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A Comparison Of The Basics Harm Reduction Approach And Personalized Normative Feedback For Reducing Alcohol-Related Behaviors Among Municipal Firefighters

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A COMPARISON OF THE BASICS HARM REDUCTION APPROACH AND
PERSONALIZED NORMATIVE FEEDBACK FOR REDUCING
ALCOHOL-RELATED BEHAVIORS AMONG
MUNICIPAL FIREFIGHTERS

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by

Stormy M. Monks

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Dedication

- ❖ To my mentor and friend, Joe Tomaka, for your constant direction and unwavering confidence in me
- ❖ To my husband, Lenny, for your persistent encouragement and commitment to me during this process
- ❖ To my confidante, Lisa, for pulling me out of overwhelming times with a talk, a joke, or a smirk
- ❖ To my nine amazing children, Samantha Stormy, Taylor, Christian, Destiny, Stephen, Kimberly, Addison, Angel, and Aren, for your inspiration and for letting me be more than your Mom

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by

STORMY M. MONKS, MPH, CHES

DISSERTATION

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The University of Texas at El Paso
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of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

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Abstract

Firefighting is a hazardous occupation due to the nature of firefighting duties including frequent exposure to traumatic events. Firefighters have been shown to cope with stress by drinking alcohol (Bacharach, Bamberger, & Doveh, 2008). Indeed, studies of firefighters have found that roughly 30% report being problem drinkers (Boxer & Wild, 1993) and 47% of firefighters have a diagnosis of alcohol abuse or dependence (North, Tivis, McMillen, Pfefferbaum, Spitznagel et al., 2002). Despite high rates of alcohol use, most firefighters receive inadequate training regarding alcohol and other risky behaviors. Furthermore, fire departments rarely act proactively regarding problems like alcohol consumption.

The present study adapted two brief intervention approaches that have been widely used to reduce risks in college students, for use in a large sample of municipal firefighters. Thus, 740 firefighters participated in a single intervention session and completed follow up assessments 3-4 months later. Firefighters were assigned to one of three conditions: BASICS Psychoeducation + Personalized Normative Feedback (PNF), PNF alone, or Control. Measures of alcohol-related outcomes included alcohol risk levels, alcohol-related problems, and alcohol consumption patterns.

Two-way, 3 (Control, BASICS, & PNF) x 2 (time), between subjects ANOVAs suggested main effects for time such that alcohol risk levels ($F = 10.88, p < .001$) and alcohol-related problems ($F = 7.03, p < .01$) decreased significantly from intervention to follow up, and that this effect was uniform across all three conditions. Overall, the results suggest that firefighters are responsive to a variety of intervention strategies. Although the results failed to support the hypothesis that the brief interventions would be more effective than an educational control condition among firefighters, the results of this study are positive from a public health perspective. Specifically, the results suggest that a variety of brief interventions can significantly reduce alcohol-related outcomes four months following a single alcohol intervention. However, further research is needed to rule out alternative explanations for the observed pattern of results.

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Chapter 1: Introduction

Alcohol use is a leading public health problem in the U.S. with alcohol consumption and related risks contributing to thousands of preventable deaths, increased risk of injury, physical and sexual assault, poor academic/job performance, lost educational opportunities, and millions of dollars in health care, property damage, and other costs (Dowdall, 2003; Hingson, Heeren, Winter, & Wechsler, 2005). Many factors contribute to alcohol misuse including, but not limited to, positive outcome expectancies, myths about drinking and its potential consequences, low self-efficacy to resist peer pressure encouraging overdrinking, misperceptions of social norms regarding alcohol use, beliefs that alcohol is a useful coping strategy for reducing academic, job, and social stress, and underestimation of drinking-related risks (Blume & Marlatt, 2006).

Prevalence of alcohol use and related problems differ by occupations. For example, such issues are more common among blue collar than white collar professions (Marchand, 2008). In addition, demanding and high stress professions, like police work, emergency responding, and firefighting, may lead to an increased use of alcohol for tension reduction and coping purposes (Cardiel, Morales-Monks, & Tomaka, 2012).

Inherent duties and job-related stressors make firefighting a hazardous occupation. Indeed, 2008 saw nearly 80,000 firefighters injured while on duty (Karter & Molis, 2009). Firefighters have also seen their job responsibilities expand from actual firefighting to the handling of a multitude of medical emergencies. As such, firefighters have become “first responders” to a wide variety of situations, increasing their exposure to traumatic situations (Murphy, Beaton, Pike, & Johnson, 1999).

When faced with traumatic events, firefighters cope primarily by seeking support of friends and family, but many also cope by drinking alcohol (North, Tivis, McMillen, Pfefferbaum, Spitznagel et al., 2002). For example, one study of firefighters found that 29% of them reported being problem drinkers

(Boxer & Wild, 1993). A similar study found 47% of firefighters to have a diagnosis of alcohol abuse or dependence (North, Tivis, McMillen, Pfefferbaum, Spitznagel et al., 2002). Boxer and Wild (1993) have suggested that firefighters use alcohol as self-medication strategy. Others have suggested that “escapist” reasons for drinking mediate the relationship between job stressors and alcohol consumption among firefighters (Cooper, Russell, & Frone, 1990; Greenberg & Grunberg, 1995).

Despite high rates of alcohol use (Boxer & Wild, 1993), most firefighters receive inadequate training regarding alcohol and other personal risk behaviors (A. Hernandez, EPFD, Personal Communication, February 10, 2011; North, Trivis, McMillen, Pfefferbaum, Cox et al., 2002). Although it varies by location, it is usually the responsibility of individual departments to organize and provide firefighter training. Such training typically focuses on fire-fighting techniques, basic emergency medical procedures, and other job-related topics and, as such, little time remains for teaching firefighters coping skills, helping them combat job stressors, or addressing other concerns such as alcohol risk behaviors. Furthermore, it is rare for departments to act proactively regarding problems like alcohol consumption. Instead, most are reactive, employing remediation methods such as psychological counseling which are potentially stigmatizing and unpalatable to most firefighters and which reach only a small proportion of those affected by drug and alcohol abuse (North, Trivis, McMillen, Pfefferbaum, Cox et al., 2002).

In response to this, the present study adapted two brief motivational intervention (BMI) protocols that have been widely used and shown successful at reducing alcohol risks in college student populations and tested them in a sample of firefighters. BASICS (Brief Alcohol Screening and Intervention for College Students) is a harm reduction approach for risky alcohol use in which the ultimate goal is a reduction of adverse consequences from alcohol consumption by decreasing the incidence of binge drinking and related risk behaviors (Dimeff, Baer, Kivlahan, & Marlatt, 1999). Indeed, an NIAAA task force identified BASICS as a “Tier 1” intervention, because of its known

efficacy in reducing alcohol consumption and risk behaviors among college-age drinkers (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2002). Personalized Normative Feedback (PNF), both as a component of the BASICS program and frequently used independently as a stand-alone intervention, focuses on reviewing the provision of personalized feedback based on the baseline assessment of drinking patterns in relation to normative data and functions as a guide for discussion about alcohol risk behaviors (Dimeff et al., 1999). There is also good evidence that PNF interventions, originally part of the more comprehensive BASICS intervention, can substantially reduce alcohol consumption and related risk behaviors on their own, apart from the larger BASICS approach (Walters & Neighbors, 2005).

