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Social Anxiety and Engagement in Risky Behaviors: Exploring the Role of Emotion Regulation

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SOCIAL ANXIETY AND ENGAGEMENT IN RISKY BEHAVIORS: EXPLORING THE ROLE OF EMOTION REGULATION

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ABSTRACT

Social anxiety disorder (SAD) is a chronic, prevalent disorder that is characterized by persistent and marked fear of social situations when there is potential for negative evaluation from others. Although SAD is typically characterized by inhibition and escape behaviors, some research suggests some individuals with SAD display approach-oriented behaviors wherein individuals engage in greater risky behaviors (e.g., aggression, sexual impulsivity, substance use). This approach-oriented presentation appears to have an earlier onset, greater symptoms severity and greater functional impairment. Emotion regulation (ER) is the ability to use strategies to engage in goal directed behavior. ER difficulties have been shown to be associated with the maintenance and severity of SAD and may help explain the circumstances under which individuals with SAD engage in risky behaviors. Therefore, the current study aims to explore emotion regulation difficulties in relation to social anxiety and risk taking. Participants were 168 undergraduate students at the University of Mississippi who completed self-report measures including the Social Phobia Inventory, Difficulties with Emotion Regulation Scale, and the Risky, Impulsive, and Self-Destructive Behavior Questionnaire. Participants also completed the Balloon Analogue Risk Task as a behavioral measure of risk-taking propensity. Consistent with prior literature and hypothesis one, results demonstrated that that social anxiety and emotion regulation difficulties were positively correlated. Moderation analyses revealed a significant interaction of emotion dysregulation in the relationship between social anxiety and engagement in risky behavior; however, this was not in the predicted direction. Specifically, higher levels of emotion

dysregulation strengthened an inverse association between social anxiety symptoms and engagement in risky behavior, whereas the hypothesis predicted a positive association. Further research is needed to examine potential limitations in this study including research that explores real time assessment of emotion regulation strategies and abilities. Additionally, one potential avenue for future research is the use of other behavioral and self-report measures that assess risk-taking propensity that may be more consistent with specific behavioral patterns observed in approach-oriented SAD, such as the Domain-specific Risk-Taking Scale. In the context of the larger literature, this study highlights the need for domain specific behavioral measures of risk taking and the need for studies to investigate factors that contribute to risky behaviors, and in particular, in the context of social situations, among individuals with social anxiety.

Keywords: Emotion Regulation, Social Anxiety, Risky Behaviors, College Students

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INTRODUCTION

The lifetime prevalence rates for anxiety disorders are estimated to be 28.8% (Kessler et al., 2005), representing the most prevalent class of psychiatric disorders. Social anxiety disorder (SAD) is one of the most common anxiety disorders, with prevalence estimates between 7.1 and 12.1% in the United States (Ruscio et al., 2008) and similar rates found in other cultural groups (Hofmann et al., 2010). SAD is characterized by a marked and persistent fear of social situations, where there is a potential for negative evaluation from others, and this threat is seen as out of proportion to the actual threat posed by the situation (American Psychiatric Association, 2013). This fear of social situations is typically present across life domains (Wong et al., 2012), has been shown to result in functional impairment related to work/study and social life (Aderka et al., 2012), and is highly comorbid with mood disorders (Cairney et al., 2007). SAD typically onsets during adolescence (Grant et al., 2005; Kessler et al., 2005), and the course of SAD is chronic and has been shown to impact individuals for 16.3 (Grant et al., 2005) to 22.9 years (Wittchen et al., 2000). Currently, untreated anxiety represents a significant economic burden (Dams et al., 2017; Stuhldreher et al., 2014) and has a substantial negative impact on quality of life across multiple domains (Dryman et al., 2016; Eng et al., 2005; Olatunji et al., 2007, 2010).

Social evaluation fears are considered a normal aspect of development; however, in a small proportion of children, these social fears lead to the development of SAD (Grant et al., 2005). Developmental trajectory models of SAD posit that social anxiety symptoms begin to develop between early childhood and young adulthood, and a combination of biological (e.g.,

emotional and attentional regulation to threat), proximal (e.g., social skills and cognitive processes), and environmental (e.g., parent and peer influences) factors contribute to the persistence of these symptoms (Poole et al., 2018). Extending this information, Spence and Rapee (2016) provide evidence for an interactive model whereby intrinsic (e.g., social skills, social performance, safety behaviors, cognitive processes) and environmental factors (e.g., parent and peer influences, early social experiences, culture, negative life events) interact with temperament (e.g., behavioral inhibition), which contributes to the level of social anxiety one experiences in a situation and increases risk of developing SAD. In addition, factors such as culture, personal factors (e.g., age, gender), and interference with daily activities influence the trajectory of SAD (Spence & Rapee, 2016). Individuals with greater risk factors who experience adverse learning are posited to be more likely to develop maladaptive schema and beliefs relating to the self and others (e.g., negative self-view and the belief that they have little control over the outcomes of social situations) and avoid perceived situations where negative evaluation or rejection may be possible, which prevents the disconfirmation of these distorted cognitions. These maladaptive beliefs contribute to cognitive biases and distortions throughout the duration of social interactions and the subsequent development of SAD (Spence & Rapee, 2016).

Cognitive Behavioral Models of Social Anxiety

Cognitive behavioral models have been used to identify and describe the mechanisms contributing to the development and maintenance of SAD. Two prominent models of social anxiety emphasize the importance of core negative beliefs about the heightened probability and cost of adverse outcomes in social situations (e.g., it is likely that I will say the wrong thing *and* that will lead to social isolation), attentional focus towards identifying potential threat cues, the subsequent dysfunctional thoughts (e.g., distorted mental representations of how others perceive

them, unrealistic standards of social performance, consequences of not meeting those expectations), and consider how safety behaviors, such as avoidance and increased self-monitoring, contribute to the maintenance of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997). Consequently, the combination of anxiety, cognitive processes, and safety behaviors impede social performance and the interaction (Wong et al., 2012)

Although the models converge, there are several subtle distinctions. For instance, Clark and Wells, (1995) expand on attentional bias and emphasize self-focused attention. In particular, the perceived threat of negative evaluation in those with SAD leads to increased self-observation and a focus on interoceptive information to produce an impression of themselves that they assume reflects others perception of themselves. This leads to the initiation and maintenance of social anxiety and prevents the individual from attending to others' reactions. Conversely, Rapee and Heimberg's (1997) model emphasizes that attention is externally focused on finding potential external threat cues that indicate negative evaluation from others. Additionally, Clark and Wells (1995) refer to safety behaviors as behaviors engaged in to prevent negative evaluation from others (e.g., wearing dark clothing to hide sweating) and discuss how they contribute to maintaining social anxiety symptoms by preventing individuals with SAD from experiencing dis-confirmatory evidence of their negative belief or feared consequence. Whereas Rapee and Heimberg (1997) describe safety behaviors as behaviors aimed at reducing negative outcomes, these behaviors are not considered to be more problematic than overt avoidance and greater emphasis is placed on post-event processing as a maintaining factor (J. Wong et al., 2014). Subsequent work has continued to build upon these models to clarify and expand on additional processes. For instance, Hofmann (2007) emphasizes perceived loss of emotional

control that contributes to greater fear of anxiety and perceived social threats that lead to dysfunctional cognitions, which increases the expectation of a negative outcome.

Extensive research provides support for the theoretical basis of these processes. Compared to non-anxious individuals, individuals with SAD symptoms report greater cognitive biases in ambiguous social situations (Arnaudova et al., 2013; Beard & Amir, 2009). Socially anxious individuals are less likely to interpret ambiguous cues as benign and their reaction times are slower when rejecting threat interpretations when compared to non-anxious participants. (Beard & Amir, 2009). In social situations, higher levels of anxiety and arousal have been demonstrated in laboratory studies (Bar-Haim et al., 2007; Wild et al., 2008), and have a greater tendency to misinterpret internal and external cues, engage in negative post-event processing (Gaydukevych & Kocovski, 2012), and endorse pre-emptive and within-situation avoidance (e.g., distraction; Brozovich & Heimberg, 2008). Wild et al (2008) provide evidence that individuals who were led to believe that their arousal had increased reported feeling like they come across badly to others and have more bodily sensations than individuals who did not receive feedback on their arousal or were led to believe it decreased. This finding provides support for cognitive models of social anxiety that emphasize the role of self-focused attention and more specifically, attention to internal cues in maintaining social anxiety. Clark and Wells (1995) proposed socially anxious individuals engage in post-event processing following a social event, whereby, their social performance is extensively reviewed. During this review, the negative self-perceptions of the event and prior instances of social failure are retrieved, which leads to the event being recalled as more negative than it initially was, thereby further contributing to a fear of social situations (Makkar & Grisham, 2011). Cumulatively, prior findings suggest that individuals with SAD are more risk aversive (Jazaieri et al., 2014) and

more likely to exhibit threat interpretation biases towards ambiguous social stimuli on both behavioral and self-report measures (Amir et al., 2012; Beard & Amir, 2009; Chen et al., 2020) when compared to non-socially anxious counterparts.

Approach-Oriented Social Anxiety

Although behavioral avoidance, submissive behaviors, and shyness are typically core characteristics of individuals with SAD (Hofmann et al., 2004), recent studies suggest evidence of an "atypical" presentation of SAD. Specifically, a small portion of individuals with SAD exhibited higher levels of anger, aggression, sexual impulsivity, and substance use difficulties (Kashdan et al., 2009; Kashdan & McKnight, 2010; Ölmez & Ataoglu, 2018) than other socially anxious individuals. Rather than displaying escape-oriented avoidance behaviors, this presentation is conceptualized as engaging in approach-oriented behaviors when faced with social anxiety. For instance, Kashdan et al (2009) provide an illustration of how the two presentations differ. Individuals with typical social anxiety regarding an upcoming party are more likely to stay at home and avoid the situation. Individuals with approach-oriented social anxiety are likely to attend the party. At the party they may be controlling, dominant and aggressive during social interactions (e.g., directing the conversation, being judgmental of others, changing topics or leaving to talk to other people). Whereas submissive behaviors (e.g., compliance, acquiescence) would function to increase social acceptance in this situation, this aggressive behavior may be done to manage the situation and maintain control over who they accept or reject before it can be done to them. There is limited research on the etiology of this subtype; however, individuals with this approach-oriented presentation of social anxiety tend to have an earlier age of onset and greater symptom severity (Kashdan et al., 2009; Mörtberg et al., 2014a). In addition, a study using the national comorbidity survey-replication data found that the

atypical, approach-oriented presentation of SAD showed greater functional impairment, poorer global health, and were more likely to be male, younger in age and have lower education and income (Kashan et al., 2009).

Recently, researchers have sought to understand the approach-oriented presentation of SAD through the developmental risk factors and maintenance factors that may be unique to these individuals. In terms of developmental factors, there is currently insufficient data to thoroughly assess etiological pathways within approach-oriented presenting SAD. However, there are several hypothesized reasons why risk-taking, and impulsivity may be high within SAD populations. Some risk-taking and impulsivity theories are centered on self-control; one model emphasizes self-control strength as a common resource that is limited and easily depleted through frequent acts of self-control (Muraven & Baumeister, 2000). Once these resources are depleted, it is difficult for individuals to inhibit their impulses (Muraven & Baumeister, 2000) which compromises executive functioning (Baumeister, 2002). However, there is little evidence to support this theory, with some meta-analyses finding that self-control does not decrease as a function of prior use (Carter et al., 2015), and that publication bias allowed this hypothesis to appear tenable (Carter & McCullough, 2014). Alternative hypotheses emphasize that engagement in impulsive acts may lead to embarrassment and regret, and these response patterns may contribute to the fear of evaluation and the development of SAD (Kashdan et al., 2009), which aligns with the developmental model of SAD proposed by Spence and Rapee (2016). That is, negative emotional experiences that occur following impulsive acts may lead to fear of negative evaluation and contribute to the development of SAD. Additional biological and environmental factors may also be influential and contribute to the high rates of co-occurring impulsivity, bipolar disorder, and substance use disorders (Kashdan et al., 2009). Another

potential explanation considers the potential role of societal expectations. Specifically, impulsive behaviors, such as substance use, may be a way to self-medicate and cope with maladaptive life circumstances (Kashdan et al., 2009). Consequently, individuals with an approach-oriented presentation of SAD may engage in approach-oriented behaviors, such as substance use, unsafe sexual practices or aggression, for many reasons including refusing social attention, rejecting or criticizing others in an effort to prevent or deter negative evaluation from others (Kashdan & McKnight, 2010; Ölmez & Ataoglu, 2018)**.** In other words, engagement in risky behaviors could be a way to protect their social status and prevent rejection, as research suggests that individuals with SAD perceive themselves as having a lower social rank (Weisman et al., 2011). Alternative explanations for engaging in high-risk behaviors included providing a quick coping mechanism for their anxiety. However, it is currently not understood whether SAD is a result of impulsive behaviors during social interactions or whether individuals use impulsive means to cope with their SAD (Ölmez & Ataoglu, 2019).

