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COGNITIVE VULNERABILITY AS A PREDICTOR OF ALCOHOL MISUSE AND POSTTRAUMATIC STRESS IN TRAUMA-EXPOSED UNIVERSITY STUDENTS

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A research report submitted in partial fulfilment of the requirements for the degree of MA by coursework and Research Report in the field of Clinical Psychology in the Faculty of Humanities

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Declaration

I declare that this research report is my own, unaided work. It has not been submitted before for any other degree of examination at this or any other university.

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16 January 2013

ABSTRACT

Cognitive vulnerabilities have been implicated in the development of post-traumatic stress disorder and alcohol use disorders, two disorders that commonly co-occur. The comorbidity of these two disorders continues to pose a significant threat to the well being of university students. This study investigated the associations between the cognitive vulnerability of negative attributional style and both post-traumatic stress symptoms and alcohol use patterns. The number of reported traumatic events were also included in analyses. A battery of self-report questionnaires was completed by 123 university undergraduate students (mean age of 20.41 years). Negative attributional style was found to be significantly associated with post-traumatic stress symptoms, but not with alcohol use. It was also suggested that multiple traumas have an impact on post-traumatic stress, despite levels of alcohol use. These results suggested that the cognitive vulnerability of negative attributional style is predictive of posttraumatic stress in students and research in this area is valuable for increasing resilience, prevention and recovery among trauma survivors. Recommendations for future research, especially concerning multiple traumatisation is discussed.

Keywords: attributional style; alcohol; attribution; cognitive vulnerability; trauma; post-traumatic stress

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CHAPTER ONE
INTRODUCTION

Research suggests that a substantial proportion of university students have a history of exposure to traumatic events, or may experience a traumatic event during their university years (Borsari, Read & Campbell, 2008). These exposures leave many students vulnerable to experiencing debilitating posttraumatic stress symptomatology (PTSS) or posttraumatic stress disorder (PTSD). Additionally, many students with prominent PTSS suffer from substance use disorders, such as cocaine, cannibas, amphetamines and alcohol use or symptoms of these disorders (to name a few) (Ford, Hawke, Alessu, Ledgerwood & Petry, 2007). Alcohol use disorders (AUD), more specifically alcohol abuse and alcohol dependence disorders, however, are commonly linked to PTSS and trauma (E.g. Cornelius et al., 2010; Edwards, Dunham, Ries & Barrett, 2006; Oiumette & Brown, 2003; Stewart, Pihl, Conrad & Dongier, 1998). In addition, alcohol use is common among university students and for a considerable number of these students alcohol use develops into an alcohol use disorder (Borsari et al., 2008; Young & Mayson, 2010). In fact alcohol use disorders have been found to be common in the university aged population (Blanco et al., 2008). Despite the comorbidity of these two disorders being well documented in the literature; few studies have examined or explored the complex relationship between PTSS/ PTSD and AUD. The identification of predictive factors for the development of both PTSD and AUD would have important implications for preventative and treatment efforts in university students (Elwood, Mott, Williams, Lohr & Schroefer, 2009b).

Cognitive vulnerabilities are one such factor that has been found to be associated with each of PTSD and AUD in the literature (Goldstein, Abela, Buchana & Seligman, 2000; Gray, Pumphrey & Lombardo, 2003; Williams, Evans, Needham & Wilson, 2002), yet few studies have investigated cognitive vulnerabilities as a potentially shared risk factor for the dual diagnosis of PTSD and AUD. The current study aims to investigate cognitive vulnerability, namely negative attributional style (NAS), and its predictive value in terms of the comorbid development of AUD and PTSD (specifically alcohol abuse and dependence disorders) in students with a history of trauma.

The following literature review will discuss prevalence of PTSD and AUD in university students. From there, the review will move to discuss the comorbidity of PTSD and AUD,

and the casual pathways that have been investigated in the literature. Further discussion will examine cognitive vulnerabilities as predictive factors for this comorbidity, making reference to various studies. This review will thereby propose that further study in this area of research would be invaluable to the advancement of university student healthcare, in addition to expanding our understanding of the association between AUD and PTSD.

CHAPTER TWO
LITERATURE REVIEW

2.1 Trauma and posttraumatic stress

Many people, who are faced with a traumatic life event, are able to adapt and cope with the consequent stress that may follow after the event. However, for a substantial minority, the stress experienced may cause severe and, in some cases, long-term symptoms that may render them unable to function in their normal capacity. In these cases, people will be diagnosed with PTSD or are said to show symptoms of the disorder (Kaminer & Eagle, 2010). Traumatic events, as described by the *Diagnostic and Statistical Manual of Mental disorders* (DSM-IV-TR) (APA, 2000) are events that expose an individual to actual or threatened death or serious injury, or a threat to the physical integrity of self or others. These events elicit a reaction of intense fear, helplessness and horror (Kaminer & Eagle, 2010). Posttraumatic stress symptoms include some of the following: re-experiencing the traumatic event, persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, persistent symptoms of increased arousal, duration of symptoms for longer than one month. Finally, people who are diagnosed with PTSD or have prominent PTSS may experience significant distress and impairment in social, occupational or other important areas of functioning (APA, 2000). Furthermore, research suggests that individuals in the general population with PTSD are more likely to meet criteria for at least one other psychiatric disorder (Galea, Nandi & Vlahov, 2005). Coexisting disorders with PTSD include Major Depressive Disorder, Dysthymia, Anxiety disorders and substance abuse/dependency (Galea et al., 2005). Therefore, PTSD and PTSS have serious implications for everyday functioning as well as mental health. Hence, the diagnosis or symptoms of this disorder and related psychological conditions are a significant public health problem (Edwards, 2005).

2.2 Prevalence of PTSD in university students

Research with university students has shown that a substantial number of students have a history of exposure to traumatic events, or have witnessed at least one traumatic event in their lifetime (Sloan & Marx, 2004). Additionally, many students will experience some kind of traumatic event while at university. In South Africa, for example, van Olst (2008) found that 88.6% of 632 university students reported experiencing at least one traumatic event in their lifetime. In this study, each participant had experienced, on average, 2.22 traumatic events. Similarly, Govender (2010) found that 93.7% of South African university students in this

sample had experienced at least one incident of trauma, with 65.56% of this sample reporting two or more traumas. Hoffmann (2002) had similar findings with 70.6% of this study's sample having experienced one or more traumatic events. International studies have also found high percentages of university students to have experienced a traumatic event as well as multiple traumas (Breslau, Davis, Andreski & Peterson, 1991; Dalenberg & Palesh, 2004; Lauterbach & Vrana, 2001; Vrana & Lauterbach, 1994). Read, White, Automate, Colder and Farrow (2011) reported that 66% of their sample reported a traumatic event, with 45% reporting multiple traumas (two or more). The average number of traumas experienced by this sample was 1.5 (SD=1.45). These studies, both international and South African, highlight the high percentages of university students who have had exposure to a traumatic event in their lifetime as well as exposure to multiple traumas. South African studies seem to show higher percentages of both single and multiple traumas in university students as compared to international studies.

As a result of exposure to trauma, a significant number of these students often experience PTSS, or will be diagnosed with PTSD (Borsari et al., 2008). Throughout the literature, exposure to trauma and number of traumatic events experienced has been found to be significantly associated with PTSS (Govender, 2010; Peltzer, 1998; Read et al., 2011). It has been suggested that in the case of multiple traumas there is a cumulative effect whereby those students experiencing multiple traumas, will more likely experience severe or elevated levels of PTSS (Peltzer, 1998; Williams, Williams, Stein, Seedate, Jackson & Moomal, 2007). In line with this, various South African studies have reported substantially elevated levels of PTSS in the general population (Roe-Berning, 2009). Literature concerned with multiple traumatisation, which is still a fairly new area of research, has also suggested that multiple trauma may lead to different symptom outcomes with a suggestion of more complex symptoms (Cloitre et al., 2009; Hageenars, Fisch & van Minnen, 2001). In other words multiple traumas may lead to a broader spectrum of symptoms (Maes, Delmeire, Mylle & Altamura, 2001). However, the impact of specific traumatising events and the specific symptoms of PTSD caused by these events still need to be investigated (Edwards, 2005).

With this in mind, South Africa has been characterised as a country with extremely high rates of violent crime, sexual violence and domestic abuse, with over one third of the population being exposed to some kind of violence during their lifetime (Kaminer, Grimsrud, Myer, Stein & Williams, 2008). With high rates of domestic and criminal violence in South Africa,

South Africa presents a unique context where people are exposed to ongoing traumatisation (Edwards, 2005). Studies have indicated that violence, more than any other form of trauma, is likely to be associated with the development of PTSD (Breslau et al., 1998; Zlotnick et al., 2006). Taking into account the high rates of violent crime, with the addition of other non-violent traumatic experiences such as a high incidence of serious motor vehicle accidents, many South Africans are exposed to multiple traumatisations. The implication of this for mental heath in South Africa, specifically in relation to PTSS, is a serious cause for concern. It is also an important area of study as South Africa seems to be unique in not only the rates of multiple traumas but the prevalence of primarily violent trauma which characterises South African society (Edwards, 2005; Kaminer et al., 2008).

With regards to gender and how men and women differ in terms of trauma exposure and PTSD, it is suggested that women are more frequently exposed to traumatic events that involve sexual violence while men are more frequently exposed to traumatic events such as car accidents and physical assault (Norris, Foster & Weisshaar, 2002). Traumatic exposure such as sexual violence is strongly associated with the development with PTSD (in both men and women) and there is evidence to suggest that women are more likely than men to develop PTSD (Norris et al., 2002). The rate of developing PTSD in women is approximately twice as high as in men (Tolin & Foa, 2006). Furthermore, it has been reported that internationally as well as in South African studies that on average women report more PTSS than men (Bernat, Ronfeldt, Calhoun & Arias, 1998; Govender & Killian, 2001; Lauterbach & Vrana, 2001; Read et al. 2011). It has been suggested that women may have different emotion- focused coping strategies to men that lead them to experience higher levels of distress (Govender & Killian, 2001).

2.3 Prevalence of AUD (alcohol dependence and abuse) in university students

Surveys of South African university students have indicated that 20%-80% of students drink alcohol and 17.1%-58% engage in hazardous or harmful drinking (Peltzer & Ramlagan, 2009). A South African study at Rhodes University found 57.9% of the sample to engage in hazardous and harmful drinking (Young & Mayson, 2010); while in an international study (Reavley, Jorm, McCann & Lubman, 2011) found 33% of the students were classified as hazardous drinkers. This university period is generally a time for these young adults to experience new freedoms, one of which is access to alcohol, as well as to participate in other forms of substance use. For many of these students, this alcohol use will develop into alcohol

dependence or abuse disorder (Borsari et al., 2008). Regular and excessive alcohol and substance use during university years is associated with significant health problems, as well as adverse effects to well-being and safety (Arria, Vincent & Calderia, 2009). Alcohol, which is the most commonly used substance among young adults, also contributes to many injury-related deaths in young adults, and causes significant disruption within families and communities (Corte & Zucker, 2008). In South Africa, excessive drinking has also been associated with trauma, violence, crime, unsafe sexual practices, brain injury and mortality and morbidity (Peltzer & Ramlagan, 2009). Although alcohol use may be the norm for some university students, the development of substance use disorders in even a small number of students can have serious implications.

This being said, the range of alcohol use is quite varied across studies. In a country such as South Africa, it is important to consider the diversity of the student body and how ethnicity and culture may impact upon alcohol consumption. Ethnic differences have been found to be associated with different drinking patterns (Wechsler & Kuo, 2003). Specifically, white students have been found to drink more hazardously than black, Indian and coloured students (Young & Mayson, 2010). Pillay, Roberts and Rule (2006) also found a similar trend of alcohol consumption difference between diverse racial groups in South Africa. Similarly in terms of gender differences, men have generally been found to drink larger quantities of alcohol than women and are more prone to problematic drinking than women students (Young & De Klerk, 2008; Young & Mayson, 2010). They have also been found to engage in alcohol use earlier than women (Pihl, 1999). Additionally, this pattern of alcohol use among men and women is found in international studies as well (Kokotalio et al., 2004; Lauterbach & Vrana, 2002; Meyers, 2001). Interestingly, in a South African study, it was found that men tend to drink more than women, however women may still engage in hazardous drinking and are still vulnerable to the effects of alcohol use (Young & De Klerk, 2008).

2.4 Alcohol abuse and dependence

Alcohol use disorders can be divided into two categories: alcohol abuse disorder and alcohol dependence disorder. It is important to define these two disorders, as the two are quite distinct and both may have serious consequences (Simons, Carey & Wills, 2009). According to the DSM-IV-TR (APA, 2000), alcohol dependence is a maladaptive pattern of substance use, leading to clinically significant impairment or distress. Symptoms can include physiological dependence on alcohol (evident by increased tolerance or withdrawal

symptoms), alcohol consumed in larger amounts or over longer periods of time than intended, persistent desire to cut down use (which is never fulfilled) and a great deal of time spend obtaining, using and recovering from alcohol use. Finally, a further symptom of alcohol dependence is continued use of alcohol despite the knowledge of having recurrent physical or psychological problems caused by alcohol use.

Alcohol abuse as defined by the DSM-IV-TR (APA, 2000) as a maladaptive pattern of alcohol use leading to clinically significant impairment or distress. However it differs to alcohol dependence as symptoms of abuse include: recurrent use resulting in failure to fulfil major obligations (work, school and home), substance use in situations which are physically hazardous (e.g. driving a car), alcohol-related legal problems and continued use despite the significant problems cause by the use. Therefore while both alcohol abuse and dependence may lead to impairment in functioning, alcohol abuse specifically impacts on major obligations, is related to hazardous behaviour and to legal problems. Importantly, alcohol abuse or symptoms do not meet the criteria for alcohol dependence as specified above.

2.5 Comorbidity of PTSD and AUD in university students

It is well established in the literature that, following exposure to traumatic events, PTSD develops in a proportion of students. However, it is not the only disorder that can develop following this type of exposure (O'Donnell, Creamer & Pattison, 2004). Research has documented a comorbidity of PTSD and alcohol-related disorders (Stewart, Pihl, Conrad & Dongier, 1998). According to various studies (e.g. Chilcoat & Menard, 2003; Hien, Cohen & Campbell, 2005) adults with alcohol-related problems are substantially more likely to experience PTSD or show symptoms than adults without alcohol-related problems. In support of this, Cornelius and colleagues (2010) found that PTSD symptoms contribute to the development of substance use and alcohol-related disorders. Furthermore, Edwards, Dunham, Ries and Barnett (2006) investigated a sample of university students and found that traumatic stress symptoms were a significant predictor of alcohol use. Similarly, students with a history of trauma were more likely to engage in risky behaviours, such as alcohol and other substance abuse (Green et al., 2005). Saladin, Brady, Dansky and Kilpatrick (1995) investigated the PTSS of a group of individuals seeking treatment for AUD. They suggested that this group showed a level of hyperarousal symptoms and a significant problem with sleep disturbance as well as were more likely to report physiological reactivity to trauma-related events. Additionally students, who reported higher levels of traumatic stress symptoms, also

reported consumption of larger amounts of alcohol (Edwards et al., 2006; Stewart et al., 1998).