Although these interventions have been developed and tested primarily in college students, they may also be appropriate for firefighters for several reasons. First, studies have shown that firefighters have drinking patterns similar to those seen among college students. Indeed, Boxer and Wild (1993) found that of 29% of firefighters had current problems related to alcohol use and North, Trivis, McMillen, Pfefferbaum, Spitznagel, and colleagues (2002) found that nearly 50% of firefighters had a history of alcohol problems. This finding is consistent with college student alcohol research which suggests that approximately 35% of students screened are, in fact, “at-risk” drinkers and eligible for an alcohol risk-reduction program (Tomaka, Palacios, Morales-Monks, Davis, 2012). Second, firefighters experience similar social pressures to drink as do college students. In a report of inappropriate off-duty behaviors of firefighters, Downey (ND) found that the firefighting social environment was not only accepting of alcohol use and misuse, but also reinforced by social pressures to belong and be accepted in the “brotherhood.” Specifically, firefighters consider themselves part of a fraternal brotherhood, not too removed from college fraternity (A. Hernandez, EPFD, Personal Communication, 2011). Third, like college students, firefighters do not like to be labeled as alcohol abusers and as such may respond better to public health approaches to alcohol risk reduction that avoid labeling them as such. In addition, by

being prevention-oriented and public health focused, programs such as BASICS and PNF avoid many of the shortcomings and potential stigmatization of traditional approaches to alcohol problems.

Based on these similarities, the present study examined whether approaches used primarily in college students, specifically the BASICS/PNF approach, would be effective in a sample of municipal firefighters. Overall, it was hypothesized that the two BMIs would be more effective in decreasing alcohol-related outcomes than a standard alcohol education intervention that emphasized legal risks and responsibilities for firefighters.

Accordingly, this dissertation project had one primary specific aim:

To examine the effectiveness of BASICS Psychoeducation + PNF and PNF alone against an educational control for reducing alcohol risk levels, alcohol-related problems, and alcohol consumption among municipal firefighters

It was hypothesized that the BASICS Psychoeducation + PNF and the PNF alone conditions would be more effective in reducing alcohol-related problems, alcohol risk levels, and alcohol consumption among firefighters at four months follow-up than an educational control group. It was also hypothesized that BASICS + PNF would be more effective than PNF alone.

As described above, the purpose of this study was to examine the effectiveness of two brief motivational interventions on alcohol risk levels, alcohol-related problems, and alcohol consumption among a sample of firefighters and compare them with a standard educational intervention. To do so, this study employed a 3 x 2 fully between subjects quasi-experimental posttest only design using an independent pretest sample (Shadish, Cook, & Campbell, 2002) that crossed three levels of alcohol intervention with two time points. The design was completely between subjects to ensure participant anonymity, a requirement of the El Paso Fire Department, in order to maintain participant privacy and encourage truthful responding. As such, it did not link pre- and post-test scores. Outcome measures were collected at four months post-intervention and included alcohol risk levels, alcohol-related problems, and alcohol consumption patterns.

The study was conducted at the El Paso Fire Department (EPFD) Training Academy. Participants in this study included 740 uniformed El Paso firefighters, approximately 89% of the El Paso firefighting population. Firefighters attended the “Alcohol-Risk Reduction” training in groups of 20-30 containing members of a specific EPFD shift and including firefighters from multiple fire stations across the city. Because the nature of the training setting prohibited random assignment of individuals to groups, assignment to intervention condition was done on a group level and consistent with their shift assignments. Although random assignment of individuals was not possible, this procedure allowed all stations and all shifts to be represented relatively equally across intervention conditions, and as such these factors were not confounded with experimental condition.

EPFD firefighters were expected to participate in the alcohol risk-reduction training aspects of the study as part of their required four-month training cycle. Regarding voluntary participation in research, all firefighters had the opportunity to opt out of the research part of the study (i.e. assessment and follow-up questionnaires), while still receiving their training hours.

Following completion of informed consent statements and the assessment packet (30-60 minutes), firefighters experienced one of three interventions dependent on the condition to which each training group has been assigned. Twelve training groups received the Standard Alcohol Education Intervention Presentation, 12 training groups the BASICS Psychoeducation and PNF intervention, and 12 training groups received the PNF Intervention. Participants completed a follow-up assessment approximately four months after the intervention and as part of their next training cycle.

Chapter 2: Background and Significance

2.1 HEALTHY PEOPLE 2020

This study was consistent with the aims of *Healthy People 2020, the Health Goals and Objectives for the Nation*. The project is most consistent with objectives listed under the Substance Abuse Goal: to *reduce substance abuse to protect the health, safety, and quality of life for all, especially children*. Particularly relevant are objectives, SA - 14.3 Reduce the proportion of persons engaging in binge drinking during the past 30 days - Adults 18 years and older, SA - 15 Reduce the proportion of adults who drank excessively in the previous 30 days, SA - 16 Reduce average annual alcohol consumption, SA - 17 Decrease the rate of alcohol-impaired driving, and SA - 20 Decrease the number of deaths attributable to alcohol (United States Department of Health and Human Services [HHS], Healthy People 2020, 2011).

To the extent that injuries and violence are strongly associated with alcohol consumption, the project was also consistent with several objectives listed under the Injury and Violence Prevention Goal: to *reduce unintentional injuries, and violence, reduce their consequences*. Particularly relevant are the Unintentional Injury Objectives, including IVP – 11 Reduce unintentional injury deaths, IVP – 12 Reduce nonfatal unintentional injuries, IVP – 13 Reduce motor vehicle crash-related deaths, and IVP – 14 Reduce nonfatal motor vehicle crash-related injuries. Violence Prevention objectives are also relevant, including IVP – 32 Reduce nonfatal physical assault injuries, IVP – 33 Reduce physical assaults, IVP – 39 Reduce violence by current or former intimate partners, and IVP – 40 Reduce sexual violence (HHS, Healthy People 2020, 2011).

2.2. THE MAGNITUDE AND SEVERITY OF THE PROBLEM

Alcohol abuse remains one of the most significant public health problems in the United States (Room, Babor, & Rehm, 2005). Specifically, the Centers for Disease Control and Prevention (CDC, 2004) report heavy alcohol use as the third leading lifestyle-related cause of death in the U.S., with

alcohol use associated with over 80,000 deaths per year (Mokdad, Marks, Stroup, & Gerberding, 2004). In the general population, Behavioral Risk Factor Surveillance System (CDC, 2002) surveys have consistently shown rates of heavy episodic consumption or *binge drinking* (consuming 5 or more drinks in one sitting in the previous month) have remained stable at about 15%, whereas rates of *chronic drinking* (2 or more drinks per day or 60 or more drinks per month), have increased over the past 12 years, rising from 3% to close to 6% in more recent surveys. According to Town, Naimi, Mokdad, and Brewer (2006), among the 55% of current adult drinkers in the U.S., 17% engage in excessive drinking with 92% of excessive drinkers binge drinking and 25% engaging in heavy drinking in the last thirty days. While binge drinking is typically thought to be a characteristic of young adult drinking, 70% of binge drinking is actually occurring in those aged 26 and older. Binge drinking has also been shown to be more prevalent among men than women, with men reporting nearly thirteen binge drinking episodes per year compared to three for women (Naimi et al., 2003).