A growing body of work has demonstrated evidence for diverse presentations of SAD based on the self-regulation of risk-taking behaviors. Findings suggest that engagement in approach-orientated and high-risk behaviors are associated with different health-related outcomes and behavioral patterns. In non-clinical populations, both observational and experimental studies provide support for this approach-oriented presentation. In one self-report study (Kashdan et al., 2008), subtypes of social anxiety were evaluated, and results indicated that the approach-oriented group was characterized by strong curiosity and social status enhancement appraisals for social and risk-taking behaviors. In contrast, the avoidance-oriented group was characterized by strong threat appraisal and weak approach appraisal for sexual, aggressive, and substance use behaviors. The approach-oriented group reported greater difficulties managing

emotions and hostile impulses, less social resources, and engaged in greater social activity and risk-taking behaviors (e.g., sex, aggression, substance use) over a three-month period. Latent class analysis has demonstrated that approach-oriented social anxiety has higher externalizing behaviors such as ADHD symptomology and substance use when compared with other socially anxious individuals (Lipton et al., 2016). In a separate experimental study examining alcohol cravings, Adams et al (2019) found that those who reported high social anxiety had increased alcohol cravings on the alcohol cravings questionnaire that was administered at baseline and post-cue exposure. Results suggest that alcohol cravings were moderated by trait impulsivity. Specifically, moderation analysis showed that social anxiety positively predicted post-cue alcohol cravings for individuals with high levels of impulsivity, but not for individuals with low levels of trait impulsivity. Within clinical samples, there is also evidence supporting two distinct subgroups of SAD. In a large sample of individuals seeking treatment for SAD, the first group was characterized by elevated social fears, avoidance patterns and low novelty seeking. The second group featured high novelty seeking in addition to elevated social fears (Kashdan & Hofmann, 2008). This finding of two distinct groups has been supported by latent class analysis looking at individuals with current and lifetime SAD utilizing data from the National Comorbidity Survey-Replication dataset (Kashdan et al., 2009). Across clinical and community samples, this approach-oriented presentation of SAD has been associated with several adverse outcomes and a greater likelihood of endorsing externalizing behaviors, including higher levels of impulsivity (Kashdan & McKnight, 2010), novelty seeking behaviors, anger, aggression, substance use difficulties (Kashdan & Hoffman, 2008), and increased risk of suicidality (Jakuszkowiak-Wojten et al., 2015; Pierò, 2010).

Beyond research explicitly examining the approach-oriented features of SAD, there is also extensive research demonstrating strong connections between SAD and drinking behaviors. Most of this work has focused on drinking as a coping mechanism (Schry & White, 2013); yet, other research has investigated co-morbidities and treatment implications that may further inform the conceptualization of processes associated with externalizing and risk behaviors among individuals with SAD. Oliveira et al's (2018) systematic review suggests that patients with both alcohol use disorder and SAD have a higher prevalence of psychiatric comorbidities, namely depression. This systematic review suggests that individuals with alcohol use disorder (AUD) and SAD have higher rates of suicidal thoughts, plans, and attempts than individuals with AUD but without SAD (Oliveria et al., 2018). In research investigating alcohol use as a strategy for coping with anxiety in social situations, individuals with approach-motivated subtype of SAD were more likely to report severe alcohol misuse and dependence and scored higher on rash impulsiveness when compared with individuals with subclinical SAD symptoms and risky alcohol/subclinical SAD symptom groups (Nicholls et al., 2014). Similarly, a separate study found the interaction between social anxiety and impulsivity was a statistically significant predictor of alcohol related problems but not alcohol use. Further investigation of this using a mediated moderation showed this interaction was mediated by coping motives alone (Keough et al., 2016). Consequently, these results suggest that impulsivity and coping motives may play a mechanistic role in the relationship between approach-oriented SAD and related drinking behaviors. Keough et al (2016) suggest that this is consistent with ongoing literature that posits using alcohol as a coping motivate, which increases the risk of alcohol related problems.

Conceptualization of Approach-Oriented Social Anxiety

When considering those with SAD who engage in risky behaviors, one potential explanation is that engagement in these behaviors functions as a coping strategy. It has been posited that impulsive behavior may be used by anxious individuals when negative internal experiences occur in order to manage negative affect (Jakuszkowiak-Wojten et al., 2015). Individuals with approach oriented SAD have reported greater difficulties managing negative emotions, less social support, and lower levels of psychological flexibility (Kashdan et al., 2008). Additionally, anxious individuals have been shown to be at an increased risk for high risk behaviors, such as suicidality (Jakuszkowiak-Wojten et al., 2015; Pierò, 2010). It is speculated that increased suicidality and higher incidence of suicide attempts may be due to interactions with anxiety-specific factors such as anticipatory anxiety and attentional hypervigilance (Jakuszkowiak-Wojten et al., 2015). Limited research has also shown trait impulsivity can increase risk of suicidality in anxious samples (Pierò, 2010). Furthermore, Askénazy et al (2003) suggest that adolescents who engage in high-risk behaviors could potentially be categorized as belonging to an impulsive-anxious subgroup, which would subsequently help to understand the increased suicidality and self-aggressive behaviors displayed. In one study, individuals with atypical anxious-impulsive SAD showed higher severity of SAD, increased depressive symptoms and lower levels of self-directness when compared to typical inhibited social anxiety, and were less likely to achieve clinically significant change post-treatment (Mörtberg et al., 2014). Self-directedness is a concept that involves the ability to control, regulate, and adapt behavior (Cloninger, 1993), with low self-directedness being linked to increased risk of suicide (Piero, 2010). Consequently, this finding suggests that a subset of individuals with SAD are at greater risk for engaging in high-risk behaviors, such as suicide due to an intolerance of negative

emotionality. Cumulatively, the evidence suggests that engaging in impulsive, high-risk behaviors may help to cope with higher levels of anxiety.

The literature has identified several factors that appear to influence the connections between SAD and externalizing behaviors. For instance, impulsivity has been shown to moderate the relationship between social anxiety and alcohol cravings, with cravings being stronger when impulsivity is high (Adams et al., 2019). In one study, participants with social anxiety between 15 to 18-year-old completed a modified trier social stress test (Reynolds et al., 2013). Participants were either told they would give a speech or rest period following the administration of the Balloon Analogue Risk Task (BART). Results indicated that social stress influenced risk-taking behavior; wherein participants in the high social stress condition exhibited greater risk-taking behaviors compared to the low stress condition. Expectancy effects, and in particular, greater expectations of desirable outcomes, have also been shown to contribute to increased engagement in risky behaviors in a socially anxious sample. Specifically, one correlational study utilized hierarchical regressions to demonstrate that in socially anxious individuals, higher expectancy of desired outcomes predicted greater risk-taking behavioral intentions (Kashdan et al., 2006). These positive outcome expectancies also appeared to moderate the relationship between social anxiety, sexual risk-taking, and aggression in a sample of college students (Kashdan et al., 2006). Another influential factor in risk taking is social referencing (Parkinson et al., 2012). In social referencing, others' facial expressions provide information about a situation; for example, others appearing calm may tell an individual that a situation is not as dangerous as they suspected, or others' anxiety may communicate higher levels of risk in a situation (Parkinson et al., 2012). These positive or negative reactions influence an individual's decision making. Parkinson et al (2012) utilized a modified Balloon Analogue Risk Task (BART) and

found that the emotional expressivity of a reference person affected participants' self-reported anxiety and behavioral measures of risk taking. Specifically, risk-taking behaviors decreased when their partner appeared anxious, whereas risk-taking behaviors increased when their partner suppressed their facial expressions, particularly when framed in terms of potential gains (Parkinson et al., 2012). Whilst this study does not look directly at social anxiety, applying Rapee and Heimberg's (1997) cognitive behavioral model of SAD, those with SAD who have increased attentional focus on external cues may engage in social referencing, which may influence decisions to engage in risk-taking behavior.

Social Anxiety and Emotion Regulation

Despite these efforts to understand the link between SAD and high-risk behaviors, additional research is needed to further inform case conceptualization and treatment. One potential mechanism that may help to further explain connections between social anxiety and risk-taking is emotion regulation. Emotion regulation is the awareness and modulation of one's emotions, ability to flexibly use strategies to engage in goal-directed behavior, and refrain from engaging in impulsive behaviors when experiencing negative emotions (Gratz & Roemer, 2004). Current research indicates emotion regulation difficulties are associated with social anxiety (Farmer & Kashdan, 2012; Helbig-Lang et al., 2015; Mennin et al., 2007; Turk et al., 2005). Helbig-Lang et al (2015) explored emotion regulation deficits in individuals with social anxiety and depression. It was found that in those with SAD, emotion regulation deficits included non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, limited access to emotion regulation strategies, and lack of emotional clarity – even after controlling for depressive symptoms. This suggests that SAD is characterized by broad emotion regulation difficulties.

Emotion regulation ability plays an important role in the selection of emotion regulation strategies that are deployed during unpleasant and unwanted emotions. There are different factors that affect the selection of strategies, such as emotional intensity. With low intensity negative emotions, acceptance (Lennarz et al., 2019) and cognitive reappraisal (Sheppes et al., 2011) were more likely to be utilized. Whereas, with high intensity negative emotions, suppression, problem-solving, distraction, avoidance, social support and rumination were more commonly used (Lennarz et al., 2019). Sheppes et al (2011) found support for their hypothesis that in these high intensity negative emotion situation individuals prefer to use strategies that assist with disengagement or distraction to block emotional processing during the early stages. Although this has not been explicitly investigated in a socially anxious population, this knowledge may help in understanding the externalizing behaviors (e.g., substance, health-risk sexual behaviors and aggression) that are seen in approach-oriented SAD. Research exploring social anxiety and emotion regulation suggests that individuals with SAD demonstrate inflexible emotion regulation strategies (O'Toole et al., 2017) and suppress more positive (O'Toole et al., 2017; Turk et al., 2005) and more negative emotions (O'Toole et al., 2017; Spokas et al., 2009). Additionally, those with SAD endorse stronger beliefs about the value of emotional control, and this was related to daily use of emotional suppression techniques (Goodman et al., 2021). Individuals with SAD also report greater avoidance (O'Toole et al., 2017; Werner et al., 2011), particularly at higher levels of negative emotionality (O'Toole et al., 2017), and greater difficulty with cognitive reappraisal (Kivity & Huppert, 2019), than their non-anxious peers. Since research suggests that cognitive reappraisal is an emotion regulation strategy commonly used at lower levels of emotional intensity (Sheppes et al., 2011), this suggests that those with SAD may have emotion regulation deficits across the spectrum of emotional intensity. Furthermore,

individuals with SAD demonstrate a poorer ability to identify their own emotional states (Werner et al., 2011), utilize emotional knowledge within social settings (Mennin et al., 2009) and have lower self-efficacy when implementing cognitive reappraisal, meaning they were less likely to view the technique as successful (Werner et al., 2011). Currently, the cognitive behavioral models of social anxiety posit that individuals with social anxiety focus on potential threat cues that are either internal (Clark and Wells, 1995) or external (Rapee and Heimberg, 1997), which leads to dysfunctional thoughts, and safety behaviors (e.g., avoidance, increased self-monitoring). Hofmann (2007) later added to these models and highlighted that perceived loss of emotional control which contributes to greater of anxiety, suggesting a deficit in emotion regulation abilities. Cumulatively, this evidence suggests that consideration of emotion regulation deficits may be beneficial in helping to understand the mechanisms that contribute to engagement in avoidance-based and approach-based behaviors in individuals with SAD.

