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Effects of Emotional Intelligence and Social Support on the Relationship Between Childhood Maltreatment and Disordered Eating

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Abstract

Current research has established a connection between childhood maltreatment and eating disorders, and some studies have looked at emotional intelligence or social support as mediators of this connection. However, little research has looked at how emotional intelligence and social support work together in the relationship between childhood maltreatment and eating disorders. This study looked at how emotional intelligence and social support act as mediators in this relationship. Undergraduate students (N=134) were administered the Childhood Trauma Questionnaire (CTQ-90), Wong-Law Emotional Intelligence Scale (WLEIS), Difficulties in Emotion Regulation Scale (DERS), Perceived Social Support Scale (PSSS), and the Eating Attitudes Test (EAT-26). Correlations between scales were analyzed to determine associations, which were used for sequential mediation analysis. Disordered eating behaviors were positively correlated with childhood maltreatment, particularly emotional abuse and total maltreatment. Maltreatment was not correlated with the emotional intelligence scale; however, it was positively correlated to emotion regulation difficulty, which further correlated positively with disordered eating and negatively with social support. Social support is negatively correlated with disordered eating. Mediation analysis showed that childhood maltreatment predicts disordered eating, and that emotion regulation acts as a mediator between maltreatment and disordered eating. Social support does not act as a mediator between any of the other variables, nor does it predict or is predicted by the other variables, indicating that there is not a sequential mediation pathway for maltreatment, emotion regulation, social support, and disordered eating. These results highlight the importance of emotion regulation difficulties in the development of disordered

eating patterns in those with a history of childhood maltreatment, indicating a greater emphasis needed on emotion regulation abilities in the treatment of eating disorders.

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Effects of Emotional Intelligence and Social Support on the Relationship Between Childhood Maltreatment and Disordered Eating

Childhood maltreatment, which involves deliberate harm to a child or a failure to provide for their needs, is tragically common. In 2018, the Children's Bureau reported 678,000 confirmed cases in the U.S. (U.S. Department of Health and Human Services, 2020) True rates of maltreatment may be much higher, as many cases go unreported. Experiences of childhood maltreatment can lead to numerous negative effects, both short-term and later in life. Maltreated children are more likely to experience emotional and behavioral problems, and negative externalizing behaviors, and adults with a history of childhood maltreatment are at a higher risk of poorer physical health, mental health disorders such as PTSD and eating disorders, decreased emotion regulation ability and social support levels, and suicidality (Armour et al., 2016; Cloitre et al., 2019; VanMeter, et al., 2020; Zhao, et al., 2019).

The negative effects and outcomes of childhood maltreatment do not exist in a vacuum but are impacted by a number of situational and personal factors. The type(s), severity, and duration of maltreatment can impact both the presence and severity of negative outcomes, and the presence of multiple types of maltreatment may increase negative effects (Matsumoto et al., 2021). Certain internal traits of an individual, such as emotion regulation and other factors of emotional intelligence, may mediate the relationship between childhood maltreatment and negative outcomes. External traits, such as the social support system outside the maltreatment environment, may also impact outcomes (Racine & Wildes, 2013; Zhao et al., 2019). Additionally, many of the negative effects can impact each other, both within and outside the context of childhood maltreatment. Many mental disorders tend to co-occur, regardless of the initial cause. For instance, eating disorders are connected to other

mental health problems such as depression, PTSD, and suicidality. The eating disorder may precede other mental health disorders or follow them (Armour et al., 2016).

The etiology of eating disorders is complex, with childhood maltreatment being one of many factors that can increase the risk of eating disordered behaviors. The connection between childhood maltreatment and eating disorders is well-established; however, less research has been done on what links them. Those with eating disorders tend to have lower emotion regulation abilities. Several studies have suggested that emotion regulation may act as a mediator between childhood maltreatment or other childhood trauma and eating disordered behaviors (Han & Pistole, 2013; Racine & Wildes, 2013, 2015). Those with eating disorders report lower levels of social support. Tiller et al. found that although perceptions of social support varied by specific disorder, those with eating disorders tend to have lower levels of actual social support (1998). Emotion regulation, and emotional intelligence more generally, is related to social support, and these factors may work together to impact the presence and severity of mental health problems such as eating disorders (Lopez-Zafra et al., 2019; Marroquin, 2011; Metaj-Macula, 2017; Zhao et al., 2019). Though some research has been done looking at two or three of these variables, none have been found to look at all four- childhood maltreatment, emotional intelligence, social support, and disordered eating- at once.

The purpose of this study was to look at emotional intelligence and social support as possible sequential mediators between childhood maltreatment and disordered eating behaviors. This study also looks at the direction of the relationship between emotional intelligence and social support. It was hypothesized that childhood maltreatment predicts emotional intelligence, which predicts social support, which then predicts disordered eating

behaviors. Understanding the multifaceted, intertwined mediators between childhood maltreatment and disordered eating behaviors can help both prevent the development of eating disorders/disordered eating and aid in improving their treatment.

Literature Review

Childhood Maltreatment

Definitions

Childhood maltreatment is a broad category of harm intentionally inflicted on children. It involves deliberate abusive or violent actions done to a child by a parent or other caregiver, which cause direct physical or mental harm to the child. Childhood maltreatment can cause numerous short- and long-term negative effects on physical and mental health, and impact the development of many mental health disorders, including depression, anxiety, and PTSD (Zhao et al., 2019). Since overarching definitions of childhood maltreatment are so broad, it is split into five types of maltreatment: sexual abuse, physical abuse, emotional abuse, physical neglect, and emotional neglect (Monteleone et al., 2019). Often, the occurrences of these types overlap. Many studies report that over half of participants that report having experienced one type of maltreatment, also experienced at least one more. The exact rates and strongest overlaps vary by study. One meta-analysis, which pooled the data from 11 other studies for a participant pool of over 25,000, found that the strongest overlap was between physical and emotional abuse. Physical and emotional neglect, and emotional abuse and neglect, were also shown to have particularly strong overlap. Sexual abuse did not overlap as strongly with any other form of maltreatment, but still showed some correlation. All five types showed positive associations with each other (Matsumoto et al., 2021). Given

the large sample size of the data, it can be generalized to larger populations like those from which the data was collected (the U.S. and several European countries). However, it may not apply to populations in African or Asian countries- more research would be needed in those populations. Nonetheless, the study highlights the significant overlaps between types of childhood maltreatment.

Unfortunately, many studies and government agencies (such as Child Protective Services [CPS]) fail to recognize emotional neglect. This is likely due to how difficult it is to measure and report. In many cases, emotional neglect does not appear to have any immediate threat to child safety, so it may go under-reported. Thus, some studies may exclude it or connect it more broadly as neglect. A study measuring childhood maltreatment rates in Denmark combined physical and emotional neglect into a general category of neglect. They found a 3.0% rate of neglect among participants, with rates slightly higher among females (Christofferson et al., 2013). Though this may be a sufficient approach to measuring neglect, as the two types sometimes overlap, the measures of neglect in this study focus primarily on the physical, rather than emotional. Thus, neglect may have been under-reported. Still, measures of neglect or emotional abuse cover certain aspects of emotional neglect and may overlap with it, and thus can have implications in emotional neglect regardless. Another study measuring severity of childhood maltreatment looked at CPS data classed into five categories: sexual, physical, and emotional abuse, failure to provide, and lack of supervision (Litrownik et al., 2005). Failure to provide is representative of physical neglect, while lack of supervision may represent a type of emotional neglect. Though the entirety of emotional neglect is not covered by the study, it may be a better way of measuring an aspect of it, since

it uses measurable, real-world data. Nonetheless, measures of emotional neglect are lacking, and prevalence of this form of childhood maltreatment is likely underestimated.

Effects

All types of childhood maltreatment can have negative short-term and long-term effects. These effects can be seen in maltreated children as young as four. One study measured both maltreated and non-maltreated children ages 4-12 at a summer camp for two consecutive years. The maltreated children were shown to use greater emotion-focused coping strategies, while the non-maltreated children used more avoidance or problem-focused coping strategies. Maltreated children were more likely to show clinically significant externalizing behaviors, and the number of subtypes of maltreatment experienced affected the number of both internalizing and externalizing symptoms displayed (VanMeter et al., 2020). This study is limited by the low socioeconomic status (SES) of most the participating families; however, this lines up with the lower-than-average SES of many families reported to CPS. It cannot be determined for certain if results would be similar in maltreated children from higher SES families; however, as the non-maltreated children from low SES families had better outcomes, it is likely that experiencing maltreatment has a stronger effect than socioeconomic status in determining behavioral outcomes.

