

THE ROLE OF EXPERIENTIAL AVOIDANCE IN TRAUMA, SUBSTANCE ABUSE,  
AND OTHER EXPERIENCES

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Experiential avoidance (EA) is a process in which a person attempts to avoid, dismiss, or change experiences such as emotions, behaviors, and thoughts. EA is associated with a number of psychological disorders and is generally harmful to psychological well-being. Various studies have explored the role of EA as a mediator, while others have studied EA as a moderator. The current study aimed to further understand and broaden the knowledge of the role of EA in regard to trauma, substance abuse, aggression, and impulsivity by examining relationships between these variables with EA as a mediator and as a moderator. Experientially avoidant behaviors (i.e., substance abuse, aggression, and impulsivity) were related to higher levels of EA. EA was found to partially mediate the relationship between the number of traumatic experiences and posttraumatic stress disorder (PTSD) symptoms, as well as the relationship between substance abuse and PTSD. EA was also found to moderate the relationship between PTSD symptoms and aggression. Findings from the present study as well as its limitations and future directions for research are discussed.

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## CHAPTER 1

### INTRODUCTION

Most people will at some point in their lives experience a traumatic event. Experiencing trauma is often correlated with substance abuse, aggression, impulsivity, and the development of various psychopathologies such as posttraumatic Stress disorder (PTSD) (Jakupcak & Tull, 2005; Roy, 2005; Widom, Schuck, & White, 2006). Research suggests experiential avoidance (EA) – or efforts to avoid, dismiss, or change experiences such as emotions, behaviors, and thoughts – worsens prognosis (Hayes et al., 2004). While EA is a fairly new term and is intended to be a broad construct, there is a long-standing theoretical and empirical tradition of examining similar terms in relation to traumatic events (e.g., cognitive avoidance, emotional avoidance, and avoidant coping; Hayes, Wilson, Gifford, Folette, & Strosahl, 1996). While the role EA plays following a traumatic event has been well documented, the role of EA in aspects related to trauma such as substance abuse, aggression, and impulsivity are still unclear. Thus, the current paper discusses these topics and outlines a research study which further explored relationships among these constructs and the importance of EA in relation to them.

#### Trauma, Substance Abuse, Aggression, and Impulsivity

Substance abuse, aggression, and impulsivity are frequently exhibited together, and individuals who show these behaviors are likely to have a number of other psychological difficulties (Beseler, Taylor, Kraemer, Leeman, 2012; Koller, Preuß, Bottlender, Wenzel & Soyka, 2002; Moeller, Dougherty, Barratt, Oderinde, Mathias, Harper, and Swann, 2002; Moss, 1989; Murray, Patkar, Mannelli, DeMaria, Desai & Vergare, 2003; Parrott & Giancola, 2006; Roozen, van der Kroft, van Marle, Franken, 2011). The co-occurrence of substance abuse,

aggression, and impulsivity has been found to predict suicidal ideation and behaviors (Brodsky, Oquendo, Ellis, Haas, Malone, & Mann, 2001; Cuomo, Sarchiapone, Giannantonio, Mancini & Roy, 2008; Martinotti, Carli, Tedeschi, Giannantonio, Roy, Janiri, & Sarchiapone, 2009; Renaud, Berlim, McGirr, Tousignant & Turecki, 2008). Therefore, understanding more about these variables as they relate to each other and to potential underlying constructs is important.

Some research has explored relationships among these variables to gain a better understanding of the roles that aggression and impulsivity play in relation to substance abuse (Beseler et al., 2012; Moss, 1989; Murray et al., 2003; Parrott & Giancola, 2006; Roozen et al., 2011). A few studies have found that EA moderates relationships between some of these variables or between these or related variables (e.g., impulsivity, anxiety regulation) and psychological distress. Other studies have demonstrated that EA moderates relationships between such psychological distress and demographic variables (Pickett, Barrdeen, & Orcutt, 2011; Robertson & Hopko, 2009).

One area where these variables have been studied extensively, and in which clinical and empirical support for their co-occurrence is found, is in the context of PTSD and trauma (Casada & Roache, 2005; Cuomo et al., 2008; Martinotti et al., 2009). Substance abuse, aggression, and impulsivity have been conceptualized as externalizing behaviors of PTSD (Casada & Roache, 2005; Miller, 2003; Tyler, 2002). Further, in several studies, EA has been found to mediate the relationship between trauma and PTSD, and EA is thought to lead to the development of PTSD and/or the maintenance of PTSD symptomology (Follette, 2005; Marx & Sloan, 2005; Plumb, Orsillo, & Luterek, 2004; Reddy, Pickett, & Orcutt, 2006). Thus, it appears – at least for some people – that EA plays a role in whether PTSD develops after a person experiences a trauma, and it may be that EA plays a role, more specifically, in how PTSD is overtly expressed as well.

The expression of symptoms may vary greatly, while the function may be quite similar. Pervasive attempts to avoid painful thoughts, feelings, bodily sensations, and the places and situations that occasion them may lead to a host of psychological symptoms and problem behaviors such as anxiety, substance abuse, aggression, and the like (Hayes et al., 1996). This process provides a functional explanation for the existing empirical research on the multiple correlates of trauma. Individuals who utilize one form of EA, such as using drugs may be likely to utilize another form, like exhibiting aggressive behavior. Indeed, there is some empirical support for these behaviors being functionally equivalent with respect to avoidance in a general adolescent sample (Howe-Martin, Murrell, & Guarnaccia, 2012). To date, these relationships have not been studied as functionally related in an adult sample exposed to trauma. Therefore, the present study conceptualized substance abuse, aggression, and impulsivity as functionally-related, externalizing behaviors related to experiencing a trauma and sought to further understand the role of EA in relationships among them.

### Experiential Avoidance

The person who risks nothing, does nothing, has nothing, is nothing, and becomes nothing. He may avoid suffering and sorrow, but he simply cannot learn and feel and change and grow and love and live.

*-Leo F. Buscaglia*

### *Defining Experiential Avoidance*

“Experiential avoidance is the phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them” (Hayes et al., 2004, p. 554). EA has been

recognized and studied in many different therapeutic interventions. For example, from a psychodynamic approach the term repression might be used to refer to the same type of phenomenon (Hayes et al., 1996). Terms like “emotional avoidance,” “cognitive avoidance,” and “avoidant coping” have been used to describe this idea as well; however, the term experiential avoidance encompasses all of these ideas (avoiding both thoughts and feelings) and is considered a broader term (Hayes et al., 1996). Utilizing a limited amount of short-term avoidance can be helpful in a variety of situations. For example, individuals who control their nervousness during a job interview may perform better. On the contrary avoidance can become problematic when these same people spend most of their time managing emotion rather than working on their valued goals (Kashdan, Barrios, Forsyth, & Steger, 2006).

There has been increased interest in the topic of EA over the last several years due to the vast amount of empirical evidence supporting third wave behavioral therapies such as acceptance and commitment therapy (ACT; Hayes et al., 1999) in treating a wide variety of psychological symptoms. ACT utilizes a functional contextual approach, meaning that the principles of behavior analysis are applied to relevant individuals’ direct and indirect learning history in order to predict and influence behavior. There is recognition that all behaviors are initiated and maintained for one or more purposes in various contexts, and these transactional relationships are always changing. Therefore, these therapeutic approaches emphasize mindful acceptance of emotions, thoughts, physical sensations, and so on, without judgment. ACT specifically targets acceptance and psychological flexibility, and from this perspective, the opposite of acceptance is EA. While the idea of acceptance is sometimes confused with resignation or dwelling on an emotion or experience, this understanding is inaccurate. Acceptance is an active process and includes a willingness to have emotions, thoughts, physical sensations, and such, even those that

are negative and uncomfortable. A main component to ACT is the idea that excessive EA is what ultimately exacerbates or creates suffering; therefore, ACT encourages acceptance and normalizes the human experience of emotion.

### *The Importance of EA*

EA can be conceptualized as how someone relates to distress rather than the level of distress itself. In this way, if EA is decreased, a person could have improved functioning even without a decrease in negative emotions (Hayes et al., 1999). For example, a person may be depressed and attempt to avoid the feelings of depression by spending a large amount of time sleeping and isolating themselves. By acknowledging and accepting their feelings of depression and working toward valued goals, the feelings of depression may decrease; and, the person's behaviors may change in terms of less sleeping and isolation, hopefully leading to a more meaningful life for them (spending time with friends, family, fulfillment through work, etc.). Further, symptoms sometimes decrease after behavioral changes (Barraca, 2011) however; the aim is not necessarily symptom reduction. The aim is living a more meaningful life by targeting avoidance that is interfering with valued goals. Through targeting EA, ACT has been effective in treating many issues including depression and anxiety (Dougher, 1994; Folke & Parling, 2004; Forman, Herbert, Moitra, Yeomans, & Gellar, 2007; Hayes, Boyd, & Sewell, 2011).

EA is correlated with many psychological disorders (Hayes et al., 2004). From some philosophical perspectives, psychological disorders are constructs that may exist separately from each other and from the variety of associated symptoms that characterize them as distinct clusters of pathology. Thus, a resultant symptom might be viewed as separate from the development of the disorder. From a functional contextual perspective, many symptoms within current

*Diagnostic Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000) diagnoses can be viewed as manifestations of avoidant behavior (Gamez, Chmielewski, Kotov, Ruggero, Watson, 2011). For example, avoiding people, places, or thoughts that remind someone of a traumatic event is viewed as a symptom of PTSD; but, these behaviors can also be viewed as a contributing factor to the development of the disorder. Hayes and Gifford (1997) explain that EA is harmful to a person's psychological well-being in the following ways. First, by attempting to avoid painful experiences, people cause these experiences to increase. By avoiding thinking or feeling something, persons often end up thinking or experiencing it more (Wegner, 1989). A second way EA can be harmful is in the consequences of avoidant behaviors. For example, if one uses drugs to avoid painful emotions, this may block out emotion at the time, but the long term effects of this behavior can be addiction, lost relationships, various health complications, or other related problems. Third, a person may associate unhealthy avoidant behavior with painful emotions (i.e., classical conditioning). This can be useful in understanding the co-morbidity between addiction and other psychological disorders. For example, a person may use alcohol to avoid anxiety. In the future, even if they have stopped using alcohol, they may feel the urge to drink alcohol anytime they feel anxious. Finally, a person can put themselves in danger by avoiding painful memories and not using the experience to guide them in the future. For example, if a person is in an abusive relationship and avoids the pain associated with thinking about the last time their partner was abusive, they may continue to stay in that relationship and risk future abuse.

As mentioned previously, EA is related to many psychological disorders and symptoms associated with disorders. This study aimed to further understand the role of EA in symptoms

and behaviors often associated with traumatic experience, specifically PTSD, substance abuse, aggression, and impulsivity.

### *EA and Trauma*

There is a great deal of pain in life and perhaps the only pain that can be avoided is the pain that comes from trying to avoid pain.

- R. D. Laing

EA following a trauma can contribute to, or exacerbate, psychological distress (Marx & Sloan, 2005). Tull and colleagues (2004) used two different measures of EA and discovered that certain components of EA differently related to psychopathology following trauma. More specifically, thought suppression predicted PTSD symptoms above the contributions of the number of traumatic events and more general psychological distress, but avoidance of a more emotional nature (and not thought suppression) predicted depression, anxiety and somatic symptoms, even when PTSD symptoms were statistically controlled.

The relationship between trauma and EA has been demonstrated in many different contexts. For example, in a college population, undergraduate students with a history of trauma who used EA as a coping strategy had higher levels of psychological distress, as indicated by symptoms of PTSD and depression (Plumb et al., 2004). Similarly, another study in the college population found EA mediated the relationship between childhood emotional abuse and current psychological health (Reddy et al., 2006). Researchers speculate it is not only the childhood abuse experiences that lead to psychological distress, but the attempt to avoid thinking about the experiences later. A survey of college females found EA mediated the relationship between childhood sexual abuse and current psychological distress (Marx & Sloan, 2002). Rosenthal, Hall, Palm, Batten, and Follette (2005) replicated these findings in their study of college women,



where they too found EA mediated the relationship between childhood sexual abuse and psychological distress. Additional studies have explored how EA and childhood sexual abuse affect sexual functioning. For example, Batten, Follette, and Aban (2001) found college women with histories of childhood sexual abuse reported higher levels of EA and high-risk sexual behavior than women without histories of childhood sexual abuse. Additionally, Leonard, Iverson, and Follette (2008) found higher levels of EA were related to lower levels of sexual satisfaction in women who had histories of childhood sexual abuse.

While these studies are restricted to the college population, their results have been found to generalize to outside populations as well. A study with civilian Kosovo war survivors indicated persons high in EA had more severe psychological distress related to war trauma (Morina, 2007). Boesch, Koss, Figueredo, and Coan (2001) studied EA in female victims of rape and determined EA was related to higher levels of self-blame. Furthermore, women who used EA as a coping technique did not try to integrate the trauma experience as part of their lives. These findings were replicated in samples involving lesbian and gay participants who were victims of sexual assault and EA mediated the relationship between internalized homophobia and psychological distress, i.e. depression and PTSD (Gold, Dickstein, Marx, & Lexington, 2009; Gold, Marx, & Lexington, 2007). In a study of inner city substance abusers, persons who reported any type of childhood abuse (sexual, physical, and emotional) had higher levels of experiential avoidance than persons who reported no history of childhood abuse (Gratz, Bornovalova, Delany-Brumsey, Nick, Lejuez, & 2007). EA clearly plays an important role in trauma and PTSD, and this makes EA an important phenomenon to study given the prevalence of traumatic experiences.

## Trauma Prevalence

The prevalence rates for exposure to traumatic events in the general population vary depending upon study parameters; however, most studies reveal more than half of the population will experience a traumatic event during their lifetime. A large ( $N = 8098$ ) national study of the general population revealed 51% of women and 60% of men have experienced at least one traumatic event during their live (Kessler, Sonnega, Bromet, & Hughes, 1995). Resnick, Kilpatrick, Dansky, Saunders, and Best (1993) discovered 69% of women in the general population have experienced a traumatic event during their lifetime. Vrana and Lauterbach (1994) determined 84% of college students have experienced a traumatic event and 33% have experienced four or more traumatic events. Similarly, Bernat, Ronfeldt, Calhoun, and Arias (1998) found 67% of college students have experienced a traumatic event. Clearly, the prevalence of traumatic events is considerable.

## The Impact of Trauma

Many clinicians could testify about the large impact a traumatic event has had on at least one of their clients and the impact of traumatic events on psychological well-being has been studied extensively. In a community sample, Zlotnick et al. (2008) found persons who had experienced a traumatic event, at any age, had higher rates of psychopathology as well as higher probabilities of having an alcohol or drug use disorder, when compared with persons who never experienced a traumatic event. Furthermore, experiencing a traumatic event can lead to a person later meet criteria for a diagnosis of PTSD. According to the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000), in order to be diagnosed with PTSD, a person must have been exposed to a traumatic

event and meet two criteria and symptoms from each of the three symptom clusters: intrusive recollections (e.g., dreams, flashbacks), avoidant/numbing symptoms (e.g., efforts to avoid thoughts, people, or places associated with the trauma, feelings of detachment from others, restricted range of affect), and hyper-arousal symptoms (e.g., hyper-vigilance, irritability or angry outbursts). The *DSM-IV-TR* (2000) also states that these symptoms must last longer than one month and significantly affect functioning in important areas of one's life such as work, school, relationships and the like.

Studies show that the number of traumatic events a person experienced is directly related to a greater likelihood of the development of PTSD (El Sarraj, Punamaki, Garieballa et al., 2006; Johnson & Thompson, 2008; Kolassa et al., 2010; Owens & Chard, 2006; Mollica et al., 1998; Mollica, McInnes, Poole, & Tor, 1998). This finding has been replicated in multiple samples including, college students, refugees, and forensic populations (Garieballa et al., 2006; Kolassa et al., 2010; Owens & Chard, 2006). Furthermore, higher cumulative exposure to traumatic events is associated with a lower probability of remission of PTSD symptoms (Kolassa et al., 2010). Exposures to traumatic events and EA are also related to substance abuse.

#### Experiential Avoidance and Substance Abuse

Man seeks to escape himself in myth, and does so by any means at his disposal. Drugs, alcohol, or lies. Unable to withdraw into himself, he disguises himself. Lies and inaccuracy give him a few moments of comfort.

*-Jean Cocteau*

As the quote above alludes, people often use substances to avoid or block out emotions. The content of what is avoided depends on the person and could be any emotion from boredom to severe anxiety (Hayes et al., 1996).

Studies in community samples indicate that an avoidant coping style is related to higher levels of alcohol use (Cooper, Russell, Skinner, Frone, & Mudar, 1992; Feil & Hasking, 2008). For example, Ostafin and Marlatt (2008) studied the role of mindful acceptance, which could be conceptualized as the opposite of EA, in a college population. They were interested in the role mindfulness plays in automatic alcohol processes and hazardous drinking behavior. They discovered that mindful acceptance of current experiences, such as thoughts and feelings moderated the relationship between automatic alcohol processes and hazardous drinking behavior in that it weakened this relationship. In other words, acceptance, rather than avoidance could weaken the relationship between automatic responses where one acts without much thought and dangerous drinking behaviors. This could indicate that EA strengthens the relationship between automatic responding and hazardous drinking behaviors.

Stewart, Zvolensky, and Eifert (2002) studied undergraduate college students' motivations for drinking alcohol and the relationship to EA. Students who had higher levels of EA were more likely to endorse coping as their motivation for drinking. In other words, they were likely drinking alcohol to avoid emotions such as anxiety or depression. Similarly, Edwards, Dunham, Ries, and Barnett (2006) studied a college population and found a higher frequency of intrusive thoughts predicted a larger amount of alcohol use. One could argue that this could be evidence for EA at work, in that persons attempt to avoid their intrusive thoughts by using substances. These findings apply to substances other than alcohol as well.

Avants, Warburton, and Margolin (2000) found men and women who were in treatment for opioid dependence had significantly higher levels of avoidant coping when compared to general population. Fifty percent of the sample had depressive symptoms, with 25% of the sample meeting criteria for major depression. During 12 weeks of treatment, they found the

patients' levels of avoidant coping and depressive symptoms decreased significantly more in patients who achieved abstinence from heroin and cocaine.

Kingston, Clarke, and Remington (2010) conducted a study involving a clinical sample of persons with diagnoses of personality disorder to further understand the relationship between various problem behaviors and EA. EA predicted excessive alcohol use, drug use, nicotine abuse, deliberate self-harm, sexual promiscuity, binge eating, excessive internet computer game use, and aggression.

### *Prevalence of Substance Abuse*

According to the National Survey on Drug Use and Health (2008), 8.9% (22.2 million) of the population aged 12 and older met the criteria for substance abuse or dependence during the last year. Of the 22.2 million, 15.2 million were dependent on or abused alcohol alone, 3.9 million were dependent on, or abused, illicit drugs alone, and 3.1 million were classified with dependence on as abusers of both alcohol and illicit drugs. The national prevalence of heavy intermittent drinking among college students has remained steady for the past decade, with approximately two in every five students engaging in this drinking behavior (O'Malley & Johnston, 2002).

### *Substance Abuse and Trauma*

Trauma and substance abuse have been found to be related in many studies. While several studies examining trauma and substance abuse look at trauma in general, others look at specific types of trauma (e.g., childhood sexual abuse, combat related trauma).