Few studies have investigated facets of emotion regulation in relation to externalizing features associated with social anxiety symptoms. For instance, one study explored the role of emotion regulation on the relationship between SAD and engagement in risky health behaviors and found that individuals with SAD were more likely to engage in health-risk sexual behaviors (Rahm-Knigge et al., 2018, 2021). Notably, Rahm-Knigge et al's (2018) results suggested four main groups of participants, those that were either high or low in SAD and high or low in emotion dysregulation (e.g., lacking use of strategies to regulation emotions), difficulty with goal-directed behavior in response to emotions, and impulsivity related to emotion dysregulation. Within the sample, individuals in the high social anxiety and high in emotion dysregulation group demonstrated elevated scores regarding lacking strategies to manage emotions and non-acceptance of emotions. This group also demonstrated increased engagement in high-risk sexual

behaviors, suggesting that emotion regulation may play an important role in the relationship between social anxiety and risky behaviors. Building on these findings in a separate study, Rahm-Knigge et al (2021) demonstrated that emotion regulation is important in relation to negative urgency in socially anxious individuals, with those high in negative urgency showing worse use of emotion regulation strategies and higher engagement in health risk sexual behaviors. Together, these findings support a specific profile of SAD that is characterized by greater emotion dysregulation and engagement in high-risk health behaviors. Further research has explored impulsivity, negative affect, and externalizing behaviors in clinically relevant community samples. In one particularly relevant study, self-report measures were used to examine whether emotion regulation mediated the relationship between social anxiety and increased aggression, including hostility, anger, physical aggression, and verbal aggression (Dixon et al., 2017). Results demonstrated that emotion driven impulse control difficulties significantly accounted for the indirect relationship between social anxiety and the different facets of aggression among patients with substance use disorders. Although these findings cumulatively indicate the important role that emotion regulation plays in the relationships between SAD and engagement in risky behaviors, there are several limitations of these studies. First, the self-report measures and cross-sectional nature in these studies does not allow for temporal order to be established. Therefore, it may be beneficial to utilize behavioral measures that can assess objective risk-taking propensity rather than self-reported or subjective risk-taking behaviors in order to better understand approach-oriented SAD.

One potential direction for expanding this research is integration of the Balloon Analogue Risk Task (BART; Lejuez et al., 2002), which is a behavioral measure looking at risk-taking propensity. Prior work indicates that the BART is one of the few risk-taking behavioral measures

that is unaffected by recall bias and is considered more naturalistic than self-report measures (Harrison et al., 2005). Current literature exploring risk taking on the BART task suggests that this behavioral measure appears to correlate with self-reports of risky behaviors, impulsivity, and deficits in behavioral constraint (Lejuez et al., 2002), with similar results being found in adolescent samples (Lejuez et al., 2003). Few studies have explored this in samples with clinical levels of anxiety; yet some research has examined risk-taking in patients with post-traumatic stress disorder (PTSD). Results demonstrated that individuals with substance use disorder and co-occurring PTSD exhibit significantly greater levels of risk-taking propensity (Tull et al., 2009). However, Augsburger and Elbert (2017) report that type of trauma stressor affects global risk-taking behavior. Smith et al (2016) explored the relationship between anxiety and risk taking using the BART. They found that ambiguity moderated the relationship, where when the outcome was ambiguous participants with higher anxiety displayed less risk taking, whereas, when the outcome was not ambiguous, anxious individuals were no more risk seeking or aversive than their counterparts. Other research indicates that there may be a link between increased anxiety symptoms and decreased risk-taking on the BART (Tieskens et al., 2021), suggesting there may be a directional link between anxiety symptoms and risk avoidance. (Giorgetta et al., 2012) provide support for this by utilizing a gambling task that prevented learning from outcomes. Their results demonstrated that anxious participants were less likely to engage in risky behaviors. Interestingly, anxious participants were more likely to have negative expectations of outcomes and engaged in more avoidant behavior following a positive outcome. One proposed implication of this is that anxious participants display negative attentional bias towards risks which affects the decision-making process. Similar results were found in other

studies where those with high anxiety sensitivity were significantly less likely to take risks than their counterparts (Broman-Fulks et al., 2014).

Prior research has also explored the BART in relation to emotion regulation to understand and predict engagement in risky behaviors. For instance, Heilman et al (2010) investigated emotion regulation, risk, and uncertainty. They reported that acute cognitive reappraisal of negative emotions, such as fear, effectively reduces the experience of negative emotions and subsequently increases risk taking behaviors. They suggest that this cognitive appraisal increased participants' sense of emotional control that mitigates the aversion to risky decisions. Additionally, their results indicate that emotional suppression, another form of emotion regulation, does not mitigate risk aversion as it does not decrease the experience of negative emotions. Panno et al (2013) found similar findings, whereby, emotion regulation strategies predicted risk taking decisions on the Columbia card task, another behavioral measure of risk taking. Together these findings suggest that the downregulation of negative emotional experiences enables riskier decision making suggesting that use of emotion regulation strategies may be an influential component in the decision to engage in risky behaviors.

Current Study

Given that a growing body of literature supports that certain presentations of SAD are characterized by more approach-oriented behaviors, additional research exploring potential underlying mechanisms is warranted. Importantly, engagement in these high-risk behaviors has been associated with several adverse outcomes such as increased risk of suicidality (Pierò, 2010), substance use (Adams et al., 2019; Kashdan et al., 2008; Lipton et al., 2016), and higher levels of impulsivity, aggression and anger (Kashdan & Hofmann, 2008). Individuals with SAD have

been shown to have difficulties regulating their emotions which include deficits in non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, limited access to emotion regulation strategies, and lack of emotional clarity (Helbig-Lang et al., 2015). The purpose of the current study was to examine the psychological mechanisms associated with social anxiety, risk taking, and decision making. The current study may assist in identifying maladaptive processes contributing to risky behaviors in SAD and developing treatments to improve impairment for individuals with SAD presenting with atypical, approach-oriented behaviors. The following aims and hypotheses were examined in a sample of college students with SAD symptoms, which is a particularly relevant sample as a) SAD is highly prevalent among individuals between the ages of 18 and 24 (Fehm et al., 2008), and b) college students have also been shown to have greater engagement in high-risk behaviors such as binge drinking (Willoughby et al., 2013) and recreational risk taking (Rolison et al., 2014) than other age groups.

Study Aims and Hypotheses

Aim 1: Replicate the link between emotion dysregulation and social anxiety (Dixon et al., 2016; Helbig-Lang et al., 2015; Jazaieri et al., 2014).

1. Social anxiety would be positively associated with emotion regulation difficulties, as evidenced by higher scores on the Difficulties in Emotion Regulation Scale (DERS).

    1a. Within the DERS, the subscales of emotion-driven impulsivity and strategies would demonstrate particularly robust and significant correlations with the SAD score on the Social Phobia Inventory (SPIN).

Aim 2: Examine the main and interactive effects of emotion dysregulation in the relationship between SAD disorder symptoms and engagement in risky behaviors.

2. **Primary Hypothesis.** The main and interactive effects of SAD symptoms and emotion dysregulation on risky behaviors were examined. The following was predicted:

   2a. Social anxiety disorder symptoms would be positively related to greater engagement in risky behaviors, as evidenced by responses to the a) Risky, Impulsive, and Self-Destructive Behavior Questionnaire and b) Balloon Analogue Risk Task.

   2b. Poorer emotion regulation skills would be associated with greater engagement in risky behaviors as evidenced by responses to the a) Risky, Impulsive, and Self-Destructive Behavior Questionnaire and b) Balloon Analogue Risk Task.

   2c. Moreover, the interaction between SAD symptoms and emotion regulation would predict greater engagement in risky behaviors (Risky, Impulsive, and Self-Destructive Behavior Questionnaire; Balloon Analogue Risk Task). Specifically, it was predicted that as emotion dysregulation increased (as evidenced by higher scores on the Difficulties with Emotion Regulation Scale), SAD symptoms would be more strongly and positively associated with engagement in risky behaviors.

METHODS

Participants

The current study was part of a larger project that examined psychological and physiological mechanisms associated with social anxiety and externalizing behaviors. The sample included undergraduate college students at a public university located in the southeastern region of the United States. Participants were enrolled in psychology courses and received course credit for their participation. The pre-screen survey was used to identify eligible individuals, and inclusion criteria for the initial project were: a) screened positive for social anxiety disorder on the Social Phobia Inventory (≥19; Connor et al., 2000) and b) aged 18 years or older. A sensitivity analysis was conducted using G*power 3.1 software (Faul et al., 2007), power was set at 0.80 (alpha = .05), with four total predictors (gender, social anxiety, emotion regulation and the interaction of social anxiety and emotion regulation) and one tested predictor (interaction of difficulties of social anxiety and emotion regulation). Output parameters demonstrated a critical F value of 8.899 and an f^2 value of 0.047. Therefore, this sample has the potential sensitivity to detect an approximately small effect size (.02). The final sample was comprised of 168 participants (M = 19.02, SD = 3.106) who were predominantly female (81.0%). Participants identified as White (76.8%), Black (10.7%), Asian (3%), Hispanic/Latino (4.8%), and other (4.8%). See Table 1 for additional demographic information.

Measures

Social Phobia Inventory (SPIN)

The SPIN (Connor et al., 2000) is a 17-item measure of Social Phobia that assesses the three symptom domains of fear (e.g., "I am afraid of people in authority" and "talking to strangers scares me"), avoidance (e.g., "I avoid talking to people I don't know" and "I avoid activities in which I am the center of attention") and physiological arousal (e.g., "sweating in front of people causes me distress" and "trembling or heart palpitations bother me when I am around people"). Each item is assessed on a Likert-type scale of 0 (*not at all*) to 4 (*extremely*). Item scores are summed with higher scores representing greater levels of distress. A clinical cut-off score of 19 has been shown to distinguish between individuals with and without social phobia with a diagnostic accuracy of 79% (Connor et al., 2000). In the current study, this measure was used to screen participants, characterize the clinical severity of the sample using clinical cutoff scores, and examined as a predictor. This measure has been shown to have acceptable internal consistency (.87 to .94) and test-retest reliability (.78 to .89; Connor et al., 2000). In this study, the internal consistency was .91. See appendix D for a copy of the SPIN.

Difficulties in Emotion Regulation Scale (DERS)

The DERS (Gratz & Roemer, 2004) is a 36-item questionnaire assessing difficulties modulating emotion. The questionnaire assesses six subscales of emotion regulation including nonacceptance (e.g., "when I am upset, I become angry with myself for feeling that way"), goals (e.g., "when I am upset, I have difficulty concentrating"), emotion-driven impulsivity (e.g., "I experience my emotions as overwhelming and out of control"), awareness (e.g., "I pay attention to how I feel"), strategies (e.g., "when I am upset, I believe that I will remain that way for a long time") and clarity (e.g., "I have no idea how I am feeling"). Each item is assessed using a 5-point

Likert-type scale from 1 (*almost never*) to 5 (*almost always*). Scores are summed and higher scores imply greater problems with emotion regulation. The DERS has demonstrated robust internal consistency (α = .93) and test-retest reliability (.88) for the total score (Gratz & Roemer, 2004). This study used the total and subscale scores in the examination of the hypotheses, and specifically, the DERS was used to examine the main and interactive effects of emotion dysregulation on risky behaviors. In this study, the internal consistency was excellent (α =.93) for the total score and good for all subscales (αs = .80 to .91). See appendix B for a copy of the DERS.

Balloon Analogue Risk Task (BART)

The BART (Lejuez et al., 2002) is a computerized measure of risk taking. In the original design, participants are informed that they will receive a certain amount of money for each trial and are asked to pump up a balloon for a chance to earn money. Participants can stop inflating the balloon at any point and are informed that if the balloon bursts, then they will lose any money from that trial. Each click inflates the balloon until the threshold where the balloon explodes is met, this threshold differs across balloons and participants are not aware of the threshold. Each subsequent pump represents greater risk and potential reward. In the current study, raffle tickets were utilized to represent money earned. These tickets were then entered into a raffle for $5, $10, $25, and $50 gift cards based on money earned. Literature suggests that there is little evidence for reward specificity when using the Balloon Analogue Risk Task with risky behavior being show regardless off type of reinforcer (Prause & Lawyer, 2014). For example, Prause & Lawyer (2014) compared monetary incentive to visual sexual stimuli as a reinforcer, which found little evidence for reinforcement specificity, although some evidence for reward sensitivity which was unique to sexual risk behavior.

