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THE INFLUENCE OF CHILDHOOD EMOTIONAL MALTREATMENT AND EXCLUSION
ON DISTRESS AMONG INDIVIDUALS WITH SOCIAL ANXIETY SYMPTOMS

A Dissertation

presented in partial fulfillment of requirements

for the degree of Doctor of Philosophy

in Clinical Psychology

The University of Mississippi

by

MEGAN MARIE PERRY

August 2023

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ABSTRACT

Social anxiety disorder (SAD) is one of the most pervasive psychological conditions affecting emerging adults. Previous literature has demonstrated the importance of biological influences, individual difference characteristics, negative parenting practices, peer victimization experiences, and trauma/adversity in the development and onset of SAD. One unique adverse experience is childhood emotional maltreatment (CEM) or parent-based emotional abuse and/or neglect. CEM has been associated with more severe and persistent social anxiety symptoms in adults. In young adulthood, adverse experiences such as peer exclusion can exacerbate the cognitive and behavioral processes of SAD. However, the impact of early CEM experiences has yet to be explored on distress elicited by adult peer exclusion (i.e., social pain) among socially anxious college students. Therefore, this study aimed to examine the role of CEM experiences on distress resulting from social exclusion among emerging adults with elevated social anxiety symptoms. In the current study, students in psychology courses were screened for the presence of elevated social anxiety symptoms, and eligible students were invited via email to complete an online set of questionnaires and an experimental social exclusion paradigm (i.e., Cyberball). Consistent with study hypotheses, results supported a positive association between SA symptoms and retrospective report of CEM experiences. Further, participants who experienced the social exclusion condition reported a significant increase in social pain compared to participants within the social inclusion condition. However, contrary to study hypotheses, CEM experiences were not supported as a significant moderator in the prediction of social exclusion condition and subsequent social pain. Findings are consistent with previous studies establishing CEM as an

adverse experience contributing to adult SAD development; however, the extent of this influence remains inconclusive due to the small number of studies in this area. Future studies should examine the intersection of CEM and SAD through in-person social exclusion paradigms, longitudinal methodology, and among young adults with diverse education and socioeconomic backgrounds.

Keywords: social anxiety disorder, childhood emotional maltreatment, social exclusion, social pain

DEDICATION

This work is dedicated to Tom Sawyer, without whose tireless encouragement I would have given up long ago.

ACKNOWLEDGMENTS

I would like to thank Huckleberry Finn for his help in editing the final document. I would also like to thank Samuel L. Clemens for his support.

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CHAPTER I

INTRODUCTION

Social anxiety disorder (SAD) is characterized by intense anxiety occurring in anticipation of or during social situations. Individuals with SAD fear the scrutiny of others, negative evaluation, and perceivable physical symptoms of anxiety. Consequently, social situations are avoided or endured with intense distress (American Psychiatric Association, 2013). SAD uniquely impacts social situations and relationships, which contribute to several deficits in functioning, including poor quality of life (Dryman et al., 2016; Ruscio et al., 2008; Stein & Kean, 2000), isolation and loneliness (Baytemir & Yildiz, 2017; Lim et al., 2016; Maes et al., 2019), diminished social support (Rapee et al., 2015), and suicidality (Dilsaver et al., 2006; Rapp et al., 2017). In the United States, SAD has one of the highest prevalence rates, with a lifetime prevalence of 12.1% and 12-month prevalence of 7.1% (Ruscio et al., 2008). In particular, the highest estimated prevalence rate across the lifespan occurs among emerging adults (ages 18-24). Specifically, SAD has been estimated prevalence rate of 12.7% for women and 13.1% for men (Fehm et al., 2008). Considering the functional impairment and prevalence rates of SAD, research has focused on factors that contribute to the etiology, maintenance, and exacerbation of social anxiety.

Development of SAD

The trajectory of SAD symptoms often begins earlier in life, with onset often occurring between early childhood to young adulthood and are thought to persist with the influence of genetic/biological, psychological, and environmental factors (Poole et al., 2018). The

development of SAD is posited to begin earlier than most anxiety disorders. For example, within a meta-analytic comparison examining age of onset across anxiety disorders, SAD had the lowest estimated age of onset at approximately ten years old (Lijster et al., 2017). As children enter adolescence, prevalence rates of SAD are demonstrated to increase as socially anxious adolescents begin to avoid developmentally essential social situations, such as forming new social relationships and experience more significant life impairment (Miers et al., 2014). As adolescents become young adults, SAD is associated with more significant distress, disability, and lower quality of life due to the increased social demands, with the peak prevalence rates occurring between 18-24 years old (Park et al., 2021). In a prospective longitudinal examination of SAD, the natural course of SAD was observed such that individuals experience SAD symptoms at least 50% of the years after the onset of SAD. This finding suggests that upon meeting the threshold for SAD, less than half of individuals experience remission of symptoms over time and most individual continue to experience SAD symptoms (Vriends et al., 2014). Within the United States, community samples have observed a lifetime prevalence of up to 12.1% with onset in adolescence (Ruscio et al., 2008). Additionally, SAD among adults has been demonstrated to be highly persistent with an estimated duration of 10 years or longer, suggesting a stable and unremitting natural course (Wittchen & Fehm, 2003). In a study evaluating SAD from childhood/adolescence and again at young adulthood, 15.5% of individuals who met SAD during childhood were found to meet the criteria again as young adults, and 56.7% of individuals continued to demonstrate subthreshold symptoms of SAD as a young adult. Results supported that individuals who endorsed parental psychopathology (i.e., presence of SAD or a depressive disorder) and endorsed a fearful childhood temperament evidenced greater persistence and chronicity of SAD in young adulthood (Beesdo-Baum et al., 2012).

Theoretical conceptualizations of SAD have continued to refine the unique impact of distal factors on the development of SAD in emerging adulthood. Nevertheless, the core developmental factors of SAD include integration of biological factors including genetic and physiological components; psychological or individual difference factors, such as behavioral inhibition and personality; and environmental or social factors including harmful parenting practices, adverse and traumatic experiences, and peer victimization early in childhood (Spence & Rapee, 2016). Moreover, empirical investigations of SAD have found that these factors can change the severity of SAD presentations where multiple distal factors can have a cumulative effect and compound the persistence and intensity of SAD. Additionally, some distal factors (e.g., adversity/trauma experiences and peer victimization) have been shown to lead to more severe pathways of SAD (Spence & Rapee, 2016).

Biological Factors

Genetic, biological, and physiological influences are one set of distal factors explored in the development of SAD. A meta-analysis investigating the role of genetics in the development of SAD estimated the range of SAD heritability from genetic contributions and non-shared environmental factors is 0.13 to 0.60 and 0.31 to 0.78, respectively (Scaini et al., 2014). Notably, children with SAD were 2.90 times more likely to have a mother with clinically significant social anxiety and 2.33 times more likely to have a father with clinically significant anxiety (Hughes et al., 2009). In understanding the connection between genetic and environmental factors, research has supported that genetic markers for social anxiety can become more dominant during development when specific environmental factors, such as lower maternal responsiveness, limited parental social support, and greater maternal overprotection, are present (Burkhouse et al., 2011; Natsuaki et al., 2013). Additionally, a growing body of literature has begun to explore

the neural pathways and physiological factors at play within social anxiety. The heightened activation and sensitivity of the amygdala and prefrontal cortex have been implicated in increased anxious-emotional responding, clinically significant anxiety symptoms, and diverse presentations of anxiety disorders (Caouette & Guyer, 2014; Fox & Kalin, 2014; Hamm et al., 2014; Hattingh et al., 2013; Monk et al., 2008). Individuals diagnosed with SAD, compared to healthy controls, have demonstrated differences in physiological reactivity to social stress, including slower heart rate recovery (Schmitz et al., 2011), decreased cortisol reactivity (Crişan et al., 2016), and higher skin conductance (Kramer et al., 2012; Shirotaki et al., 2009). Indeed, while biological, genetic, and physiological mechanisms account for part of SAD etiology, they often interact with environmental factors to contribute to the severity of SAD symptoms.

Individual Difference Factors

Psychological factors include features unique at the individual level, such as personality, cognitive, emotional, motivational, attitudinal, and behavioral factors (Lehman et al., 2017). Difficult infant temperament and behavioral inhibition are the earliest known set of individual difference factors contributing to SAD through shaping how one innately responds to novel social environments (Kagan, 1984; Rapee & Spence, 2004). Infant temperament is defined as the individual differences in emotional reactivity and regulation that underlies emotional and behavioral dispositions as infants and thought to influence our initial responses to new environments as early as two months of age (Goldsmith et al., 1987). Temperament is characterized as either fearful, easy, or slow to warm (Chess & Thomas, 1977). A fearful temperament is described as an overly negative emotional reactivity and regulation tied to internalizing difficulties later in development. Fearful temperament includes an avoidant approach to new environmental stimuli (i.e., behavioral inhibition) and caregivers (i.e., insecure

attachment (Planalp & Goldsmith, 2020). Behavioral inhibition is an avoidant behavioral style in a child's initial reactions to moderately unfamiliar situations. Behavioral inhibition is depicted by intense crying, withdrawal, and extreme inhibition of vocalizations and motor activity (Coll et al., 1984).

Research has shown that children characterized with high behavioral inhibition display similar behavioral avoidance and withdrawal patterns that are similar to behavior observed in SAD, such as poor eye contact, close proximity to caregivers, and decreased verbalizations during social situations (Clark & Wells, 1995; Rapee, 2002; Rapee et al., 2011; Rapee & Spence, 2004). Building upon this work, a meta-analysis demonstrated that symptoms of behavioral inhibition corresponded to a sevenfold increase in later SAD development after controlling for temperament assessment, age at temperament assessment, parental risk, and age of SAD diagnosis. However, studies have also found that fearful temperament strengthens the influence of behavioral inhibition on social anxiety. For instance, a longitudinal examination of behavioral inhibition and social anxiety symptoms revealed that behavioral inhibition during toddlerhood is associated with SAD in adolescence for specifically males with a history of insecure attachment during infancy (Lewis-Morrarty et al., 2015). An additional longitudinal study found an interactive effect between behavioral inhibition and childhood temperament such that individuals categorized as high on behavioral inhibition and fearful temperament as children demonstrated a higher likelihood of SAD in later childhood (Muris et al., 2011). Taken together, behavioral inhibition and infant attachment are components that elucidate the developmental underpinnings of SAD.

In adolescence, a history of heightened behavioral inhibition in childhood is associated with later heightened anxious physiological responses in novel situations (McDermott et al.,

2009). Additionally, adolescents who retrospectively reported high levels of childhood behavioral inhibition were found to have decreased mentalizing abilities, such as the decreased ability to recognize internal mental states and the awareness of others' mental states, which contributes to decreased social skills and is associated with increased risk for adolescent-onset SAD (Ballespí et al., 2018). Building upon this work, longitudinal studies have supported a typical developmental trajectory, wherein high behavioral inhibition during early childhood resulted in the development of threat attentional biases and internalizing symptoms during adolescence consistent with SAD (Pérez-Edgar et al., 2010; Rankin Williams et al., 2009). Further, a prospective longitudinal investigation revealed that early parent-reported behavioral inhibition was associated with 3.79 times increased odds of developing a SAD diagnosis during adolescence (Chronis-Tuscano et al., 2009), and these findings have been repeated in other empirical investigations (Klein et al., 2010).

Early behavioral inhibition has also been associated with factors relevant to SAD in adulthood. For example, in a longitudinal study, children with high behavioral inhibition were more likely to have reduced peer social success, delayed independent living, and more significant emotional distress during early adulthood. Results revealed that high behavioral inhibition to novel situations as a child leads to an inhibited adult developmental trajectory, such that adults experience increased fear of negative evaluation, anxiety within socio-evaluative situations, and shyness consistent with adult presentations of SAD (Frenkel et al., 2015; Gest, 1997). Additionally, a longitudinal investigation found that early behavioral inhibition has been associated with adult transdiagnostic factors associated with SAD development, such as neuroticism, difficulties with emotion regulation, and intolerance of uncertainty (Brown, 2007; Leen-Feldner et al., 2004; Zdebik et al., 2018). Altogether, these findings illustrate how early

characteristics at the individual level can promote the experience of subsequent SAD symptoms at different developmental stages; yet, at the same time, the influence of environment is critical in the trajectory of these characteristics and subsequently the culmination into SAD.

Environmental Factors

Although biological, genetic, and individual factors are important to the development of SAD, the literature supports that non-shared environmental factors can account for up to 54% of the variance across ages groups (Pérez-Edgar et al., 2010). However, current conceptualizations of the developmental pathway of SAD emphasizes harmful parenting practices above other environmental factors as parenting practices is one of the most significant environmental contexts during childhood (Ollendick & Benoit, 2012). Notably, these experiences have been demonstrated to shape SAD progression by changing the severity, duration, and chronicity of social anxiety symptoms (Norton & Abbott, 2017).

The influence of parenting factors is an essential factor in understanding the development of SAD during childhood and adolescence. Parenting and SAD have been extensively described through the Parent-Child Interactional theory, where the combination of genetic, behavioral, and cognitive parent-based factors and child-based factors can increase the risk of child/adolescence onset SAD (Ollendick & Benoit, 2012). Ollendick and Benoit (2012) proposed that though developmental factors for SAD have been examined, there remains a deficit in understanding of which children with temperamental and genetic vulnerabilities go on to develop SAD. The Parent-Child Interactional theory posits that a transactive process occurs between children and anxious parents, which encourages the early onset of SAD for children. More specifically, their theory states that parental behaviors such as overcontrol, heightened criticism, and overprotection promote an anxious home environment, which causes socially anxious responses

in children with temperament and genetic vulnerabilities (Ryan & Ollendick, 2018). These behaviors promote child-onset SAD when parents model social avoidance, fear of social situations, and limited engagement in social environments, consistent with SAD. Consequently, these parents then praise their children when they model similar socially avoidant behaviors, which reinforces children's innate behavioral inhibition and insecure attachment (Dong et al., 1994; Ollendick & Horsch, 2007). The Parent-Child Interactional theory proposes that parents with heightened anxiety develop cognitive biases that subsequently encourage threatening or dangerous interpretations of ambiguous events across contexts. As these cognitive styles are modeled over time, children acquire these cognitive biases through observational learning and begin to perceive their environment as threatening (Creswell et al., 2006). Through this anxiety-promoting transactive process between parent and child, the dysfunctional behavioral avoidance and cognitive styles consistent with SAD become stronger as children progress through development.

Specific parenting behaviors, such as overcontrol, authoritarian parenting, and deficits in emotional responding have been shown to contribute to the intergenerational transmission of SAD. In a longitudinal examination of parenting, child temperament, and neural responses to social situations, research demonstrates that authoritarian parenting strengthens the developmental trajectory of behavioral inhibition into later SAD. More specifically, children with elevated levels of behavioral inhibition who experienced authoritarian parenting (i.e., overcontrolling behaviors) were more likely to develop later SAD than children with elevated behavioral inhibition who did not experience authoritarian parenting (Guyer et al., 2015). Crosby Budinger et al. (2013) compared parenting behaviors between parents with SAD and non-anxious parents during two short behavioral tasks (i.e., speech task and Etch-A-Sketch task) with

their non-anxious children. Results showed that parents who endorsed SAD exhibited parenting behaviors that encourage children's social anxiety, such as less warmth/positive affect and more criticism/self-doubting after controlling for the severity of their children's anxiety symptoms. Therefore, parents with SAD were found to promote their children's anxiety in future social situations through their behaviors than non-anxious parents. In addition, parental responsiveness to children has been implicated in the transmission of SAD. For instance, a prospective adoption study found that children whose birth mothers met criteria for SAD exhibited more behavioral inhibition if their adoptive mothers were less emotionally and verbally responsive (Natsuaki et al., 2013). Therefore, the study demonstrated that mothers' emotional and verbal responsiveness shaped the degree that children's innate predisposition for social anxiety was expressed. Further, in comparing children with SAD and healthy controls in the expression of anxiety-promoting behaviors, mothers of children with SAD demonstrated higher rates of over-involvement and negativity than mothers of the healthy control children (Asbrand et al., 2017).