Many researchers have studied the relationship between childhood trauma and substance abuse and found a direct relationship between these variables. Adults with a history of childhood abuse and no other significant substance use or psychopathology, are 4 times more likely to be smokers than those without a history of childhood abuse (Spratt et al., 2009). A longitudinal study by Spatz-Widom, Marmorstein and Raskin White (2006) found that abused and neglected children, when questioned as adults, were more likely to report using illicit drugs in the past year when compared with adults without a history of child abuse. At the age of 40, these adults with a history of child abuse and neglect were also more likely to report use of a larger number of illicit drugs, and have more problems related to substance abuse. Similarly, Enoch et al. (2010) found that men with either single diagnoses or multiple diagnoses of heroin, alcohol, and cocaine dependence had experienced significantly more childhood trauma than men without substance dependence disorders. They also discovered men who had multiple substance dependent disorders (polysubstance dependence) had higher levels of childhood trauma than those with single substance dependence. Min, Farkas, Minnes, and Singer (2007) found a history of childhood trauma was related to substance abuse and psychological distress in women. A survey of 1099 US women, in 1981(women over 30) and 1991(women ages 21-30) found that childhood sexual abuse was related to higher rates of substance abuse as an adult. The survey also discovered that more than one-third of those women who reported childhood sexual abuse reported using at least one illegal drug five or more times during their lifetime (Wilsnack, Vogeltanz, Klassen, & Harris, 1997).

Studies show trauma occurring in childhood can lead to substance abuse in the future. Although, experiencing trauma as an adult can co-occur with substance abuse as well. This can

occur in one of two ways: substance abuse prior to a traumatic experience and substance abuse following a traumatic experience.

#### Substance Abuse Prior to a Trauma

Not only does experiencing trauma make one more susceptible to substance abuse and dependence, but abusing substances may lead one to experience a trauma. For example, a person may put him/herself in a dangerous situation in order to obtain a substance and inadvertently witness or become involved in a traumatic event. Likewise, a person could experience a traumatic motor vehicle accident from driving while under the influence of a substance. Many researchers have found a strong relationship between sexual assault and substance use as well (Abbey, Clinton-Sherrod, McAuslan, Zawacki, & Buck, 2003; Greene & Navarro, 1998; Koss & Dinero, 1989; Rich, Combs-Lane, Resnick & Kilpatrick, 2004; Ullman, 2003). Cottler, Compton, Mager, Spitznagel, and Janca (1992) found when questioning persons in the general population with trauma history and substance use, that their onset of substance use occurred prior to their symptoms of PTSD.

#### Substance Abuse Following a Trauma

At other times, experiencing a trauma can lead a person to abuse substances. One theory proposes the “self-medication” hypothesis in which substance abusers use drugs in order to block out painful emotions. Further, substance abusers may choose their preferred substance based on the substance which best serves the avoidant function (Khantzian, 1985; 2003). In other words, when a person experiences a traumatic event and is bothered by intrusive thoughts or memories about that event, he/she might turn to substances as a way to attempt to block any thoughts about

the event. As previously discussed, this behavior is an example of EA. In the college population, alcohol appears to be a commonly abused substance following a traumatic experience (Edwards et al., 2006).

### *Gender Differences*

Some researchers have argued that the relationship between trauma and substance disorders differs depending on gender. For example, some studies have found a stronger relationship between childhood abuse and drug and alcohol abuse in women than in men (Widom, Ireland, and Glynn, 1995; Becker and Grilo, 2006). Breslau, Davis, and Schultz (2003) found men were at a higher risk than women for alcohol and other drug abuse and dependence in general, however when they looked at men and women who had been exposed to trauma, they found women were more likely to develop alcohol dependence.

Danielson et al. (2009) found different results in their investigation of how gender might affect the relationship between trauma and substance abuse. They discovered past exposure to trauma increased the likelihood of developing a drug or alcohol disorder in both men and women. The only difference they found was that women with a history of sexual assault were more likely to develop a drug or alcohol disorder than men with a history of sexual assault. They were unclear, however, if these results were due to more women reporting the occurrence of a sexual assault than men in their study. If there is a gender difference in the relationship between sexual assault history and substance disorders, it may be that previous studies found gender differences due to the fact that the trauma women experienced was mostly sexual assault while men experienced other forms of trauma such as combat experiences. As such, the impact of the trauma may present itself differently in different genders. Other researchers have proposed that



observed differences may be due to women being more willing to report traumatic experiences and PTSD symptoms than men (Cottler et al., 1992).

### *Substance Abuse and Aggression*

Several studies have explored the relationship between substance abuse and aggression. This relationship exists for two main reasons: one, certain drugs increase the propensity for violence and two, people resort to violence in order to obtain substances (Hoaken & Stewart, 2003). A study of male prisoners, compared prisoners with substance abuse histories to those without substance abuse histories and found those with substance abuse histories had more violent behavior during their incarceration, even when they were in prison for nonviolent crimes (Cuomo et al., 2008).

Studies also demonstrate a relationship between sexually aggressive behavior and substance abuse. More specifically, heavy alcohol use has been found to predict sexually aggressive behavior in college men. In a survey to determine prevalence of sexual assault on college campuses, 74% of the men who indicated they had committed rape, were using alcohol or drugs at the time of the rape (Koss & Dinero, 1988). Furthermore, college males who indicate they are sexually coercive, report higher levels of drinking (Carr & Van Deusen, 2004).

The relationship between substance use and aggression has been studied extensively in youth as well. Leff et al. (2003) followed a group of male and female adolescents for two years to understand more about factors leading to the initiation of cigarette use. They found that youth who began smoking during the two-year period had significantly higher levels of aggression at the beginning of the study than those who did not start smoking. Similarly, Kirisci et al. (2009)

found a measure (Drug Use Screening Inventory; DUSI-R) used to predict violence in adolescent males, was also useful for predicting substance use disorders.

Several studies involving substance abuse and aggression have explored how substance abuse affects violence in relationships (intimate partner violence). In a study of male batterers, 53% reported using marijuana within the last year, 23% reported they used marijuana more than three times a week, 23.8% of batterers used cocaine in the past year, 10% of batters used cocaine more than once a month and batterers endorsed using the following: hallucinogens (14.6%), stimulants (6.6%), sedatives/anxiolytics (11.3%), opiates (7.9%) and other substances (9.3%; Moore and Stuart, 2004). Similarly, research has found male batterers are four times more likely to smoke cigarettes than the general population and female batterers who engage in hazardous drinking behavior have higher levels violence perpetration (Stuart, Moore, Kahler, Ramsey, & Strong, 2004; Stuart, Moore, Ramsey, & Kahler, 2003). Clearly there is an important link between substance abuse and aggression. EA plays a role in aggression as well.

### Experiential Avoidance and Aggression

When we are angry, our anger is our very self. To suppress or chase away our anger is to suppress or chase away ourselves.  
When anger is born, we can be aware that anger is an energy in us, and we can change that energy into another kind of energy. If we want to transform it, first we have to know how to accept it.  
– *Thich Nhat Hanh*

Including the previously mentioned study by Kingston et al., 2010, little research has been conducted involving the relationship between EA and aggression. A study of aggressive behavior in college males exposed to interpersonal violence, found EA and emotional inexpressivity were related to higher levels of aggression (Tull, Jakupcak, Paulson, Gratz, &

2007). This suggests that if a person attempts to avoid aggressive or angry emotions, these emotions may become worse, resulting in greater aggression.

Gardner and Moore (2008) propose an Anger Avoidance Model that suggests an aversive history as a child may be related to a reduced ability to properly regulate emotion, leading to attempts to avoid anger, leading to angry thoughts and/or aggressive behaviors.

A study of 515 college men and women found those who had high levels of community victimization, high levels of avoidance and low perceived social support had higher scores on a measure of aggression (Scarpa & Haden, 2006). Interestingly, another study did not find a relationship between aggression symptoms and EA (Kashdan, Breen, Afram, & Terhar, 2010).

### *Aggression and Trauma*

Several studies have examined whether experiencing trauma is related to aggression and anger. In a study of a nonclinical, nonmilitary sample of college men, Jakupcak and Tull (2005) found a relationship between anger and PTSD symptoms. In addition, they found men who reported symptoms of PTSD following a trauma, had higher levels of anger than men who did not meet criteria for PTSD, a finding echoed by McFall, Fontana, Raskind, and Rosenheck (1999). McFall and colleagues' (1999) study involved a group of male veterans in inpatient treatment for PTSD, a group of male veterans in outpatient treatment for PTSD and a group of inpatient males in treatment for psychiatric disorders other than PTSD. They found the group with more severe PTSD (the inpatient PTSD group) had been involved in more violent acts (e.g., property destruction, threats with a weapon, threats without a weapon, physical fighting) than the other two groups.

Research in the area of trauma and aggression has also focused on the relationship between childhood trauma and aggression and indicates experiencing trauma during childhood may influence one to be aggressive as a child and/or later in life. Flemke (2009) conducted a qualitative study in which she interviewed 37 incarcerated women and found their traumatic experiences as children led them to feel angry and violent in dating relationships and other areas of their lives. Other studies have examined the effect of recent trauma on youth rather than conducting retrospective studies with adults.

A study involving 166 adolescents exposed to hurricane Katrina, indicated exposure to the hurricane was related to higher levels of aggression. Furthermore, exposure to the hurricane, along with PTSD symptoms, was even more closely related to aggression (Marsee, 2008). Cohen, Hien, and Batchelder (2008) studied the effect of childhood trauma on parenting. The study involved 176 mothers who experienced trauma as children. Results indicated a strong relationship between exposure to interpersonal trauma and parenting troubles. The amount of childhood trauma a mother experienced was significantly related to her endorsement higher abuse potential and aggression.

### *Aggression and Child Abuse*

Research in the area of child abuse and aggression focuses on understanding how experiencing violence as a child affects relationships as an adult. Research indicates individuals abused as children are more likely to be aggressive toward their spouses and experience dissatisfaction with their marriages (DiLillo et al., 2009; Sullivan, Meese, Swan, Mazure, & Snow, 2005; White and Widom, 2003). For example, Murrell, Christoff, and Henning (2007) compared male batterers who had been abused as children, who witnessed abuse as children, and

who had not witnessed abuse or experienced abuse as children. Their study found batterers who were abused as children were more likely to abuse children themselves than those who were not abused. Furthermore, the more exposure to violence batterers had as children, the more likely they were to commit violence toward persons other than their partner. Another study of male batterers found that men who witnessed threat or use of a weapon were more likely to have threatened to use or actually use a weapon against an intimate partner (Murrell, Merwin, Christoff, and Henning, 2005). Adolescent males who experienced abuse from their fathers are more likely to engage in violent behaviors themselves. The “cycle of violence” relates to the idea that children learn and model the aggressive behaviors of their parents. While this idea may account for the link between child abuse and aggression, it does not account for the relationship between other traumas and aggression (Truscott, 1992).

### *Anger and Trauma*

Anger is often a precursor to aggression so it is an important factor to consider when studying the relationship between trauma and aggression. Several studies have focused on further understanding this relationship and found that anger is a common emotional response during and following a traumatic event. Amstadter and Vernon (2008) found that while anger is a common reaction in all types of trauma, it presents differently in relation to traumas involving physical or sexual assaults. When questioning participants to report the emotions they felt when the trauma occurred and then after the trauma occurred, the participants’ level of anger stayed the same for all traumatic events except physical or sexual assault, in which levels of anger increased over time.

Most studies involving anger and trauma focus on PTSD and anger. An online survey to a community sample of 1200 participants found 648 had experienced violent trauma. Of those who had experienced violent trauma, higher levels of anger were correlated to more severe PTSD symptoms as well as poorer health and greater emotional distress (Connor, Davidson, and Lee, 2003).

Similarly, a study involving 228 youth, ages 6 to 18 with a known or suspected history of trauma, found 67% of the participants did not meet criteria for PTSD, but those that did, had higher levels of anger than those who did not. This study suggests that experiencing trauma may not necessarily lead to anger unless accompanied by symptoms of PTSD (Saigh, Yasik, Oberfield, & Halamandaris, 2007). Although anger is not always a symptom of PTSD, which leads one to wonder if perhaps there is another variable at work, such as EA that could better account for this finding.

Other studies have had similar results when exploring PTSD and anger in adults. Studies of Vietnam combat veterans find higher levels of anger in those who meet criteria for PTSD than those who do not (Chemtob, Hamada, Roitblat, & Muraoka, M., 1994; Novaco & Chemtob, 2002). Anger is an emotion that all of us experience; acting out on that emotion may have something to do with a lack of behavioral inhibition, or impulsivity.

### Experiential Avoidance and Impulsivity

Act on your impulse, swallow the bottle, cut a little deeper, put the gun to your chest.”

*-Ellen Hopkins*

There has been little research examining the relationship between EA and impulsivity. Few, if any, have studied the direct relationship between these variables. While studies have

failed to explore this relationship, a few studies have found each of these variables is related to compulsive gambling behavior. Compulsive gambling behavior could be conceptualized as a behavioral function of EA, if a person was gambling to avoid or attempt to diminish difficult emotions.

Nower, Deverensky, and Gupta (2004) studied the relationship of impulsivity, sensation seeking, coping, and substance use to problem gambling in a sample of 1,339 male and female college students. They discovered that all problem gamblers had higher levels of impulsivity than non-problem gamblers. They also found that avoidant coping was related to pathological gambling in males however they did not find this relationship in females.

### *Impulsivity and Trauma*

Few studies have examined the relationship between trauma and impulsivity; however, Roy (2005) found a small relationship between childhood trauma and impulsivity in adults, indicating that childhood trauma may be a contributing factor to impulsivity as an adult. Pickett, Bardeen, and Orcutt (2011) looked at the relationships between behavioral inhibition (BIS) and behavioral activation (BAS) system sensitivities and post-traumatic stress in college women who had experienced one or more traumas. The main effects of this study will be addressed later in this document. For the purpose of impulsivity research review, one finding is noted here: Women who scored highly on a BAS subscale (fun-seeking) and who also scored highly on a measure of EA tended to also score highly on the PTSD measure. This would indicate that impulsivity might function as avoidance; and, in any case, these scores were related to higher level of trauma related distress. Pathological gamblers with higher scores on a measure of PTSD have been shown to have higher levels of impulsivity (Ledgerwood & Petry, 2006). There is in fact some

evidence that during times of emotional distress people tend to focus on short-term outcomes in an impulsive way and do whatever they can to feel better in the moment (Tice, Bratslavsky, & Baumeister, 2001). This maladaptive form of emotion regulation sounds similar to EA, because its purpose is avoidance of negative experiences that are occurring in the moment. It may be that these processes could explain aggressive behavior as well as substance abuse.

### *Impulsivity and Substance Abuse*

The relationship between substance abuse and impulsivity has been well studied. Zernicke, Cantrell, Finn, and Lucas (2010) found the age a person had their first drink was related to higher levels of impulsivity. In other words, the younger they were at the time they had their first drink, the higher their level of impulsivity. The researchers described this as likely being a reciprocal relationship; a person who is impulsive may choose to drink at a younger age and drinking while they are developing may lead to more impulsivity. Damage to the cortex, from alcohol abuse, may lead to increased impulsivity which could increase the severity of an alcohol use disorder (Crews & Boettiger, 2009). Other studies have supported this relationship between alcohol and impulsivity. For example, Carlson, Johnson, and Jacobs (2010) discovered college students with higher frequency of binge drinking behavior also had higher levels of impulsivity.

Studies also support a relationship between impulsivity and abuse of substances other than alcohol. A study of college students revealed that students who smoked cigarettes had higher levels of impulsivity and smokers with higher levels of impulsivity were more likely to be dependent on nicotine (Spillane, Smith & Kahler, 2010). Male prisoners with substance abuse histories demonstrate higher levels of impulsivity than those without a history of substance abuse



(Cuomo et al., 2008). A study comparing persons with diagnoses of bipolar disorder to persons without bipolar disorder, determined a diagnosis of bipolar disorder was related to higher levels of impulsivity, and that levels of impulsivity were even higher for those with both bipolar disorder and substance abuse (Swann et al., 2004).

#### EA as a Mediator in the Literature

Several studies have found EA to be a mediator between relevant variables. For example, EA mediates the relationship between child abuse and psychological distress in adulthood (Reddy et al., 2006), between sexual victimization and psychological distress (Merwin, Rosenthal & Coffey, 2009), and between childhood traumas and problem behaviors (Kingston et al., 2010). Most persons who experience a traumatic event do not develop PTSD and several studies have specifically found EA mediates the relationship between trauma experience and PTSD (Marx & Sloan, 2002, 2005; Plumb et al., 2004). Further, EA mediates the relationship between more loosely associated and yet correlated variables: perfectionism and worry (Santanello & Gardner, 2007), life hassles and delusional symptoms (Goldstone, Farhall & Ong, 2011), and coping and psychopathology in chronic pain patients (Costa & Pinto-Gouveia, 2011). Clearly, EA plays an important role and may explain a significant amount of maladaptive behavior. Given these findings, it was proposed that EA would act as a mediator of the relationship between trauma and PTSD symptoms in this study.

#### EA as a Moderator in the Literature

Several studies have also found EA to moderate relationships between variables included in this study (and related variables). For example, EA moderates the relationship between

posttraumatic distress and posttraumatic growth, such that persons with greater posttraumatic distress and low reliance on EA report the greatest growth. Further, EA has been found to affect the relationship between posttraumatic distress and meaning in life, such that persons with greater posttraumatic distress and low reliance on EA report greater meaning in life (Kashdan & Kane, 2010). EA also affects the relationship between thoughts about drinking and risky drinking behaviors (Ostafin & Marlatt, 2008), and varying levels of EA are related to motivations for drinking in college students (Stewart, Zvolenky, & Eifert, 2002). Very little is known about aggression or anger in relation to EA, and previous studies looking at moderation effects have been mixed. As previously mentioned, Pickett et al. (2011) looked at the relationships between BIS and BAS sensitivities and post-traumatic stress in college women. They found that, in general, higher BIS scores were related to more PTSD symptoms. There was also a significant moderation effect for the BIS. Participants who scored highly on the measure of EA and on the measure of BIS had the highest distress. Several studies seem to show interactional effects of age and EA. In older adult populations, EA has been found to moderate the relationship between physical health symptoms and depression and anxiety symptoms, such that higher EA strengthens the relationship of physical health concerns with depression and anxiety (Andrew & Dulin, 2007). Further, Robertson and Hopko (2009) found that college aged students who were low in EA used more positive emotion words than senior citizens when describing themselves. This was not the case for college students at other levels of EA. Given these findings (this will be elaborated below), it was proposed that EA would act as a moderator in analyses concerning substance abuse, aggression, and impulsivity.

## Summary and Hypotheses

Many studies have examined the variables of trauma, substance abuse, aggression, impulsivity, and EA; however, due to lack of research, the relationships between and among some of these variables are still not well understood. The current study attempted to further understand these variables, their relationships to one another and the role EA plays in mediating or moderating these relationships. Several hypotheses were formulated based on and extending from previous research:

Hypothesis 1: Experientially avoidant behaviors (i.e., substance abuse, aggression, and impulsivity), as measured by the Alcohol Use Disorders Identification Test (AUDIT), Drug Use Disorders Identification Test (DUDIT), the Aggression Questionnaire (AGQ), and the Barratt Impulsivity Scale (BIS-11) were expected to be positively correlated with EA, as measured by the Acceptance and Action Questionnaire (AAQ-II).