Alcohol consumption rates are substantially higher among young adults, with individuals aged 18-24 having the highest overall consumption rates (O'Malley & Johnston, 2002) and 18-29 year olds having the highest rates of alcohol abuse and dependence (Grant et al., 2004; Knight et al., 2002). Moreover, the National Survey on Drug Use and Health (NSDUH) found that 11 million current drinkers were below the legal age of 21, and 7.2 million of them were binge drinkers (U.S. HHS Substance Abuse and Mental Health Services Administration [SAMHSA], 2006). Among 18-25 year olds, 41% report binge drinking and 14% report *heavy drinking* (5 or more days of binge drinking in the past thirty days; SAMSHA, 2011). Studies of college students suggest that between 70-90% drink and that 25%-50% are binge drinkers (Barnes, Welte, & Dintcheff, 1992; Meilman, Stone, Gaylor, & Turco, 1990; O'Malley & Johnston, 2002; Wechsler, Dowdall, Davenport, & Castillo, 1995; Wechsler & Isaac, 1992).

Similar figures characterize Hispanic populations where studies have shown that nearly 71% reported consuming alcohol regularly (at least monthly) and that 46% reported binge drinking in the last month (McKinnon, O'Rourke, & Byrd, 2003). These percentages are consistent with data showing Hispanics to have the highest prevalence of heavy and binge drinking compared to any other minority ethnic group (Bennett, Miller, & Woodall, 1999; Johnston, O'Malley, & Bachman, 2001; Ma & Shive, 2000). A more recent survey from the University of Texas at El Paso, a predominately Hispanic-Serving Institution found that roughly 80% of students report being current consumers of alcohol (at least monthly), 55% report binge drinking (at least once in the last month) and roughly 35% screen positive for potential alcohol use disorder using standardized instruments (Tomaka, Palacios, & Morales-Monks, 2011; Tomaka, Palacios, Morales-Monks, & Davis, 2012). Cultural and ethnic factors, social acceptance of alcohol, and proximity to Mexico, may predispose border Hispanics to higher rates of alcohol consumption and associated problems (McKinnon et al., 2003).

Additionally, research has found that those in certain occupations may have higher rates of alcohol consumption and alcohol-related problems. Specifically, occupations, such as blue collar workers, have higher alcohol risk levels (Marchand, 2008). Head, Stansfeld, and Siegrist (2004) found that a stressful psychosocial environment where there were high demands but low rewards—a characteristic of blue collar work—was a risk factor for alcohol dependence in men. This finding is consistent with another study that found a professional effort-reward imbalance to be associated with high rates of alcohol consumption (Puls, Winold, & Blank, 1998). Several studies have suggested that the relationship between occupation and alcohol use is due to stress and the need to reduce tension (Peele & Brodsky, 2000; Jose, Mheen, Oers, Mackenbach, & Garretsen, 2000).

The relationship between work place stress and alcohol use has been extensively studied (Cooper et al., 1990; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Crum, Muntaner, Eaton, & Anthony, 1995; Frone, 1999). The “work stress paradigm” is used to describe the effect of work stressors, such as

hazardous work conditions, job insecurity, workplace conflicts, harmful physical work environments, and unfair treatment, on alcohol use (Frone, 1999). Specifically, studies have shown occupations with high demands, low job control, job dissatisfaction, and little decision making authority have higher rates of problem drinking than occupations lacking these conditions. Moreover, drinking to cope has been shown to mediate this relationship (Greenberg & Grunberg, 1995; Martin, Roman, & Blum, 1996). In addition, demanding and high stress professions, like rescue work, emergency responding, and firefighting, may lead to an increased use of alcohol for tension reduction and coping purposes (Cardiel et al., 2012).

2.3 RISKS AND CONSEQUENCES ASSOCIATED WITH ALCOHOL USE

As mentioned above, alcohol use is third leading preventable cause of death in the U.S. (CDC, 2004), and is responsible for over two million years of potential life lost per year and thirty years of lost life per alcohol attributable death (Midanik et al., 2004). Additionally, alcohol use and misuse is associated with a number of health conditions and greater economic burden. More than one million emergency room visits and nearly three million physician visits are related to alcohol use, costing over two hundred twenty billion dollars per year (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011).

Among adults, risk and consequences associated with alcohol use are numerous, ranging from violence to chronic diseases. Specifically, acute effects of excessive alcohol use include unintentional injuries such as motor vehicle accidents, violence such as assaults and child abuse, sexual risks, including victimization, unplanned pregnancies, as well as alcohol poisoning (Greenfield, 1998; Naimi, Lipscomb, Brewer & Gilbert, 2003; National Center on Addiction and Substance Abuse [CASA], 1999; Sanap & Chapman, 2003; Smith, Branas, & Miller, 1999; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Long term effects of alcohol use include liver disease, cancer, gastrointestinal problems, cardiovascular disease, neurological deficiencies, mental health conditions, such as depression and anxiety, as well as prolonged social consequences like unemployment and domestic problems

(Baan, Straif, Grosse, Secretan, & El Ghissassi, 2007; Booth & Feng, 2002; Castaneda, Sussman, Westreich, Levy, & O'Malley, 1996; Corrao, Bagnardi, Zambon, & La Vecchia, 2004; Heron, 2007; Kelly et al., 1995; Leonard & Rothbard, 1999; Rehm, Gmel, Sepos, & Trevisan, 2003; Schiff, 1997).

Moreover, alcohol risks and consequences vary by gender. For example, research shows that men are more likely to engage in risky alcohol behaviors such as driving while intoxicated (National Highway Traffic Safety Administration, 2008) and being aggressive (Scott, Schafer, & Greenfield, 1999). Men have shown to be more prone to committing suicide and more likely to commit suicide while under the influence of alcohol than women (Hayward, Zubrick, & Silburn, 1992; May et al., 2002; Suokas, Suominen, & Lonnqvist, 2005). However, women are faced with specific concerns regarding sexual and reproductive health and alcohol use. Specifically, alcohol use has been shown to affect the menstrual cycle as well as increase infertility, miscarriage, stillbirth, and premature delivery (Mendelson & Mello, 1988; Wilsnack, Wilsnack, & Klassen, 1984). Women who consume alcohol excessively are also at an increased risk for unintended pregnancies, sexually transmitted infections (Thomas et al., 2001) and sexual victimizations (Abbey, 2002; Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004; Monks, Tomaka, Palacios, & Thompson, 2010).

Risks and consequences of alcohol use are particularly acute among young adults. Indeed, heavy drinking patterns exhibited during these years put young adults at high risk for a variety of negative health, academic, social, and interpersonal consequences. Negative consequences of alcohol consumption include alcohol poisoning, traumatic injuries (many due to motor vehicle accidents), poor academic performance, antisocial/aggressive behavior, sexual assault, unplanned pregnancy, and sexually transmitted disease (Hingson & Holand, 1993; Larimer, Lydum, Anderson, & Turner, 1999; Quigley & Marlatt, 1996; Rivinus & Larimer, 1993; Wechsler, et al., 1994; Wechsler, Dowdall, Davenport, & Rimm, 1995; Wechsler & Isaac, 1992).

Hingson et al.'s (2005) widely cited analysis of government and other data shows that excessive drinking among 18-24 year old college students contributed to 1,400 student deaths, 500,000 unintentional injuries, 600,000 incidents of assault, and 70,000 cases of sexual assault or date rape yearly. Moreover, 400,000 students reported engaging in unprotected sex while drunk, and 100,000 students reported having been too intoxicated to know if they consented to having sex—a finding that suggests underestimation of sexual assault. Hingson and colleagues (2005) report that nearly 150,000 college students a year experience a health problem related to their drinking, and Presley, Leichliter, & Meilman (1998) report that over 1% of students reported that they tried to commit suicide due to drinking or drug use. Additionally, more than 2 million college students drove under the influence of alcohol in the last year (Hingson et al., 2005), 11% reported participating in vandalism and destruction of property (Wechsler et al., 2002), and 5% were involved with the police (Hingson et al., 2005).