As adolescents are placed into more demanding social environments with peers, teachers, and the community, the role of adverse parenting practices becomes more prominent in the development of social anxiety symptoms during adolescence and emerging adulthood. For instance, parent educational practices, such as behavioral and psychological control and maternal supervision, were the most important factor in the prevention of SAD among adolescents, even after accounting for adolescent's difficulties in emotion regulation and low self-esteem (Gómez-Ortiz et al., 2019). In an additional longitudinal examination of parenting practices (i.e., psychological control and autonomy support) and adolescents, evidence supported that adolescents with more significant SAD symptoms also reported greater psychological control and lower autonomy support from their mothers (Nelemans et al., 2020). Building upon this

work, harmful parenting practices during adolescence have been tied to the development of greater emotional sensitivity to threats of rejection and subsequently elevated depression and social anxiety symptoms (Rudolph & Zimmer-gembeck, 2014). Then, as adolescents transition to emerging adulthood, retrospective reports have shown parental rejection and parental encouragement of social assertion are related to current symptoms of social anxiety among university students. In particular, parental rejection was associated with more significant social anxiety symptoms, whereas parental encouragement of social assertion was associated with lower social anxiety symptoms (Smout et al., 2020). A variety of negative parenting behaviors such as lack of parental responsiveness, overly critical/cold parenting style, and dismissiveness have also been associated with a greater prevalence of SAD during emerging adulthood (Schimmenti & Bifulco, 2015).

At a more extreme level, negative parenting practices may contribute to early experiences of adversity. Adverse life events during childhood and adolescence have been shown to contribute to anxiety disorders (Hoppen & Chalder, 2018; Hovens et al., 2012; Spinhoven et al., 2010). Common adverse life events during childhood include physical, sexual, emotional abuse/neglect, domestic/family violence, chronic illness, and parental pathology (Mathews et al., 2020). The pathway by which childhood adverse life events affect subsequent psychopathology has been described by the Stress Sensitization Hypothesis (Hammen et al., 2000; McLaughlin et al., 2010). The Stress Sensitization theory suggests that individuals exposed to childhood adversity have increased vulnerability to the onset of depression after stressful life events during adulthood compared to adults without a history of childhood adversity. Hammen et al. (2000) first investigated the Stress Sensitization Hypothesis within a longitudinal study that investigated the development of depression symptoms by comparing young adult women with and without a

history of childhood adversity. Results revealed that young women exposed to one or more childhood adversities had a higher likelihood of developing depressive symptoms after experiencing life stressors than young women without exposure to childhood adversity. These findings indicate that childhood adversity can sensitize individuals to psychopathology by limiting their ability to cope with stress during adulthood effectively. Applying this theory to other forms of psychopathology, McLaughlin et al. (2010) found support for the role of early adversity in the development of posttraumatic stress disorder, major depressive episode, and anxiety disorders in a national epidemiological survey of alcohol and related conditions. Results showed that after 1-2 adult major life events, women exposed to at least three childhood adverse life events had a 9.2% likelihood of developing an anxiety disorder. In contrast, women without a history of childhood adverse life events had a 3.3% likelihood. Additionally, men exposed to at least three childhood adverse life events had a 6.1% likelihood of developing an anxiety disorder after a stressful life event compared to 1.9% of men without a history of childhood adverse life events. The Stress Sensitization Hypothesis has been broadly implicated in anxiety disorders (McLaughlin et al., 2010, 2011) and among specific anxiety such as generalized anxiety disorder (Bandoli et al., 2017), panic disorder, posttraumatic stress disorder, and obsessive-compulsive disorder (Heim & Nemeroff, 2001). Further, the Stress Sensitization Hypothesis for anxiety disorders has been found across developmental stages, with early childhood adversities are associated with anxiety disorders during later childhood and adolescence (Espejo et al., 2007; Laurent et al., 2015).

Although the Stress Sensitization Hypothesis has yet to be explicitly examined in SAD samples, the literature indicates that high-stress experiences in early childhood can increase the likelihood of SAD later in development. In a nationally representative sample, childhood

maltreatment, including emotional abuse/neglect, physical abuse/neglect, and sexual abuse, was assessed in 34,653 adults aged 20 years or older. Emotional maltreatment was the most common form of childhood maltreatment, with 14.1% of the sample endorsing at least one instance of emotional abuse or neglect during childhood. Individuals endorsing a history of childhood emotional maltreatment demonstrated a higher prevalence of SAD in adulthood independent of sociodemographic, other forms of maltreatment, and family history of mental illness (Taillieu et al., 2016). Interestingly, individuals with SAD evidenced similar patterns as those hypothesized by the Stress Sensitization Hypothesis such that individuals with a diagnosis of SAD and history of adverse social experiences evidenced greater emotional sensitivity in the face of current social stress than healthy controls (Farmer & Kashdan, 2015). Further, adults with a co-occurring diagnosis of SAD and alcohol use disorder have been found to report significantly lower levels of maternal care retrospectively and more significant early childhood adversity compared to individuals without a SAD or alcohol use disorder (Rambau et al., 2018). Therefore, there is an empirical foundation for investigating the Stress Sensitization Hypothesis among adults with SAD.

One impactful component of childhood adversity is parent-based emotional abuse and neglect, otherwise known as childhood emotional maltreatment (CEM) (Gibb et al., 2007). CEM is defined as experiences of emotional abuse and emotional neglect from primary caregivers (Egeland, 2009). In the investigation of different categories of childhood trauma and SAD, experiences of CEM have been repeatedly endorsed by adults with SAD (Gren-Landell et al., 2011; Kuo et al., 2011; Simon et al., 2009). In the connection between CEM and SAD, one study compared experiences of trauma between healthy controls and adults with SAD. The results indicated that across diverse trauma histories, including sexual abuse, physical abuse/neglect,

and emotional abuse/neglect, adults diagnosed with SAD had a higher incidence of childhood emotional maltreatment than healthy controls. Additionally, adults who endorsed experiences of childhood abuse and neglect reported greater severity of SAD, depression symptoms, trait anxiety, and lower self-esteem (Kuo et al., 2011).

Prospective research has shown that childhood emotional abuse has been uniquely predictive of SAD across international samples (Lochner et al., 2010). CEM is associated with psychological distress among emerging adults, including greater internalizing and dissociative symptoms (Wright et al., 2009). Evidence has supported that childhood emotional maltreatment (CEM) has been associated with adverse outcomes tied to SAD, such as greater fear of negative evaluation and internalizing symptoms across populations with psychopathology (i.e., chronic depression, episodic depression, and borderline personality disorder; Seidl et al., 2020). Despite SAD having its most elevated prevalence rates among emerging adults, there is yet to be an empirical investigation of how CEM uniquely influences the development of SAD in young adulthood.

Summary

In examining developmental pathways for social anxiety symptoms, empirical evidence supports a combination of biological, psychological, and environmental factors in the unfolding of SAD (Spence & Rapee, 2016). Despite the high rates of SAD onset in emerging adulthood (Stein & Stein, 2008), research investigating the impact of these etiological factors has primarily focused on the development of SAD in childhood and adolescence. As adolescence evolves into the young adult years, these developmental factors, such as parenting behaviors, continue to have a relatively strong impact on young adult mental health (Saleem et al., 2019). Indeed, within a nationally representative longitudinal study, results demonstrated that a positive parent-child

relationship was predictive of young adult career success through attaining higher incomes and greater career satisfaction, autonomy, and commitment than peers without positive parenting relationships (Gordon & Cui, 2015). Further illustrating the continued connection between young adults and their parents, emerging adults have been illustrated to have decreased self-efficacy, greater difficulty coping to stress, greater use of avoidant coping, and lowered self-worth when parents exhibit high levels of psychological control and intrusive behaviors (Reed et al., 2016). Consequently, it is critical to understand factors contributing to the interplay between developmental and environmental factors in the exacerbation of SAD in emerging adulthood. One posited factor bridging early developmental experiences to adult environmental factors is the relationship between social exclusion experiences and social anxiety symptoms (Voncken et al., 2008). Research examining the intersection of social exclusion and social anxiety connects the etiological underpinnings of SAD by further extrapolating how these early developmental risk factors exacerbate the negative consequences of current social functioning deficits among young adults.

Social exclusion and SAD

Social anxiety and childhood/adolescent social exclusion has been predominately investigated through experiences of peer victimization. Peer victimization is an early adverse exclusion experience during childhood and adolescence that has been associated with increased future social anxiety symptoms in young adulthood. Between 20- 30% of children/adolescents have been affected by peer victimization, which encompasses various aggressive behaviors such as verbal/physical bullying, shunning, ignoring, and spreading rumors (Storch & Ledley, 2005). As many as 54.3% of individuals with SAD have reported bullying or victimization experiences from peers (Gren-Landell et al., 2011). Peer victimization is conceptualized as a causal

experience in the development of SAD, where individuals have negative social learning histories with their peers and subsequently begin to fear future social situations (Reijntjes et al., 2010). Within a meta-analysis of peer victimization and internalizing symptoms, it is proposed a bidirectional relationship between peer victimization experiences and social anxiety symptoms, wherein, individuals become increasingly socially anxious after peer victimization experiences and consequently future peer victimization becomes more frequent and intensifies (Reijntjes et al., 2010). Within a prospective study comparing children and adolescents with anxiety disorders to healthy controls, social anxiety was found to be the most significant predictor of future bullying, peer victimization, and exclusion (Crawford & Manassis, 2011). Peer victimization and future anxiety have been posited to occur through physiological reactivity. More specifically, peer victimization incidents are hypothesized to increase physiological reactivity (i.e., skin conductance) in future social situations by individuals learning to pair heightened physiological arousal with past social situations, resulting in increased social anxiety symptoms (Sansen et al., 2015).

Peer victimization has been demonstrated to be prospectively associated with future social anxiety symptoms across empirical investigations. For example, a longitudinal study examining childhood peer victimization experiences and subsequent adolescent social anxiety symptoms found that relational peer victimization at age eight predicted social anxiety symptoms at 10- and 13-years-old (Pickard et al., 2018). Similarly, a prospective study of ninth-grade students found relational victimization predicted social anxiety symptoms one year later. Despite other studies demonstrating a stronger association between female gender and relational victimization (Tran et al., 2012), the results did not differ by gender, suggesting relational victimization has a significant, negative impact on boys and girls (Storch & Ledley, 2005).

Additionally, a prospective study over a three-month period examined self-reported experiences of peer victimization (i.e., overt, relational, and reputational). Results demonstrated that relational victimization incidents prospectively predicted increases in social anxiety symptoms over three months for adolescents (Siegel et al., 2009). Over time, peer victimization has been associated with social anxiety symptoms and contributes to increased social withdrawal, less peer acceptance, greater peer problems, and loneliness (Barzeva et al., 2020; Storch & Masia-Warner, 2004). Cumulatively, peer victimization and harmful parenting practices combined have been demonstrated to show a higher likelihood of social anxiety symptoms among children and adolescents than either factor alone (Boel-Studt & Renner, 2014; González-Díez et al., 2017; Kaufman et al., 2020).

In adulthood these experiences are more broadly named social exclusion. Social exclusion is defined as the phenomenon of being kept apart from others with or without the explicit intent to keep one isolated (Williams, 2007). Social exclusion is theorized to cause an immediate, reflexive pain response among individuals that influences the development of coping and appraisal strategies to alleviate current and future pain (Williams & Nida, 2011). Social exclusion and the inability to rebound after exclusion have been linked to several impairing, adverse outcomes, including increased anger/aggression towards others, diminished empathy, decreased self-esteem/self-worth, impaired self-regulation, and decreased pro-social behaviors (Smart Richman & Leary, 2009). These adverse outcomes are intensified among those who endorse clinically significant psychopathology (Reinhard et al., 2020) and are particularly salient for SAD patients.

Underlying the unique connection between social exclusion and SAD is the cognitive-behavioral conceptualization of SAD, which emphasizes dysfunctional cognitive and behavioral

processes that occur before, during, and after social interactions (Clark & Wells, 1995; Heimberg et al., 2010; Hofmann, 2014; Rapee & Heimberg, 1997). The core factors maintaining SAD symptoms include more significant negative pre-and post-event processing, negative view of self, engagement in avoidance and escape behaviors, heightened attentional bias for threat cues, and perceived lower emotional control (see Rapee & Spence, 2004). These core factors are posited to increase the intensity of distress associated with perceived social exclusion during interpersonal interactions (Oaten et al., 2008). For instance, before a social situation, an individual with SAD may exhibit greater expectations of negative evaluation from others, consequently intensifying fear of social rejection. During a social situation, individuals are more likely to encode ambiguous or mild exclusion cues as threatening to their perceived social value and status. Therefore, after a social situation, these threat interpretations lead to negative post-event processing where individuals develop a heightened sensitivity to social threat cues such as increased expectations of future social rejection. Over time, this negative post-event processing leads to behavioral avoidance; wherein individuals are conditioned to fear and avoid social situations and interpersonal interactions due to perceived social exclusion (Lissek et al., 2008; Molden et al., 2009). Fear conditioning after social exclusion and subsequent social anxiety symptoms has been replicated across empirical investigations (Pejic et al., 2013).

As the literature on SAD and social exclusion has grown, research has sought to identify SAD processes at work during and after exclusion paradigms, and in particular, studies have emphasized how social exclusion shapes long-term SAD outcomes. In the laboratory, psychological distress and the consequences of social exclusion have been closely studied through, Cyberball, an experimental ball-tossing game paradigm that simulates inclusion and exclusion conditions. The procedure includes three individuals (two confederates and one

participant) placed in a virtual room. In the social exclusion condition, the participant receives the ball once and is excluded for the rest of the game (Hartgerink et al., 2015; Williams, 1997). After the game, the participant is asked to rate their distress as well as their feelings, thoughts, and behavioral urges.

Evidence supports that social exclusion may exacerbate the cognitive and behavioral processes inherent to the development of SAD. For example, evidence supported that individuals diagnosed with SAD demonstrated greater self-directed negative emotions, self-blame attributions, and less perceived control over social exclusion after experiencing a virtual social exclusion task compared to healthy controls who underwent the same task (Gutz et al., 2016). These findings suggest instances of social exclusion intensify the cognitive processes that maintain SAD. For example, individuals with SAD are faster to detect the offset of smiling during social exclusion than healthy controls, resulting in amplifying one's fears of negative evaluation and subsequently heighten social anxiety symptoms (Azoulay et al., 2020). Individuals with SAD can better detect social threats and perceived negative emotions from others during social exclusion tasks compared to non-anxious individuals (Auyeung & Alden, 2020).

SAD has also been associated with strong neural responses to social exclusion. For instance, Heeren et al. (2017) investigated the neural responses to social exclusion between individuals with SAD and healthy controls. Researchers measured individuals' sensitivity to social exclusion through self-reported feelings of exclusion and activation of brain regions associated with social exclusion (i.e., dACC, insula, MFG, PCC). Results supported that individuals who met the SAD criteria reported higher intensity feelings of exclusion and increased activation of core brain regions associated with social exclusion (Heeren et al., 2017).

Further, a systematic review of neuroimaging studies for individuals with SAD has implicated increased activity in brain regions also activated during social exclusion, including increased activity in the amygdala and limbic system (Freitas-Ferrari et al., 2010). Neural activation of brain regions associated with social exclusion among individuals with SAD compared to healthy controls has been replicated in other Cyberball-based paradigms (Iffland et al., 2014; Wang et al., 2019).