Hypothesis 2:

- a. The number of traumas a person had experienced, as measured by the Life Events Checklist (LEC), was expected to be positively correlated with PTSD symptoms (as measured by the PCL).
- b. EA was expected to be positively correlated with PTSD symptoms.
- c. Furthermore, it was hypothesized that EA would mediate the positive relationship between number of traumas and PTSD symptoms, such that the relationship between number of traumas experienced and PTSD symptoms would depend on EA.

Hypothesis 3:

- a. PTSD symptoms were expected to be a significant predictor of substance abuse; participants who evidenced higher PCL scores would have a positive substance abuse status.
- b. EA was expected to be a significant predictor of substance abuse as well-in the same direction, such that individuals with higher EA would be more likely to have a positive substance abuse status.
- c. Furthermore, EA was expected to moderate the relationship between PTSD symptoms and substance abuse. The relationship between PTSD symptoms and substance abuse was expected to be stronger for participants high in EA than for participants low in EA.

Hypothesis 4:

- a. PTSD symptoms were expected to be a significant predictor of aggression; participants who evidenced higher PCL scores would also have higher AGQ scores.
- b. EA was expected to be a significant predictor of aggression as well – in the same direction, such that individuals with higher EA would be more aggressive. In addition, EA was expected to be positively correlated with PTSD symptoms.
- c. Furthermore, EA was expected to moderate the relationship between PTSD symptoms and levels of aggression. The relationship between PTSD symptoms and aggression was expected to be stronger for participants high in EA than for participants low in EA.

Hypothesis 5:

- a. PTSD symptoms were expected to be a significant predictor of impulsivity, such that people who scored highly on the PCL would also score highly on the BIS-11.
- b. EA was also expected to be a significant predictor of impulsivity in the same direction, such that high AAQ-II scores would correspond with high BIS-11 scores. Further, EA was expected to be positively correlated with PTSD symptoms.
- c. Furthermore, EA was expected to moderate the relationship between PTSD symptoms and impulsivity. The relationship between PTSD symptoms and impulsivity was expected to be stronger for participants high in EA than for participants low in EA.

Hypothesis 6:

- a. Impulsivity was expected to be a significant predictor of substance abuse; participants who evidenced higher BIS-11 scores would have a positive substance abuse status.
- b. EA was expected to be a significant predictor of substance abuse as well-in the same direction, such that individuals with higher EA would be more likely to have a positive substance abuse status.
- c. Furthermore, EA was expected to moderate the relationship between impulsivity and substance abuse. The relationship between impulsivity and substance abuse was expected to be stronger for participants high in EA than for participants low in EA.

Hypothesis 7:

- a. Impulsivity was expected to be a significant predictor of aggression; participants who evidenced higher BIS-11 scores would also have higher AGQ scores.
- b. EA was expected to be a significant predictor of aggression as well-in the same direction, such that individuals with higher EA would be more aggressive. In addition, EA was expected to be positively correlated with impulsivity.

- c. Furthermore, EA was expected to moderate the relationship between impulsivity and aggression. The relationship between impulsivity and aggression was expected to be stronger for participants high in EA than for participants low in EA.

Hypothesis 8:

- a. Substance abuse status was expected to be a significant predictor of aggression; participants who evidenced substance abuse would also have higher AGQ scores.
- b. EA was expected to be a significant predictor of aggression as well – in the same direction, such that individuals with higher EA would be more aggressive. In addition, EA was expected to be positively correlated with substance abuse status.
- c. Furthermore, EA was expected to moderate the relationship between substance abuse and levels of aggression. The relationship between substance abuse and aggression was expected to be stronger for participants high in EA than for participants low in EA.

## CHAPTER 2

### METHOD

#### Participants

Data was collected from 368 students at the University of North Texas (UNT). Participants were recruited from the UNT Department of Psychology Research Participation Pool (the SONA system). Through this system, participants volunteered for the study and were awarded 3 credit points for their participation (1 point for every half hour of participation). All participants in the study were required to be at least 18 years old. This was the only exclusionary factor in participation. Two participants' data were removed due to incomplete surveys. After incomplete responses were removed, data was examined for univariate and multivariate outliers. First, data was inspected for participants who were outliers on multiple measures. Computation of Mahalanobis distance values revealed three multivariate outliers. Examination of the data did not indicate a clear pattern of why these individuals were outliers, however, due to their nature of being outliers on more than two variables, these cases were removed from the data set. Next, univariate outliers were removed utilizing the outlier labeling rule (Hoaglin, Iglewicz & Tukey, 1986). This method involved multiplying the interquartile range by 2.2 (Hoaglin & Iglewicz, 1987). Three univariate outliers were detected utilizing this method, bringing the final sample for the study to 360 participants.

Participants ranged in age from 18-46 years old ( $M = 20.7$ ,  $SD = 3.2$ ); 61.1% (220) were female and 38.9% (140) were male. In terms of ethnicity, 53.6% (193) of participants identified as White/Caucasian/European American, 18.6% (67) of participants identified as Hispanic American/Latino, 12.8% (46) of participants identified as Black/African American, 9.4% (34) of participants identified as Asian American/Pacific Islander, 3.6% (13) of participants identified

as multiracial, 1.7% (6) of participants identified themselves as of “other” ethnicity, and 0.3% (1) of participants were of Middle Eastern decent. In terms of educational classification, the sample was fairly equally divided across class. The sample contained 97 freshmen (26.9%), 75 sophomores (20.8%), 99 juniors (27.5%), 86 seniors (23.9%), and 3 graduate students (.8%). In terms of marital status, 87.5% (315) of participants identified themselves as single/never married, 8.1% (29) as cohabitating, 3.3% (12) as married, 1.1% (4) as divorced/separated.

### Materials

The participants in the study were administered a demographics questionnaire, the Acceptance and Action Questionnaire (AAQ-II), the Alcohol Use Disorders Identification Test (AUDIT), the Drug Use Disorders Identification Test (DUDIT), the Life Events Checklist (LEC), the PTSD Checklist (PCL), the Aggression Questionnaire (AGQ), the Barratt Impulsiveness Scale (BIS-11), and the Multidimensional Experiential Avoidance Questionnaire (MEAQ).

#### *Acceptance and Action Questionnaire*

The Acceptance and Action Questionnaire (AAQ-II; Bond, Hayes, Baer, Carpenter, Guenole, Orcutt, Waltz, & Zettle, 2011) was administered to assess EA. The AAQ has been revised a number of times. The version used for this study, the 7-item AAQ-II, was developed due to issues with the original AAQ (Hayes, Leoma, Bond, Masuda, & Lillis, 2006) which had some problems with reliability due to item wording, and item selection procedures. In the current version, lower scores are indicative of acceptance or psychological flexibility and higher scores are indicative of higher levels of EA or psychological inflexibility. Psychological

inflexibility is a newer term in the ACT literature that is sometimes used in place of EA.

Psychological flexibility is a more overarching term for acceptance (Bond et al., 2011).

The AAQ-II is a 7-item self-report measure designed for use with adults. Examples of items include “It is OK if I remember something unpleasant,” and “My painful memories prevent me from having a fulfilling life.” Each item is rated by respondents on a 7-point scale from 1-*never true* to 7-*always true*. Total scores range from 7-49, with low scores indicating greater acceptance and higher scores indicating greater EA.

The AAQ-II has satisfactory psychometric properties. These properties were assessed across six samples with a total of 2,816 participants. The AAQ-II had adequate internal consistency with a Cronbach’s alpha of .88. The test-retest reliability for a community sample was found to be .81 after three months and .79 after one year (Bond et al., 2011). The AAQ-II has adequate construct validity as well as a convergent validity. Higher scores on the AAQ-II were found to correlate with greater psychological distress. For example, in the validation studies the AAQ-II was negatively correlated with the Beck Depression Inventory-II (Beck, Steer, & Brown, 1996; Bond et al., 2011,  $r = -.71, p < .01$ ) and the SCL-90-R, Global Symptom Index (Derogatis, 1994;  $r = -.65, p < .01$ ) (Bond et al., 2005; Bond et al., 2011). The AAQ-II has also been found to be negatively correlated with a measure of thought suppression, known as the White Bear Suppression Inventory (Wegner & Zanakos, 1994;  $r = -.60, p < .01$ ).

#### *Alcohol Use Disorders Identification Test*

The Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, and Monteiro, 2001) is a commonly used measure developed by the World Health Organization for assessing harmful behavior with alcohol and alcohol abuse and dependence.



The AUDIT is a 10-item measure with questions to identify the amount and frequency of alcohol intake (Items 1-3), alcohol dependence (4-6) and alcohol consumption related problems (Shevlin & Smith, 2007). The scores on the AUDIT range from 0 to 40. A cut-off point of 8 is typically used to identify harmful alcohol intake in men, and a cut-off point of 6 is typically used for women.

The AUDIT demonstrates good psychometric properties. It has adequate internal consistency with a mean Cronbach Alpha of .80 across ten studies (Meneses-Gaya, Zuardi, Loureiro, & Crippa, 2009). It demonstrates impressive test-retest reliability after a one month period, .84 (Selin, 2003), .85 (Kim, Gulick, Nam, & Kim, 2008). The AUDIT has adequate convergent validity; it has been found to correlate moderately well ( $r = .62$ ) with the Michigan Alcoholism Screening Test (MAST; Conley, 2001).

#### *Drug Use Disorders Identification Test*

The Drug Use Disorders Identification Test (DUDIT; Berman, Bergman, Palmstierna & Schlyter, 2005) is a measure for assessing harmful behavior with drugs and drug abuse and dependence. The DUDIT is an 11-item measure with scores ranging from 0 to 44. The first 9 items each have five response options and Items 10 and 11 have three response options each. A score of 6 or more indicates drug related problems for men. A score of 2 or more indicates drug related problems for women. A score of 25 or higher in either gender indicates that the person is likely dependent on at least one drug. The DUDIT is a self-report instrument intended for use together with the AUDIT. The DUDIT has adequate internal consistency with a mean Cronbach Alpha of .80 (Berman et al., 2005). Due to the fact that this is a relatively new measure, further information is unavailable on the psychometric properties of the DUDIT.

### *Life Events Checklist*

The Life Events Checklist (LEC; Gray, Litz, Hsu, Lombardo, 2004) was developed at the National Center for Posttraumatic Stress Disorder (PTSD) to measure exposure to potentially traumatic events. The LEC consists of 16 different potentially traumatic events. It also includes one item inquiring about any other stressful experiences not listed in the 16 items. For each item, respondents are asked to indicate their experience by selecting one of the following for each event: happened to me, witnessed it, learned about it, not sure, and does not apply (Gray et al., 2004). Participants receive a score of 1 for each event that they indicated happened to them and a score of 0 for all other responses. The total score indicates the number of traumatic events a person has experienced. Higher scores indicate individuals endorsed more traumatic events.

The LEC demonstrates good psychometric properties in several samples. Gray et al. (2004) tested the LEC with a sample of college students. They found the test-retest reliability, after one week, to be  $r = .82, p < .001$ . The LEC demonstrates adequate convergent validity. Gray et al. (2004) found it to be moderately correlated ( $r = -.55, p < .001$ ) with the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000).

### *PTSD Checklist-Civilian Version*

The PTSD Checklist-Civilian Version (PCL; Weathers, Litz, Huska, & Keane, 1994) is a 17-item self-report instrument that assesses for PTSD using the diagnostic criteria B, C, and D from the *DSM-IV*. Respondents are prompted to report the level of distress that has occurred with each endorsed PTSD symptom over the prior 30 days. A five-point scale is used for informant responding (1 = *not at all*, 5 = *extremely*; Ruggiero, Del Ben, Scotti, & Rabalais, 2003). Scores range from 17-85, and higher scores indicate higher levels of PTSD symptoms.

Ruggiero et al. (2003) studied the psychometric properties of the PCL and found that the PCL had impressive internal consistency with a Cronbach's alpha of .94. They found the PCL to have strong convergent validity as well, with strong correlations (i.e.,  $r > .75$ ) between the PCL and two well-known measures for PTSD: the IES and MS-C. They also found the PCL to have adequate test-retest reliability for immediate retesters ( $r = .92, p < .00$ ), after one week ( $r = .88, p < .001$ ), and after two weeks ( $r = .68, p < .001$ ).

### *Aggression Questionnaire*

The Aggression Questionnaire (AGQ; Buss & Perry, 1992) is a widely used, 29-item, self-report questionnaire measuring aggression. It consists of four subscales of aggression: Physical, Verbal, Anger and Hostility (Tremblay & Ewart, 2005). Scores range from 29 to 145.

The AGQ demonstrates good psychometric properties in various studies (Buss & Perry, 1992; Bernstein & Gesn, 1997; Harris, 1997; O'Connor, Archer & Wu, 2001; Tremblay & Ewart, 2005; Gerevich, Bácskai, & Czobor, 2007). Buss and Perry (1992) found adequate internal consistency for the AGQ with Cronbach alphas of: .85 (Physical Aggression); .72 (Verbal Aggression); .83 (Anger); .77 (Hostility); .89 (Total Score). Similarly, Tremblay and Ewart (2005) found the AGQ to have adequate internal consistency with Cronbach Alpha's of .85 (Physical Aggression); .68 (Verbal Aggression); .78 (Anger); .75 (Hostility); and .86 (Total scale). The AGQ has demonstrated adequate test-retest reliability. For an interval of 9-week the test-retest correlations were as follows: Physical Aggression, .80; Verbal Aggression, .76; Anger, .72; Hostility, .72 and total score = .80 (Buss & Perry, 1992).

### *Barratt Impulsiveness Scale*

The Barratt Impulsiveness Scale (BIS-11; Barratt, 1959, 1994) is a 30-item self-report questionnaire designed to measure impulsiveness as a personality trait as well as the behavioral aspects of impulsiveness (Stanford et al., 2009). The BIS-11 may be scored to yield 6 first-order (Attention, Motor, Self-control, Cognitive Complexity, Perseverance, and Cognitive Instability Impulsiveness) and three second-order factors (Attentional, Motor, and Non-planning Impulsiveness). Each item has four response items with scores ranging from 1 to 4. Higher scores indicate higher levels of impulsivity. Total scores range from 30-120.

The BIS-11 exhibits adequate internal consistency with Cronbach alphas ranging from .79-.82 in various populations including college students, substance abuse patients, psychiatric patients, and prison inmates (Patton, Stanford, & Barratt, 1995). The Barratt Impulsiveness Scale has adequate test-retest reliability with a correlation after one month of  $r = .83, p < .01$  (Stanford et al., 2009). The BIS-11 has adequate convergent reliability with other self-report measures of impulsivity. For example, the total score on the BIS-11 was correlated ( $r = .63, p < .01$ ) with the impulsiveness subscale on the Eysenck Impulsiveness Scale (Eysenck, Pearson, Easting, & Allsopp, 1985).

### *Multidimensional Experiential Avoidance Questionnaire*

The Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gamez et al., 2011) was administered as an additional measure of EA. This measure was recently created as its authors argue the AAQ-II is not a good measure because of its brevity and because it assesses only two aspects of EA: “nonacceptance of distress and interference with values” rather than all

aspects of the EA construct. The MEAQ has 62 questions, which are answered on a Likert-like scale of 1-6. Total scores range from 62 to 317. Higher scores indicate greater levels of EA.

While, the MEAQ is more comprehensive than the AAQ-II, it is not as friendly for use in a clinical setting, given the length. The MEAQ is composed of six subscales (Distress Aversion, Behavioral Avoidance, Distraction/Suppression, Repression/Denial, Procrastination, and Distress Endurance). The measure has demonstrated adequate internal consistency in its subscales with alphas averaging .85 and inter-item correlations ranging from .26 to .51. Similarly the MEAQ total score had a mean alpha of .94 across to validation trials (Gamez et al., 2011). The MEAQ was found to be equal to the AAQ-II in terms of internal consistency (Gamez et al., 2011).

### Procedure

The participants signed up to participate in the study through the SONA computer system at the University of North Texas. At the time of sign up participants were directed to an online survey system known as, Survey Monkey.

They were presented with a consent form, a demographics questionnaire (see Appendix) the AAQ-II, AUDIT, DUDIT, LEC, PCL, AGQ, BIS-11 and the MEAQ. As a check on possible order effects, participants were randomly be assigned one of two differing orders, in order to prevent the AAQ-II from influencing responses to the other measures or vice versa. In other words, to prevent the participants from potentially answering in a way they felt the study would expect them or not expect them to answer. Half of the participants were given the measures in the following order: AAQ-II, AUDIT, DUDIT, LEC, PLC, AGQ, BIS-11, demographics questionnaire, and the MEAQ. The other half of the participants were given the measures in the

following order: BIS-11, AGQ, LEC, PCL, AUDIT, DUDIT, AAQ-II, demographics questionnaire, and MEAQ.

Because of the sensitive nature of the information being gathered, all identifying information was kept separate from the surveys. After the participants were awarded credit in their undergraduate psychology class, all of their identifying information was destroyed.

## CHAPTER 3

### RESULTS

#### Data Preparation

The data were analyzed using SPSS. Prior to analysis each participant's data was inspected for missing items. Two participants were removed from the sample due to their surveys being incomplete. Six more were removed due to having extreme scores, approximately equal in each direction. In sum, 8 participants were not included in the sample for analysis.

#### *Data Transformations*

Data was tested for normality using visual and statistical methods. Histograms and Q-Q plots were evaluated and Z-scores were calculated from skewness and kurtosis values and the standard errors. Four variables were in need of data transformation, due to extremely high levels of skew and kurtosis and Tukey's ladder of power transformation (Tukey, 1977) was consulted. The Posttraumatic Checklist (PCL) total score and the Life Events Checklist (LEC) total score were transformed by using a square root transformation.

The substance abuse measures (Alcohol Use Disorders Identification Test; AUDIT and Drug Use Disorders Identification Test; DUDIT) were extremely positively skewed. Traditional transformations were attempted; however, none of these were able to correct the skew due to a large number of zero scores on both of these measures. A variable was created for substance abuse utilizing the cutoff scores for these measures to indicate abuse or "problematic use." Scores were converted to categorical variables of "yes" or "no" for substance abuse based on a score above the cutoff on either measure. For the DUDIT a cutoff score of 2 for women and 6 for men was used (Berman, Bergman, Palmstierna, & Schlyter, 2005). For the AUDIT a cutoff

score of 6 for women and 8 for men was used (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). If a person met either of these criteria, they were categorized as a “yes” for substance abuse.

### Reliability Analyses

Reliability analyses were performed for each measure utilized in this study. All measures demonstrated adequate internal consistency reliability that were similar and in some cases better than in previous studies. For example, in the current study the BIS-11 yielded a Cronbach alpha of .818 for the total score. The subscale alphas were less impressive, BIS-11 attentional subscale ( $\alpha = .686$ ), BIS-11 motor subscale ( $\alpha = .586$ ), BIS-11 nonplanning subscale ( $\alpha = .713$ ), however the subscales were not part of the main analyses for this study.

The Buss-Perry Aggression Questionnaire demonstrated impressive internal consistency with an alpha of .911 for the total score. The subscales for the measure also yielded adequate internal consistency, Physical Aggression subscale ( $\alpha = .834$ ), Verbal Aggression subscale ( $\alpha = .776$ ), Anger subscale ( $\alpha = .823$ ), Hostility subscale ( $\alpha = .808$ ).

