance (Melles & Jansen, 2023; Melles et al., 2021; Wildes et al., 2010). Avoidance could be considered a possible depiction of the flight or freeze response, pending the nature or mechanism

of its occurrence. In regards to food avoidance, studied in relation to general fears and eating disorder-specific fears, it was demonstrated that individuals of all eating disorder subtypes displayed more general fears, eating disorder-specific fears, and avoidance behaviors compared to healthy controls (Melles & Jansen, 2023). Past research has also confirmed the presence of emotional avoidance in individuals with Anorexia Nervosa, in support of the idea that eating disorder symptoms may serve as a way to help individuals with Anorexia Nervosa avoid aversive emotional states (Wildes et al., 2010). In alignment with such findings, fear has also been highlighted as a maintenance mechanism for eating disorder symptoms, especially in Anorexia Nervosa, where avoidance is commonly used as a safety mechanism to mitigate individual fears (Melles et al., 2021). In individuals with a history of childhood trauma, research has also demonstrated an indirect effect between childhood maltreatment and eating disorder symptoms, related to one another through avoidant coping mechanisms (Rosenbaum et al., 2021).

Eating disorder symptomatology has also been analyzed in association with aggression and hostility, characteristics of the fight response according to Walker (Walker, 2013). In his description, individuals with the fight response are motivated by the unconscious belief that safety can be achieved and abandonment can be avoided by means of power and control. Fight types learn to respond to such feelings of abandonment with anger and contempt (Walker, 2013). As was the case with the flight and freeze response, research on the fight trauma response, specifically, and eating disorder psychopathology is limited. Associations between aggression and eating disorder symptomatology, however, have been demonstrated, with aggressive behaviors, linked to anger as an emotion, found to be frequent in individuals with eating disorders (Truglia et al., 2006). In relation to characteristics of aggression and the eating disorder subtypes, some differences have been documented. For example, in a study analyzing

the relationship between eating disorders and attitudes toward aggressiveness and four subscales of aggression, including physical aggression, verbal aggression, anger, and hostility, researchers found that individuals with Anorexia Nervosa scored lower than healthy controls in relation to physical and verbal aggression. Patients with Bulimia Nervosa scored higher on the anger subscale (Miotto et al., 2008). In regard to trauma history, childhood maltreatment has also been recognized as a risk factor for anger and aggressive behavior with hostile attribution bias and anger rumination indicated as joint mediators (Zhu et al., 2020).

The last trauma response, as defined by Walker is the fawn response, associated with codependency. Individuals with the fawn trauma response utilize codependent behaviors as a means to seek safety (Walker, 2013). In regards to codependency, past research has demonstrated in women, higher levels of codependent behavior were associated with higher levels of eating disorder behavior (Meyer & Russel, 1998). Research has shown codependency to mediate the relationship between stressful life events and eating disorder symptoms (Meyer, 1997).

In totality, findings of the exploratory portion of the study analyzing the relationship between overall eating disorder symptoms and the four trauma responses have demonstrated consistency with similar research illustrating the relationships between ED symptoms and factors such as dissociation, perfectionism, avoidance, anger, and codependency. While small positive relationships were found between each trauma response and ED symptoms, findings were most significant for the freeze response and codependency. Based on these results, along with research illustrating the mediatory roles of dissociation and codependency as they relate to ED symptoms, such associations may illustrate a possible role of the freeze and fawn responses as a risk factor or maintenance mechanism in connection to ED symptomatology (Kent & Dagnan,

1999; Meyer, 1997; Moulton et. al, 2015). Because there is limited research on the four trauma responses and eating disorder symptoms, however, the nature of such associations thus warrants further study.

Upon examination of the associations between overall ED symptoms, trauma responses, and codependency in subsamples of individuals who met the EDDS criteria for full threshold Anorexia Nervosa, Bulimia Nervosa, or Binge Eating Disorder, it was found that in individuals who met the criteria for Bulimia Nervosa, a positive association existed between ED symptoms and the freeze response, but no significant association was found between eating disorder symptoms and the fight response, the flight response, or codependency. While it is possible that Bulimia Nervosa may be related to the freeze trauma response in alignment with research demonstrating the association between Bulimia Nervosa and dissociation, additional research is needed to confirm and clarify the nature of these findings (Groth-Marnat & Michel, 2000; McShane & Zirkel, 2008). Given the limitations of the study, especially the size of the subsamples, to better understand the relationships between Bulimia Nervosa and the freeze response, as well as to identify any distinctions between eating disorder subtypes and each trauma response, further research is essential. Additionally, because of the small number of individuals who met the criteria for full-threshold Anorexia Nervosa and full-threshold Binge Eating Disorder, findings for these subtypes remain unknown and warrant further exploration.