Individuals with SAD have been found to experience greater negative consequences to social exclusion than their non-anxious counterparts. For instance, individuals with SAD have shown more significant self-reported distress than non-anxious controls in response to a social exclusion task (Heeren et al., 2017). Emphasizing this connection among individuals with SAD, Davidson et al. (2019) illustrated that social exclusion generated both momentary and extended distress even after controlling for participant's levels of anxiety sensitivity, emotion regulation deficits, and state anxiety. Additionally, individuals who endorsed greater social anxiety symptoms exhibited decreased pro-social behavior such as helping others and forming positive relationships after instances of social exclusion. Extending these findings, individuals who demonstrate decreased positive behaviors towards others after social exclusion resulted in reports of greater social isolation and increased loneliness (Deng et al., 2017; Weerdmeester & Lange, 2019).

Cumulatively, research on exclusion and SAD demonstrates that this population has an increased vulnerability to social exclusion, which results in greater negative outcomes after social rejection experiences compared to non-socially anxious individuals. SAD conceptualizations support that learning histories of negative social experiences result in greater social anxiety symptoms and dysfunctional responses to social exclusion. Despite these

connections, there is a paucity of research on the intersect between an early developmental history of repeated social exclusion (i.e., peer victimization, childhood maltreatment) and the known relationship between adult SAD symptoms and responses to current social exclusion. Nevertheless, multiple and chronic experiences of social exclusion are known to culminate in what is described as social pain (Fung & Alden, 2017). Social pain is defined as broadly the unpleasant discomfort, distress, or negative emotion created by intentional social disconnection (MacDonald & Leary, 2005). Social pain has been implicated in victimization experiences and associated with greater psychological difficulty. For instance, social pain in survivors of childhood maltreatment is also implicated in later difficulties with emotional adjustment during adulthood (Downey et al., 1997). Interestingly, Luterek et al. (2004) found that greater social pain acted as a mechanism in associating childhood sexual abuse experiences and greater adult depressive symptoms, anger suppression, and attenuated emotional expression. Furthermore, childhood emotional maltreatment experiences have been connected to later adult psychopathology (e.g., borderline personality disorder, depression) through greater sensitivity to social pain (Chango et al., 2012; Chesin et al., 2015; Foxhall et al., 2019; Goodman et al., 2014).

In addition to broad psychological difficulties, social pain has been specifically implicated in victimization experiences associated with SAD development, such as peer victimization (McIver et al., 2018; Schriber et al., 2018) and childhood maltreatment (King, 2016). For instance, studies evaluating past peer victimization experiences and reactivity to recent experiences of social exclusion have found individuals with experiences of peer victimization evidenced increased reactivity to future instances of social exclusion (McIver et al., 2018; Schriber et al., 2018). Additionally, individuals who endorsed childhood victimization experiences (i.e., parental physical abuse, exposure to domestic violence), compared to healthy

controls, reported greater social anxiety symptoms and feelings of exclusion when interacting with novel peers. Moreover, research indicates children exposed to childhood maltreatment early in development have hypoactivation in brain regions associated with greater coping skills after interpersonal rejection, which has been shown to contribute to greater social pain and social anxiety symptoms (Puetz et al., 2016; van den Berg et al., 2018).

To date, several studies have evaluated social pain as a mechanism in social exclusion experiences and SAD. In one study, social pain was evaluated through self-reported distress and discomfort during a Cyberball social exclusion task (e.g., "My feelings were hurt from not being involved in the game"). Results illustrated that greater social pain during a virtual rejection condition led to greater social anxiety symptoms during future interpersonal interactions, which subsequently decreases interpersonal functioning (Fung & Alden, 2017). Building upon these findings, one study found that individuals who endorsed greater social anxiety symptoms responded to the social pain of exclusion with greater reactivity and decreased willingness to approach others in future social interactions, resulting in a cycle of greater social anxiety symptoms and social pain (Hudd & Moscovitch, 2020). Finally, Levinson et al. (2013) demonstrated that reactivity to social exclusion during a virtual task prospectively predicted social anxiety symptoms up to two months after experiences of social exclusion among a college student population. These data illustrate that social exclusion has a lasting, negative impact on individuals with elevated social anxiety symptoms. Additionally, greater social exclusion reactivity may be indicative of later psychological difficulty. Although these studies provide support for the connection between social pain and the experience of social anxiety symptoms, developmental factors that may influence this association have been overlooked within the literature. Taken together, these findings illustrate that though social pain has an essential role in

the trajectory of SAD, there is a need to bring the gap between known etiological factors within SAD and social pain. Specifically, it is imperative to examine the connection between early childhood emotional maltreatment experiences and adult SAD as these are the earliest known incidents of social exclusion and lay the foundations for adult reactivity to exclusion.

Current Study

The purpose of the current study was to examine the influence of childhood emotional maltreatment history on self-reported social pain following exclusion among young adults with elevated social anxiety symptoms. Compared to physical and sexual childhood maltreatment, CEM has higher rates among individuals with SAD (Simon et al., 2009) and has been associated with greater SAD symptom severity (Bruce et al., 2012). In the current study, it was posited that more intense CEM experiences could potentially impact one's experience of distress to current social exclusion through acquiring a heightened vulnerability to social exclusion through chronic experiences of social rejection during childhood/adolescence. Resultantly, individuals with a significant history of CEM may develop more intense negative reactions to exclusion. This hypothesis is consistent with previous empirical investigation of childhood maltreatment and social exclusion, wherein a history higher intensity CEM experiences has been associated with greater neural reactivity and emotional distress after perceived social rejection (Puetz et al., 2016; van Harmelen et al., 2014). Although sensitivity to social pain has been shown prospectively predict social anxiety symptoms among college students (Levinson et al., 2013), there has yet to be an empirical investigation of CEM experiences as a vulnerability factor in one's sensitivity to social pain after exclusion among socially anxious individuals. As young adults (18-24 years old) are at heightened risk for SAD (Fehm et al., 2008), it is imperative to understand the contribution of CEM experiences to social pain after social exclusion to identify

vulnerable young adults with greater risk of developing social anxiety symptoms. Such findings have the potential to inform mental health providers of treatment targets for SAD interventions in young adults such as reducing social pain and increasing coping strategies after perceived experiences of social exclusion.

The current study examined college students with elevated social anxiety symptoms in completion of a between-subjects experimental design where socially anxious college students were randomized to experience social inclusion or exclusion during a Cyberball virtual ball-tossing paradigm. The primary dependent variable was social pain, measured as the intensity of distress after completing Cyberball. The primary independent variables were conditions of social inclusion and exclusion. The primary hypothesis was that past experiences of CEM would moderate the relationship between the social exclusion condition and social pain, wherein, individuals with CEM experiences would evidence more intense social pain after a virtual social exclusion paradigm (i.e., Cyberball).

Aim 1: To characterize and examine the prevalence of CEM experiences among young adults with social anxiety symptoms.

Hypothesis 1: Greater perceived severity of exposure to CEM experiences would be associated with greater social anxiety symptoms among young adults.

Aim 2: To examine experiences of social inclusion/exclusion in relation to social pain after a Cyberball lab task.

Hypothesis 2) The social exclusion condition would be significantly associated with a greater experience of social pain compared to the social inclusion group after the Cyberball computer task after controlling for baseline social pain.

Aim 3: To examine past experiences of CEM as a moderator between social inclusion/exclusion and social pain among socially anxious college students.

Hypothesis 3) Perceived severity of exposure to CEM experiences would moderate the relationship between social exclusion and social pain, wherein college students with more severe exposure to CEM experiences will evidence greater social pain after social exclusion than peers with a less exposure to CEM experiences.

CHAPTER II

METHODS

Participants

The current study recruited undergraduate students aged 18 years and older from psychology courses at the University of Mississippi. As compensation, students received either course credit or extra credit for completion of the study. According to a 120 study meta-analysis examining the influence of environmental variables' ability to moderate ostracism-based distress within Cyberball, Cyberball's ostracism paradigm produces a large effect among young adults. However, Cyberball can be resistant to interaction effects; therefore a small effect size was implemented (Hartgerink et al., 2015). Additionally, within the same meta-analysis, the mean sample size of studies examining moderation analyses within Cyberball was $N = 110$ (Hartgerink et al., 2015). Next, an a priori analysis was conducted using G*Power 3 (Faul et al., 2007) to determine the sample size necessary to conduct a moderation analysis with a small effect size. Results indicated that a minimum sample size of $N = 100$ would be adequate for a small effect ($f^2 = 0.10$) at 0.8 power with a required statistical significance of $p < .05$. Taking together the results of the power analysis and past empirical investigations, an adequate sample size for the current study was $N = 110$.

Individuals completed a brief social anxiety screening measure through the SONA online recruitment system, and those with elevated social anxiety symptoms were recruited to participate in the current study (SPIN; Connor et al., 2000). The inclusion criterion was that individuals had to have a total score of 11 or above on the SPIN, which has indicated the

presence of at least minimal social anxiety symptoms (J. Davidson, personal communication, May 14, 2015), to be eligible for participation in the current study. Exclusion criteria were: a) individuals completing Cyberball through other Sona studies, and b) individuals outside the emerging adult age range (18-24) years old.

Among the 152 participants included in the analyses, the sample was predominately female ($n = 118$, 77.6%), with a mean age of 19.41 years ($SD = 1.31$). Participants identified as 79.6% White, 9.9% Black, 5.9% Asian, 3.3% Hispanic/Latino, and 0.7% Other. Participants described their student status as 59.9% first year, 19.1% second year, 11.8% third year, 8.6% fourth year, and 0.7% other. A total of ($n = 145$) participants participated in the Cyberball paradigm, and participants were randomized to the inclusion condition ($n = 72$) or exclusion condition ($n = 73$).

Participants' Female Caregiver Demographics

Participants reported their primary female caregiver had a current mean age of 49.27 years ($SD = 5.81$). Participants identified their primary female caregivers as 80.8% White, 10.3% Black, 5.5% Asian, and 2.7% Hispanic/Latino. Participants described female primary caregiver's highest education status as 18.5% High school/GED, 10.3% Associate's degree, 35.6% Bachelors, 24.7% Master's Degree, 9.6% Professional Degree. Participants identified their primary female caregiver's relationship status as 2.7% Single never married, 80.1% Married, 2.7% Widowed, 11.6% Divorced, and 2.7% Separated.

Participants' Male Caregiver Demographics

Participants reported their primary male caregiver had a current mean age of 51.53 years ($SD = 7.28$). Participants identified their primary male caregivers as 81.5% White, 10.3% Black, 4.8% Asian, and 2.1% Hispanic/Latino. Participants described their primary male caregiver's

highest education status as 21.9% High school/GED, 8.2% Associate’s degree, 31.5% Bachelors, 24% Master’s Degree, 9.6% Professional Degree. Participants identified male primary caregiver’s relationship status as 1.4% Single never married, 82.2% Married, 2.7% Widowed, 9.6% Divorced, and 4.1% Separated.

Thus, on average, the participants’ caregivers were primarily White, had a college degree, and were married.

Design

The current study implemented a between-subjects experimental design. Participants were randomly assigned via Qualtrics to one of two conditions in the Cyberball 5.0 (a) inclusion into a virtual ball-tossing game, or (b) exclusion into a virtual ball-tossing game. See Figure 1.

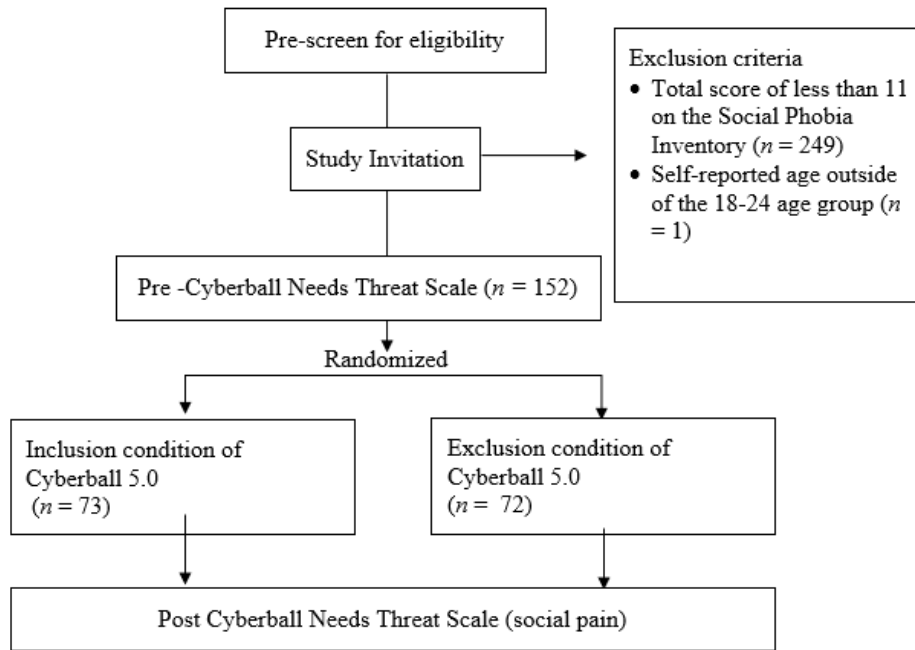


Figure 1. *Participant flow*

Measures

The *Demographics Questionnaire* documented participants' age, race, ethnicity, and gender among eligible participants. Other demographic information assessed was current GPA, living situation, medical, and psychiatric history. Additionally, maternal and paternal demographic information was collected, such as age, race, ethnicity, years of education, occupation, and relationship status.

The *Social Phobia Inventory (SPIN; Connor et al., 2000)* is a brief screening questionnaire for the different clinical dimensions of SAD. The SPIN assesses several domains of social anxiety such as avoidance, fear of interaction/performance, and physical arousal. Item includes “I am bothered by blushing in front of others” and “I avoid going to parties.” The measure included 17 items implementing a 5-point Likert-type scale from 0 = *not at all* to 4 = *extremely*. The questionnaire generates a total score where higher scores indicate greater severity of social anxiety symptoms. A total score of 19 and above has been empirically supported as a clinical cutoff score for SAD (Antony et al., 2006). Psychometrically, the SPIN has demonstrated strong test-retest reliability, internal cohesion, convergent validity, and divergent validity across diverse ages groups such as adolescents and adults (Connor et al., 2000; Ranta et al., 2007). Within the current study, the SPIN demonstrated high internal consistency ($\alpha = 0.94$).

The *Child Trauma Questionnaire-Short Form (CTQ; Bernstein et al., 2003)* is a retrospective self-report questionnaire given to adults and designed to assess several domains of childhood maltreatment, including physical/emotional abuse, physical/emotional neglect, and sexual abuse during childhood and adolescence. The CTQ served as a measurement of exposure to childhood emotional maltreatment within the study. The measure includes 28 items implementing a 5-point Likert-type scale from 1 = *never true* to 5 = *very often true*. The questionnaire generates five separate subscales (i.e., emotional abuse, physical abuse, sexual

abuse, emotional neglect, and physical neglect) looking at the different types of childhood maltreatment. Items include rating statements such as “My parent wished I had not been born” and “People in my family said hurtful or insulting things to me.” Additionally, items are summed together to create five separate subscale scores with items (2, 5, 7, 13, 19, 26, and 28) reverse coded before they are summed together. Higher scores on the CTQ indicate greater severity and intensity of childhood trauma experiences. The moderate-severe cutoff scores for each subscale are as follows 13+ for emotional abuse, 10+ for physical abuse, 8+ for sexual abuse, 15+ for emotional neglect, and 10+ for physical neglect and has evidenced excellent psychometrics such as internal consistency, test-retest reliability, and convergent validity (Bernstein & Fink, 1998). Within a meta-analysis examining the administration and implementation of the CTQ, the Childhood Trauma Questionnaire has been found one of the most common and empirically supported measures to assess trauma experiences during childhood with over 1,000 citations (MacDonald et al., 2016). The Childhood Trauma Questionnaire has been extensively used with young adults (Gama et al., 2021; John et al., 2018; Kaubrys et al., 2021) and delivered through online administrations (Groth et al., 2020; Thal et al., 2019; Wilson et al., 2019). Within the current study, the CTQ demonstrated good internal consistency ($\alpha = 0.78$).