The MEAQ yielded an alpha of .922 for the total score. The subscales were as follows, Behavioral Avoidance ( $\alpha = .872$ ), Distress Aversion ( $\alpha = .881$ ), Procrastination ( $\alpha = .823$ ), Distraction and Suppression ( $\alpha = .887$ ), Repression and Denial ( $\alpha = .867$ ), Distress Endurance ( $\alpha = .864$ ).

The alpha for the LEC was not able to be fully calculated due to two of the items having entirely zeros. The alpha for the 15 out of 17 items that was calculated was equal to .652. Additionally, the PCL demonstrated impressive internal consistency with an alpha of .917.



The AUDIT had an alpha of .842. Similarly, the DUDIT yielded an alpha of .882. The AAQ-II had adequate internal consistency as well with an alpha of .919.

### Descriptive Statistics

The means and standard deviations of each measure and their subscales for the total sample are presented in Table 1.

Table 1

*Means and Standard Deviations for Scales and Subscales Based on the Entire Sample (n = 360)*

Measure	M	SD	Possible Range	Actual Range
BIS-11	62.31	9.99	30-120	38-92
Aggression	70.97	19.04	29-145	30-121
PCL	33.17	12.29	17-85	17-69
LEC	2.45	2.11	0-17	0-11
AAQ-II	19.09	9.06	7-49	7-49
MEAQ	200.11	35.79	62-317	91-297
AUDIT	5.93	5.76	0-40	0-29
DUDIT	2.79	5.26	0-44	0-42

### *Descriptive Statistics for Trauma/PTSD*

Descriptive statistics for LEC were conducted to understand more about the experiences the sample endorsed. The choices provided on the LEC for each trauma listed are “Happened to me,” “Witnessed it,” “Learned About it,” “Not sure,” or “Doesn’t apply”. Of the total sample, 335 participants (93.1%) endorsed that they directly experienced or witnessed a traumatic event and 296 participants (82% of the sample) endorsed that at least one of the traumatic events happened to them directly. See Table 2 for more details regarding trauma type. Further, the PCL scores were evaluated for the prevalence of PTSD. Utilizing a cutoff of 44 (Terhakopian,

Sinaii, Engel, Schnurr, & Hoge, 2008), 73 participants in the study had significant symptoms that could indicate PTSD (20.9% of females in the study and 19.2% of males).

Table 2

*Traumatic Experiences Endorsed by Participants (n = 360)*

Type of Trauma	“Happened to me”	“Witnessed it”
Natural Disaster	91(25.3%)	53(14.7%)
Fire or Explosion	26(7.2%)	73(20.3%)
Transportation Accident	177(49.2%)	62(17.2%)
Serious Accident at work, home, or during recreational activity	60(16%)	73(20.3%)
Exposure to Toxic Substance	27(7.5%)	8(2.2%)
Physical assault	100(27.8%)	78(21.7%)
Assault with a weapon	36(10%)	21(5.8%)
Sexual Assault	53(14.7%)	8(2.2%)
Other unwanted or uncomfortable sexual experience	109(30.3%)	13(3.6%)
Combat or exposure to a warzone	6(1.7%)	11(3.1%)
Captivity	5(1.4%)	7(1.9%)
Life-threatening illness or injury	29(8.1%)	108(30%)
Severe human suffering	11(3.1%)	58(16.1%)
Sudden, violent death (like homicide or suicide)	-----	40(11.1%)
Sudden, unexpected death of someone close	-----	116(32.2%)
Serious injury, harm or death you caused to someone else	6(1.7%)	17(4.7%)
Any other very stressful event or experience	147(40.8)	36(10%)

*Descriptive Statistics for Substance Abuse*

Descriptive statistics were conducted to understand more about the sample in regard to alcohol and drug use. Based on the cut-offs in the DUDIT and AUDIT manuals (2 for women and 6 for men and 6 for women and 8 for men, respectively), 30.6% of the sample met criteria

for drug abuse and 35.8% of the sample met criteria for alcohol abuse. When assessing alcohol and drug use combined, 170 participants (47% of the sample) met criteria for some form of substance abuse. When analyzing prevalence for each gender, 34% of males and 55.5% of females met criteria for substance abuse.

With regard to alcohol use, 78(21.7%) participants endorsed that they never have a drink containing alcohol, 84(23.3%) participants endorsed drinking alcohol once a month or less, 77(21.4%) participants reported drinking alcohol 2-4 times a month, 108(30%) participants reported drinking alcohol 2-3 times a week, and 13(3.6%) participants reported drinking alcohol 4 or more times a week. Regarding quantity, 173(48.1%) participants reported drinking 1-2 drinks on days when they drink, 112(31.1%) participants reported drinking 3-4 drinks on days when they drink, 50(13.9%) participants reported drinking 5-6 drinks on days when they drink, 19(5.3%) participants reported drinking 7-9 drinks on days when they drink, and 6(1.7%) participants reported drinking 10 or more drinks on days when they drink alcohol.

In terms of drug use, 241(66.9%) participants reported never using drugs, 62 (17.2%) reported using drugs once a month, 27(7.5%) participants reported using drugs 2-4 times a month, 9(2.5%) participants reported using drugs 2-3 times a week, 21(5.8%) participants reported using drugs 4 or more times a week. With regard to using more than one type of drug on the same occasion, 309(85.8%) participants said they never used more than one type of drug on the same occasion, 31(8.6%) reported they do this once a month or less, 13(3.6%) reported they do this 2-4 times a month, 5(1.4%) reported they do this 2-3 times a week, 2(.6%) reported they do this 4 times a week or more. On days they use drugs, 97(26.9%) participants reported using 1-2 times a day, 16(4.4%) participants reported using 3-4 times a day, 1(.3%) participant reported using 5-6 times a day and 1(.3%) participant reported using 7 or more times a day. Of

those who endorsed using drugs, 36 (10%) participants reported being heavily influenced by drugs less than once a month, 8(2.2%) reported being heavily influenced by drugs every month, 5(1.4%) reported being heavily influenced by drugs every week, and 8(2.2%) reported being heavily influenced by drugs daily or almost daily.

### Preliminary Analyses

Preliminary analyses were conducted in which demographic variables were correlated with other variables to address any need to treat these variables as covariates (see Table 3). The PCL was correlated with gender. Substance abuse was correlated gender, age, and year in school. Finally, the BIS-11 was correlated with marital status. These variables were treated as covariates when correlated with the outcome variable for all analyses.

Table 3

*Correlations of Outcome Variables with Demographic Variables (n = 360)*

	PCL	Substance Abuse	BIS-11	AGQ	Gender	Age	Marital Status	Ethnicity	Year in School
PCL	1.00	.19**	.29**	.48**	.13*	.05	.09	.003	.03
Substance Abuse	.19**	1.00	.30**	.16**	.21**	.15*	.09	-.05	.14**
BIS-11	.29**	.30**	1.00	.44**	.04	.01	.11	-.00	.02
AGQ	.48**	.16**	.44**	1.00	-.05	.02	.09	.07	-.04
Gender	.13*	.21**	.04	-.05	1.00	-.04	.08	.00	.02
Age	.05	.15**	.01	.02	-.04	1.00	.17**	-.05	.57**
Marital Status	.09	.09	.11*	.09	.08	.17*	1.00	-.14**	.08
Ethnicity	.00	-.05	-.00	.07	.00	-.05	-.14**	1.00	-.06
Year in School	.03	.14**	.02	-.04	.02	.57*	.08	-.06	1.00

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

*MEAQ and AAQ-II*

Exploratory analyses were conducted to understand the relationship between the MEAQ and the AAQ-II. Correlations were conducted comparing the AAQ-II to the MEAQ total score as well as the subscales of the measure. The AAQ-II and the MEAQ were significantly related,  $r(360) = .55, p < .01$ . The correlations for the subscales of the MEAQ with the AAQ-II are listed in Table 4.

Table 4

*Correlations between the AAQ-II and MEAQ*

	AAQ-II	MEAQ	MEAQ B.A.	MEAQ D.A.	MEAQ P.	MEAQ D/S	MEAQ R/D	MEAQ D.E.
AAQ-II	1.00	.55*	.42*	.44*	.41*	.31*	.34*	-.24*
MEAQ	.55*	1.00	.82*	.79*	.68*	.57*	.71*	-.36*
MEAQ B.A.	.42*	.82*	1.00	.60*	.54*	.52*	.44*	-.173*
MEAQ D.A.	.44*	.79*	.60*	1.00	.42*	.50*	.39*	-.10
MEAQ P.	.41*	.68*	.54*	.42*	1.00	.26*	.39*	-.22*
MEAQ D/S	.31*	.57*	.52*	.50*	.26*	1.00	.30*	.23*
MEAQ R/D	.34*	.71*	.44*	.39*	.39*	.30*	1.00	-.17*
MEAQ D.E.	-.24*	-.36*	-.17*	-.10	-.22*	.23*	-.17*	1.00

*Note, \*p < .01, B.A.=Behavioral Avoidance, D.A.=Distress Aversion, P=Procrastination, D/S=Distraction/Suppression, R/D= Repression/Denial, D.E.= Distress Endurance*

Hypotheses Testing

For all analyses, tests of multicollinearity were conducted to assure the assumption of non-collinearity was not violated. Multicollinearity was not an issue in any of the analyses based on VIF scores, which were under 3 in most cases, well under the typical cutoff of 10. Also,

correlations were examined to assess for any high correlations between variables and all correlations were below .60.

Given that several previous studies have found significant between gender differences in EA (e.g., Bond et al., 2011; Howe-Martin et al., 2012) and in trauma and related variables as previously discussed, exploratory analyses were conducted in which the above analyses (Hypotheses 1-8) were repeated separately for each gender. Interestingly, some differences were found for Hypotheses 1, 3, and 4. Exploratory analyses were also conducted using the MEAQ as the measure of EA. For each hypothesis, the main analysis is discussed first, followed by the exploratory analyses with the MEAQ, and then findings for gender (where applicable). For the third hypothesis, an exploratory analysis was carried out with EA as a mediator and is discussed as well.

### *Hypothesis 1*

The first hypothesis was that higher levels of experientially avoidant behaviors (substance abuse, aggression, and impulsivity) as measured by the DUDIT and AUDIT combined, AGQ, and the BIS-11, respectively were expected to be positively correlated with higher EA scores, as measured by the AAQ-II. Thus, positive relationships were hypothesized between experientially avoidant behaviors and EA scores. These relationships were tested by conducting a series of Pearson product moment correlations and point-biserial correlations for substance abuse. As mentioned previously, a dichotomous variable for substance abuse was created and utilized as the measure for substance abuse in all analyses. Bonferroni adjustments were implemented based on the number of comparisons, 3 comparisons, yielding a Bonferroni

corrected alpha of  $p < .02$ . All of the correlations were significant at the  $p < .01$  level and are presented in Table 5.

Table 5

*Correlations for Hypothesis 1, Comparing EA Behaviors with the AAQ-II (n = 360)*

	AAQ-II	AGQ	BIS-11	Substance Abuse
AAQ-II	1.00	.43*	.25*	.14*
AGQ	.43*	1.00	.44*	.16*
BIS-11	.25*	.44*	1.00	.30*
Substance Abuse	.14*	.16*	.30*	1.00

*Note.* \* $p < .01$

#### Exploratory Analyses with the MEAQ for Hypothesis 1

Exploratory analyses were conducted to further explore Hypothesis 1. The first hypothesis was retested utilizing the MEAQ total score for exploratory purposes. The correlations were significant at the  $p < .01$  level, other than the correlation with substance abuse (see Table 6). The correlation of Substance Abuse with the MEAQ was significant at the  $p < .05$  level, however this does not fit within the Bonferroni corrected alpha of  $p < .02$ , so it must be interpreted with caution. Further exploratory analyses were conducted with the subscales of the MEAQ and are presented in Table 7.

Table 6

*Exploratory Correlations Comparing EA Behaviors with the MEAQ Total Score (n = 360)*

	MEAQ	AGQ	BIS-11	Substance Abuse
MEAQ	1.00	.42**	.35**	.11*
AGQ	.42**	1.00	.44**	.16*
BIS-11	.35**	.44**	1.00	.30*
Substance Abuse	.11*	.16*	.30*	1.00

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

Table 7

*Exploratory Correlations Comparing EA Behaviors with the MEAQ Subscales (n = 360)*

	MEAQ BA	MEAQ DA	MEAQ P	MEAQ DS	MEAQ RD	MEAQ RD	AGQ	BIS- 11	Sub. Abuse
MEAQ BA	1.00	.60**	.54**	.52**	.44**	-.17**	.27**	.19**	.01
MEAQ DA	.60**	1.00	.42**	.50**	.39**	-.10	.33**	.18**	.14**
MEAQ P	.54**	.42**	1.00	.26**	.39**	-.22**	.33**	.48**	.13*
MEAQ DS	.52**	.50**	.26**	1.00	.30**	.23**	.17**	.01	-.02
MEAQ RD	.44**	.39**	.39**	.30**	1.00	-.17**	.40**	.29**	.07
MEAQ DE	-.17**	-.10	-.22**	.23**	-.17**	1.00	-.13*	-.28**	-.09
AGQ	.27**	.33**	.33**	.17**	.40**	-.13*	1.00	.44**	.16*
BIS-11	.19**	.18**	.48**	.01	.29**	-.28**	.44**	1.00	.30*
Sub. Abuse	.01	.14**	.13*	-.02	.07	-.09	.16*	.30*	1.00

*Note.* BA= Behavioral Avoidance, DA= Distress Aversion, P= Procrastination, DS=Distraction and Suppression, RD= Repression and Denial, DE=Distress Endurance, \*\* $p < .01$ , \* $p < .05$

The AUDIT, DUDIT, AGQ, and BIS-11 scores were summed to create a variable for EA behaviors and this composite was also analyzed. This variable was normally distributed and significantly correlated with the AAQ-II,  $r(360) = .40, p < .01$  and the MEAQ,  $r(360) = .43, p < .01$ . Further exploratory analyses were conducted to better understand the relationship between the subscales of the BIS-11 and AGQ and EA (as measured by the AAQ-II and MEAQ). Correlations of the BIS-11 and AGQ subscales with the AAQ-II and MEAQ were statistically significant. See Tables 8 and 9.



Table 8

*Exploratory Correlations for Hypothesis 1, Comparing Subscales of the BIS-11 with the AAQ-II and MEAQ (n = 360)*

	AAQ-II	MEAQ	BIS-11 Attentional	BIS-11 Motor	BIS-11 Non- Planning
AAQ-II	1.00	.55**	.33**	.11*	.18**
MEAQ	.55**	1.00	.34**	.18*	.32**
BIS-11 Attentional	.33**	.34**	1.00	.44**	.42**
BIS-11 Motor	.11*	.18**	.44**	1.00	.45**
BIS-11 Non- Planning	.18**	.32**	.42**	.45**	1.00

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

Table 9

*Exploratory Correlations for Hypothesis 1, Comparing Subscales of the AGQ with the AAQ-II and MEAQ (n = 360)*

	AAQ-II	MEAQ	AGQ Phys. Agg.	AGQ Verbal Agg.	AGQ Anger	AGQ Hostility
AAQ-II	1.00	.55**	.14**	.22**	.38**	.59**
MEAQ	.55**	1.00	.22**	.13*	.38**	.53*
AGQ Phys. Agg.	.14**	.22**	1.00	.50**	.58**	.32**
AGQ Verbal Agg.	.22**	.13*	.50**	1.00	.60**	.44**
AGQ Anger	.38**	.38**	.58**	.60**	1.00	.57**
AGQ Hostility	.59**	.53*	.32**	.44**	.57**	1.00

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

### Exploratory Analyses Utilizing Gender for Hypothesis 1

In analyzing the first hypothesis for each gender (EA behaviors and EA), the AAQ-II was correlated with substance abuse status, however the correlations were not significant at the  $p < .05$  level of significance, likely due to the decrease in power by creating separate smaller sample sizes for gender. Similarly, for males, the BIS-11 was correlated with the AAQ-II, but no longer at the  $p < .05$  level of significance. The MEAQ was correlated with substance abuse for males.

The correlation of the MEAQ with substance abuse was not at the  $p < .05$  level of significance for females, however again, this may have been due to decreased power from reducing the sample size (see Tables 10 and 11).

Table 10

*Correlations for Males for Hypothesis 1 (n = 140)*

	BIS-11	AGQ	Substance Abuse	AAQ-II	MEAQ
BIS-11	1.00	.28**	.30**	.14	.26**
AGQ	.28**	1.00	.09	.40**	.33**
Substance Abuse	.30**	.09	1.00	.14	.17*
AAQ-II	.14	.40**	.14	1.00	.50**
MEAQ	.26**	.33**	.17*	.50**	1.00

*Note, \*\*p < .01, \*p < .05.*

Table 11

*Correlations for Females for Hypothesis 1 (n = 220)*

	BIS-11	AGQ	Substance Abuse	AAQ-II	MEAQ
BIS-11	1.00	.54**	.29**	.33**	.41**
AGQ	.54**	1.00	.21**	.46**	.49**
Substance Abuse	.29**	.21**	1.00	.10	.02
AAQ-II	.33**	.46**	.10	1.00	.57**
MEAQ	.41**	.49**	.02	.57**	1.00

*Note, \*\*p < .01, \*p < .05.*

### *Hypothesis 2*

The second hypothesis stated that: a) the number of traumas a person has experienced, as measured by the Life Events Checklist (LEC), was expected to be positively correlated with PTSD symptoms, b) EA was expected to be positively correlated with PTSD symptoms and c)

EA would mediate the positive relationship between number of traumas and PTSD symptoms, such that the relationship between trauma experience and PTSD symptoms would depend on EA.

Gender was treated as a covariate in the analysis in order to control for the correlation of gender with the outcome variable, PCL. Gender did not explain a statistically significant amount of variance of the mediator, EA,  $F(1, 356) = 2.645, p = .105$ . The unexplained variance in EA was equal to 78.554 ( $SD = 8.863$ ) controlling for trauma and the covariate, with a multiple correlation for the regression equation of .218. Gender did not explain a statistically significant amount of variance of the outcome, PTSD,  $F(1, 355) = 2.487, p = .116$ . The unexplained variance in PTSD was equal to .624 ( $SD = .790$ ) controlling for trauma, EA, and the covariate, with a multiple correlation for the regression equation of .647.

Baron and Kenny's (1986) four step process for mediation testing was utilized (see Table 12). In step 1, a regression analysis was conducted with number of traumatic events entered as the independent variable and post-traumatic stress symptoms as the dependent variable. The model was significant,  $F(1, 357) = 30.498; p < .001$ , accounting for 15% of variance,  $\beta = .360; p < .001$ .

In step 2, a regression was conducted to examine whether LEC predicted experiential avoidance. This model was also significant,  $F(2, 357) = 8.919; p < .001$ , accounting for 4.8% of the variance,  $\beta = .197; p < .001$ .