In addition to health risks, the economic costs of underage drinking are staggering, including \$35 billion toward violent crime, \$18 billion for traffic crashes, \$1.5 billion for suicide attempts, \$1 billion for alcohol treatment, \$0.5 billion for Fetal Alcohol Syndrome cases, \$0.5 billion for drowning, \$0.3 billion for burns and \$0.3 billion for alcohol poisoning (Dowdall, 2003).

2.4 FACTORS THAT FACILITATE DRINKING AMONG YOUNG ADULTS

Although the present study examines firefighters, a population that would not be considered “young adults” by most definitions, research on factors that facilitate and promote drinking among young people is relevant to them. This is primarily because most adult drinkers established patterns of drinking when they were that age which they now carry-on in adult life. Heavy drinking on college campuses is not new. In fact, Menninger (1929) described drinking by college students as one of several “mental hygiene” problems faced by these students, along with “necking,” “deviltry,” flunking, stealing and suicide. Some years later, Keller (1948) described college drinking as “common,” although

intensive study of college drinking would not begin in earnest until the mid-1960's (e.g., Bruyn, 1966; Lundin & Sawyer, 1965; Park, 1967; Williams, 1965).

The prominence of the college drinking experience suggests that heavy alcohol consumption during the college years remains a "rite of passage" for many students. Given newfound freedoms and independence, young adults engage in the decision making regarding when, where, with whom, how often, and how heavily to drink (Presley, Meilman, & Leichliter, 2002). Of course, these choices are not context-free as multiple individual, environmental, and societal factors facilitate alcohol use among young adults. Common individual factors include such things as history of alcohol use, family and parental attitudes and behaviors, ethnicity, knowledge of risks, positive attitudes, beliefs, and expectancies about the benefits of alcohol use, high stress, and the inability to refuse peer pressure to drink and to avoid alcohol promoting social functions (Dowdall & Wechsler, 2002). Environmental influences include the campus environment (e.g., "party schools", women's colleges, social clubs and fraternities), alcohol availability, residential living conditions (e.g., "dry" dorms), and social network factors such as the need for social acceptance, established peer groups, and systems. Wider societal factors also play a role, including near universal acceptance of alcohol and the seemingly unending promotion of its acceptance and use in the media.

Relevant to research on more adult populations, research suggests that the majority of young adults "mature out" of the heavy drinking patterns seen in the college years, particularly as they leave college and assume greater familial and work related responsibilities (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Marlatt et al., 1998). Considering this information, the key intervention goal, from a public health perspective, is to focus on risk reduction, encourage moderation and safety as well as encourage maturation across a broad spectrum of college drinkers and during this life phase. This is not to ignore the relatively small percentage of alcohol dependent drinkers (e.g., Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996), but by focusing on the larger contingent of risky,

but not dependent drinkers, brief intervention programs represent a promising public health approach to reducing risks associated with heavy alcohol consumption.

2.5 FACTORS THAT FACILITATE DRINKING AMONG FIREFIGHTERS

Inherent duties and work stressors make firefighting a hazardous occupation (Murphy et al., 1999). Indeed, 2008 saw nearly 80,000 firefighters injured while on duty (Karter & Molis, 2009). Job-related injuries have been shown to be three to five times higher among firefighters than those working in the private industry (International Association of Fire Fighters [IAFF], 1995, 2000). The very nature of the firefighting profession—daily exposure to both physical and mental stressors—may leave firefighters at an increased risk for health conditions and negative lifestyle choices (Murphy, Bond, Beaton, Murphy, & Johnson, 2002).

Firefighters face additional risk factors for negative behavioral and health outcomes. First and foremost, firefighters traditionally work in 24-hour rotating shifts; these shifts are often characterized by drastic and momentary changes in the environment (International Association of Fire Chiefs [IAFC], 2007). For example, one moment they may be eating, sleeping, studying, or watching television, the next they are running to the truck and planning a fire rescue. Dealing with these sudden changes accompanied by a lack of proper sleep may lead to occupational stress, poor job performance as well as job dissatisfaction (Beaton & Murphy, 1993; Murphy et al., 1999). Secondly, firefighters have a dynamic social environment; at times following a strict paramilitary chain of command and at others establishing a sense of camaraderie and brotherhood among co-workers. These teamwork type relationships have repeatedly been shown to contribute to off duty alcohol use (Fillmore, 1992; Murphy et al., 1999). Thirdly, firefighting and rescue work in general is described as a profession following the high demand/low control paradigm. Studies have shown that this type work environment can lead to higher rates of occupational stress and health complications, such as heart disease (Karasek et al., 1988; Kales, Tsismenakis, Zhang, & Soteriades, 2009). In addition, demanding and high stress professions,

like rescue work, emergency responding, and firefighting, may lead to increased use of alcohol and higher rates of problem drinking for tension reduction and coping purposes (Cardiel et al., 2012; Greenberg & Grunberg, 1995; Martin et al., 1996).

Finally, firefighters have also seen their job responsibilities expand from actual firefighting to the handling of a multitude of medical emergencies. In fact, all but approximately fifteen uniformed firefighters in El Paso, Texas are dual certified as firefighter and emergency medical technicians (EMT; A. Hernandez, EPFD, Personal Communication, May 2012). Additionally, El Paso Firefighters reported to over forty six thousand medical incidents in 2011, totaling 70% of the number of emergency responses and only 2% were fire related incidents (EPFD, 2012). As such, firefighters have become “first responders” to a wide variety of situations, increasing their exposure to traumatic situations (Murphy et al., 1999). Frequent exposure to traumatic events has left firefighters with high rates of Post-Traumatic Stress Disorder (PTSD) symptoms (Cardiel et al., 2012; McFarlane, 1998). Research has shown that exposure to trauma increases alcohol use, with approximately 52% of men and 28% of women with PTSD also meeting the criteria for alcohol abuse or dependence (Hruska, Fallon, Spoonster, Sledjeski, & Delahanty, 2011; Vujanovic, Marshall-Berenz, & Zvolensky, 2011).

McFarlane (1998) reviewed the evidence linking PTSD to alcohol abuse. After examining the strength of association between PTSD and alcohol abuse among three different populations, including firefighters, he concluded that although there is no simple relationship, a significant association exists between PTSD and drug and alcohol abuse/dependence. Similarly, Chilcoat & Breslau (1998) reported that in both clinical and community-based samples, strong and consistent associations between PTSD and alcohol abuse/dependence were evident. Cardiel, Morales-Monks, and Tomaka (2012) took this research a step further by not only showing that PTSD and alcohol outcomes were related among firefighters, but that drinking to cope and general maladaptive coping mediated this relationship. (Cardiel et al., 2012; North, Tivis, McMillen, Pfefferbaum, Cox et al., 2002).