The *Needs Threat Scale* (NTS; van Beest & Williams, 2006) is a self-report questionnaire designed to assess distress associated with social exclusion and ostracism and, in the current study, was conceptualized as social pain. As social pain is defined as the distress, discomfort, and negative emotions caused by social exclusion (MacDonald & Leary, 2005), social pain is demonstrated through the ostracism literature as distress associated with social exclusion (Davidson et al., 2019; Sandstrom et al., 2017). Further, The Needs Threat Scale is a budding metric within empirical investigations of social pain (Donate et al., 2017; Riva et al.,

2011). The measure includes 20 items implementing a 7-point Likert type scale from 1 = *do not agree* to 7 = *agree*. The NTS generates four subscales to evaluate ostracism distress, including belongingness (e.g., "I feel as one with the other players"), self-esteem (e.g., "Playing the game made me feel insecure"), control (e.g., "I felt in control over the game"), and meaningful existence (e.g., "I think it's useless that I participated in the game"). Items were scored as a total score to indicate overall social pain, with a greater total score indicates lower ostracism-based distress/social pain. The NTS has evidenced adequate convergent and divergent validity and demonstrated greater validity with the use of the total score rather than the separate subscales (Gerber et al., 2017). Within the current study the NTS demonstrated strong internal consistency ($\alpha = 0.94$).

The *Peer Victimization in College Survey (PVIC; Cole et al., 2020)* is a 126 itemed self-report questionnaire designed to assess peer victimization experiences (e.g., microaggressions, hazing, academic victimization, and sexual harassment/assault) during the college period. Items are rated by a presence or absence (yes/no) or "prefer not to answer". The questionnaire is scored as series of subscales including hazing/peer pressure, verbal aggression, broken trust, sabotage for a total of 10 subscales assessing divers peer victimization experiences. Additionally, the PVIC assesses 10 contributing factors to peer victimization experiences including campus climate, health or disability, race or ethnicity, and interpersonal conflict. The PVIC demonstrated strong construct, discriminant, and convergent validity to identify meaningful peer victimization experiences that result in internalizing and externalizing symptoms (Cole et al., 2020). With the current study, the PVIC demonstrated excellent internal consistency ($\alpha = 0.95$).

The ***Social Interaction Anxiety Scale (SIAS, Mattick & Clarke, 1998)*** is a 20-item self-report measure that social anxiety symptoms elicited through interactions with others (e.g., meeting new people, initiating conversations, going to a party). Items are rated on a 5-point Likert-type scale from 0=*not at all* to 4=*extremely*. The questionnaire is scored as a total score with a possible total of 60. Previous literature has supported that two clinical cutoff scores for the SIAS is 34 which is indicative of social phobia and 43 which indicates the presence of social anxiety disorder (Heimberg, Mueller, Holt, Hope, & Liebowtiz, 1992). The SIAS has good test-retest reliability, convergent, and divergent validity (Mattick & Clarke, 1998). Finally, the SIAS demonstrated high internal validity (Cronbach's $\alpha = .91$; Mattick & Clarke, 1998). Within the current study, the SIAS demonstrated excellent internal consistency ($\alpha = 0.90$).

The ***Social Phobia Scale (SPS, Mattick & Clarke, 1998)*** is a 20-item self-report questionnaire that assesses social anxiety during performance activities (e.g., speaking, writing, acting) or general observation from others (e.g., noticing blushing). Items are rated on a 5-point Likert-type scale from 0=*not at all* to 4=*extremely*. SPS is scored similarly to the SIAS and scored as a global score. Previous literature supports that the clinical cutoff score used for the SPS is 24 to indicate performance social phobia. (Heimberg et al., 1992). The SPS has demonstrated high internal consistency (Cronbach's $\alpha = 0.89$; Mattick & Clarke, 1998). Additionally, the SPS has shown good test-retest reliability, convergent, and divergent reliability (Mattick & Clarke, 1998). Within the current study, the SPS demonstrated excellent internal consistency ($\alpha = 0.93$).

Cyberball and Manipulation Check Questions

First, participants were asked to report the vividness or clarity of picturing the game and other players. Additionally, participants were asked their perception of inclusion status by being

asked to estimate the percent of throws they received during the game (e.g., Approximately how many throws did you receive during the course of the game?). Participants were asked to rate their vividness/ clarity of the game and their inclusion/exclusion experience on a 5 point Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree* (Iffland et al., 2014).

Procedure

All procedures were approved by the University of Mississippi's institutional review board before participant recruitment. Students were administered the SPIN screener as a part of the initial questionnaire students complete to access the SONA online system. Students who scored 11 or above on the SPIN were invited through email to participate in a study entitled “Childhood Experiences and Mentalization Skills.” After obtaining informed written consent, participants were given a randomized, online set of questionnaires, including the Demographics Questionnaire and CTQ. These questionnaires included attention and validity checks throughout the set of measures to ensure participants answered questions to the best of their abilities. Due to the sensitive information collected with the CTQ, participants were assured in the initial consent form that all information will be anonymous and de-identified. Additionally, participants who endorsed greater intensity of childhood trauma experiences were given a list of referrals for community centers and clinics as well as contact information for the Health and Anxiety, Research and Treatment Lab.

After completing initial online questionnaires, participants were informed that they would be tested on their mental visualization skills through a virtual ball-tossing game called Cyberball 5.0 with what they believed were two other virtual players. However, these players were computer-generated. The two-player model was selected as this design is the most widely used among studies implementing the Cyberball paradigm according to a meta-analysis examining

Cyberball design features and their impact on perceived ostracism (Hartgerink et al., 2015). Next, participants were randomly assigned to the experimental condition (Cyberball exclusion) or the control condition (Cyberball inclusion) through Qualtrics randomizing software. Before the Cyberball manipulation began, participants were instructed to mentally visualize the game through questions such as ("Imagine what the others look like. What sort of people are they? Where are you playing? Is it warm and sunny or cold and rainy?"; Iffland et al., 2014). Following the end of the game, participants were asked to complete a self-report measure of social pain (Needs Threat Scale).

Cyberball Exclusion Condition

The Cyberball virtual ostracism ball-tossing game implemented by Williams and Jarvis (2006) was adapted for the current study. Participants were given the ball and asked to indicate whom they want to throw the ball to by clicking on one of the other players' icons. Participants were given the ball twice during the game and were not given the ball again. The game lasted for a total of 30 ball tosses.

Cyberball Inclusion Condition

The Cyberball virtual ostracism ball-tossing game implemented by Williams and Jarvis (2006) was adapted for the current study. Participants were given the ball and asked to indicate whom they want to throw the ball to by clicking on one of the other players' icons. Participants received the ball approximately 33% of throws for a total of 30 ball tosses.

Data Cleaning Procedure

Statistical analyses were completed using the statistic software SPSS Version 26 (IBM Corp., 2019). Duplicate cases, ineligible participants (i.e., participants who were not 18-24-

years-old), and participants who did not consent to use of their data were excluded ($n = 8$). Twelve participants were excluded due to failure to provide correct responses to the attention check items. Mahalanobis distance was used to identify potential outlier variables (Ben-Gal, 2005), and four participants were identified as outliers and subsequently removed, resulting in a sample of 152 participants. Lastly, missing data were evaluated. Data was determined to be missing at random through Little's MCAR test ($X^2 [10060, N = 152] = 7734.54, p > .05$). Data imputation was used for cases with at least 80% complete data using the regression based multiple imputation ($n = 11$).

Regarding the Childhood Trauma Questionnaire, the sexual abuse, physical neglect, and physical abuse subscales demonstrated a positively skewed distribution and were considered leptokurtic through visual inspection and descriptive analyses (see Table 1). The skewness and kurtosis suggest participants predominately had ratings of maltreatment experiences in the low range. However, all other variables, including the outcomes variables, met assumptions of normality, skewness, and kurtosis; therefore, the planned analyses were conducted. The alpha for hypothesis testing will set at .01 instead of .05 to reduce the error of false positive in the current study analyses.

Table 1

Childhood Trauma Questionnaire (N = 136)

	Skewness	Kurtosis	<i>M(SD)</i>
Emotional Neglect	.722	-.452	9.20(3.92)
Emotional Abuse	1.07	.394	9.11(4.11)
Physical Abuse	1.91	4.26	6.97(2.44)
Physical Neglect	1.45	1.30	6.35(1.86)
Sexual Abuse	3.67	13.48	5.73(2.33)

Note. In addition to calculating skewness and kurtosis values, the distribution curves of the Childhood Trauma Questionnaire (CTQ) were inspected.

CHAPTER III

RESULTS

Preliminary Data Analysis

Manipulation Check and Evaluation of Cyberball

With regard to assessment of the validity of the Cyberball experimental paradigm, participants were asked about their experiences regarding their perception of the manipulation. Of participants who completed Cyberball, 10.3% ($n = 15$) rated they could not clearly imagine other players, 50.7% ($n = 74$) rated they could somewhat imagine other players, and 39.0% ($n = 57$) rated they could very clearly imagine other players. Consequently, the majority of participants endorsed the virtual Cyberball paradigm as believable. Additionally, participants reported the extent to which they felt they were being ignored or excluded by other players, wherein 36.3% ($n = 53$) reported not at all, 27.4% ($n = 40$) participants reported somewhat, and 35.9% ($n = 52$) reported very much. These results are consistent with the random assignment of inclusion and exclusion Cyberball condition as evidenced by a significant chi square analysis $X^2(2, N = 145) = 101.457, p < .01$ indicating that participants within the inclusion condition endorsed “not at all” or “somewhat” and participants within the exclusion condition endorsed “somewhat” or “very much”.

Examination of Baseline Equivalence

A series of analyses was conducted to examine baseline equivalence between the Cyberball conditions. First, t-tests were implemented to examine differences in age, social

anxiety symptoms (i.e., total SPS and SIAS scores), and CEM experiences (i.e., CTQ subscale scores) between the inclusion and exclusion Cyberball conditions. Independent t-tests supported that there were no significant differences between the inclusion and exclusion conditions for age ($t(144) = -.393, p = .70$), interaction-based social anxiety total scores ($t(134) = -2.63, p = .01$), performance-based social anxiety ($t(138) = -2.10, p = .039$), emotional neglect ($t(133) = -.852, p = .396$), emotional abuse ($t(133) = -.477, p = .634$), sexual abuse ($t(133) = 1.53, p = .125$), physical abuse ($t(132) = .282, p = .779$), and physical neglect ($t(133) = -.352, p = .725$). Second chi-square tests were conducted to examine differences in gender and race/ethnicity differences between participants in the Cyberball inclusion and exclusion conditions. Chi-square tests revealed that there were no significant differences in gender $X^2(3, N = 146) = .033, p = .983$ and race/ethnicity $X^2(2, N = 146) = 3.79, p = .580$ between inclusion and exclusion conditions.

Analyses were conducted to examine potential differences between individuals who only completed the self-report questionnaires (Hypothesis 1) and individuals who completed the self-report questionnaires and Cyberball (Hypotheses 2 and 3). Results indicated that there were no significant differences with regard to gender $X^2(1, N = 152) = .93, p > .01$, age $X^2(1, N = 152) = 1.65, p > .01$, race/ethnicity $X^2(1, N = 152) = 1.35, p > .01$, and academic year $X^2(1, N = 152) = .77, p > .01$.

Psychological Characteristics of the Sample

Regarding psychological characteristics of the sample, participants endorsed mild to high social anxiety symptoms. Specifically, the sample generally endorsed elevated interaction-based social anxiety symptoms ($M = 36.16, SD = 11.89$), with 52% of the sample scoring at or above the clinical cutoff for social phobia (≥ 34 ; Mattick & Clarke, 1998). The sample endorsed an

elevated level of performance social anxiety ($M = 14.90$, $SD = 11.89$), with the 24.3% of the sample scoring at or above the clinical cutoff for social phobia (≥ 24 ; Mattick & Clarke, 1998).

Participants endorsed elevated moderate to severe experiences of childhood emotional maltreatment through the Childhood Trauma Questionnaire (see Table 2). Severity ratings were calculated by calculating the percentage of participants that were at or above the empirical based moderate-severe cutoff exposure score (Bernstein et al., 2003). Regarding emotional maltreatment, 9.9% ($M = 9.2$, $SD = 3.89$) of participants reported moderate to severe emotional neglect and 22.7% ($M = 9.15$, $SD = 4.15$) of participants reported moderate to severe emotional abuse.

Table 2

Childhood Trauma Questionnaire Moderate to Severe Clinical Cutoff (N = 152)

	% (n)
Emotional Neglect	9.9(15)
Emotional Abuse	22.7(34)
Physical Abuse	11.6(17)
Physical Neglect	9.9(15)
Sexual Abuse	9.2(13)

Note. Percentages calculated by determining the number of participants who endorsed at or above the clinical cutoff scores of the Childhood Trauma Questionnaire (CTQ).

Examination of Study Hypotheses

Hypothesis 1

A series of Pearson bivariate correlations were conducted to examine the relationship between social anxiety symptoms (interaction-based and performance-based symptoms) and CEM experiences (emotional abuse and emotional neglect) (see Fig. 2 and 3). Consistent with the hypothesis, performance-based social anxiety symptoms were significantly positively correlated with greater intensity of emotional abuse ($r = .387$, $p < .01$) and emotional neglect ($r = .249$, $p < .01$). Additionally, results supported significant positive correlations between

interaction-based social anxiety symptoms and greater intensity of emotional abuse ($r = .398, p < .01$) and emotional neglect ($r = .313, p < .01$).