Limitations and Future Research

Limitations of this study include a relatively small sample size and a heavy reliance on self-report questionnaires for all measured variables. Additionally, to account for differences in biological sex, this study was restricted to females and is thus limited in its capacity to be generalized to a larger population outside of the selected demographic. In regards to the

exploratory section, it is important to note that data gathered in relation to eating disorder subtypes was extremely limited given the extremely small subsample of individuals meeting the criteria for each eating disorder subtype, the use of a self-report measure as a representation of each ED subtype and the utilization of a non-clinical sample.

Future studies are recommended to further explore the possible differentiation between CPTSD and PTSD diagnoses and their associated symptoms as they relate to childhood trauma and eating disorder symptomatology. Such research would be useful to clarify the distinction between comorbid CPTSD and PTSD diagnoses as proposed risk factors for eating disorder symptomatology, especially in individuals with a history of childhood maltreatment, and would help to better explain the nature of the relationship that was demonstrated between CPTSD symptoms and eating disorder symptoms.

Because research on the four trauma responses and eating disorder symptoms is limited, further study in this domain is also recommended in order to clarify the nature of the associations found between the four trauma responses and overall ED symptomatology, especially between ED symptoms, the freeze response, and codependency. Future studies are also recommended to better understand how these findings may be related to childhood trauma, PTSD, and CPTSD symptoms, and to reveal any distinctions in relationships that may exist between ED subtypes and the trauma responses to better understand possible maintenance factors for eating disorders.

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Table 1

Demographics Characteristics of Participants

	Total *N* = 167	
	n	%
Gender		
Female	153	91.6
Male	4	2.4
Transgender	6	3.6
Non-binary/Genderqueer	2	1.2
Other (Not Specified)	1	0.6
Missing/Prefer not to answer	1	0.6
Race		
Black/African-American or African-Caribbean	25	15.0
Hispanic or Latinx	14	8.4
White/ European- American	100	59.9
East, South, Central or Southeast Asian	17	10.2
Middle Eastern	1	0.6
Multiracial	7	4.2
Other (Caribbean)	1	0.6
Other (Syrian-American)	1	0.6
Missing/Prefer not to answer	1	0.6
Relationship Status		
Single	142	85.0
Married	12	7.2
Other (In a Committed Relationship, In a Relationship, or in a non-married relationship)	7	4.2
Other (Dating)	1	0.6
Other (Engaged)	1	0.6
Other (Living with Partner)	2	1.2
Missing/Prefer not to answer	2	1.2

Employment Status		
Student, unemployed	48	28.7
Student, part-time employment	59	35.3
Student, full-time employment	56	33.5
Missing/Prefer not to answer	4	2.4
Household Income		
Under $15,000	19	11.4
$15,000 - $24,999	20	12.0
$25,000 - $34,999	26	15.6
$35,000 - $49,999	17	10.2
$50,000 - $74,999	25	15.0
$75,000 - $99,999	22	13.2
$100,000 and above	31	18.6
Missing/Prefer not to answer	7	4.2

Note. *N*, total number of participants in sample; *n* = total number of participants in particular subgroup.

Table 2

Age Distribution of Participants

	Total *N* = 167	
	n	%
Age		
18.00	9	5.4
19.00	13	7.8
20.00	14	8.4
21.00	23	13.8
22.00	24	14.4
23.00	30	18.0
24.00	24	14.4
25.00	28	16.8
36.00	1	0.6
Missing (System)	1	0.6

Note. *N*, total number of participants in sample; *n* = total number of participants in particular subgroup.

Age: Mean: 22.30; Median: 22.50; Variance: 5.448; Std: 2.334; Min: 18; Max: 36; Range: 18.

Table 3

Correlations Between Childhood Trauma, PTSD and CPTSD Related Variables

Variable	*r*	*n*
PTSD sum	.51***	165
Re-experience	.46***	166
Avoidance	.42***	165
Sense of Current Threat	.42***	167
DSO sum	.49***	165
Affective Dysregulation	.38***	167
Negative Self Concept	.41***	166
Relationship Difficulties	.45***	165

Note. N=167; DSO= Disturbances in Self Organization (Cloitre et al., 2018).
*p < .05. **p < .01. ***p < .001

Table 4

Correlations Between Eating Disorder Symptomatology and Childhood Trauma Related Variables

Variable	*r*	*n*
Childhood Trauma	.15	167
Sexual Abuse	.13	163
Emotional Abuse	.22**	167
Physical Neglect	.18*	167
Emotional Neglect	-.05	166
Physical Abuse	.15	166