Childhood maltreatment is also connected to difficulties adjusting and a greater incidence of mental health problems. It has been shown to affect the transition to college. In a study on college students, childhood maltreatment, especially emotional abuse and neglect, is associated with greater perceived stress. The relationship is stronger in females than males. This relationship may be mediated by emotional regulation ability and trait resilience in females (Hong et al., 2018). The lower correlation and lack of mediation in males may be

related to how males are socialized. Men are taught to express less emotions than women and may be more able and likely to suppress feelings of stress. This socialization could lead to different impacts of maltreatment than seen in females, such as increased aggression or substance use. Another study of Chinese college students found that childhood maltreatment increased the incidence and number of mental health symptoms experienced. Social support and emotional intelligence were both determined as mediating factors working together, with social support mediating between maltreatment and emotional intelligence, and emotional intelligence mediating between social support and mental health symptoms. No significant gender differences were found between childhood maltreatment and mental health symptoms, but females were shown to have higher social support (Zhao et al., 2019). This study highlights how mediation pathways and outcomes can be rather complex, with numerous variables impacting each other. The finding of social support impacting emotional intelligence in this pathway, rather than the other way around, may be indicative of the collectivist culture in China and other Asian countries. In a Western country with a more individualistic culture such as the U.S., it is possible that emotional intelligence may have a greater impact on social support in the pathway. More research is needed to determine the presence of this possible cultural difference.

Childhood maltreatment plays a role in the development of eating disorders. One large-scale study found that in females 16 and older, a history of childhood physical or sexual abuse increased the incidence of disordered eating behaviors. Increased prevalence of these behaviors was present across different classes of weights and included behaviors causing both weight loss and weight gain. Maltreatment history impacted behaviors but did not significantly affect weight itself. The presence of disordered eating behaviors was correlated

with increased risk of depression, PTSD, and suicidality (Armour et al., 2016). It is possible that the impact on mental health psychopathologies may be a more direct result of abuse than the study implies. This is because abuse, especially sexual abuse, tends to cause PTSD, regardless of other mental health symptomologies. Childhood maltreatment can directly affect the development of eating disorders and may both directly and indirectly affect the development of other mental health disorders. Another study looked at the association of childhood maltreatment more generally with disordered eating behaviors. All types of maltreatment were connected to eating disorders, with emotional abuse showing the strongest and more direct association, and emotional abuse acted as a mediator between other types of maltreatment and eating disorders. Though some association was found between certain types of maltreatment and different eating disorder behaviors, all types of maltreatment were associated with all types of disordered eating (Montelone et al., 2019). The mediation by emotional abuse is likely due to the frequent co-occurrence between other types of maltreatment and emotional abuse. The lack of evidence for differences in associations between maltreatment types and specific eating disorders may be due to a common underlying pathway in the development of the disorders, and the specific manifestation of disordered eating may result from individual differences in personality, genetics, and other early experiences.

Previous studies show how childhood maltreatment has a plethora of negative effects on well-being, negatively impacting emotional intelligence, behavior, social support levels, eating patterns, and physical and mental health. It has also been linked to many mental health disorders such as depression, post-traumatic stress disorder, and eating disorders, both directly and with other measures of well-being mediating the impact of maltreatment history.

Little research has looked at the interplay of multiple factors of well-being as mediators in the impact of childhood maltreatment on mental health, particularly in subsets of mental health conditions such as eating disorders.

Disordered Eating

Definition and Comparison to Eating Disorders

Disordered eating involves a range of unhealthy eating behaviors, which may or may not qualify as an eating disorder. It can involve behaviors such as chronic dieting, restriction, binge eating, purging behaviors, or any other unhealthy behaviors used to lose or maintain weight, which may be less severe or frequent than those meeting the requirements of a full-blown eating disorder (Pereira & Alvarenga, 2007). Although not considered as serious as eating disorders, disordered eating can still have significant consequences. Perhaps the most notable study on the effects of dieting is known as the Minnesota Starvation Experiment. In this experiment, 32 men followed specific diets with varying calories over several phases, including a 12-week control phase at the start of the experiment, during which they were fed around 3400 calories per day, a starvation phase in which caloric intakes were cut by over half to 1,570 calories per day, and several recovery phases. After twelve weeks of consuming a semi-starvation diet, the participants showed a decrease in strength, stamina, heart rate, and body temperature, and an increase in irritability, depression, and fatigue. They also developed an obsession with food, and once allowed to consume an unlimited amount of food again, many ate an upwards of 10,000 calories per day (Keys et al., 1950). More recent studies have found similar conclusions. The presence of disordered eating behaviors in young adulthood has been correlated to poorer physical health, higher BMI, and greater psychological distress, even ten years later (Kärkkäinen et al., 2017). Although most studies

on disordered eating focus on younger adults, their conclusions may apply to older adults as well. One study by Patrick et al. (2011), in which about a fifth of the participants were middle aged or older, found that disordered eating and body dissatisfaction remains correlated with psychological satisfaction, regardless of age.

Eating disorders are psychological illnesses that affect eating behaviors. In the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition* (DSM-5), eating disorders are defined as, "a persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial functioning" (American Psychological Association [APA], 2013, p. 328). They involve highly unusual and irregular eating patterns, which tend to be chronic. The three commonly known eating disorders that occur in adolescents and adults are anorexia nervosa, bulimia nervosa, and binge eating disorder (Brownell & Walsh, 2017). These conditions can cause numerous physical and mental health problems, and even be deadly. One longitudinal study found that over an 18-year period, 4.5% of eating disorder patients died from their disorder. Over half the deaths were due to medical conditions, but about 15% were due to suicide (Crow et al., 2009). Other mental health conditions are highly comorbid with eating disorders. Over half of those with any given eating disorder have at least one comorbid mental health disorder, with the presence of comorbidities particularly high in those with bulimia nervosa (Hudson et al., 2007).

Disordered eating and eating disorders are similar in behaviors and types of effects. However, they differ in several ways. Disordered eating is defined more broadly than eating disorders and is not confined to fit in specific categories. Disordered eating behaviors are also less severe than those seen in eating disorders (Zhang et al., 2022). Because disordered

eating is defined so broadly and includes certain behaviors that many people may consider normal (such as chronic dieting), it is significantly more common than eating disorders, which are relatively rare. Although disordered eating is not typically severe and may even be seen as normal, it is shown to have many of the same psychological effects as eating disorders, and it has the potential to lead to an eating disorder. Thus, further research on both the causes and treatment of disordered eating may be needed.

Etiology

Disordered eating behaviors are complex symptoms with multifaceted etiology. One significant factor in the development of disordered eating is a trauma history, particularly in childhood. In adolescents with eating disorders, over 2/3 report having experienced some form of childhood trauma (Groth et al., 2020). In adults with eating disorders, trauma history appears to exist at a lower, but still significant, rate. A Swedish study found that 18.6% of respondents had experienced at least one traumatic event prior to developing an eating disorder. Of these, 61.9% had experienced trauma before reaching adulthood. Although trauma history was not linked to any specific eating disorder, it increased the severity of disordered eating symptoms (Backholm et al., 2013). The disparity in rates of trauma history between adolescents and adults appears large but may be explained by age differences. Adolescents may react stronger to trauma and be more likely to develop disordered eating patterns as a means of coping, especially if the trauma occurred earlier in life. Regardless of this disparity, general trauma history is unusually high in eating disorder patients.

Childhood maltreatment is a form of trauma that has been shown to impact the development of disordered eating. Many studies focus more on childhood abuse rather than neglect, particularly physical or sexual abuse, or maltreatment more broadly. Physical and

sexual child abuse have been shown to increase the risk of developing disordered eating behaviors. The development of these behaviors, in turn, can negatively impact other mental health outcomes and increase the risk of suicidal thoughts and/or behaviors (Armour et al., 2016). All types of childhood maltreatment can impact the development of disordered eating and eating disorders. In a study of patients with anorexia nervosa, any type of childhood abuse correlated to the severity of the condition, with emotional abuse having the strongest correlation. Childhood abuse also impairs emotional regulation capabilities, which may further increase the likelihood and severity of an eating disorder (Racine & Wildes, 2014).

Those with eating disorders are believed to be impaired in several measures of emotional intelligence. Emotion regulation in particular has shown to be lower in those with eating disorders. Those diagnosed with an eating disorder report lower general emotion regulation than a comparison group. Regardless of diagnosis status, greater emotion dysregulation is associated with cognitive symptoms of eating disorders, as well as binge eating (Monell et al., 2018). In adolescents, emotional dysregulation is strongly linked with certain disordered eating behaviors, such as binge eating and fasting. Behaviors associated with anorexia nervosa or binge eating disorder had a stronger link to emotional dysregulation than purging behaviors found primarily in bulimia nervosa (Trompeter et al., 2021). In college students, lower attachment security has been shown to increase incidence of binge eating. This association is fully mediated by emotional dysregulation, possibly because those with a less secure attachment tend to develop or learn emotional regulation skills in childhood (Han & Pistole, 2014). Measures of emotional understanding, such as recognition and awareness, are also associated with the pathology of eating disorders. In a study of facial recognition, women with anorexia were less able to recognize certain facial expression then

healthy controls. However, they were more apt at recognizing anger (Dapelo et al., 2015). Alexithymia is the inability to recognize and express emotions. In eating disorder patients, higher levels of alexithymia decreased emotional regulation and impulse control. This association is higher in anorexia patients than bulimia patients (Brown et al., 2017). The lack of ability to identify and healthily express emotions may make it more difficult to regulate them, which in turn could lead to coping using disordered eating behaviors.