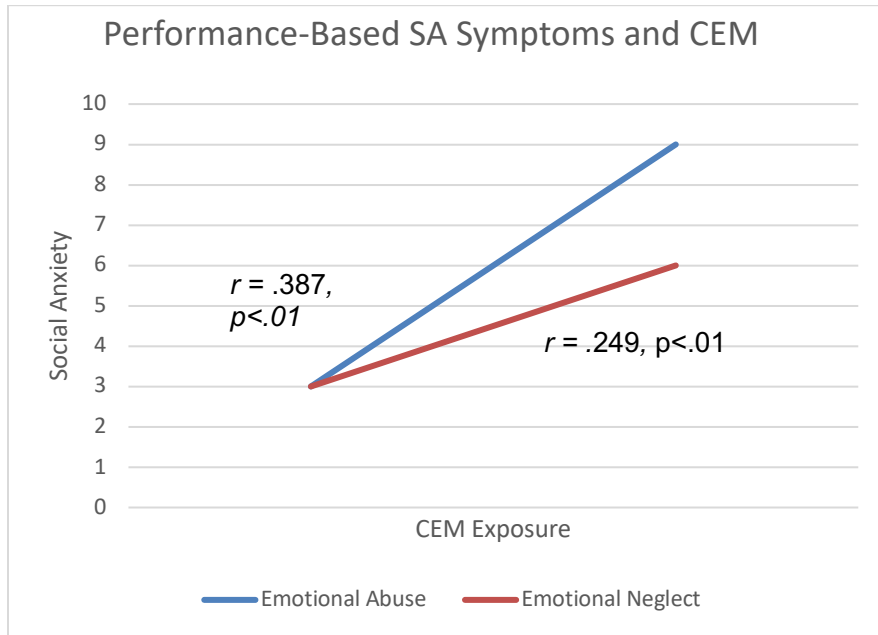


Figure 2. Performance-Based Social Anxiety and CEM

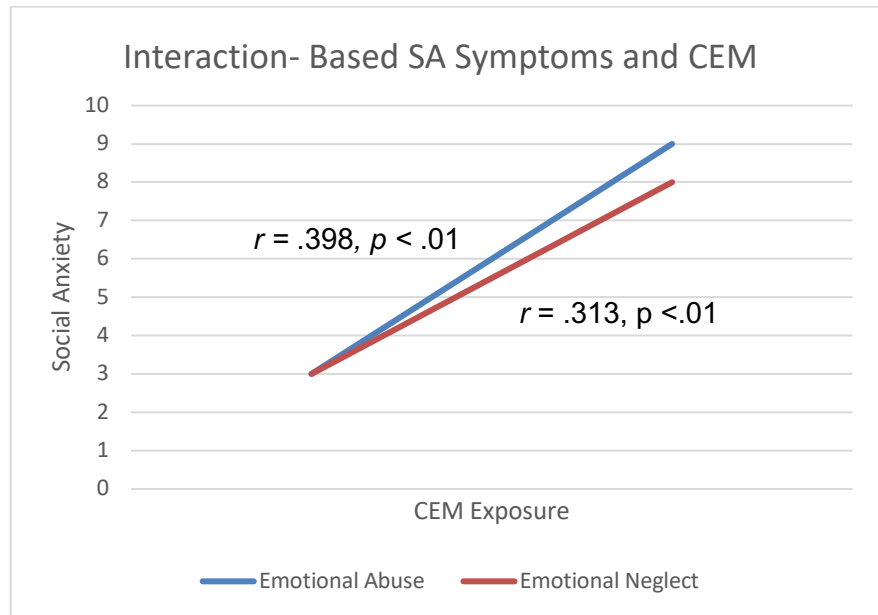


Figure 3. Interaction-Based Social Anxiety and CEM

Hypothesis 2

A mixed model repeated-measures ANOVA was completed to evaluate the impact of Cyberball condition (inclusion vs. exclusion) on participants experience of social pain from pre- to post-task (see Table 3). Within these analyses, higher mean scores of social pain indicates lower social pain. Condition was entered as the between-subjects factor, and the within-subjects factor was pre-Cyberball and post-Cyberball social pain. Results revealed there was no main effect of time ($F[1, 132] = 1.87, p = .174$), with similar overall scores for pre-Cyberball social pain ($M = 65.1, SD = 14.8$) and post-Cyberball social pain ($M = 64.1, SD = 16.3$). Additionally, results revealed there was no main effect of condition ($F[1, 132] = .985, p = .323$) with the inclusion condition ($M = 65.8, SD = 15.63$) experiencing similar levels of social pain as the exclusion condition ($M = 63.27, SD = 15.94$).

Table 3

Summary of Correlational and Descriptive Analyses

Variable	1	2	3	4	5	6
1. SPS						
2. SIAS	.783***					
3. NTS_1	-.525***	-.629***				
4. NTS_2	-.452***	-.547***	.791***			
5. Emo_N	.252***	.326***	-.518***	-.417***		
6. Emo_A	.424***	.435***	-.543***	-.430***	.656***	
<i>M</i>	15.11	36.20	65.52	64.10	9.24	9.22
<i>SD</i>	12.04	16.21	15.01	16.18	3.89	4.16
OR	48	68	68	76	15	18
ER	80	80	80	80	20	20
<i>N</i>	145	141	142	144	141	141

Note. SPS= Social Phobia Scale, SIAS= Social Interaction Anxiety Scale, NTS_1 = Pre-Task Social Pain, NTS_2 = Post-Task Cyberball Social Pain, Emo_N = Emotional Neglect, Emo_A = Emotional Abuse. OR = Observed range, ER = Expected Range

* $p < .05$, ** $p < .01$, *** $p < .001$

However, results indicated a significant interaction effect between time and condition $F(1, 132) = 19.69, p < .01$. Post hoc analyses were implemented to elucidate the significant interaction effect through pairwise comparisons wherein at the post-task assessment of social

pain there was a significant mean difference ($M_d = 6.17, SD = 2.3, p < .01$) between the inclusion ($M = 67.05, SD = 1.9$) and exclusion conditions ($M = 60.89, SD = 2.1$). Results illustrated that those participating in the exclusion condition reported greater social pain than those participating in the inclusion condition compared to baseline assessment of social pain wherein there was no significant difference between inclusion and exclusion.

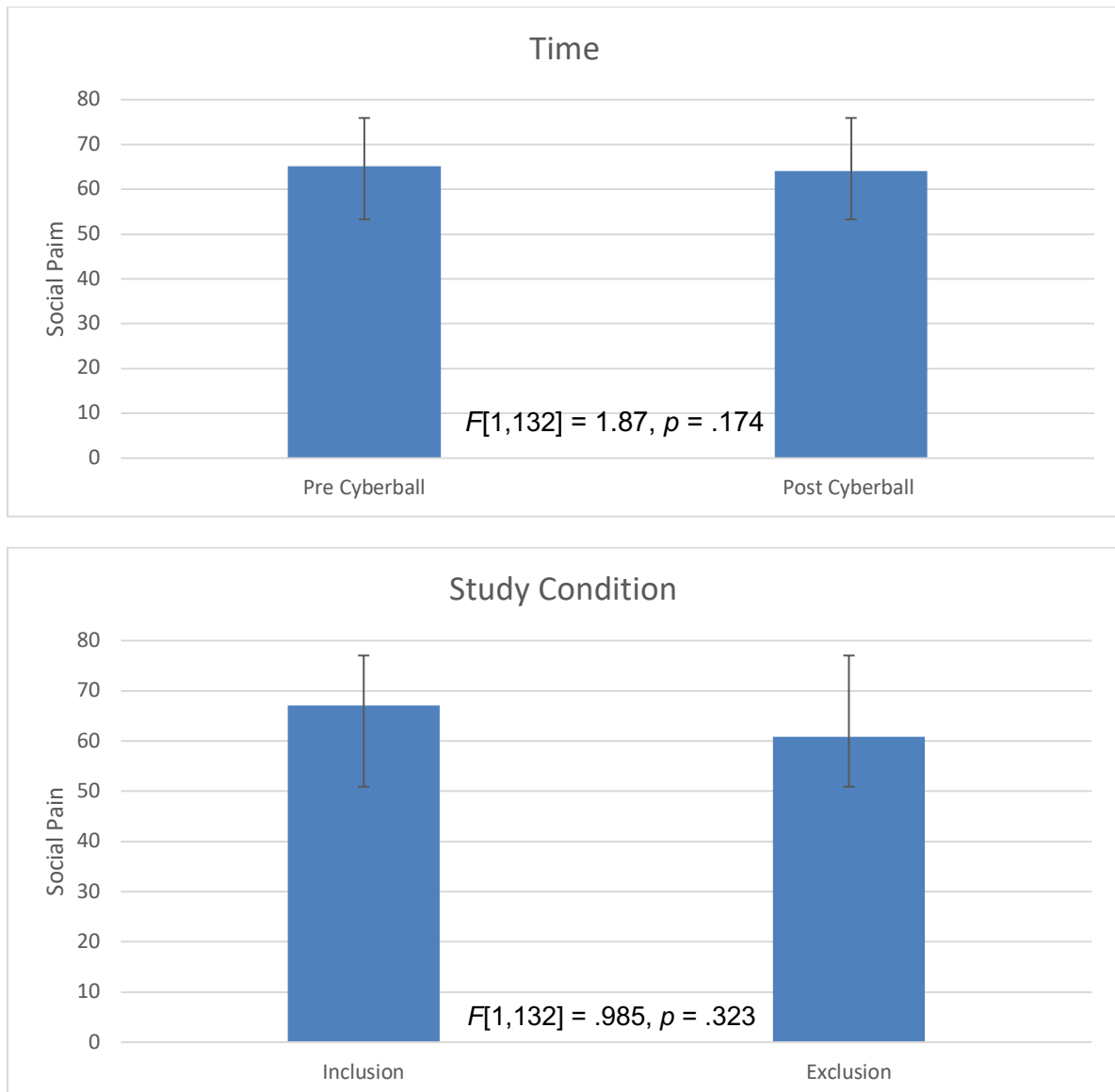


Figure 4. *Main Effects of Time and Condition*

Hypothesis 3

To evaluate the hypothesis that perceived severity of exposure to CEM experiences would moderate the relationship between social exclusion and social pain, moderation analyses were conducted using two hierarchical regression models with CEM experiences (emotional abuse and emotional neglect) as the moderator, social exclusion status as the predictor, and social pain as the outcome. Additionally, all predictor values were mean centered and condition was dummy coded (0 = exclusion, 1 = inclusion) for these analyses. The first model examined the moderating effect of emotional abuse on post Cyberball social pain (see Table 4). Step 1 included pre-Cyberball social pain and indicated that pre-task social pain accounted for 60.0% of variance in post-task social pain ($R^2 = .60$, $\Delta R^2 = .60$, $F(1,121) = 177.88$, $p < .01$). In the next step, condition status (i.e., Inclusion, Exclusion) and exposure to emotional abuse experiences were entered into the model and indicated they together accounted for 65.2% of the variance of post-task social pain ($R^2 = .65$, $\Delta R^2 = .06$, $F(2,119) = 74.20$, $p < .01$), wherein pre-task social pain and condition were significant predictors of post-task social pain. In the final step, the condition status and emotional abuse interaction term was included. Results revealed that pre-task social pain and condition remained significant factors; however, the interaction between condition status and emotional abuse experiences was not significant ($R^2 = .65$, $\Delta R^2 = .00$; $F[1,118] = 55.2$, $p = .824$). An exploratory analysis was conducted where pre-Cyberball social pain was not controlled for within the regression. Again, results revealed a nonsignificant moderation between condition status and emotional abuse experience $R^2 = .51$, $\Delta R^2 = .26$, $F(2,119) = 55.2$, $p = .279$.

Table 4*Differences in Social Pain between Conditions: Results of the Mixed Model ANOVA*

ANOVA Results		<i>Sum of squares</i>	<i>df</i>	<i>Mean square</i>	<i>F</i>	<i>p</i>	η^2
Between Subjects Effects	Condition	425.9	1	425.9	.98	.323	.01
	Error (Condition)	57115.4	132	432.7	--	--	--
Within-Subjects Effects	Time	83.8	1	83.8	1.87	.174	.01
	Time x Condition	885.30	1	885.30	19.7	< .001	.13
	Error (Time)	5932.57	132	44.94	--	--	--
Post-hoc Analyses and Descriptive Statistics		Exclusion Condition		Inclusion Condition		<i>P</i>	<i>D</i>
		<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>		
Pre-Cyberball Social Pain		65.65	1.87	64.54	1.77	.03	1.11
Post-Cyberball Social Pain		60.89	2.02	67.10	1.90	<.01	6.21

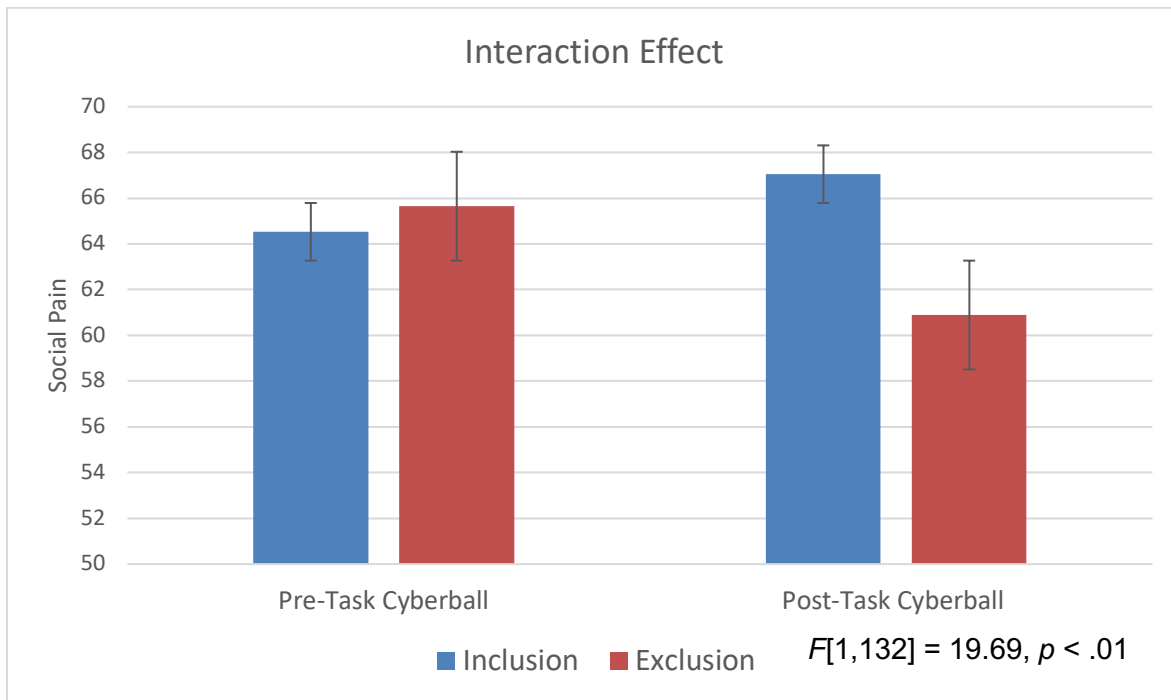
Note. Time = Pre-Task Cyberball Social Pain – Post-Task Cyberball Social Pain. Greater scores of social pain indicates lower social pain.

The second model examined the moderating effect of emotional neglect on post-Cyberball social pain (see Table 5). Step 1 included pre-Cyberball social pain and indicated that pre-task social pain accounted for 60.0 % of variance in post-task social pain ($R^2 = .60$, $\Delta R^2 = .60$, $F(1,121) = 177.88$, $p < .01$). In the next step, condition status (Inclusion, Exclusion) and exposure to emotional neglect experiences were entered into the model and accounted for 65.5% of the variance of post-task social pain ($R^2 = .655$, $\Delta R^2 = .06$, $F(2,119) = 75.30$, $p < .01$), with pre-task social pain and condition emerging as significant predictors. In the final step, the condition status and emotional neglect interaction term was included. Pre-task social pain and condition were significant predictors of post-task social pain; however, results revealed a nonsignificant interaction between condition status and emotional neglect experiences $R^2 = .655$, $\Delta R^2 = .01$, $F(1,118) = 57.6$, $p = .137$. An exploratory analysis was conducted where pre-Cyberball social pain was not controlled for within the regression. Again, results revealed a nonsignificant moderation between condition status and emotional neglect experience $R^2 = .51$, $\Delta R^2 = .26$, $F(1,128) = 15.1$, $p = .134$.

Table 5*Results of the Moderation of Childhood Emotional Abuse Experiences on Post-task Social Pain*

Variable	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>R</i> ²	ΔR^2
Step 1					.60	.60
Pre-Task Social Pain	.771	.06	13.34	.000		
Step 2					.65	.06
Pre-Task Social Pain	.75	.07	11.63	.000		
Condition	.24	1.73	4.36	.000		
Emotional Abuse (EA)	-.04	.25	-.65	.519		
Step 3					.65	.000
Pre-Task Social Pain	.75	.072	11.50	.000		
Condition	.24	1.73	4.35	.000		
Emotional Abuse	-.03	.33	-.35	.726		
Condition * EA	-.02	.42	-.22	.824		

Note. Pre-Task Social Pain = First Administration of Needs Threat Scale; Condition = Cyberball Inclusion or Exclusion Condition; Emotional Abuse = Childhood Trauma Questionnaire Emotional Abuse Subscale; Condition * EA = Interaction term between Cyberball Condition and Emotional Abuse Subscale.