The above studies illustrate the high comorbidity of AUD and PTSD. Additionally, PTSD and substance use literature points to a reciprocity cycle between trauma, traumatic stress and alcohol use (Ouimette & Brown, 2003). More specifically, when an individual has a traumatic experience, symptoms of PTSD or the disorder itself, it places the individual at risk of substance use disorders. This substance use may put the individual at risk of exposure to further trauma, in turn aggravating the symptoms of PTSD. This exacerbation may even lead to further substance abuse. For example Cottler, Compton, Mager, Spitznagel and Janca (1992) suggested that in order for substance abusers (such as cocaine or alcohol users) to actually have access to the drugs, they repeatedly place themselves in dangerous situations. In doing so they may either aggravate post traumatic stress symptoms they already have or experience new traumas. With particular reference to cocaine procurement, cocaine users developed PTSD as a result of trauma in this context (Cottler et al., 1992).

Similarly, individuals who are engaging with excessive alcohol use may find that it increases their risky behaviours. Such risky behaviours associated with alcohol use are involvement in violence, crime, unsafe sexual practices, which may further put them at risk for the development of PTSS (Peltzer & Ramlagan, 2009). Individuals engaging in these risky behaviours may also drink more in order to cope with their involvement in these behaviours. It is therefore, suggested, that this reciprocity cycle plays a role in the maintenance of both alcohol use and PTSS. Blanchard and colleagues (1996) suggested that alcohol use disorder in individuals with PTSD, predicted long-term PTSD symptom maintenance. After a one year follow up of these individuals, the PTSD symptoms were actually worse. One can see how this reciprocity cycle may allow for the two disorders to co-occur.

In summary, as mentioned above, university years are typically when many students experiment with substances for the first time. Thus, due to the number of students who will come to university with traumatic stress symptoms, or experience traumatic events at university, it is reasonable to hypothesise that these students may develop a problem with substance abuse or that their risk for experiencing a trauma is related. Consequently, a substantial number of students may be left vulnerable to the development of PTSD and AUD comorbidity.

2.6 Theories behind the development of AUD/PTSD

It is clear that there is a high degree of comorbidity between PTSD and substance use disorders such as AUD, even with regards to university students. However, the causal relationship between PTSD and AUD is not fully understood (Chilcoat & Breslau, 1998). Only a proportion of people who experience a traumatic event will develop PTSD or PTSS, while a different percentage will develop both PTSD and AUD, or symptoms of both. Furthermore, a proportion of people will only experience AUD. Consequently, the question of why some people develop these disorders and some people do not is of importance to consider. For this reason, there has been much interest in the factors that might mediate exposure to psychological trauma and facilitate development of disorders such as substance abuse disorder (Amir et al., 1997).

There are several pathways that can account for PTSD-AUD comorbidity. The first of which, the self-medication model, proposes that PTSD symptoms typically precede alcohol-related problems (Gulliver & Steffen, 2010; Stewart et al., 1998). In other words, individuals with PTSD symptoms may try to control or get rid of their symptoms by using alcohol or other substances. Contrarily, a second pathway proposes that alcohol use and dependence increases susceptibility to the development of PTSD. In other words, long-term substance abuse may increase levels of anxiety and arousal and may render an individual more vulnerable to the development of PTSD after a traumatic event (Stewart et al., 1998). Other theories propose that substance abuse and alcohol use symptoms may actually exaggerate PTSD symptoms, delay processing and acknowledgement of the traumatic experience which causes the symptoms. Similarly, AUD and its withdrawal symptoms, such as anxiety, may overlap with symptoms of PTSD, causing the comorbidity of both disorders to seem more extreme than they really are (Stewart et al., 1998). As mentioned above, PTSD and AUD have been found to have a reciprocity relationship, with co-occurrence potentially resulting in a worsening of both disorders (Edwards et al., 2006). It is important to note that these proposed pathways are not necessarily mutually exclusive, and that the mechanisms contributing to the association between PTSD and AUD are not fully explained by these theories.

This is an important point, as one particular model may not necessarily explain the association between PTSD and AUD for two different individuals. An individual may be more vulnerable to developing AUD as a self-medication technique, while another might not have this susceptibility. Thereby, other factors, such as pre-stressor factors (e.g. personality

and genetics) may also play a role in the development of both PTSD and AUD. One such factor is the coping style of an individual exposed to a traumatic event. Coping styles can be utilised in the aftermath of a traumatic event and may play a role in the adjustment of an individual (Amir et al., 1997). Two broad coping styles, emotion-focused coping and problem-focused coping, are an example of pre-stressor factors. Emotion-focused coping attempts to regulate emotion (but may use avoidance to do so) and problem-focused coping involves actively planning and engaging in the behaviour to overcome it (Folkman & Lazarus, 1985; Holahan & Moos, 1987). Studies suggest that emotion-focused coping in individual prior to a traumatic event is associated with development of problematic psychological symptoms and outcomes (Coyne & Racioppo, 2000).

Another factor that may play a role in the development of disorders such as PTSD is social support. The social support system of an individual, who has experienced a traumatic event, can play an important role in facilitating recovering and protecting against posttraumatic stress (Wilcox, 2010). Results of a study (Harris, 2005) suggested a positive correlation between positive social support and lower report of PTSD symptomatology. Therefore, it is suggested that a person with social support and the appropriate coping style prior to a traumatic event, may be better equipped to handle the stresses associated with the trauma. In contrast, a person with inappropriate social support systems and coping style may be at risk of developing symptoms of PTSD.

In line with this, this study aims to explore a different type of pre-stressor factor, namely cognitive vulnerability, as a different mechanism to explain the development of PTSD and AUD. Given the high rates of comorbidity of PTSD and substance abuse such as alcohol abuse and dependence, it seems important to further understand the association between the symptoms of the former and those of the latter, and to further explore predictive factors for this comorbidity, which could allow for prevention of these disorders in the target group.

2.7 Cognitive vulnerabilities as predictive factors

The idea that cognitive vulnerabilities function as predictive factors for the development of several disorders has received heightened attention over the past few years (Elwood, Hahn, Olatunji & Williams, 2009a). Theories to do with cognitive vulnerabilities propose that individuals differ in the way that they cope with life's circumstances. For example how they interpret, perceive and react to certain events (Skitch, 2007). For example, an individual who

is vulnerable to feelings of hopelessness and depression may show an error in thinking, presuming that negative life events are his/her fault, leading to iterative pessimistic predications and assumptions about life (Elwood et al., 2009a). Consequently, these cognitions of pessimism and self-blame can result in the development of psychological disorders.

Importantly to this study, cognitive vulnerability theories are diathesis-stress models, which propose that an interaction between negative life events and cognitive vulnerabilities will predict the development of psychological disorders (Skitch, 2007). Diathesis-stress models have been widely applied to the understanding of the development of PTSD in certain individuals. This model proposes that individual differences, prior to exposure of a traumatic event, contribute to individual potential for the development of PTSD. Additionally, higher levels of the relevant cognitive vulnerability, present before the traumatic experience, put that individual at higher risk for the development of PTSD (Elwood et al., 2009a). Furthermore, these models propose that cognitive vulnerabilities remain latent until activated by stress or negative life events that are serious enough to do so. Once activated, cognitive vulnerabilities influence individual's characteristic of attending to negative life events and thereby influence the development of disorders such as PTSD (Elwood et al., 2009a).

Within a diathesis-stress model, there are various factors that may contribute to the development of a disorder. Factors can relate to the outcome or severity of the disorder or play a role in the development of the disorder. However, the strongest type of factor is both necessary and sufficient in the development of the disorder (Elwood et al., 2009a). Furthermore, it is important to distinguish between risk-factors and vulnerability factors when talking about a diathesis-stress model. A risk factor may be correlated with the development of a disorder, but vulnerability factors are more causally related to the development of a disorder. This causal nature of vulnerabilities, such as cognitive vulnerabilities, suggests that with further understanding these can hold predictive value (Zvolensky, Schmidt, Bernstein & Keough, 2006). While vulnerability factors are just one factor, their causal nature suggests that their role in the development of disorders such as PTSD may be prominent. However, it is important to take note that there are various factors that could play a role in the development of a disorder such as PTSD and a full diathesis-stress model would take into account all these factors (pre-, peri-, and post-trauma factors).

This being said, it is plausible that cognitive vulnerabilities that are known to predict PTSD/PTSS may also predict the development of AUDs. That AUDs and PTSD may share a common vulnerability that helps to account for the common comorbid occurrence established in the literature (Arria et al., 2009). Few studies have explored how AUD and PTSD interface and what common vulnerability factors underlie these disorders. Negative attributional style (NAS) is the cognitive vulnerability chosen in this study as a predictor of comorbid PTSD-AUD, due to the support in the literature for its relation to PTSD (Gray et al., 2003; Mikulincer & Solomon, 1988; Runyon & Kenny, 2002; Williams et al., 2002).

Extending on this, the DSM-IV-TR requires the responses of intense fear, helplessness, or horror to an event in order to meet the criteria for having experienced a traumatic event. Attributional style and how one comes to understand and experience negative events (like trauma) have been consistently associated the development of PTSD (Gray et al., 2003). While the other cognitive vulnerabilities of rumination (thinking about negative emotions), looming cognitive style (making predictions about future threat) and anxiety sensitivity (fear of anxiety-related symptoms based on the belief that they will have harmful consequences) have been found to be associated with the development of PTSD, these vulnerabilities, especially rumination and anxiety sensitivity are responses to already negative events and states of depression, worry and anxiety elicited from those events (Elwood et al., 2009a).

It is suggested, however, that attributional style serves to determine the fear, helplessness and horror experienced in response to an event and plays a significant role in whether an individual's experience of an event is traumatic or not. Additionally, if negative events are frequent (as in South Africa where rates of trauma are high) the pattern of attributions made to negative events becomes more entrenched. Therefore, attributional style particularly is of interest in this study as study of it may further help to understand the experience of events as traumatic and the development of PTSD, as well as preventative measures that may be put in place. As this cognitive vulnerability may influence how a negative event is experienced, it may also be linked to the development of alcohol use disorders in response to negative events. Furthermore, NAS is also strongly linked to depression (Mcelderry, 2009) which has also been found to be linked to both PTSS (Kaslow, Rehm & Siegel, 1984) and AUD (Skitch, 2007) in the literature. Taking this into account it seemed an appropriate vulnerability factor to explore. Although there has been some research concerning cognitive vulnerability as a predictive factor for the development of PTSD, few studies have examined the cognitive

vulnerabilities associated with PTSD as predictors for AUD symptoms. Existing and relevant studies will be discussed subsequently.

2.8 Negative attributional style

Attribution theories have been applied to various areas of research, most specifically to the study of depression. However attributional style and how one makes attributions about negative events (such as traumas) can be understood as influencing the outcome of PTSS or PTSD (Mikulincer & Solmon, 1988; Williams et al., 2002). The three dimensions of attributional style for negative events are the internal, stable and global dimensions. Internal attributions refer to the perception that the negative event was caused by factors within a person and that the person is directly responsible for the event, global attributions refer to the generalised perceptions of events, individuals and behaviours and that something like a traumatic event is likely to happen in any circumstance and stable attributions refer to the perception that events are caused by fixed and constant factors and are likely to occur again (Reiland, 2006). In the face of a negative life event, individuals with NAS will have the tendency to assume that these events are their responsibility, and that they will always continue to happen in all areas of their life. In other words, the individual will attribute internal, global and stable attributions to negative events that occur in their life (Gray et al., 2003; Reiland, 2006). A person who has a premorbid NAS before a traumatic event will be likely to experience more chronic and debilitating symptoms of PTSD because of the way that they processed and understood the experience (McCormick, Taber & Kruedelbach, 1989). Individuals who have a high propensity for NAS are vulnerable to feelings of depression and helplessness. In line with this, it makes sense that symptoms of PTSD such as avoidance and hypervigilence would be exaggerated in an individual who believes that traumatic events will continue to occur and are likely to occur anywhere or at any point in their life (Gray et al., 2003).

Gray and colleagues (2003) found that NAS was associated with the development of PTSD symptoms and that, the higher the level of NAS, the more severe the symptoms of PTSD, following a traumatic event. As mentioned above, depression and attributional style are often found to be associated in the literature (Mcelderry, 2009). Studies looking at the different dimensions of NAS and their associations with PTSS versus their association with depression have found mixed results. Some studies have found stable and internal attributions to be more related to depressive symptoms than PTSS (Ginzburg, Solomon, Dekel & Neria, 2003;

Reiland, 2006), while others have found these dimensions predictive of PTSS and shown a consistent link between NAS and the development of PTSD after a traumatic experience (Mikulincer & Solomon, 1988; Williams et al., 2002). Two studies with samples of university students (Gray et al., 2003; Reliand, 2006) both found that NAS was associated with PTSS. In contrast, although this association is well documented in literature, some studies have failed, most probably due to methodological differences, to find significant associations between NAS and PTSD. Although these studies did find that students who tended to attribute negative events to internal, global and stable causes were more likely to experience emotional distress (Elwood et al., 2009a; Greening, Stoppelbain & Docter, 2002)

In terms of which dimensions of attributional style are most predictive of PTSD, studies have differed, some finding internal attributions as the most predictive (Runyon & Kenny, 2002), and others finding both internal and stable as most predictive (Feiring, Taska & Chen, 2002). Other studies have implicated global attributions (Wenninger & Ehler, 1998) and stable attributions (Gray et al., 2003). Furthermore, it is unknown whether attributional style constitutes a premorbid vulnerability to PTSD (diathesis-stress model as discussed earlier) exposure following trauma exposure or if PTSD causes certain negative attributions in some cases. Studies have shown that the origin or development of NAS is related to the occurrence of negative life events and interpersonal experiences (Johnson & Miller, 1990; Seligman et al., 1984). However how this applies to university students' experience of traumatic events is not entirely known.

Relatively few studies have analysed NAS as a vulnerability factor to AUD. Goldstein and colleagues (2000), in a longitudinal study of undergraduate students, found that NAS predicted an increase in liquor/spirits consumption. In support of this, Dowd, Lawson, and Petosa (1986) found that alcoholics differed to non-alcoholics in terms of their level of attributional style. McCormick and colleagues (1989) found that veterans with comorbid PTSD symptoms and alcohol addiction had higher levels of NAS than veterans not suffering from PTSD. In contrast to this, another study of undergraduate students (Goldstein, 2006) found that the interaction of NAS and negative life events did not better account for alcohol consumption in this group of students. These results provide some support for the idea that NAS, as a predictor of PTSD, may also be a predictive factor for the development of comorbid PTSD and AUD, and indicate that further research is necessary. This is especially

valuable in students, who are not considered a clinical sample, and thus the associations between these variables can be understood in terms of the general population.

