CHILDHOOD TRAUMA, ADULT PSYCHOSOCIAL STRESS, AND THE MEDIATING EFFECTS OF ALCOHOL CONSUMPTION

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DEDICATION

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The present study examined the relationship between childhood trauma and adult psychosocial stress, and assessed for the potential mediating effects of alcohol consumption. Data were collected from 66 alcohol dependent men currently enrolled in residential drug and alcohol treatment. Participants completed interviews and questionnaires to assess for the experience of childhood trauma, chronic psychosocial stress experienced in the six months preceding treatment, and the frequency and quantity of alcohol consumption.

While the relationship the experience of childhood trauma and adult psychosocial stress was not found to be significant, the presence of a statistical trend was identified. Additionally, alcohol did not mediate the relationship between childhood trauma and adult psychosocial stress. While study hypotheses were not supported, significant relationships were identified between various domains childhood trauma and alcohol consumption. Major findings included significant positive correlations between a total measure of childhood trauma and the number of drinks and the number of drinks consumed per drinking day in the six months preceding treatment, and number of drinks consumed in the six months preceding treatment. Present findings expand upon existing literature by using continuous variables to assess both trauma and stress in an alcohol dependent population.

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ACE – Adverse Childhood Experience

CAI – Childhood Adversity Interview

CMM – Child Multi- Type Maltreatment

CPA – Childhood Physical Abuse

CSA – Childhood Sexual Abuse

CTQ – Childhood Trauma Questionnaire

DrInC – Drinker Inventory of Consequences

HMO – Health maintenance Organization

HPA – Hypothalamic- Pituitary Adrenal

MATCH – Matching Alcoholism Treatments to Client Heterogeneity

SCID – Structured Clinical Interview for DSM-IV Disorders

SRD – Stress Response Dampening

TLFB – Time Line Follow- Back

CHAPTER ONE
Introduction

The relationship between psychosocial stress and alcohol dependence has been widely researched. To date, the literature has painted a muddled picture as to the direction of the relationship (Allan, 1985; Brady & Sonne, 1999; Hart & Fazaa, 2004). In addition to providing conflicting findings, research examining this relationship has consistently been criticized for being riddled with methodological problems that marginalize findings (Allan, 1985; Brown & Birley, 1968; Hart & Fazaa, 2004). The relationship between psychosocial stress and alcohol dependence is further complicated when childhood trauma is taken into consideration. Although studies have linked the experience of childhood trauma with later increased psychosocial stress (Harmer & Sanderson, 1999; McEwen, 1998; Thakkar & McCanne, 2000; Vranceanu, Hobfoll, & Johnson, 2007), and with future alcohol use disorders (Clark, Lesnick, & Hegedus, 1997; MacMillan et al., 2001; Trent, Stander, Thomsen, & Merrill, 2007), the exact relation between these three variables remains unclear. Further research in this area is necessary to clarify the trauma/stress/alcohol relationship in order to more effectively target at–risk populations for early interventions.

Upon the culmination of this review, specific research questions are posed. Specifically, the hypothesis that adult psychosocial stress is predicted by childhood trauma and this relationship is mediated by alcohol use. To elucidate the relation between childhood trauma, alcohol consumption, and adult psychosocial stress, the extant literature is reviewed. Literature pertaining to the relation of childhood trauma and later

development of alcohol use disorders will be reviewed first with a focus on trauma definition, the effect of research design, and possible differential effects of trauma on the sexes. The review provides evidence for links between the experience of childhood trauma and later problematic alcohol consumption. Next, the relationship between alcohol use disorders and psychosocial stress will be examined. Major conceptual approaches and methodological issues inherent to the investigation of the alcohol/stress relationship will be reviewed. The direction of the alcohol/stress relationship is subsequently examined; compelling support for alcohol consumption leading to increased psychosocial stress will be provided. The relationship between childhood trauma and psychosocial stress will also be examined. Literature supporting a link between childhood trauma and increased psychosocial stress is reviewed. Upon the culmination of this review, support for the proposed hypotheses will be summarized.

CHAPTER TWO
Review of the Literature

Childhood Trauma and Future Alcohol Use Disorders

Financial Impact

Childhood trauma has a profound impact on society. Between 1986 and 1993, reports of child maltreatment in the U.S. doubled (U.S. Department of Helath and Human Services, 2010). The most recent national data reported in *Child Maltreatment, 2008* indicated that in that year there were 3.3 million reported cases of suspected abuse and neglect involving an estimated six million children. Of those 3.3 million cases, 772,000 children were victims of substantiated cases of abuse and neglect. Closer examination of the substantiated cases revealed that 71.1% were cases of neglect, 16.1% were cases of physical abuse, 9.1% were cases of sexual abuse, and 7.3% were cases of psychological maltreatment (U.S. Department of Helath and Human Services, 2010). Such high rates of child abuse and neglect take a large economic toll on the national economy, and it is estimated that in 2007 the cost of child abuse and neglect was 103.8 billion dollars (Wang & Holton, 2007).

Alcohol use disorders also have a negative impact on society. It is estimated that ten percent of the U.S. population has an alcohol-related disease, and over 100,000 people die annually from alcohol related diseases and injuries (Cardoso, Wolf, & West, 2009). The national annual health care expenditure for alcohol related problems is roughly 22.5 billion dollars while the total cost of alcohol problems amounts to an

estimated 175.9 billion dollars per year. The estimated cost of alcohol use disorders far outweighs that produced by all other drug problems ($114.2 billion; Rice, 1999).

Childhood Sexual Abuse and Alcohol use Disorders

The relationship between childhood trauma and the subsequent development of substance use disorders has been a popular topic of research. Pertinent work in this area can be categorized based on the particular definition of childhood trauma that is employed (Polusny & Follette, 1995). Much of the literature in this area has used the experience of childhood sexual abuse (CSA) as the sole indicator of childhood trauma. Other researchers have elected to implement a more heterogeneous definition of trauma, including various forms of physical and emotional abuse and neglect (Polusny & Follette, 1995). Both the narrower and broader definitions of childhood trauma seem to arrive at similar conclusions regardless of the heterogeneity of their sample: childhood trauma is positively correlated with the development of future alcohol use disorders (Clark et al., 1997; Hamburger, Leeb, & Swahn, 2008; MacMillan et al., 2001; Trent et al., 2007).

A review of the literature indicated that the relationship between CSA and the development of an alcohol use disorder has been examined both by the substance abuse and CSA camps (Polusny & Follette, 1995). A study by Clark, Lesnick & Hegedus (1997) utilizing self report interviews identified that adolescents being treated for alcohol abuse or dependence were 18-21 times more likely than a control group to report having been sexually abused. Other adverse life events were also more common in the experimental group relative to the control group, including having a close friend die, arguments within the family, and legal difficulties (Clark et al., 1997). A population

based community survey in Ontario utilized a standardized interview to similarly demonstrate that childhood sexual abuse in both men and women was significantly associated with later alcohol abuse and dependence (MacMillan et al., 2001; Mullen, Martin, Anderson, Romans, & Herbison, 1993). Thus, while it is not possible to say that a causal relationship exists between CSA and later alcohol use disorders, it has been demonstrated by multiple researchers that CSA is associated with, and tends to precede, said disorders (Clark et al., 1997; Dembo, Williams, Wothke, Schmeidler, & Brown, 1992).

Studies examining females who have experienced childhood sexual abuse have consistently demonstrated that more severe forms of CSA are associated with excessive alcohol consumption later in life (Kendler et al., 2000; Mullen et al., 1993). In a study examining a random community sample of women, women who had experienced childhood sexual abuse were not statistically significantly more likely to use alcohol than women without a history of abuse. However, women who had experienced childhood sexual abuse involving intercourse were significantly more likely than non-abused women to use excessive amounts of alcohol (34% v. 9%; Mullen et al., 1993). A similar study by Kendler et al. (2000) examined a population-based sample of female adult twins and their experiences of three levels of CSA: non-genital, genital, and CSA involving intercourse. Kendler et al. (2002) concluded that while all three levels of CSA were significantly associated with later alcohol dependence, odds ratios dramatically increased as the severity of the CSA increased (Kendler et al., 2000).

Childhood Physical Abuse and Neglect and Future Alcohol Use Disorders

Studies that have operationalized childhood trauma in a more heterogeneous manner, typically emphasizing physical abuse, have yielded similar results. Trent et al. (2007) found that males and females who self-reported a history of childhood physical abuse (CPA) were significantly more likely than non-abused peers to exhibit alcohol problems (Trent et al., 2007). In addition to finding a link between CSA and alcohol use disorders, the aforementioned study by Clark et al. (1997) found that adolescents being treated for alcohol use disorders were 6-12 times more likely to have been physically abused as compared to control subjects (Clark et al., 1997). Similarly MacMillan et al. (2001) showed that rates of alcohol abuse and dependence in a general population sample were significantly higher for people who had experienced childhood physical abuse as compared to those with no abuse history.

A final noteworthy study retrospectively examined the relationship between ten categories of Adverse Childhood Experiences (ACE) and drug use. Adverse experiences examined in the study included physical abuse, sexual abuse, emotional abuse, physical and emotional neglect, and various forms of household dysfunction. Analysis revealed that each category of ACE increased the likelihood for early initiation of drug use. In addition, those with five or more ACE's were 7- to 10-fold more likely to report illicit drug use problems, addiction to illicit drugs, and parenteral drug use. Total ACE score also had a strong graded relationship to drug initiation extending into adulthood (Dube et al., 2003). These findings demonstrate that each category of ACE, be it CSA or various types of physical abuse and neglect, are associated with future drug problems.

The Effect of Research Design on Childhood Trauma and Later Alcohol Use Disorders

Much of the data supporting a link between trauma and alcohol use disorders is retrospective in nature (Clark et al., 1997; MacMillan et al., 2001; Trent et al., 2007; Widom, Weiler, & Cottler, 1999). It is interesting to note that a prospective examination of this relationship reveals somewhat discrepant findings. The impact of study design was highlighted in a 1999 study by Widom, Weiler, & Cottler. While this study examined drug abuse as opposed to alcohol abuse and/or dependence, its inclusion in this review is necessary in order to report possible study design effects. Widom et al. (1999) examined substantiated cases of child abuse/ neglect from 1967-1971. Study participants were matched with non-abused/ neglected children and followed prospectively into adulthood in order to assess the impact of abuse/ neglect on later drug abuse. Participants were interviewed as adults to assess for self-reported childhood victimization. When the data was examined retrospectively, self-reports of early childhood victimization were strongly associated with increased risk for drug abuse diagnosis for the overall sample, as well as for men and women when they were examined separately. Prospective analysis of the same data, however, painted a much different picture; abused/neglected individuals and controls did not differ in the likelihood of having a lifetime drug abuse diagnosis. "In sum, these analyses, based on a prospective examination of the consequences of childhood victimization, revealed little increase in risk for drug abuse/ dependence diagnosis but a modest tendency for more current drug abuse among victims of childhood abuse/ neglect" (Widom et al., 1999, p. 873).

While these findings are puzzling, one possible explanation has been presented to account for the discrepant findings of retrospective and prospective studies. Widom et al. (1999) cited the concept of *clinician's illusion* as a possible explanation for this

discrepancy. *Clinicians illusion* is the idea that the sample of a given population who work on a long term basis with a clinician is unlike a research sample which more closely resembles persons who "ever" develop a condition. Ultimately, the source of the discrepancy remains unknown, but highlights the complexity of the relationship between child maltreatment and future alcohol use disorders.