**Figure 5.** *Interaction Effect between Condition and Time***Exploratory Analyses**

In light of the null findings for Hypothesis 3 and an existing evidence base on other forms of childhood maltreatment and peer victimization, exploratory analyses were conducted to examine these factors in the moderation models.

Total Childhood Maltreatment Score Moderation

An exploratory moderation analysis evaluating the moderating influence of total self-reported childhood maltreatment (emotional abuse, emotional neglect, physical abuse, physical neglect, and sexual abuse) on experience of social pain was conducted (see Table 6). Step 1 included pre-Cyberball social pain and indicated that pre-Cyberball social pain accounted for 59.5% of the variance in post-task social pain ($R^2 = .595$, $\Delta R^2 = .595$, $F(1,121) = 177.88$, $p < .01$). In the next step, condition status (i.e., Inclusion, Exclusion) and childhood maltreatment experiences were entered into the model and accounted for 65.3% of the variance in post-task Cyberball social pain ($R^2 = .653$, $\Delta R^2 = .06$, $F[2,119] = 74.58$, $p < .01$), with pre-task social pain and condition emerging as significant predictors. In the final step, the condition status and childhood maltreatment interaction term between was included. Results revealed a nonsignificant interaction between condition status and childhood maltreatment experiences $R^2 = .66$, $\Delta R^2 = .00$, $F(1,118) = 56.54$, $p = .22$.

Table 6

Results of the Moderation of Childhood Emotional Neglect Experiences on Post-task Social Pain

Variable	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>R</i> ²	ΔR^2
Step 1					.60	.60
Pre-Task Social Pain	.77	.06	13.33	.000		
Step 2					.66	.06
Pre-Task Social Pain	.73	.07	11.80	.000		
Condition	.24	1.73	4.44	.000		
Emotional Neglect (EN)	-.08	.26	-1.29	.196		
Step 3					.66	.01
Pre-Task Social Pain	.73	.07	11.74	.000		
Condition	.24	1.72	4.51	.000		
Emotional Neglect	-.01	.36	-.13	.894		
Condition * EN	-.13	.45	-1.50	.137		

Note. Pre-Task Social Pain = First Administration of Needs Threat Scale; Condition = Cyberball Inclusion or Exclusion Condition; Emotional Neglect = Childhood Trauma Questionnaire Emotional Neglect Subscale; Condition * EN = Interaction term between Cyberball Condition and Emotional Neglect Subscale.

Peer Victimization in College Survey

Exploratory analyses were conducted to evaluate current experiences of peer victimization in college in their moderating influence on the experience of post-Cyberball social pain (see Table 7). The first scale examined social exclusion experiences such as “other people ignore or overlook me in person or online”. Step 1 included pre-task Cyberball and indicated that pre-task Cyberball accounted for 63.6% of the variance in post-task social pain ($R^2 = .636$, $\Delta R^2 = .636$, $F(1,124) = 216.99$, $p < .01$). In the next step, condition status (i.e., Inclusion and Exclusion) and peer social exclusion experiences were entered into the model and accounted for 68.4% of the variance in post-task Cyberball social pain ($R^2 = .684$, $\Delta R^2 = .05$, $F[2,122] = 88.20$, $p < .01$), with pre-task social pain and condition emerging as significant predictors. In the final step, the condition status and peer social exclusion term between was included. Results revealed the interaction between condition status and childhood maltreatment experiences did not add significant variance to the model, $R^2 = .69$, $\Delta R^2 = .00$, $F(1,121) = 65.65$, $p = .81$. Other similar subscales were evaluated including hazing/peer pressure, sexual victimization, sabotage, belittlement, online peer victimization, verbal aggression, physical aggression, stereotyping, and broken trust. No interaction terms investigated revealed a significant moderation on post-task Cyberball social pain.

Table 7*Results of the Moderation of Total Childhood Maltreatment on Post-task Social Pain*

Variable	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>R</i> ²	ΔR^2
Step 1					.60	.60
Pre-Task Social Pain	.77	.06	13.3	.000		
Step 2					.65	.06
Pre-Task Social Pain	.74	.07	11.58	.000		
Condition	.24	1.73	4.34	.000		
Childhood Maltreatment (CM)	-.06	.09	-.93	.357		
Step 3					.66	.00
Pre-Task Social Pain	.73	.07	11.07	.000		
Condition	.23	1.72	4.39	.000		
CM	-.15	.14	-1.53	.129		
Condition * CM	-.10	.16	-1.22	.224		

Note. Pre-Task Social Pain = First Administration of Needs Threat Scale; Condition = Cyberball Inclusion or Exclusion Condition; Childhood Maltreatment = Childhood Trauma Questionnaire Total Score; Condition * CM = Interaction term between Cyberball Condition and Childhood Emotional Maltreatment.

Table 8*Results of the Moderation of Peer Victimization Social Exclusion on Post-task Social Pain*

Variable	<i>B</i>	<i>SE</i>	<i>T</i>	<i>P</i>	<i>R</i> ²	ΔR^2
Step 1					.64	.64
Pre-Task Social Pain	.80	.06	14.66	.000		
Step 2					.68	.05
Pre-Task Social Pain	.78	.06	14.12	.000		
Condition	.21	1.64	4.23	.000		
Social Exclusion (SE)	.05	.82	.88	.383		
Step 3					.69	.00
Pre-Task Social Pain	.78	.06	14.01	.000		
Condition	.22	1.65	4.21	.000		
Social Exclusion	.04	.99	.60	.601		
Condition * SE	.02	1.6	.24	.812		

Note. Pre-Task Social Pain = First Administration of Needs Threat Scale; Condition = Cyberball Inclusion or Exclusion Condition; Social Exclusion = Peer Victimization in College Survey Social Exclusion Subscale; Condition * SE = Interaction term between Cyberball Condition and Social Exclusion Subscale.

CHAPTER IV

DISCUSSION

The development and trajectory of SAD is considered multifaceted and includes developmental, biological, individual differences, and environmental influences (Spence & Rapee, 2016). One noteworthy factor investigated across previous literature has been CEM experiences due to its association with more persistent and chronic social anxiety symptoms (Gren-Landell et al., 2011; Kuo et al., 2011; Simon et al., 2009). However, previous literature exploring the connection between childhood maltreatment experiences and social anxiety symptoms has predominately been examined within treatment-seeking samples (Simon et al., 2009) and children (Copeland et al., 2007). Despite CEM's association with social anxiety symptoms, the influence of previous CEM experiences on the young adults' experience of social anxiety and social stress (i.e., peer exclusion and victimization) has yet to be investigated. Therefore, the current study aimed to examine the influence of CEM experiences on the perception of current distress induced by social exclusion (i.e., social pain) and peer victimization among socially anxious young adults. Consistent with the recruitment procedures, most participants endorsed clinical levels of social anxiety symptoms and nearly one-fourth of the sample reported moderate-severe levels of emotional abuse and approximately 10% of participants reported moderate-severe levels of emotional neglect. Previous research estimates college student emotional abuse at approximately 9.60% - 11.55% and emotional neglect at approximately 12.53% - 14.43% (Sun et al., 2023); thus, slightly higher levels of emotional abuse and similar levels of emotional neglect were observed in the current study.

To examine the first hypothesis of the current study, Pearson bivariate correlations were conducted among key variables (social anxiety symptoms and CEM experiences). Consistent with the hypothesis and previous empirical evidence (Gren-Landell et al., 2011; Kuo et al., 2011; Lochner et al., 2010; Simon et al., 2009), participants who endorsed greater current performance-based social anxiety symptoms reported more intense experiences of emotional abuse and neglect from primary caregivers. Additionally, participants who endorsed greater interaction-based social anxiety symptoms reported more intense experiences of emotional abuse and neglect. This evidence provides additional support for the association between experiences of CEM and greater chronicity and severity of social anxiety symptoms within young adulthood. These results highlight the established SAD developmental framework connecting childhood adverse experiences as etiological contributor to adult SAD symptoms.

The second hypothesis examined the influence of the Cyberball conditions (i.e., inclusion and exclusion) on the experience of social pain prior to and following the Cyberball task. Results revealed that time nor Cyberball condition alone had a significant influence on subsequent levels of social pain. However, an interaction was observed, wherein participants who had undergone the exclusion condition of Cyberball experienced greater social pain after the task compared to baseline. These findings are fully consistent with the hypothesis and previous empirical investigations of Cyberball, indicating that the exclusion condition elicited greater social pain than the inclusion condition during the post-Cyberball assessment of social pain (Slegers, Proulx, and van Beest, 2017). For young adults with heightened social anxiety symptoms, social connectedness is essential to mental health (Cruwys et al., 2013) and longevity (Giles et al., 2012). The results contribute to the expanding body of evidence demonstrating social exclusion experiences among socially anxious young adults results in greater intensity of negative

emotional experiences (e.g., anger, resentment, sadness; Donatè et al., 2017) and intensifies the cognitive biases and behavioral avoidance present within SAD (i.e., greater fear of negative evaluation and avoidance of social situations; Nishiyama et al., 2015).

The third hypothesis examined the influence of exposure to CEM experiences on participants reported social pain after completing Cyberball. Contrary to study hypotheses, results revealed that emotional abuse and emotional neglect experiences had an unsupported influence on participants' experience of social pain after completion of the Cyberball exclusion condition. This finding is inconsistent with prior work demonstrating that a greater intensity CEM is associated with greater social anxiety symptoms (Davidson et al., 2019; Heeren et al., 2017, Iffland et al., 2014; Wang et al., 2019). Given these results, exploratory analyses were conducted to assess the influence of CEM as well as other types of childhood maltreatment experiences (e.g., physical neglect, physical abuse, and sexual abuse) on current experiences of social pain. Again, contrary to prior empirical investigations, results did not support the influence of total childhood maltreatment on participants experience of social pain after the Cyberball exclusion condition.

Finally, exploratory analyses were conducted to assess college-based peer victimization experiences (i.e., hazing peer pressure, sexual victimization, stereotyping, broken trust, and social exclusion) influence on current experiences of social pain. Similarly, peer victimization was not found to influence participants' experience of social pain. Altogether, these results suggest that adverse experiences (childhood maltreatment and peer victimization experiences) may not contribute to the change in social pain above and beyond participants' Cyberball inclusion/exclusion condition. Resultantly, these findings support Cyberball's ability to produce

feelings of ostracism after a single incidence of social exclusion; however, results are resistant to distal environmental influences (i.e., number and intensity of adverse social experiences).

A number of potential explanations and limitations may account for the present findings and be used to inform future research. First, CEM experiences will be examined within the developmental trajectory of social anxiety symptoms. Then, the general limitations of methodology and sample will be discussed. Lastly, future directions given the limitations of the current study will be explored.

One potential explanation for the unsupported results between CEM experiences, social anxiety symptoms, and current social pain is the consideration of more prevalent alternative developmental pathways of SAD (i.e., biological, individual differences, and broad parenting practices). According to Egeland (2009), it is estimated that approximately 8.9% of childhood maltreatment consists of emotional maltreatment, whereas, negative parenting practices, individual temperament, and biological differences have an overall higher prevalence rate than CEM experiences within individuals with SAD (Ollendick & Benoit, 2012). The current study did not measure or account for genetic, temperamental, or general parenting practices influences in the prediction of current social pain after social exclusion.

A second potential explanation for CEM's inconclusive influence on young adults' social pain is the inability for the current study to account for developmental changes that occur within the parent-child relationship during young adulthood. Developmental changes in this period include increased young adult autonomy, leaving home, decreased social dependence on one's parents (Gillspie et al., 2020). Throughout these transitions, parents who have been able to adjust parenting practices (e.g., parental involvement and parental warmth) to children's developmental level, such as less parental involvement while providing consistent parental warmth, have been

demonstrated to have a higher quality relationship with young adults (Fang, Fosco, Redmond, & Feinberg, 2022). However, dysfunctional perceived parenting (e.g., poor parental emotional, financial, and educational support) is associated with reported unsatisfactory parental relationships (Kuroda, 2017), problematic alcohol use (Serido et al., 2013), and greater mental health difficulties (Rebellon & Straus, 2017). Consequently, a greater intensity of CEM may not be representative of parents' ability to accept these developmental changes, which is hypothesized to contribute to young adults' current experience of social pain.

To further elucidate inconclusive findings, young adults with chronic exposure to CEM have been found to exhibit interpersonal functioning dysfunction resulting in impairment within their own relationships. For example, a metaanalysis examining CEM experiences among young parents found those who endorsed CEM themselves were more likely to self-report negative parenting behaviors with their own children such as greater psychological aggression, corporal punishment, overcontrol, and intrusiveness (Savage et al., 2019). Further, young adults with a history of CEM have increased likelihood of interpersonal violence among romantic relationships (Loucks, van Dellen, & Shaffer; 2019), greater alcohol use (Bunford, Wymbs, Dawson, & Shorey, 2017), and disordered eating attitudes (Emery, Yoon, Mason, & Neumark-Sztainer; 2021), which suggests CEM has a long-lasting impact on young adults' relationships and distress. Moreover, it is posited that social pain may not be an accurate proxy to capture this broader interpersonal dysfunction. Lastly, this sample was collected among college attending young adults; consequently, the sample was not representative of young adults across diverse socioeconomic and education levels. Moreover, the literature supports that lower socioeconomic and education levels are associated with higher prevalence rates of CEM (Doidge et al., 2017).

Therefore, CEM exposure may have more diverse consequences that were unable to be evaluated within the current study.

Limitations

One potential limitation of the current study may be virtual nature of the social exclusion paradigm Cyberball. Despite Cyberball being the gold standard in ostracism and social exclusion research with successful implementation in over 5,000 participants (Williams, Cheung, & Choi; 2000), current literature has noted several limitations to the virtual nature of this social exclusion task. First, Wirth and colleagues (2014) identified Cyberball's limited ability to induce continuous group-interaction during Cyberball compared to in vivo social exclusion paradigms. Moreover, researchers identified Cyberball's limited ability to influence group perceptions such as a group's efficacy and meaning. Therefore, alternative social exclusion paradigms have been created incorporating group task, goals, and interactions to address these concerns in additional virtual social exclusion paradigms. Another limitation Cyberball presents is the restricted ability for the virtual ball tossing game to mirror victimization-based social pain experiences (e.g., bullying, peer pressure, and belittlement; Chen, Williams, Fitness, and Newton; 2008). Researchers developed a social exclusion task in which participants were asked to write and retell a social exclusion experience from their own life to address this limitation; however, this paradigm produce limited results. Therefore, refinement of social exclusion paradigms to reflect lived social pain experiences remains needed to further enhance methodology among social exclusion-based studies and improve our understanding of the impact of exclusion.

Another potential limitation for the current study is the reliance on adult-based retrospective self- report of parent-child interaction rather than a prospective cohort design. Moreover, a limited range was observed for CEM experiences; thus, the limited variability may

have contributed to the lack of support for Hypothesis 3. Retrospective reports of CEM are unable to capture observations of parent-child interactions and are dependent on young adults' memory and interpretation of events. More specifically, individuals with SAD are known to have cognitive biases, such as a greater negative evaluation biases (Clark & Wells, 1995); therefore, it is difficult to differentiate accurate interpretation from greater negative evaluation of parent-child interactions. It should be noted that prospective studies examining CEM in children can be challenging to collect due mandated reporting related ethical obligations to child protective services, fear among parents to disclose maltreatment experiences, and lack of standardization among prospective methods (e.g., child protective services case records, child report, parent report; Kerig & Fedorowicz, 1999). Therefore, adult-retrospective methodology was selected to capture maltreatment experiences in light of the aforementioned limitations.