For steps 3 and 4, a regression analysis was performed to determine whether the proposed mediator (EA) significantly predicts PTSD symptoms. This model was also significant and accounted for 42% of the variance,  $F(3, 356) = 85.441; p < .001$ . For step 3 of the analysis, EA was a significant predictor of PTSD symptoms,  $\beta = .535; p < .001$ . In regard to step 4 of the

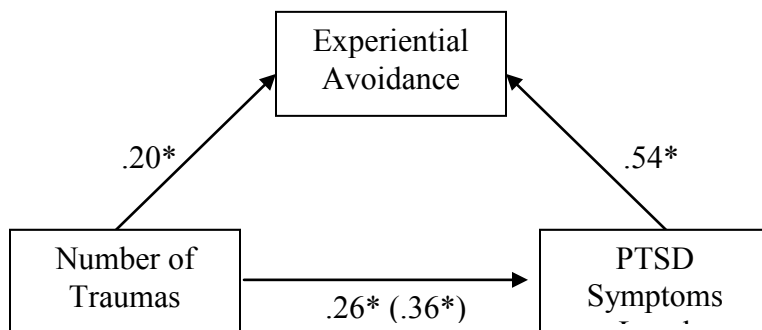
analysis, when EA as a mediator was added in, the standardized beta coefficient was reduced for LEC,  $\beta = .255$ ;  $p < .001$ .

A Sobel test was conducted to determine the significance of indirect effects of the relationship between number of traumatic events experienced on PTSD symptoms as mediated by EA. Results indicated that there was a significant partial mediation in the model,  $z = 3.649$ ,  $p < .001$ , therefore the second hypothesis was partially supported. See Figure 1.

Table 12

*Baron and Kenny Steps of Mediation for Hypothesis 2*

Step	Estimate	95% CI	Beta	P
1	.67	.49-.85	.36	<.001
2	3.23	1.6-4.9	.20	<.001
3	.06	.05-.07	.54	<.001
4	.48	.33-.63	.26	<.001



*Figure 1.* Mediation diagram with standardized coefficients for Hypothesis 2, EA partially mediating the relationship between traumas and PTSD for the entire sample ( $n = 360$ ,  $*p < .05$ ).

Exploratory Analyses for Hypothesis 2 with the MEAQ

The second hypothesis was reanalyzed utilizing the MEAQ in place of the AAQ-II for exploratory purposes. The same steps were followed as above. First simple correlations were

conducted between the three variables. The correlation between the MEAQ and PCL was statistically significant,  $r = .46, p < .01$ , however the correlation between the LEC and the MEAQ was not statistically significant,  $r = .078, p > .05$ . Therefore, the tests for mediation with the MEAQ as a mediator were not conducted.

### *Hypothesis 3*

The third hypothesis stated that: a) PTSD symptoms were expected to be a significant predictor of substance abuse; participants who evidenced higher PCL scores would have a positive substance abuse status. b) EA was expected to be a significant predictor of substance abuse as well-in the same direction, such that individuals with higher EA would be more likely to have a positive substance abuse status. c) Furthermore, EA was expected to moderate the relationship between PTSD symptoms and substance abuse. The relationship between PTSD symptoms and substance abuse was expected to be stronger for participants high in EA than for participants low in EA.

Prior to testing this hypothesis, the predictor variable, PTSD symptoms and the moderator, EA (AAQ-II) were centered in order to eliminate any multicollinearity effects between variables. The variables were centered by subtracting the sample mean from all individuals' scores on the variable, getting a revised sample mean of 0 for that variable. Next simple correlations were utilized to test for the relationship between the variables (See Table 13). The final step of the moderation analysis was a hierarchical binary logistic regression, due to the dichotomous outcome variable, substance abuse status.

In the first step, gender, age, and year in school were entered as covariates and gender and year in school were noted to be categorical. In the logistic regression calculation these were

dummy coded. The overall model was significant,  $\chi^2 = 30.312, p < .001, df = 1,6$ ; Nagelkerke's  $R^2 = .11$ , however only gender was found to be a significant predictor in the model, Wald = 15.34,  $b = -.903, \text{Exp}(B) = .406, p < .001$ .

In the second step, the predictor PCL (PTSD symptoms) was entered and the model was significant,  $\chi^2 = 39.36, p < .001, df = 1,7$ ; Nagelkerke's  $R^2 = .14$ . PTSD symptoms were a significant predictor of substance abuse status, controlling for demographic covariates, Wald = 8.82,  $b = .33, \text{Exp}(B) = 1.39, p < .01$  with a 95% confidence interval of 1.118 to 1.725. EA (AAQ-II score) was entered in the second step and the overall model was significant,  $\chi^2 = 39.49, p < .001, df = 1,8$ ; Nagelkerke's  $R^2 = .14$ . EA was not a significant predictor in the model, however, Wald = .135,  $b = .006, \text{Exp}(B) = 1.01, p = .714$  with a 95% confidence interval of .976 to 1.04. In the final step of the regression analysis, an interaction term between PCL scores and AAQ-II scores was created (by multiplying the scores) and entered. The overall model was significant,  $\chi^2 = 39.50, p < .001, df = 1,9$ ; Nagelkerke's  $R^2 = .14$ , however the interaction did not account for a significant proportion of the variance in substance abuse status, Wald = .005,  $b = -.001, \text{Exp}(B) = .999, p = .943$  with a 95% confidence interval of .977 to 1.02.

The hypothesized relationship between PTSD and substance abuse status was supported, however the moderation model with EA moderating this relationship was not statistically significant.

Table 13

*Correlations between Variables for Hypothesis 3*

	PTSD symptoms	AAQ-II	Substance Abuse (0,1)
PTSD symptoms	1.00	.59**	.19**
AAQ-II	.59**	1.00	.14*
Substance Abuse	.19**	.14*	1.00

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

### Exploratory Analyses for Hypothesis 3 with the MEAQ

Exploratory analyses were conducted reanalyzing the third hypothesis utilizing the MEAQ in place of the AAQ-II. The same steps were followed as outlined above. The final step of the moderation analysis was a hierarchical binary logistic regression, due to a dichotomous outcome variable, substance abuse status. The findings were similar to the AAQ-II. EA measured with the MEAQ was not a significant predictor in the model. The exploratory moderation model with EA (MEAQ) moderating this relationship was not statistically significant.

### Exploratory Analyses for Hypothesis 3 with EA as a Mediator

Since there is an existent literature on the use of substances occurring prior to a traumatic event and because there are a couple of studies that indicate that EA (Kingston et al., 2010) or avoidant coping (Avants et al., 2000) predict substance abuse, an exploratory analysis was conducted to determine if EA would mediate the relationship between substance abuse predicting PTSD symptoms. In order to test this theory, Baron and Kenny's (1986) four step process for mediation testing was utilized (see Table 14). Prior to analyses, substance abuse status and gender were dummy coded (1, -1) and the AAQ-II was mean centered. Due to the correlation between gender and PTSD scores, gender was entered as a covariate in the analysis.

Gender did not explain a statistically significant amount of variance of the mediator, EA,  $F(1, 356) = 1.704$  ( $p = .193$ ). The unexplained variance in EA was equal to 80.585 ( $SD = 8.977$ ) controlling for substance abuse and the covariate, with a multiple correlation for the regression equation of .152. Gender did not explain a statistically significant amount of variance of the outcome, PTSD,  $F(1, 355) = 1.550$  ( $p = .214$ ). The unexplained variance in PTSD was equal to

.681 ( $SD = .825$ ) controlling for trauma, EA, and the covariate, with a multiple correlation for the regression equation of .605.

Baron and Kenny's (1986) four step process for mediation testing was utilized (see Table 12). In Step 1, a regression analysis was conducted with substance abuse entered as the independent variable and post-traumatic stress symptoms as the dependent variable. The model was significant,  $F(2, 357) = 8.112; p < .001$ , accounting for 4.3% of the variance,  $\beta = .168; p < .01$ .

In Step 2, a regression was conducted to examine whether substance abuse predicted experiential avoidance. This model was also significant,  $F(2, 357) = 4.196.; p < .05$ , accounting for 2.3% of the variance,  $\beta = .121; p < .05$ .

For Steps 3 and 4, a regression analysis was performed with both substance abuse and EA predicting PTSD symptoms, while controlling for gender. This model was also significant and accounted for 37% of the variance,  $F(3, 356) = 68.344; p < .001$ . For step 3 of the analysis, EA was a significant predictor of PTSD,  $\beta = .574; p < .001$ . For step 4 of the analysis, the beta was reduced for substance abuse with EA in the model,  $\beta = .098; p < .05$ .

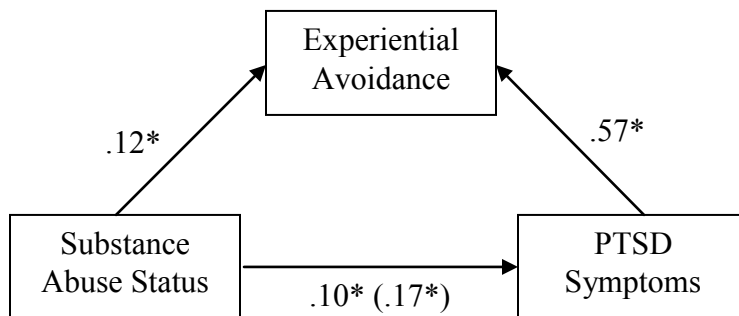
A Sobel test was conducted to determine the significance of indirect effects of the relationship between number of traumatic events experienced on PTSD symptoms as mediated by EA. Results indicated that there was a significant partial mediation in the model,  $z = 2.229, p < .05$ , see Figure 2.



Table 14

*Baron and Kenny Steps of Mediation for Hypothesis 3 Exploratory Findings with SA Predicting PTSD Symptoms*

Step	Estimate	95% CI	Beta	P
1	.35	.13-.56	.17	<.001
2	2.19	.28-4.09	.12	.024
3	.07	.06-.08	.57	<.001
4	.20	.03-.38	.01	.024



*Figure 2.* Mediation diagram with standardized coefficients for exploratory analysis of Hypothesis 3, EA partially mediating the relationship between substance abuse and PTSD symptoms for the entire sample ( $n = 360$ ,  $* p < .05$ ).

Exploratory Analyses Utilizing Gender for Hypothesis 3

When the analyses were run separately for each gender, it was discovered that the significant exploratory finding for the third hypothesis (substance abuse predicting PTSD with EA as a mediator), was no longer significant at the  $p < .05$  level of significance for either gender. This was likely due to power reduction from smaller sample sizes for each gender than the entire sample combined. For males, the first step with substance abuse predicting PTSD symptoms was significant,  $R^2=.04$ ,  $F(1, 138)= 5.901$ ,  $p < .05$ . The second step with substance abuse predicting EA symptoms was not significant,  $R^2= .02$ ,  $F(1, 139)= 2.816$ ,  $p = .10$ . For females, the first step with substance abuse predicting PTSD symptoms was significant,  $R^2= .02$ ,  $F(1, 218)= 4.552$ ,  $p < .05$ . The second step with substance abuse predicting EA was not significant,

$R^2 = .01$ ,  $F(1, 219) = 2.287$ ,  $p = .13$ . For both genders, substance abuse status did not significantly predict EA in the second step of the mediation analysis, therefore the analyses were discontinued.

#### *Hypothesis 4*

The fourth hypothesis stated that: a) PTSD symptoms were expected to be a significant predictor of aggression; participants who evidenced higher PCL scores would also have higher AGQ scores, b) EA was expected to be a significant predictor of aggression as well – in the same direction, such that individuals with higher EA would be more aggressive. In addition, EA was expected to be positively correlated with PTSD symptoms. c) Furthermore, EA was expected to moderate the relationship between PTSD symptoms and levels of aggression. The relationship between PTSD symptoms and aggression was expected to be stronger for participants high in EA than for participants low in EA.

Prior to testing this hypothesis, the predictor variable (PTSD symptom level) and the moderator (EA) were centered in order to eliminate any multicollinearity effects between variables. The variables were centered by subtracting the sample mean from all individuals' scores on the variable, getting a revised sample mean of 0 for that variable. Next simple correlations were utilized to test for the relationship between the variables, see Table 15. The final step of the moderation analysis was a hierarchical multiple regression.

In the first step, the predictor PTSD symptom level (PCL score) was entered. This variable accounted for a portion of the variance in total Aggression scores,  $R^2 = .23$ ,  $F(1, 358) = 104.64$ ,  $p < .001$ . EA (AAQ-II score) was entered in the second step. The model was significant,  $R^2 = .26$ ,  $F(2, 357) = 62.29$ ,  $p < .001$  and EA significantly added to the amount of

variance in the criterion accounted for,  $\Delta R^2 = .03$ ,  $\Delta F(1, 357) = 15.66$ ,  $p < .001$ ,  $\beta = .22$ ,  $b = .47$ ,  $t(359) = 3.96$ ,  $p < .001$ . In the final step of the regression analysis, an interaction term between PCL scores and AAQ-II scores was created (by multiplying the scores) and entered. The overall model was significant,  $R^2 = .27$ ,  $F(3, 356) = 43.30$ ,  $p < .001$  and the interaction accounted for a significant proportion of the variance in aggression scores,  $\Delta R^2 = .01$ ,  $\Delta F(1, 356) = 4.21$ ,  $p < .001$ ,  $\beta = -.10$ ,  $b = -.18$ ,  $t(359) = -2.05$ ,  $p < .05$ . The fourth hypothesis was not supported. Although there was an interaction effect, it was opposite of what was expected. The relationship between PTSD symptoms and aggression was stronger for participants low in EA than for participants high in EA. (See Figure 3).

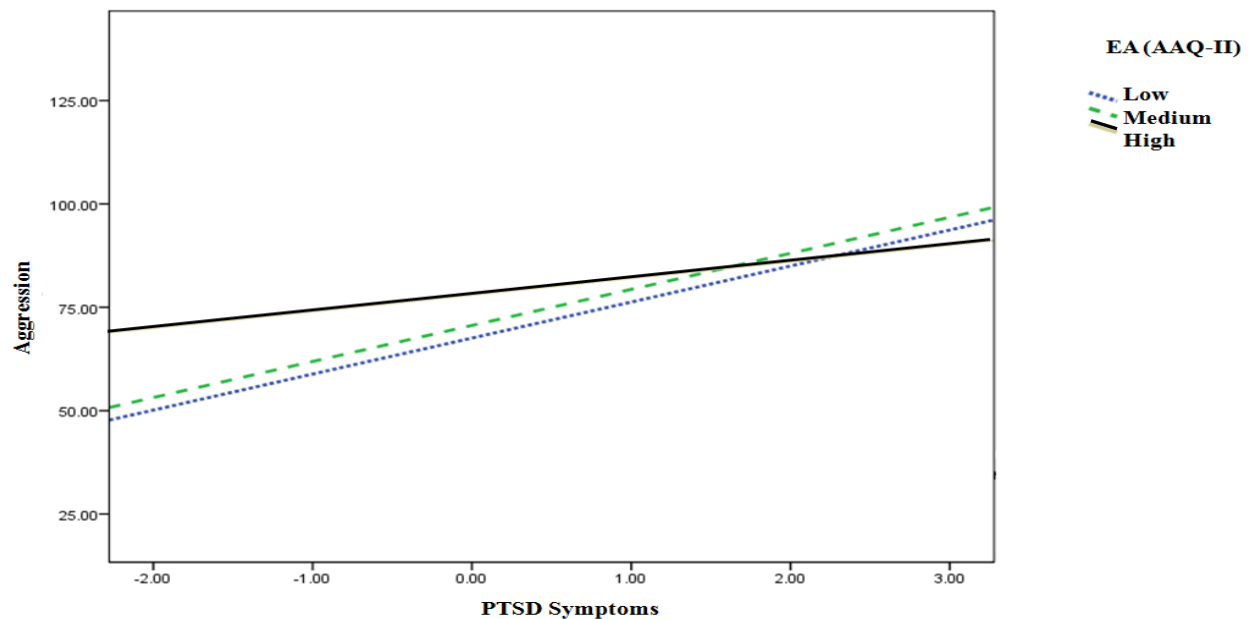


Figure 3. Graphical depiction of the moderation effect of PTSD on aggression by EA for the entire sample ( $n = 360$ ).

Table 15

*Correlations between Variables for Hypothesis 4*

	PCL	AAQ-II	Aggression
PCL	1.00	.59*	.48*
AAQ-II	.59*	1.00	.43*
Aggression	.48*	.43*	1.00

\*Note,  $p < .01$ .

Exploratory Analyses for Hypothesis 4 with the MEAQ

The analyses of the fourth hypothesis were carried out in the same manner as above, utilizing the MEAQ in place of the AAQ-II for exploratory purposes. Although the fourth hypothesis was supported with the AAQ-II, the MEAQ was not found to moderate the relationship between PTSD and Aggression.

Exploratory Analyses Utilizing Gender for Hypothesis 4

When the analyses were run separately for each gender it was discovered that there were differences in the findings between men and women for the fourth hypothesis. The fourth hypothesis was that EA would serve as a moderator, and that the relationship between PTSD symptoms and aggression would be stronger for participants high in EA than for participants low in EA.

The same analyses conducted for Hypothesis 4 for the entire sample, were conducted for males only. In the first step, the predictor PTSD symptom level (PCL score) was entered. This variable accounted for a portion of the variance in total aggression scores,  $R^2 = .17$ ,  $F(1, 138) = 27.39$ ,  $p < .001$ . EA (AAQ-II score) was entered in the second step. The model was significant  $R^2 = .21$ ,  $F(1, 137) = 18.54$ ,  $p < .001$  and EA significantly added to the amount of variance in the criterion accounted for,  $\Delta R^2 = .05$ ,  $\Delta F(1, 137) = 8.24$ ,  $p < .01$ ,  $\beta = .26$ ,  $b = .48$ ,  $t(139) = 2.87$ ,  $p < .01$ .

.01. In the final step of the regression analysis, an interaction term between PCL scores and AAQ-II scores was created (by multiplying the scores). The overall model was significant,  $R^2 = .22$ ,  $F(1, 136) = 12.67$ ,  $p < .001$ , however the interaction was not a significant predictor in the model and did not add a significant proportion of the variance in aggression scores,  $\Delta R^2 = .01$ ,  $\Delta F(1, 136) = .957$ ,  $p = .33$ ,  $\beta = -.08$ ,  $b = -.12$ ,  $t(139) = -.978$ ,  $p = .33$ . This finding not being significant at the  $p < .05$  level of significance may have in part been due to a smaller sample size, reducing the power.

The same analyses conducted for hypothesis four for the entire sample, were conducted for females only. In the first step, the predictor PTSD symptom level (PCL score) was entered. This variable accounted for a portion of the variance in total aggression scores,  $R^2 = .28$ ,  $F(1, 218) = 86.66$ ,  $p < .001$ . EA (AAQ-II score) was entered in the second step. The model was significant,  $R^2 = .31$ ,  $F(2, 217) = 48.51$ ,  $p < .001$  and EA significantly added to the amount of variance in the criterion accounted for,  $\Delta R^2 = .03$ ,  $\Delta F(1, 217) = 7.70$ ,  $p < .01$ ,  $\beta = .20$ ,  $b = .46$ ,  $t(219) = 2.78$ ,  $p < .01$ . In the final step of the regression analysis, an interaction term between PCL scores and AAQ-II scores was created (by multiplying the scores). The overall model was significant,  $R^2 = .32$ ,  $F(3, 216) = 34.38$ ,  $p < .001$  and the interaction was a significant predictor in the model and added a significant proportion of the variance in aggression scores,  $\Delta R^2 = .01$ ,  $\Delta F(1, 216) = 4.53$ ,  $p = .03$ ,  $\beta = -.13$ ,  $b = -.26$ ,  $t(219) = -2.13$ ,  $p = .03$ . As with the entire sample, this finding was opposite of the expected outcome; the relationship between PTSD symptoms and aggression was stronger for participants low in EA than for participants high in EA. (See Figure 4).