Differential Effects of Childhood Trauma on the Sexes

As previously mentioned, 772,000 children were determined to have been victims of abuse or neglect in 2008 (U.S. Department of Helath and Human Services, 2010). Of those substantiated cases, 51.3% of the victims were female, while 48.3% were male (U.S. Department of Helath and Human Services, 2010). Younger children were found to have the highest rates of abuse and neglect; 32.6% of victims were younger than four years of age, 23.6% were between the ages of four and seven, and 18.9% of child victims were between the ages of eight and eleven. Comparable numbers of both sexes between the ages of birth to one year were found to have the highest rates of maltreatment. "The rate of child victimization for boys in the age group of birth to 1 year was 21.8 per 1,000 male children of the same age group. The child victimization rate for girls in the age group of birth to 1 year was 21.3 per 1,000 female children of the same age group" (U.S. Department of Health and Human Services, 2010, P. 26).

A substantial body of literature has demonstrated a link between various types of childhood trauma and future alcohol use disorders. There is some debate as to whether the strength of the relationship is affected by gender. A faction of researchers maintains that the relationship is stronger for women than for men (Langeland & Hartgers, 1998;

Widom, Ireland, & Glynn, 1995). A review by Langeland and Hartgers (1998) reported "current evidence is insufficient to draw conclusions about CSA or CPA and alcoholism among men. Among females, however, there is a higher likelihood of alcohol problems if they were sexually or physically abused as children" (p. 336).

The strength of the relationship between females experiencing childhood trauma and having later problems with alcohol is impressive and adds fuel to the gender debate *(see CSA and Alcohol Use Disorders; Kendler et al., 2000)*. Some researchers have stated that the relationship between childhood trauma and future alcohol use disorders in men may be nonexistent. For example, Widom, Ireland & Glynn (1995) concluded that abused and neglected men were not at increased risk for alcohol problems in young adulthood. That pattern was found to extend into middle adulthood (Widom et al., 1995).

In answer to the aforementioned studies there exists evidence supporting a link between the experience of childhood trauma and later alcohol use disorders in men. A 2007 study of naval recruits produced evidence indicating that the relationship between CPA and alcohol problems was as strong or stronger for men as compared to women (Trent et al., 2007). The risk ratios for males were at least as high as those for women on most alcohol measures. Additionally, CSA was more strongly related to binge drinking in men than in women (Trent et al., 2007). In a cross-sectional survey of all public school students living in a high-risk community Hamburger et al. (2008) similarly presented evidence that CSA endured by boys but not girls, led to heavy episodic drinking. The risk was roughly 25 times higher in those who had experienced CSA than compared to those who had not. In summary, CPA and CSA experienced by men have

been associated with later alcohol abuse, dependence, and binge drinking (MacMillan et al., 2001; Trent et al., 2007).

As noted by Chandy, Blum and Resnick (1996) the smaller body of evidence linking male experienced childhood trauma and later problems with alcohol may be due to the apparent preponderance to study childhood trauma in girls. It has been argued that sexual abuse in boys is seen as uncommon or as having a marginal effect on their future development (Watkins & Bentovim, 1992). Thus, while evidence linking male experienced childhood trauma and later alcohol problems can be found in the literature, the relatively small number of studies may be due to the general lack of investigation into trauma experienced by the male sex.

Psychosocial Stress and Alcohol Use Disorders

Conceptual Approaches

The relationship between adult psychosocial stress and alcohol use has been widely reported in research findings, though the direction of the relationship remains open for debate (Bondy, 1996; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Fillmore & Golding, 1994; Hart & Fazaa, 2004; O'Doherty, 1991). Multiple theoretical models have been proposed to explain the complex relationship between stress and alcohol consumption, but none have proven valid (Pohorecky, 1991). Pohorecky noted that no single model of alcohol ingestion would apply to all individuals; different models may be instrumental for initiating alcohol ingestion and for maintaining alcohol consumption.

Additionally, different models of consumption may apply at each individual life stage (Pohorecky, 1991).

An early and prominent model of the relationship is the tension reduction hypothesis (TRH) formulated by Conger (1956). A review by Pohorecky (1991) noted that the original TRH was based on two experimental observations; that a hungry organism's "drive" can be reduced by alcohol, and that alcohol can decrease the experimentally-induced "neurotic" behavior of animals (Pohorecky, 1991). In general, the TRH posits that alcohol consumption and stress interact in a cycle of negative reinforcement; alcohol is consumed in an effort to decrease tension and emotional distress. Essentially, stressful life events can lead to the consumption of alcohol (Cappell & Greeley, 1987; Conger, 1956; Greeley & Oei, 1999; Pohorecky, 1991).

Conger's original TRH was the dominant theory in the research community for 20 years. As the scientific community began to critically evaluate the original formulation of the TRH, it became clear that this theory was insufficient to thoroughly explain the relationship between alcohol consumption and stress. As noted by Pohorecky (1991)

> It is clear that the TRH as originally postulated is no longer adequate… Considering the multidimensionality of factors that appear to contribute to the control of alcohol ingestion, it is unlikely that a single model could possibly be relevant to alcohol ingestion under all conditions. More likely different models may be relevant to alcohol consumption under specific conditions, or for specific populations. (p. 438)

The realization that the TRH was not adequate to explain all drinking behavior prompted the proliferation of new theories aimed at describing the pathways through which stress may lead to alcohol consumption. As its name suggests, the self-awareness model focuses on the ability of alcohol to decrease distressing self-awareness (Chassin, Mann, & Sher, 1988; Hull, 1981; Pohorecky, 1991; Wilson, 1983). Hull posited that alcohol interfered with the encoding process of self-awareness thereby decreasing "the individual's sensitivity to both the self-relevance of cues regarding appropriate forms of behavior and the self-evaluative nature of feedback about past behavior (Hull, 1981)." Disruption in the encoding process provides psychological relief from stress by decreasing self-criticism and negative affect. However, a critical review of this model indicated that it might not apply to all segments of the population, specifically adolescents (Chassin et al., 1988).

The attention allocation model posits that alcohol decreases stress indirectly through the impairment of the cognitive and perceptual processes. This model differs from the Self-Awareness model in that cognitive and perceptual impairment is not restricted to self-related issues, but rather it expands to all domains. In effect, alcohol acts as a stress buffer rather than a coping mechanism (Pohorecky, 1991).

Deficiencies in the self-awareness model led to the development of the social learning model. The social learning model identifies self-observation as leading to performance judgment, self-evaluation, and affective reaction (Wilson, 1983). This model essentially identifies learning, cognition, and reinforcement as controlling alcohol consumption (Pohorecky, 1991; Wilson, 1983).

Evaluation of the social learning model gave way to the stress response dampening model (SRD) of alcohol ingestion (Pohorecky, 1991). Sudies that applied the SRD model concluded that non-alcohol dependent males determined to be at-risk for developing alcoholism achieved more pronounced reduction of their cardiovascular and affective responses to stress than males not considered being at-risk (Sher & Levenson, 1982). Essentially people who are at-risk for, or are currently experiencing, an alcohol use disorder find the consumption of alcohol greatly reinforcing due to their obtaining a greater amount of stress-response-dampening (Pohorecky, 1991; Sher & Levenson, 1982).

The stress reduction hypothesis is a variant of the TRH and SRD models. This model proposes that people drink in response to *eustress* or good stress, rather than in response to distress. Thus, the cycle of drinking becomes reinforcing and self-perpetuating (Pohorecky, 1991).

The coping model, as its name suggests, states that alcohol is ingested as a coping mechanism, with an individual's expectations about the effects of alcohol consumption modulating the level of consumption (Cooper, Russell, & George, 1988). In effect, individuals who have positive expectancies about the effects of alcohol will ingest more alcohol (Pohorecky, 1991). Some support has been generated for this model. Data from a study of 88 regular drinkers indicated that men who more strongly anticipated positive outcomes or feelings of carelessness from drinking, drank more alcohol on high stress days than they did on low stress days. Additionally, men who anticipated impairment from drinking drank less on stressful days. The association between

expectancy and alcohol consumption was not seen in the women participants (Armeli, Carney, Tennen, Affleck, & O'Neil, 2000).

Methodological Issues in Stress/ Alcohol Studies

As research progressed in the area, findings began to emerge that were somewhat critical of the TRH and the methods used to support it. Data originally put fourth in support of the TRH was called into question due to methodological issues present in its collection (Allan, 1985; Brown & Birley, 1968; Hart & Fazaa, 2004). In fact, methodological issues present in many early TRH studies now lend support to a reverse causation model; the idea that alcohol consumption itself may lead to an increase in stressful life events (Bondy, 1996; Cooper et al., 1992; O'Doherty, 1991; Room, Bondy, & Ferris, 1995; Trent et al., 2007).

One widely cited methodological issue is the concept of the "independence" of the stressful event from the effects of alcohol. The concept of stressful event *independence* was introduced by Brown and Birley (1968) in their examination of schizophrenia and was later applied to alcohol/stress research. They noted, "a major difficulty in this kind of study has been that many events considered as precipitants could simply have been brought about by the unnoticed onset of the condition itself" (Brown & Birley, 1968, P. 204). Only the events untainted by symptoms of schizophrenia should be considered when investigating whether or not a stressful event preceded the onset of schizophrenia. The application of this idea to the alcohol/ stress relationship would necessitate that only stressful events that are totally uninfluenced by alcohol be included in analysis. This concept was further discussed by Allan and Cooke (1985); they pointed

out “marital disharmony could easily arise during such a period [of alcohol use] and be erroneously labeled as a cause rather than a consequence of alcohol misuse” (p. 149). Studies examining stressful life events as possible causes for alcohol consumption therefore should only include events that are clearly outside and separate from the influence of alcohol use. Dohrenwend & Dohrenwend (1978) similarly noted many stressful events are “likely to be manifestations of or responses to underlying pathology rather than causes of such pathology” (p. 9). They postulated that three categories of stressful events would be necessary in order to study stress in relation to any “illness:” a) events that are confounded with the psychiatric condition of illness; b) events consisting of physical illnesses and injuries; c) and events that are independent of the participants physical health and psychiatric condition (Dohrenwend & Dohrenwend, 1978).

An additional methodological problem inherent to the study of stressful life events is the retrospective nature of event recall. As discussed by Allan and Cooke (1985), Bartlett (1932) is credited for developing the concept of *effort after meaning* (Bartlett, 1932). Effort after meaning is the tendency for a person to explain a current condition or situation in terms of previous events or experiences. A seminal study by Stott (1958) examined the frequency of “shocks” reported by mothers who gave birth to children with Downs Syndrome. Stott reported “in a survey by interview and questionnaire, shock and other psychosomatic stress in the form of distress and harassment of the mother, etc. were found to be significantly more frequent in the pregnancies antecedent to both mongoloid and non-mongoloid defect” (p. 54). Though shocks were later found to be irrelevant in the development of Downs Syndrome, the mothers reorganized their memories in an effort to give meaning, or explain away, the

cause of the defect (Allan, 1985). The idea of effort after meaning, and the retrospective nature of life stress studies, present real challenges for many studies advocating for the TRH.

An additional methodological issue that was originally highlighted by Allan & Cooke (1985) is the definition of a stressful event. It was noted that virtually every life event could be noted as a source of stress. Critical examination of events deemed stressful is necessary in order to prevent mundane inconveniences from being regarded as a source of stress, and to prevent the concept of stress from being rendered meaningless (Allan, 1985). It has been suggested that a coding system for stressful events be developed before data collection begins in order to maintain constancy (Allan, 1985).