In addition, the limitations of the demographics and psychological characteristics of the current sample should be noted. The current study examined predominantly White women; yet, a study examining demographic characteristics of childhood maltreatment found the highest maltreatment prevalence rates among men, non-college-educated individuals, and lower socioeconomic status (Scher, Forde, McQuaid, & Stein, 2004). Therefore, the current study results may not be representative of young adults with heightened risk of CEM. Additionally, the current study did not exclude individuals with other prevalent psychological disorders that co-occur with childhood maltreatment experiences such as major depressive disorder, posttraumatic stress disorder, panic disorder, and substance use disorders (Teicher & Samson, 2013). Therefore, the unique contribution of SAD in the experience of social pain among individuals with a history of CEM remains inconclusive.

Lastly, Cyberball produces a consistently large ostracism effect that has been exhibited across several studies according to a metaanalysis of 120 experiments (Hartgerink et al., 2015); however, the large effect of ostracism has also been demonstrated to be resistant to the effects of moderation. Hargernik and colleagues' (2015) metaanalysis supports the current study findings such that the majority of participants reported elevated social pain after participation in the Cyberball exclusion condition; however, childhood maltreatment (emotional abuse, emotional neglect, physical abuse, physical neglect, and sexual abuse) and current peer victimization experiences did not significantly contribute to reported social pain. Therefore, it is hypothesized that adverse events such as childhood maltreatment and peer victimization are distal influences on Cyberball's social pain induction and thus minimally contribute to the distress elicited.

Future Directions

Overall, the results of the current study add to the growing developmental framework to understand the etiology of SAD. Young adults, age 18-24 years old, are uniquely vulnerable to SAD with prevalence rates estimated to be between 12.7% to 13.1%, the highest prevalence rates compared to all other age groups (Fehm et al., 2008). Further, emerging adults are at risk for greater functional impairment resulting from social anxiety symptoms such as isolation and loneliness (Baytemir & Yildiz, 2017; Lim et al., 2016; Maes et al., 2019), diminished social support (Rapee et al., 2015), and suicidality (Dilsaver et al., 2006; Rapp et al., 2017). Therefore, it is essential that future directions of this research examine alternative developmental pathways through broad parenting practices and alternative social exclusion paradigms to better understand risk factors that lead to greater intensity and chronicity of social anxiety symptoms among young adults. Moreover, future studies should assess the developmental pathway of SAD through longitudinal methodology (i.e., multiple assessments of CEM experiences over time) to elucidate

the changes in intensity and chronicity of SA symptoms from greater exposure to CEM. Finally, future studies should investigate the influence of CEM and current peer victimization experiences within SAD treatment. Although there is an expansive evidence base for effective cognitive-behavioral psychological treatment for SAD (Feeney et al., 2004), individuals with experiences of childhood maltreatment and peer victimization can be resistant to gold-standard psychological treatments (Teicher, Gordon, & Nemeroff, 2021). Therefore, investigating the influence of repeated CEM exposure and peer victimization on young adults' SAD treatment outcomes could be impactful by identifying these high-risk individuals.

The current study contributes to the growing literature base examining the developmental pathways of SAD among young adults. Despite limitations of the findings and methodology, results established the importance of social exclusion in the experience of social pain among young adults with elevated social anxiety symptoms. Further, findings were supportive of an association between self-reported social anxiety symptoms and retrospective reports of CEM. As the intersection between CEM and SAD etiology continues to be examined in future studies, results will likely lead to greater identification and assessment of socially anxious at-risk young adults within university settings.

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APPENDIX

APPENDIX A

DEMOGRAPHIC QUESTIONNAIRE

1. What gender do you identify?
 - a. Male
 - b. Female
 - c. Non-binary
 - d. Other

2. What was your sex at birth?
 - a. Male
 - b. Female

3. Age: _____

4. With which ethnicity/race do you identify with?
 - a. Native American
 - b. Asian/Pacific
 - c. Black/African American
 - d. Hispanic/Latino
 - e. White/Caucasian
 - f. Other
 - g. Prefer no answer

5. Year in college
 - a. Freshman (1st year)
 - b. Sophomore (2nd year)
 - c. Junior (3rd year)
 - d. Senior (4th year)
 - e. Other _____

6. Number of credits enrolled in this semester _____

7. Current GPA _____

8. Major _____

9. Living situation for 2019-2020
- a. On campus dormitory
 - b. Greek affiliated housing
 - c. Off campus apartment/house
 - d. Living with parents/family
 - e. Other _____
10. Previous significant medical or psychiatric history
- _____
11. With which ethnicity/race does your mother or female primary caregiver identify with?
- a. Native American
 - b. Asian/Pacific
 - c. Black/African American
 - d. Hispanic/Latino
 - e. White Caucasian
 - f. Other
 - g. Prefer no answer
12. Current age of your mother or female primary caregiver _____
13. Highest achieved education of your mother or female primary caregiver
- a. High school/GED
 - b. Associate's degree or Trade school
 - c. Bachelors (BA, BS)
 - d. Masters (MA, MS)
 - e. Professional Degree (MD, JD, PhD, EdD)
 - f. Prefer no answer
14. Relationship status of your mother or female primary caregiver
- a. Single (Never married)
 - b. Married or in domestic partnership
 - c. Widowed
 - d. Divorced
 - e. Separated
15. Mother's or Female primary caregiver's occupation _____
16. With which ethnicity/race does your father or male primary caregiver identify with?
- a. Native American
 - b. Asian/Pacific
 - c. Black/African American
 - d. Hispanic/Latino
 - e. White Caucasian
 - f. Other
 - g. Prefer no answer

17. Current age of your father or male primary caregiver _____
18. Highest achieved education of your father or male primary caregiver
- a. High school/GED
 - b. Associate's degree or Trade school
 - c. Bachelors (BA, BS)
 - d. Masters (MA, MS)
 - e. Professional Degree (MD, JD, PhD, EdD)
 - f. Prefer no answer
19. Relationship status of your father or male primary caregiver
- a. Single (Never married)
 - b. Married or in domestic partnership
 - c. Widowed
 - d. Divorced
 - e. Separated
20. Father's or Male primary caregiver's occupation _____

APPENDIX B

SOCIAL PHOBIA INVENTORY

Instructions: Please read each statement and circle in the column that indicates how much the statement applied to you **over the past week**.

	Not at all	A Little Bit	Somewhat	Very Much	Extremely
1. I am afraid of people in authority.	0	1	2	3	4
2. I am bothered by blushing in front of people.	0	1	2	3	4
3. Parties and social events scare me.	0	1	2	3	4
4. I avoid talking to people I don't know.	0	1	2	3	4
5. Being criticized scares me a lot.	0	1	2	3	4
6. I avoid doing things or speaking to people for fear of embarrassment.	0	1	2	3	4
7. Sweating in front of people causes me distress.	0	1	2	3	4
8. I avoid going to parties.	0	1	2	3	4
9. I avoid activities in which I am the center of attention.	0	1	2	3	4
10. Talking to strangers scares me.	0	1	2	3	4
11. I avoid having to give speeches.	0	1	2	3	4
12. I would do anything to avoid being criticized	0	1	2	3	4
13. Heart palpitations bother me when I am around people.	0	1	2	3	4
14. I am afraid of doing things when people might be watching.	0	1	2	3	4
15. Being embarrassed or looking stupid are among my worst fears.	0	1	2	3	4
16. I avoid speaking to anyone in authority.	0	1	2	3	4
17. Trembling or shaking in front of others is distressing to me.	0	1	2	3	4

APPENDIX C

CHILDHOOD TRAUMA QUESTIONNAIRE-SHORT FORM

Directions: These questions ask about some of your experiences growing up as a child and a teenager. For each question, circle the number that best describes how you feel. Although some of these questions are of a personal nature, please try to answer as honestly as you can. Your answers will be kept confidential.

When I was growing up, ...

	Never True	Rarely True	Sometimes True	Often True	Very Often True
1. I didn't have enough to eat.	1	2	3	4	5
2. I knew that there was someone to take care of me and protect me.	1	2	3	4	5
3. People in my family called me things like "stupid", "lazy", or "ugly".	1	2	3	4	5
4. My parents were too drunk or high to take care of the family.	1	2	3	4	5
5. There was someone in the family who helped me feel important or special.	1	2	3	4	5
6. I had to wear dirty clothes.	1	2	3	4	5
7. I felt loved.	1	2	3	4	5
8. I thought that my parents wished I had never been born.	1	2	3	4	5
9. I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.	1	2	3	4	5
10. There was nothing I wanted to change about my family.	1	2	3	4	5
11. People in my family hit me so hard that it left bruises or marks.	1	2	3	4	5
12. I was punished with a belt, a board, a cord (or some other hard object).	1	2	3	4	5

13. People in my family looked out for each other.	1	2	3	4	5
14. People in my family said hurtful or insulting things to me.	1	2	3	4	5
15. I believe I was physically abused.	1	2	3	4	5
16. I had the perfect childhood.	1	2	3	4	5
17. I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor.	1	2	3	4	5
18. Someone in my family hated me.	1	2	3	4	5
19. People in my family felt close to each other.	1	2	3	4	5
20. Someone tried to touch me in a sexual way or tried to make me touch them.	1	2	3	4	5
21. Someone threatened to hurt me or tell lies about me unless I did something sexual with them.	1	2	3	4	5
22. I had the best family in the world	1	2	3	4	5
23. Someone tried to make me do sexual things or watch sexual things.	1	2	3	4	5
24. Someone molested me (took advantage of me sexually).	1	2	3	4	5
25. I believe that I was emotionally abused.	1	2	3	4	5
26. There was someone to take me to the doctor if I needed it.	1	2	3	4	5
27. I believe I was sexually abused.	1	2	3	4	5
28. My family was a source of strength and support.	1	2	3	4	5

APPENDIX D

NEEDS THREAT SCALE

Instructions: For each statement, please circle the number that best represents the feeling you are experiencing right now.

	Strongly Disagree	Disagree	Neither disagree or agree	Agree	Strongly Agree
1. I feel “disconnected”	1	2	3	4	5
2. I feel rejected	1	2	3	4	5
3. I feel like an outsider	1	2	3	4	5
4. I feel like I belong to the group	1	2	3	4	5
5. I feel that others interacted with me a lot	1	2	3	4	5
6. I feel good about myself	1	2	3	4	5
7. My self-esteem is high	1	2	3	4	5
8. I feel liked	1	2	3	4	5
9. I feel satisfied	1	2	3	4	5
10. I feel invisible	1	2	3	4	5
11. I feel meaningless	1	2	3	4	5
12. I feel nonexistent	1	2	3	4	5
13. I feel important	1	2	3	4	5
14. I feel useful	1	2	3	4	5
15. I feel powerful	1	2	3	4	5
16. I feel I have control over the course of the game	1	2	3	4	5
17. I feel insecure	1	2	3	4	5
18. I feel I have the ability to significantly alter events	1	2	3	4	5
19. I feel unable to influence the actions of others	1	2	3	4	5
20. I feel that others decide everything	1	2	3	4	5

APPENDIX E

MANIPULATION CHECK FOR CYBERBALL

Instructions: For each statement, please circle the number that best represents the feeling you are experiencing right now.

	Strongly Disagree	Disagree	Neither disagree or agree	Agree	Strongly Agree
1. I was ignored	1	2	3	4	5
2. I was excluded	1	2	3	4	5

Approximately how many throws did you receive during the course of the game? _____

VITA

VITA

EDUCATION

- August 2023
(Expected) **Predocctoral Psychology Internship**
Oregon Health & Sciences University, Portland, OR
Track: Special Health Needs
- August 2023
(Expected) **Doctor of Philosophy, Clinical Psychology**
University of Mississippi, University, MS
Dissertation: The Influence of Childhood Emotional Maltreatment and Exclusion on Distress among Individuals with Social Anxiety Symptoms
Advisor: Laura J. Dixon Ph.D.
- May 2020 **Master of Arts, Clinical Psychology**
University of Mississippi, Oxford, MS
Thesis: Understanding Social Anxiety Symptoms through Interpersonal Emotion Regulation Strategies
Chairperson: Laura J. Dixon, Ph.D.
- May 2017 **Bachelor of Arts, Major: Psychology, Minors: Neuroscience, Management, General Business**
Miami University, Oxford, OH
Honors Thesis: The Role of Fearful Temperament and Maternal Control Behavior on the Development of Self-consciousness in Toddlerhood
Chairperson: Elizabeth Kiel, Ph.D.

LICENSES & CERTIFICATIONS

- 2022 **CPR Lifeline Training**
Certified via the American Heart Association

- 2020 **Examination for the Professional Practice in Psychology (EPPP)**
Passed at the Doctoral level
- 2020 **Registered Behavior Technician**
RBT License # RBT-20-131067
- 2021 **Nonviolent Crisis Intervention**
Certified via the Crisis Prevention Institute

CLINICAL EXPERIENCE

- Aug 2022-
Jul 2023 **Predoctoral Internship**
Oregon & Health Sciences University, Portland, OR
Major Rotations: Pediatric Psychology, LEND Assessment, and Psychology Only Treatment
Minor Rotations: Inpatient Consultation Liaison, Behavioral Pediatrics, and Pediatric Pain Psychology
Year-long Experiences: Outpatient Therapy, Primary Care Behavioral Consultation, Leadership Education in Neurodevelopmental Disabilities (LEND), and Research
Supervisors: Kurt Freeman, Ph.D., ABBP; Michael Harris, Ph.D.; Kim Reynolds, Ph.D., Andrew Riley, Ph.D., and David Wagner Ph.D.
- Jul 2021-
Jun 2022 **Graduate Level Therapist and Assessor**
Stonewater Adolescent Recovery, Oxford, MS
- Conducted full cognitive assessments for residents presenting problems such as suspected specific learning disorder, attention-deficit hyperactivity disorder, and cognitive processing difficulties.
 - Lead a bi-weekly DBT principles-based group therapy tailored for short-term residential substance abuse recovery treatment program
 - Provided individual sessions focused on relapse prevention and healthy coping skills.
 - Completed initial psychological evaluations using structured clinical interviews (MINI-KID 7.0.2, MINI 7.02), self-report measures, and personality assessments (PAI-A, MACI-II).
 - Case load of 4-6 individual therapy clients and 1-2 weekly group therapy and assessment sessions.
- Supervisors: Kristin Austin, Ph.D.; Todd Hendrix, P-LPC
- Jul 2020-
Jun 2021 **Graduate Level Therapist/ Registered Behavior Technician**
Behavior, Attention, and Developmental Disabilities Consultants, Southaven, MS

- Implemented Applied Behavior Analysis (ABA) based individual therapy to children and adolescents with developmental and intellectual disabilities including Autism Spectrum Disorder.
- Administered cognitive, attention-deficit, and autism-spectrum assessment batteries with children and adolescents with developmental and intellectual disabilities
- Provided peer supervision & consultation of Applied Behavior Analysis techniques to junior clinicians.
- Case load of 3-4 ABA therapy clients and 1-2 weekly assessments.
Supervisor: Emily Thomas Johnson, Ph.D./BCBA-D; Kayla Grimmer, M.S./BCBA

Aug 2019-
May 2020

Behavioral Health Consultant

Institute of Community Services Head Start; Coldwater, and Hickory Flatt, MS

- Created and implemented behavioral interventions and programs for children aged five and younger enrolled in Head Start programs throughout North Mississippi.
- Consulted with teachers, administrators, and parents regarding children's behavior at home and in the classroom.
- Case load of 3-4 schools, each with multiple classrooms.
Supervisor: Alan Gross, Ph.D.