In general, firefighters have been shown to engage in risky alcohol consumption and have high rates of alcohol dependence. Overall, approximately 80% of firefighters are current consumers of alcohol (Murphy et al., 2002), and 29% of firefighters report having possible or probable problems with alcohol use (Boxer & Wild, 1993). Similar studies have found that 42% to 47% of firefighters have had a lifetime diagnosis of alcohol abuse or dependence (McFarlane, 1998; North, Tivis, McMillen, Pfefferbaum, Spitznagel et al., 2002). Haddock and colleagues (2012) reported that 56% of career firefighters surveyed reported binge drinking and 9% reported driving while intoxicated in the last month. Consistent findings were reported by volunteer firefighters with 45% reporting binge drinking and 10% reporting driving while intoxicated in the last month (Haddock et al., 2012). While there are no published records for the general population to see, the EPFD had approximately eleven DUI and/or DWIs in 2010, with some being repeat offenses. This number is double what was reported in 2008 and 2009, 6 and 5 DUI/DWIs respectively (A. Hernandez, EPFD, Personal Communication, May 2010). It is suggested that firefighters use alcohol as a self-medication strategy and stress reduction strategy while others have similarly suggested that “escapist” reasons for drinking mediate the relationship between occupational stressors and alcohol consumption among firefighters (Bacharach, Bamberger, & Doveh, 2008; Cooper et al., 1990; Greenberg & Grunberg, 1995).

Despite high rates of alcohol use (Boxer & Wild, 1993; North, Tivis, McMillen, Pfefferbaum, Spitznagel et al., 2002), most firefighters receive inadequate training regarding alcohol and other personal risk behaviors (A. Hernandez, EPFD, Personal Communication, February 10, 2011; North, Tivis, McMillen, Pfefferbaum, Spitznagel et al., 2002). Although it varies by location, it is usually the responsibility of individual departments to organize and provide firefighter training. Such training typically focuses on fire-fighting techniques, basic emergency medical procedures, and other job-related topics and, as such, little time remains for teaching firefighters coping skills, helping them combat job stressors, or addressing other concerns such as alcohol risk behaviors. Furthermore, it is rare for

departments to act proactively regarding problems like alcohol consumption, often having vague substance use policies and lacking follow through (Murphy et al., 1999). Instead, most fire departments are reactive, employing remediation methods such as psychological counseling which are potentially stigmatizing and unpalatable to most firefighters, which reach only a small proportion of those affected by drug and alcohol abuse.

While firefighting and rescue work in general is different from most occupations, there are obvious similarities between firefighters and college students. First, studies have shown that firefighters have drinking patterns similar to those seen among college students. Indeed, Boxer and Wild (1993) found that 29% of firefighters had current problems related to alcohol use and North. Tivis, McMillen, Pfefferbaum, Spitznagel, and colleagues (2002) found that nearly 50% of firefighters had a history of alcohol abuse or dependence. This finding is consistent with college student alcohol research which suggests that approximately 35% of students screened are, in fact, “at-risk” drinkers and eligible for an alcohol risk-reduction program (Tomaka et al., 2012).

Second, firefighters experience similar social pressures to drink as do college students. In a report of inappropriate off-duty behaviors of firefighters, Downey (ND) found that the firefighting social environment was not only accepting of alcohol use and misuse, but also reinforced by social pressures to belong and be accepted in the “brotherhood.” Specifically, firefighters consider themselves part of a fraternal brotherhood, not too removed from college fraternity (A. Hernandez, Personal Communication, 2011).

Third, like college students, firefighters do not like to be labeled as alcohol abusers and are less likely to recommend seeking help to another firefighter (Murphy et al., 2002). Thus, firefighters may respond better to public health approaches to alcohol risk reduction that avoid labeling them as such. In addition, by being prevention-oriented and public health focused, harm reduction programs developed

for college students may avoid the many of the shortcomings and potential stigmatization of traditional approaches to alcohol problems in this population.

2.6 APPROACHES TO REDUCING ALCOHOL USE AMONG COLLEGE STUDENTS

Although the present study focused on firefighters, much of what is known about public health approaches to alcohol risk-reduction comes from studies of the college student population. Since estimates of drinking in firefighter populations show that firefighters have patterns of drinking that mirror those of college student in many respects (see above), research on college students may be equally relevant to firefighters.

Brief motivational interventions have been specially designed to reduce problems associated with alcohol use by college students. The National Institute on Alcohol Abuse and Alcoholism has assisted these efforts by creating a framework of recommended strategies for decreasing use and risky behaviors in this population. These recommendations include the use of cognitive-behavioral skills with the emphasis on social norms and the use of motivational enhancement interventions (NIAAA, 2002). Two commonly implemented approaches are the Alcohol Skills Training Program/BASICS Program and Personalized Normative Feedback (PNF) interventions. These approaches are related in that PNF is a key component of the more comprehensive ASTP/BASICS approach. Both of these approaches have rich theoretical backgrounds. Theories that have contributed to the development of these intervention approaches include Motivational Interviewing, Stages of Change, Social Cognitive Theory, Self-Efficacy Theory, Self-Monitoring Theory, Alcohol Expectancy Theory, the Motivational Model of Alcohol Use, and Social Norming Theory (Dimeff et al., 1999).

2.6.1 ASTP/BASICS

Marlatt and colleagues (e.g., Baer et al. 1992; Kivlahan, Marlatt, Fromme, Coppel & Williams, 1990) developed and tested the Alcohol Skills Training Program (ASTP), which evolved into Brief Alcohol Screening and Intervention for College Students (BASICS; Blume & Marlatt, 2004; Dimeff et

al., 1999; Marlatt et al., 1998). ASTP and BASICS are both part of the NIAAA (2002) framework of recommended strategies and SAMHSA model programs. Both include the use of cognitive-behavioral skills training, an emphasis on feedback regarding social norms, and the use of motivational enhancement strategies such as motivational interviewing (MI; Miller & Rollnick, 2002).

The BASICS program is essentially a one or two session version of ASTP combined with principles of MI. Overall, the program focuses on reducing harmful alcohol use and alcohol-related problems while teaching students how to cope effectively in social situations involving alcohol (Dimeff et al., 1999; Marlatt et al., 1998). The program relies on a combination of (a) information regarding alcohol use, (b) motivational techniques to facilitate awareness and behavior change, and (c) cognitive behavioral strategies such as learning to manage drinking limits, using monitoring cards, setting alcohol limits, using role-play scenarios for planning drinking activities and practicing drink refusal skills. Essential features include in-depth assessment of alcohol consumption patterns, consequences related to use, and analysis of expectancies regarding alcohol. Assessment results are used to provide personalized normative feedback to participants, along with information on typical or normative use. In addition to feedback, the program provides information about alcohol's effects, sharing of personal experiences with alcohol, developing behavioral strategies to moderate use, education related to increased awareness and monitoring of BAL, and examining the client's willingness and desire to change.

To enhance motivation for change, BASICS facilitators conduct sessions using the spirit and techniques of MI (Miller & Rollnick, 1991). Miller and Rollnick (2002) have defined MI as "a person-centered, directive method of communication for enhancing intrinsic motivation to change by exploring and resolving ambivalence" (p. 25). Ambivalence is a key concept in MI, and it occurs when individuals have multiple, conflicting cognitions and emotions about ongoing behaviors. Individuals at some level may recognize that ongoing behavior is destructive and harmful, yet be unwilling or unable to give up the behavior because it fills a different need or desire. Motivational interviewing includes the expression

of accurate empathy with the client, helping the client develop an awareness of discrepancies between actual and desired behaviors, avoiding argumentation, rolling with client resistance, supporting self-efficacy, maintaining that responsibility for change lies with the individual, and offering a menu of behavioral change options. The motivational interviewing philosophy and principles help facilitate change in drinking patterns through increasing acceptance of the person, reducing resistance, and increasing intrinsic motivation for change.