Direction of the Stress/ Alcohol Relationship: A Review of the Literature

Among researchers who support the idea that stressful life experiences can lead to alcohol consumption there remains debate as to how stress actually effects alcohol consumption. Some researchers have produced data indicating that various forms of psychosocial stress lead to alcohol abuse and dependence (Lloyd & Turner, 2008; Mulia, Ye, Zemore, & Greenfield, 2008). A 2008 study of young adults in an urban community produced data indicating that exposure to adverse life events was implicated in the onset of alcohol dependence. "Lifetime stress exposure exhibits a pattern of association with alcohol dependence that is consistent with a cumulative impact interpretation (Lloyd, 2008, p.217)" that is, both recent events and events more distant in time were associated with the onset of alcohol dependence. A second study, examining social disadvantage as a source of life stress and its association with alcohol use, produced similar results (Mulia

et al., 2008). Caucasians, African Americans, and Hispanics who experienced social disadvantage were found to be at increased risk for *problem drinking.* Problem drinking was operationally defined as having experienced one or more negative social consequences due to drinking and/ or exhibiting multiple symptoms meeting criteria for alcohol dependence. Various types of social disadvantage were associated with a twofold to sixfold greater risk of experiencing alcohol problems (Mulia et al., 2008). In summary, adverse life events and exposure to social disadvantage have been counted as sources of psychosocial stress and have been associated with later alcohol abuse and dependence (Lloyd & Turner, 2008; Mulia et al., 2008).

Other studies have indicated that stress does not necessarily lead to alcohol abuse and dependence, but rather it effects the amount of alcohol consumed (Dawson, Grant, & Ruan, 2005; Hill & Angel, 2005; San Jose, Oers, Mheen, Garretsen, & Mackenbach, 2000). Dawson, Grant, and Ruan (2005) examined the effect of past year acute stress on both volume of alcohol consumption and frequency of consumption. The study revealed a positive relationship between the number of past year stressors and all measures of heavy drinking for men and women. Frequency of heavy drinking increased with each additional stressor, while the frequency of moderate drinking decreased. While stress did not lead participants to drink more often, they did substitute larger quantities of alcohol on days when they drank under stress (Dawson et al., 2005). Similar results were obtained in a study examining negative life events and chronic stressors in relation to alcohol consumption. Under stressful conditions, a person's alcohol consumption was likely to migrate to extremes on the continuum; "people under stressful conditions are more likely to either abstain or drink heavily rather than drink lightly or moderately" (San

Jose, 2000, p. 453). San Jose and colleagues showed that the life event of getting divorced was associated with abstinence from alcohol in men and women, while life events including being the victim of a crime, decrease in financial position, and reporting two or more stressful life events was associated with an increase in alcohol consumption in men. Various sources of chronic stress were differentially associated with either abstinence or increased drinking in both men and women. Chronic stressors associated with abstinence from alcohol in men and women included financial difficulties, unfavorable marital status and unfavorable employment status. Chronic stressors associated with heavy alcohol consumption included unfavorable marital status and unfavorable employment status (San Jose et al., 2000).

Researchers who believe stress is causally implicated in increased alcohol consumption have raised questions regarding possible differential effects for women. While subtle differences may exist in the literature with regard to gender (Schroder & Perrine, 2007), data exists that indicates the experience of life stress is related to increased frequency and quantity of alcohol consumption in women (Hill & Angel, 2005; Schroder & Perrine, 2007).

While the aforementioned studies support the experience of stress leading to various problems with increased alcohol consumption, there remains a substantial body of literature that has cast serious doubt on that linear relationship (Brennan, Schutte, & Moos, 1999; Breslin, O'Keeffe, Burrell, Ratliff-Crain, & Baum, 1995; Hart & Fazaa, 2004; Helzer, Badger, Searles, Rose, & Mongeon, 2006; McCreary & Sadava, 2000; O'Doherty, 1991; Rohsenow, 1982; Schroder & Perrine, 2007). A study of 36 heavy socially drinking men used daily mood and drinking records to investigate the

relationship between daily moods, social anxiety, and alcohol consumption (Rohsenow, 1982). Drinking was unrelated to stressful life experiences and there were no correlations between the frequency and intensity of any daily moods and drinking rates or frequency of intoxication (Rohsenow, 1982); congruent results were reported by McCreary and Sadava (2000). A prospective study of older adults yielded similar findings (Brennan et al., 1999). Adults were interviewed at the beginning of the study, as well as one-year and four years later to assess drinking behaviors and life stress. Stressors were not found to predict heavier or more frequent drinking. In fact, increased health stressors for women, and increased financial stressors for men, were found to be correlated with decreased alcohol consumption (Brennan et al., 1999).

Additional studies further suggests that certain types of stress actually decrease alcohol consumption (Breslin et al., 1995; Helzer et al., 2006). In a 2006 study, 33 males reported their daily alcohol intake and stress levels for two years. Stress was actually inversely related to alcohol consumption; "our findings do not support the concept of increases in drinking as a response to increases in perceived stress" (Helzer, 2000, p. 808). A second prospective study examining middle-aged women and the effects of stress and coping on alcohol use also supported an inverse relationship. In this sample, drinking was found to be inversely related to weekly stress, that is, perceived increases in stress led to decreases in alcohol consumption (Breslin et al., 1995).

Two studies refute the existence of a relationship where stressful events lead to alcohol consumption, and they raise the possibility alcohol consumption may actually lead to increases in life stress (Hart & Fazaa, 2004; O'Doherty, 1991). Both studies derive support for the idea that alcohol consumption may lead to stressful events by

examining alcohol independent vs. alcohol dependent events. O'Doherty's (1991) examination of heroin users and heavy drinkers concluded that while the heroin users and heavy drinkers reported more stressful events than control groups, the majority of stressful events were consequences of the drug/alcohol use itself. When looking at only alcohol/ drug uncontaminated events, the experimental groups actually reported fewer events than the control group. O'Doherty concluded that "although it (alcohol/ drug use) may reduce awareness of one type of life stress, it introduces many new stresses into ones life which possibly become functional in maintaining the drug use and thereby creating further stress" (p.106). It should be noted that while the authors make no mention of whether participants met criteria for substance abuse and/or dependence, participants were recruited from drug and alcohol treatment clinics. Heavy drinkers were also accepted into the study if they drank 50 or more standard units of alcohol each week (O'Doherty, 1991).

A study by Heart & Fazaa (2004) provided additional data to refute the idea that stressful events lead to the consumption of alcohol. College students were administered a life stress index and asked to indicate all stressful events that occurred to them in the past six months. All stress events were subsequently evaluated to determine whether they were likely to have been caused by the abusive use of alcohol. Alcohol uncontaminated stress events included events such as "significant increase in time or distance traveled to daily activities," while a typical alcohol contaminated stress event would be getting fired or laid-off. Alcohol contaminated stress events showed moderately strong associations to alcohol misuse in both men and women, while alcohol uncontaminated stress events were more weakly associated with alcohol misuse. It is important to note that the magnitude of

association between alcohol contaminated stress events and alcohol misuse was stronger for men than for women (25% vs. 9%). The authors concluded that problematic alcohol consumption triggers new life stressors and/ or exacerbates ongoing stressors (Hart & Fazaa, 2004).

Childhood Trauma and Adult Psychosocial Stress

Thus far the progression from childhood trauma to alcohol use disorders, and the directionality of the alcohol stress relationship has been reviewed. If a pathway exists leading from childhood trauma to alcohol dependence and subsequent increases in psychosocial stress, an examination of the relationship between childhood trauma and adult stress is indicated to further clarify the trauma/alcohol/stress interaction.

A review of the literature revealed that the experience of childhood trauma has been associated with increased levels of adult stress (Harmer & Sanderson, 1999; McEwen, 1998; Thakkar & McCanne, 2000; Vranceanu et al., 2007). While no consistent definition of stress is used in the aforementioned studies, stress was generally defined as resulting from some of all of the following experiences; decreased social support, parenting stress, daily hassles, and actual or perceived loss of resources.

One way in which childhood trauma increases adult stress is through its effects on social support (Harmer & Sanderson, 1999; Vranceanu et al., 2007). Vranceanu, Hobfoll and Johnson concluded that child multi-type maltreatment (CMM) was not only predictive of decreased social support and increased stress in adulthood, but that there is a cyclical nature to the relationship. It was noted that CMM makes women more

vulnerable to stressors and additional losses that place increased demands on their lives and further erodes social support (Vranceanu et al., 2007). Decreased social support as a result of negative childhood experiences was also present in a study by Harmer and Sanderson (1999). Harmer and Sanderson examined mothers who were recovering from either drug or alcohol addiction. They noted that higher levels of neglect and growing up in a negative home environment were significantly correlated with lower levels of social support from family, higher levels of distress and parenting stress, and greater use of problematic parenting behaviors. In addition to having lower levels of social support, these mothers utilized social support less than the general population (Harmer & Sanderson, 1999).

In addition to being associated with decreased social support, traumatic events have been associated with increased physical symptoms and physical health problems which can greatly impact perceived stress (Baker, Norris, Jones, & Murphy, 2009; Smith et al., 2009). Smith et al. (2009) found that women with fibromyalgia were three times more likely than healthy controls to report physical, sexual, or emotional abuse as a child. Additionally, for patients with fibromyalgia the experience of child abuse was related to worse overall physical health (Smith et al., 2009). Traumatic events may lead to both increases in stress and worse health across the lifespan (McEwen, 1998; Sapolsky, 1999).

An additional study examined the effect of psychological distress in childhood trauma survivors who abuse drugs. For every type of trauma studied, current psychological distress increased dramatically as childhood trauma severity increased (Medrano, Hatch, Zule, & Desmond, 2002). While psychological distress cannot be equated with psychosocial stress, it seems plausible that two may be highly correlated.

Conclusion and Hypotheses

Based upon the above literature review, the following hypotheses are presented:

1. Adult psychosocial stress in adult alcohol-dependent men is predicted by childhood trauma (see Figure 1 Panel A).

Childhood trauma has been associated with increased levels of psychosocial stress as an adult (Baker et al., 2009; Harmer & Sanderson, 1999; McEwen, 1998; Smith et al., 2009; Thakkar & McCanne, 2000; Vranceanu et al., 2007). Evidence for this progression from trauma to stress has been generated by studies examining social support (Harmer & Sanderson, 1999; Vranceanu et al., 2007), increased physical symptoms (Baker et al., 2009), and physical health problems (McEwen, 1998; Smith et al., 2009), as sources of life stress.

2. The relationship between psychosocial stress and childhood trauma in adult alcohol-dependent men is mediated by alcohol use (see Figure 2).

Childhood trauma has additionally been associated with later alcohol use disorders (see Figure 2 path a). The association appears to be present regardless of whether trauma is defined as consisting solely of CSA, or in a more heterogeneous manor consisting of CSA, CPA, and various forms of neglect (Clark et al., 1997; Dembo et al., 1992; Hamburger et al., 2008; MacMillan et al., 2001; Trent et al., 2007).