Social support, both perceived and actual, may contribute to the development of disordered eating. Patients with anorexia nervosa and bulimia nervosa both have lower social support than a general student population, with a smaller sized support circle and lower levels of practical or emotional support. Anorexia patients are generally satisfied with their levels of social support, which bulimia patients report greater dissatisfaction with their social support (Tiller et al., 1997). In a study on college women, social support, particularly from friends, was associated with lower levels of binge eating. The impact of family support was mixed, depending on race. In African American women, social support from family decreased the likelihood of binge eating, while in Caucasian women, family social support had the opposite effect (Mason & Lewis, 2017). Social support is not only potentially preventative, but can aid in recovery as well. Individuals that have recovered from an eating disorder report that closeness, empathy, compassion, and understanding in their relationships with family, friends, and treatment providers aided in recovery, while isolation, lack of direct communication, and trivializing or demeaning comments hindered recovery (Linville et al., 2012). Many of the aspects affecting recovery are directly related to social support and communication.

Emotional Intelligence and Social Support

Definitions

Emotional intelligence and social support are two interconnected factors of psychological well-being. Emotional intelligence is defined as "the ability to perceive, recognize, and manage one's emotions" (Ciarrochi et al., 2001, pp. 2). Several different models of emotional intelligence have been proposed, but they tend to contain traits like self-awareness, empathy, emotion regulation and utilization, and healthy emotional expression and self-control (Schulze et al., 2005). Though described as a type of intelligence, it is distinct from traditional measures of intelligence, such as IQ. In adults, emotional intelligence and IQ appear to have some connection, but the two are not strongly correlated (Dirkson et al., 2002). This may suggest that to a certain degree, a level of general intelligence is required to have the capacity for emotional intelligence, but high IQ does not always indicate high emotional intelligence. In children, the connection between IQ and emotional intelligence is slightly higher, and correlates to age. Both IQ and emotional intelligence have a positive effect on behavior and anxiety levels in stressful situations, such as going to the dentist (Aminabadi et al., 2011). Two components of emotional intelligence, self-control and emotion regulation, involve overriding natural human reactions to preferred or more controlled ones. They are strongly correlated to each other and to general behavioral control (Paschke et al., 2016). Emotional intelligence also involves and understanding of emotions in the self and others. A lack of understanding one's emotions can decrease emotional regulation, which can in turn negatively impact some aspects of mental health (Brown et al., 2017).

Social support is a fundamental part of a person's social functioning. Social support is characterized by a reciprocal relationship between at least two people, in which practical help and emotional support are exchanged. It involves practical/tangible support, emotional support, appraisal, and exchange of information, and is based on social network and embeddedness, or strength, of relationships (Langford et al., 1997). Social support is a key component of social relationships, which provide both help and companionship. The size of one's social network, variety within it, and the quality of social support are all important for a person's general health and well-being (Cotten, 2014). Often, people's perceptions of social support received do not perfectly match their actual social support. In a study of social support via social media, people tend to perceive themselves as having a different level of social support than they actually have. Whether perceived or actual support was higher depended upon mental health. Mentally healthy individuals had higher perceived social support than actual, while depressed individuals had higher actual social support than perceived (Park et al., 2016). Though there is little research that the same differences would be present in in-person social support, this study has important implications as the world is becoming more digitalized. Regardless of the differences between perception and reality, a person's perception of social support has a greater impact on their well-being than actual support. In a study of HIV-positive adults, higher perceived social support significantly improved well-being, while actual social support had a minimal impact (McDowell & Serovich, 2007).

Connections

Emotional intelligence and social support have a strong positive correlation. Their relationship can be seen even in young people. In high school students, higher emotional

intelligence is positively correlated with perceived social support. Both general emotional intelligence and specific aspects, such as emotion recognition in self and others, affected social support (Fabio et al., 2011). The direction of their relationship varies by study. One study of Serbian college students found that emotional intelligence increased social support. Emotions and emotion regulation affect how people relate to and understand others, so higher emotional intelligence may improve both quantity and quality of interpersonal interactions and relationships (Metaj-Macula, 2017). Another study, done in Chinese college students, found that in those with experiences of childhood maltreatment, social support mediated between that and emotional intelligence, and emotional intelligence mediated between social support and mental health symptoms. Here, decreased social support due to childhood maltreatment negatively impacts emotional intelligence, rather than the other way around (Zhao et al., 2019). Though cultural differences may explain the different directions between these two variables, it is more likely that the relationship goes both ways. Higher emotional intelligence may improve a person's self-control and understanding of others' emotions, which can help increase their social network and quality of relationships. Higher social support, especially during childhood, may help a person learn how to regulate their emotions and understand the feelings and intentions of others, thus improving their emotional intelligence.

Levels of emotional intelligence and social support impact well-being and mental and physical health outcomes. Emotional intelligence may serve as a protective factor against mental health problems. In college students, emotional intelligence can lessen the impact of stress on mental health outcomes such as depression, hopelessness, and suicidal ideation (Ciarrochi et al., 2002). Those with higher emotional intelligence may be better able to

control their reactions to stress, preventing a spiral into depression or other mental health problems. Emotion regulation has been shown to improve both physical and mental health. In women diagnosed with PTSD, emotion regulation can mediate the relationship between adverse childhood events (ACEs) and depression, PTSD, and physical health problems (Cloitre et al., 2019). Emotion regulation may also impact recovery from mental health conditions. In people with clinical depression, the use of emotion regulation strategies predicted diagnostic status six months later. Those who used two emotion regulation strategies- cognitive reappraisal and reflection- more frequently were more likely to no longer fit the diagnostic criteria of major depressive disorder (Arditte & Joormann, 2011). These studies suggest the possibility that the training of certain emotional regulation strategies may have implications in mental health treatment.

Levels of healthy social relationships and support can impact one's sense of well-being and life satisfaction. In adolescents, perceived social support correlates to higher measures of life satisfaction and lower incidence of depression symptoms (Lopez-Zafra et al., 2019). Social support and social conflict can have opposing, but independent, effects on well-being. Social support has a strong positive correlation with quality of life, while social conflict, whether with or in a group or with one person, has a strong negative correlation with quality of life. Social support and conflict are not strongly correlated to each other, but social support can be protective against the negative effects on well-being from social conflict (Abbey et al., 2010). The correlation between social support and well-being exists across a general population of all ages, but its impact and mediators may be different based on age. Older adults experience more satisfaction with their social network but may be more prone to loneliness from lack of social support than younger individuals. One study found differences

in the impact of social support based on attachment style. In younger adults, traits of anxious attachment had a stronger negative correlation to social support and well-being, while in older adults, avoidant attachment style played a larger role (Kafetsios & Sideridis, 2006).

Purpose of the Study

The current literature shows the individual correlations between childhood maltreatment, emotional intelligence, social support, and disordered eating psychopathology. Childhood maltreatment history correlates to lower emotional intelligence and social support, and higher incidence of disordered eating behaviors and other maladaptive behaviors/coping. Eating disorder patients are shown to have lower levels of emotional intelligence and social support, and a higher likelihood of childhood trauma history. Emotional intelligence and social support are strongly correlated, and both can impact general well-being and severity of disordered eating. Though many studies show the relationships between two or three of these variables, none analyzes all four at once. Studies looking at the possible sequential mediation of emotional intelligence and social support in the relationship between childhood maltreatment and disordered eating behaviors are necessary. To address the current gaps in the research, the purpose of this study is to analyze the relationships between childhood maltreatment, emotional intelligence, social support and disordered eating. The question asked by this study was, "How do emotional intelligence and social support impact the relationship between childhood maltreatment and disordered eating behaviors in college students?" Further questions include:

1. Does childhood maltreatment predict disordered eating?
2. Does childhood maltreatment predict emotional intelligence and social support?
3. Do emotional intelligence and social support predict disordered eating?

4. Do emotional intelligence and social support mediate the pathway between maltreatment and disordered eating?

This study was designed to test a hypothesized sequential mediation model in which emotional intelligence and social support serve as mediators in the pathway between childhood maltreatment and disordered eating.

Method

Participants

Participants (N = 134) were recruited through introductory psychology courses at the University of Northern Colorado during the spring and fall 2023 semesters. Participation was voluntary, and students were given two credits towards the research participation requirements for the courses. The ages of these participants ranged from 18 to 30, with a mean age of 19.66 and standard deviation of 2.563. The sample included 102 (76.1%) females, 29 (21.6%) males, and 3 (2.2%) nonbinary individuals. Participants were given the option to select multiple ethnicities, with 106 identifying as White, 38 as Hispanic/Latino, 5 as Black, 5 as Asian, 3 as Native Hawaiian/Pacific Islander, and 1 as Other. At the time of participation, 77 (57.5%) participants were freshmen, 26 (19.4%) were sophomores, 22 (16.4%) were juniors, and 9 (6.7%) were seniors. 53 (39.6%) of participants identified themselves as first-generation college students. These demographics are mostly consistent with the university's student population.

Measures

Childhood Trauma Questionnaire-Short Form (CTQ-SF)

The CTQ-SF is a self-report measure of childhood abuse and neglect history. It was developed by Bernstein et al. (2003) as a streamlined version of the original CTQ scale created nearly a decade earlier (Bernstein et al., 1994). It consists of 28 questions, scored on a 5-point Likert scale (1 = *never true*, 2 = *rarely true,* 3 = *sometimes true*, 4 = *often true,* 5 = *very often true*). The scale includes 25 questions split evenly across five subscales of maltreatment types: Physical Abuse, Emotional Abuse, Sexual Abuse, Physical Neglect, and Emotional Neglect. There are another three questions designed to test the validity of responses. They relate to a "perfect family" construct, and high scores on these questions is indicative of denial of maltreatment experience, which may impact responses to other questions. Responses of "very often true" to at least two of the three questions fail the validity test, and those responses were excluded from the final sample.