It is important to note that although it relies on the principles and philosophy of MI, BASICS does not involve true MI per se. Rather it uses the spirit of MI to assist delivery of educational material to promote development of cognitive-behavioral skills (Blume & Marlatt, 2006; Dimeff et al., 1999).

2.6.2 Personalized Normative Feedback

First developed as part of the BASICS intervention, Personalized Normative Feedback (PNF) has evolved as its own unique intervention modality with its own distinct research base (Riper et al., 2009; Walters & Neighbors, 2005). PNF, usually given visually on a standardized feedback form (or “screen” in on-line applications), provides a drinking risk profile based on the relevant results of a larger assessment battery that students complete as part of the intervention. Feedback regarding drinking patterns (i.e., typical quantity, frequency, and peak BAL) are provided along with graphical comparison to campus and/or national (i.e., social) norms, norms that are thought to reflect drinking levels of the “typical student.” Comparisons with the typical student are important because they are expected to create discrepancies between the individual’s ongoing behavior and normative standards. Raising awareness of such discrepancies is important because most heavy drinking college students have developed exaggerated normative beliefs—likely based on their salient surroundings—and correcting these biased normative perceptions is key to PNF-related behavior change (Borsari & Carey, 2000; Neighbors, Larimer, & Lewis, 2004). Other information can include the most prevalent consequences that the individual has experienced because of his or her alcohol use, along with salient alcohol

expectancies. Within the BASICS approach, the form does not provide a summary judgment, but rather serves as a starter or focal point for further discussion. Such opportunities are not provided in all PNF interventions such as in the mailed and emailed interventions. Students are encouraged to keep (or print) the form and use it for future reference (Dimeff et al., 1999).

Use of PNF, either as part of a larger program or as a stand-alone intervention, assumes that heavy alcohol use by college students is due in large measure to biased perceptions of peer drinking levels (i.e., drinking norms; Lewis & Neighbors, 2006), perceptions that foster continued heavy drinking behavior. Heavy drinkers develop biased normative beliefs largely because they spend considerable time with other heavy drinkers (i.e., their friends), thereby developing a “false consensus” regarding the relative prevalence of their own behavior (Marks & Miller, 1987; Mullen & Goethals, 1990). The key to behavior change, from this perspective is the correction of biased normative beliefs through the presentation of actual norms in comparison with personal levels of drinking, typically in graphic fashion (Lewis & Neighbors, 2006). To provide PNF, the intervention facilitator must have information regarding the participant’s alcohol consumption, the participant’s perception on their peer’s use, and the actual alcohol consumption norm (Lewis & Neighbors, 2006). By offering personalized normative feedback, the intervention facilitator is able to show the differences between the participant’s alcohol use and the typical student or peer without being confrontational.

2.7 EFFECTIVENESS OF BRIEF MOTIVATIONAL INTERVENTIONS USING ASTP/BASICS

Several randomized controlled experiments have shown brief interventions using the ASTP/BASICS approach to reduce alcohol consumption and related problems in college samples, and to do so for periods ranging from 6 weeks (Murphy et al., 2001) to four years (Baer et al., 2001). Initial studies examined 10- and 6-week versions of ASTP against no-intervention and assessment only interventions (Kivlahan et al., 1990 and Baer et al., 1992 respectively). In both cases, students randomly

assigned to the ASTP program fared better in terms of alcohol consumption and related problems than did no-intervention controls.

Later studies demonstrated the effectiveness of a briefer format consisting of one or two sessions, an approach that would eventually be called “BASICS,” against no-intervention controls (Marlatt et al., 1998). In addition to random assignment, the landmark Marlatt study was unique in several ways, including examination of long term outcomes (i.e., 2 years), screening for program eligibility in high school, and the use of collateral reports (i.e., roommates and friends) to support the validity of self-reported alcohol consumption and related problems. It was also the first to show evidence for the process of “maturing out” of heavy consumption patterns over time (1998).

A number of studies have subsequently confirmed the efficacy of the BASICS approach. For example, Borsari and Carey (2000) found that at 6-weeks post intervention, BASICS participants drank significantly less, had fewer drinks per week, fewer times consuming alcohol in the month, and fewer binge drinking episodes per month, than no-treatment controls. In addition to showing shorter-term efficacy, this study also demonstrated that reasonable outcomes could be expected from a single, one-hour session and that BASICS could be replicated successfully outside the University of Washington. Similarly, Murphy and colleagues (2001) found that a one-session version of BASICS outperformed both an education-only and a no intervention control group, and that BASICS was particularly effective among heavier drinkers.

Finally, other studies have shown that BASICS can be effective with targeted groups including fraternity members (Larimer et al., 2001) and students mandated to receive treatment (Borsari & Carey, 2005). Overall, these studies confirm the effectiveness of the BASICS approach to brief intervention.

2.8 EFFECTIVENESS OF PERSONALIZED NORMATIVE FEEDBACK

PNF as a stand-alone intervention has also shown effectiveness for reducing alcohol consumption and related risks among college students and has done so using a variety of formats

including standard mail delivery (Collins, Carey, & Sliwinski, 2002), the internet (Neighbors et al., 2004), and face-to-face as part of a brief intervention (Dimeff & McNeely, 2000; Riper et al., 2009; Walters & Neighbors, 2005). Research on PNF has blossomed relative to research on BASICS, in part because of easier implementation and adaptability of the implementation, the ability to impact large communities, and relatively lower costs when compared to more involved interventions. Personalized normative feedback has been shown to be an effective intervention for reducing consumption for periods lasting as long as six months (Neighbors et al., 2004).

A number of studies have compared PNF to no-feedback (i.e., no intervention) control conditions. In one of the first studies, Agostinelli, Brown, and Miller (1995), compared mailing PNF to participants to a no-feedback condition. Results indicated that PNF significantly reduced alcohol consumption relative to no-intervention controls at a six-week follow-up assessment. In a similar comparison of mailed PNF versus no-feedback, Collins, Carey, and Sliwinski (2002), found PNF to result in lower peak drinking (in one day) and frequency of drinking relative to no-feedback controls. Neighbors et al., (2004) also found positive results for PNF versus no-feedback controls, this time using PNF delivered via computer. Finally, Lewis, Neighbors, Oster-Aaland, Kirkeby, and Larimer, 2007, replicated these findings in their comparison of gender-specific PNF, gender-neutral feedback, and no feedback controls. At five-month follow-up, students receiving PNF personalized feedback, regardless of gender specificity, had reduced their drinking more than no feedback controls. This study also showed that PNF produced significant changes in perceptions of typical student drinking, perceptions that partially mediated the change in overall drinking.

Researchers have also used PNF as part of a “mini-intervention” in which PNF is delivered and discussed during a brief (i.e., 15 min) face-to-face interview. Dimeff and McNeely (2000), for example, randomized at-risk college drinkers to experience a brief face-to-face PNF intervention or to an assessment only control group. The PNF intervention consisted of a computerized alcohol assessment

and the printing of a PNF form. The form, then, facilitated a brief discussion between the student and a health care professional. At one-month follow-up, PNF students had reduced their alcohol consumption and alcohol-related problems relative to control participants. Overall, these studies provide good support for the effectiveness of PNF relative to no-feedback/no-intervention controls.