To score the BART, a primary score is created based on adjusted average number of pumps on unexploded balloons, and greater scores indicate greater risk-taking inclination. Adjusted average pumps has been widely used within the literature to represent risk taking inclination (Canning et al., 2021). The adjusted average pumps represents the number of Balloon pumps adjusted for the number of balloons that did not explode (Lejuez et al., 2002; Reynolds et al., 2013). Similar to prior research twenty trials per participant were conducted (Reynolds et al., 2013). The BART has been shown to be a valid behavioral measure of risk taking (Lauriola et al., 2014) and demonstrates acceptable test-retest reliability (r = .77) (White et al., 2008). In this study, the BART adjusted average number of pumps score was used as an outcome variable in testing study hypotheses.

Risky, Impulsive, and Self-Destructive Behavior Questionnaire (RISQ)

The RISQ (Sadeh & Baskin-Sommers, 2017) is a 38-item measure that measures eight domain-specific factors of (1) aggression, (2) self-harm, (3) gambling, (4) risky sexual behaviors, (5) impulsive eating, (6) heavy alcohol use and reckless behavior. It has been validated in community, student, and veteran populations. For each item, participants were asked to report the total number of times they engaged in the behavior across the lifespan, total number of times in the past month, how old they were the first time they engaged in the behavior, and impairment or problems due to the behavior, such as going to the hospital, legal trouble, problems at work or with friends and family. Additionally, participants were asked about affective reasons for why they engage in the behaviors. This is categorized as avoidance of negative emotions ("I do this behavior to stop feeling upset, distressed, or overwhelmed") or approach of pleasurable emotions ("I do this behavior to feel excitement, to get a thrill or to feel pleasure"). These two items are rated on a scale from 0 (*strongly disagree*) to 4 (*strongly agree*). Given the use of a college

sample, risky sexual behavior (Rahm-Knigge et al., 2018, 2021), aggression (Kashdan & Hofmann, 2008) and heavy alcohol use (Lipton et al., 2016), the subscales examining risky sex, aggression and alcohol use will be utilized to characterize the sample. For the subscales related to last month and total lifetime, behaviors are summed to create a total score for risky behavior. Additional subscales are available for the age of onset for each of the categories (e.g., drug use, aggression, gambling, sexual behavior, alcohol use, self-harm, eating behaviors, and reckless behaviors), which is calculated via the mean for related items (e.g., mean age of onset for all items related to alcohol usage). For the subscales looking at perceived consequences, avoidance, and approach, the mean is used to calculate subscale scores. Each subscale is scored by summing the total behaviors across the lifetime and in the past month, mean age of onset, mean perceived consequences and affective triggers (mean approach divided by mean avoidance). For this study, the total score over the past month was utilized to evaluate risky behavior and other information was used for descriptive purposes. In addition, age of onset and frequency over the past month for aggression, sexual behavior and alcohol was utilized to help characterize the sample and the types of risky impulsive behavior being engaged in by individuals with SAD symptoms. This measure has been shown to have excellent internal reliability (Cronbach's alpha = .92; Sadeh & Baskin-Sommers, 2016). See Appendix C for a copy of the RISQ.

Demographic Characteristics

Participants were asked to report socio-demographic information, including age, race, ethnicity, gender, sex, academic year, living situation, and sexuality. See Table 1 for demographic characteristics and appendix E for a copy of the demographic questionnaire.

Procedure

Eligible students were invited via email to participate in a project described as "learning about emotions, personality and behaviors in social situations." Individuals signed up for a timeslot via the Sona credit system and came to the research lab for their study session.

First, participants were provided with information on the study tasks and written informed consent was obtained. Next, they were asked to complete a questionnaire packet, including demographics, DERS, SPIN, and RISQ. As part of the larger project, participants also completed additional self-report measures, a brief clinical interview assessing social anxiety symptoms, a modified Trier Speech Task (Allen et al., 2016; Nelson et al., 2010), and psychophysiological arousal was assessed; however, these procedures go beyond the scope of the current study and are not described in detail. Relevant to the current study, participants were randomly assigned to complete the BART prior to or after delivering engaging in the speech task. In the BART pre-speech condition, participants were informed about the speech task, given three minutes to prepare the speech, and then completed the BART task. In the BART post-speech condition, participants were given three minutes to prepare their speech, delivered the speech, and then completed the BART task. Lastly, the study debriefing was conducted, and participants were provided with information about the purpose of the study. During the debriefing, participants were informed that the audience members used in the Trier social stress test were lab members instructed to act in a neutral manner. Participants also received their tickets based on the number of points they earned during the BART, which were entered into a raffle for gift cards ranging from $5 to $50. Additionally, participants were provided with a referral to a local psychological services center.

RESULTS

Data Cleaning Procedures

Statistical analyses were performed using SPSS Version 29 (*IBM SPSS Statistics | IBM*, 2022). First, the primary variables (SPIN, DERS, BART, RISQ) were screened for missing data, outliers, and assumptions. Mahalanobis distance residuals were saved and analyzed with anything greater than +/-3 being identified as an outlier and excluded from the analysis. Of the initial sample of 188 participants, seventeen were excluded for unusable data on the BART paradigm and three were excluded using Mahalanobis distance, leading to a total of 20 participants being excluded. The final sample consisted of 168 participants.

Data characteristics were explored. With the exception of the RISQ, all data met the assumptions of multicollinearity, homogeneity, and linearity. Q-Plots, P-Plots and histograms were visually examined and determined to be normal, and the majority of data points fell close to the "ideal" line on these plots. Skewness and kurtosis were generated within the SPSS output during the exploratory phase of data analysis and did not indicate non-normality, with the exception of the RISQ. See Table 2 for skewness and kurtosis data. Regarding the RISQ, data violated normality (M = 38.452, SD = 164.750) for skewness (5.593) and kurtosis (30.198). There was a vast range of responses for total risky behavior over the past month from 0 to 1021. Q-Plots, P-Plots and histograms were visually examined and determined to be non-normal. Thus, this information indicated the need to select analyses that did not require assumptions of normality (or to cautiously use these analyses) for examining these data.

Next, a series of independent samples *t*-tests were conducted to examine potential differences between participants who completed the BART prior to the speech task (n = 86) compared to participants who completed the BART following the speech task (n = 81) on variables relevant to the current study. Results indicated that there were no significant between-group differences for social anxiety symptoms (t [166] = 1.541, p =.125), emotion regulation difficulties (t [166] = .653, p =.515), including use of emotion regulation strategies (t [166] = .880, p = .380) and difficulties with emotion-driven impulsivity (t [166] = -.090, p =.929), total engagement in risky behavior (t [166] = -.393, p =.695) over the past month, and response to the BART (t [166] = 1.087, p =.279). In addition, engagement in risky behaviors specific to the college sample were examined, and results indicated no differences in engagement in risky sexual behavior (t [166] = -.675, p = .501), risky alcohol use (t [166] = -1.610, p =.109), aggressive behavior (t [166] = 1.007, p =.315)., Thus, the absence of significant between-group differences on these variables supported the examination of the current hypotheses in the full sample.

Participant Characteristics

Regarding the psychological characteristics, participants endorsed mild to very severe social anxiety symptoms (M = 31.93, SD = 12.50), with 82.1% scoring above the clinical cut off for social anxiety (≥ 19 SPIN score; Connor et al., 2000). In terms of risky behaviors, 86.9% endorsed engaging in risky behaviors, including gambling (3.6%), aggression (5.4%), risky sexual behavior (10.1%), risky alcohol use (15.6%), self-harm behavior (16.1%), drug use (17.3%), impulsive eating (35.7), and reckless behavior such as spending, driving behaviors and other illegal behaviors (69.6%) over the past month. Age of onset for engaging in risky behavior varied. For instance, risky alcohol use first occurred between the ages of 15 and 21 years (M =

17.45, *SD* = 1.07), risky sexual behavior between the ages of 10 and 20 years (*M* = 17.52, *SD* = 1.69), and aggression between the ages of 3.5 and 19 years (*M* = 13.14, *SD* = 3.50).

Hypothesis 1

A series of Pearson's bivariate correlations were conducted to examine the relationship between emotion regulation and social anxiety symptoms. Consistent with hypothesis, results demonstrated a significant positive correlation between social anxiety and difficulties with emotion regulation ($r = .496$, $p < .001$). Similarly, results supported significant positive correlations between social anxiety and difficulties controlling impulsivity when experiencing negative emotions ($r = .282$, $p < .001$) and difficulties implementing emotion regulation strategies ($r = .457$, $p < .001$). Social anxiety symptoms were positively correlated with all the difficulties with emotion regulation subscales, with the exception of the awareness subscale. The strategies subscale demonstrated strongest correlation with social anxiety symptoms, which was consistent with hypothesis. However, the correlation between emotion-driven impulsivity and social anxiety symptoms was smaller than expected. Additional correlations showed no significant correlations between performance on the Balloon Analogue Risk Task and social anxiety symptoms or emotion regulation difficulties. See Table 3 for a summary of correlations. Additional analyses were conducted with outliers included, and findings revealed that the correlation coefficients remained the significant with the inclusion of outliers.

Hypothesis 2

A hierarchical regression model was conducted to test the following hypotheses: a) SAD symptoms would be positively related to engagement in risky behaviors (hypothesis 2a); b) poorer emotion regulation would account for additional unique variance in greater engagement in

in risky behaviors (hypothesis 2b), and c) that the interaction between SAD symptoms and emotion regulation would positively predict risky behaviors, and this relationship will be stronger for individuals with higher emotion dysregulation (hypothesis 2c). Risky behaviors was the outcome variable, which was assessed by the BART responses for this series of analyses. Gender was included as a control variable in the first step given research showing significant differences in gender relating to social anxiety symptoms (Asher & Aderka, 2018) and engagement in risky behavior (Byrnes et al., 1999).

See Table 4 for the full results of each step of the model. In the first step, gender accounted for 0% of the variance for engagement in risky behavior ($R^2 = .000$, $\Delta R^2 = .000$, F [1, 166] = .081, $p = .776$). In the next step, social anxiety was entered into the model and accounted for 0.8% of the variance in engagement in risky behaviors ($R^2 = .008$, $\Delta R^2 = .007$, F [1, 165] = 1.239, $p = .267$). In the next step, difficulties with emotion regulation was added into the model and accounted for 1% of the variance of engagement in risky behaviors ($R^2 = .010$, $\Delta R^2 = .002$, F [1, 164] = .275, $p = .600$). In the final step, the social anxiety and difficulties with emotion regulation interaction term was included. Results revealed the interaction between social anxiety and emotion regulation difficulties was significant ($R^2 = .033$, $\Delta R^2 = .024$, F [1, 163] = .3.997, $p = .047$) and accounted for 2.4% unique variance in risky behaviors. Thus, the interaction was probed with PROCESS (Hayes, 2013). The Johnson-Neyman technique indicated that the relationship between social anxiety and engagement in risky behaviors on the Balloon analogue risk task was significant when difficulties with emotion regulation was higher than 123.31, which encompassed 14.88% of responses. The strength of the inverse relationship increased as emotion dysregulation levels increased. See Figure 1 for the Johnson-Neyman plot. These results were inconsistent with hypothesis 2c as higher levels of emotion dysregulation led to an inverse

relationship between social anxiety and engagement in risky behaviors (i.e., higher social anxiety was associated with lower engagement in risky behaviors in the context of higher levels of emotion dysregulation). The model was also examined with the outliers included. With the inclusion of outliers, the final model was insignificant ($R^2 = .024$, $\Delta R^2 = .005$, F [1, 166] = .876, $p = .351$).

Exploratory data analyses for self-reported risky behaviors on the Risky, Impulsive, and Self-destructive Behavior Questionnaire (RISQ) demonstrated that responses violated patterns of normal distribution (see Table 2). Therefore, several methods were used to examine the relationship between social anxiety, emotion regulation difficulties, and self-reported risky behaviors. First, a spearman's rank order correlation was conducted to examine the relationship between the behavioral measure of risky behavior (BART) and self-reported engagement in risky behavior (RISQ). No significant correlation was found between the BART and the RISQ (r_s (166) = -.026, $p = .742$). Next, a hierarchical regression model was conducted (see Table 5). Step 1 included controlling gender which indicated that gender accounted for 0% of the variance for engagement in risky behavior ($R^2 = .000$, $\Delta R^2 = .000$, F [1, 166] = .007, $p = .933$). In the next step, social anxiety was entered into the model and accounted for 1% of the variance in self-reported engagement in risky behaviors ($R^2 = .010$, $\Delta R^2 = .010$, F [1, 165] = .1.631, $p = .203$). In the next step difficulties with emotion regulation was added into the model and accounted for 1.7% of the variance of self-reported engagement in risky behaviors ($R^2 = .017$, $\Delta R^2 = .008$, F [1, 164] = .1.258, $p = .264$). In the final step, the social anxiety and difficulties with emotion regulation interaction term was included. Results revealed the interaction between social anxiety and emotion regulation was not significant ($R^2 = .026$, $\Delta R^2 = .008$, F [1, 163] = 1.415, $p = .236$).