Note. N=167; Scores for childhood trauma were derived from mean CTQ scores (Bernstein et al., 2003).
*p < .05. **p < .01. ***p<.001

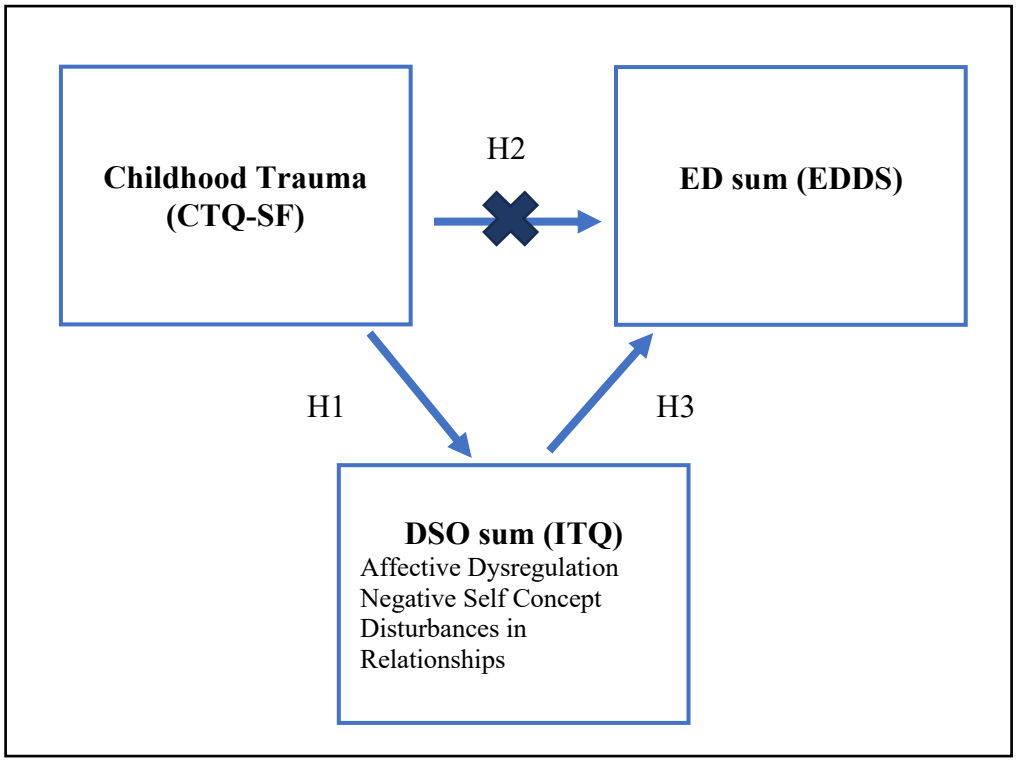
Table 5

Path Estimates from Mediation Model: Childhood Trauma, CPTSD Symptoms and Eating Disorder Symptoms

Effect	Model Segment	Coef (SE)	*p*	95% CI Lower Bound	95% CI Upper Bound
Childhood Trauma to DSO sum	H1	4.36 (0.61)	.000	3.15	5.57
DSO sum to ED sum	H3	0.47 (0.17)	.007	0.13	0.81
Direct effect	H2	0.98 (1.54)	.52	-2.06	4.03
Indirect Effect	H4	2.03 (0.97)	.04	0.36	4.15

Note. $n = 165$

Figure 1. Indirect relationship between childhood trauma and eating disorder symptomatology, mediated by CPTSD symptomatology.



Note: DSO = Disturbances in Self Organization. ED sum = Eating disorder sum score

Table 6

Correlations Between Eating Disorder Symptoms, PTSD and CPTSD Related Variables

Variable	*r*	*n*
PTSD sum	.26***	165
Re-experience	.23**	166
Avoidance	.26***	165
Sense of Current Threat	.20**	167
DSO sum	.26***	165
Affective Dysregulation	.25**	167
Negative Self Concept	.22**	166
Relationship Difficulties	.20**	165

Note. N=167; DSO= Disturbances in Self Organization (Cloitre et al., 2018).
*p < .05. **p < .01. ***p < .001

Table 7

Correlations Between Eating Disorder Symptoms and Trauma Response Related Variables

Variable	*r*	*n*
Fight	.20**	167
Flight	.16*	167
Freeze	.29***	167
Codependency	.30***	166

Note. N=167
*p < .05. **p < .01. ***p < .001

Table 8

Correlations Between Eating Disorder Symptoms and Trauma Response Related Variables (Bulimia Nervosa)

Variable	*r*	*n*
Fight	.36	24
Flight	.01	24
Freeze	.48*	24
Codependency	.40	24

Note. N=24.

*p < .05. **p < .01. ***p < .001