Although these studies support for the effectiveness of PNF, comparisons of PNF relative to other interventions or comparisons of PNF alone versus combined conditions (e.g., PNF with motivational interviewing [MI]) have provided less unanimous support for the relative effectiveness of PNF as a stand-alone intervention. In support of PNF stand-alone interventions, Walters' (2000) PNF study randomized at-risk students into three groups: a two-hour PNF intervention with discussion, a mailed PNF condition, and an assessment only control condition. The two-hour PNF intervention included some aspects of the BASICS approach discussed above, such as alcohol education, a discussion of PNF, and adherence to the spirit of motivational interviewing, but was not BASICS per se. At the six-week follow-up, participants in both the two-hour PNF condition and the mailed PNF condition showed reduced alcohol consumption relative to controls. The absence of differences between the two PNF conditions suggested that PNF could be effective as a briefer, more cost-effective, stand-alone intervention (Walters & Neighbors, 2005).

Juarez, Walters, Daugherty, and Radi (2006) also provided some support for the conclusion that PNF can be as effective as a stand-alone intervention. In this randomized trial five levels of MI and feedback, including a combined MI and PNF condition, a MI session alone, a mailed feedback alone, a MI with mailed feedback, and an assessment only – control group, were implemented to determine the effectiveness of both MI and PNF. After eight weeks, all groups had reduced their alcohol use, but there remained a main effect for PNF such that groups including it as all or part of the intervention showed significantly greater reductions in alcohol use. Results also indicated that PNF only produced greater reductions in alcohol use than the MI only condition, but not the MI and PNF combined condition.

In a recent meta-analysis, researchers examined fourteen randomized controlled trials of single session PNF interventions. These interventions were stand-alone PNF interventions, thus the researchers termed the PNF interventions as those “without therapeutic guidance” (Riper et al., 2009). While this research did not specify college student populations, nine of the fourteen studies analyzed had target populations of college students. Results from the meta-analysis suggested that the use of PNF as a stand-alone intervention was practical and cost effective as well as effective at reducing risky alcohol use with an average effect size of $d = .22$. The findings also suggested that PNF is an effective intervention among various populations, in various settings, and across varying methods of dissemination. PNF intervention studies produced analogous effect sizes to those of more involved alcohol brief interventions (Riper et al., 2009). Overall, the results of the studies reviewed thus far suggest that stand-alone PNF interventions are as effective as other brief interventions such as a BASICS intervention.

There are, however, other studies that have shown PNF alone to be less effective than more involved interventions. For example, Monti et al. (2007) compared PNF with a combined PNF with MI condition in an 18-24 year old emergency room population. In contrast to Walters (2000) and Juarez et al. (2006), those in the combined condition had significantly reduced their alcohol consumption compared to PNF only participants who had not. Moreover, the between groups differences were considerable with those receiving MI and PNF reducing their alcohol use by three to four times more than the PNF only participants—a pattern that was maintained at one-year follow-up.

White, Mun, Pugh, & Morgan (2007) also found a similar pattern among mandated students randomly assigned to a brief MI session with PNF or a PNF only condition. Although both groups reported significant reductions in alcohol consumption at a four-month follow-up, only the combined participants had maintained such reductions at the 15-month follow-up. Specifically, PNF only participants had returned to baseline levels after experiencing an initial decline at four months. Based on these findings, the authors suggest that PNF comparison studies conduct longer-term follow-ups than the

usual follow-up of several weeks to six months. Overall, both Monti et al. and the White et al. studies suggest that the effects of PNF while initially robust are less enduring than more involved interventions. It is important to note that neither of these studies were conducted with samples of general college student at-risk drinkers, rather their target populations were students in an emergency room setting and students mandated to attend an alcohol intervention (Monti et al., 2007; White, Mun, Pugh, & Morgan, 2007).

In summary, research comparing more involved interventions to stand-alone PNF interventions is mixed regarding overall effectiveness. On the one hand, studies consistently show that PNF is better than no intervention at all. On the other hand, comparisons against other, typically more intensive, interventions have been mixed. Whereas some studies show PNF to be equally effective as more involved interventions, other studies suggest an advantage of more involved interventions, both immediately and in the longer-term. Perhaps because of this situation, Walters and Neighbors (2005) have recommended that further research directly compare personalized feedback in different settings and in different formats. Such studies will allow researchers to evaluate the effectiveness of PNF as its own entity (Walters & Neighbors, 2005). White et al. (2007) echo this concern and in particular suggest the need for more longitudinal studies of PNF as well as comparisons of PNF with other brief interventions (White et al., 2007).

2.9 PROJECT RATIONALE AND GENERAL HYPOTHESES

This study had two general purposes. The first was to test the effectiveness of these public health approaches in a population that is at the same time very similar and very different from traditional college students. As noted, firefighters are similar to college students in that they have similar drinking patterns, social pressures, and may not respond well to remedial approaches to alcohol use. However, they differ in that the very nature of their profession may promote alcohol use as a means of coping with occupational stressors as discussed above. The second was to address the issues discussed above

regarding the relative effectiveness of BASICS Psychoeducation and PNF, and PNF alone against an educational control condition. Accordingly, both purposes were reflected in the study's sole specific aim: to examine the effectiveness of BASICS Psychoeducation + PNF and PNF alone against an educational control for reducing alcohol risk levels, alcohol-related problems, and alcohol consumption among municipal firefighters. It was anticipated that the BASICS Psychoeducation + PNF condition would be the most effective in reducing alcohol risk levels, alcohol-related problems, and alcohol consumption among firefighters at four months follow-up. Also, the PNF only condition would fare better than the educational control group in reducing alcohol risk levels, alcohol-related problems, and alcohol consumption.

To examine the effectiveness of these two theory-based interventions, this study employed a 3 x 2 fully between subjects quasi-experimental posttest only design using an independent pretest sample (Shadish et al., 2002) that crosses three levels of alcohol intervention with two time points. The design was completely between subjects to ensure participant anonymity, a requirement of the El Paso Fire Department, a step necessary to maintain participant privacy and encourage truthful responding. As such, no linking of scores (pre- and post-test) was possible. Outcome measures were collected at four months post-intervention and included alcohol risk levels, alcohol-related problems, and alcohol consumption patterns.

2.10 PRELIMINARY STUDIES

This dissertation research project is based on a project conducted by the dissertation committee chair, Dr. Joe Tomaka, a dissertation committee member, Dr. Sharon Davis, and the investigator, Stormy Morales-Monks. The El Paso BASICS Program was a screening and brief intervention program for risky-drinking college students at UTEP. Initially funded by SAMHSA, this project delivered the BASICS intervention with PNF for three years and has served as the model for the dissertation study.

The El Paso BASICS Program screened over 10,000 UTEP students and provided brief intervention services to 940 of them.

Over the three years of implementation, the dissertation study investigator amassed considerable experience relating to the successful implementation of the BASICS Psychoeducation + PNF intervention (Fresquez, Tomaka, Morales, Salaiz, & Thompson, 2008; Morales et al., 2007; Servo, Tomaka, Morales, & Thompson, 2008; Tomaka et al., 2012). Overall, the results of the preliminary study suggested that the BASICS intervention was effective in reducing alcohol-related outcomes over twelve months post-intervention follow-up among predominantly Hispanic college students. Not only were AUDIT alcohol risk scores reduced by 50% six months following participation in the program, but drinking behaviors and drinking-related problems showed consistent declines over the same time period. Additionally, the data show that the BASICS approach is effective with a predominantly Hispanic population (See Tomaka et al., 2012).