As mentioned previously, individuals with PTSD or PTSS have elevated rates of comorbid disorders. Studies have demonstrated that among men with PTSD, alcohol abuse and dependence is the most common comorbid disorder. This is followed by depression, anxiety disorders and other non-alcohol substance use disorders. Among women with PTSD, depression and other anxiety disorders are of the highest comorbidity followed by alcohol use and dependence disorders (Kressler, Sonnega, Bromet, Hughes & Nelson, 1995). Additionally, research suggests that developmental pathways may differ with regards to gender and the comorbid development of disorders, but there is insufficient support for the idea that attributional style of women is more often negative then in men (Piccinelli & Wilkinson, 2000). Studies seem to suggest that there is no significant difference in men and women with regards to attributional style (Goldstein, 2006, Haddad, 2001).

2.9 Relevant studies examining cognitive vulnerability factors and PTSS and AUD

To my knowledge, there are few studies that have examined cognitive vulnerability factors as predictors for the comorbidity of PTSD and AUD. Furthermore, there are no studies that have examined the cognitive vulnerability of NAS specifically. One study, mentioned above, did find that veterans' comorbid in PTSD symptoms and alcohol addiction had higher levels of NAS than veterans not suffering from PTSD (McCormick et al., 1989). In contrast to this, McElderry (2009) investigated attributional style, in adults receiving outpatient–addiction-services, who had experienced traumatic events. This study found that attributional style did not facilitate the relationship between depressive symptoms, PTSD symptoms and alcohol abuse among individuals with exposure to traumatic events. With so few targeted studies, further research in this area is mandatory if the interaction between cognitive vulnerability factors and PTSD and AUD is to be understood.

2.10 Conclusion

South Africa, with its high levels of violent crime and the concurrent trauma among its tertiary population, potentially has high levels of PTSD and substance use, particularly alcohol use, among its university students. The need to promote the health and well-being of these students makes the comorbidity of these disorders an important area of study. It seems that, although there is some understanding of the association between PTSD and AUD, the

true extent of the relationship needs further exploration. The investigation of cognitive vulnerabilities, specifically NAS, could allow for a more comprehensive and predictive account of PTSD and AUD development in university students. Once understood, these factors can be targeted for use in interventions and preventative measures in university student samples.

2.11 Aim

The current study aimed to investigate whether, in a sample of university students, trauma exposure in conjunction with a negative attributional style would predict PTSS or alcohol use. An additional aim was to explore whether or not trauma exposure negative attributional style would be predictive of both PTSS and alcohol use. For the purposes of this study, trauma exposure was operationalised as the number of reported traumatic events.

2.12 Rationale

The present study aimed to explore attributional style as a predictive factor for the development of posttraumatic stress, AUD (alcohol use or dependence), or the simultaneous occurrence of both in students who have had exposure to trauma. In the literature, investigations of cognitive vulnerability factors such as attributional style for the development of PTSD have been separate to similar studies that have investigated cognitive vulnerability factors for the development of AUD. Although there have been studies that have developed exploratory models of these disorders, few studies have focused on predictive factors for the comorbid occurrence of these disorders, although this prevalence of comorbidity has been established in the literature (Arria et al., 2009). Given the high levels of comorbidity, further understanding about how AUD and PTSD interface and develop would be important for research in this field as well as university and general health care.

It has been established in the literature review that the prevalence of trauma among university students is high, and consequently many of these students are at risk for the development of PTSS. PTSS can have detrimental effects on physical and mental health. Similarly, many university students experiment and engage in alcohol use as it is the most commonly used substance among young adults. However, many students who experiment with alcohol may develop an AUD, the consequences of which are associated with violence, trauma, crime, unsafe sexual relations, morbidity and mortality (Peltzer & Ramlagan, 2009). These disorders alone are detrimental to health and are of serious concern, but the comorbid occurrence poses

a significant challenge to health care workers trying to treat either disorder. The comorbidity of these two disorders has poor treatment outcomes and it may be useful to explore predictive factors in this development so as to provide preventative treatment, rather than intervention treatment. For example, if it is shown that attributional style predicts severity of posttraumatic stress symptomatology, if a student approached health services after a traumatic event, attributional style can be one aspect of that student that can be considered in understanding what their reaction might be.

As mentioned above, both disorders seem to be quite prevalent among the student population and this makes it an appropriate population to focus on. It may also be useful to gather more information about the prevalence of these disorders in this population as well. Attributional style was chosen in this study because of their suggested association with PTSD. Therefore, it is suggested that use of these this vulnerability factors will be beneficial to this area of research, to gain a better understanding of their association with AUD in university students, thereby gaining a better understanding of comorbid PTSS and AUD.

2. 13 Research question:

In university students, is trauma exposure and a negative attributional style for negative events (high scores on internal, global and stable dimensions) associated with PTSS and/or alcohol use?

2. 14 Hypotheses:

Hypothesis 1: In university students, trauma exposure and negative attributional style will be associated with both PTSS and alcohol Use.

Hypothesis 2: In university students, trauma exposure and negative attributional style will predict PTSS.

Hypothesis 3: In university students, trauma exposure and negative attributional style will predict alcohol Use.

CHAPTER THREE
METHODOLOGY

3.1 Research design

This study used a quantitative cross-sectional design. This design allowed for the various variables to be measured and for associations to be made between variables. Data gathered and analysed were descriptive as this study was concerned with describing the existing relationships between the variables. Independent variables in this study were the number of traumas experienced and NAS, while the dependent variables were PTSS and alcohol use. This quantitative design allowed for the use of self-report questionnaires as well as statistical analysis to be done on the data gathered. This design allowed for anonymity for this particular kind of research and it was convenient for distribution purposes and allowed administration to a large group of people (Rosenthal & Rosnow, 1991).

3.2 Participants

Participants of this study were 123 undergraduate students from the Psychology department at the University of the Witwatersrand (WITS). This study used convenience sampling as undergraduate students in this faculty were easily accessible and importantly this choice of sample was based on existing literature that suggests the student population is considered a population that is vulnerable to the effects of PTSS and alcohol use. Both male (n=29) and female (n=91) participants were included in this study, and the mean age of the sample was 20.41 years (SD=2.43). Table 1 describes the demographic characteristics of the sample used for this study, which was representative of the WITS student population. The sample was ethnically diverse and consisted of mostly female participants, which is generally representative of the Humanities student population that was used in this research.

Table 1

Demographic characteristics of the sample

Variable	*N*	Percentage
Gender (*n*=120)		
Male	29	24.17
Female	91	75.83
Ethnicity (*n*=123)		
White	49	39.84
Black	51	41.46
Indian	13	10.57
Coloured	8	6.50
Asian	2	1.63
Marital Status (*n*=120)		
Single	115	95.83
Married	2	1.67
Divorced	3	2.50
Religion (*n*=117)		
Christian	91	77.78
Hindu	7	5.98
Atheist	6	5.13
Jewish	4	3.42
Islam	4	3.42
Other	5	4.27

3.3 Measures

3.3.1 Demographic information In addition to the core measures, participants were asked to complete a short demographic questionnaire (Appendix A). This measure asked questions about the participant's age, gender, ethnicity, marital status and home language. This information was used for descriptive purposes only, so as to indentify the parameters, and extent of generalisability of the findings. Participants were also asked about their substance use excluding the substance of alcohol, in order to see if other types of substance use needed to be considered in this study.

3.3.2 Current alcohol use

The Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) is a 10-item self-report measure, designed to identify persons with hazardous or harmful patterns of alcohol consumption (see Appendix B). This measure has been previously used in studies in South Africa (Simbayi et al., 2004; Young & Mayson, 2010) and has been endorsed by the World Heath Organization (WHO).The AUDIT is made up three subscales (dependence symptoms, harmful alcohol use, and hazardous alcohol use). For example, a dependence question on the AUDIT is, "how often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?" An example of a harmful use question on the AUDIT is, "how often do you have six or more drinks on one occasion?" Lastly, an example of a hazardous alcohol use question is, "have you or someone else been injured as a result of your drinking?" Participants were asked to respond with yes or no and frequency. The AUDIT was standardized on primary health care patients in six countries. The AUDIT demonstrates good test-retest reliability (r=0.86) (Bohn, Babor, & Kranzler, 1995). A single score was calculated that indicated harmful or hazardous patterns of alcohol consumption. An AUDIT cut-off score of 7 was used to indicate hazardous drinking for participants who scored 7 or above (Conigrave, Hall & Saunders, 1995). In line with studies done in South Africa, scores of 7-15 were considered as hazardous alcohol use, scores of 16-19 as harmful alcohol use and a score of 20 or above indicating alcohol dependence and/or abuse (Young & de Klerk, 2008).

3.3.3 Trauma exposure

The Traumatic Stress Schedule (TSS; Norris, 1990) is a short screening instrument for assessing traumatic stress in the general population and was used to collect information regarding traumatic events experienced by the sample group (see Appendix C). According to Norris (1992) the measure has good reliability and validity. An acceptable total alpha value (0.75) has been reported as a measure of the TSS's internal consistency (Norris, 1992). This measure has been used in South Africa previously in a study by Van Olst (2008). The TSS consists of ten questions where the participant is required to answer "yes" or "no" and to indicate if the trauma happened 0-3 months ago; 3-6 months ago; 6-12 months ago; 12-18 months ago; 18-24 months ago and/or more than 24 months ago. These traumatic events are categorized as follows: 1) robbery; 2) physical assault; 3) sexual assault, forced unwanted

sexual activity of any kind; 4) death of a loved one through accident, homicide or suicide; 5) experienced hijacking; 6) motor vehicle accident; 7) serving in combat; 8) injury and damage due to fire and 9) injury from natural or manmade disaster. The TSS takes approximately five minutes to complete. Once the number of responses for the different types of trauma over the different time periods was calculated, a lifetime frequency of traumatic events was calculated by summing the number of positive responses.

3.3.4 Post-traumatic stress symptoms

The Impact of Events Scale – Revised (IES-R; Weiss & Marmar, 1996) is a 22-item self-report measure that assesses subjective distress caused by traumatic events (see Appendix D). It is a revised version of the 15-item IES (Horowitz, Wilner & Alvarez, 1979). The IES-R contains 7 additional items related to hyperarousal symptoms of PTSD. According to Creamer, Bell and Failla (2003) this measures has a high internal consistency (co-efficient alpha 0.96). Additionally, it has been used in South Africa previously (e.g. Peltzer, 1998). Participants were asked to indentify a specific stressful life event and then indicate how much they were distressed during the previous month by each 'difficulty' listed. Items are rated on a 5-point scale ranging from 0 ('not at all') to 4 ('extremely'). The time frame of one month was used for this measure because it is important to look at current symptoms of subjective distress as it is difficult to accurately measure past symptoms retrospectively (Stanton, Bower & Low, 2006). A single score was calculated for this measure that is the sum of all the subscales.

3.3.5 Attributional Style

The Attributional Style Questionnaire (ASQ; Peterson et al., 1982) is a self-report instrument in which scores for explanatory style for bad events and for good events using internal versus external, stable versus unstable and global versus specific causes for those events are yielded (see Appendix E). In the ASQ, 12 hypothetical events, half good and half bad, are presented. An example of a good event is "you get a raise" and an example of a bad event is "you go out on a date and it goes badly." Each question allows the participant to interpret the event and its probable cause along a 7-point continuum for each of the three causal dimensions, 1) whether the outcome was due to something about them or something about other people or circumstances (locus), 2) whether this cause again will be present (stability), and 3) whether the cause influences just this situation or other areas of life (globality). The ASQ was normed on college students, clinically depressed individuals, and people undergoing various stressful

events. The ASQ has internal consistency reliabilities of r=.66 for internality, r=.85 for stability, and r=.88 for globality (Peterson & Seligman, 1984). While there are six positive and six negative hypothetical scenarios, it has become the norm to administer only the negative scenarios because the attributions of the positive scenarios/ events have not been found to be related to PTSD or any other clinically meaningful constructs (e.g. Joseph & Gray, 2010; Nezu, Kalmar, Ronan & Clavijo, 1986). As such, these typically culminate into three scores on the dimensions of internal attributions, stable attributions, and global attributions. The total score for attributional style was calculated by adding the scores of the three dimensions.

3.4 Procedure

First, ethical approval was obtained from the Human Research Ethics Committee (HREC) (see Appendix F). Permission was then obtained from relevant lecturers in the psychology and health sciences departments in order to attend their double lectures and speak to the class about participating in the study. The researcher then went to the particular lecture, as pre-arranged with the lecturer, and introduced herself and gave a brief description of the study. The researcher also explained the voluntary, anonymous and confidential nature of participation and that any biographical information given would not lead to identification. Participants were incited to take part and given the assurance that anybody who chose to not participate would not receive any negative consequences.

The students who wanted to take part were given a questionnaire pack. Each pack included an invitation letter explaining the research, a short demographic questionnaire, as well as the questionnaires discussed above. Included in the packs was a participant information sheet (refer to Appendix G), giving the participants an e-mail address if further information was required, as well as some details about places they can go to if they feel they needed to talk about anything answered in the questionnaires. It also stated the researcher's e-mail address if they require feedback or results from the research. They were also informed that even if they took a pack they had a right to discontinue the questionnaires at any point during completion.

Students were then asked to complete the pack of questionnaires for fifteen minutes before the break of the lecture and during the break of the lecture, as it was a double lecture (two hours), and after the lecture if they are unable to complete the questionnaires during this time. This questionnaire pack took about thirty minutes to complete. Students with completed

packs were instructed to put their packs into a box by the door, to ensure they remained anonymous. Students were then thanked for their participation and given a debriefing sheet (refer to Appendix H) at the end that explained, in more detail, the purpose of this study. Questionnaires packs were numbered and kept in a safe and the researcher was the only one who handled the questionnaires.

3.5 Data analysis

A power analysis was conducted and suggested that a minimum of 112 participants would be required to have sufficient power to detect small to moderate effect sizes. The first step in the data analytic process was to test parametric assumptions to explore whether or not parametric statistics would be appropriate for this data. Secondly, descriptive statistics were calculated for all key variables to enable comparison with other samples of trauma-affected individuals. Preliminary analyses were used to test whether or not there were gender differences in any of the key variables as the literature suggested gender differences in both substance use patterns and PTSD prevalence in some samples. As there were no significant gender difference in this particular sample, analyses was conducted on the entire sample, assuming that all participants were drawn from the same population. A Pearson-r correlation was also conducted to examine the systematic relationship between variables.