Wong-Law Emotional Intelligence Scale (WLEIS)

The WLEIS is a self-report measure of emotional intelligence. It was developed by Wong and Law (2002) as a short yet more comprehensive scale of general emotional intelligence. It is designed to be used across broad populations, and is often used with college students and in workplace management studies. The scale has 16 questions scored on a seven-point Likert scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *slightly disagree*, 4 = *neither agree nor disagree*, 5 = *slightly agree*, 6 = *agree*, 7 = *strongly agree*). The questions are split into four subscales: Self-emotion Appraisal, Others-emotion appraisal, Use of Emotions, and Regulation of Emotions. Emotional intelligence consists of numerous abilities and a variety of knowledge, so the scale and its subscales were created to be broad, to capture a high-level overview of the respondent's general emotional intelligence.

Difficulties in Emotion Regulation Scale (DERS)

The DERS is a self-report scale measuring emotion regulation problems. It was developed by Gratz and Raimer (2004) to measure difficulties in coping and regulating emotions on a broader level. The scale consists of 36 questions scored with a five-point Likert scale (1 = *almost never,* 2 = *sometimes*, 3 = *about half the time,* 4 = *most of the time,* 5 = *almost always*). The questions contain six subscales: Nonacceptance of Emotional Responses, Difficulties Engaging in Goal-directed Behavior, Impulse Control Difficulties, Lack of Emotional Awareness, Limited Access to Emotion Regulation Strategies, and Lack of Emotional Clarity. Emotion regulation is the broadest component of emotional intelligence, and is particularly significant in looking at mental health disorders that involve maladaptive coping, such as borderline personality disorder or eating disorders. Unlike other scales used in this study, the DERS looks at the lack of an attribute, rather than its presence.

Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS is a self-report measure of perceived levels of social support. It was developed by Zimet et al. (1988) to quantify social support levels of distinct types. The scale consists of 12 questions, scored with a seven-point Likert scale (1 = *very strongly disagree*, 2 = *strongly disagree*, 3 = *mildly disagree*, 4 = *neutral*, 5 = *mildly agree*, 6 = *strongly agree*, 7 = *very strongly agree*). The questions are split into three subscales: Family, Friends, and Significant Other. It is designed to measure the presence of each type of social support, as well as the perceived adequacy of support.

Eating Attitudes Test (EAT-26) Procedures

The EAT-26 is a screening tool measuring disordered eating attitudes and behaviors. It was developed by Garner et al. (1982) to refine the EAT-40 test developed in 1979 (Garner and Garfinkel, 1979). Both versions of the EAT were initially developed for clinical screening purposes, but they are also used frequently in research to measure disordered eating. The tool's main section consists of 26 questions measuring various attitudes, beliefs, and behaviors found among various eating disorders. There are two shorter sections in the questionnaire as well, but for this study only the largest section was used. It has three subscales: Dieting, Bulimia and Food Preoccupation, and Oral Control. The scale typically uses a non-traditional scoring system (0 = *never*, *rarely*, *sometimes*, 1 = *often*, 2 = *usually*, 3 = *always*) in clinical settings. However, the questions were scored using a 6-point Likert scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *usually*, 6 = *always*) for use in this study.

Procedures

Researchers administered a set of self-report questionnaires through the online platform *Qualtrics*. Participants were recruited through introductory psychology courses. They signed up for the study through the university's SONA platform, where they were given a description of the study and the link to participate remotely. After giving informed consent, participants filled out demographic information and completed the *CTQ*, *WLEIS*, *DERS*, *MSPSS*, and *EAT-26* scales. At the end of the survey was a debriefing containing more information about the study and data being collected, as well as links to mental health support and other resources. Estimated time of completion was 30-45 minutes, and participants were given 2 research credits to fulfill the research participation requirement of

their psychology course. Participation was entirely anonymous, and each response was assigned a number for confidentiality.

Data was analyzed using SPSS 29.0.1 to look at how the variables correlate and impact or predict other variables. Relationships between the total scales and subscales of the *CTQ*, *WLEIS*, *DERS*, *MSPSS*, and *EAT-26* were examined using bivariate correlation. These correlations were used to determine what scales and subscales could potentially fit the hypothesized model. These scales and subscales were then analyzed using Hays PROCESS 4.0 to determine if any subscales of emotional intelligence/emotion regulation and social support mediated the pathway from childhood maltreatment and disordered eating patterns.

Results

The following analysis includes descriptive statistics of the five measures, and the correlations between childhood maltreatment, different measures/aspects of emotional intelligence, social support, and disordered eating. Significant correlations between scales and subscales were then used for mediation analysis to determine the role of emotional intelligence and social support in mediating between childhood maltreatment and disordered eating.

Descriptive Statistics

As a traditional Likert scale was used to score the EAT-26 over its usual scoring system, analysis of the instrument's descriptives is necessary to complete before using it for further analysis. The scale's range in this study is 26-156, as opposed to the usual 0-78. Each subscale is looked at based on averages, as the subscales are not of equal size, so their ranges are each 1-6. The scoring values are not one-to-one from the original scoring, so algebraic

comparison is more difficult; however, means should be relatively lower on the range, and standard deviations not a substantial fraction of the range. All three subscales' means were in a range of 1.9-2.5, with standard deviations less than 1.1. The total EAT-26 score mean was also relatively low (M = 59.1395, S.D. = 19.89926), with a range of 30-117.

The means, standard deviations, and minimum and maximum values for the CTQ-SF, WLEIS, MSPSS, EAT-26, and DERS scores and their subscales are shown in Table 1. Note that the subscales for the EAT-26 and DERS are based on each respondent's average response for questions in each subscale, as the subscales in those measures are not equal sizes. No substantial gender differences between scores were found. Minor gender differences were found in EAT-26 total scores (sig. = .029, but the differences were determined small enough to not look at gender differences further.

Table 1. Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Emotional Abuse	5	25	11.9699	5.93518
Physical Abuse	5	25	7.1194	4.02071
Sexual Abuse	5	25	6.5746	3.89211
Emotional Neglect	5	25	10.9925	4.79112
Physical Neglect	5	18	7.5075	3.20419
CTQ Total	25	113	44.1353	16.69412
Self-Emotion Appraisal	9	28	20.3955	4.31298
Regulation of Emotions	7	28	21.6119	4.01671
Use of Emotions	4	28	20.6194	5.31107
Others-Emotion Appraisal	8	28	20.2331	4.42597
WLEIS Total	52	108	82.7895	12.39505
Significant Other	4	28	23.1053	5.88947
Family	4	28	20.9627	5.83019
Friends	4	28	21.6767	5.51657
MSPSS Total	16	84	65.5909	13.32847
Dieting	1.08	5.62	2.4822	1.00411
Bulimia/Food Preoccupation	1	5.83	1.9289	0.90302

Oral Control	1	4.29	2.1802	0.75713
EAT-26 Total	30	117	59.1395	19.89926
Nonacceptance	1	4.83	2.5896	1.07647
Goal directed behavior	1	5	3.0556	0.99281
Impulse Control	1	4.5	1.7904	0.62552
Emotional Awareness	1	5	2.6742	0.89397
Regulation Strategies	1	4.13	2.3225	0.80667
Emotional Clarity	1	5	2.3537	0.80147
DERS Total	38	140	87.8	22.76792

Correlations between Maltreatment and Disordered Eating

A Pearson one-tailed correlation analysis was conducted between childhood maltreatment, measured by the CTQ-SF, and disordered eating patterns, measured by the EAT-26, to determine their association. Correlations can be found in Table 2. Emotional abuse and CTQ total score (overall maltreatment) were found to be significantly positively correlated with disordered eating. Emotional abuse was found to be correlated to all disordered eating subscales and total score, with the strongest correlation found between emotional abuse and EAT-26 total score, $r(126) = .327$, $p < .001$. Total maltreatment scores were found to be positively correlated with dieting and total disordered eating, with the stronger correlation between the total scores, $r(126) = .239$, $p = .003$. Physical and sexual abuse showed some weaker correlation to disordered eating (at $p < .05$, $p > .01$), while neglect of any type was not significantly correlated to disordered eating patterns.

Table 2. Correlations of CTQ-SF and EAT-26

	Dieting	Bulimia/Food Preoccupation	Oral Control	EAT-26 Total
Emotional Abuse	**.284****	**.269****	**.235****	**.327****
Physical Abuse	.159*	0.109	0.041	.150*
Sexual Abuse	.143*	0.039	0.065	0.124

Emotional Neglect	0.11	0.07	0.108	0.127
Physical Neglect	0.08	0.059	0.128	0.108
CTQ Total	**.219****	.165*	.166*	**.239****

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Correlations between Maltreatment and Emotional Intelligence

Correlation analysis between childhood maltreatment, measured with the CTQ-SF, and emotional intelligence, measured by the WLEIS, showed little correlation. Between the five subscales of the CTQ, four subscales of the WLEIS, and total scores of both, only four pairs of variables were found to have significant correlation at the p <.05 level: emotional abuse and use of emotions, $r(131) = -.189$, $p = .015$, emotional neglect and use of emotions, $r(132) = -.161$, $p = .031$, physical abuse and regulation of emotions, $r(132) = .154$, $p = .038$, and physical abuse and total emotional intelligence, $r(131) = .172$, $p = .024$. No correlations at the $p < .01$ level were found, so the WLEIS was not used for any further analysis.