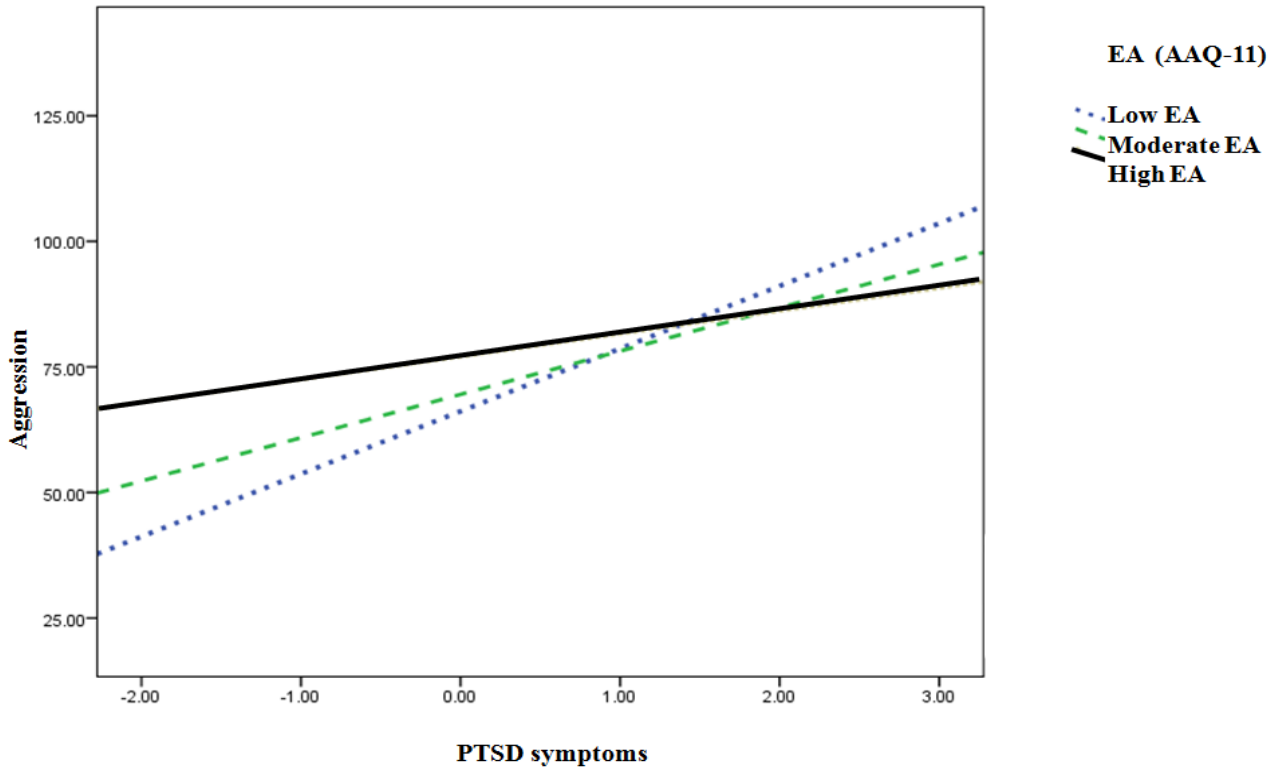


Figure 4. Graphical depiction of the moderation effect of PTSD on aggression by EA for females ( $n = 220$ ).

#### Hypothesis 5

The fifth hypothesis stated that: a) PTSD symptoms were expected to be a significant predictor of impulsivity, such that people who scored highly on the PCL would also score highly on the BIS-11. b) EA was also expected to be a significant predictor of impulsivity in the same direction, such that high AAQ-II scores would correspond with high BIS-11 scores. Further, EA was expected to be positively correlated with PTSD symptoms. Furthermore, EA was expected to moderate the relationship between PTSD symptoms and impulsivity. The relationship between PTSD symptoms and impulsivity was expected to be stronger for participants high in EA than for participants low in EA.

Prior to testing this hypothesis, the predictor variable (PTSD symptom level) and the

moderator (EA) were centered in order to eliminate any multicollinearity effects between variables. The variables were centered by subtracting the sample mean from all individuals' scores on the variable, getting a revised sample mean of 0 for that variable. Next simple correlations were utilized to test for the relationship between the variables (See Table 16). The final step of the moderation analysis was a hierarchical multiple regression. Marital status was found to be correlated with impulsivity, therefore it was entered as a covariate in the analyses.

In the first step, the predictor PTSD symptom level (PCL score) and the covariate (marital status dummy coded variables) were entered. PTSD accounted for a small portion of the variance in total impulsivity scores,  $R^2 = .11$ ,  $F(6, 353) = 7.035$ ,  $p < .001$ . EA (AAQ-II score) was entered in the second step. The model with EA entered in was significant,  $R^2 = .12$ ,  $F(7, 352) = 6.711$ ,  $p < .001$  and EA significantly added to the amount of variance in the criterion accounted for,  $\Delta R^2 = .011$ ,  $\Delta F(1, 352) = 4.37$ ,  $p < .05$ ,  $\beta = .13$ ,  $b = .14$ ,  $t(359) = 2.09$ ,  $p < .05$ . In the final step of the regression analysis, an interaction term between PCL scores and AAQ-II scores was created and entered. The overall model was significant  $R^2 = .13$ ,  $F(8, 351) = 6.295$ ,  $p < .001$ , however the interaction did not significantly add to the amount of variance in the criterion accounted for,  $\Delta R^2 = .01$ ,  $\Delta F(1, 351) = 3.10$ ,  $p = .079$ ,  $\beta = -.09$ ,  $b = -.09$ ,  $t(359) = -1.76$ ,  $p = .079$ . The hypothesized relationship between PTSD and impulsivity was supported, however the moderation model with EA moderating this relationship was not statistically significant.

Table 16

*Correlations between Variables for Hypothesis 5*

	PCL	AAQ-II	Impulsivity
PCL	1.00	.59*	.29*
AAQ-II	.59*	1.00	.25*
Impulsivity	.29*	.25*	1.00

\*Note,  $p < .01$ .

## Exploratory Analyses for Hypothesis 5 with the MEAQ

The analyses for hypothesis 5 were repeated and carried out exactly as they were above, utilizing the MEAQ in place of the AAQ-II for exploratory purposes. The moderation model with EA (MEAQ) moderating this relationship was not statistically significant.

## *Hypothesis 6*

The sixth hypothesis stated that: a) Impulsivity was expected to be a significant predictor of substance abuse; participants who evidenced higher BIS-11 scores would have a positive substance abuse status. b) EA was expected to be a significant predictor of substance abuse as well-in the same direction, such that individuals with higher EA would be more likely to have a positive substance abuse status. Furthermore, EA was expected to moderate the relationship between impulsivity and substance abuse. The relationship between impulsivity and substance abuse was expected to be stronger for participants high in EA than for participants low in EA.

Prior to testing this hypothesis, the predictor variable, Impulsivity (BIS-11) and the moderator, EA (AAQ-II) were centered in order to eliminate any multicollinearity effects between variables. The variables were centered by subtracting the sample mean from all individuals' scores on the variable, getting a revised sample mean of 0 for that variable. Next simple correlations were utilized to test for the relationship between the variables (See Table 17). The final step of the moderation analysis was a hierarchical binary logistic regression, due to the dichotomous outcome variable, substance abuse status.

In the first step, gender, age, and year in school were entered as covariates and gender and year in school were noted to be categorical. In the logistic regression calculation these were dummy coded. The overall model was significant,  $\chi^2 = 30.312, p < .001, df = 1,6$ ; Nagelkerke's



$R^2 = .11$ , however only gender was found to be a significant predictor in the model, Wald = 15.34,  $b = -.903$ ,  $\text{Exp}(B) = .406$ ,  $p < .001$ .

In the second step, the predictor impulsivity (BIS-11 total score) was entered and the model was significant,  $\chi^2 = 64.51$ ,  $p < .001$ ,  $df = 1,7$ ; Nagelkerke's  $R^2 = .22$ . Impulsivity was found to be a significant predictor of substance abuse status, controlling for demographic covariates, Wald = 30.12,  $b = .07$ ,  $\text{Exp}(B) = 1.072$ ,  $p < .001$  with a 95% confidence interval of 1.046 to 1.099. EA (AAQ-II score) was entered in the second step and the model was significant,  $\chi^2 = 64.95$ ,  $p < .001$ ,  $df = 1,8$ ; Nagelkerke's  $R^2 = .22$ . EA was not a significant predictor in the model, however, Wald = .439,  $b = .001$ ,  $\text{Exp}(B) = 1.01$ ,  $p = .507$  with a 95% confidence interval of .983 to 1.04.

In the final step of the regression analysis, an interaction term between impulsivity and AAQ-II scores was created (by multiplying the scores) and entered. The overall model was significant,  $\chi^2 = 65.28$ ,  $p < .001$ ,  $df = 1,9$ ; Nagelkerke's  $R^2 = .22$ , however the interaction did not account for a significant proportion of the variance in substance abuse status, Wald = .337,  $b = -.001$ ,  $\text{Exp}(B) = .999$ ,  $p = .561$  with a 95% confidence interval of .977 to 1.00.

The hypothesized relationship between impulsivity and substance abuse status was supported, however the moderation model with EA moderating this relationship was not statistically significant.

Table 17

*Correlations between Variables for Hypothesis 6*

	Impulsivity	AAQ-II	Substance Abuse (0,1)
Impulsivity	1.00	.25**	.30**
AAQ-II	.25**	1.00	.14*
Substance Abuse	.30**	.14*	1.00

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

## Exploratory Analyses for Hypothesis 6 with the MEAQ

Exploratory analyses were conducted reanalyzing the sixth hypothesis utilizing the MEAQ in place of the AAQ-II. The same steps were followed as outlined above. The final step of the moderation analysis was a hierarchical binary logistic regression, due to a dichotomous outcome variable, substance abuse status. The findings were similar to the AAQ-II. EA measured with the MEAQ was not a significant predictor in the model. The exploratory moderation model with EA (MEAQ) moderating this relationship was not statistically significant.

## *Hypothesis 7*

The seventh hypothesis stated that: a) Impulsivity was expected to be a significant predictor of aggression; participants who evidenced higher BIS-11 scores would also have higher AGQ scores. b) EA was expected to be a significant predictor of aggression as well-in the same direction, such that individuals with higher EA would be more aggressive. In addition, EA was expected to be positively correlated with impulsivity. Furthermore, EA was expected to moderate the relationship between impulsivity and aggression. The relationship between impulsivity and aggression was expected to be stronger for participants high in EA than for participants low in EA.

Prior to testing this hypothesis, the predictor variable (impulsivity) and the moderator (EA) were centered in order to eliminate any multicollinearity effects between variables. The variables were centered by subtracting the sample mean from all individuals' scores on the variable, getting a revised sample mean of 0 for that variable. Next simple correlations were

utilized to test for the relationship between the variables (See Table 18). The final step of the moderation analysis was a hierarchical multiple regression.

In the first step, the predictor, impulsivity (BIS-11 total score) was entered. This variable accounted for a moderate portion of the variance in total aggression scores,  $R^2 = .19$ ,  $F(1, 358) = 85.58$ ,  $p < .001$ . EA (AAQ-II score) was entered in the second step. The model was significant,  $R^2 = .30$ ,  $F(2, 357) = 76.21$ ,  $p < .001$  and EA significantly added to the amount of variance in the criterion accounted for,  $\Delta R^2 = .11$ ,  $\Delta F(1, 357) = 54.14$ ,  $p < .001$ ,  $b = .71$ ,  $\beta = .34$ ,  $t(359) = 7.36$ ,  $p < .001$ . In the final step of the regression analysis, an interaction term between BIS-11 scores and AAQ-II scores was created and entered. The overall model was significant,  $R^2 = .30$ ,  $F(3, 356) = 50.66$ ,  $p < .001$ , however the interaction did not significantly add to the amount of variance in the criterion accounted for,  $\Delta R^2 = .000$ ,  $\Delta F(1, 356) = .000$ ,  $p = .993$ ,  $b = 8.19$ ,  $\beta = .000$ ,  $t(359) = .009$ ,  $p = .993$ .

The hypothesized relationship between impulsivity and aggression was supported, however the hypothesized moderation model with EA moderating this relationship was not statistically significant.

Table 18

*Correlations between Variables for Hypothesis 7*

	Impulsivity	AAQ-II	Aggression
Impulsivity	1.00	.25*	.44*
AAQ-II	.25*	1.00	.43*
Aggression	.44*	.43*	1.00

*Note, \* $p < .01$ .*

Exploratory Analyses for Hypothesis 7 with the MEAQ

The seventh hypothesis was reanalyzed exactly as outlined above, utilizing the MEAQ in

place of the AAQ-II for exploratory purposes. The exploratory hypothesized moderation model with EA (MEAQ) moderating this relationship was not statistically significant.

### *Hypothesis 8*

The eighth hypothesis stated that: a) Substance abuse status was expected to be a significant predictor of aggression; participants who evidenced substance abuse would also have higher AGQ scores. b) EA was expected to be a significant predictor of aggression as well – in the same direction, such that individuals with higher EA would be more aggressive. In addition, EA was expected to be positively correlated with substance abuse status. Furthermore, EA was expected to moderate the relationship between substance abuse and levels of aggression. The relationship between substance abuse and aggression was expected to be stronger for participants high in EA than for participants low in EA.

Prior to testing this hypothesis, the predictor variable (substance abuse) was dummy coded (1, -1) and the moderator (EA) was centered in order to eliminate any multicollinearity effects between variables. The variable was centered by subtracting the sample mean from all individuals' scores on the variable, getting a revised sample mean of 0 for that variable. Next simple correlations were utilized to test for the relationship between the variables (see Table 19). The final step of the moderation analysis was a hierarchical multiple regression.

In the first step, the predictor, Substance Abuse status was entered. This variable accounted for a small portion of the variance in total aggression scores,  $R^2 = .02$ ,  $F(1, 358) = 8.77$ ,  $p < .01$ . EA (AAQ-II score) was entered in the second step. The overall model was significant,  $R^2 = .19$ ,  $F(2, 357) = 42.39$ ,  $p < .001$  and EA significantly added to the amount of variance in the criterion accounted for,  $\Delta R^2 = .17$ ,  $\Delta F(1, 357) = 74.22$ ,  $p < .001$ ,  $b = .87$ ,  $\beta = .41$ ,

$t(359) = 8.62, p < .001$ . In the final step of the regression analysis, an interaction term between substance abuse status and AAQ-II scores was created and entered. The overall model was significant,  $R^2 = .19, F(3, 356) = 28.26, p < .01$ , however the interaction did not significantly add to the amount of variance in the criterion accounted for,  $\Delta R^2 = .000, \Delta F(1, 356) = .185, p = .668, b = .04, \beta = .021, t(359) = .430, p = .668$ .

The hypothesized relationship between substance abuse and aggression was supported; however the hypothesized moderation model with EA moderating this relationship was not statistically significant.

Table 19

*Correlations between Variables for Hypothesis 8*

	Substance Abuse (1, -1)	AAQ-II	Aggression
Substance Abuse	1.00	.14*	.16**
AAQ-II	.14*	1.00	.43*
Aggression	.16*	.43*	1.00

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

Exploratory Analyses for Hypothesis 8 with the MEAQ

The eighth hypothesis was repeated following the same steps outlined above, utilizing the MEAQ as a measure of EA in place of the AAQ-II for exploratory purposes. The exploratory hypothesized moderation model with the MEAQ (EA) moderating this relationship was not statistically significant.

## CHAPTER 4

### DISCUSSION

The present study sought to further understand the role of experiential avoidance (EA) as it relates to trauma experience, posttraumatic stress disorder (PTSD), substance abuse, aggression and impulsivity. There are several interesting and potentially useful findings which will be discussed including the prevalence of trauma and substance abuse, findings of simple correlations, the role of EA as a mediator, the role of EA as a moderator, and exploratory findings regarding gender differences and on utilizing the Multidimensional Experiential Avoidance Questionnaire (MEAQ). Further, the clinical implications for these findings, the limitations of the study, and future directions for research will be discussed.

#### Prevalence of Trauma

In the present study, 93.1% of the sample reported that they had either directly experienced or witnessed a traumatic event. Most of the sample (82%) reported they had directly experienced a traumatic event. The prevalence of trauma in the sample was higher than anticipated. It was considered that the considerably higher than expected rate might have resulted from the use of the LEC. One of the options on the LEC is “any other very stressful event or experience” which seems vague and general. Further, “very stressful event” could be interpreted in a number of different ways that may or may not be traumatic. When the potentially problematic item was removed, the total percentage of participants who endorsed having directly experienced a traumatic event dropped to 76.1%, which is more consistent with previously found prevalence rates in the undergraduate college sample. While a variety of

measures have been used to estimate trauma experiences, prevalence rates previously reported in college samples tend to range from 67-84% (Bernat, Rondfeldt, Calhoun, & Arias, 1998; Vrana & Lauterbach, 1994). Even if the prevalence rate for exposure to trauma in this sample is more likely 76% (as compared to 93%), that is still surprisingly high. Clearly the prevalence of trauma in the college population is an area of concern.

It appears that certain traumatic events are more common than others. The present study indicated the most prevalent types of trauma to be transportation accidents (which involves any motor vehicle; 49.2%), physical assaults (27.8%), and “other unwanted or uncomfortable sexual experience” (30.3%) which was listed separately from sexual assault (14.7%). Drivers under the age of 24 represent 14.6% of drivers in the United States, but they are involved in over one fourth of total fatal motor vehicle accidents in the country (National Safety Council, 2002). The age and culture of this sample (college population) makes them more susceptible to a higher incidence of transportation accidents for many reasons including more risk taking behavior, more cell phone use while driving, and more substance abuse than the general population. Studies indicate that substance use and negative incidents related to substance use increase in the first few years of college (Fromme, Corbin, & Kruse, 2008; White, McMorris, Catalano, Fleming, Hagerty, & Abbott, 2006). Furthermore, approximately 2.8 million college students between the ages of 18-24, report driving while under the influence of alcohol (Hingson, Heeren, Winter & Wechsler, 2005). College students have higher rates of cell phone use while driving than the general population (Cramer, Mayer & Ryan, 2007). Research indicates that 86% of college aged cell-phone owners talk on their cell-phones while driving and, 21% of driving accidents or near accidents by college students occurred while they were using their cell phones (Seo & Torabi,

2004). Furthermore, approximately 91% of college students report to have used text messaging while driving (Harrison, 2011).

Even with transportation accidents removed, along with the general question about “any other very stressful event or experience”, the prevalence rate for experiencing a traumatic event in the current sample was 66.1%. The large number of unwanted sexual experiences and sexual assault rates in the present sample is unfortunately fairly consistent with previous findings in college samples (Koss, Gidycz, & Wisniewski, 1987). Further, the rate of completed sexual assaults (14.7%) is consistent with previous research with the undergraduate population at the University of North Texas which was found to be 14.5% in 2008 (Pepper, 2009). This could be explained partially by the higher rates of substance abuse in college populations. Previous research indicates that over one-half of sexual assaults in the college population are committed by men who have been drinking alcohol and half of sexual assault victims in the college population report use of alcohol at the time of the assault (Abbey et. al, 2001). Another study found the prevalence of alcohol related sexual assault was 14.7% in the college population with three times more women than men reporting they had experienced an alcohol related sexual assault (Howard, Griffin, & Bradley, 2008). The current study found relationships between substance abuse, impulsivity and aggression. It could be the case that these relationships in the college population make one more likely to experience or commit a sexual assault. These interpersonal traumas are often related to the development of PTSD.