The pattern of findings did not change when the analyses were conducted with the outliers included.

Given these findings, self-reported risky behavior was dichotomized (0 = did not engage in risky behavior over the past month, 1 = did engage in risky behavior over the past month). A binary logistic regression was performed to ascertain the effects of gender, social anxiety, difficulties with emotion regulation, and the interaction of social anxiety and difficulties with emotion regulation on the likelihood that participants engaged in risky behaviors. See Table 6 for the full models. Consistent with the hierarchical linear regression models, the first three steps of the logistical regression were not significant, indicating that there was no main effects of difficulties with emotion regulation and social anxiety on self-reported engagement in risky behaviors. The final logistic regression model was not statistically significant χ^2 (4) = 3.760, p = .440, and the interaction did not significantly predict engagement in self-reported risky behaviors over the past month. The model explained 4.7% (Nagelkerke R^2) of the variance in engagement in risky behaviors. Thus, results did not support the hypothesis that the interaction between SAD and difficulties with emotion regulation would predict self-reported risky behaviors. The pattern of findings did not change when analyses were conducted with the outliers included.

Discussion

The core feature of SAD is the fear of social evaluation where the threat is seen as out of proportion to the actual threat posed by the situation (American Psychiatric Association, 2013). Typically, social anxiety presents across multiple domains and can lead the individual to avoid situations where perceived negative evaluation or rejection may be possible (Spence & Rapee, 2016). However, some research suggests there is an atypical presentation that is characterized by

approach behaviors such as substance use, unsafe sexual practices and aggression (Kashdan et al., 2009; Kashdan & McKnight, 2010). One proposed mechanism for understanding this is emotion regulation. Individuals with SAD symptoms have been shown to have greater difficulties regulating their emotions, with specific deficits in accepting their emotional responses, difficulties engaging in goal-directed behavior, and difficulties with emotion-driven impulsivity (Helbig-Lang et al., 2015). Therefore, the current study aimed to replicate the relationship between social anxiety and emotion regulation deficits, and to explore the role of emotion regulation in the relation between social anxiety and risky behaviors among individuals with social anxiety symptoms.

To examine the first hypothesis, a series of Pearson bivariate correlations examined correlations between social anxiety and key study variables (emotion regulation, behavioral risk taking, and self-reported risk taking). Commensurate with hypothesis 1 and previous research (Farmer & Kashdan, 2012; Giorgetta et al., 2012; Helbig-Lang et al., 2015; Jazaieri et al., 2014; Mennin et al., 2009; Sackl-Pammer et al., 2019; Turk et al., 2005), higher levels of social anxiety were associated with greater difficulties regulating emotions. The findings also partially supported hypothesis 1a, with the strategies subscale of the difficulties with emotion regulation having the strongest correlation with social anxiety. Contrary with prediction and previous research, a weaker correlation with emotion driven impulsivity and SAD was observed. In particular, Dixon et al (2016) found a stronger association between emotion driven impulsivity and SAD than the one observed in the current study. One potential reason for this is that Dixon et al (2016) utilized a clinical sample, with individuals in residential treatment for substance use disorder (e.g., alcohol, cocaine, marijuana, and amphetamines) suggesting that these individuals may have more clinically significant levels of social anxiety and engagement in impulsive

behavior. Future work should continue to examine these associations to to better understand the conditions under which social anxiety and emotion driven impulsivity are associated. Consistent with Helbig-Lang et al (2015) non acceptance of one's emotions, lack of emotional clarity, difficulty engaging in goal directed behaviors, and difficulty applying strategies were found to strongly correlated with social anxiety, with awareness of emotions being the only subscale not significantly correlated. One potential reason individuals with SAD have greater difficulties applying strategies is that there appears to be an increased use of maladaptive emotion regulation strategies (e.g., rumination, emotional suppression), rather than a decreased use of adaptive emotion regulation strategies (Aldao et al., 2010; Aldao & Nolen-Hoeksema, 2012; Sackl-Pammer et al., 2019).

Additional correlation results showed that social anxiety was not associated with engagement in any risky behavior; however, two domains of emotion dysregulation, including difficulties with emotion-driven impulsivity and deployment of emotion regulation strategies, were associated with self-reported engagement in risky aggressive behavior. This finding is consistent with a prior study showing that, emotion-driven impulsivity was positively associated with anger, hostility, verbal, and physical aggression, however, SAD was only significantly associated with anger and hostility (Dixon et al., 2016). With regard to specific emotion regulation deficits that may affect risk taking among individuals with social anxiety, Rahmn-Knigge et al (2018, 2021) explored social anxiety, emotion regulation, and health-risk sexual behaviors in a sample of undergraduate students. The results showed that individuals with social anxiety were more likely to engage in the risky behavior, particularly if they also demonstrated difficulties with certain aspects of emotion regulation. More specifically, these individuals found it difficult to apply adaptive strategies to manage their emotions and struggled with non-

acceptance of their emotions. However, contrary to prior research (Heilman et al., 2010; Panno et al., 2013), there was no correlation between performance on the Balloon Analogue Risk Task and social anxiety or emotion dysregulation. Heilman et al., (2010) is one of few recent studies that have explored associations between emotion regulation strategies and risk-taking behaviors. They reported that type of emotion regulation strategy is influential in risk taking, with individuals who engage in cognitive reappraisal leading to more risk-taking on the balloon analogue risk task and the Iowa gambling task, whereas individuals who engaged in emotional suppression as an emotion regulation strategy did not show this same increase in risky behavior. Similarly, the second study demonstrated that individuals who were able to successfully able to employ emotion regulation strategies were able to engage in more goal-directed behavior, rather than engaging in risky- decision making (Martin & Delgado, 2011). Prior literature exploring inhibition focused SAD supports that these individuals are less likely to engage in risk taking behavior (Broman-Fulks et al., 2014; Giorgetta et al., 2012; Lorian & Grisham, 2010; Maner et al., 2007). However, the current research found no evidence to support the link between SAD and engagement in risk taking behavior. Therefore, additional further research is needed to identify how emotion regulation influences social anxiety symptoms in both typically presenting and approach-oriented presentations to better understand engagement in risky behaviors within these populations.

The second hypothesis examined the main and interactive effects of social anxiety symptoms and emotion regulation difficulties on risky behaviors. With regard to the main effects, hypotheses 2a and b predicted that social anxiety (2a) and emotion regulation difficulties (2b) would be positively related to engagement in risky behavior on self-reported and behavioral indicators of risky behaviors. Results demonstrated neither social anxiety nor emotion regulation

difficulties was significantly predictive of engagement in risky behavior on either outcome. Hypothesis 2c was the primary hypothesis and predicted the interaction between social anxiety and emotion regulation difficulties would account for significant variance in risky behavior. Results showed that the interaction between social anxiety and emotion regulation difficulties was significant in predicting risky behavior on the behavioral risk task. However, further exploration into this interaction revealed the pattern of findings were not in the anticipated direction, with results showing that higher levels of emotion dysregulation contributed to a negative relationship between social anxiety and engagement in risky behaviors. A number of potential explanations and limitations may account for the current findings and be used to inform research.

One important consideration of the current study was the sample. The current study yielded a sample with social anxiety severity that is consistent with prior research exploring social anxiety in college student populations (Fisak & Hammond, 2013; Ghaedi et al., 2010). College students are recognized to frequently engage in high-risk behaviors (e.g., binge drinking, driving under the influence, health-risk sexual behavior; Marin et al., 2019; Romm et al., 2022; White et al., 2008), and although most individuals in this study reported engagement in at least one risky behavior, self-reported endorsement of risky behaviors was relatively low, which may have been due to social desirability. Previous studies have shown that social desirability affects reporting of alcohol use (Davis et al., 2010) and risky sexual behavior (King, 2022). However, it is worth noting that given the wide distribution of self-reported risky behaviors there is some willingness of individuals with social anxiety to engage in risky behaviors. In addition, this study did not explicitly recruit approach-oriented socially anxious sample, which may have limited the ability to detect these findings. Unfortunately, validated assessment strategies for identifying

approach-oriented SAD have not been documented. Therefore, the current study attempted to utilize key factors that are associated with engagement in risky behaviors (e.g., college students). Given that approach-oriented SAD is associated with earlier onset, greater symptom severity (Kashdan et al., 2009; Mörtberg et al., 2014b), greater functional impairment, and poorer global health (Kashdan et al., 2009), it may be beneficial for future research to utilize different SAD criterion or consider examining this presentation within other samples. For instance, Dixon and colleagues (2016) examined emotion regulation difficulties, SAD, and aggression in a sample of adults who were seeking treatment for substance use disorders. Additionally, future research may benefit from the development of a screening tool specifically for approach-oriented SAD.

Risk taking behaviors have been widely studied, and there are several potential findings that may account for the results regarding self-report and behavioral indicators of risky behaviors observed within the current study. Risk taking is influenced by characteristics of the decision maker (e.g., age, gender, cultural differences), along with the context of the risky behavior (e.g., situational differences, emotionality of the decision; Figner et al., 2009; Figner & Weber, 2011). These individual differences and situational characteristics can also interact, leading individuals to have different reactions to these situational contexts (Figner & Weber, 2011). One potential explanation for the results found in the current study is that the sample was predominantly female. It is well documented that in the majority of tasks males are more likely than females to engage in risk behaviors in both laboratory (Byrnes et al., 1999) and field (Jianakoplos & Bernasek, 1998) studies due to their perception of risk. This has specifically been looked at within the context of the Balloon Analogue Risk Task, with Lighthall et al. (2009) demonstrating that acute stress further amplifies sex differences in risk taking, making women more risk avoidant and men more risk seeking. For example, individual characterizes (e.g., anxiety

symptoms) can also interact with the context (e.g., risk-taking tasks). Previous research has demonstrated that individuals with higher anxiety tend to make fewer risky choices that non-anxious participants, particularly after making gains on a gambling task (Giorgetta et al., 2012). Therefore, in the current study anxious individuals may have demonstrated risk-aversion after making gains on the balloon analogue risk task. Future research would benefit from exploring how emotional valence and stress within a situation affects the risk-taking processes particularly within the subtype of approach-oriented social anxiety

Contrary to previous studies (Lejuez et al., 2002, 2003), the current study found no correlation between the behavioral task and self-reported risky behavior. However, the current findings are consistent with previous research that has found the link between actual risk taking and behavioral measures of risk taking to be low and unsatisfactory (Dang et al., 2020; Gahagen, 2014). There are several proposed reasons why self-report and behavioral measures may not be correlated. Self-report and behavioral measures are distinct because they are designed to measure very different response processes, with behavioral measures aiming to maximize structure and performance, whereas self-report is based on perception of performance which is a more subjective process. This can lead to behavioral measures tapping into people's maximum performance, whereas self-report may be more representative of typical behavior (Dang et al., 2020) and may reflect the emotionality involved in undertaking risk in real life (Bran & Vaidis, 2020). Ongoing research has explored the discrepancy between self-report and behavioral measures with a focus on impulsive behaviors and found that there is consistently low correlations between trait impulsivity, laboratory behavioral tasks, and daily-life impulsive behaviors, with many researchers arguing that multiple methods should be used to better understand the construct (Sharma et al., 2014). Bran and Vaidis (2020) propose one explanation

for the discrepancy between self-reported and behavioral measures of risk taking may lie in arousal. They argue that few studies looking at behavioral risk-taking measure the level of arousal the task induced. For instance, previous literature (Anderson & Brown, 1984) has shown that gambling in a casino versus a laboratory induces more arousal, which may lead to high sensations seekers taking more risks in real life than behavioral measures. Therefore, one potential explanation for the discrepancy between the significant result on the behavioral task and the self-reported risky behavior could be that the different measurement techniques may be tapping into different aspects of the construct. Therefore, it would be beneficial for future research to develop a behavioral measure of risk-taking that is emotionally inductive, and more closely approximates risk taking in the real world. Until then, future research should continue to utilize a multitude of approaches looking about both behavioral measures of risk taking and self-reported engagement in risky behaviors.