Correlation analysis between the CTQ and emotion dysregulation, measured with the DERS, shows stronger and more significant correlation than with general emotional intelligence. These correlations are shown in Table 3. Emotional abuse, sexual abuse, emotional neglect, and total maltreatment scores were found to be positively correlated to several subscales of emotion dysregulation and total DERS. The strongest correlation was found between sexual abuse and nonacceptance, $r(130) = .320$, $p < .001$. Sexual abuse was also correlated to dysregulation total score. Emotional abuse was correlated to nonacceptance, lack of regulation strategies, and total dysregulation, with the strongest correlations found between emotional abuse and nonacceptance, $r(129) = .300$, $p < .001$, and emotional abuse and lack of regulation strategies, $r(128) = .296$, $p < .001$. Emotional neglect

was found to be correlated with nonacceptance, $r(130) = .273$, $p < .001$. Total maltreatment score was found to be correlated with nonacceptance and lack of regulation strategies, with the stronger correlation between total maltreatment and nonacceptance, $r(129) = .283$, $p < .001$.

Table 3. Correlations of CTQ-SF and DERS

	Nonacceptance	Goal directed behavior	Impulse Control	Emotional Awareness	Regulation Strategies	Emotional Clarity	DERS Total
Emotional Abuse	**.300****	0.109	.156*	-0.003	**.296****	.160*	**.257****
Physical Abuse	-0.019	-0.117	-0.107	-0.038	0.019	-0.1	-0.067
Sexual Abuse	**.320****	0.039	.150*	0.031	.198*	0.077	**.205****
Emotional Neglect	**.273****	0.007	0.03	0.141	.176*	.143*	.201*
Physical Neglect	.145*	0.031	-0.004	0.076	0.084	.170*	0.126
CTQ Total	**.283****	0.028	0.072	0.051	**.222****	0.123	.204*

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Correlations between Maltreatment and Social Support

Correlation analysis between childhood maltreatment and perceived social support, as measured by the MSPSS, showed significant negative correlations between several types of maltreatment and realms of social support. Correlations are shown in Table 4. Emotional neglect was found to be correlated to all subscales and total social support, with the strongest correlation found between emotional neglect and family support, $r(132) = -.559$, $p < .001$. Emotional abuse, physical abuse, physical neglect, and total maltreatment scores were found to be correlated to family and total perceived social support, with stronger negative correlations to family support than total perceived social support. The strongest correlations were between emotional abuse and family support, and total maltreatment and family

support, with equal correlations of $r(131) = -.436$, $p < .001$. The only maltreatment scale not associated with social support was physical abuse.

Table 4. Correlations of CTQ-SF and MSPSS

	Significant Other	Family	Friends	MSPSS Total
Emotional Abuse	-0.095	**-.436****	-0.131	**-.283****
Physical Abuse	-0.126	**-.253****	-.149*	**-.223****
Sexual Abuse	0.058	0.002	0.106	0.075
Emotional Neglect	**-.281****	**-.559****	**-.216****	**-.457****
Physical Neglect	-0.077	**-.295****	-0.088	**-.205****
CTQ Total	-.145*	**-.436****	-0.139	**-.308****

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Correlations between Emotional Intelligence and Social Support

Because general emotional intelligence, measured with the WLEIS, was not correlated with maltreatment, correlation between the WLEIS and MSPSS was not looked at; instead, the DERS was substituted for the WLEIS, as emotion regulation is a major part of emotional intelligence, to determine the correlations of emotion dysregulation and social support. Correlation analysis between emotion dysregulation and perceived social support showed significant negative correlation between several subscales of dysregulation and all types of support. Lack of emotional awareness was correlated to all social support scores, with the strongest correlation between lack of awareness and total perceived social support, $r(129) = -.324$, $p < .001$. Lack of emotional clarity and total emotion dysregulation were correlated with family and total perceived social support, with the strongest correlation found between lack of emotional clarity and family support, $r(132) = -.326$, $p < .001$. Lack of regulation strategies was correlated with family support, $r(129) = -.266$, $p = .001$.

Table 5. Correlations of DERS and MSPSS

	Significant Other	Family	Friends	MSPSS Total
Nonacceptance	-0.034	-.174*	-0.082	-0.117
Goal directed behavior	.168*	-0.138	0.047	0.041
Impulse Control	0.00	-0.056	-0.066	-0.043
Emotional Awareness	**-.221****	**-.309****	**-.240****	**-.324****
Regulation Strategies	-0.035	**-.266****	-.164*	-.190*
Emotional Clarity	-0.076	**-.326****	-.165*	**-.236****
DERS Total	-0.055	**-.307****	-.162*	**-.215****

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Correlations between Emotional Intelligence and Disordered Eating

As with correlations between the DERS and other variables, emotion dysregulation scores are being used in place of general emotional intelligence. Correlation analysis between emotion dysregulation and disordered eating patterns shows significant positive correlations between several subscales and total dysregulation and all scales of disordered eating. Correlations are shown in Table 6. Nonacceptance, lack of regulation strategies, and total dysregulation were correlated with all subscales and total disordered eating. Correlation was stronger with total disordered eating scores than with the subscales, with the strongest correlations between lack of regulation strategies and total disordered eating, $r(124) = .412$, $p < .001$, and total dysregulation and total disordered eating, $r(123) = .399$, $p < .001$. Lack of emotional clarity was correlated with dieting, bulimia/food preoccupation, and total disordered eating, and lack of goal directed behavior was correlated with oral control and total disordered eating, with the strongest correlation between lack of clarity and bulimia/preoccupation, $r(127) = .310$, $p < .001$.

Table 6. Correlations of DERS and EAT-26

	Dieting	Bulimia/Food Preoccupation	Oral Control	EAT-26 Total
Nonacceptance	**.255****	**.259****	**.228****	**.313****
Goal directed behavior	.189*	0.132	**.287****	**.263****
Impulse Control	.148*	.186*	.169*	.190*
Emotional Awareness	.151*	0.131	0.04	.153*
Regulation Strategies	**.343****	**.294****	**.331****	**.412****
Emotional Clarity	**.268****	**.310****	0.124	**.308****
DERS Total	**.332****	**.317****	**.284****	**.399****

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Correlations between Social Support and Disordered Eating

Correlation analysis between perceived social support and disordered eating patterns shows negative correlations between several subscales and the total scores. At the $p < .01$ level, the only significant correlation is between total perceived social support and bulimia/food preoccupation, $r(125) = -.211$, $p = .009$. At the $p < .05$ level, family, friend, and total perceived social support are all correlated with dieting, bulimia/food preoccupation, and total disordered eating. The strongest correlation (after what was present at the $p < .01$ level) was found between family support and total disordered eating, $r(127) = -.187$, $p = .017$. The correlations between these two variables are weaker than correlations between other pairs of variables, and most the significant correlations are only significant at $p < .05$, not $p < .01$.

Table 7. Correlations of MSPSS and EAT-26

	Dieting	Bulimia/Food Preoccupation	Oral Control	EAT-26 Total
Significant Other	-0.09	-0.095	0.097	-0.048
Family	-.146*	-.177*	-0.1	-.187*
Friends	-.158*	-.175*	-0.067	-.166*
MSPSS Total	-.171*	**-.211****	-0.02	-.175*

* Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Maltreatment to Disordered Eating: Emotional Intelligence and Social Support as Mediators

To determine if emotional intelligence and social support acted as mediators between maltreatment and disordered eating, all subscales of the variables were looked at. Potential pathways were drawn from correlations between the CTQ (predictor) and DERS (first mediator), DERS and MSPSS (second mediator), MSPSS and EAT-26 (outcome), and the CTQ-SF and EAT-26 to test for a sequential mediation model. Subscales utilized in the mediation analysis include CTQ emotional abuse and total, DERS nonacceptance and lack of regulation strategies, MSPSS family support and total, and EAT-26 bulimia/preoccupation and total. Each mediation analysis was completed using the Hays Process module in SPSS, and direct and indirect effects were looked at between four sets of four subscales.