In order to explore the research questions, a multivariate analysis of variance (MANOVA) was conducted to explore whether the scores on these three dimensions (internal, global and stable dimensions of attributional style) predict the two dependent variables (alcohol use and PTSS). The MANOVA was used to test these effects at both the univariate (alcohol use or PTSS only) and multivariate (comorbid alcohol use and PTSS) levels, allowed for the testing of both research questions. The MANOVA analysis allowed for both research questions to be answered in one parsimonious step. MANOVA analyses also protected against and reduced the probability of Type 1 error in a sample of this size, as rather than using separate analyses of variance to understand each variable this test assess all the variables in one analyses (Devlin, 2006). Assumption of Independence of observations, Assumption of Linearity and the assumption of normality of each variable were also tested to ensure the MANOVA could be used.

Several one-way ANOVAs were conducted in order to explore variables not considered in the MANOVA. The above analyses were conducted using SAS.

3.6 Ethical considerations

Participants were asked about traumatic events that they had experienced as well as their alcohol use, and as these questions may have been quite personal and evocative, confidentially of the study was explained to the participants as well as maintained throughout the study. Participants were not pressurised to fill in the questionnaires and were aware of their rights to discontinue the questionnaires at any time they wanted to. Furthermore, no one, other than the researcher, had access to the research material. Participants were not asked to put their names or student numbers on the questionnaires and completed questionnaires were placed inside a box to ensure anonymity. The questionnaires were also administered in the students usual lecture hall as to make them feel comfortable while filling out the questionnaires. Students were also reminded several times that the study was completely voluntary.

Contact details and contact persons or relevant help centres were given to the participants to take home with them. These help centres (which are located close to the university and require little or no payment) that were included on this list were the WITS trauma clinic, the Centre for Career Development Unit and Lifeline. These centres were also contacted to let them know this study was taking place, if students did contact them. An e-mail address was also provided for any additional questions about the research.

Finally, when the questionnaires were handed out to students, the students were informed of the aim of the study. Students were welcome to ask questions and had information that was available to them if it was needed. It was explained to the students that by filling out the questionnaires, they were providing informed consent for participation in this study.

CHAPTER FOUR
RESULTS

4.1 Overview of chapter

The following chapter presents the results of statistical analyses that were undertaken to explore the relations between trauma (number of traumas experienced), negative attributional style, post-traumatic stress symptomatology (PTSS) and alcohol use in a college student sample. The descriptive statistics will be presented first, along with the results of the Pearson-r correlations that were conducted in order to determine the relationship between the various variables. Further, the parametric assumptions of multivariate analysis of variance (MANOVA) will be presented. A MANOVA will then be presented to determine the main effects and interactions of the variables of trauma, NAS (as independent variables), and PTSS and alcohol use (as dependent variables). Further exploration of the variable of alcohol use will also be conducted. These results will be used in this chapter to address the research questions and hypotheses as set out in the previous chapter.

4.2 Descriptive statistics of sample

Table 2 shows the mean, standard deviation, minimum and maximum scores of each variable. The common statistical test of Cook's Distance was used to identify outliers in this data. Two outliers were identified, however analyses were re-run without these outliers to examine their specific influence on the results. As no significant differences were found, these observations were not omitted from the data as to maintain statistical power (Ho & Naugher, 1998). For those variables that had a missing data point, the mean was imputed for that point. For more than one missing data point, that particular participant's data was left out from the analysis, therefore different variables have different sample sizes as SAS uses listwise deletion to deal with missing data.

Table 2

Descriptive Statistics of each variable

Variable	***n***	**Mean**	**Std Deviation**	**Min**	**Max**
Alcohol Use	123	4.02	4.29	0	20
Trauma	123	2.25	1.29	0	6
PTSS	114	40.97	20.51	0	84.9
NAS	111	3.85	0.75	24	106
Internal	111	3.73	0.94	7	38
Global	111	3.69	1.12	9	42
Stable	111	4.12	1.06	6	39

Note. NAS refers to negative attributional style. Internal, Global and Stable are dimensions that make up this variable.

The variable alcohol use represents the scores calculated from the AUDIT measure. This measure is used to identify individuals with hazardous or harmful patterns of alcohol use. Alcohol use (as measured by the AUDIT) was split into two groups – high and low according to a cut off score of 7 rather than using it as a continuous measure. Participants in the high group with a score of 7 or more were considered to engage in harmful or hazardous drinking, while participants in the low group were considered to engage in non-problematic or no drinking. The original AUDIT measure was devised with a recommended cut-off score of 11. However, in line with reductions in recommended safe drinking limits, a low cut-off point of 8 was adopted (Babor et al., 1989). This cut-off was found to provide good sensitivity and specificity in the detection of current social and medical problems related to alcohol. However, a cut-off score of 7 is recommended as it gives increased sensitivity in screening for risk of trauma and hypertension while maintaining acceptable specificity, especially in college student samples (Conigrave, Hall & Saunders, 1995). In this sample, with a mean alcohol use level of 4.02 (*SD*= 4.29*),* the majority of students do not engage in harmful or hazardous drinking and were not diagnosed with an AUD. Seventy eight percent of this sample indicated that they did drink alcohol. Table 3 further describes the pattern of alcohol use according to categories used in other South African studies using the AUDIT (Young & de Klerk, 2008).

Table 3

Pattern of alcohol use in this sample

Alcohol Use	***N***	**Percentage**
No Use	26	21.14
Low - Moderate Use (1-6)	70	56.91
Hazardous Use (7-15)	24	19.51
Harmful Use (16-19)	2	1.63
Dependent Use/Abuse (<20)	1	0.81

Referring back to Table 2 the variable trauma represents the number of traumatic events reported by the sample group as measured by the Traumatic Stress Schedule. The mean number of traumas in this sample was 2.25 (*SD*= 1.29*)*, which suggests that the majority of students in this sample reported experiencing at least two traumatic events (multiple traumas) over the course of their lifespan.

PTSS (post-traumatic stress symptomatology) represents the scores calculated by the IES-R measure. Given a possible range of 0-88, a meaningful score for this variable is considered to be 24 and above (Creamer et al., (2003). Additionally, according to Creamer and colleagues (2003), scores of 33 and over are representative of significant post-traumatic stress with PTSD as a clinical concern. Furthermore, a score of 37 and above suggest high levels of traumatic stress and a possible diagnosis of PTSD (Creamer et al., 2003). The mean score for PTSS in this sample surpassed the critical level of 24 (*M*=40.97, *SD*=20.51). This mean score is representative of high levels of post-traumatic stress and PTSD as a clinical concern. This suggests that, in this sample, the mean levels of PTSS are extremely high. Individuals in this reported significant post-traumatic stress symptomatology and emotional distress associated with traumatic event(s).

The variable of NAS represents the average score for NAS (combining the dimensions of Internal, Global and Stable). This score (and the scores of the specific dimensions) lies on a continuum from 1-7, a score closer to 7 representing more negative attributions. The averages indicated for each dimension specifically indicated that participants rated events as having causes which were more internal than external, more stable than unstable, and more global than specific.

4.3 Substance use

As mentioned 78% of this sample of South African university students indicated that they did drink alcohol (this ranges from low to hazardous or harmful drinking as seen in Table 3). This was expected of this sample as alcohol has been found to be the most common substance used by university students (Peltzer & Ramlagan, 2009). However Table 4 below describes the sample's reported use of alternative substance use, not including alcohol consumption.

Table 4

Descriptive Statistics for substance use excluding alcohol

Substance	*n*	Percentage
Cannabis	10	8.13
Other	4	3.25
None	109	88.62

Note. 'Other' referred to substances such as pain medication

4.4 Gender

4.4.1 Gender and PTSS

On average, women in the sample showed higher levels of PTSS (*M*=42.13, *SD*=20.35) than men (*M*=34.55; *SD*=19.80). A one-way ANOVA was conducted to determine if there was a significant difference between men and women on the variable of PTSS. However, PTSS did not vary as a function of gender, $F_{(1, 110)} = 2.82$, $p = 0.09$. These results suggest that in this sample, trauma exposure was the same for both men and women. However, the possibility of this being a Type II error can not be excluded given the relative lack of power inherent in the unequal sample sizes with three times more women than men.

4.4.2 Gender and trauma

On average, men in this sample had experienced more traumatic events (*M*=2.52, *SD*=1.62) than women (*M*=2.14, *SD*=1.18). A one-way ANOVA was conducted to determine if there was a significant difference between men and women on the variable of trauma. However, trauma did not vary as a function of gender, $F_{(1, 119)} = 1.32$, $p = 0.26$. These results suggest that in this sample, trauma exposure was the same for both men and women.

4.4.3 Gender and alcohol use

On average, men in this sample showed higher levels of alcohol use (*M*=4.69, *SD*=4.21) than women (*M*=3.85, *SD*=4.37). A one-way ANOVA was conducted to determine if there was a significant different between men and women on this variable of alcohol use. However, alcohol use did not vary as a function of gender, $F_{(1, 119)} = 1.08$, p=0.86. These results suggest that men in this sample did not drink significantly more than women as well as supporting the low levels of alcohol consumption reported in this sample. As such, in this sample, there were no gender differences in alcohol use patters, trauma exposure and levels of PTSS as has been reported in other samples, although the significance level for gender differences was close to significance (p= 0.09).

4.5 Pearson's correlation analysis. A correlation procedure was conducted across the main variables of alcohol use, trauma, PTSS, age and NAS (Internal, Stable and Global). The correlation is shown in Table 5.

Table 5

Correlation matrix across the variables in the study

Variable	Alcohol Use	Trauma	Internal	Stable	Global	PTSS	NAS	Age
1. Alcohol Use	-	0.1	0.01	0.06	0.13	0.10	0.09	-0.00047
2. Trauma		-	0.02	0.08	0.21*	0.19*	0.14	0.19*
3. Internal			-	0.18 [a]	0.32**	0.09	0.65**	-0.09
4. Stable				-	0.53**	0.17 [a]	0.76**	-0.07
5. Global					-	0.34**	0.83**	-0.05
6. PTSS						-	0.28**	0.03
7. NAS							-	-0.09
8. Age								-

Note. *p<0.05, **p<0.01, [a] close to significant at p<0.05

Results indicate that traumas (number of traumas) was significantly positively correlated with PTSS, suggesting that as the number of traumas reported increased, so too did the levels of reported post-traumatic stress symptomatology in this sample. This finding is explored in

more detail and captured in Table 6 below, where it shows how the mean levels of PTSS increase as the number of traumatic events increase. In order to depict this table, the traumas variable was divided into those with no trauma exposure (depicted categorically as a '0'), exposure to one traumatic event, and those who reported two or more trauma exposures. In this sample, PTSS was also significantly correlated with age, suggesting that the older participants were, the higher the reported number of traumatic experiences in their lifetime.

As would be expected, Internal, Stable and Global dimensions were significantly and strongly correlated with their composite score, which reflected the NAS. NAS was significantly correlated with PTSS, suggesting that as the levels of NAS increased, so did the reported levels of PTSS. This finding suggests that a NAS (which is a combination of scores that reflect Internal, Stable and Global attributions for negative events) was strongly related to PTSS. The Global dimension of attributional style related to the general tendency to attribute negative events to global causes. This dimension was most significantly correlated with both PTSS and with the number of traumas. The Stable dimension was close to being significantly correlated with PTSS, also suggesting this dimension may be related to PTSS. Alcohol use was not significantly correlated with any other variable. The possibility of a Type II error (failure to reject a false null hypothesis) may not be excluded given the modest sample size which was possibly not sufficient enough to detect smaller effect sizes.

Table 6

Number of traumas and PTSS

Traumatic Events	*N*	PTSS (*M*)	Std Deviation
None	6	27.17	21.08
Single	30	37.95	15.68
Multiple (2 or more)	78	43.19	21.73

Note. Scores of 33 and over are representative of significant post-traumatic stress with PTSD as a clinical concern

In sum, the descriptive statistics and correlation analysis suggest that in this sample, students have substantially elevated levels of PTSS. In addition, on average, the majority reported multiple exposures to traumatic events. Additionally, alcohol use was low and the majority of students did not surpass the AUDIT cut of 7 that indicated harmful drinking. Finally, it was

suggested that NAS and number of traumas was significantly correlated with PTSS, however alcohol use was not significantly correlated with any other variable.

4.6 Preliminary analysis: assumptions of MANOVA

The basic requirements of MANOVA are that there are two or more dependent variables as well as one or more independent variable that is categorical or treated as such. These requirements were met before proceeding with the assumptions of MANOVA. The following parametric assumptions of MANOVA were tested and met before proceeding with the main analysis

4.6.1 Assumption of independence of observations

This assumption assumes that the tests were administered individually and that a participant's participation was not dependent on the participation of another participant (Stevens, 2002). If interactions amongst participants were involved, observations may influence each other. A small amount of dependence amongst observations can cause the actual α to be several times greater than the level of significance (Stevens, 2002). While this sample was a sample of convenience, there was independence of observations and therefore it was assumed that this assumption was met.

4.6.2 Assumption of linearity

MAONVA assumes linear relationships between all dependent variables. Scatter plots of this sample's variables suggest that dependent variables are linearly related.

4.6.3 Assumption of normality

Tests of normality, such as the Shapiro Wilk's test of normality, are used to assess whether the scores of each measure were normally distributed around the sampling mean, or that the sampling distribution between means is normal (Howell, 2008). While MANOVA assumes multivariate normality, it can be extremely difficult to establish multivariate normality. As such, it is convention to assume that univariate normality of dependent variables is sufficient to meet this assumption, especially as univariate normality is a necessary precondition for multivariate normality (Johnson & Wichern, 1992). Tests of univariate normality were conducted for each variable in this study as shown in Table 7. A non significant Shapiro-Wilk's *W* was indicative of normality. Normality tests for independent variables are also provided.

Table 7

Shapiro-Wilk's test of normality

Variable	Shapiro Wilk's W	*p*-value
Alcohol use	0.84	<0.0001
Trauma	0.92	<0.0001
PTSS	0.98	0.17
Internal	0.99	0.30
Global	0.99	0.39
Stable	0.99	0.49

The *p*-values, as shown in Table 7, indicate that all variables, except the alcohol use and trauma variables, were non-significant and therefore represent a normal distribution for these variables. The Shapiro Wilk's *W* statistic tests the null hypothesis that the distribution of a particular variable approximates normality. A significant result, thus, rejects this null hypothesis suggesting non normality. Important to note is that, for the trauma variable, it would not be expected to find that the number of traumas experienced is normally distributed in the greater population. The distribution would likely be negatively skewed as most people who likely report experiencing fewer traumas. In the same vein, it would not be expected for alcohol use to be normally distributed as the majority of students did not engage in alcohol use or engaged in low-moderate alcohol use. However, it was initially expected that alcohol use would not be normally distributed due to the majority of students engaging in high alcohol use (this will be discussed further in the discussion section). The PTSS variable was normally distributed which would be contrary to what would be expected in the greater population. However, this is likely the case for international research where the majority of sample participants have not experienced a traumatic event. This normal distribution of PTSS is likely related to the unique South African context research suggests that the majority of people have, or will experience a trauma at some point in their lifetime. In fact, with a mean trauma exposure rate of two events before the age of 25 years, it would be expected that PTSS would be normally distributed as opposed to negatively skewed in a South African sample.