After the onset of an alcohol use disorder, the relationship between alcohol consumption and the experience of psychosocial stress is complex. While some research supports the experience of stress leading to increased alcohol consumption (Dawson et

al., 2005; Hill & Angel, 2005; Lloyd & Turner, 2008; Mulia et al., 2008; San Jose et al., 2000), these studies have come under question due to methodological issues inherent to the study of stress i.e., the concepts of illness independent vs. illness dependent events, effort after meaning, and the definition of a stressful event (Allan, 1985; Brown & Birley, 1968; Dohrenwend & Dohrenwend, 1978; Hart & Fazaa, 2004; O'Doherty, 1991). Subsequent studies have suggested, in fact, that the relationship between alcohol use and stress occurs in the reverse direction as initially proposed. That is, alcohol use increases subsequent stress (Hart & Fazaa, 2004; O'Doherty, 1991). Thus, the hypothesis that alcohol consumption acts as a mediator in the relationship between childhood trauma and adult psychosocial stress is proposed.

Primary Aim

To investigate the relationship between childhood trauma and adult psychosocial stress, and whether this relationship is mediated by alcohol consumption.

Childhood trauma will be assessed using the total raw score from the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998). Adult psychosocial stress will be assessed using the total subject rated chronic stress score from the chronic stress portion of the Life Stress Interview (Hammen et al., 1995). Total number of standard drinks consumed in the past six months, as measured by the Time Line Follow Back (TLFB; Sobell & Sobell, 1992) will serve as the measure of alcohol consumption. The primary aim will be investigated through the following research questions: (a) is the experience of childhood trauma associated with an increase in adult psychosocial stress, (b) is the experience of childhood trauma associated with level of alcohol consumption in

adulthood, (c) is alcohol consumption associated with an increase in experienced psychosocial stress, and (d) does level of alcohol consumption mediate the relation between childhood trauma and adult psychosocial stress?

Exploratory Aims

To further investigate the relationship between childhood trauma and adult psychosocial stress and whether this relationship is mediated by alcohol using alternative measures of the constructs of interest.

Exploratory Aim 1: Re-evaluate Hypothesis 2 using alternative measures of childhood trauma. Childhood trauma will be evaluated using individual domain scores from the CTQ, the total trauma score from the Childhood Adversity Interview (CAI; Dienes, Hammen, Henry, Cohen, & Daley, 2006), and individual domain scores from the CAI.

Exploratory Aim 2: Re-evaluate Hypothesis 2 using alternative measures of adult psychosocial stress. Adult psychosocial stress will be evaluated using the total researcher rated chronic score from the Life Stress Interview.

Exploratory Aim 3: Re-evaluate Hypothesis 2 using alternative measures of alcohol consumption. Alcohol consumption will be evaluated using alternative values from the TLFB, lifetime number of drinks consumed, lifetime number of days drank, total days drank in the past six months, and number of drinks consumed per drinking day in the six months preceding treatment. Additionally, total score obtained on the Drinker Inventory of Consequences (DrInC) Lifetime version will serve as a measure of alcohol consumption.

CHAPTER THREE
Methodology

Participants

Inclusionary Criteria

The present study used data from a larger study funded by the Integrative Neuroscience Initiative on Alcoholism (INIAStress; U01AA13515) and the Department of Veterans Affairs. The parent study examined the effects of trauma, stress, and the persistence of hypothalamic-pituitary-adrenal (HPA) axis dysregulation in alcoholism. The inclusion and exclusion criteria of the present study were dictated by the parent study and the complexities involved in the examination of HPA axis functioning.

Sixty-six treatment-seeking males with an active DSM-IV diagnosis of alcohol dependence were studied. In order to be considered eligible for the study, participants must have been between the ages of 18 and 60. A minimum five-year active history of alcohol dependence was required for participation. While consuming other illicit substances was not an exclusionary criterion, participants were required to identify alcohol as their lifetime drug of choice. All participants were enrolled in a residential drug and alcohol treatment program at the time of recruitment and thus abstinent from alcohol consumption.

Rationale for Inclusionary Criteria

Rationale for the inclusion of men alone was mandated by the parent study, which focuses on the examination of the HPA axis and stress response in men. For additional information concerning the exclusion of women from the study see *Rationale for Exclusionary Criteria* section.

The inclusion of patients enrolled in a residential drug and alcohol treatment facility was again mandated by the complexities involved in studying the HPA axis. This criterion was also needed in the present study in order to ensure abstinence from alcohol and drugs through random drug testing. Ensuring that all participants were free from the influences of alcohol and drugs improved the overall quality of participation, improved recall on retrospective measures, and ensured that the physiological effects of withdrawal from alcohol had subsided.

Exclusionary Criteria

Participants were excluded from participation if they had an active Axis I diagnosis (except for PTSD). The use of medications known to effect HPA axis functioning or neural activity within the previous two weeks, including all psychotropic medications, was an exclusionary criterion. Any medical conditions that could have affected HPA axis functioning, possibly endangered the patient's health or behavioral stability, limited cooperation (e.g., dementia), or put the patient at medical risk (i.e., significant hematologic, hepatic, renal, or cardiovascular pathology) were also criteria for exclusion. Thus, patients who concomitantly used anxiolytics, antidepressants, opioids, lithium, anticonvulsants, sedative/hypnotics, buspirone, beta blockers, alpha adrenergic drugs, steroids, beta agonists, clonidine, dopamine agonists, naltrexone, acamprosate, or

disulfiram were also excluded from the study. Patients with past or present neurologic disorders (e.g., head trauma with loss of consciousness requiring hospitalization, transient ischemic attacks, stroke, and/ or tumor) were also excluded from participation.

Rationale for Exclusionary Criteria

Women were excluded from participation in the parent study. HPA axis response differs between the sexes and in women is dependent upon menstrual phase. Additional difficulties of including women in the parent study included clinical and physiological differences between the sexes in stress response, and dependence of biological stress response on menstrual phase.

Due to documented HPA axis alterations in persons with Axis I disorders, and the potential confounds that could arise related to retrospective reporting of stress and trauma, persons with active Axis I non-substance use disorders diagnoses were excluded from participation. Patients with previous Axis I diagnoses were included if they did not meet diagnostic criteria for said diagnosis at the time of screening, and did not require medication for the stabilization of psychiatric symptoms.

Setting

The parent study recruited alcohol-dependent males from two Dallas area residential drug and alcohol treatment facilities: Homeward Bound, Inc., and the Dallas Veterans Affairs (VA) medical center. Alcohol-dependent participants were admitted for inpatient detoxification followed by a three to four week treatment program on a residential unit.

Screening and recruitment by research assistants took place during all phases of treatment.

Procedure

All participants were screened by a trained research assistant. The study was explained to participants and informed consent was obtained. The Structured Clinical Interview for DSM-IV Axis I Disorders (Patient Edition, Version 2.0; SCID) was administered to confirm the absence of active axis I diagnoses (First, Spitzer, Gibbon, & Williams, 1996). Subsequently a medical history and physical, and laboratory studies were obtained to confirm that participation in the study was not contraindicated. Once eligibility was confirmed, trained research assistants administered all interviews and assessments while participants were in residential treatment. Residential treatment facilities utilize 24-hour supervision and breathalyzers following unaccompanied passes or when drinking is suspected. Screening for the use of drugs and alcohol ensured the best possible recall and participation in study activities.

Measures

Childhood Trauma Questionnaire (CTQ)

The Childhood Trauma Questionnaire (CTQ) is a self-administered measure that screens for childhood abuse and neglect. Participants respond to 28 questions on a 5-point Likert scale ranging from *Never True* to *Very Often True*. Participants are asked to respond

based on their experiences "growing up as a child or teenager." The CTQ obtains information on five types of maltreatment including emotional, physical, and sexual abuse, and emotional and physical neglect. The CTQ also includes a 3-item Minimization/Denial Scale for identifying false-negative trauma reports. Items are summed to produce scaled scores ranging from 5-25 to quantify the severity of each type of maltreatment encountered; the higher the score the greater the severity of maltreatment. Scaled scores can be used to identify abuse threshold (i.e., minimal, moderate, severe, or extreme abuse) or converted to a percentile rank (Bernstein & Fink, 1998).

CTQ items reflect common definitions of abuse and neglect as found in the childhood trauma literature. Bernstein and Fink (1998) define the five abuse/neglect domains in the CTQ manual as follows:

> *Emotional abuse* refers to verbal assaults on a child's sense of worth or well-being, or any humiliating, demeaning, or threatening behavior directed toward a child by an older person. *Physical abuse* refers to bodily assaults on a child by an older person that pose a risk of, or result in, injury. *Sexual abuse* refers to sexual contact or conduct between a child and an older person; explicit coercion is a frequent but not essential feature of these experiences. *Emotional neglect* refers to the failure of caretakers to provide a child's basic psychological and emotional needs, such as love, encouragement, belonging, and support. *Physical neglect* refers to the failure of caregivers to provide a child's basic physical needs, including food, shelter, safety and supervision, and health (p. 6).

The *Minimization/Denial* Scale helps to identify individuals who answer with socially desirable responses or individuals likely to produce false-negative reports (Bernstein & Fink, 1998).

The psychometric characteristics of the CTQ were studied across seven samples of clinical and nonreferred individuals: adult substance abusers, adolescent psychiatric inpatients, adult psychiatric outpatients, females with fibromyalgia, females with rheumatoid arthritis, college undergraduate students, and randomly selected female members of a health maintenance organization (HMO). In total, 2,201 men and women with varying ages, income levels, race/ethnicity, and diagnoses were represented in the seven groups (Bernstein & Fink, 1998).

Internal consistency reliability coefficients for the CTQ scales were computed with Cronbach's alpha for all of the validation samples. Median reliability coefficients ranged from satisfactory to excellent. Reliability coefficients for the adult substance abuser sample were as follows: emotional abuse = .84; physical abuse = .81; sexual abuse = .93; emotional neglect = .88; physical neglect = .68 (Bernstein & Fink, 1998).

Test-retest reliability of the CTQ was assessed with the adult substance abuser sample. Intraclass correlations were high: Emotional Abuse, $r = .80$; Physical Abuse, $r = .80$; Sexual Abuse, $r = .81$; Emotional Neglect, $r = .81$; Physical Neglect, $r = .79$; overall, $r = .86$.

Childhood Adversity Interview (CAI)

The Childhood Adversity Interview (Dienes et al., 2006) is a semi-structured interview that focuses on seven subtypes of childhood adversity that occur up to the age of 13 (age

12 and under): separation and loss involving the primary caretaker(s); significant loss involving others and/or life-threatening illness or injury to others or self; physical neglect; emotional abuse or assault; physical abuse or assault; witnessing violence; and sexual abuse or assault. The interviewer is provided with specific prompts and queries designed to elicit information about the concrete behavioral aspects of events. The interviewer is provided with detailed criteria for rating the severity of each of the seven subtypes of adversity. Severity scores range from one, (no evidence of adversity) to five, (extreme adversity: Fink, Bernstein, Handelsman, Foote, & Lovejoy, 1995; Rao, Hammen, Ortiz, Chen, & Poland, 2008).

The CAI is comparable in content to the instrument developed by Fink et al. (1995) which had inter-rater reliability scores ranging between .73 – 1.00 as well as evidence of convergent and discriminant validity. Intraclass correlations for the severity ratings of the current instrument ranged from .63 to 1.00, mean correlation of .86 (Dienes et al., 2006).