First, pathways between CTQ total and EAT-26 total were examined. DERS regulation strategies and MSPSS total were used as potential mediators. Without the mediators in the model, the pathway between CTQ total and EAT-26 total was significant, $b = .2919$, $t = 2.7809$, $p = .0063$. With DERS strategies and MSPSS total added as mediators, the pathway between CTQ total and EAT-26 total became nonsignificant, indicating

significant mediation (b = .1820, t = 1.7707, p = .0792). The pathways between CTQ total and DERS strategies, and of DERS strategies and EAT-26, were both found to be significant (p = .0231, .0000), but the pathways between DERS strategies and MSPSS total, and of MSPSS total and EAT-26 total, were not significant (p = .1582, .4250). Thus, DERS strategies acted as a mediator, while MSPSS total did not. The indirect effect of DERS strategies was b = .0885, LLCI ULCI [.0099, .1923], which fully mediated the pathway between CTQ total and EAT-26 total. (shown in Figure 1)

Next, the pathways between CTQ emotional abuse and EAT-26 total were examined. Two pairs of potential mediators were identified: DERS nonacceptance and MSPSS family support, and DERS lack of strategies and MSPSS family support. For the first model, the pathway between CTQ emotional abuse and EAT-26 total without mediators was significant, b = 1.0812, t(126) = 3.8473, p = .0002. With DERS nonacceptance and MSPSS family support added as mediators, the pathway between CTQ emotional abuse and EAT-26 total became weaker but remained significant, b = .7795, t = 2.4900, p = .0141. The pathways between CTQ emotional abuse and DERS nonacceptance, and between DERS nonacceptance and EAT-26 total, were significant (p = .0008, .0142), but the pathways between DERS nonacceptance and MSPSS family support, and between MSPSS family support and EAT-26 total, were not significant (p = .5503, .4815). The indirect effect of DERS nonacceptance was b = .2127, LLCI ULCI [.0174, .5017], which partially mediated the pathway between CTQ emotional abuse and EAT-26 total. (shown in Figure 2)

For the second model between CTQ emotional abuse and EAT-26 total, the pathway between these two variables without mediators was once again significant, b = 1.0667, t(125) = 3.7698, p = .0003. With DERS lack of strategies and MSPSS family support added as

mediators, the pathway between CTQ emotional abuse and EAT-26 total became weaker yet remained significant, b = .7274, t = 2.4229, p = .0169. The pathways between CTQ emotional abuse and DERS strategies, and between DERS strategies and EAT-26 total, were significant (p = .0012, .0002), but the pathways between DERS strategies and MSPSS family support, and between MSPSS family support and EAT-26 total, were not significant (p = .0728, .8354). The indirect effect of DERS strategies was b = .3141, LLCI ULCI [.0998, .5881], which partially mediated the pathway between CTQ emotional abuse and EAT-26 total. (shown in Figure 3)

Finally, the pathways between CTQ emotional abuse and EAT-26 bulimia/food preoccupation (BFP) were examined. DERS total and MSPSS total were identified as potential mediators. The pathway between CTQ emotional abuse and EAT-26 BFP without mediators was significant, b = .0421, t = 3.2218, p = .0016. With DERS total and MSPSS total added as mediators, the pathway between CTQ emotional abuse and EAT-26 BFP became weaker yet was still significant, b = .0278, t = 2.1377, p = .0346. The pathways between CTQ emotional abuse and DERS total, and between DERS total and EAT-26 BFP, were significant (p = .0110, .0008), while the pathways between DERS total and MSPSS total, and between MSPSS total and EAT-26 BFP, were not significant (p = .1059, .1713). The indirect effect of DERS total was b = .0101, LLCI ULCI [.0016, .0208], which partially mediated the pathway between CTQ emotional abuse and EAT-26 BFP. (shown in Figure 4) Of note with this model is that although the pathways are significant, they are notably weaker than those of the other three models.

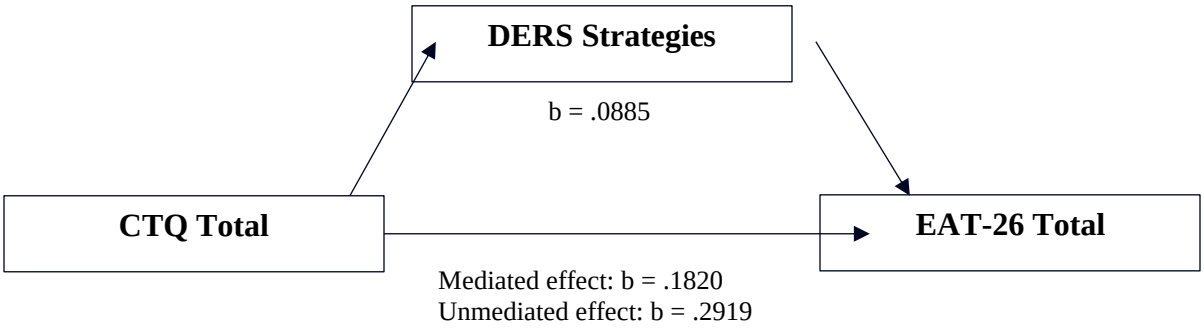

Figure 1. DERS Strategies mediates the relationship between CTQ total and EAT-26 total.

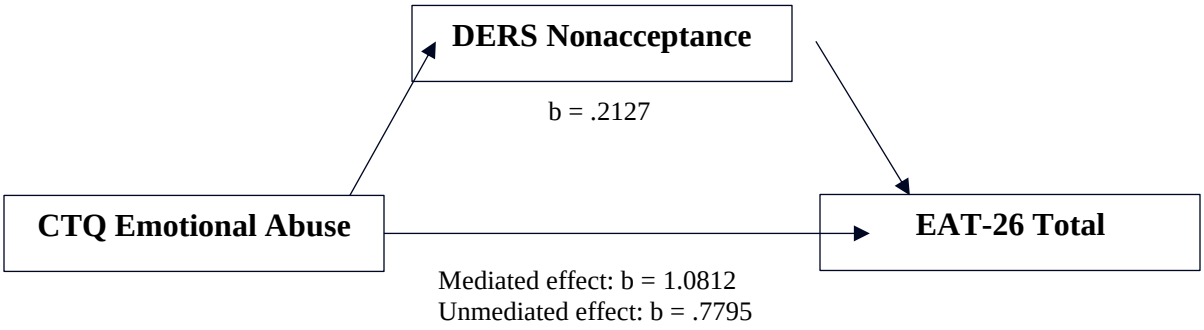

Figure 2. DERS Nonacceptance partially mediates the relationship between CTQ total and EAT-26 total.

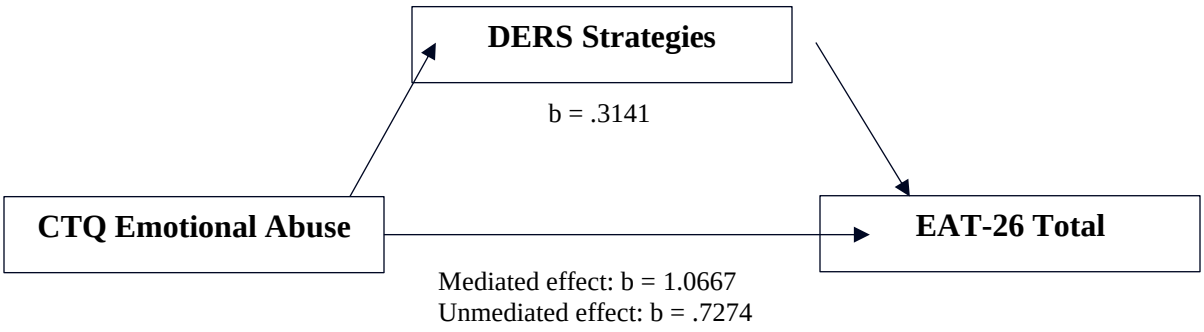

Figure 3. DERS Strategies partially mediates the relationship between CTQ emotional abuse and EAT-26 total.

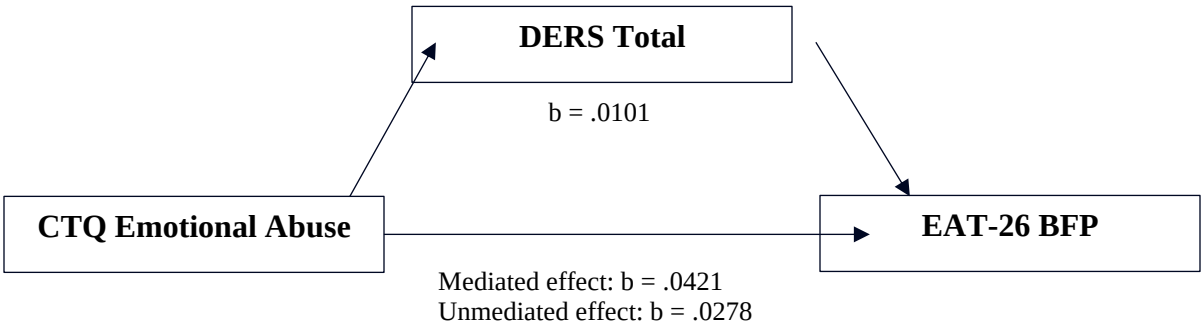

Figure 4. DERS total partially mediates the relationship between CTQ emotional abuse and EAT-26 bulimia/food preoccupation (BFP).

Discussion

The purpose of this study was to examine the mediating roles of emotional intelligence and social support on the relationship between childhood maltreatment and disordered eating patterns. Previous research suggests that childhood maltreatment predicts disordered eating patterns (Armour et al., 2016; Groth et al., 2019; Monteleone et al., 2019), and this relationship may have numerous mediators, such as emotional intelligence (including emotion regulation) and social support (Cloitre et al., 2019; Racine & Wildes, 2013; Tiller et al., 1997). However, no previous research looked at multiple mediators acting at once, prompting the design of this study. A sequential mediation model was hypothesized, in which childhood maltreatment predicted emotional intelligence, which predicted perceived social support, which predicted disordered eating patterns. In this model, it was hypothesized that childhood maltreatment predicts disordered eating, and emotional intelligence and social support both mediate the relationship between childhood maltreatment and disordered eating.