Given that the above parametric assumptions were met, parametric statistics were used in the main analysis.

4.7 Main analysis

A two way MANOVA (multivariate analysis of variance) was conducted to determine the main effects and interactions of the variables of trauma, NAS (as independent variables), and PTSS and alcohol use (and dependent variables) in order to explore the first hypothesis. A Wilk's Lambda test, which is a test statistic used in MANOVA to test whether there are differences between the means of identified groups of subjects on a combination of dependent variables, was used. The Wilk's Lambda was chosen to report all multivariate results as it is the most robust and common test where there are more than two groups formed by independent variables (Stevens, 2002). Following this, univariate analyses were conducted to explore the second and third hypotheses.

4.7.1 Hypothesis 1: In university students, trauma exposure and negative attributional style will be associated with both PTSS and alcohol use.

The above hypothesis proposes that there will be a significant main effect for each of traumas (number of traumas) and alcohol use variables. The Proc GLM in SAS procedure was conducted where alcohol use and PTSS were dependent variables, and NAS and trauma as the independent variable. A one way MANOVA revealed s significant multivariate effect for NAS, Wilk's $\lambda = 0.92$, $F_{(2, 100)} = 4.23$, $p = 0.02$. Furthermore this analysis revealed a non significant multivariate effect for trauma, Wilk's $\lambda = 0.95$, $F_{(2, 100)} = 2.52$, $p = 0.09$. These results indicate that, overall, as expected, a NAS is multivariately associated with both PTSS and alcohol use. However, the number of traumas reported was not significantly associated with both PTSS and alcohol use in this sample. The univariate tests are discussed in the following hypotheses as they formed part of subsequent hypotheses.

4.7.2 Hypothesis 2: In university students, trauma exposure and negative attributional style will predict PTSS.

A two way ANOVA was conducted to test this hypothesis. This was parsimoniously achieved in doing the multivariate analysis and looking at univariate indices in the SAS output to answer this hypothesis. A significant overall effect was found, $F_{(2, 103)} = 6.25$, $p = 0.0028$. Specifically, a significant main effect for NAS was found $F_{(1, 103)} = 8.76$, $p = 0.0038$. Additionally a near significant main effect for number of traumas was also found $F_{(1, 103)}$

=3.73, p=0.056. A non-significant NAS X traumas interaction, $F_{(1, 103)}$ =0.37, p=0.54, suggested that the effects of NAS on PTSS was not dependent on the number of reported traumas but rather that both variables were uniquely and possibly directly associated with PTSS.

4.7.3 Hypothesis 3: In university students, trauma exposure and negative attributional style will predict alcohol use.

A two-way ANOVA was conducted to test this hypothesis. Overall, a non significant overall effect was found, $F_{(2, 103)}$ = 1.65, p=0.19. A non-significant main effect was found for both NAS $F_{(1, 103)}$ = 1.79, p=0.18 and trauma $F_{(1, 103)}$ = 1.52, p=0.22. Additionally, as would be expected, there was also a non-significant NASX traumas interaction, $F_{(1, 103)}$= 0.05, p=0.82. These results suggest that NAS and number of traumas were not significantly associated with alcohol use, contrary to the study's predictions.

4.7.4 Additional analyses

As NAS was not significantly associated with alcohol use, the association of PTSS and NAS with alcohol use was also explored. The main aim of these additional analyses was to explore whether or not alcohol use plays a potential moderating role in the relation between trauma exposure and PTSS. As seen in Table 8, although lower NAS and fewer PTSS are seen in the low alcohol group and higher NAS and more PTSS are seen in the high alcohol group, there was no significant difference between the two groups, $F_{(3, 110)}$ = 0.69, p=0.56. The differences observed in this sample are therefore relative and may be due to chance as they do not reflect systematic differences. Therefore, alcohol use does not seem to be significantly associated with NAS and PTSS in this sample.

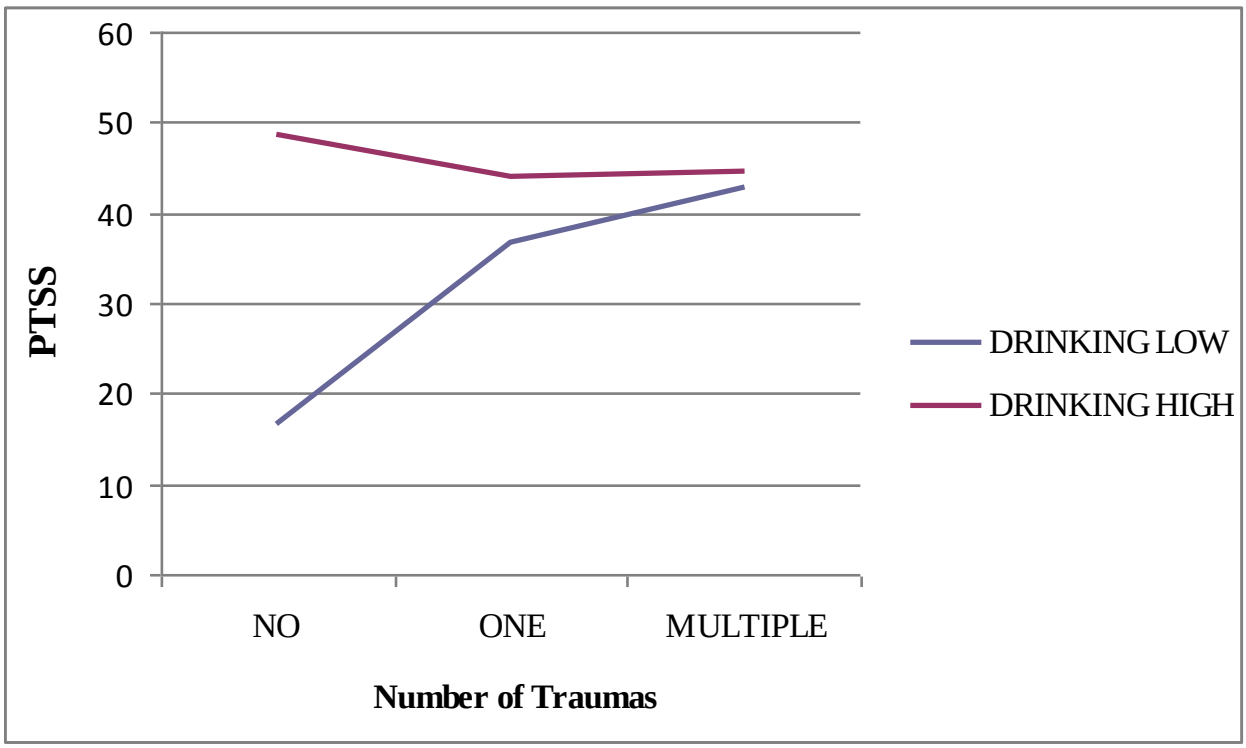
Table 8

PTSS and NAS as a function of alcohol use

Alcohol use pattern	**NAS**	**PTSS**
Low use	68.92	39.97
High use	70.88	44.73

A two-way ANOVA was conducted to further explore the relationship between number of traumas, alcohol use and their association with PTSS. In these additional analyses, alcohol use was operationalised as a moderator variable. The cut-off score of 7 was used for the alcohol use variable instead of using the continuous measure. This allowed this variable to conform to the requirements of the ANOVA procedure. Overall, alcohol use and number of traumas were found to be significantly associated with PTSS, $F_{(3, 113)} = 3.06$, p=0.03. Specifically a significant main effect for trauma $F_{(1, 113)} = 4.30$, p=0.04 was found as would be expected. Additionally, a non-significant main effect for alcohol was found $F_{(1, 113)} = 0.45$, p=0.51. A significant trauma X alcohol use interaction suggested that effects of alcohol use, or rather problem drinking, on PTSS are dependent on the number of traumas experienced, $F_{(1, 113)} = 4.43$, p=0.04. Specifically, posthoc tests with Tukey's LSD suggested that the effects of problem drinking were most harmful for people with low trauma exposure (operationalised as less than one trauma). For those with multiple trauma exposures in their history, PTSS was more related to the experience of multiple traumas than to whether or not they also engaged in problem drinking. Figure 1 shows this interaction.

Figure 1. *Trauma and alcohol use and their association to PTSS*



Note. Scores of 33 and over are representative of significant post-traumatic stress with PTSD as a clinical concern

In sum, the assumptions and requirements of MANOVA were met for this analysis. The variables of trauma and alcohol use were found not to be normally distributed in this sample, however these findings are expected in the greater population. The variable of PTSS was unexpectedly found to be normally distributed, however this makes sense taking into account the mean trauma exposure per participant in this sample. In terms of the main analysis, NAS was found to be significantly multivariately associated with both PTSS and alcohol use, however univariately NAS was significantly associated with PTSS, but not alcohol use. Interestingly, it also was found that PTSS was more related to the experience of multiple traumas than to whether or not alcohol was used, although alcohol use was found to be associated with greater reported levels of PTSS in circumstances where less than two traumatic events were experienced.

CHAPTER FIVE
DISCUSSION

5.1 Discussion of preliminary results

5.1.1 Trauma

As was initially expected, the current study found that this sample of South African university students (mean age was 20.41 years) had experienced many incidences of trauma. Of 123 participants, 95.12% had experienced at least one trauma in their lifetime, with 68.29% of this sample having experienced multiple traumas (two or more). In line with this, the mean number of traumatic events experienced by this sample was 2.25 (*SD*= 1.29). This study supports findings of other South African studies. With a similar sample of South African university students (mean age was 20.4 years) and using the same measurement of trauma (Traumatic Stress Schedule), Hoffmann (2002) found 70.6% of their sample (*n*=245) to have experienced one or more traumas. Of this sample, 41.6% reported experiencing multiple traumas. Van Olst (2008) reported similar findings (using the TSS), with 88.6% of the study sample (n=632) having experienced at least one traumatic event in their lifetime. On average in this study, each participant experienced 2.22 occurrences of traumatic events. Furthermore, Govender (2010) found that 93.37% of their sample (South African students with a mean age of 21.03 years) experienced at least occurrence of trauma, with 65.56% of this sample reporting two or more traumas. The above South African studies support the findings of the current study and highlight the high number of traumatic events experienced in university students, as well as the high percentage of multiple trauma experienced. These findings also reflect the high trauma rates in South Africa. Interestingly, these studies also suggest that the frequency of traumatic events experienced seems to have increased in more recent years. However the rates are consistently high in all the above studies.

In terms of international studies targeting trauma in the student populations, a number have also found that a substantial percentage of students have experienced trauma. In an American study, Breslau and colleagues (1991) found nearly 70% of the sample to have experienced at least one trauma in their lifetime. Vrana & Lauterbach (1994) found 84% of their sample to have experienced at least one trauma, with about 40% of this sample having experienced multiple traumas. Another American study (Lauterbach & Vrana, 2001) found 80% of students in their sample (n=322) to have experienced at least one traumatic event. Additionally 60% of this sample had experienced multiple traumas. Read and colleagues

(2011) reported that 66% of their sample reported a traumatic event, with 45% reporting multiple traumas (two or more). The average number of traumas experienced by this sample was 1.5 (SD=1.45). A Russian study (Dalenberg & Palesh, 2004) also found that 66% of their student sample (mean age of 20.5) experienced at least one traumatic event.

There is quite a lot of variability in these estimates, which may be due to the broad definitions of trauma that have been applied throughout these different studies, as well as the different measures used (Read et al., 2011). The substantial percentage of young people who report these events may also raise some concern about over reporting of minor incidents as traumatic, and these factors may both be worth considering in future studies (Vrana & Lauterbach, 1994). However these studies support the high trauma levels found in this current study, but also point to South African percentages being similar, but slightly higher than international studies. Similarly the percentage of multiple traumas also seems to be higher in South African students.

South Africa has been characterised as a country with extremely high rates of violent crime, sexual violence and domestic abuse and high incidence of serious motor vehicle accidents, ranking as one of the countries with the highest levels of crime and violence in the world (Altbeker, 2007). Given these high levels of crime in South Africa, many individuals will be exposed to violent crime on more than one occasion. It is, therefore, possible that due to the high and continuous rates of violent crime and road accident related traumas in South Africa; that there may be differences in the types and severity of trauma reported in South Africa compared to international studies. Traumatic events as described by the DSM-IV-TR (APA, 2000) involve actual or threatened death or serious injury, or a threat to the physical integrity of self or others. These events elicit a reaction of intense fear, helplessness and horror (Kaminer & Eagle, 2010). It may be the case that trauma exposures seen in South African studies are unique to the South African context and do not necessarily result in traumatisation as defined by the DSM-IV-TR (APA, 2000). Conversely, the definition of traumatisation may be too broad and thus leads to the inappropriate application of the concepts of trauma and PTSD (McNally, 2004). This inappropriate application may lead to similar results of traumatisation being seen in South Africa and international studies, when in fact the type and severity of traumatisation are very different. Perhaps DSM-IV-TR (APA, 2000) criteria for traumatic events need to examine a variety of traumatic stressors in terms of their application

to the DSM-IV-TR and with respect to their ability to elicit PTSD symptoms (Weathers & Keane, 2007).

Overall, the results suggest that university students are not protected against trauma and, in fact, are quite susceptible to it. Literature seems to support the notion that occurrence of trauma is highest during late adolescence and early adulthood, which corresponds to the age group of the current study as well as the above studies (Breslau et al., 1998).

5.1.2 Post-traumatic stress symptoms (PTSS)

In the current study, the sample reported significantly high levels of post-traumatic stress symptoms after traumatic events (*M*=40.97, *SD*=20.51). In this study 60.53% of the sample reported experiencing significant symptoms of PTSD, with PTSD as a clinical concern (PTSS score>33). Furthermore, 56.14% reported high levels of post-traumatic stress with a possible diagnosis of PTSD (PTSS score>37). Trauma was also found to be significantly positively correlated with PTSS. In line with findings from other South African studies, this study's findings suggest that South African university students, in general, experience very high levels of post-traumatic stress symptoms on average.