Limitations and Future Directions

A few additional limitations and suggestions for future research should be considered. First, the current study explored general severity of social anxiety but did not assess for functional impairment or distress outside of the Social Phobia Inventory, and individuals with approach-oriented social anxiety has previously been found to have greater symptom severity and functional impairment (Kashdan et al., 2009). As individuals with approach-oriented social anxiety do not engage in the typical avoidance focused behaviors, their level of functional impairment may not be best captured by the Social Phobia Inventory, and future research should consider including additional eligibility criteria, such as functional impairment, distress, or other behavioral indicators (e.g., propensity to engage in “fight” or approach-oriented behaviors) that may be indicative of approach-oriented social anxiety symptoms. Second, within the current

study, 81.9% of the sample were under the age of 20, and the sample was predominantly white and female. Prior research suggests that individuals aged 14 to 19 (Figner & Weber, 2011) and males (Byrnes et al., 1999) are more likely to engage in risky behavior, with race being influential when looking at specific categories of risk taking behavior, for example high risk sexual behavior (Childs & Ray, 2015). Therefore, the current study results may not be representative of adults with different demographic backgrounds within the community who experience symptoms of social anxiety, or those who engage frequently engage in risk taking behavior.

Another limitation to consider is the assessment measures for risk and emotion regulation difficulties. Individuals' engagement in risk taking behaviors can be assessed in a multitude of ways. For instance, research has shown that risk taking is domain specific, meaning that somebody's financial risk taking behavior may not predict their engagement in recreational risk taking (Figner & Weber, 2011; Weber, 2010). Therefore, the Balloon Analogue Risk Task may not have approximated risk-taking behaviors expected to be observed among individuals with SAD. Behavioral tasks that are domain specific, and approximate risk taking in social situations are needed. Secondly, the Risky, Impulsive, and Self-Destructive Behavior Questionnaire asks individuals to rate their engagement over the past month on specific behaviors (e.g., paid for sex, used marijuana, punched someone etc.), which may not have given the most accurate representation of overall engagement in risky behaviors among college students. Future research should consider using the Domain-specific Risk-Taking Scale (Blais & Weber, 2006), which asks individuals to rate their propensity for risk taking on more common place behaviors (e.g., sunbathing without sunscreen, riding a motorcycle without a helmet, and drinking heavily at a social functioning). This measure has previously shown to be correlated with social anxiety, with

undergraduate students with social anxiety showing higher levels of risk avoidance in the social and recreational domains, but not in the financial, ethical and health/safety risk domains (Lorian & Grisham, 2010) and may provide insight into risk taking propensity in approach-oriented social anxiety (Kashdan et al., 2006). Additionally, when assessing risk taking in those with social anxiety experimentally, it would be beneficial to utilize paradigms that target social and recreational risk-taking propensity in addition to risk-taking measures that activate affective processes. Furthermore, assessment of emotion regulation utilized the Difficulties with Emotion Regulation Scale (Gratz & Roemer, 2004), which asks participants to rate the extent to which each statement applies to them. Although one's propensity to regulate their emotions is critical to understand, it may be helpful to evaluate emotion regulation abilities in the context of specific situations and in real time given the importance of context in predicting engagement in risky behavior. Prior literature (Stone et al., 2019) has utilized ecological momentary assessment technology to assess emotion regulation in anxious samples, which may be beneficial in understanding the nuanced process of regulating one's emotion and selection of emotion regulation strategies in those with approach-oriented social anxiety.

Finally, it should also be considered that the current study applied a cross-sectional design, which prevents directionality from being established. Although this study included experimental and self-report components, the assessment of emotion regulation was conducted via self-report, and the project was not conducted to specifically examine the current hypotheses. Consequently, it may be beneficial for future research to refine the experimental process, such as using assessment of real time use of emotion regulation abilities and strategies in response to a behavioral risk-taking task in socially anxious individuals. Inclusion of a control (e.g., non-socially anxious individuals) or comparison (e.g., avoidant vs. approach oriented social anxiety)

group may allow for the comparison of the different emotion regulation strategies utilized by individuals when faced with risk-taking situations. Recent research explored the comparison of social versus individual risk-taking in individuals with and without major depression, finding that although individual risk taking did not differ, social risk-taking was decreased in those with depression (Follett et al., 2023). Future research could continue to build on this exploring the differences in individual and social risking taking in those with approach-oriented and avoidance oriented social anxiety and a healthy comparison group. Additionally, future research could implement a longitudinal study design to better understand the development of engagement in risky behavior in approach-oriented social anxiety and its relationship with emotion regulation difficulties.

Conclusion

Overall, the results of the current study contribute to the growing body of literature exploring social anxiety and emotion regulation and the potential role this plays in engagement in risky behaviors. Results supported prior empirical findings for emotion regulation deficits in individuals with social anxiety symptoms. Specifically, high levels of emotion dysregulation strengthen an inverse association between social anxiety disorder symptoms and engagement in risky behavior. Future research would benefit from exploring the role of emotion regulation within an approach-oriented social anxiety sample as well as exploring further aspects of risk taking such as risk-taking propensity.

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APPENDIX

APPENDIX A

Tables and Figures

Table 1

Participant Sociodemographic Characteristics (n = 168)

		N (%)
Gender	Male	30 (17.9)
	Female	136 (81.0)
	Other	2 (1.2)
Sex	Male	31 (18.5)
	Female	137 (81.5)
Sexuality	Heterosexual	143 (85.1)
	Gay	4 (2.4)
	Lesbian	1 (.6)
	Bisexual	11 (6.5)
	Asexual	3 (1.8)
	Other	4 (2.4)
Race/Ethnicity	White	129 (76.8)
	Black	18 (10.7)
	Asian	5 (3)
	Hispanic/Latino	8 (4.8)
	Other	8 (4.8)
Academic Year	Freshman	129 (76.8)
	Sophomore	21 (12.5)
	Junior	14 (8.3)
	Senior	2 (1.2)
	Other	2 (1.2)
Living Situation	On-campus dorm	128 (76.2)
	Greek-affiliated house	3 (1.8)
	Off-campus housing	9 (5.4)
	Family home	6 (3.6)
	Other	22 (13.1)

Table 2

Normality and mean of variables

	Skewness	Kurtosis	*M (SD)*
Social Phobia Inventory	.053	-.475	31.691 (12.50)
DERS	.064	-.586	95.702 (22.71)
DERS Impulsivity	.979	.820	12.37 (.388)
DERS Strategies	.392	-5.-1	20.263 (.577)
BART	.623	.309	25.62 (12.53)
RISQ total last month	5.593	30.198	38.45 (164.75)
RISQ last month aggression	9.114	92.764	.143 (.898)
RISQ last month sexual behaviors	6.357	49.240	.208 (.847)
RISQ last month alcohol use	8.359	86.452	.786 (2.67)

Note. RISQ = Risky impulsive self-destructive questionnaire, DERS = Difficulties with emotion regulations scale, BART = Balloon Analogue Risk Task. In addition to calculating skewness and Kurtosis, the distributions were visually inspected.

Table 3

Descriptive Statistics and Pearson Correlations between Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SPIN	-												
2. DERS total	.496**	-											
3. DERS Impulsivity	.282**	.733**	-										
4. DERS Strategies	.457**	.890**	.663**	-									
5. DERS non-acceptance	.442**	.731**	.384**	.616**	-								
6. DERS Clarity	.420**	.626**	.348**	.423**	.327**	-							
7. DERS Awareness	.136	.426**	.157*	.198*	.165*	.385**	-						
8. DERS Goals	.253**	.628**	.443**	.584**	.326**	.239**	-.067	-					
9. BART	-.086	-.081	-.080	-.078	-.084	-.059	-.096	.078	-				
10. Total RISQ	-.099	.024	.018	.012	.006	.001	.041	.023	.044	-			
11. RISQ Aggression	.079	.197*	.172*	.189*	.140	.044	.147	.082	-.057	-.017	-		
12. RISQ sexual	-.050	.108	.133	.094	.037	.087	.116	-.014	-.066	.021	.339**	-	
13. RISQ Alcohol	-.096	-.057	.004	-.080	-.018	-.051	-.121	.044	-.058	.175*	-.017	.015	-
Mean	31.69	95.70	12.32	20.23	16.08	13.77	17.42	15.90	25.62	38.45	.1429	.21	.79
SD	12.50	22.71	4.83	7.32	6.35	4.14	5.18	5.13	12.53	164.75	.90	.85	2.68
Observed Range	5-68	45-143	6-30	8-39	6-30	5-25	6-30	5-25	2-68	0-1021	0-10	0-8	0-10
Possible Range	0-68	36-180	6-30	8-40	6-30	5-25	6-30	5-25	-	-	-	-	-
Cronbach's α	.905	.928	.852	.889	.912	.798	.824	.899	-	-	-	-	-

Note. * Correlation is significant at the .05 level, ** Correlation is significant at the .01 level; All RISQ variables evaluate self-reported engagement in risky behavior over the past month. SPIN = Social Phobia Inventory; DERS = Difficulties with Emotion Regulation Scale with subscales in impulsivity, strategies, non-acceptance, clarity, awareness, and goals; Total RISQ= Risky Impulsive Self-destructive Behavior Questionnaire over the past month; RISQ aggression = RISQ Aggression subscale; RISQ Sexual = RISQ Sexual Behavior subscale; RISQ Alcohol = RISQ Alcohol subscale; *SD* = Standard Deviation.

Table 4

Results of the moderation analysis examining the role of emotion regulation on social anxiety and behavioral engagement in risky behaviors

Variable	*B*	*SE*	*β*	*T*	*p*	R^2	ΔR^2
Step 1						.000	.000
Constant	25.49	1.074		23.741			
Gender	.712	2.499	.022	.285	.776		
Step 2						.008	.007
Constant	28.226	2.682		10.526			
Gender	.752	2.498	.023	.301	.764		
Social anxiety	-.087	.078	-.086	-1.113	.267		
Step 3						.010	.002
Constant	30.023	4.353		6.896			
Gender	.544	2.535	.017	.215	.830		
Social anxiety	-.063	.090	-.063	-.689	.486		
Emotion dysregulation	-.026	.050	-.048	-.525	.600		
Step 4						.033	.024
Constant	10.080	10.868		.927			
Gender	-.026	2.528	-.001	-.010	.992		
Social anxiety	.585	.336	.584	1.741	.084		
Emotion dysregulation	.198	.122	.358	1.614	.108		
Emotion dysregulation × social anxiety	-.007	.003	-.932	-1.999	.047		

Note: Behavioral engagement in risky behaviors = performance on the Balloon Analogue Risk Task, which was assessed using adjusted average pump count. Social Anxiety = SPIN (Social Phobia Inventory), Emotion dysregulation = DERS (Difficulties with Emotion Regulation Scale), emotion dysregulation x Social Anxiety = DERS x SPIN.

Table 5

Results of the moderation analyses examining the role of emotion regulation on social anxiety and self-reported engagement in risky behavior

Variable	*B*	*SE*	*β*	*T*	*p*	R^2	ΔR^2
Step 1						.000	.000
Constant	37.942	14.118		2.688	.008		
Gender	2.768	32.865	.007	.084	.993		
Step 2						.010	.010
Constant	79.160	35.806		2.248	.026		
Gender	3.366	32.806	.008	.103	.918		
Social anxiety	-1.304	1.021	-.099	-1.277	.203		
Step 3						.017	.008
Constant	28.864	57.006		.506	.613		
Gender	9.181	33.188	.022	.277	.782		
Social anxiety	-1.968	1.180	-.149	-1.668	.097		
Emotion dysregulation	.734	.655	.101	1.122	.264		
Step 4						.026	.008
Constant	-127.73	143.428		-.891	.374		
Gender	4.709	33.359	.011	.141	.888		
Social anxiety	3.122	4.438	.237	.703	.483		
Emotion dysregulation	2.493	1.616	.344	1.542	.125		
Emotion dysregulation × social anxiety	-.054	.046	-.557	-1.190	.236		

Note: Self-reported engagement in risky behavior = RISQ (Risky Impulsive Self-destructive Behavior Questionnaire), social anxiety = SPIN (Social Phobia Inventory), emotion dysregulation = DERS (Difficulties with Emotion Regulation Scale), emotion dysregulation x social anxiety = DERS x SPIN.