UCLA Life Stress Interview (UCLA)

The Life Stress interview is a semi-structured interview that obtains information on both chronic and episodic/acute stress in ten content areas: family relationships, independence from family, close friendships, romantic relationships, social life, school, work, finances, health of subject, and health of family (Hammen et al., 1995). Both the participant and the interviewer make chronic stress severity ratings for each of the ten domains over the previous six months. Chronic stress severity ratings range from 1 (exceptionally good) to 5 (extremely stressful and maladaptive; Rao et al., 2008). Intraclass correlations for test

retest reliability ranged from .73 to .95 with a mean intraclass correlation of .88 (Dienes et al., 2006).

This interview yields ten interviewer ratings of chronic stress severity and ten participant ratings of chronic stress severity. Chronic stress severity ratings can be totaled to obtain participant and interviewer ratings of total chronic stress.

Time Line Follow- Back (TLFB)

The TLFB procedure (Sobell, Maisto, Sobell, & Cooper, 1979; Sobell & Sobell, 1992) was developed as a way to aid in the recall of past drinking behaviors. TLFB administration involves presenting participants with blank calendars and asking them to provide daily estimates of their drinking behaviors over a specific time period. Memory aids are used to enhance participant recall of their drinking behaviors (e.g., listing key dates; identifying periods of regular drinking patterns or periods of abstinence). The research assistant leads the participant through the calendars and aids in the reconstruction of an accurate drinking account. The TLFB has been shown to have high reliability and validity when individually administered by an interviewer (Sobell & Sobell, 1992).

For the purposes of the current study, monthly calendars were used to record drinking behavior for the 90 days leading up to abstinence. Alcohol reports were converted into standard drink units. In addition to the three-month calendar history, a lifetime history of alcohol consumption was obtained. Variables yielded from these procedures include lifetime standard drinks consumed, lifetime number of days drank,

standard drinks consumed in the past 90 days, and number of days drank in the past 90 days.

Drinker Inventory of Consequences- Lifetime Consequences

The Drinker Inventory of Consequences (DrInC) was developed by Miller, Tonigan, and Longabaugh (1995) for use in Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity). The DrInC is a self-administered 50-item questionnaire that measures adverse consequences of alcohol abuse in five areas: physical consequences, intrapersonal consequences, interpersonal consequences, social responsibility, and impulse control consequences (Forcehimes, Tonigan, Miller, Kenna, & Baer, 2007; Hester & Squires, 2008; Miller, Tonigan, & Longabaugh, 1995). The DrInC contains items that examine general alcohol problems apart from consumption and dependence. The 50-item DrInC is available in two forms; one form assesses consequences of alcohol abuse in the past three months, and a second form assesses lifetime consequences of alcohol abuse (Miller et al., 1995).

The Drinker Inventory of Consequences Version-2L (DrInC-2L) assesses the overall number of alcohol related problems that have occurred during a person's life (Miller et al., 1995). Participant responses are converted into five subscale scores as well as a total score. Subscale and total scores can then be converted into decile scores, which compare the survey takers responses to the responses of the normative group. It is important to note that the normative group consisted of 1,728 people who were in treatment for alcohol abuse or dependence (Miller et al., 1995).

The DrInC-2L has been demonstrated to be a valid and reliable measure of the adverse consequences of alcohol (Forcehimes et al., 2007; Miller et al., 1995). Miller et al. (1995) reported internal consistency coefficients (Chronbach) for five of the six scales falling within the .70- .80 range; the physical consequences subscale coefficient was .62. Test-retest Pearson correlations exceeded .90 for five of the six subscales. The Pearson correlation for the impulse control subscale was .79 (Miller et al., 1995). These psychometric findings were replicated by Forcehimes, Tonigan, Miller, Kenna, and Baer (2007). Forcehimes (2007) and colleagues stated, "we found support for convergent, divergent, and discriminate validity of the DrInC. It is non-redundant with measures of consumption and dependence, being more closely related to the later than the former (p. 1703)."

Patient Demographic Form

A patient demographic form that was developed for the purposes of the parent study will be used to compile demographic information. This questionnaire will collect information pertaining to age, race/ethnicity, marital status, and educational attainment (years completed), among other things. The information gathered from the use of this questionnaire will be used to describe the study sample.

Data Analysis

What is a Mediator Variable?

Hypotheses dealing with mediation posit how, or by what means, a predictor variable (*X*) affects a criterion variable (*Y*) through one or more intervening variables, or mediators

(M; Preacher & Hayes, 2008). A variable may be called a *mediator* "to the extent that it accounts for the relation between the predictor and the criterion" (Barron & Kenny, 1986, p. 1176). Panel A of Figure 1 shows the effect of a predictor variable (*X*) on a criterion variable (*Y*). This total relationship between *X* and *Y* is referred to as the *total effect* and is denoted as *c*.

Panel B of Figure 1 shows a *simple mediation model*, where the mediator variable (*M)* mediates the effect of *X* on *Y*. In this model, *c*′ denotes the *direct effect* of *X* on *Y*, while the *indirect effect* of *X* on *Y* through *M* is the product of *a* and *b*. "The indirect effect is interpreted as the amount by which two cases who differ by one unit on *X* are expected to differ on *Y* through *X*'s effect on *M*, which in turn affects *Y*. The direct effect is interpreted as the part of the effect of *X* on *Y* that is independent of the pathway through *M*" (Hayes, 2009, p. 3). When panel A and B are observed together it becomes evident that $c = c' + ab$. Essentially, the indirect effect is the difference between the total effect and the direct effect of *X*: $ab = c - c'$.

Approaches for Testing Mediating Relationships

An early and straightforward method for evaluating mediation is the *causal steps approach* developed by Baron and Kenny (1986). In this approach, *M* is considered a mediator if (1) *X* significantly predicts *Y*, (2) *X* significantly predicts *M*, (3) *M* significantly predicts *Y*, and (4) the relation between *X* and *Y* is reduced when M is included in the analysis (Preacher & Hayes, 2004). If the aforementioned three criteria are met, two additional assumptions must be met; there should be no measurement error

in *M*, and *Y* should not cause *M*. If all of the above requirements are met, the Baron and Kenny method infers that mediation has taken place (Preacher & Hayes, 2004).

Recently, the Baron and Kenny method has been criticized for a variety of shortcomings. A major criticism of this method is that it does not actually quantify the intervening effect, but rather, it infers its existence through testing the aforementioned three hypotheses (Hayes, 2009). Additionally, this method poses a risk of increased Type I and Type II error. As discussed by Holmbeck (2002) and summarized in Preacher and Hayes (2004):

> It is possible to observe a change from a significant X→Y path to a nonsignificant X→Y path upon the addition of a mediator to the model with a very small change in the absolute size of the coefficient. This pattern of results may lead a researcher to erroneously conclude that a mediation effect is present (Type I error). Conversely, it is possible to observe a large change in the X→Y path upon the addition of a mediator to the model without observing an appreciable drop in statistical significance (Type II error; p. 719).

Alternative and more statistically rigorous methods for testing mediation are available; these tests include the Sobel test and the empirical M-test (Hayes, 2009; Preacher & Hayes, 2004). While these tests are considered preferable to the Baron and Kenny method, they too have been criticized for various shortcomings; the Sobel test requires the sample size to be large, and it assumes a normal distribution, while the empirical M-test has been called cumbersome for its required use of tables (Hayes, 2009).

An additional method for testing mediation is the Bootstrapping method. The bootstrapping procedure developed by Preacher and Hayes (2004) is thought to be the

most comprehensive and valid method to assess for mediation (Hayes, 2009; Holmbeck, 2002; Preacher & Hayes, 2004; Reitzel et al., 2010). The Bootstrapping procedure is a nonparametric, formal test for effect size (Preacher & Hayes, 2004). In this method the dataset is randomly sampled many (e.g., 5000) times with replacement and the indirect effect in each sample is calculated. "Upon completion, the analyst will have (5000) estimates of the indirect effect, the distribution of which functions as an empirical approximation of the sampling distribution of the indirect effect when taking a sample of size *n* from the original population" (Hayes, 2009, p. 7).

The bootstrapping method is the preferred method for detecting intervening variable effects for a number of reasons. Bootstrapping is a nonparametric test and thus it makes no assumption about the shape of the sampling distribution. Additionally, it avoids the increases in Type I and Type II error that are inherent in the Baron and Kenny method (Holmbeck, 2002; Reitzel et al., 2010).

Proposed Statistics

The primary aim of this study is to examine the relationship between childhood trauma and adult psychosocial stress, and the potential mediating effects of alcohol; see Figure 2. It is hypothesized that adult psychosocial stress is predicted by childhood trauma and this relationship is mediated by amount of alcohol use. Due to the comprehensiveness of the measures proposed in this study, there are multiple ways to quantify the constructs of interest. See *measures* section for a description of the variables selected for testing of the primary hypothesis. Prior to exploring mediation effects, descriptive statistics were calculated to provide an accurate description of the study sample.

The bootstrapping method for assessing statistical mediation was used in this study. The bootstrapping method was carried out via a macro expansion for SPSS introduced by Preacher and Hayes (2004). The macro initially follows the causal-step approach (Baron & Kenny, 1986). Paths a, b, c, and c′ from Fig. 2 was analyzed using linear regression analyses. Linear regressions will be conducted for the association between childhood trauma and alcohol use (path a), and alcohol use and adult psychosocial stress (path b). In the case of path c, the linear regression for childhood trauma and adult psychosocial stress was calculated, while path c′ was examined correcting for the mediator effects. The size of the mediation effect was computed by multiplying path a with path b. Next, the statistical significance of the mediation effect was tested using a non-parametric bootstrap approach (Preacher & Hayes, 2004). The dataset was randomly sampled 5000 times with replacement and the indirect effect in each sample will be recorded.

Secondary analyses were conducted using the individual domain scores of the childhood trauma and adult psychosocial stress measures. Additionally, the CAI was introduced as an alternative indicator of childhood trauma.

CHAPTER FOUR
Results

Demographic Variables

A total of 66 patients were screened and consented into the study. As can be seen in Table 1, the majority of the sample was Caucasian (71.2%). The average age of the sample was 41.7 years, with a standard deviation of 9.84. The average years of education completed by the participants was 12.2, with a standard deviation of 1.9 years. See Table 1 for participant demographic information.

Childhood Trauma

Childhood Trauma Questionnaire (CTQ)

A total of 58 participants completed the CTQ. The average total raw score reported by participants was 29.92 with a standard deviation of 10.64. Total domain scores were as follows: emotional abuse (M = 5.25, SD = 3.01), physical abuse (M = 7.93, SD = 3.37), sexual abuse (M = 6.11, SD = 3.54), emotional neglect (M = 6.49, SD = 3.01), and physical neglect (M = 4.6, SD = 1.9). See Table 2 for means and standard deviations for each of the CTQ domains.

Childhood Adversity Interview (CAI)

A total of 63 participants completed the CAI. Possible scores on the CAI ranged from 7-35. The average CAI score was 11.4 with a standard deviation of 3.71. Please see Table 3 for descriptive statistics pertaining to individual CAI domains.

Alcohol Consumption

Timeline Follow-Back (TLFB)

The TLFB was used to measure and quantify both lifetime and more temporal patterns of alcohol consumption. Sixty-five participants completed the TLFB. With regard to lifetime alcohol consumption, the lifetime average number of standard drinks consumed was 101,482.13 with a standard deviation of 84,637.34. The average lifetime number of days spent drinking was 6,805.23 with a standard deviation of 3,307.95.