South African studies have yielded similar results with the reporting of relatively high incidence of psychological distress following trauma (Hoffmann, 2002). Govender (2010) also found trauma to be significantly positively correlated with PTSS symptoms with a mean PTSS score of 37.26. The mean PTSS score for participants who had experienced multiple traumas was 43.47, and similarly in the current study the PTSS score for multiple traumas was 43.19. Peltzer (1998) also found a significant positive relationship between exposure to traumatic events and post-traumatic stress symptoms. Although Roe-Berning (2009) (not a study of a student population) found the mean PTSS score to be 50.10 (*SD*=18.94) which is significantly elevated. This community sample consisted of 135 participants (*M*=39 years).

In terms of international studies, Vrana and Lauterbach (1994) found the mean PTSS score to be 33.4 (*SD*=18.7) and, like other studies, that PTSS was significantly correlated to traumatic events. Bernat and colleagues (1998) reported the mean PTSS score to be 16.65 (*SD*=18.04), and 67% of their sample reported at least one traumatic event. Only 4% of the full sample (*n*=936) reported full symptoms of PTSD. More recent studies, within which PTSS scores were not available (IES-R measure was not used), showed that about 9% of the sample met

the criteria for PTSD. PTSS was also positively correlated to number of traumas (Read et al., 2011). Lauterbach and Vrana (2001) reported 3.2% of the sample (*n*=322) having received a presumptive PTSD diagnosis, with 5% being one symptom short of the full diagnostic criteria.

Therefore it seems that all studies found a significant association between number of traumas and PTSS. Although the percentage of participants who experienced traumatic events is similar in most of the studies, PTSS seems to be elevated in the current study as well as generally in South African studies. This may be due to exposure to multiple traumas in South Africa, more so than in international studies. In terms of PTSS being normally distributed in this present study's sample, it may be the case that this distribution may be related to the South Africa's unique context and that a normal distribution of PTSS is actually expected in a South African sample. Thus it is important to consider a cumulative effect of trauma and what the consequences of this might be. Those with multiple traumas are substantially more likely to be highly distressed than those whom experienced none or one trauma (Williams et al., 2007). A direct assessment of multiple trauma and psychiatric disorders such as PTSD would be important in future studies (Williams et al., 2007). Recent researchers have started exploring the notion of continuous traumatic stress and whether or not this may be a better descriptor of the uniquely South African trauma context (Kaminer & Eagle, 2010). PTSD and PTSS is a common occurrence in South Africa and these studies show an alarmingly high degree of exposure in many settings, suggesting that this exposure is a significant contributing factor to the high incidence of PTSS.

5.1.3 Pattern of alcohol use

In this study, the AUDIT measure was used to assess alcohol use and a cut-off score of 7 was used to indicate hazardous drinking. Out of the sample of students, 78.86% did drink alcohol to some extent, however out of these, only 27.84% drink hazardously. Out of the full sample, 21.95% drink hazardously. These findings were unexpected: it was expected that a larger percentage of this sample would engage in hazardous drinking or may have developed an AUD as outlined in the literature review. The mean AUDIT score for this sample was 4.02 (*SD*=4.29) and only 0.81% of this sample could be considered to have an Alcohol Dependence or Abuse diagnosis. Contrary results were found in other South African studies. Young and de Klerk (2008) undertook a study during two consecutive years at Rhodes University, finding a mean AUDIT score of 8.94 in 2007 and 8.84 in 2008. Both levels of

alcohol use were substantially higher than the means found in the current study. Both sets of results suggest that half of the students who completed the questionnaire exceeded the clinical cut off score (which was 8 for their study) and therefore were at risk for alcohol related harm. About one third of all students fell into the hazardous drinking category (scores of 8-15). Another study at Rhodes university in 2010 (Young & Mayson) found that 57.9% of the sample engaged in hazardous drinking. This study used a cut off score of 6 for women and 8 for men. However, rates of alcohol use do seem to range somewhat, as suggested by Peltzer and Ramlagan (2009), with a range from 20-80% and an estimate of 17.1-58% engaging in hazardous drinking. Thus the alcohol use of this study's sample falls within this expected range.

In terms of international studies, an American study (Kokatalio et al., 2004) used a cut off score of 8 for the AUDIT and found their mean AUDIT score to be 7.45 (SD=0.29). Furthermore, another study (Reavley et al., 2011) found the mean AUDIT score for their sample of tertiary education students to be 6.0 (5.7). In this sample, 84% of students drank and, out of those who drank, 33% of the students were classified as hazardous drinkers.

With consideration of these studies, the alcohol use in the current study was relatively low and for the most part was not considered an alcohol use or dependence disorder. A factor implicated in the low levels of drink may have to do with the demographic profile of the sample in the current study. Lower drinking rates have been found to be associated with ethnically diverse student bodies (Wechsler & Kuo, 2003). The same is true of student demographics that include high proportion of female students. Gender differences and their association with alcohol consumption are well documented in studies in South Africa. These studies have found that male university students tend to drink larger quantities of alcohol and are more prone to problematic drinking than female students (Meyer, 2001; Tolken, 2008; Young & De Klerk, 2008). In the current study, there were many more females than males (however there was not a significant different between men and women), and this may account for the low levels of drinking found in this study. Race and culture also plays a role in student drinking. White students have been found more likely to be classified as hazardous, harmful and dependent drinkers than coloured, black and Indian students (Young & De Klerk, 2008). Pillay and colleagues (2006) also revealed a similar trend of alcohol consumption difference between diverse racial groups in South Africa. Since lower levels of drinking are found among black South African students, results in this study make sense, as

the majority of students in this sample are black, with 18.7% being a combination of Indian, Asian and coloured participants.

Different cut-off scores for the AUDIT measure used in these studies may have also influenced the different findings. It has been suggested that the AUDIT questionnaire is a useful and reliable measure of alcohol consumption in South African university contexts. Importantly, using evidence-based cut-off points is important; for example, using different cut off scores for men and women. This helps to correct gender discrepancies and account for the sensitivity of the measure (Young & Mayson, 2010). Thus, sensitivities and specificity for varying cut off points should be determined in terms of the sample, although a cut off of 6-8 is suggested to be optimal, and should be considered in future studies (Kokotailo et al., 2004).

5.1.4 Attributional Style

In terms of other studies that used attributional style and the ASQ, findings suggest that attributional style does influence responses and reactions to adverse events and traumas (Gray et al., 2003; Mikulincer & Solomon, 1988). Although research on attributions and PTSD up to this point have been limited, it was expected that this sample would have more internal, global and stable attributions for negative events (suggesting a negative attributional style), especially because of the elevated PTSS and multiple exposure to traumatic events found in this sample. Negative attributional style will be discussed further in the discussion of hypothesis three.

5.1.5 Gender

As was expected in this sample, on average women reported more PTSS than men. Although the difference between the groups was not significant, the results suggest that with a larger sample size this may have become significant. These findings are similar to what has been found both in South African and international literature (Bernat et al., 1998; Govender & Killian, 2001; Lauterbach & Vrana, 2001; Read et al., 2011). An explanation for these results is that women may have a different strategy for coping with traumatic stress than men – a more emotion focused coping strategy which leads to higher levels of distress. Men may take on a more problem focused coping strategy where they are more active and take control of their situation (Govender & Killian, 2001). Alternatively men may report less PTSS due to society's gender roles and expectations of men and their ability to remain strong and superior to women (Hoffmann, 2002).

In terms of number of trauma reported by men and women, findings were consistent with studies that found men to experience more traumatic events than women (although this difference was not significant in the present study) (Breslau et al., 1991; Norris, 1992; Vrana & Lauterbach, 1994). In line with this, studies have found that men may be exposed to specific kind of events as compared to women, more specifically life threatening situations and accidents, while women are more exposed to sexual and interpersonal abuse (Bernat et al., 1998; Vrana & Lauterbach, 1994).

In terms of alcohol use reported by men and women, findings were similar to both international and South African literature that suggested in tertiary education students, particularly male students, that men reported significantly higher alcohol use than women (Kokotailo et al., 2004; Lauterbach & Vrana, 2002; Young & de Klerk, 2008; Young & Mayson, 2010). Importantly, although this study cautiously supports the evidence to suggest men generally drink more than women, this difference was not significant and was relative. In addition, the average AUDIT score for men was not that high compared to the cut off point of 7. In other studies it was found that male students have relatively high levels of risky alcohol consumption (Reavly et al., 2011). Thus, it seems in this study, alcohol use was relatively low, especially among men due to the reasons already discussed. This is an important difference in this study to consider. What is also highlighted in this study and in other literature is the importance of considering men and women in different ways – using gender appropriate cut off scores as women may have lower levels of drinking, but it doesn't mean they are not aversely affected by alcohol use (Young & Mayson, 2010) and that alcohol use intervention should ideally be tailored to gender (Reavly et al., 2011). Future research should explore and establish gender-based cut off scores that give the highest levels of sensitivity and specificity. Additionally, due to the use of a convenience sample in the present study, the sample was drawn from a population where there were fewer males than females. This may have affected the lack of gender differences seen in this study. Future research should examine more equal number of men and women participants in order to examine these relationships more closely

5.2 Discussion of main analyses (Hypotheses)

The hypothesis that a negative attributional style and the number of traumas reported will be associated with PTSS and alcohol use was supported, as was expected, in this study.

Importantly, in this particular sample, the average levels of alcohol use were generally not high enough to be considered problematic. Additionally, in this sample, negative attributional style may not necessary predict problematic alcohol use (AUD). Furthermore, it was expected that the cognitive vulnerability of negative attributional style may role in predicting this occurrence of both PTSS and alcohol use (McCormick et al., 1989). Possibly with a different kind of sample in terms of ethnicity and gender, a comorbidity of PTSS and AUD use may have been found. These findings highlight the importance of cognitive vulnerability factors such as negative attributional style in evaluating and predicting the psychological outcomes of a traumatic event. This hypothesis was unpacked further in the following discussion.

5.2.1 Hypothesis 2: In university students, trauma exposure and negative attributional style will predict PTSS.

The second hypothesis predicted that a negative attributional style and number of traumatic events would predict PTSS severity was supported in this study. Although the number of traumas experienced by this sample was not significantly associated with PTSS, this association came close to significance, suggesting that with a larger sample size (an increase in power) this association may become significant. Although number of traumas experienced was not significant, negative attributional style was found to be significantly associated with PTSS severity, in this way supporting this hypothesis. Additionally, the interaction between number of traumas and negative attributional style was not significant which reflects that number of traumas and this variable's association to PTSS is not dependent on the level of negative attributional style. Rather, that these two variables are uniquely predictive of the development of PTSS. These findings are supported by the significant correlation relationships found between these variables. Although negative attributional style was found to be more strongly correlated with PTSS, both negative attributional style and number of traumas was significantly correlated with PTSS.

This being said, the number of reported traumas does have unique predictability in terms of the development of PTSS, although it may not have been significant in the present study. These findings fall in line with other South African studies that have yielded similar findings and found significant positive relationship between exposure to traumatic (number of events) events and the development of post-traumatic stress symptoms (Hoffman, 2002; Peltzer, 1998). The explanation made for the stronger association between negative attributional style and PTSS is that although development of PTSS is not necessarily dependent on the level of

negative attributional style (as the severity and circumstances surrounding a traumatic event may be more strongly associated with PTSS) the types of attributions and inferences that people generate about a traumatic experience may exacerbate symptoms of PTSD, especially if these attributions are negative (Gray et al., 2003; Reiland, 2006). In an international study (Falsetti & Resick, 1995) similar results were found as results indicated that multiple traumas did not predict PTSD, but rather that casual attributions related to those traumas did. This study indicated that causal attributions (as measured by the ASQ) were moderate predictors of symptomatology.

These results support the literature that suggests that there is a consistent link between negative attributional style and the development of PTSS and PTSD after a traumatic event (Mikulincer & Solomon, 1988; Williams et al., 2002). Two studies with samples of university students (Gray et al., 2003; Reliand, 2006) both found high levels of PTSS and high number of traumatic events reported in their samples. These studies support the present study's findings that negative attributional style was associated with PTSS. Both studies supported the idea that more internal, stable and global attributions for traumatic events are associated with PTSD.

In the present study it was found that globality was significantly correlated with PTSS, stability was close to significantly correlated with PTSS and the internality was not significantly correlated with PTSS. Similarly, Gray and colleagues (2003) found (after controlling for depression) that more stable attributions for traumatic events are more likely to be associated with PTSS following a traumatic exposure. Reliand (2006) suggest that only two of the three dimensions were significantly correlated with PTSD symptoms, namely stability and globality were associated with PTSD symptom severity.

Unfortunately, the present study did not control for depression. However literature suggests that internal attributions specifically, as well as stable attributions are not consistently predictive of PTSS, but were more related to depressive symptoms than PTSD symptoms (Reiland, 2006, Ginzburg et al., 2003). Furthermore, external rather than internal attributions for traumatic events have also been associated with PTSD (Mikulincer & Solomon, 1988). However, the findings in terms of specific attributions are quite mixed. According to studies (Gray et al., 2003; Reliand, 2006) that both used a similar sample to this present study, stable and global attributions are most predictive of PTSD. These findings were also supported by

Wenninger & Ehlers (1998) and Joseph, Williams and Yule (1995). While directionality is not possible to infer from the simple correlation analyses conducted in the data analysis, it is likely that attributing causes of negative events to global and stable causes is a risk factor for the development of higher levels of PTSS.

It is unknown whether attributional style constitutes a premorbid vulnerability to PTSD following trauma exposure (following a diathesis-model for the development of PTSS) or if PTSD causes certain negative attributions. However it seems clear that negative attributions, although they may not sufficiently explain the development of PTSD, may play a role in development of post-traumatic stress (Lack, Sullivan, Scott & Beck-Xaysuda, 2010). As seen in this study, it is not only the frequency of traumatic events that predicts PTSS but an individual's interpretation of these events and the implication and consequences of this interpretation. A person who has a premorbid negative attributional style before a traumatic event will be likely to experience more chronic and debilitating symptoms of PTSD because of the way that they process and understand the experience (McCormick et al., 1989). Future research should explore these relations in a longitudinal design in order to ascertain potential causative mechanisms in the relation between these two phenomena.

Looking at the dimensions of stable and global attribution specifically, especially in the case of multiple traumas, one can understand how these negative attributions may reinforce the idea that traumatic events may keep happening (stable) and that they will occur in many different settings (global). The correlations suggest that people with a higher global and stable attributional style reported experiencing more events. Thus, in the case of an individual with a premorbid negative attributional style, exposure to multiple traumas only entrenches these negative attributions and beliefs about the world, increasing fear and symptoms of PTSD (Elwood et al., 2009a). In line with this, it makes sense that symptoms of PTSD such as avoidance and hypervigilence would be exaggerated in an individual who believes that traumatic events will continue to occur and are likely to occur anywhere or at any point in their life (Gray et al., 2003).