Sept 2019-
Jun 2020

Diagnostic Services Intern & Psychological and Behavioral Services Intern

North Mississippi Regional Center, Oxford, MS

- Planned and conducted comprehensive psychological assessments with children and adults with developmental, intellectual, and behavioral disorders.
- Completed integrated reports and provided assessment feedback.
- Implemented individual behavioral and psychological interventions for residential clients with intellectual and developmental disabilities including Lesch-Nyhan Syndrome, Prader-Willi Syndrome, and Neurodevelopmental delay due to fetal exposure to alcohol.
- Provided DBT therapy for special populations to Prader-Willi Syndrome group.
- Conducted dementia and tardive dyskinesia assessments.
- Case load of 4-7.
Supervisors: Tom Moore, Ph.D., Mark Wildmon, Ph.D., Stefan Schulenberg, Ph. D.

Jun 2018-
Jun 2022

Graduate Therapist

University of Mississippi Psychological Services Center, Oxford, MS

- Implement evidence-based practices within individual therapy while receiving group supervision. Emphasis on working with child and adolescent populations.

- Experience with clients struggling with a range of psychological issues such as emotion dysregulation, pediatric feeding difficulties, social anxiety, problematic anger, generalized anxiety, posttraumatic stress disorder, and autism spectrum disorder.
 - Coordinated DBT treatment team across mental healthcare providers.
 - Administered the following measures based on client's needs: RCADS-P, RCADS, BASC-3, PCL-5, DASS-21, and YOQ.
 - Implement following structured interviews during intake appointments MINI (5.0, 6.0, 7.02), MINI-KID (7.02), CHIPS, PCHIPS.
 - Supervised junior clinicians in initial therapy intakes and interventions.
 - Case load of 2-5 clients at a time.
- Supervisors: John Young, Ph.D.; Scott Gustafson, Ph.D., ABPP; Laura Dixon, Ph.D.; Sarah Bilsky, Ph.D.; Danielle Maack, Ph.D.; Kristen Austin, Ph.D.

PUBLICATIONS

Peer-Reviewed Publications

Witcraft, S.M., **Perry, M.M.**, Viana, A.G., Tull, M.T., & Dixon, L.J. (in press). A preliminary investigation of prenatal anxiety sensitivity and postpartum distress. *Journal of Midwifery & Women's Health*.

Dixon, L.J., Schadeegg, M.J., Clark, H.M., & **Perry, M.M.** (2023). Public awareness of misophonia in U.S. adults: A population-based study. *Current Psychology (New Brunswick, N.J.)*

Boullion, G.Q., Witcraft, S.M., Schadeegg, M.J., **Perry, M.M.**, & Dixon, L.J. (2021). Emotion regulation difficulties and depression among individuals with dermatological and body dysmorphic concerns. *Journal of Nervous and Mental Disease*, 209(9), 650-655.

Dixon, L.D., Witcraft, S.M., & **Perry, M.M.** (2019). How does anxiety affect adults with skin disease? Examining the indirect effect of anxiety symptoms on impairment through anxiety sensitivity. *Cognitive Therapy and Research*. 43(1), 14-23.

Kochli, D. E., Campbell, T. L., Hollingsworth, E.H., Lab, R.S., Postle, A.F., **Perry, M.M.**, Mordzinski, V.M., & Quinn, J.J. (2018). Combine administration of MK-801 and cycloheximide produces a delayed potentiation of fear discrimination memory extinction. *Behavioral Neuroscience Reports*, 132(2), 99-105.

Manuscripts in Preparation

Perry, M.M., Schadeegg, M.J., & Dixon, L.J. (*in preparation*). The influence of perceived visibility of skin disease symptoms on social functioning.

PRESENTATIONS

Conference Oral Presentations:

Dixon, L.J., Schadeegg, M.J., Boullion, G.Q., Witcraft, S.M., & **Perry, M.M.**, (2019, November). Obsessive- compulsive related disorders, emotion-regulation, and quality of life in adults with skin disease. In J.McCann (Chair), *Change that Matters: What, Why, and How Meaningful Change Happens in CBT for Anxiety-Related Disorders*. Symposium presented at the Association of Behavioral and Cognitive Therapies 53rd Annual Convention, Atlanta, GA.

Boullion G. Q., Dixon, L.J., **Perry, M.M.** (2018, November). *Emotion regulation difficulties and depression among individuals with dermatological and body dysmorphic concerns*. In B. Mathes and B. Summers (Chairs), *Recent advances in OC Spectrum disorders: A transdiagnostic and translational perspective*. Symposium presented at the Association of Behavioral and Cognitive Therapies 52nd Annual Convention, Washington, D.C.

Perry, M.M. (2017, September). Symposium chair. *The age of anxiety: Exploring and assessing anxiety and its problematic health correlates*. Symposium presented at the Mississippi Psychological Association's 68th Annual Convention, Biloxi, MS.

Perry, M.M., & Dixon, L.J. (2018, April). *The significance of access to emotion regulation strategies on maternal postpartum quality of life and parenting*. Data Blitz presented at the 5th annual University of Mississippi Psychology Research Day, Oxford, MS.

Conference Poster Presentations:

*denotes mentored undergraduate author

Perry, M.M., & Dixon, L.J. (2022, November). *The influence of childhood emotional maltreatment and exclusion on distress among individuals with social anxiety symptoms*. Poster accepted for the 56th Association of Behavioral and Cognitive Therapies Annual Convention, New York City, NY.

Perry, M.M., Protti, T.A., & Dixon, L.J. (2021, November). *Perceived interpersonal support and loneliness among socially anxious college students*. Poster presentation at the 55th Association of Behavioral and Cognitive Therapies Annual Convention, Virtual.

Turner, T.,* **Perry, M.M.**, Dixon, L.J. (2021, September). *Evaluating depression, social anxiety, and interpersonal support among college students*. Poster presentation at the 72nd Mississippi Psychological Association, Virtual.

Perry, M. M., Schadeegg, M.J., & Dixon, L.J. (2020, November). *Understanding the impact of maternal parenting practices on college students' experiences of social anxiety through emotion regulation*. Poster presentation at 54th Association of Behavioral and Cognitive Therapies Annual Convention, Virtual.

- Perry, M.M.**, Means, B., Goode, K., Flynn, J.S., & Willard, V.W. (2020, March). *Parent-reported social functioning amongst pre-school aged survivors of solid and brain tumors*. Poster presentation at 51st Society of Pediatric Psychology Annual Conference, Virtual
***Hem/Onc/BMT SIG Award**
- Perry, M.M.**, Boullion, G.Q., Schadegg, M.J., Witcraft, S.M., & Dixon, L.J. (2019, November). *Examining interpersonal and intrapersonal emotion regulation, social anxiety, and aggression among college students*. Poster presentation at the 53rd Association for Behavioral and Cognitive Therapies Annual Convention, Atlanta, GA.
- Boullion, G.Q., **Perry, M.M.**, Witcraft, S.M., Schadegg, M.J., & Dixon, L.J. (2019, November). *Social anxiety and loneliness: The indirect effect of emotion regulation difficulties*. Poster presentation at 53rd Association for Behavioral and Cognitive Therapies Annual Convention, Atlanta, GA.
- Schadegg, M.J., Witcraft, S.M., **Perry, M.M.**, Boullion, G.Q., & Dixon, L.J. (2019, November) *An aggressive reaction to sound: The interactive effects of anxiety sensitivity and misophonia on facets of aggression*. Poster presentation at 53rd Association for Behavioral and Cognitive Therapies Annual Convention, Atlanta, GA.
- Witcraft, S.M., Schadegg, M.J., Boullion, G.Q., **Perry, M.M.**, & Dixon, L.J. (2019, November). *What sensitivities matter in dental anxiety?* Poster presentation at 53rd Association for Behavioral and Cognitive Therapies Annual Convention, Atlanta, GA.
- Young, G.K.*, Harris, M.A.*, **Perry, M.M.** & Dixon, L.J. (2019, April) *Examination of communication and social media usage among socially anxious*. Poster presented at the 6th annual University of Mississippi Psychology Research Day, Oxford, MS.
- Perry, M.M.**, Flynn, J.S., Means, B., Goode, K., & Willard, V.W. (2019, April) *Associations between facilitative parenting and social functioning in survivors of pediatric brain tumors*. Poster presented at the 50th Society of Pediatric Psychology Annual Conference, New Orleans, LA.
- Perry, M.M.**, Boullion, G.Q., Witcraft, S.M., Viana, A., & Dixon, L.J. (2018, November). *The importance of mother's perceived ability to regulate emotions in postpartum maternal quality of life and parenting distress*. Poster presentation at the 52nd Association for Behavioral and Cognitive Therapies Annual Convention, Washington, D.C.
- Witcraft, S.M., **Perry M.M.**, Boullion, G.Q., Dixon & L.J. (2018, November). *The moderating role of anxiety sensitivity social concerns in stress and quality of life among adults with skin disease*. Poster presentation at the 52nd Association for Behavioral and Cognitive Therapies Annual Convention, Washington, D.C.

Witcraft, S.M., Dixon, L.J., Perry, M.M., Gratz, K.L., & Tull, M.T. (2017, October). *Correlates of nonmedical use of prescription drugs among patients with co-occurring anxiety and substance use disorders*. Poster presentation at the 51st Association for Behavioral and Cognitive Therapies Annual Convention, San Diego, CA.

Byrket, K., Kalomiris, A.E., **Perry, M.M.**, Thomas, R., & Kiel-Luebbe, E. (2017, May). *Error-related negativity and social anxiety in kindergarteners: The moderating role of the student-teacher relationship quality*. Poster presentation at the Undergraduate Research Forum, Miami University, Oxford, OH.

Campbell, T.L., Lab, R.S., Hollingsworth, E.W., Mordzinski, V.M., **Perry, M.M.**, Postle, A.F., Kochli, D.E., Quinn, J.J. (2017, May). *The role of NMDA receptors in the retrieval and reconsolidation of context fear discrimination*. Poster presentation at the Undergraduate Research Forum, Miami University, Oxford, OH.

Perry, M.M., & Kiel-Luebbe, E. (2017, April). *Anxiety risk and self-consciousness in boys and girls*. Poster presentation at the Society for Research in Child Development, Austin, TX.

Perry, M.M., Genaro, J.L., Lindner, H.E., Dye, C. N., Kochli, D.E., Floyd, R.J., & Quinn, J.J. (2016, November). *Role of inhibition of the VTA with a GABA agonist in disrupting fear memories*. Poster presentation at the Society of Neuroscience, San Diego, CA.

RESEARCH EXPERIENCE

- Aug 2022-present **Predoctoral Intern Research Assistant**
Novel Interventions in Children's Healthcare
Department of Pediatrics, Oregon Health & Sciences University
Supervisor: David Wagner, Ph.D.
- Aug 2017-present **Graduate Research Assistant**
Health, Anxiety, Research, and Treatment Laboratory
Department of Psychology, University of Mississippi
Supervisor: Laura Dixon, Ph.D.
- Sept 2018-Sept 2019 **Graduate Research Assistant**
Social Functioning Outcomes in Children with Cancer
Department of Psychology, St. Jude's Children's Research Hospital
Supervisor: Victoria Willard, Ph.D.
- Aug 2014-Aug 2017 **Undergraduate Research Assistant**
Behaviors, Emotions, and Relationships Research Lab
Department of Psychology, Miami University
Supervisor: Elizabeth Kiel, Ph.D.
- May 2016- **Undergraduate Research Assistant**

May 2017 *Behavioral Neuroscience Lab*
Department of Psychology, Miami University
Supervisor: Jennifer Quinn, Ph.D.

Jan 2012-
May 2015 **Undergraduate Research Assistant**
Broadening Undergraduate Research Perspectives in Behavioral Neuroscience
Department of Psychology, Miami University
Supervisor: Jennifer Quinn, Ph.D.

TEACHING EXPERIENCE

Aug 2021-
Dec 2021 **Teaching Assistant**
University of Mississippi
Course: Social Psychology
Instructor: Joseph Wellman, Ph.D.

Jan 2021-
May 2021 **Teaching Assistant**
University of Mississippi
Course: Theories of Personality
Instructor: Kimberly Sallis, Ph.D.

Aug 2020-
Dec 2020 **Teaching Assistant**
University of Mississippi
Course: Social Psychology
Instructor: Marilyn Mendolia, Ph.D.

Jan 2020-
May 2020 **Teaching Assistant**
University of Mississippi
Course: Introduction to Psychology
Instructor: Melissa Redding, Ph.D.

Jan 2019-
May 2019 **Teaching Assistant**
University of Mississippi
Course: Applied Behavior Analysis
Supervisor: Kate Kellum, Ph.D.

Aug 2018-
Dec 2018 **Teaching Assistant**
University of Mississippi
Course: Developmental Psychology
Supervisor: Kurt Streeter, Ph.D.

Aug 2017 **Guest Lecturer**
University of Mississippi
Course: Introduction to Psychology
Lecture: Current Diagnosis and Treatment of Anxiety Disorders

Aug 2017-
Dec 2017 **Teaching Assistant**
University of Mississippi
Course: Introduction to Psychology
Supervisor: Kurt Streeter, Ph.D.

LEADERSHIP EXPERIENCE & MENTORSHIP

Aug 2021-
May 2022 **Clinical Psychology Student Representative**
University of Mississippi Psychology Department

Jan 2021-
May 2022 **Undergraduate Honors Thesis Mentor**
University of Mississippi Psychology Department
Thesis: Examination of Depression and Anxiety among Postpartum Women

Aug 2020-
May 2021 **Graduate Peer Mentor**
University of Mississippi Psychology Diversity Committee

Aug 2018-
May 2019 **Undergraduate Honors Thesis Mentor**
University of Mississippi Psychology Department
Thesis: Examination of Communication and Social Media Usage among Socially Anxious Individuals

EDITORIAL EXPERIENCE

Mentored Ad-Hoc Reviewer
Anxiety, Stress, & Coping
Behavior Therapy
Journal of Clinical Psychology
Behavior in Practice

AWARDS & ACHIEVEMENTS

2023 Recipient of the Cynthia Belar Postdoctoral Applicant Scholarship
2017-
2021 Recipient of Graduate Honors Fellowship, University of Mississippi

2020	Hematology/Oncology/BMT Sig Poster Award, April 2020
2017	Departmental Honors, May 2017
2017	Phi Beta Kappa Honors Society, May 2017
2017	Senior Service Leadership Award, May 2017
2016	Dean's Scholar Award, May 2016
2016	Undergraduate Research Award, May 2016
2015, 2016	President's List, Fall 2015, 2016
2014, 2015	Dean's List, Fall 2014, Spring 2015
2013	Redhawk Excellence Scholarship

PROFESSIONAL MEMBERSHIPS

Society of Pediatric Psychology
 Society for Clinical Child and Adolescent Psychology
 Association of Behavioral and Cognitive Therapies
 Mississippi Psychological Association
 Society for Research in Child Development
 Society for Neuroscience

WORKSHOPS AND SEMINARS

Attended:

2021	Seminar on <i>Behavior Analytic Skills & Knowledge</i> . Spring 2021
2020	Seminar on <i>Dialectical Behavior Therapy</i> . Fall 2020
2020	Workshop from APA, <i>Telepsychology Best Practices 101</i> . 8-hour webinar, March 2020.
2020	Workshop from National Register of Health Services, <i>Telepsychology with Children and Teens in the Age of COVID-19</i> . March, 2020
2019	Workshop from ABCT, <i>Functional Analysis in Process-based CBT</i> , November, 2019
2019	Workshop from University of Mississippi, <i>Administration and Scoring of the Woodcock Johnson- Fourth Edition (WJ-IV)</i> , September 2019
2018	Seminar on <i>Evidence-based Services</i> . Fall 2018