When looking at drinking habits in the six months preceding treatment, participants consumed an average of 2,775.74 standard drinks (SD = 1979.49) and spent an average of 150.44 days drinking (SD = 41.72). The average number of drinks consumed per drinking day in the six months preceding treatment was 18.4 with a standard deviation of 11.5 drinks.

Drinker Inventory of Consequences (DrInC)

A total of 56 participants completed the DrInC. Average DrInC score was 37.07 with a standard deviation of 5.28. A DrInC total score of 37 converts to a decile score of 7, meaning that on average, participants reported an overall high number of alcohol problems compared to a sample of men who met criteria for either alcohol abuse or

dependence. A decile score of 7 indicates a "high" severity of overall alcohol involvement.

Adult Psychosocial Stress

Sixty-three participants completed the UCLA Life Stress Interview. For the purposes of this study only eight of the ten content domains were queried; independence from family and school ratings were omitted as these domains were created with a younger target demographic in mind. Possible scores on the UCLA interview range from eight to forty. The average subject rating of psychosocial stress experienced in the past six months was 17.95 (SD = 5.04). Researcher ratings of stress were somewhat higher, with a mean rating of 23.93 (SD = 4.34).

Data Management

It should be noted that while 66 participants attempted to complete the interviews and questionnaires utilized in this study, not all 66 participants fully completed all parts of the interviews and questionnaires. In instances when a participant did not fully complete an interview or questionnaire the said omission may have prevented the calculation of a domain or total score. For this reason analyses may utilize data from fewer than 66 participants. The number of participants included in each calculation is noted in each respective section.

Hypothesis 1

In order to evaluate Hypothesis 1, the relationship between the total raw CTQ score and the total subject rated UCLA score was examined by calculating the Pearson product-moment correlation coefficient. While analysis of Hypothesis 1 was not statistically significant, $r(54) = .259$, $p = .056$, the presence of a statistical trend is suggested.

To further explore the relationship between childhood trauma and adult stress alternative measures of trauma and stress were examined; total scores as well as domain scores for the CTQ and CAI were used as indicators of childhood trauma, while subject rated and researcher rated chronic UCLA stress scores were used as indicators of adult psychosocial stress. A total of 28 combinations of trauma and stress were assessed. Only the CAI domain of witnessing violence and the UCLA subject rated chronic stress score were significantly correlated $r(54) = .293$, $p = .021$. Due to the large number of correlations that were assessed, the Bonferroni adjusted alpha level of .00178 (.05/28) must be used to evaluate the significance of exploratory finding. Using the Bonferroni adjusted alpha level of .00178 the correlation between CAI witnessing violence and UCLA SR chronic stress score is no longer significant. See Table 4 for trauma/ stress data.

Hypothesis 2

It was hypothesized that the relationship between psychosocial stress and childhood trauma in adult alcohol dependent men would be mediated by alcohol use (see Figure 2).

In Hypothesis 2, total raw CTQ score served as the measure of childhood trauma, number of standard drinks consumed in the past six months served as the measure of alcohol consumption, and subject rated UCLA score served as the measure of adult psychosocial stress. Analysis of Hypothesis 1 indicated that that the total effect of childhood trauma on adult stress was not significant. Before formally assessing for the presence of mediation in Hypothesis 2, the significance of paths *a* and *b* are examined.

Childhood Trauma and Alcohol

In Hypothesis 2, path *a* (see Figure 2) examines the relationship between childhood trauma and alcohol. CTQ total raw score was found to be significantly correlated with the number of standard drinks consumed in the six months preceding treatment $r(54) = .362$, $p < .01$.

In order to further evaluate the relationship between childhood trauma and alcohol c total scores as well as domain scores for the CTQ and CAI were used as indicators of childhood trauma, and TLFB values and DrInC values were used as indicators of alcohol consumption. In total, 84 combinations of trauma and alcohol values were assessed for significant correlations. Findings of significant positive correlations between childhood trauma and later alcohol consumption were numerous. The total CTQ raw score as well as the CTQ domains of emotional abuse, physical abuse, and emotional neglect were all positively associated with the total number of drinks consumed in the six months preceding treatment. The CAI domains of emotional abuse/ assault, physical neglect, and witnessing violence were also positively correlated with the number of standard drinks consumed in the six months preceding treatment. Number of

standard drinks consumed per drinking day in the six months preceding treatment was significantly correlated with CTQ and CAI total scores, all domains of the CTQ, and with the CAI domains of emotional abuse/assault, physical abuse/assault, and witnessing violence. Additionally, the CTQ domain of physical neglect was also positively correlated with total DrInC score. The only negative correlations existed between CTQ total score and lifetime number of days drank, and between the CAI domain of physical neglect and the number of days drank in the six months preceding treatment. See Table 5 for a complete record of childhood trauma/ alcohol consumption analyses.

Alcohol and Adult Psychosocial Stress

Pearson product-moment correlation coefficients revealed that path *b* of Figure 2 was not statistically significant. For a complete record of alcohol consumption/ adult stress analyses see Table 6.

Hypothesis 2: Mediation Analysis

In order to evaluate Hypothesis 2 total raw CTQ score served as the measure of childhood trauma, number of standard drinks consumed in the past six months served as the measure of alcohol consumption, and subject rated UCLA score served as the measure of adult psychosocial stress. Analysis utilizing the SPSS INDIRECT macro (Preacher & Hayes, 2004) indicated that alcohol did not significantly mediate the relation between the CTQ total score and subject-rated UCLA stress score (See Figure 3).

Exploratory Hypotheses

The exploratory hypotheses aimed to re-evaluate the mediation model outlined in Hypothesis 2 (see Figure 2) using alternative measures. In total, 168 variations of the mediation model were evaluated using the aforementioned SPSS INDIRECT macro (Preacher & Hayes, 2004). Mediation was not found to take place in any of the 168 variations.

The Investigation of an Alternative Mediation Model

Given the numerous correlations between childhood trauma and later alcohol consumption, an alternative mediation model was devised and analyzed (See Figure 4, Panel A). Adult psychosocial stress was investigated as a possible mediator in the relationship between childhood trauma and later alcohol consumption. Total raw CTQ score served as the measure of childhood trauma, total subject rated UCLA score served as the measure of adult psychosocial stress, and total number of standard drinks consumed in the six months preceding treatment served as the measure of alcohol consumption. Analyses using the INDIRECT macro (Preacher & Hayes, 2004) revealed that stress did not mediate the relationship between childhood trauma and alcohol consumption (see Figure 4, panel B for analyses).

CHAPTER FIVE
Conclusions and Recommendations

While the correlation between childhood trauma and adult psychosocial stress in Hypothesis 1 was not significant, the *p*- value of .051 suggests the presence of a statistical trend. This trend suggests that if a larger sample had been evaluated, a significant finding may have resulted for Hypothesis 1.

In Hypothesis 2 alcohol was not found to mediate the relationship between childhood trauma and adult psychosocial stress. While the proposed mediation model was not supported, several significant correlations were identified between childhood trauma and alcohol consumption in leg *a* of Figure 2.

Significant Correlations

Childhood Trauma and Adult Psychosocial Stress

Correlations between 28 combinations of trauma and stress variables were evaluated, and only the correlation between the CAI domain of witnessing violence and SR UCLA was found to be significant (see Table 4). Due to the large number of correlations that were assessed, the Bonferroni adjusted alpha level of .00178 (.05/28) must be used to evaluate the significance of all exploratory findings. Using the Bonferroni adjusted alpha level of .00178 the correlation between CAI witnessing violence and UCLA SR chronic stress score is no longer significant. With available literature supporting a relationship between childhood trauma and later stress it is important to discuss possible reasons for null findings.

The lack of more significant findings may be the result of the measure of adult stress used in the present study. The available literature supporting a relationship between childhood trauma and adult stress defined stress as resulting from some or all of the following experiences; decreased social support, parenting stress, daily hassles, and actual or perceived loss of resources (Baker et al., 2009; Harmer & Sanderson, 1999; McEwen, 1998; Smith et al., 2009; Vranceanu et al., 2007). Specifically, in previous studies childhood trauma was found to increase adult stress through its effects on social support (Harmer & Sanderson, 1999; Vranceanu et al., 2007) and later physical symptoms and health problems (Baker et al., 2009; Smith et al., 2009). The measure of stress used in the present study was a cumulative rating of all chronic stress experienced in the six months preceding treatment. It is possible that significant results would have been generated if specific types of stress (i.e., social stress or health related stress) had been used as indicators of stress. Additionally, it is possible that the exclusion of episodic stress events may have diminished the likelihood of finding significant correlations.

While the use of a single total chronic stress score may have decreased the likelihood of finding significant correlations in the current study, it is important to note that it has been argued that the UCLA has overcome some of the shortcomings present in other measures of stress. As noted by Allan and Cooke (1985) standardized interviews, like the UCLA, are preferable to a checklist approach when assessing for stressful life events. Standardized interviews can increase the participant's motivation and involvement, and can clarify the meaning of any ambiguous items (Allan, 1985). The structure present in a standardized interview also eliminates the subjective interpretation

and rating of events. The UCLA may be better than the aforementioned checklist approach for two reasons. First, the UCLA provides structured prompts and requires the interviewer to query and clarify specific areas of stress. Second, the subjective nature of stressful event interpretation is eliminated in the researcher total rating, while preserved in the subject total rating. Thus, the UCLA provides both an objective rating of stress in specified areas, as well as a more subjective measure of stress that takes into account the participants interpretation of various events.

It is also possible that despite literature supporting a progression from childhood trauma to increased psychosocial stress (Baker et al., 2009; Harmer & Sanderson, 1999; McEwen, 1998; Smith et al., 2009; Thakkar & McCanne, 2000; Vranceanu et al., 2007), a progression may not actually take place.

Childhood Trauma and Alcohol

Evaluation of the proposed mediation model revealed numerous positive significant correlations between childhood trauma and later alcohol consumption (see Table 5). The present findings are consistent with existing literature linking the experience of childhood trauma with later alcohol use disorders (Clark et al., 1997; Kendler et al., 2000; Langeland & Hartgers, 1998; MacMillan et al., 2001; Mullen et al., 1993; Polusny & Follette, 1995; Trent et al., 2007). The negative correlation between childhood trauma and later alcohol consumption existed between CTQ total score and lifetime number of days drank. While interesting, this finding is somewhat misleading; lifetime number of days drank does not take into account a participants age. Assessed in tandem with the other trauma/alcohol findings, the negative correlation may suggest that alcohol

dependent men who experienced higher levels of trauma tend to drink heavily for a shorter period of time. When total CTQ score and lifetime number of days drank were re-assessed controlling for age, the correlation was no longer statistically significant $r(50) = -.138$, $p = .321$. Similarly, the negative correlation between the CAI domain of physical neglect and the number of days drank in the six months preceding treatment ($r(61) = -.248$, $p = .050$) requires clarification. As the number of drinks per drinking day was positively correlated with most types of childhood trauma, the observed negative correlation indicates that binging was greater (fewer days drinking but more drinks consumed per drinking day) in those with greater childhood trauma.

The present findings correlating childhood trauma with later alcohol consumption expand upon existing literature. While reviewed literature linked the experience of childhood trauma with later alcohol use disorders (Clark et al., 1997; Kendler et al., 2000; Langeland & Hartgers, 1998; MacMillan et al., 2001; Mullen et al., 1993; Polusny & Follette, 1995; Trent et al., 2007), literature was not found that examined trauma and alcohol consumption as continuous variables. The present study indicates that the severity of trauma experienced within an alcohol dependent population, as assessed by the CTQ total score, is correlated with the amount of alcohol consumed in the six months preceding treatment $r(54) = .362$, $p < .01$. Essentially, the present data indicate that alcohol dependent men who have experienced more childhood trauma drink more heavily before entering treatment.