However in a place like South Africa where multiple traumas are common, it is possible that attributions may change to become more negative (it would be useful for future studies to look at attributional style longitudinally). This idea is supported by Foa, Zinbarg and Rothbaum (1992) who suggested that multiple or frequent traumatisation may lead to a

change in general attitude towards people, situations and the world, where the world becomes an unpredictable and dangerous place. Studies have shown that the origin or development of negative attributional style is related to negative interpersonal experiences (Seligman et al., 1984) and the occurrence of undesirable life events (Johnson & Miller, 1990). Depression is also a significant predictor of a negative attributional style, and PTSD symptoms often overlap with depression (Kaslow et al., 1984). Therefore, it is possible that frequent negative life events in the form of trauma be associated with the development of a negative attributional style. Future research into when attributions start to affect emotion and self-concept during development would be important for this area of research. Therefore, it may be that in a place such as South Africa, where multiple traumas are a common occurrence, that the attributions that individuals place on events, such as traumas, may become negative as they experience trauma, and in turn the negative attributional style exacerbates symptoms of PTSD.

In summary, negative attributional style was found to predict both PTSS and alcohol use. However, although negative attributional style and PTSS were significantly correlated and it is likely that negative attributional style predicts elevated levels of PTSS, this is not necessarily the case for alcohol as alcohol use was generally not problematic in this sample. However, it is suggested that negative attributional style may play a role in both PTSS and alcohol use, and with a different sample, problematic alcohol use (e.g. an AUD) and elevated PTSS may have both been predicted. Expanding on this, with further univariate analysis it was found that negative attributional style did significantly predict PTSS that the attributions (global, stable and internal) that the participants made about negative life events were significant in predicting how they would experience PTSS in the aftermath of that event. Specifically global and stable dimensions of negative attributional style were implicated in this. Further, it is unknown if attributional style constitutes a premorbid vulnerability to PTSD following exposure or of PTSD causes certain negative attributions. Specifically in South Africa where multiple traumatisations are common, it may be the case that attributions that individuals make about traumatic events may become more negative as increasing number of traumas are experienced.

5.2.2 Hypothesis 3: In university students, trauma exposure and negative attributional style will predict alcohol use.

The third hypothesis, that students with a negative attributional style who have experienced traumatic events would predict alcohol use, was not supported in this study, consequently negative attributional style was not shown to predict problematic alcohol use such as AUD. The findings suggest that both negative attributional style and number of traumas were not significantly predictive of alcohol use. Additionally, there was a non-significant interaction between negative attributional style and trauma suggesting neither variable is uniquely or dependently predictive of alcohol use.

These results were unexpected as the literature suggests that students with a history of trauma are more likely to engage in alcohol use as well as other risky behaviours (Green et al., 2005). The concept behind this is that with increased number of trauma, PTSD will increase (seen evidence for this in this study). There is evidence to suggest that students who reported higher levels of traumatic stress symptoms, also report consumption of larger amounts of alcohol (Edwards et al., 2006; Stewart et al., 1998). Additionally, there is evidence to suggest a reciprocity cycle between trauma, traumatic stress and alcohol use (Ouimette & Brown, 2003). More specifically, when an individual has a traumatic experience, with symptoms of PTSD, it places the individual at risk of substance use disorders. This substance use may put the individual at risk of exposure to further trauma, in turn aggravating the symptoms of PTSD. This may even lead to further substance abuse. However, these findings were not supported in the present study. These findings run counter to the generally positive associations between PTSD and alcohol use, as reported in the above literature.

However, other studies have found similar results to the present study (Lauterbach & Vrana, 2002; Op Den Velde et al., 2002). Lauterbach and Vrana (2002) found that students in their sample with high levels of PTSS and multiple trauma exposure did not differ to students with lower levels of PTSS and trauma exposure in terms of alcohol use. These studies found the relationship between multiple traumatisation and alcohol use to be unclear.

An explanation for these findings is what has been mentioned earlier, that this study's sample had relatively low rate of alcohol use, possibly because of the demographic profile of the study. This may also be due to low reporting of alcohol use because of the use of self-report measure which has limited reliability in terms of what individuals may report. The

underreporting of alcohol consumptions may be particularly associated with individuals who have alcohol dependence or abuse (Op Den Velde et al., 2002). Another possibility is that the traumatic events experienced by this sample of university students were not severe enough to produce symptoms of substance abuse (Stewart, 1996). However, the number of traumas experienced by this sample makes this less likely. Another reason why there may not be a significant association is that university drinking is largely determined by social situations and the high levels of drinking may decrease when students are out of the university environment (Lauterbach & Vrana, 2002). Although some of participants' high alcohol consumption may be considered alcohol use or dependence, it may not be directly due to trauma.

In terms of negative attributional style, it was also found that this variable was not significantly predictive of alcohol use. Literature reviewed had mixed findings with very little literature on this subject. Dowd and colleagues (1986) reported that in their sample, alcoholics differed from non-alcoholics in terms of negative attributional style – making more global and stable attributions. Goldstein and colleagues (2000) also found that people with negative attributional style were more likely to have increased hard-alcohol consumption. However there are also studies that show findings are similar to the present study.

Goldstein (2006) found that negative attributional style as well as negative life events (such as traumas) did not better account for alcohol consumption. Similarly to the present study, this study found alcohol consumption of the students to be lower than expected and seen in other studies. Goldstein (2006) suggested that ethnicity in the study may play a role in the association between negative attributional style and symptoms of alcohol use. For example how the black participants differed from white participants in how they handled their attributions to events – their coping and help seeking after the event and how symptoms of PTSS were understood (Bhui et al., 2011). Further studies might investigate how attributions differ cross-culturally. Furthermore, McElderry (2009) found that experiences of traumatic events did not significantly predict alcohol use and attributional style was not associated with alcohol use. Similarly to the argument made above, negative attributional style may not have been associated with this sample of university students as alcohol consumption among university students may take place in the context of socialising and celebration, not because of the negative perception of traumas and life events (Lauterbach & Vrana, 2002).

As the present study found that there was not a significant association between negative attributional style, number of traumas and alcohol use, further analyses were conducted. Although it was not found that number of traumas predicted alcohol use, the literature points to a consistent pattern of PTSD and alcohol use comorbidity. Furthermore, Maes and colleagues (2001) also suggested that the relationship between PTSD symptoms and alcohol consumption is not necessarily unidirectional. Therefore, it was important to explore these variables further to see if alcohol use interacts with number of traumas to predict PTSS. The findings of this particular investigation showed that alcohol use and trauma together were significantly predictive of PTSS. Although the main effect for alcohol was non-significant, the main effect for trauma was significant. A significant trauma and alcohol interaction suggested that the effects of alcohol on PTSS are dependent on the number of traumas experienced. Specifically, that alcohol use was most detrimental for participants who reported exposure to one trauma or less. However, where multiple traumas are concerned, alcohol use does not seem to be a risk factor for higher levels of PTSD. The only risk factor seems to be the fact that the individual has been exposed to more than one trauma. This may be related to shuttered assumptions and warrants further research to explore mechanisms that might be associated with the development of PTSS. Additionally, it may be the case that alcohol use acts as a moderator in the relationship between trauma exposure and PTSS and in this study specifically, describing the relationship between PTSS and alcohol use as being comorbid may not be an accurate conceptualisation.

This finding seems to suggest (see Figure 1) that when this sample of students experienced multiple traumas, alcohol use in both the low and high alcohol groups did not seem to counteract the outcome of the PTSS severity. Both groups, despite their alcohol consumption, developed severe and a similar level of PTSS (40+) when multiple traumas were experienced. As mentioned, the relationship between alcohol use and PTSS is well documented in the literature, and as seen in Figure 1, in the presence of single or no traumas, the high alcohol group's PTSS seem to decrease while the low alcohol group's PTSS increases with the experience of a trauma. This falls in line with literature that suggests that individuals with higher alcohol consumption may have symptoms that overlap with PTSS symptoms (e.g. withdrawal symptoms) causing what looks like a more exaggerated PTSS symptoms (Stewart et al., 1998). Additionally, some studies support the idea that higher alcohol consumption, as long as it is not associated with dependence as defined by the AUDIT, may act as a protective factor for PTSD following trauma and decrease PTSD symptoms (self-medication

hypothesis). Furthermore, individuals who drink minimally, as many participants in this sample did, are at more of a risk for the development of PTSS, as they do not have that protective factor and alcohol cannot act as a form of self-medication (Maes et al., 2001; McFarlane et al., 2009). This can be seen as the low alcohol group's PTSS increased as traumas increased.

However, this being said, these patterns of interaction between these variables, as previously reported in the literature no longer applied in the case of multiple traumatisation in predicting PTSS. Literature concerned with multiple traumatisations, which is still a fairly new area of research, suggests that multiple trauma may lead to different symptom outcome, possibly more complex symptoms (Cloitre et al., 2009; Hagenaars et al., 2001). In addition to PTSD symptoms, trauma frequency may play a role in impairments in affect regulation and interpersonal functioning (Hagenaars et al., 2011). In other words it may lead to a broader spectrum of symptoms (Maes et al., 2001), possibly that may not be counteracted or increased by alcohol use.

The type of multiple traumas may also play a role in South Africa specifically, as violent crime and victimisation is the most common type of trauma experienced as compared to international studies. In this sample, 45% of students experienced one or more incident of forceful robbery, mugging, smash and grab or hold up, 59% of students experienced one or more violent death, specifically in the form of accidents, homicides and suicides. Forty nine percent (49%) of students experienced one or more hijacking or someone close to them experienced a hijacking. In comparison to an international study (Read et al., 2001), 24% of their sample experienced some kind of physical violence and 34% experienced someone they knew dying, however the cause of death was not necessarily violent, as in homicides and suicides. Thus, it is suggest that South African individuals may experience increased and severe PTSD symptoms related to the violent nature of crime that characterises South African society. Furthermore, that the PTSD symptoms experienced due to multiple traumas may not necessarily be strongly associated with alcohol use (Govender, 2010; Kaltam & Bonanno, 2003; Kaminer et al., 2008). Alternatively, the alcohol use in this group (as mentioned previously) may not have been severe enough to see the usual pattern of alcohol use and PTSS reported in the literature. However, the multiple traumas as seen in this study and the outcomes of this, is still an important area of study to investigate in future research.

In summary, negative attributional style was not found to predict alcohol use. As discussed earlier, the low levels of alcohol use seen in this sample may be a consequence of the specific demographic profile of the sample. Furthermore, alcohol use in university students may be determined by the social environment and may, in fact, not be due to trauma or negative attributional style at all. Ethnicity and culture is also an important consideration, both in terms of attributions made but also about alcohol use. Further exploration of alcohol use showed that where multiple traumas were concerned, alcohol use did not seem to be a risk factor for high levels of PTSS but rather alcohol use may act as a moderator in the relationship between PTSS and trauma exposure. It was suggested that multiple traumatisation may play a role in a different symptom outcome, one that cannot be counteracted by alcohol use. These findings highlight important research that can be done in the area of multiple traumatisations and the outcomes for co-morbid PTSS and alcohol use and how these variables interact with one another. South Africa especially is a place of substantially higher rates of violent crime and multiple traumas and the type of traumas as well, may affect PTSS more substantially where alcohol use no longer plays a significant role in the levels of PTSS. Future studies should consider looking at different types of traumas, as well as frequency of traumas in determining PTSS and alcohol use comorbidity, as well as each of these variables separately. Future research needs to explore multiple traumatisations as it presents the greater risk for mental health in the aftermath of trauma.

5.3 Limitations of the study

Aspects of the data collection may have potentially limited the findings of this study. As a convenience sample was drawn from a Humanities and Health Science undergraduate population, more women then men participated in this study. Therefore, the generalisability of this sample may be limited to this particular population. Additionally, having fewer men than women in this study may have limited the results in terms of alcohol use as well as a lack of differences found between men and women on various variables. Furthermore, an AUDIT cut-off score was used for the whole sample and was not different for men and women. If a lower cut-off score was used for women, this may influenced the patterns of alcohol use found. In terms of the measures used, participants did not answer the TSS questions appropriately. Some participants indicated that they had experienced a traumatic event but did not indicate what they had experienced or how long ago they had experienced it. There may have also been some words such as ‘perpetrator’ that some participants didn’t understand. There may have also been a limitation in terms of social desirability and the

pattern of alcohol use found. Specifically for participants who were engaging in hazardous alcohol use. These limitations were an unfortunate consequence of using self-report questionnaires.

Finally, this study did not control for depression which may have been useful in terms of understanding how different dimensions of negative attributions were associated with PTSD specifically. The small sample size was also problematic, as some analyses may have become significant with a larger statistical power. Future studies on university students should attempt to have larger sample sizes including different faculties.

5.4 Recommendations for future research

It is apparent throughout this study that multiple traumas and the consequences of this kind of exposure is a valuable area of research for future studies – especially South African studies. Additionally, types of trauma, such as violent crime and the implications of these types of trauma for long-term treatment and outcomes warrant further research. Longitudinal studies tracking attributional style will also be important to assess how and if attributional style does change over time with exposure to multiple traumatic events. There were no differences found between men and women in this study. Future studies may benefit by incorporating more equal numbers of men and women in their studies. Further, future studies should include different AUDIT cut-off scores for men and women to allow for a more reliable picture of alcohol use in the sample as a whole. Furthermore, this study could be replicated in a clinical sample where greater levels of distress and AUD are found. This may give further insight into the role of attributional style in predicting PTSS and alcohol use.

CHAPTER SIX
CONCLUSION

6. Conclusion

This study explored the cognitive vulnerability of negative attributional style as a predictor of post-traumatic stress symptoms and alcohol use in a sample of university students. Overall, this study did not support the PTSD-AUD comorbidity highlighted by studies in the literature review. Thus, the theories that are usually applied to account for this comorbidity did not apply to this study. Although multivariately negative attributional style was found to predict both PTSS and alcohol, on further inspection of these variables, negative attributional style was not found to predict alcohol use at all. However, additional analysis found evidence that instead of being a comorbid difficulty, alcohol use was found to be a moderator of the relation between trauma exposure and post-traumatic stress symptoms.

The present study found lower levels of problematic alcohol use than would be expected in a college sample. The low levels of alcohol use found may be accounted for by the demographic and cultural factors pertaining to this sample or possibly alcohol use levels were limited by self-report AUDIT measure used to collect data. Interestingly, it was found that multiple traumatisation influenced PTSS over and above affects of alcohol use. This highlighted the idea that multiple traumatisations may produce a broader or more complex range of symptoms that have not yet been accounted for by other studies. Similarly, in the context of South Africa, the type and severities and frequencies of trauma was highlighted as a valuable area of study for a better understanding of PTSD.