Table 6

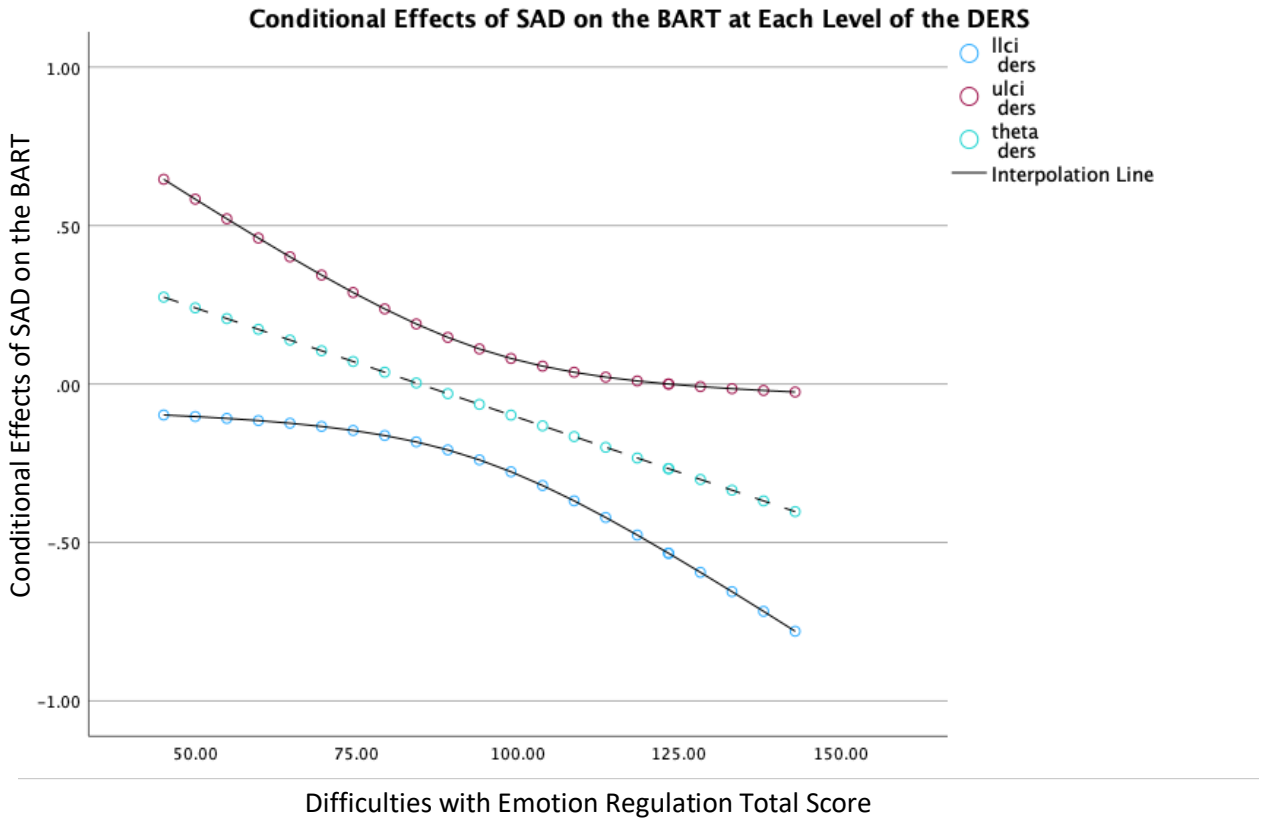
Binomial logistic regression exploring the role of gender, social anxiety, and emotion regulation on self-reported engagement in risky behaviors

	B	*SE*	Wald	*df*	*p*	Odds Ratio	95% CI for Odd's Ratio	
							Lower	Upper
Step 1								
Gender	-.074	.540	.019	1	.890	.928	.322	2.675
Constant	1.931	.245	61.857	1	<.001	6.895		
Step 2								
Gender	-.075	.540	0.19	1	.890	.928	.322	2.676
Social anxiety	-.011	.017	.384	1	.535	.989	.956	1.024
Constant	2.281	.627	13.251	1	<.001	9.788		
Step 3								
Gender	.100	.553	.032	1	.857	1.105	.373	3.268
Social anxiety	-.032	.020	2.496	1	.114	.968	.930	1.008
Emotion dysregulation	.023	.011	4.074	1	.044	1.023	1.001	1.046
Constant	.805	.943	.730	1	.393	2.237		
Step 4								
Gender	.202	.611	.109	1	.741	1.224	.369	4.055
Social anxiety	-.058	.083	.502	1	.478	.943	.802	1.109
Emotion dysregulation	.010	.033	.090	1	.764	1.010	.947	1.077
Emotion dysregulation × social anxiety	.000	.001	.073	1	.787	1.000	.999	1.002
Constant	2.081	2.853	.532	1	.466	8.015		

Note. Self-reported engagement in risky behavior = RISQ (Risky Impulsive Self-destructive Behavior Questionnaire; 0 = did not engage in risky behavior over the past month, 1 = engaged in risky behavior over the past month), social anxiety = SPIN (Social Phobia Inventory), emotion dysregulation = DERS (Difficulties with Emotion Regulation Scale), emotion dysregulation x social anxiety = DERS x SPIN.

Figure 1

Johnson Neyman plot of the interaction between social anxiety and emotion dysregulation on behavioral engagement in risky behaviors



APPENDIX B

DERS

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item:

1	2	3	4	5
Almost never (0-10%)	Sometimes (11-35%)	About half the time (36-65%)	Most of the time (66-90%)	Almost always (91-100%)

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

APPENDIX C

SUBID:_____

0	1	2	3	4
Strongly Disagree	Somewhat Disagree	Equally Disagree/Agree	Somewhat Agree	Strongly

		A	B	C	D	E	F
		How many times total have you done this in your life?	How many times have you done this in the past month?	How old were you the first time?	Did it ever cause you any problems, such as • going to the hospital • legal trouble • problems at work, with family or friends	I do this behavior to stop feeling upset, distressed, or overwhelmed	I do this behavior to feel excitement, to get a thrill, or to feel pleasure
	Behavior	# TOTAL	# past MONTH	Age	Check box if *YES*	Rate 0-4	Rate 0-4
8	Gotten in a physical fight						
9	Thought about killing yourself						
10	Had sex for money or drugs						
11	Drank alcohol until you blacked or passed out						
12	Used hallucinogens, LSD, mushrooms						
13	Gone to work intoxicated or high						
14	Attacked someone with a weapon, such as a knife or gun						
15	Punched or hit someone with a fist or object						
16	Cut, burned, or hurt yourself on purpose without trying to die						
17	Lost more money than you could afford gambling						
18	Threatened to physically hurt someone						
19	Threatened someone with a weapon, such as a knife or gun						

For each behavior, fill-in how many times you did it in your lifetime (A) & the total number of times you did it the past month (B). ***Enter one number for each time period, even if it is your best guess. Please do not put a range, but enter a single number*** (e.g., behaviors engaged in everyday for multiple years can be written in as 1000+, behaviors engaged in daily for a single year can be written in as 365, any other frequency should be estimated using your best guess). If you have ever done the behavior, write how old you were the first time (C) and check the box if the behavior ever caused you ***any*** problems, regardless of the specific problem (D). For the last two columns (E & F), use the scale in the box to rate how much you agree with each statement from 0 = Strongly Disagree to 4 = Strongly Agree. ***Please provide ratings for both statements (E & F), and treat them as separate questions.*** The first two rows are examples of how to complete each item.

0 Strongly Disagree | **1 Somewhat Disagree** | **2 Equally Disagree/Agree** | **3 Somewhat Agree** | **4 Strongly**

		A	B	C	D	E	F
		How many times total have you done this **in your life**?	**How many times** have you done this **in the past month**?	**How old** were you the **first time**?	Did it ever **cause you any problems**, such as • going to the hospital • legal trouble • problems at work, with family or friends	I do this behavior to **stop feeling upset, distressed, or overwhelmed**	I do this behavior to **feel excitement, to get a thrill, or to feel pleasure**
	Behavior	**# TOTAL**	**# past MONTH**	**Age**	**Y=*YES***	**Rate 0-4**	**Rate 0-4**
Ex.	*Driven a car while intoxicated*	*10*	*2*	*18*	Y	*4*	*3*
Ex.	*Jumped out of a plane*	*0*					
1	**Shoplifted things**						
2	**Drove 30mph or faster over the speed limit**						
3	**Bet on sports, horses, or other animals**						
4	**Used cocaine or crack**						
5	**Bought drugs**						
6	**Impulsively bought stuff you did not need & won't use**						
7	**Had unprotected sex with someone you just met or didn't know well**						

SUBID:_____

0 Strongly Disagree | **1 Somewhat Disagree** | **2 Equally Disagree/Agree** | **3 Somewhat Agree** | **4 Strongly**

		A	B	C	D	E	F
		How many times total have you done this **in your life**?	**How many times** have you done this **in the past month**?	**How old** were you the **first time**?	Did it ever **cause you any problems**, such as • going to the hospital • legal trouble • problems at work, with family or friends	I do this behavior to **stop feeling upset, distressed, or overwhelmed**	I do this behavior to **feel excitement, to get a thrill, or to feel pleasure**
	Behavior	**# TOTAL**	**# past MONTH**	**Age**	**Check box if *YES***	**Rate 0-4**	**Rate 0-4**
20	**Used heroin**						
21	**Destroyed or vandalized property**						
22	**Drank 5 or more alcoholic drinks in 3 hours or less**						
23	**Paid for sex**						
24	**Sold drugs**						
25	**Robbed someone**						
26	**Tried to kill yourself**						
27	**Used marijuana**						
28	**Had difficulty stopping eating**						
29	**Been in 2 or more sexual relationships at the same time**						
30	**Bought expensive items you could not afford on the spur of the moment**						
31	**Abused multiple drugs at once**						
32	**Played lotteries, card games for money, or went to the casino**						
33	**Gambled illegally (not part of a legal business, using a bookie)**						
34	**Abused prescription medication**						
35	**Ate a lot of food when not hungry**						
36	**Had a plan to kill yourself**						
37	**Ran red lights or ignored stop signs**						
38	**Stole money**						

APPENDIX D

Social Phobia Inventory (SPIN)

Directions: Please circle the number that best corresponds to how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any one statement.

	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 E

Background and Sociodemographic Information

What was your sex at birth?
0 = Male
1 = Female
2 = Other (Please Specify): _____

Which of the following best describes your gender identity?
1 = Female/Woman
2 = Male/Man
3 = Transgender
4 = Other Genders (Please specify): _____

What is your date of birth? _____ What is your age (in years)? _____

Is English a second language for you?
0 = No
1 = Yes

Were you born in the United States?
0 = No
1 = Yes

If NO:
How long have you been living here? _____
Where were your born? _____

What is your ethnic background?
1 = White
2 = Native American/American Indian
3 = Black/African-American
4 = Chinese or Chinese-American
5 = Japanese or Japanese-American
6 = Korean or Korean-American
7 = Other Asian or Asian-American
8 = Mexican, Mexican American, or Chicano
9 = Puerto Rican
10 = Other Hispanic/Latino
11 = East Indian
12 = Middle Eastern/Arab
13 = Other (Please specify): _____

How do you self-identify?
1 = Gay
2 = Lesbian
3 = Bisexual
4 = Queer
5 = Questioning
6 = Heterosexual/Straight
7 = Asexual
8 = Other (Please specify): _____

Year in school

a. Freshman (1st year)
b. Sophomore (2nd year)
c. Junior (3rd year)
d. Senior (4th year)
e. Other: _____

Current GPA: _____
Number of credit hours enrolled in this semester: _____
Major: _____

Housing Status

a) On-campus dorm
b) Greek-affiliated house
c) Alone in off-campus apartment or house
d) With roommate in off-campus apartment or house
e) With parent(s) or family member
f) Other: _____

VITA

EDUCATION

University of Mississippi, *Mississippi, USA* — Expected 2027
Doctor of Philosophy, Clinical Psychology — GPA 4.0
Advisor: Laura Dixon, Ph.D.

University of Mississippi, *Mississippi, USA* — Expected 2023
Master of Arts in Psychology, Emphasis: Clinical Psychology — GPA 4.0
Thesis: Social Anxiety and Engagement in Risky Behaviors: Exploring the Role of Emotion Regulation
Advisor: Laura Dixon, Ph.D.

University of Nottingham, *Nottingham, England* — 2019
Master of Science in Health Psychology, *Merit* — GPA 3.7
Thesis: Social Support in Online Forums for Lupus Patients: A thematic analysis
Advisors: Heather Buchanan, Ph.D., Neil Coulson, Ph.D.