#### Findings Related to PTSD

The present study found PTSD to be related to substance abuse, aggression, and impulsivity. These relationships were predicted as part of several hypotheses. The findings are



not surprising and are consistent with past research findings that PTSD relates to a variety of symptoms. The correlation between PTSD and substance abuse is consistent with previous findings throughout the literature (Spratt et al., 2009; Spatz-Widom et al., 2006; Enoch et al., 2010; Min et al., 2007; Wilsnack et al., 1997; Dom, De Wilde, Hulstijn, & Sabbe, 2007; Schäfer et al., 2007; Waldrop, Santa Ana, Saladin, McRae, & Brady, 2007). This finding could be explained by self-medication, as mentioned previously, but substance abuse could also predispose someone to the development of PTSD through changes in brain functioning and/or persons predisposing themselves to be more likely to encounter a traumatic situation due to substance abuse. An example of this idea would be a person abusing substances while driving thus resulting in a traumatic event such as a car accident or a person placing oneself in a dangerous situation in order to obtain substances.

The relationship between PTSD and aggression has been established by previous studies as well and was not an unexpected finding in the present study (Jakupcak & Tull, 2005; McFall et al., 1999; Marsee, 2008). One way to conceptualize this relationship is that the hyperarousal symptoms present in PTSD could lead a person to potentially react in an aggressive manner when provoked, particularly if the traumatic event that caused the PTSD was one that involved attack on oneself (combat, rape, physical assault, assault with a weapon, etc.).

The findings of the current study related to PTSD and impulsivity are consistent with the work of other researchers who found a positive relationship between PTSD and impulsivity (Fehon, Grilo, Lipschitz, 2005; Kotler, Iancu, Efroni & Amir, 2001; Ledgerwood & Petry, 2006; Roy, 2005). This could be explained by avoidance in that a person may be so avoidant that they impulsively react in order to avoid thoughts and feelings associated with decisions. Further, the hyperarousal component of PTSD could be contributory as well. Perhaps the on edge feeling, or

the fight or flight reaction coupled with avoidance leaves little time to think things through and impulsivity becomes a quicker, easier, more automatic strategy for coping. On the other hand, this relationship could be understood as impulsivity placing one at more risk to end up in a potentially traumatic situation. As mentioned previously, the most prevalent traumatic experience in the current study was motor vehicle accidents. Impulsivity and substance abuse were correlated in the present study. These factors alone, and even more so combined, could easily lead to risk taking behavior and accidents.

#### Prevalence of Substance Abuse

In the present study, 47% of the sample met the criteria for substance abuse, based on typically used cut-offs for the DUDIT and the AUDIT. In terms of type of abuse, 35.8% of the sample met criteria for alcohol abuse and 30.6% of the sample met criteria for drug abuse. This is consistent with previous findings which indicate approximately 38% of college students meet the criteria for either alcohol abuse or dependence and 37.5% of college students engage in illicit drug use within a year time span (SAMHSA, 2005; Knight et al., 2002).

Interestingly, in the current study, the rate of substance abuse was higher for females (55.5%) than for males (34%). This contradicts with previous findings that indicate higher rates of substance abuse for males than females in young adulthood as well as perceptions by society that men engage in higher rates of substance abuse than women (Chen & Jacobson, 2012; Rahav, Wilsnack, Bloomfield, Gmel, & Kuntsche, 2006). Perhaps this had to do with different cutoffs for each gender; however, research for the study of the AUDIT in college populations indicates the use of a lower cutoff for women than men (DeMartini & Carey, 2012; Olthuis, Zamboanga, Ham, & Van Tyne, 2011). Lower cutoffs are typically used for women due to research

indicating women have more physical, mental, and social consequences from substance abuse, even with lower amounts consumed (Brienza & Stein, 2002; Nolen-Hoeksema, 2004; Rossow, Hauge, 2004). There is a lot of variability in the literature regarding gender differences and substance abuse (Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). Recent literature suggests that while there were differences in substance use across gender in the past, this is no longer the case and the gender gap is closing (Bloomfield, Gmel, Neve & Mustonen, 2001; Neve, Drop, Lemmens, Swinkels, 1996; Roche, Deehan, 2002; Wagner, de Andrade Stempliuk, Zilberman, Barroso, & de Andrade, 2007). There is speculation the increase in female drinking prevalence is related to changes in gender roles over time (Nolen-Hoeksema, 2004; Parker & Harford, 1992). This theory may help explain the findings of the current study. It is also important to note that there was a larger sample of women (220) than men (140) in the present study. Perhaps if there were more men in the present study, creating more variability within the sample of men, prevalence across genders would be more equal.

#### Correlations: EA as Related to Externalizing (and Avoidant) Behaviors

The first hypothesis stated that EA would be correlated with substance use, aggression, and impulsivity. As predicted, EA was correlated with substance use, aggression, and impulsivity. Substance use, aggression, and impulsivity could all be conceptualized as avoidant responses or behaviors. As pointed out in literature and discussed often in clinical settings, substance abuse is often seen as an unhealthy, harmful way of attempting to cope with or avoid painful emotions. Persons often turn to substances to block out difficult memories or painful emotions, and may avoid others and isolate as part of their substance use. The finding of the current study is consistent with other findings in the literature (Cooper et al., 1992; Feil &

Hasking, 2008; Ostafin and Marlatt, 2008; Stewart et al., 2002; Edwards et al., 2006; Avants et al., 2000; Kingston et al., 2010).

In terms of the finding of a positive relationship between EA and aggression, a person could avoid angry emotions leading to an aggressive outburst or use aggression as a way to mask other emotions and avoid discussing concerns with someone (passive aggressive behavior). The anger avoidance model suggests that when avoidance is used as a coping strategy to deal with stressful events avoidance can take the form of aggressive behavior (Gardner & Moore, 2008). Interestingly, the anger and hostility subscales of the AGQ were more highly correlated with EA, than the verbal aggression and physical aggression subscales. This could indicate anger and hostility build the more they are avoided, while physical and verbal aggression involve more awareness of emotion and involve placing oneself near the person being confronted, which may not be as avoidant of a behavior. There has been very little research comparing the AAQ-II with aggression; however, a recent study of 49 returning male Iraqi war veterans and their wives found a significant relationship between the ten-item AAQ-II and aggression in the male veterans. This finding was not significant for their wives; however the finding was approaching significance (Reddy, Meis, Erbes, Polusny, & Duke, 2011). The current study found a significant relationship between the AAQ-II and aggression for men and women. The differences in the current study are that the participants are from a college sample, the seven-item AAQ-II was used, a larger sample size was used and a different measure of aggression was utilized. These differences may account for the significant finding for both genders in the current study.

Impulsivity can also be conceptualized as an experientially avoidant response. A person may be more impulsive to avoid having to think through a difficult decision or to avoid having to

face or think about potential consequences of their actions. They may use impulsive decisions as a way to avoid painful experiences. For example, a person might spend a lot of money shopping as a way to try to avoid painful emotions, without thinking through the consequences of not being able to pay important necessary bills. To date, there is little research on the relationship between EA and impulsivity, but a recent study exploring the role of EA in problematic internet pornography use found a significant relationship between impulsivity and the AAQ-II (Wetterneck, Burgess, Short, Smith & Cervantes, 2012). The findings of that study are consistent with the current study in that higher levels of impulsivity were related to higher levels of EA.

When examining the subscales of the BIS-11, the attentional capacity subscale was the most highly correlated with EA (as measured by the AAQ-II and MEAQ) of the subscales, indicating lack of attention to be related to avoidance. This is an interesting finding considering that some of the main components of ACT in the treatment of EA are mindful awareness and contact with the present moment. While the AAQ-II and MEAQ were fairly similar in terms of correlations with the BIS-11 subscales, one interesting difference between the AAQ-II and MEAQ emerged when examining the BIS-11 Non-Planning subscale. The MEAQ was more highly correlated with this subscale than the AAQ-II, which led to the MEAQ being more highly correlated with the BIS-11 overall. Perhaps, the MEAQ taps into more impulsivity type experiences than the AAQ-II does. Prior to the current study, no studies have examined the relationship between the MEAQ and BIS-11 or the MEAQ and AAQ-II. Further research is needed to better understand the similarities and differences between these measures.

### *Gender Differences*

It was determined when examining the genders separately that the relationship between EA (as measured by the AAQ-II) and substance abuse was no longer significant for either gender. This was likely due to having smaller sample sizes, thereby lessening the power and the ability to detect the correlation, as it was a small correlation for the entire sample to begin with. Further, when looking at differences in gender related to EA and substance abuse, the MEAQ was found to be significantly related to substance abuse for men, but not for women. This could mean the MEAQ picks up on differences between genders in terms of substance abuse and there may be something unique in the way men experience EA related to substance abuse. These findings are interesting in the context of previous literature, which suggests alcohol use in male college students is positively related to life satisfaction in regard to social interaction, whereas alcohol use in female college students is negatively related to general life satisfaction and is not related to social satisfaction (Murphy, McDevitt-Murphy & Barnett, 2005). It was expected that EA would be related to substance abuse due to substance abuse serving as an avoidant behavior of negative experiences such as unhappiness and dissatisfaction with life. Perhaps, the MEAQ taps into some avoidance of social experiences and could explain the relationship between male substance abuse and EA on the MEAQ. College males may use alcohol in an attempt to avoid anxiety associated with social situations or to avoid feelings associated with not fitting in by not conforming to peer pressure in certain situations.

Another gender difference that was discovered was that the BIS-11 and the AAQ-II, were not correlated among males, but were correlated among females. Alternatively, the MEAQ and the BIS-II were correlated for males and females in the study. It is important to note, as mentioned previously, that the differences in gender may in part be due to differences in sample

sizes and power differences as there were more women than men in the study. As previously mentioned there is little research on the relationship between impulsivity and EA; however, the previously mentioned study regarding problematic internet pornography use, did not discuss gender differences in regard to the relationship between EA and the AAQ-II (Wetterneck, et al., 2012). It may be the case that the MEAQ-II better relates to impulsivity for males.

#### EA as a Mediator

The present study hypothesized EA would fully mediate the relationship between number of traumatic experiences and PTSD. As expected there was a relationship between number of traumatic experiences and PTSD symptoms. EA was found to partially mediate the relationship between trauma and PTSD, however not to the extent that would be expected based on the literature. However the finding of the present study is consistent with previous research that EA contributes to psychological distress, at least partially.

It appears EA does appear to play a role in PTSD, although there is a bit of a dilemma with this due to the fact that avoidance is also a symptom of PTSD. The DSM-IV (2002) states that an important feature of the diagnosis of PTSD (criterion C) includes, “efforts to avoid thoughts, feelings, or conversations associated with the trauma and efforts to avoid activities, places, or people that arouse recollections of the trauma.” So the question arises of whether avoidance is a symptom that then maintains the disorder or if persons who are avoidant are more likely to develop PTSD. EA likely contributes to the development of PTSD and perpetuates the disorder. One study found that those with avoidant coping strategies prior to a trauma were more likely to develop PTSD than those who did not use avoidant coping strategies prior to the traumatic experience (Gil, 2005). Further, avoidance following trauma has been theorized to

cause PTSD and exacerbates symptoms (flashbacks, nightmares, etc.), which is evidenced by the fact that effective treatments for PTSD often involve in-vivo exposure to the traumatic event that led to the development of PTSD.

The present study did not find as strong of a mediating affect as expected. There may be many factors that contribute to PTSD other than EA such as the type of trauma or personality factors of the individual or it may be that current measures of EA do not fully capture this avoidance. For example, Thompson and Waltz (2010) found mindfulness added to the prediction of PTSD avoidance symptoms above and beyond the predictive ability of EA, such that it explained the variance beyond that accounted for by EA.

Because the literature pointed to substance abuse as an antecedent for trauma, a mediation analysis was conducted with substance abuse predicting PTSD symptoms with EA as a mediator. Interestingly, this finding was significant. This makes sense considering the sample being from a college population. It seems many traumatic experiences in the college population could coincide with substance abuse, for example, date rape or motor vehicle accidents.

The exploratory finding of substance abuse predicting PTSD symptoms with EA partially mediating the relationship, indicates that abusing substances possibly contributes to the development or exacerbation of PTSD symptoms. This makes sense from an avoidance standpoint. EA mediating this relationship may indicate that it is the avoidance factor of substance abuse that contributes to the development of PTSD, not just the substance abuse, per se. As mentioned previously, substance abuse contributes to the likelihood of encountering a traumatic event (abusing substances and driving, or putting oneself in dangerous situations in order to obtain a substance). One possibility is that the avoidance of traumatic experience following substance abuse, is exacerbated through continued substance abuse, thereby



contributing to the development of PTSD symptoms. Interestingly, when analyzing this hypothesis for each gender separately, the finding was no longer significant, due to EA no longer being significantly related to substance abuse. As mentioned previously, this seems related to having a smaller sample size, because gender was not found to be a significant predictor in the model when running this analysis in the entire sample.

### EA as a Moderator

The current study hypothesized EA would moderate several relationships between PTSD, aggression, impulsivity, and substance abuse based on several previous studies that have demonstrated EA to moderate various relationships between several variables including PTSD, other psychological distress, substance abuse, aggression, and impulsivity.

#### *EA as a Moderator for PTSD and Substance Abuse*

It was hypothesized that EA would moderate the relationship between PTSD and substance abuse. The relationship between PTSD symptoms and substance abuse was expected to be stronger for participants high in EA than for participants low in EA. A significant relationship was found between PTSD and substance abuse, but EA was not a significant predictor and did not significantly moderate the relationship. Previous studies, to the researcher's knowledge, have not examined this exact relationship. However, the findings of this study seem contradictory to previous research in related studies. For example, Ostafin and Marlatt (2008) and Stewart et al. (2002) found EA to act as a moderator in substance abuse related behaviors. Perhaps there is something unique about the trauma and substance abuse relationship, which those studies which focused on cognitions and motivation for substance use did not pick up on.

Additionally, this study used a measure that collapsed alcohol and other substances into one dichotomous measure and some information may have been lost in that process.

### *EA as a Moderator for PTSD and Aggression*

It was hypothesized EA would moderate the relationship between PTSD and aggression. The relationship between PTSD symptoms and aggression was expected to be stronger for participants high in EA than for participants low in EA. A significant relationship was found between PTSD and aggression and EA was found to moderate this relationship, however EA moderated this relationship in the opposite direction than hypothesized. The relationship between PTSD symptoms and aggression was stronger for participants low in EA than for participants high in EA. Upon further exploratory analysis of this hypothesis when looking at genders separately, this finding was significant for females, and not significant for males, however effect sizes were comparable, thus these findings may also exist for men if utilizing a larger sample of men.

The finding of the relationship between PTSD symptoms and aggression being stronger for participants low in EA than for participants high in EA was surprising, given that previous literature has found that EA plays an important role in the relationship between PTSD and aggression (Tull et al., 2007). Research on the relationship between EA and aggression is lacking, however. Recent research suggests the hyperarousal symptom cluster of PTSD is a stronger predictor of aggression than other clusters such as avoidance or re-experiencing of symptoms (Taft, Kaloupek, Schumm, Marshall, Panuzio, King & Keane, 2007). The findings of the current study support this, as it appears that higher levels of experiential avoidance are related to lower levels of PTSD and aggression rather than higher levels. Gardner and Moore

(2008) discuss that anger/aggression may be secondary reactions to another emotion and that this is particularly common with fear as a primary emotion. Perhaps it is an awareness of the emotion of fear (low EA) that relates to higher levels of aggression. According to a study by Murphy et al. (2004), 48% of persons with a diagnosis of PTSD report difficulties with anger. Fear and anger/aggression are thought to be adaptive and autonomic emotions that originally served to protect humankind. These emotions are tied to bodily autonomic responses such as pulse rate, adrenaline, perspiration, breathing, and so forth (Kemper, 1987). Perhaps, the hyperarousal aspect of PTSD (fear) is closely associated with aggression and these occur in a more automatic state without as much thought or control. Therefore, some avoidance and attempt to stop these reactions or lessen them is helpful in preventing aggressive outbursts or unhealthy responses to anger. Further, venting aggressive behavior has been found to increase the experience of anger, contrary to popular societal beliefs that releasing anger in a cathartic way is helpful in reducing feelings of anger (Bushman, 2002). As mentioned earlier in this paper, some avoidance is beneficial, such as during an important job interview one might avoid feelings of anxiety in order to better answer questions. It is when the avoidance interferes with values and becomes excessive that it becomes problematic. Perhaps, some avoidance is beneficial in reducing aggression particularly in persons with PTSD. Research indicates that PTSD severity is closely related to aggression, including the present study (Byrne & Riggs, 1996; Makin-Byrd, Bonn-Miller, Drescher, & Timko, 2012; Monson, Taft, & Fredman, 2009; Taft et al., 2007).

The moderation effect of EA on the relationship between PTSD and aggression was not significant at the  $p > .05$  level for males and may indicate that EA is not as important in the relationship between PTSD and aggression in men as it is in women. However it is important to note that this finding might be significant in a larger sample of men as the present study had

fewer men than women in the sample. Further, the effect sizes for the samples of men and women, when analyzing them separately, were comparable. This finding is interesting, given that a recent study of male veterans returning from combat found EA to be significantly related to physical aggression for men but not for women, which in fact seems opposite of the findings of the present study. However that study did not study EA as a moderator between PTSD and aggression (Reddy et al., 2011). It is also important to note that their study was of veterans and their wives and the current study involved college students. Further, their study involved a different measure of aggression (Conflict Tactics Scale).

One possible explanation for the gender differences other than a smaller sample of men and women, is that women are two times more likely than men to develop PTSD after exposure to a traumatic event (Kessler et al., 1995). It may be that the women in the present study reported higher levels of PTSD symptoms than the men as well as there were fewer men than women in the study. The differences in gender for this finding may have in part been due to a smaller sample of men than women, thus less power to detect these findings in the sample of men.

#### *EA as a Moderator for PTSD and Impulsivity*

The current study hypothesized PTSD would predict impulsivity and EA would moderate this relationship. The relationship between PTSD symptoms and impulsivity was expected to be stronger for participants high in EA than for participants low in EA. As mentioned previously, a positive relationship was found between PTSD and impulsivity; however, EA did not moderate the relationship. There is currently very little research on the relationship between PTSD symptoms and impulsivity. The current study found a positive relationship such that higher

levels of PTSD were related to higher levels of impulsivity. Impulsivity may predispose one to be more likely to get into potentially traumatic situations due to poor decision making, or perhaps PTSD symptoms impair one's impulse control. It appears EA does not impact the strength of the relationship.

There were gender differences with the relationship between the AAQ-II and BIS-11, but these differences may have been due to a smaller sample of men than women, thus less power in the sample of men to detect this relationship. Males did not have a significant relationship between the AAQ-II and BIS-11. Even when analyzing men and women separately for the hypothesis of EA as a moderator between PTSD and impulsivity, the findings were not significant. Interestingly, as discussed previously, exploratory analyses found EA partially mediated the relationship between PTSD and impulsivity for females, which indicates the role of EA in this relationship is different than what was hypothesized in that rather than strengthening this relationship, EA partially contributes to the relationship and is partially responsible for why these variables are related.