Alcohol and Adult Psychosocial Stress

Correlations between alcohol consumption or severity of alcohol involvement and level of adult psychosocial stress were not significant (see Table 6). Again, it is possible that the measure of adult psychosocial stress used in the present study contributed to the lack of findings. UCLA total chronic score as rated by either the participant or the researcher excludes all episodically stressful events from the total score, whereas other studies supporting the progression from alcohol consumption to increased stress did not differentiate between chronic and episodic stress (Hart & Fazaa, 2004; O'Doherty, 1991). A more inclusive measure of stress may have yielded significant correlations with alcohol consumption.

Additionally, the fact that the UCLA does not differentiate between alcohol independent and alcohol dependent stress events may have affected findings. As previously discussed, when assessing the relationship between alcohol consumption and stress it is necessary to determine whether the stress event was likely influenced by the use of alcohol (Allan, 1985; Brown & Birley, 1968; Dohrenwend & Dohrenwend, 1978). Hart and Fazaa (2004) used a checklist approach to assess for stressful life events. A version of the College Students Life Event Inventory was administered, and each of the 98-items were rated by a panel of judges as either *contaminated* by the effects of alcohol misuse, or *uncontaminated*. Alcohol contaminated stress events showed moderately strong associations to alcohol misuse in both men and women, while alcohol uncontaminated stress events were more weakly associated with alcohol misuse (Hart & Fazaa, 2004). While it is not possible to differentiate between alcohol independent and alcohol dependent stress events in the UCLA chronic stress interview, the ability to study

only events determined to be contaminated by the effects of alcohol may have produced significant findings.

The lack of significant positive or negative correlations highlights the complexity of the alcohol/ stress relationship. Numerous theoretical models have been put fourth in an attempt to elucidate the alcohol/ stress interaction, but none have proven to be valid (Pohorecky, 1991). While unexpected, present findings indicating that a significant relationship is absent between alcohol and adult psychosocial stress is consist with some existing literature (Brennan et al., 1999; Breslin et al., 1995; Hart & Fazaa, 2004; Helzer et al., 2006; McCreary & Sadava, 2000; Schroder & Perrine, 2007).

Limitations

Limitations present in the current study are important to note. First, analyzed data was subject to a restricted range of values. Since all study participants had a current diagnosis of alcohol dependence, the amount of reported alcohol consumption was uniformly high. This high level of alcohol consumption limits the variability in the sample and decreases the likelihood of detecting correlations between the constructs of interest. If healthy controls or a second participant group carrying a diagnosis of alcohol abuse had been included in analysis, it is possible that very different findings would have resulted. In general, adding variability to the sample would increase the likelihood of significant correlations.

An additional limitation to note resulted from the use of the UCLA life stress interview. As previously mentioned, existing studies linking childhood trauma with later

stress did not differentiate between chronic and episodic stress, and many studies assessed a single facet or domain of stress (Baker et al., 2009; Harmer & Sanderson, 1999; Smith et al., 2009; Vranceanu et al., 2007). Using a combination of chronic and episodic stress or evaluating individual domains of life stress may have provided a more comprehensive measure of life stress.

Additional aspects of the UCLA life stress interview that limit its usefulness are the required retrospective recall of events, and the large window of time for which stress scores are generated. The task of recalling chronic stressors encountered over a six-month time frame and subjectively rating their stressfulness can be difficult. While the checklist approach to stress assessment has drawbacks, it may be preferable as it is far less difficult to simply recall the occurrence of a stressful event than it is to recall and rate the event's stressfulness.

Findings related to path *b* of Hypothesis 2 (see Figure 2) may have been influenced by an additional characteristic of the UCLA life stress interview; the fact that it does not differentiate between alcohol independent and alcohol dependent stress events. As previously discussed, it is necessary to differentiate between alcohol independent and alcohol dependent events (Allan, 1985; Brown & Birley, 1968; Dohrenwend & Dohrenwend, 1978). Including only stress events influenced by the effects of alcohol would have been preferable, and may have impacted study findings. As previously mentioned, a study by Hart and Fazaa (2004) concluded that alcohol contaminated stress events showed moderately strong associations to alcohol misuse in both men and women, while alcohol uncontaminated stress events were more weakly associated with alcohol misuse.

Implications and Directions for Future Research

The statistical trend detected in the analysis of Hypothesis 1 highlights the need to re-evaluate the relationship between childhood trauma and adult psychosocial stress utilizing a larger sample size. Had more participants been included in the analysis of Hypothesis 1 statistically significant findings may have resulted.

While the UCLA chronic stress interview has many positive attributes (i.e., structured questions, specific prompts, and both subjective and objective stress ratings) future research may benefit by incorporating an alternative measure of adult stress to reassess the hypotheses tested in the current study. A stress measure that differentiated between alcohol independent and dependent events, produces individual domain stress scores, as well as a total score incorporating both chronic and episodic sources of stress, may be indicated. One option would be to follow the procedure outlined by Hart and Fazaa (2004). A checklist style stress assessment could be administered, and items could be assessed by a panel to assess for the contamination of the stress event with alcohol.

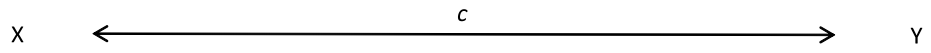
While study Hypothesis 2 was not supported, some interesting and significant findings linking childhood trauma with alcohol consumption were generated. These findings expanded upon existing literature by assessing both trauma and alcohol consumption as continuous variables within an alcohol dependent population. Present findings indicate that alcohol dependent men who have experienced more severe childhood trauma drink more heavily before entering treatment. Combining existing data linking the experience of childhood trauma with later alcohol use disorders (Kendler et

al., 2000; MacMillan et al., 2001; Mullen et al., 1993; Trent et al., 2007; Zierler et al., 1991) with the knowledge that men who drink more heavily before entering treatment likely experienced more severe trauma, could help guide mental health professionals in their care and treatment planning. This knowledge may prompt mental health professionals to more closely monitor and assess for the presence of alcohol related disorders in individuals who report having experienced childhood trauma. Additionally, when working with individuals in treatment for alcohol dependence, counselors may use this knowledge to more rigorously assess for a history of childhood trauma.

APPENDIX A
Figures

Figure 1. Simple Mediation Model

Panel A



Panel B

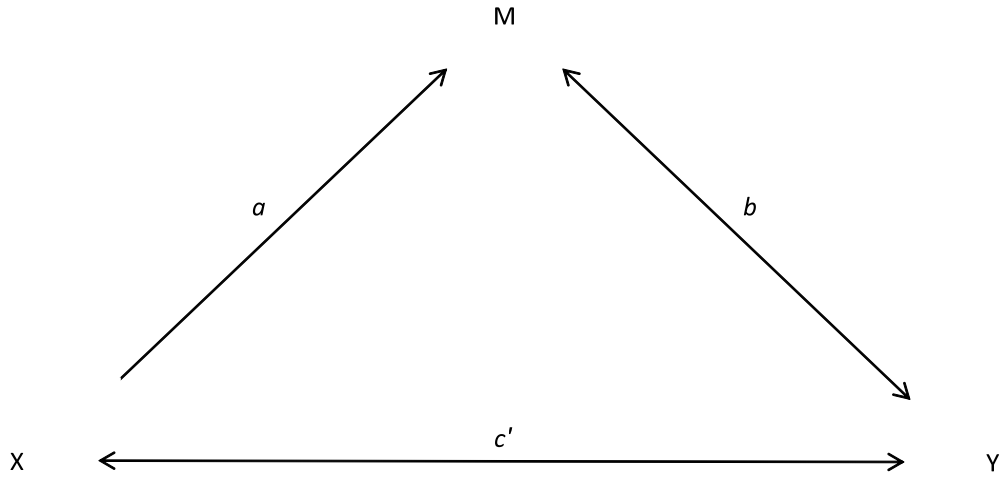


Figure 2.

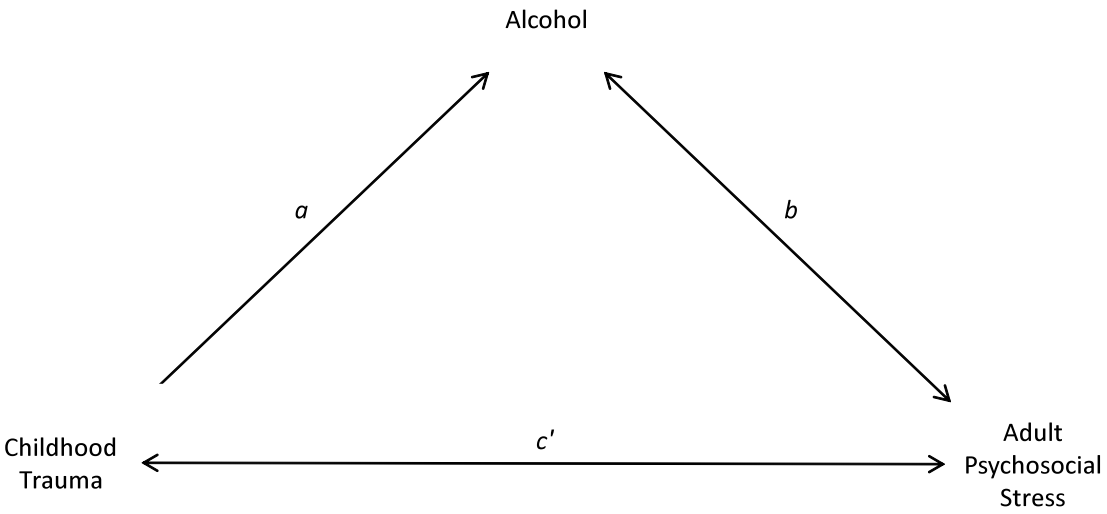


Figure 3.