However, the results of this study did indicate that negative attributional style was predictive of PTSS and that the more negative the attributions made, the more elevated the PTSS. This study also suggested that global and stable attributions may have been most predictive of PTSS. Taking into account multiple traumatisations, it was discussed whether PTSS and PTSD may cause certain attributions or whether attributional style constitutes a premorbid factor for developing PTSD following exposure to a traumatic event. This is an important area of study for future research. These findings supported the idea of the diatheses-stress model, and that negative attributional style is cognitive vulnerability for the development for PTSS. However, this study did not support the idea that negative attributional style was a cognitive vulnerability for both alcohol use and PTSS.

The study of the relationship between cognitive vulnerabilities and PTSD and alcohol use is a promising line of research for increasing resilience and recovery among trauma survivors. Negative attributional style may be important in the prediction of PTSS following a traumatic event and may be implicated in the prevention of severe PTSS or PTSD in future.

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APPENDICES

Appendix A

Demographic Questionnaire
Please complete the following questionnaire by circling the appropriate answer or filling in the answer:

Sex: MALE FEMALE

Age: _____

Marital status: MARRIED SINGLE DIVORCED WIDOWED

Ethnicity (for descriptive purposes only):
WHITE COLOURED BLACK INDIAN ASIAN OTHER

Religion: _____

Home Language / Mother Tongue: ENGLISH AFRIKAANS XHOSA ZULU SOTHO TSWANA OTHER

If Other, please specify: _____

Do you currently and regularly (1-4 times a week) engage in any type of substance use? If so please indicate below by ticking next to the substance that you engage with regularly:

Cannibas (dagga)	
Mandrax (mathaqualone)	
Heroin	
Ecstacy	
LSD	
Other (please specify)	

Appendix B

The Alcohol Use Disorder Identification Test (AUDIT)

1. How often do you have a drink containing alcohol?

Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a Week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

1 or 2	3 or 4 ¨	5 or 6	7 to 9	10 or more

3. How often do you have six or more drinks on one occasion?

Never	Less than monthly	¨ Monthly	Weekly	Daily/ almost daily

4. How often during the last year have you found it difficult to get the thought of alcohol out of your mind?

Never	Less than monthly	Monthly	Weekly	Daily/ almost daily

5. How often during the last year have you found that you were not able to stop drinking once you had started?

Never	Less than monthly	Monthly	Weekly	Daily/ almost daily

6. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

Never	Less than monthly	Monthly	Weekly	Daily/ almost daily

7. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

Never	Less than monthly	Monthly	Weekly	Daily/ almost daily

8. How often during the last year have you had a feeling of guilt or remorse after drinking?

Never	Less than monthly	Monthly	Weekly	Daily/ almost daily

9. Have you or someone else been injured as a result of your drinking?

No	Yes, but not in the last year	Yes, during the last year

10. Has a relative, friend, doctor or any other health worker been concerned about your drinking or suggested you cut down?

No	Yes, but not in the last year	Yes, during the last year

Appendix C

Traumatic Stress Schedule

Please read the statements below and answer the questions by choosing the answer of your choice. Please place a cross (x) over the chosen answer. Write in your answer for question 10.

1	Did anyone ever take or attempt to take something from you by force or threat of force, such as in a robbery, mugging, smash and grab or holdup?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
2	Did anyone ever beat you up or attack you?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
3	Did anyone ever make you have sex by using force or threatening to harm you? This includes any type of unwanted sexual activity.	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
4	Did a very close friend or a close family member ever die because of an accident, homicide, or suicide?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
5	Have you ever been hijacked or someone very close to you been hijacked?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
6	Were you ever in a motor vehicle accident serious enough to cause injury to one or more passengers?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
7	Did you ever serve in combat?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
8	Did you ever suffer injury or extensive property damage because of fire?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
9	Did you ever suffer injury or property damage because of severe weather or either a natural or manmade disaster?	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago
10	Did you experience any other events not mentioned above? If so, please specify below.	No	Yes	0-3 months ago	3-6 months ago	6-12 months ago	12-18 months ago	18-24 months ago	more than 24 months ago

Specify other

_____

_____

Appendix D
Impact of Events Scale - Revised

The following is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you during the past month with respect to the most recent/significant stressful life event. Please indicate which event you were thinking of and how long ago this event took place.
Stressful/ traumatic event:_____ How long ago:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Any reminder brought back feelings about it.	0	1	2	3	4
2. I had trouble staying asleep.	0	1	2	3	4
3. Other things kept making me think about it.	0	1	2	3	4
4. I felt irritable and angry.	0	1	2	3	4
5. I avoided letting myself get upset when I thought about it or was reminded of it.	0	1	2	3	4
6. I thought about it when I didn't mean to.	0	1	2	3	4
7. I felt as if it hadn't happened or wasn't real.	0	1	2	3	4
8. I stayed away from reminders of it.	0	1	2	3	4
9. Pictures about it popped into my mind.	0	1	2	3	4
10. I was jumpy and easily startled.	0	1	2	3	4
11. I tried not to think about it.	0	1	2	3	4
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.	0	1	2	3	4
13. My feelings about it were kind of numb.	0	1	2	3	4
14. I found myself acting or feeling like I was back at that time.	0	1	2	3	4
15. I had trouble falling asleep.	0	1	2	3	4
16. I had waves of strong feelings about it.	0	1	2	3	4
17. I tried to remove it from my memory.	0	1	2	3	4
18. I had trouble concentrating.	0	1	2	3	4

19. Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.	0	1	2	3	4
20. I had dreams about it.	0	1	2	3	4
21. I felt watchful and on-guard.	0	1	2	3	4
22. I tried not to talk about it.	0	1	2	3	4

Appendix E

Attributional Style Questionnaire

Please try to vividly imagine yourself in the situations that follow. If such a situation happened to you, what would you feel would have caused it? While events may have many causes, we want you to pick only one-the *major* cause if this event happened to *you.* Please write this cause in the blank provided after each event. Next we want you to answer some questions about the *cause* and a final question about the *situation.* To summarize, we want you to.

1. Read each situation and vividly imagine it happening to you.
2. Decide what you feel would be the *major* cause of the situation if it happened to you.
3. Write one cause in the blank provided.
4. Answer three questions about the *cause.*
5. Answer one question about the *situation.*
6. Go on to the next situation.

(1) You have been looking for a job unsuccessfully for some time.

a) Write down the *one* major cause _____

b) Is the cause of your unsuccessful job search due to something about you or to something about other people or circumstances? (*Circle one number)*

Totally due to other People or circumstance						Totally due to me
1	**2**	**3**	**4**	**5**	**6**	**7**

c) In the future when looking for a job, will this cause again be present? (*circle one number*)

Will never again be present						Will always be present
1	**2**	**3**	**4**	**5**	**6**	**7**

d) Is the cause something that just influences looking for a job or does it also influence other areas of your life? *(circle one number)*

just this particular situation						all situations in my life
1	**2**	**3**	**4**	**5**	**6**	**7**

e) How important would this situation be if it happened to you? *(circle one number)*

Not at all						Extremely
1	**2**	**3**	**4**	**5**	**6**	**7**

(2) You're at a red traffic light when someone smashes your window and grabs your bag and phone.

a) Write down the *one* major cause

_____

b) Is the cause of the situation due to something about you or to something about other people or circumstances? (*Circle one number)*

Totally due to other People or circumstance | Totally due to me

1 2 3 4 5 6 7

c) In the future if something like this happens again, will this cause again be present? (*circle one number*)

Will never again be present | Will always be present

1 2 3 4 5 6 7

d) Is the cause something that just influences similar situations or does it also influence other areas of your life?

just this particular situation | all situations in my life

1 2 3 4 5 6 7

e) How "big" would this situation be if it happened to you? *(circle one number)*

Not at all | Extremely

1 2 3 4 5 6 7

(3) You give an important talk in front of a group and the audience reacts negatively.

a) Write down the *one* major cause _____

b) Is the cause of the situation due to something about you or to something about other people or circumstances? (*Circle one number)*

Totally due to other People or circumstance | Totally due to me

1 2 3 4 5 6 7

c) In the future if something like this happens again, will this cause again be present? (*circle one number*)

Will never again | Will always

be present be present

1 2 3 4 5 6 7

d) Is the cause something that just influences similar situations or does it also influence other areas of your life? *(circle one number)*

just this particular all situations

situation in my life

1 2 3 4 5 6 7

e) How "big" would this situation be if it happened to you? *(circle one number)*

Not at all Extremely

1 2 3 4 5 6 7

(4) You meet a friend who acts hostilely toward you.

a) Write down the *one* major cause _____

b) Is the cause of the situation due to something about you or to something about other people or circumstances? (*Circle one number)*

Totally due to other
Totally due
People or circumstance to me

1 2 3 4 5 6 7

c) In the future if something like this happens again, will this cause again be present? (*circle one number*)

Will never again Will always

be present be present

1 2 3 4 5 6 7

d) Is the cause something that just influences similar situations or does it also influence other areas of your life?

just this particular all situations

situation in my life

1 2 3 4 5 6 7

e) How "big" would this situation be if it happened to you? *(circle one number)*

Not at all Extremely

1 2 3 4 5 6 7

(5) You can't get all the work done that others expect of you.

a) Write down the *one* major cause _____

b) Is the cause of the situation due to something about you or to something about other people or circumstances? (*Circle one number)*

Totally due to other
Totally due
People or circumstance to me
1 2 3 4 5 6 7

c) In the future if something like this happens again, will this cause again be present? (*circle one number*)

Will never again Will always
be present be present
1 2 3 4 5 6 7

d) Is the cause something that just influences similar situations or does it also influence other areas of your life?

just this particular all situations
situation in my life
1 2 3 4 5 6 7

e) How "big" would this situation be if it happened to you? *(circle one number)*

Not at all Extremely
1 2 3 4 5 6 7

(6) You go out on a date and it goes badly.

a) Write down the *one* major cause _____

b) Is the cause of the situation due to something about you or to something about other people or circumstances? (*Circle one number)*

Totally due to other
Totally due
People or circumstance to me
1 2 3 4 5 6 7

c) In the future if something like this happens again, will this cause again be present? (*circle one number*)

Will never again Will always
be present be present
1 2 3 4 5 6 7

d) Is the cause something that just influences similar situations or does it also influence other areas of your life? *(circle one number)*

just this particular situation | all situations in my life

1 2 3 4 5 6 7

e) How "big" would this situation be if it happened to you? *(circle one number)*

Not at all | Extremely

1 2 3 4 5 6 7

Appendix F

Ethical Approval from the Human Research Ethics Committee (HREC)

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

HUMAN RESEARCH ETHICS COMMITTEE (SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: MCLIN/11/002 IH**
PROJECT TITLE:	Cognitive vulnerability as a predictor of alcohol misuse and posttraumatic stress in trauma-exposed university students.
INVESTIGATORS	Webster Victoria
DEPARTMENT	Psychology
DATE CONSIDERED	23/03/11
DECISION OF COMMITTEE*	Approved

This ethical clearance is valid for 2 years and may be renewed upon application

DATE: 19 May 2011

CHAIRPERSON
(Professor M. Lucas)

cc Supervisor:

Dr E. Price
Psychology

DECLARATION OF INVESTIGATOR (S)

To be completed in duplicate and **one copy** returned to the Secretary, Room 100015, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure be contemplated from the research procedure, as approved, I/we undertake to submit a revised protocol to the Committee.

This ethical clearance will expire on 31 December 2013

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix G
Participant information sheet



UNIVERSITY
OF THE
WITWATERSRAND,
JOHANNESBURG

School of Human and Community Development
Private Bag 3, Wits 2050, Johannesburg, South Africa
Tel: (011) 717-4500 Fax: (011) 717-4559

Hi,

My name is Victoria Webster and I am currently in the MA Clinical Psychology programme at the University of the Witwatersrand. I am currently working on research in partial fulfilment for my degree and I would like to invite you to participate in my research project.

My research is focused on trauma, and on how we respond to and deal with the aftermath of trauma. Depending on the way people cope with trauma, it can have negative consequences. I am specifically trying to identify factors that come into play in response to the struggle with a trauma and what predicts these negative consequences. The aim is to contribute not only to literature on the subject, but also to generating new ideas around interventions in coping with trauma, specifically in university students.

If you choose to participate in this project you will be asked to complete a series of questionnaires. The questionnaires relate to how we make sense of our world, and how we respond to the demands it makes on us, with a focus on trauma. These questionnaires are not tests, in other words there is no pass or fail, and will take approximately 30 minutes to complete. If you choose to complete the questionnaires please answer as carefully and honestly as possible.

It must be stressed that your participation in the research process is voluntary, and you may withdraw at any time. Participation will have no risks and no benefits to yourself.

While you will be asked questions of your personal circumstances you will not be asked for any identifying information such as your name or student number. As such you will remain anonymous. With regards to your responses, all information will be treated in a confidential manner, and will not be made public in any way that could reveal your identity to an outside party. Results will be used for research purposes and may be reported in scientific journals, but not in any way that will reveal any specifics of any individual. By filling in the following questionnaires you will be giving your consent to participate in this study.

This research will be asking you to think of a difficult experience, if you are feeling distressed in any way please contact one of the following organisations who offer free counselling services:

Counselling and Careers Development Unit (CCDU)	Tel: 011 717 9140/32
Trauma Clinic	Tel: 011 403 5102/3
Lifeline	Tel: 011 728 1347

You are also more than welcome to come and speak to me and I will help arrange an

appropriate sessions where you may speak about your thoughts and feelings. Please feel free to keep this form with this information on it so that you can refer back to these contact details.

If you have any further questions about this research please contact me on the e-mail address given below.

Finally, for anyone who is interested in the outcome of the research project, you will be given a one-page summary of the research results on request. You may request these results via the e-mail address below.

Thank you for your time! Your participation in this study would be greatly appreciated.

Kind Regards

Victoria Webster
(Researcher)
research.wits@gmail.com

Dr. Esther Price
(Supervisor)
Esther.Price@wits.ac.za

Appendix H

Debriefing Sheet

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

School of Human and Community Development
Private Bag 3, Wits 2050, Johannesburg, South Africa
Tel: (011) 717-4500 Fax: (011) 717-4559

Hi,

Thank you for participating in this research.

You have just participated in research that aims to explore university student's experiences of trauma as well as how students make sense of this trauma. This research also looks to explore how alcohol use is affected by the experience of trauma and how, in turn, the use of alcohol affects how people experience the trauma. Parts of the research may have evoked some uncomfortable feelings. If this has happened to you, please contact any of the below organisations if you feel that these questionnaires have caused you any distress. Additionally you can e-mail me (see e-mail address below) with further questions about this research or if you are interested in the results from this research.

Counselling and Careers Development Unit (CCDU)	Tel: 011 717 9140/32
Trauma Clinic	Tel: 011 403 5102/3
Lifeline	Tel: 011 728 1347

Kind regards,
Victoria Webster

Victoria Webster
(Researcher)
research.wits@gmail.com

Dr. Esther Price
(Supervisor)
Esther.Price@wits.ac.za