As hypothesized, childhood maltreatment predicted disordered eating patterns. All three types of abuse and total maltreatment scores were significantly positively correlated to disordered eating, with emotional abuse and total maltreatment having the strongest correlations. Both emotional abuse and total maltreatment predicted disordered eating patterns. These findings are consistent with previous research (Armour et al., 2016; Monteleone et al., 2019; Rai et al., 2019). It is unusual that physical neglect was not significantly correlated with disordered eating, as previous research shows that those with eating disorders have a high rate of childhood physical neglect (Pignatelli et al., 2016). It is likely that other factors may be mitigating the relationship of physical neglect on disordered eating in this study, particularly as they relate to college students, such as access to strong social networks or a greater focus on school.

Childhood maltreatment was not correlated to general emotional intelligence. There are several possible reasons for this. First, while some research shows correlation between childhood maltreatment and the WLEIS measure of emotional intelligence used in this study (Zhao et al., 2019), a larger quantity of research focuses on emotion regulation specifically. Childhood maltreatment was correlated with the more well-established DERS measure of emotion regulation, indicating that aspects of emotion regulation may be more significant than general emotional intelligence, and that the DERS is a more effective tool than the WLEIS. The lack of correlation with emotional intelligence may also be due to demographics. The participants were predominantly young adults ages 18-21, and about three quarters female, which could affect emotional intelligence scores. A different cohort, with a wider age range and more balanced gender ratios, may show greater correlation between the two variables. Because of the lack of correlation, the DERS measure of emotion

regulation was used in place of the WLEIS in mediation analysis. Childhood maltreatment, particularly emotional abuse and total maltreatment, were correlated with several types of emotion regulation difficulties. Both total maltreatment and emotional abuse predicted emotion regulation difficulties. This relationship is consistent with previous research (Han & Pistole, 2013; Racine & Wildes, 2013; 2015, Rai et al., 2019).

Emotion regulation was also correlated to perceived social support. However, neither variable predicted the other. Furthermore, perceived social support was correlated to disordered eating, but it did not predict eating patterns. The lack of impact on or of social support may be the result of the participants. The study was completed using American college students in Colorado. The United States is a very individualistic culture, which may lead to social support having a weaker relationship to emotion regulation (and other metrics of emotional intelligence) than in a more collectivist culture. One study done with college students in China, looking at general emotional intelligence and social support, found social support predicted emotional intelligence (Zhao et al., 2019). The same individualistic culture also may explain why social support did not play a role in disordered eating.

Though not part of the hypothesized model, the relationships between childhood maltreatment and social support, and between emotion dysregulation and disordered eating, were examined due to support in the literature. Childhood maltreatment was correlated to perceived social support. Most types of maltreatment were strongly negatively correlated with family and general social support. Total maltreatment and emotional intelligence were found to predict perceived social support. This is supported by the literature (Pepin & Banyard, 2006, Zhao et al., 2019), and is to be expected in the context of who perpetrates the abuse and neglect. The perpetrator is usually related to the victim, whether it is a parent or

grandparent, sibling, or another close relative. Those who experienced childhood maltreatment at the hands of a relative are likely to distance themselves from that person. In some families, distancing from one relative may require distancing from other relatives as well, leaving the person estranged from their family. Thus, those with maltreatment history would have significantly decreased family support.

Emotion regulation difficulties, particularly nonacceptance and lack of strategies, was correlated to disordered eating patterns. Emotion regulation difficulties also predicted disordered eating. This is consistent with previous research (Brown et al., 2018; Monell et al., 2018; Trompeter et al., 2021). Emotion regulation was also correlated to perceived social support. However, neither variable predicted the other. Furthermore, perceived social support was correlated to disordered eating, but it did not predict eating patterns. The lack of impact on or of social support may be the result of the participants. The study was completed using American college students in Colorado. The United States is a very individualistic culture, which may lead to social support having a weaker relationship to emotion regulation (and other metrics of emotional intelligence) than in a more collectivist culture. One study done with college students in China, looking at general emotional intelligence and social support, found social support predicted emotional intelligence (Zhao et al., 2019). The same individualistic culture also may explain why social support did not play a role in disordered eating.

The mediation models showed that emotion regulation acted as a mediator between childhood maltreatment and disordered eating patterns, but did not mediate between childhood maltreatment and perceived social support. Additionally, social support did not mediate the relationships between any other variables. The role of emotion regulation in the

pathway between maltreatment and disordered eating is consistent with previous research (Cloitre et al., 2019; Racine & Wildes, 2015; Rai et al., 2019). Disordered eating and eating disorders, contrary to the popular belief that they are solely appearance based, often develop as an unhealthy means of coping with any negative aspects of life, such as childhood maltreatment and other trauma. When someone feels out of control and has no better way to regulate, they may turn to food and unhealthy eating patterns to regain a sense of control or numb their emotions. In this way, difficulties in healthy emotion regulation leads to unhealthy attempts at emotion regulation, and emotion regulation skills may mitigate the effects of trauma in disordered eating. Social support not acting as a mediator in any pathway is to be expected, given that it did not predict any other variable. A different measure of social support may produce a different result. The measure used in this study looks at perceived social support. Perception is subjective, so one person's idea of adequate support may be noticeably more or less than another's, or may change based on circumstances. Perceived and actual support levels may vary, so a measure of actual support may mediate where perceived social support does not. One previous study by Tiller et al. showed that though actual social support was universally lower among eating disorder patients, perception of that support varied by disorder (1998). Further research is needed to look at the roles of actual versus perceived support in the pathway between childhood maltreatment and disordered eating.

Limitations

This study has several limitations. First, the study was conducted at a single college in Colorado, with only 134 valid responses composed of students from psychology courses. This participant pool was approximately three quarters female-identifying students, and was

predominantly White and Hispanic. Thus, certain populations may be underrepresented in this study. The age was restricted to 18-30 years, so the findings may not apply to a different age cohort. Second, the data was collected through anonymous self-report surveys, through which participants may over- or under-represent maltreatment, emotional intelligence and emotion regulation capabilities, and disordered eating behaviors. The sensitive nature of the topics may impact responses as well. Also, disordered eating and eating disorders may have an element of denial, which can lead to under-reporting. While measures of denial can be accounted for in maltreatment, it is harder to factor in with disordered eating. All measures used are considered to have high validity, but the possibility of over or under reporting is still important to consider. Finally, participants may self-select for the survey based on prior information given, which may also have some impact on results.

Implications and Directions of Further Research

This study has several implications. First, it further highlights the role of emotion dysregulation in the development of disordered eating symptoms among those with childhood maltreatment history. Eating disorders and even subclinical disordered eating behaviors can quickly become deadly, and eating disorders have a low recovery rate, even after several decades. The role of emotion dysregulation indicates that a greater emphasis on emotion regulation skills is important in treating disordered eating symptoms. Second, it suggests that perceived social support may not play a role in the development of disordered eating patterns in certain cohorts of those with maltreatment history. Further study is needed with more diverse groups to determine when perceived social support does or does not impact eating patterns. Finally, emotion regulation partially mediated between emotional

abuse and disordered eating, indicating that other mediators are likely present that were not looked at in this study.

Replication of the study with a larger, more diverse sample may help confirm findings. Given the lack of correlations with the emotional intelligence scale used, an alternative emotional intelligence scale should be considered in future studies. Another consideration is looking at actual social support, rather than perceived, as their influences may be different. Also, other mediators should be considered, such as other mental health symptoms or food insecurity. Finally, moderation of the maltreatment to disordered eating, with respect to emotional intelligence and social support, to look at the potential role they may play outside of mediation.

This study offers further support to the mediation effect of emotion regulation on the pathway between childhood maltreatment and disordered eating. It also suggests that perceived social support, though predicted by childhood maltreatment, does not necessarily play a significant role in the pathway. By looking at these pathways, this study adds to the current understanding of the complex etiology of disordered eating in those who experienced childhood maltreatment.

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Appendix A

Childhood Trauma Questionnaire (CTQ)

(1=Never True, 2=Rarely True, 3=Sometimes True, 4=Often True, 5=Very Often True)

When I was growing up…

1. I didn't have enough to eat.
2. I knew that there was someone to take care of me and protect me.
3. People in my family called me things like "stupid," "lazy," or "ugly."
4. My parents were too drunk or high to take care of the family.
5. There was someone in my family who helped me feel that I was important or special.
6. I had to wear dirty clothes.
7. I felt loved.
8. I thought that my parents wished I had never been born.
9. I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.
10. There was nothing I wanted to change about my family.
11. People in my family hit me so hard that it left me with bruises or marks.
12. I was punished with a belt, a board, a cord, or some other hard object.
13. People in my family looked out for each other.
14. People in my family said hurtful or insulting things to me.
15. I believe that I was physically abused.
16. I had the perfect childhood.
17. I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor.
18. I felt that someone in my family hated me.
19. People in my family felt close to each other.
20. Someone tried to touch me in a sexual way, or tried to make me touch them.
21. Someone threatened to hurt me or tell lies about me unless I did something sexual with them.
22. I had the best family in the world.
23. Someone tried to make me do sexual things or watch sexual things.
24. Someone molested me.
25. I believe that I was emotionally abused.
26. There was someone to take me to the doctor if I needed it.
27. I believe that I was sexually abused.
28. My family was a source of strength and support.