Hobart and William Smith Colleges*, New York, USA* — 2016 to 2018
Bachelor of Science in Psychology, Minor in Sociology*, summa cum laude* — GPA 3.96
Advisor: Julie Kingery, Ph.D., Renee Monson, Ph.D.

University of East Anglia, *Norwich, England* — 2014 to 2016
Bachelor of Science, Psychology, *Upper Second-Class Honors (2:1)*
Non-degree granting, transferred to Hobart and William Smith 2016

HONORS AND AWARDS

2021- 2025	Excellence in Inclusivity Fellowship
Fall 2022	Phi Kappa Phi Honors Society
June 2018	Collegiate Rowing Coaches Association Athlete Scholar Award
Fall 2016 to May 2018	Hobart and William Smith Dean's List
2018	Liberty League All-Academic Team
2017 & 2018	National Invitational Rowing Championship All-Academic Team
Spring 2015	Gold Duke of Edinburgh Award

MANUSCRIPTS UNDER REVIEW

Dixon, L., Schadegg, M., Clark, H., **Sevier, C.,** & Witcraft, S (In Preparation) Prevalence, *Phenomenology, and Impact of Misophonia in a Nationally Representative Sample of U.S. Adults.*

CONFERENCE POSTERS AND PRESENTATIONS

*Denotes undergraduate student mentee

Completed:

Sevier, C., Clark, H., & Dixon, L., (2022, November 19). *The Indirect Role of Emotion Regulation Difficulties in the Association Between Social Anxiety and Engagement in Risky Behaviors* [Poster Presentation]. Association for Behavioral and Cognitive Therapies, New York, NY.

Fair, L.G*., **Sevier, C.J**., & Dixon, L. J. (2022, September 29). *Analyzing the Unique Role of Perseverative Thinking in Insomnia in College Students.* [poster presentation]. Mississippi Psychological Association Annual Convention. Hattiesburg, MS.

Woodward, L.E*., **Sevier, C.J**., & Dixon, L. J. (2022, September 29). *Examination of Impulsivity in Relation to Facets of Aggression among Socially Anxious Individuals.* [poster presentation]. Mississippi Psychological Association Annual Convention. Hattiesburg, MS.

Kimble, S., Sachner, L.**, Sevier, C.,** Klein, K., Kaplan., & Fruzzetti, A. (2021, November 16). *Families Need Help Too: Exploring the Needs of Families After Child Suicide Attempts* [Virtual Conference Poster Presentation]. Association for Behavioral and Cognitive Therapies. New Orleans, LA.

Sevier, C., Klein, K., Payne, L., Fruzztti, A., & Kaplan, C. (2021, January 27). *Families Need Help Too: Exploring the Needs of Families After Suicide Attempts.* [Virtual Conference Poster Presentation]. McLean Hospital Annual Research Day, Belmont, MA, United States.

Klein, K., Yadlosky, L., **Sevier, C.**, Watson, J. (2021, January 27). *Exploring Experiences of Teen and Young Adult Siblings of Clients with BPD.* [Virtual Conference Poster Presentation]. McLean Hospital Annual Research Day, Belmont, MA, United States.

Sevier, C., Klein, K., Kumpf, E., Payne, L., Kaplan, C., Fruzzetti, A., & Auerbach, R. (2020, November 19-22). *Effects of Residential Dialectical Behavior Therapy on Emotion Dysregulation and Risk-Taking Behaviors for Suicidal/Self-Harming Adolescents.* [Virtual Conference Poster Presentation]. Association for Behavioral and Cognitive Therapies, Philadelphia, PA, United States.

Klein, K., **Sevier, C.,** Kumpf, E., Payne, L., Kaplan, C., Fruzzetti, A., & Auerbach, R. (2020, June 11-12). *Outcomes of Dialectical Behavior Therapy: Residential Treatment Program for Female Adolescents* [Virtual Conference Poster Presentation]. Youth Suicide Research Consortium National Conference, New York, NY, United States.

Kumpf, E., **Sevier, C.,** Klein, K., Payne, L., Kaplan, C., Fruzzetti, A., & Auerbach, R. (2020, June 11-12). *Outcomes of Dialectical Behavior Therapy: Residential Treatment Program for Female Adolescents* [Virtual Conference Poster Presentation]. Youth Suicide Research Consortium National Conference, New York, NY, United States.

RESEARCH EXPERIENCE

Graduate Student Researcher, University of Mississippi **Present**
Primary Investigator: Dr. Laura Dixon, Ph.D.
Health Anxiety Research and Treatment (HART) Lab

- Misophonia Research Fund Grant | Amount Awarded: $399,986

- Conducted clinical interivews including the Diagnostic Interview for Anxiety, Mood, and OCD, and Related Neuropsychiatric Disorders and the Diagnostic Interview for Personality Disorders-5

Clinical Research Assistant, McLean Hospital, *Belmont, MA* Jan 2020 -
Supervisors: Alan Fruzzetti, Ph.D., Luciana Payne, Ph.D., Cynthia Kaplan., Ph.D. June 2021
Emotion Regulation Family Therapy and Trauma (ERFTT) Lab

- Effectiveness of Residential Dialectical Behavior Therapy for Adolescent Females
    - Coding and cleaning data, conducting statistical analysis, preparing visual representations of data
    - Assisting with literature reviews, article summaries and manuscript preparation
- Validation of Self-hatred Scale in Borderline Personality Disorder Populations
    - Assisting in preparing IRB applications including protocol summaries, background literature, preparing recruitment tools and consent forms
    - Identifying measures for study inclusion and entering surveys into REDCap
- Family Connections: Managing Suicidality and Trauma Recovery
    - Coding and cleaning data for statistical analysis and coding qualitative trauma data
    - Tracking participant completion and ensuring participant incentives have been delivered
    - Supporting preparation of a continued IRB application
- Residential Treatment Progress
    - Administering clinical assessments to program residents via REDCap at multiple time intervals
    - Utilizing SPSS syntax to reverse code variables and calculate variable totals and subscales

CLINICAL EXPERIENCE

Graduate Clinician, Psychological Services Center, University of Mississippi 2022-
Supervisors: Laura Dixon, Ph.D., Kristin Austin, Ph.D., John Young, Ph.D., Present

- Conduct intake assessments and develop treatment plans for patients
- Document and monitor patient progress
- Provide evidence-based treatment to children, adolescents and adults from the local community
- Utilized evidence-based clinical interviews to conceptualize cases prior to conducting therapy
- Participated in weekly supervison meetings

Behavioral Health Consultant, Oxford Pediatric Group, *Oxford, MS* 07/2023-
Supervisor: John Young, Ph.D. Present

- Conduct intake evaluation, ADHD assessments, emotional and behavioral assessments, and cognitive assessments in a primary care setting
- Provide brief CBT interventions for children and adolescents addressing anxiety, depression and behavioral concerns
- Assign appropriate CPT. Codes, track insurance reimbursement rates and share data with the pediatric clinic

- Consult and collaborate with a multidisciplinary team of doctors, nurses, community healthcare providers and teachers

Mental Health Consultant, Institute of Community Services (Headstart), *Mississippi, USA* 09/2023-Present
- Serve as the primary consultant for multiple head start organizations across rural areas of Northwest Mississippi.
- Attend weekly visits to observe student behaviors, teacher interactions, and classroom environments
- Consult with teachers to discuss maladaptive classroom behaviors
- Develop behavior intervention plans to address classroom interfering behaviors
- Assist teachers in implementing behavior intervention plans

Graduate Clinician, The Baddour Center, *Senatobia, MS* 2022-2023
Supervisor: Joshua Fullweiler, Ph.D.
- Administered evidence-based interventions to adult and geriatric individuals with comorbid psychiatric, intellectual, and developmental disorders
- Created behavior plans for individuals with intellectual and developmental disorders
- Conducted cognitive assessments on incoming residents, including scoring tests and providing assessment reports
- Attended weekly supervision meetings and participated in didactics related to evidence-based clinical interventions
- Attended consultation meetings with psychiatric nurse to provide behavioral observations

Post-Baccalaureate Fellowship, McLean Hospital, *Belmont, MA* 2019 - 2021
Supervisors: Fairlee Fabrett, Ph.D. Michael Macht-Greenberg, Ph.D.
- Participating in monthly professional development and educational seminars
- Completing two yearlong rotations at programs in the child and adolescent division

3East Boys and Girls Programs, Mclean Hospital, *Belmont, MA* 2019 - 2021
Supervisors: Anna Precht, Psy.D., Michael Hollander, Ph.D., Alan Fruzzetti, Ph.D. Gillian Galen, Psy.D, Judith Mintz, Ph.D., Blaise Aguirre., M.D.
- Providing individual dialectical behaviour therapy skills coaching and phone coaching to patients aged 13 to 22 experiencing emotion dysregulation.
- Supervising patients and intervening during crisis situations both in milieu settings and on community outings.
- Collaborating with clinical teams, including psychiatrists and social workers, to provide evidence-based and individualized treatment.
- Assisting in leading therapeutic groups on coping with daily life skills, including DBT, CBT and mentalization skills.
- Providing biweekly psychoeducation for male and female graduates of the residential program.
- Trained in medication administration.

Mental Health Specialist, Mclean Hospital, *Belmont, MA* 2020 - 2021
- Providing mental health triage including conducting initial patient interviews to assess risk for incoming patients with a range of diagnosis including depression, bipolar and schizoaffective disorders for a range of ages
- Assessing patients psychiatric and mental stability including taking vital signs, orthostatic blood pressure and breathalyzer readings

- Assisting patients and families during the evaluation process, providing information and implementing de-escalation strategies for patients experiencing acute psychiatric crises, including being trained in safe patient restraints
- Perform patient centered intervention within the confines of a psychiatric evaluation center

National Health Service Administrator, *Surrey, England* 2018 - 2019
- Updated Patient records and triaged messages from patients and their families to pass critical information onto clinical teams in a timely manner

YMCA Camp Hi-Rock, *Mt. Washington, MA* 2015
- Worked as a special needs counsellor to support two autistic children, and engage them in camp life
- Worked with children from a variety of socioeconomic backgrounds, including homeless children to teach classes and manage cabin life

TEACHING EXPERIENCE

Teaching Assistant, University of Mississippi, *Oxford, MS* 2021-2022
- Course: Psychology 311: Psychopathology and Integrative approaches
  Supervisor: Alan Gross, Ph.D.
- Course: Psychology 315: Theories of Personality
  Supervisor: Kimberly Sallis, Ph.D.
- Course: Psychology 321: Social Psychology
  Supervisor: Joseph Wellman, Ph.D.

Clinical Educator, McLean Hospital 3East DBT Programs, *Belmont, MA* Jan 2021 – June 2021
Supervisors: Gillian Galen, Psy.D, Judith Mintz, Ph.D.
- Lead DBT module groups for adolescents with borderline personality disorder and related mental health conditions in emotion regulation, mindfulness, distress tolerance and interpersonal effectiveness
- Provided direct patient care to residents in emotional distress through DBT skills coaching
- Work in a multi-disciplinary team to devise a cohesive, effective DBT treatment approach and record clinical notes

Tutor, *Geneva, NY, United States* 2016 - 2018
Tutor Corps, Intervention Specialist
- Tier 2 Intervention Specialist; applied a trauma centered approach to provide education in an inclusive and therapeutic manner for children in failing school districts

Geneva Public Schools, Volunteer Classroom Assistant
- Worked as a teaching assistant in a Headstart classroom to support low-income children and families

TRAINING AND CERTIFICATIONS

- APA Telepsychology Best Practices 10: 4 Successfully completed sections [virtual training] 2021
    - Clinical Evaluation and Care: Cultural Competencies and Documentation
    - Technology: Video, Email, Text Messaging & Apps
    - Legal, Regulatory & Ethical Rules of the Road
    - Getting Paid: Reimbursement Strategies & Marketing Your Professional Services Online
- CITI Training 2020 - 2023
- Mandatory reporter and HIPPA compliant training 2019 - 2023

AFFILIATIONS

British Psychological Society, MBPsS, GBC
Graduate basis for chartered membership is a standard set by BPS to ensure sufficient breadth and depth of psychology has been studied prior to undertaking postgraduate training in psychology

SKILLS

SPSS, REDcap, Patient Record Tools (Including EPIC), CRM Slate, Database Management, Windows and Mac Platforms