#### *EA as a Moderator for Impulsivity and Substance Abuse*

The current study hypothesized that impulsivity would positively affect substance abuse status and EA would moderate this relationship. The relationship between impulsivity and substance abuse was expected to be stronger for participants high in EA than for participants low in EA. The first part of this hypothesis was confirmed; impulsivity positively predicted substance abuse and this finding is consistent with previous research (Zernicke et al., 2010; Crews & Boettiger, 2009; Carlson et al., 2010). Furthermore, research in this area has determined that impaired control of substance use is correlated with impulsivity, particularly in

undergraduate college samples such as the sample utilized in the current study (Leeman, Kulesza, Stewart, Copeland, 2012; Nagoshi, 1999; Patock-Peckham, King, Morgan-Lopez, Ulloa, Filson-Moses, 2011; Patock-Peckham & Morgan-Lopez, 2006). In the present study, EA did not significantly moderate the relationship between impulsivity and substance abuse as predicted. As mentioned previously, substance abuse can be conceptualized as a behavioral function of EA, which may explain why EA did not affect the relationship. If substance abuse is a form of EA, one could argue EA would not strengthen this relationship because it is already in action through substance abuse. Further research should be conducted to better understand the role of EA in substance abuse.

#### *EA as a Moderator for Impulsivity and Aggression*

It was also hypothesized that impulsivity would predict aggression and EA would moderate that relationship. The relationship between impulsivity and aggression was expected to be stronger for participants high in EA than for participants low in EA. Impulsivity was found to significantly predict aggression; however, EA did not significantly influence the relationship. The finding that impulsivity was related to aggression was consistent with previous findings in the literature. For example, studies have found impulsiveness and aggression to be positively related in depressed persons who had attempted suicide (Perroud, Baud, Mouthon, Courtet, Malfosse, 2011). Further, a study of female batterers concluded that trait anger and impulsivity were significantly related to aggression (Shorey, Brasfield, Febres, Stuart, 2011).

The current study failed to find EA as a moderator for the relationship between impulsivity and aggression. Interestingly, a study of an undergraduate college sample by Dahlen, Martin, Ragan, and Kuhlman (2004) found the similar correlations with the BIS-11 and

AGQ. Furthermore, it was determined that higher levels of boredom were related to higher levels of aggression and that boredom was a much more significant predictor of aggressiveness than impulsivity. From an avoidance lens, one could speculate aggression is a response to avoiding boredom, perhaps EA would moderate the relationship between boredom and aggression. As discussed previously, exploratory analyses found EA partially mediated the relationship between impulsivity and aggression for females, which might indicate the role of EA in this relationship is different than what was hypothesized. Rather than strengthening this relationship, EA partially contributed to the relationship for women in the study.

#### *EA as a Moderator for Substance Abuse and Aggression*

The present study hypothesized substance abuse would predict aggression and EA would moderate this relationship. The relationship between substance abuse and aggression was expected to be stronger for participants high in EA than for participants low in EA. Substance abuse significantly predicted aggression, as did EA, however EA did not serve to moderate this relationship as predicted. The finding of substance abuse predicting aggression is consistent with previous findings in the literature (Carr & Van Deusen, 2004; Cuomo et al., 2008; Hoaken & Stewart, 2003; Kirisci et al., 2009; Koss & Dinero, 1988; Leff et al., 2003; Moore & Stewart, 2004; Stuart, Moore, Kahler, Ramsey, & Strong, 2004; Stuart, Moore, Ramsey, & Kahler, 2003). EA did not moderate the relationship as predicted. It may be the case as mentioned previously, that another variable such as boredom would have a more significant effect as a moderator, particularly in this population.

## Measurement of EA

The current study utilized the AAQ-II as a measure of EA for the purposes of analyzing the hypotheses. A newer measure of EA, the MEAQ was included in this study as an additional measure of EA for exploratory purposes. It appears these measures do not measure the same construct, in that they were significantly correlated ( $r=.55$ ) but not at the level that would indicate they are measuring the same construct. Further, the MEAQ did correlate with aggression, impulsivity, and substance abuse, but was less significantly correlated with substance abuse than the AAQ-II was for the total sample. Furthermore, the AAQ-II was found to partially mediate the relationship between trauma and PTSD symptoms, and moderate the relationship between PTSD and aggression. These same analyses utilizing the MEAQ were not significant. The AAQ-II and the MEAQ were both found to partially mediate the relationship between substance abuse and PTSD symptoms in an exploratory analysis of the third hypothesis.

Further, exploratory analyses for gender revealed differences between the AAQ-II and MEAQ. The AAQ-II was not found to be related to the BIS-11 in men, but it was for women. Further the MEAQ was correlated with substance abuse in men, but this was not the case for women and the AAQ-II was found to be a significant partial mediator of the relationship between impulsivity and aggression in females but not for males. The MEAQ was found to significantly partially mediate the relationship between impulsivity and aggression for both males and females.

The differences between measures could be due to many different factors. One being that the AAQ-II is composed of 7 questions while the MEAQ has 62. The MEAQ is multidimensional with several subscales and the AAQ-II is unidimensional and brief. When reviewing the AAQ-II questions they appear to mostly address avoidance of thoughts, memories,



and emotions and seem that it would also pick up on a person having the idea that negative feelings are incorrect or wrong. The creators of the MEAQ argue that the AAQ-II measures a broader construct than just EA. However, it could be argued that the MEAQ, because it has 62 questions, seems to measure many different areas. Surprisingly, the MEAQ was did not mediate the relationship between trauma and PTSD. If the construct we refer to as EA is in fact responsible and contributory for psychopathology, one would expect a measure of EA to at least partially mediate that relationship, theoretically. The MEAQ was correlated with avoidant behaviors (substance abuse, aggression, impulsivity). Perhaps the MEAQ is better at identifying behavioral components of EA than cognitive or emotional pieces, given that the MEAQ was correlated with substance abuse for males but not for females in the present study. Substance abuse in females in the college population is often related to emotional factors, whereas college males' drinking is more closely tied to social pressure and expectations (Murphy et al., 2005). Several measures of EA have been developed that are problem specific. It might be interesting to see how such measures (e.g., Chronic Pain AAQ, Body Image AAQ, etc.) perform with respect to these variables.

### Clinical Implications

The findings from this study could be useful in further understanding and supporting clinical interventions that are currently being utilized. The present study found that EA is significantly related to impulsivity, aggression, substance abuse, number of traumatic events experienced, and PTSD. Further, EA was found to partially mediate the relationship between number of traumatic experiences and PTSD as well as the relationship between substance abuse

and PTSD. PTSD was related to substance abuse, aggression, and impulsivity. Impulsivity predicted substance abuse and aggression and substance abuse was found to predict aggression.

First of all, the fact that EA is related to these difficulties and in fact mediates and moderates certain outcomes, indicates the need for continuing to treat EA as part of therapy, through techniques such as mindful acceptance and exposure. For example, ACT and Mindfulness Based Stress Reduction (MBSR) have been found to be useful therapies in veteran populations in reduction of PTSD and depressive symptoms (Blevins, Roca, Spencer, 2011; Kearney, McDermott, Malte, Martinez, and Simpson, 2012). Further, ACT has been shown to be effective in the treatment of workplace stress (Bond & Bunce, 2003), psychosis (Bach & Hayes, 2002; Gaudiano & Herbert, 2006), test anxiety (Zettle, 2003), trichotillomania (Woods, Wetterneck, & Flessner, 2006), epilepsy (Lundgren, Dahl, Melin, & Kies, 2006), obsessive-compulsive disorder (Twohig, Hayes, & Masuda, 2006), social anxiety disorder (Dalrymple & Herbert, 2007), chronic pain (McCracken & Eccleston, 2006), cigarette smoking cessation (Gifford et al., 2004), diabetes (Gregg, 2004), depression and anxiety (Forman et al., 2007), and substance abuse (Smout, Longo, Harrison, Minniti, Wickes, & White, 2010). Another form of therapy that is often used in the treatment of PTSD is Prolonged Exposure (PE) therapy, which utilizes exposure techniques to encourage acceptance, rather than avoidance of difficult experiences and situations. PE has been studied extensively and has been found to be an effective therapy for PTSD (Foa, Hembree, Cahill, et al., 2005; Marks, Lovell, Noshirvani, Livanou, Thrasher, 1998; Paunovic, Öst, 2001; Resick, Nishith, Weaver, Astin, Feuer, 2002; Rothbaum, Astin, Marsteller, 2005; Powers, Halpern, Ferenschak, Gillihan, Foa, 2010; Nacasch, Foa, Huppert, et al., 2011).

In terms of substance abuse treatment, the findings of the current study, that EA is positively correlated with substance abuse and even partially mediates the relationship between substance abuse and PTSD is supported by many mindfulness based treatments for substance abuse treatment that have become increasingly popular over the last several years. A study on Vipassana mindfulness meditation in a prison setting compared a sample with no meditation course to a sample that participated in the mindfulness course and determined the mindfulness participants had less substance use and less psychiatric symptoms when followed three months after the mindfulness course was completed (Bowen, Witkiewitz et al., 2006). As mentioned above, ACT has been found to be an effective treatment for substance abuse. Similarly, Mindfulness Based Relapse Prevention (MBRP), which encourages acceptance and awareness of cravings and experiences surrounding substances as a way to decrease craving, has been found to be a promising treatment for substance abuse (Bowen, Chawla et al., 2009). A recent study explored the roles of mindfulness and impulsivity in alcohol abuse and determined that acting impulsively while experiencing a negative affect was positively correlated with amount of alcohol consumption and amount of alcohol- related risk taking behaviors (Murphy & MacKillop, 2012). This could be interpreted as impulsivity serving as a form of avoidance of negative affect.

In regard to impulsivity and aggression, Dialectical Behavior Therapy (DBT) which also utilizes mindfulness and acceptance has been shown to reduce impulsivity in persons diagnosed with Borderline Personality Disorder (BPD) and even impulsive aggression in a prison population (Shelton, Sampl, Kesten, Zhang, Trestman, 2009; Soler et al., 2011).

The finding that the relationship between PTSD symptoms and aggression was stronger for participants low in EA than for participants high in EA has important clinical implications,

and might indicate that it may not always be helpful to target EA in clinical interventions due to the possibility that this could increase aggression in persons with PTSD. It might be important to treat avoidance of a specific trauma, but to encourage some avoidance of persons or situations that tend to evoke aggression. For example, a person avoiding a person who was directly related to their trauma might be beneficial and useful for preventing an aggressive outburst. If the finding of the present study is replicated in other studies, it may be important for clinicians to be aware that while targeting EA in PTSD is important, it may also increase the relationship between PTSD and aggression and that they should use caution and assess for aggressive tendencies in their patients throughout treatment.

Further, the gender differences found in the present study could be important to consider in clinical settings. It may be that treatment approaches should be different for different genders when it comes to certain issues. For example, EA moderated the relationship between PTSD and aggression in females, but not in males, indicating that although the presentation of symptoms of PTSD may appear similar across gender, the underlying relationships and mechanisms may differ by gender, possibly indicating the need for treatment approaches for different genders for certain symptoms of PTSD. However these gender differences should be researched further as they could be related to a difference in sample size for men and women (less power for the sample of men).

### Limitations

The current study had important limitations to consider when interpreting the results. For one, the results of the current study may have limited generalizability. The sample in the current study was limited by location, age, and culture. Students in the university may differ from their

non-university counterparts. Results might differ considerably if this study were replicated using a sample not taken from a university setting, such as an inpatient sample, veteran population, prison inmate sample, or even a general community sample. Related to the use of a university sample, approximately 95% of the participants in the current study fell between the ages of 18-25. If this study were conducted using a broader age range, the findings might also be different. Similarly, over half of the sample (53.6%) identified as White/Caucasian/European and other ethnic groups were less well represented, indicating there may be cultural factors that are not being considered which may further limit the generalizability of the findings presented in this study. Similarly, gender was not equally represented in the sample utilized in this study, as 61.1% of the sample was women. This is especially important to keep in mind when interpreting between group differences. However, it should also be noted that variances between the groups of men and women were not statistically problematic.

Another limitation to this study was that all of the measures were self-report and online. Although this allowed the participants anonymity, it might also affect accuracy. Although the participants' responses were anonymous, they may have answered differently due to the fact they were in a study and may have been influenced by social desirability. For example, participants may not have been completely forthcoming about their substance use, or they may have attempted to answer in ways based on what they thought the study was addressing. Furthermore, because they were completing it online with no monitoring, they could have answered quickly to get through the questions without giving as much thought or effort as they might in a situation with a study administrator present.

Another limitation to this study that could have broadened the interpretation of results, is the failure to assess when traumatic events took place and when substance abuse began. This

information could have contributed to further understanding regarding the relationship between these variables and others in terms of how childhood abuse, for instance, affects substance abuse in college. Furthermore, this was not a longitudinal study. Therefore, although meditation could suggest that one variable leads to a mediator and then to an outcome variable there could be other models that better explain the findings or other variables or mediators that could add more knowledge to the finding or better account for the relationship. Another statistical limitation is sample size with respect to moderation effects. While 360 participants is a generally adequate sample size, detecting moderations often requires larger numbers (Frazier, Tix, & Barron, 2004). With a larger sample, more sophisticated modeling techniques could have been utilized as well, in attempts to integrate relationships more. Finally, as mentioned previously, the MEAQ yielded different results than the measure utilized to test the hypotheses (AAQ-II) on certain hypotheses. This calls into question these findings as well as the measures and whether they are in fact measuring EA, however some of the findings were similar for both measures.

### Directions for Future Research

Many findings in the present study suggest directions for future research. For example, due to the limitations mentioned above, the current study could be replicated to assess for any differences when tested in different populations, such as with a community sample, veterans, prison inmates, etc.

The current study had an exploratory finding that EA partially mediates the relationship between substance abuse and PTSD, in that substance abuse and EA predict PTSD. This is an interesting finding that would benefit from further exploration. Typically, research has studied PTSD as a predictor of substance abuse, however it appears that substance abuse as well as EA

together predict PTSD. Further exploration of this finding could yield important data for clinical utility. One possible option could be a longitudinal study in soldiers where substance use prior to traumatic exposure (deployment) to understand if there is something unique about substance abuse that contributes to the development of PTSD, other than the previously mentioned theories in this paper (puts one more at risk to experience a trauma, or affects the brain's processes). Further, it appears EA somewhat accounts for this finding, indicating that more understanding about the role of EA plays would be helpful in continuing to understand optimal treatments for PTSD and substance abuse.

Further research regarding the gender differences in EA as a moderator for the relationship between PTSD and aggression is warranted. The current study found that EA moderates the relationship between PTSD and aggression for females only, but certain patterns in the data (correlations among the variables and how they changed when entered) indicate hypothesizing about mediation in the relationship between PTSD and aggression for both genders. Further research in this area in general would be useful given that few studies have examined the role of EA in PTSD and aggression. Further, these differences may have been due to differences in sample sizes in the samples of men and women. There was a smaller sample of men and that sample may have lacked the power to detect relationships that were detected in the larger sample of women.

Another direction for future research is studying the relationship between PTSD and impulsivity. The current study found a significant relationship between these variables, however a review of the literature revealed this relationship has hardly been studied. This may be an important consideration as only a few studies have discussed overlap between PTSD and ADHD (Adler, Kunz, Chua, Rotrosen & Resnick, 2004; Brattberg, 2006; Daud & Rydelius, 2009).

Perhaps impulsivity is what contributes to the overlap between these disorders, and future research should investigate the similarities.

Other than the previously mentioned affect of EA as a moderator in the relationship of PTSD symptoms and aggression, EA did not moderate any of the relationships it was hypothesized to moderate. In investigating some of the findings, it seems as if EA may mediate some of these relationships instead. Thus, investigation of a mediational role of EA in the relationships between substance abuse, aggression, and impulsivity is a direction to take this research.

Finally, it seems the measures of EA are not significantly correlated at the level that would suggest they are measuring the same construct, indicating the need to study this EA further. Perhaps it may be necessary to further study the context in which certain measures of EA are better than others to improve the use of these measures for research as well as clinically. The MEAQ is a fairly new measure, and could benefit from further research on its relationship to other variables. The AFQ-Y has shown promising results as a measure for EA with use in the college population (Schmalz & Murrell, 2010). A future research study should incorporate all three of these measures of EA to understand how closely they are related and how they may load onto each other in some way in order to further understand if these measures are measuring the same thing (EA) or in fact, very different, but similar constructs. A study including the AFQ-Y with the MEAQ would be interesting, because it does not appear these have been explored in the same study, likely due to the fact that until recently, the AFQ-Y had only been used in samples of youth.



## Conclusion

EA is an important topic to understanding more about psychological difficulties. It seems often in our society that people view human emotions that are not pleasant to experience (anger, sadness, fear, etc.) as indications there is something wrong with them, when in fact these are part of the human experience. This often leads to EA and in turn exacerbates or creates problems. When a person turns to EA as a method to manage painful, difficult emotions, thoughts, behaviors, and so on, these often grow and worsen. This idea, while seen clinically and treated successfully through newer third wave behavioral therapies, as well as older exposure type therapies, has proven to be a difficult concept to capture and measure on paper.

The aim of this study was to further understand the role EA plays in mediating difficulties as well as moderating them. To date, studies have found EA as a mediator and moderator of many different relationships, as well as correlated with many psychological symptoms and disorders; however, less is known about the role of EA in aggression and impulsivity in general as well as how these may be related to trauma and moderated by EA. This study found EA to be related to PTSD, trauma, substance abuse, aggression, and impulsivity. Further EA was found to significantly partially mediate the relationship between trauma and PTSD. EA also partially mediated the relationship between substance abuse and PTSD. EA was also found to significantly moderate the relationship between PTSD and aggression, such that the relationship between PTSD symptoms and aggression was stronger for participants low in EA than for participants high in EA. Despite these significant findings, many of the proposed hypotheses of EA as a moderator were not significant.

The current study utilized two different measures of EA, one for exploratory purposes, and found differing results from these measures. This may indicate the need to understand more

about measurement of EA and understand what it is that current EA measures are actually measuring. EA is a broad construct, making this a difficult concept to capture on paper.

The present study was able to further knowledge regarding EA as it relates to substance abuse, PTSD, impulsivity, and aggression as well as the role of EA as a mediator and moderator. Further, the present study revealed possible differences in the constructs being measured by the MEAQ and the AAQ-II. EA is an important factor in many psychological difficulties. Research should continue to expand the understanding and measurement of this construct as it is already being treated successfully in clinical setting through techniques such as exposure, mindfulness, and acceptance.

APPENDIX  
DEMOGRAPHICS QUESTIONNAIRE

Instructions: Please provide the following information that is requested below.

**What is your gender?**

- Female
- Male

**Please type your age below:**

**Which of the following best describes your current marital status?**

- Divorced
- Living with another
- Married
- Separated
- Single
- Widowed

**How do you classify yourself with respect to race?**

- Arab
- Asian/Pacific Islander
- Black
- Caucasian/White
- Hispanic
- Indigenous or Aboriginal
- Latino
- Multiracial
- Other

**What is current education classification?**

- Freshman
- Sophomore
- Junior
- Senior
- Graduate Student

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