Appendix B

Difficulties in Emotion Regulation Scale (DERS)

(1=Almost Never, 2=Sometimes, 3=About Half the Time, 4=Most of the Time, 5=Always)

1. I am clear about my feelings.
2. I pay attention to how I feel.
3. I experience my emotions as overwhelming and out of control.
4. I have no idea how I am feeling.
5. I have difficulty making sense out of my feelings.
6. I am attentive to my feelings
7. I know exactly how I am feeling.
8. I care about what I am feeling.
9. I am confused about how I feel.
10. When I am upset, I acknowledge my emotions.
11. When I am upset, I become angry with myself for feeling that way.
12. When I am upset, I become embarrassed for feeling that way.
13. When I am upset, I have difficulty getting work done.
14. When I am upset, I become out of control.
15. When I am upset, I believe that I will remain that way for a long time.
16. When I am upset, I believe that I will end up feeling very depressed.
17. When I am upset, I believe that my feelings are valid and important.
18. When I am upset, I have difficulty focusing on other things.
19. When I am upset, I feel out of control.
20. When I am upset, I can still get things done.
21. When I am upset, I feel ashamed at myself for feeling that way.
22. When I am upset, I know that I can find a way to eventually feel better.
23. When I am upset, I feel like I am weak.
24. When I am upset, I feel like I can remain in control of my behaviors.
25. When I am upset, I feel guilty for feeling that way.
26. When I am upset, I have difficulty concentrating.
27. When I am upset, I have difficulty controlling my behaviors.
28. When I am upset, I believe there is nothing I can do to make myself feel better.
29. When I am upset, I become irritated at myself for feeling that way.
30. When I am upset, I start to feel very bad at myself.
31. When I am upset, I believe that wallowing in it is all I can do.
32. When I am upset, I lose control over my behavior.
33. When I am upset, I have difficulty thinking about anything else.
34. When I am upset, I take time to figure out what I'm really feeling.
35. When I am upset, it takes me a long time to feel better.
36. When I am upset, my emotions feel overwhelming.

Subscale Scoring:

1. Nonacceptance of emotional responses (NONACCEPT): 11, 12, 21, 23, 25, 29
2. Difficulty engaging in Goal-directed behavior (GOALS): 13, 18, 20R, 26, 33

3. Impulse control difficulties (IMPULSE): 3, 14, 19, 24R, 27, 32
4. Lack of emotional awareness (AWARENESS): 2R, 6R, 8R, 10R, 17R, 34R
5. Limited access to emotion regulation strategies (STRATEGIES): 15, 16, 22R, 28, 30, 31, 35, 36
6. Lack of emotional clarity (CLARITY): 1R, 4, 5, 7R, 9
Total score: sum of all subscales
**"R" indicates reverse scored item

Appendix C

Wong and Law Emotional Intelligence Scale (WLEIS)

(1=Strongly Disagree, 2=Disagree, 3=Slightly Disagree, 4=Neither Agree nor Disagree,

5=Slightly Agree, 6=Agree, 7=Strongly Agree)

1. I have a good sense of why I feel certain feelings most of the time.
2. I have a good understanding of my own emotions.
3. I really understand what I feel.
4. I always know whether I am happy or not.
5. I always know my friends' emotions from their behavior.
6. I am a good observer of others' emotions.
7. I am sensitive to the feelings and emotions of others.
8. I have a good understanding of the emotions of people around me.
9. I always set goals for myself and then try my best to achieve them.
10. I always tell myself I am a competent person.
11. I am a self-motivating person.
12. I would always encourage myself to try my best.
13. I am able to control my temper so that I can handle difficulties rationally.
14. I am quite capable of controlling my own emotions.
15. I can always calm down quickly when I am very angry.
16. I have good control of my emotions.

Subscale Scoring:

Total Emotional Intelligence = Average items 1-16.
Total Self-emotions appraisal = Average items 1-4.
Total Others-Emotion Appraisal = Average items 5-8.
Total Use of Emotion = Average items 9-12.
Total Regulation of Emotions = Average items 13-16.

Appendix D

Multidimensional Scale of Perceived Social Support (MSPSS)

(1=Very Strongly Disagree, 2= Strongly Disagree, 3=Mildly Disagree, 4=Neutral, 5=Mildly Agree, 6= Strongly Agree, 7=Very Strongly Agree)

1. There is a special person who is around when I am in need.
2. There is a special person with whom I can share my joys and sorrows.
3. My family really tries to help me.
4. I get the emotional help and support I need from my family.
5. I have a special person who is a real source of comfort to me.
6. My friends really try to help me.
7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and sorrows.
10. There is a special person in my life who cares about my feelings.
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

Subscale Scoring:

Family: 3, 4, 8, 11
Friends: 6, 7, 9, 12
Significant Other: 1, 2, 5, 10

Appendix E

Eating Attitudes Test (EAT-26)

Part B: (1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Usually, 6=Always)

1. Am terrified about being overweight.
2. Avoid eating when I am hungry.
3. Find myself preoccupied with food.
4. Have gone on eating binges where I feel that I may not be able to stop.
5. Cut my food into small pieces.
6. Aware of the calorie content of foods that I eat.
7. Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.)
8. Feel that others would prefer if I ate more.
9. Vomit after I have eaten.
10. Feel extremely guilty after eating.
11. Am preoccupied with a desire to be thinner.
12. Think about burning up calories when I exercise.
13. Other people think that I am too thin.
14. Am preoccupied with the thought of having fat on my body.
15. Take longer than others to eat my meals.
16. Avoid foods with sugar in them.
17. Eat diet foods.
18. Feel that food controls my life.
19. Display self-control around food.
20. Feel that others pressure me to eat.
21. Give too much time and thought to food.
22. Feel uncomfortable after eating sweets.
23. Engage in dieting behavior.
24. Like my stomach to be empty.
25. Have the impulse to vomit after meals.
26. Enjoy trying new rich foods.

Subscale Scoring:

Dieting: 1, 6, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24, 26
Bulimia & Food Preoccupation: 3, 4, 9, 18, 21, 25
Oral Control: 2, 5, 8, 13, 15, 19, 20

Part C: (1=Never, 2=Once a month or less, 3=2-3 times a month, 4=Once a week, 5=2-6 time a week, 6=Once a day or more)

A. Gone on eating binges where you feel that you may not be able to stop?
B. Ever made yourself sick (vomited) to control your weight or shape?
C. Ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?
D. Exercised more than 60 minutes a day to lose or to control your weight?
E. Lost 20 pounds or more in the past 6 months (1=No, 2=Yes)

Appendix F

Institutional Review Board Exempt Letter

UNIVERSITY OF
NORTHERN COLORADO
Institutional Review Board

Date:	02/01/2023
Principal Investigator:	Marilyn Welsh
Committee Action:	**IRB EXEMPT DETERMINATION – New Protocol**
Action Date:	02/01/2023
Protocol Number:	2301047190
Protocol Title:	Stressful Childhood Experiences, Social-Emotional Functioning, and Eating Behaviors
Expiration Date:	

The University of Northern Colorado Institutional Review Board has reviewed your protocol and determined your project to be exempt under 45 CFR 46.104(d)(701) (702) for research involving

Category 1 (2018): RESEARCH CONDUCTED IN EDUCATIONAL SETTINGS. Research, conducted in established or commonly accepted educational settings, that specifically involves normal educational practices that are not likely to adversely impact students' opportunity to learn required educational content or the assessment of educators who provide instruction. This includes most research on regular and special education instructional strategies, and research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

Category 2 (2018): EDUCATIONAL TESTS, SURVEYS, INTERVIEWS, OR OBSERVATIONS OF PUBLIC BEHAVIOR. Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or (iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 45 CFR 46.111(a)(7).

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UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

You may begin conducting your research as outlined in your protocol. Your study does not require further review from the IRB, unless changes need to be made to your approved protocol.

As the Principal Investigator (PI), you are still responsible for contacting the UNC IRB office if and when:

- You wish to deviate from the described protocol and would like to formally submit a modification request. Prior IRB approval must be obtained before any changes can be implemented (except to eliminate an immediate hazard to research participants).
- You make changes to the research personnel working on this study (add or drop research staff on this protocol).
- At the end of the study or before you leave The University of Northern Colorado and are no longer a student or employee, to request your protocol be closed. *You cannot continue to reference UNC on any documents (including the informed consent form) or conduct the study under the auspices of UNC if you are no longer a student/employee of this university.
- You have received or have been made aware of any complaints, problems, or adverse events that are related or possibly related to participation in the research.

If you have any questions, please contact the Research Compliance Manager, Nicole Morse, at 970-351-1910 or via e-mail at nicole.morse@unco.edu. Additional information concerning the requirements for the protection of human subjects may be found at the Office of Human Research Protection website - http://hhs.gov/ohrp/ and https://www.unco.edu/research/research-integrity-and-compliance/institutional-review-board/.

Sincerely,

Nicole Morse
Research Compliance Manager

University of Northern Colorado: FWA00000784