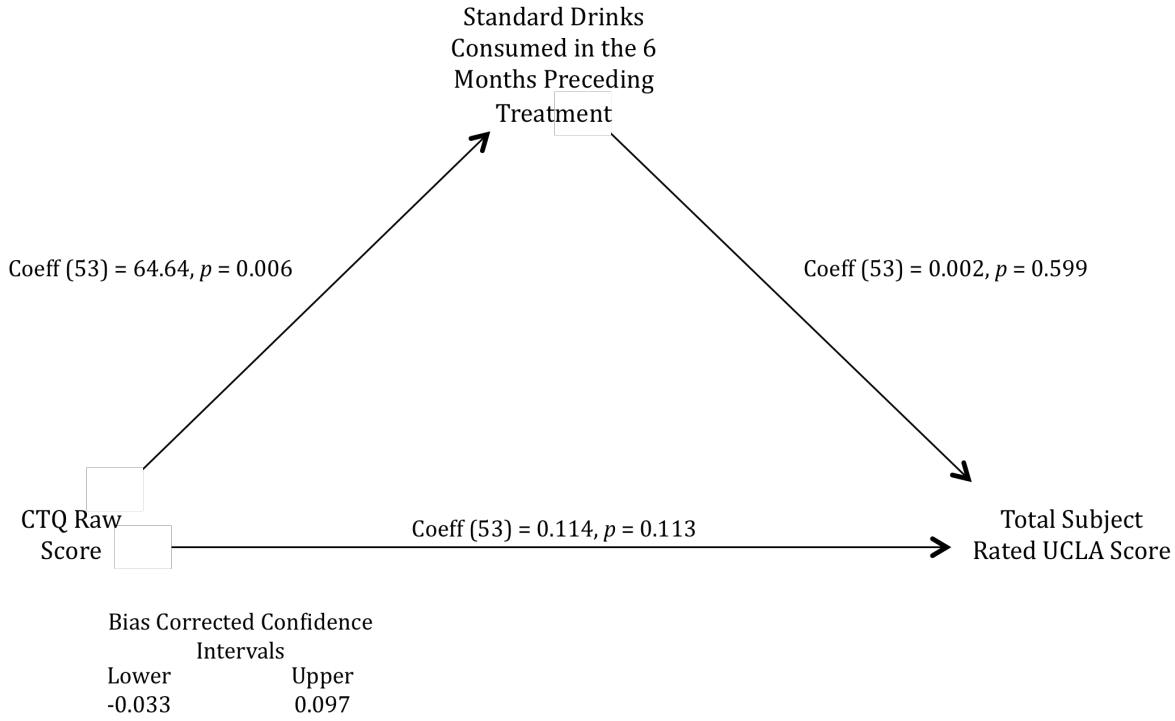
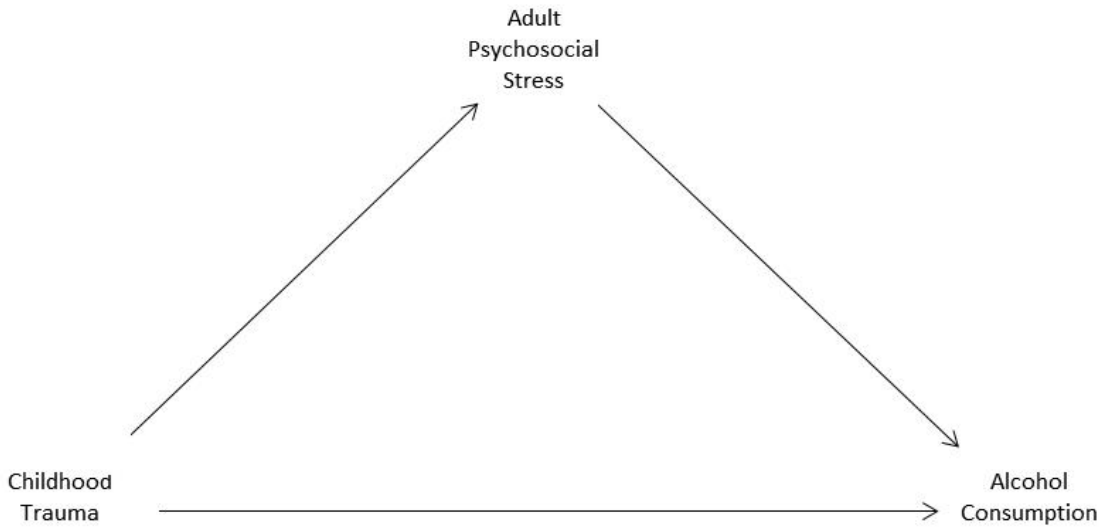
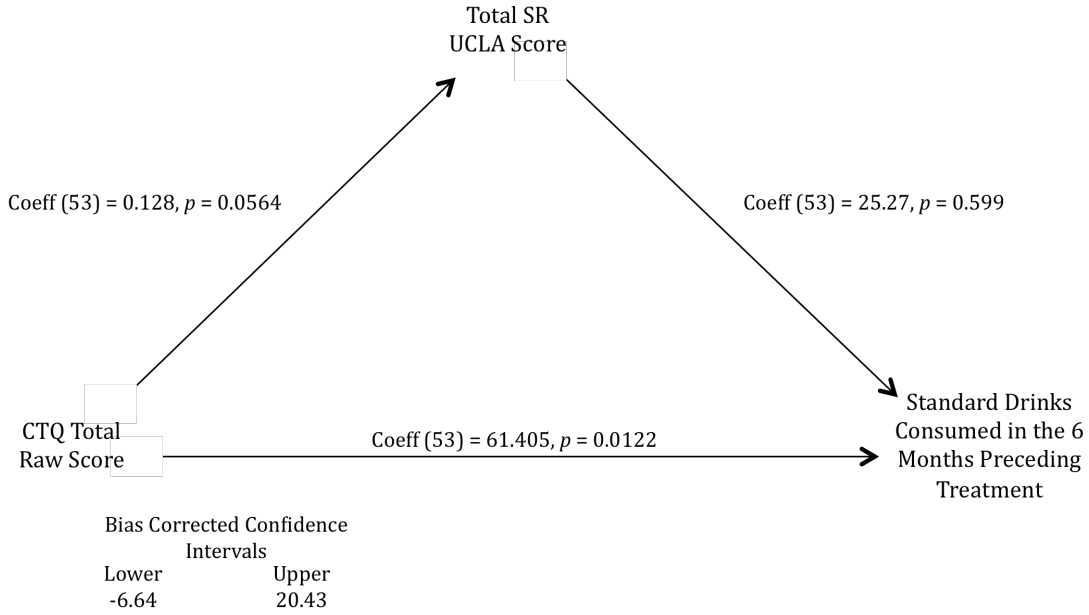

Standard Drinks Consumed in the 6 Months Preceding Treatment
Coeff (53) = 64.64, p = 0.006
Coeff (53) = 0.002, p = 0.599
CTQ Raw Score
Coeff (53) = 0.114, p = 0.113
Total Subject Rated UCLA Score
Bias Corrected Confidence Intervals
Lower
-0.033
Upper
0.097

Figure 4.

Panel A



Panel B



APPENDIX B
Tables

Table 1. Participant Demographic

Demographic Variables

Variables	**(n=66)**
Age-Mean (SD)	41.74 (9.85)
Range in Years	20-59
Race (%)	
Caucasian	71.2
African American	15.2
Latino	6.1
Asian	0.0
Native American/Alaskan Native	4.5
Other	1.5
Marital Status (%)	
Single	40.9
Married	12.1
Separated	12.1
Divorced	30.3
Living Together	4.5
Years of Education - Mean	12.2
Range in Years	9-19

Table 2.

Childhood Trauma Questionairre

Domain	N	Mean	Standard Deviation
Total Score	56	29.93	10.64
Emotional Abuse	58	5.25	3.02
Physical Abuse	57	7.93	3.37
Sexual Abuse	57	6.11	3.54
Emotional Neglect	57	6.49	3.02
Physical Neglect	58	4.64	1.91

Table 3.

Childhood Adversity Interview

Domain	N	Mean	Standard Deviation
Total Score	57	11.45	3.71
Separation/Loss	63	1.57	0.79
Illness/Injury/Non-Caretaker Loss	63	1.71	1.28
Physical Neglect	63	1.4	0.87
Emotional Abuse/Assault	63	1.49	0.8
Physical Abuse/Assault	63	2.21	1.02
Witnessing Violence	63	1.97	1.12
Sexual Abuse/Assault	62	1.2	0.85

Table 4.

Correlations: Childhood Trauma and Adult Psychosocial Stress

Trauma	Subject Rated UCLA		Researcher Rated UCLA	
	r	p-value	*r*	p-value
CTQ Emotional Abuse	0.155	0.254	0.114	0.404
CTQ Physical Abuse	0.154	0.258	-0.024	0.859
CTQ Sexual Abuse	0.253	0.060	0.175	0.197
CTQ Emotional Neglect	0.110	0.423	0.234	0.086
CTQ Physical Neglect	0.190	0.162	0.197	0.147
CTQ Total Score	0.259	0.056	0.149	0.276
CAI Separation and Loss	-0.194	0.132	0.001	0.992
CAI Illness/ Injury/ Non-caretaker	0.158	0.219	-0.061	0.637
CAI Physical Neglect	-0.048	0.713	0.100	0.438
CAI Emotional Abuse/ Assault	0.076	0.555	0.118	0.360
CAI Physical Abuse/ Assault	0.127	0.324	-0.073	0.573
CAI Witnessing Violence	0.293	0.021	0.170	0.186
CAI Sexual Abuse/ Assault	-0.113	0.385	0.131	0.316
CAI Total Score	0.079	0.563	0.108	0.426

Table 5.

Correlations: Childhood Trauma and Alcohol

Trauma	Lifetime Drinks Consumed		Lifetime Days Drank		Days Drank 6 Months		Number Drinks 6 Months		Drinking Day 6 Months		DrInc	
	r	p-value	*r*	p-value	*r*	p-value	*r*	p-value	*r*	p-value	*r*	p-value
CTQ Emotional Abuse	-0.041	0.764	-0.232	0.083	-0.093	0.490	0.356	0.006	0.451	0.000	0.174	0.205
CTQ Physical Abuse	-0.058	0.671	-0.196	0.147	0.086	0.525	0.359	0.006	0.368	0.005	0.178	0.197
CTQ Sexual Abuse	-0.017	0.900	-0.151	0.265	-0.042	0.758	0.221	0.099	0.305	0.022	-0.015	0.913
CTQ Emotional Neglect	0.031	0.820	-0.204	0.131	-0.087	0.521	0.307	0.020	0.393	0.003	0.247	0.072
CTQ Physical Neglect	-0.093	0.494	-0.163	0.226	-0.098	0.466	-0.089	0.505	-0.012	0.931	0.340	0.011
CTQ Total Score	-0.056	0.686	-0.283	0.037	-0.070	0.609	0.362	0.006	0.464	0.000	0.257	0.063
CAI Separation and Loss	-0.027	0.838	-0.033	0.798	-0.073	0.568	-0.050	0.695	-0.037	0.774	0.054	0.691
CAI Illness/ Injury/ Non-caretaker	0.137	0.289	-0.005	0.968	0.048	0.707	0.007	0.956	-0.031	0.812	0.035	0.800
CAI Physical Neglect	-0.093	0.473	-0.181	0.159	-0.248	0.050	0.002	0.986	0.122	0.344	0.132	0.333
CAI Emotional Abuse/ Assault	0.000	0.999	-0.134	0.298	0.046	0.722	0.350	0.005	0.377	0.003	0.173	0.202
CAI Physical Abuse/ Assault	-0.166	0.198	-0.236	0.065	0.160	0.210	0.160	0.210	0.340	0.007	0.025	0.855
CAI Witnessing Violence	-0.068	0.599	-0.189	0.142	0.000	0.997	0.278	0.027	0.338	0.007	0.031	0.823
CAI Sexual Abuse/ Assault	0.088	0.501	0.004	0.978	0.029	0.820	0.168	0.191	0.184	0.156	-0.073	0.596
CAI Total Score	-0.007	0.957	-0.135	0.320	0.015	0.913	0.242	0.070	0.278	0.038	0.069	0.614

Table 6

Correlations: Alcohol and Adult Psychosocial Stress

Alcohol	Subject Rated UCLA		Researcher Rated UCLA	
	r	p-value	*r*	p-value
Lifetime Drinks Consumed	0.084	0.517	0.121	0.349
Lifetime Days Drank	-0.133	0.303	-0.007	0.959
6 Mos. Drinks Consumed	0.175	0.171	0.055	0.666
6 Mos. Days Drank	0.059	0.648	-0.239	0.059
6 Mos Drinks per Day Drinking	0.176	0.172	0.186	0.148

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