Chapter 3: Methods

3.1 DESIGN OVERVIEW

As described above, the purpose of the study was to examine the effectiveness of two brief motivational interventions on alcohol risk levels, alcohol-related problems, and alcohol consumption among a population of firefighters and compare them with a standard educational intervention. To do so, this study employed a 3 x 2 fully between subjects quasi-experimental posttest only design using an independent pretest sample (Shadish et al., 2002) that crosses three levels of alcohol intervention with two time points. The design was completely between subjects to ensure participant anonymity, a step necessary to maintain participant privacy and encourage truthful responding as well as meet the requirements of the El Paso Fire Department. As such, no linking of scores (pre and posttest) was possible. Although between subjects comparisons offer less statistical power than within-subjects comparisons, the sample was sufficient to compensate for the loss in statistical power. Outcome measures were collected four months post-intervention and included alcohol risk levels, alcohol-related problems, and alcohol consumption patterns.

3.2 SETTING

The geographical setting for the current study was the city of El Paso, Texas. El Paso is the sixth largest city in the state of Texas and the twenty-second largest in the United States. El Paso is located in far west Texas, adjoins Cd. Juarez, Mexico, and is just south of New Mexico. Participants in this study were all firefighters employed by the city of El Paso, Texas Fire Department.

The specific study site was the EPFD Training Academy. This space consisted of three large classrooms suitable for groups of approximately 20-30 firefighters per session, as well as, an office space with computer and printer accessibility. Based on the needs of the participants, follow-up assessments may have occurred at remote sites, such as neighborhood Fire Stations.

3.3 PARTICIPANTS

Participants in this study included 740 uniformed El Paso firefighters. Demographic data for this population revealed that participants were 98% male with the majority (76%) reporting Hispanic or Latino ethnicity. The mean age was nearly thirty eight years old and the majority of the participants were non-ranking firefighters with an average of one hundred forty five service months. Although largely overlapping, the post-test sample reported being 98% male, and 78% Hispanic or Latino with a mean age of thirty eight year old non-ranking firefighters with an average of one hundred forty six service months.

3.4 POWER

Several analyses were conducted using G*Power software (Erdfelder, Faul & Buchner, 1996; Faul, Erdfelder, Lang, & Buchner, 2007) to determine achieved statistical power post hoc. The first set examined power for the 3 X 2 intervention by time between-subjects design. This analysis used a sample size of 1404, alpha of .05, and a small effect size ($f = .10$). This analysis revealed an achieved power of .93 to detect a main effect for Intervention Modality, power of .96 to detect a main effect for time, and power of .90 to detect the expected Intervention Modality x Time Period interaction. A secondary power analysis showed that the pretest sample ($n = 740$) and posttest samples ($n = 664$) had sufficient power to detect zero-order correlations of .10 and .11, respectively, at $\alpha = .05$.

3.5 MATERIALS AND MEASURES

3.5.1 Personalized Normative Feedback Form (PNF)

Provision of personalized normative feedback regarding consumption patterns, alcohol beliefs and expectancies, and alcohol-related experiences is part of the standard BASICS intervention protocol (see Dimeff et al., 1999) and an important component of the proposed study. Specifically, identical forms were used in the two conditions that include normative feedback (i.e., the PNF-only condition and the BASICS Psychoeducation + PNF condition). The study employed a version of the form that was

based on the form used as part of the El Paso BASICS Program (Tomaka et al., 2012). Participants received a two-page PNF form that used individual data compiled from the assessment session. The form included personalized alcohol consumption data including frequency, quantity, and an estimated peak blood alcohol level. It also had direct comparisons with normative data based on the United States average drinking patterns. The form also included a list of personally experienced alcohol-related problems (from the RAPI), and colorful graphics and figures that enhance comparisons of individual consumption and problems to normative data. The form also listed individual negative and positive expectancies to facilitate discussion during the session.

Study staff created individualized PNF forms immediately after firefighters completed their assessment questionnaires. To provide adequate time for creation, researchers used a “coat check” procedure to assure anonymity (no names on forms or questionnaires), but which also allowed provision of personalized feedback. The coat check procedure is described below.

3.5.2 Alcohol Use Identification Test (AUDIT)

The AUDIT assesses at-risk drinking and screens for potential alcohol-related problems in three specific areas including hazardous alcohol use (e.g., frequency and quantity of drinking), dependence symptoms (e.g., impaired control over and increased salience of drinking) and harmful alcohol use (e.g., guilt after drinking, alcohol-related injuries) (Babor, Biddle-Higgins, Saunders, & Monteiro, 2001). Although typically assessed within the last year, the 10-item instrument was modified to ask about alcohol consumption and behaviors within the last three months (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). Total scores range from 0 – 40, and scores of 8 or greater are indicative of “at-risk drinking” (Babor et al., 2001). The AUDIT has a reliability of $\alpha = .86$ (Babor et al., 2001). Based on the UTEP BASICS preliminary studies and the present study, the AUDIT has a reliability of $\alpha = .77$ and $\alpha = .82$, respectively (Tomaka et al., 2012). This instrument was used for both assessment and follow-up questionnaires.

3.5.3 Rutgers Alcohol Problems Index (RAPI)

The RAPI's 23-items examine the frequency of alcohol-related problems and situations experienced within the last three months (White & Labouvie, 1989). Responses to statements such as, "Got into fights with other people"; "Neglected your responsibilities" are summed providing a total RAPI score. Response options include never, 1-2 times, 3-5 times, 6- 10 times, or more than 10 times. Total scores range from 0 – 92, with higher scores indicating more frequency and/or quantity of alcohol related problems. The RAPI has a reliability of $\alpha = .92$ (White & Labouvie, 1989). Based on the UTEP BASICS preliminary studies and the present study, the RAPI has a reliability of $\alpha = .91$ and $\alpha = .90$, respectively (Tomaka et al., 2012). This instrument was used for both assessment and follow-up questionnaires.

3.5.4 Daily Drinking Questionnaire (DDQ)

The DDQ is used to assess unique drinking patterns across a "typical week" occurring within the last month including the specific days any alcohol was consumed and the number of drinks consumed (Collins, Parks, & Marlatt, 1985). Three behavioral measures from the instrument are recorded including, (a) the overall number of days that alcohol was consumed, (b) binge drinking frequency, (c) and peak alcohol consumption on any one occasion. For the purposes of this study, three outcome measures were taken from the information provided on the DDQ including Mean Weekly Drinking Days, Mean Weekly Drinking Hours, and Mean Weekly Drinks. While the modified outcome measures are not traditionally used it was necessary to examine the DDQ in this manner given the nature of the firefighters rotating shift work. All questions were assessed in reference to the last thirty days. This instrument was used for both assessment and follow-up questionnaires.

3.5.5 Comprehensive Effects of Alcohol (CEoA)

The CEoA identifies the extent to which an individual holds positive and negative expectancies for alcohol use (Fromme, Stroot, & Kaplan, 1993). In addition to overall positive and negative

expectancy scores, the instrument produces seven subscale scores with four subscales relating to positive expectancies and three relating to negative expectancies. Positive expectancies include Sociability, Tension Reduction, Liquid Courage, Sexuality, whereas negative expectancies include Cognitive and Behavioral Impairment, Risk and Aggression, and Negative Self-Perception. Each question leads the participant in a two-step process. The first step of this questionnaire is to identify if an alcohol expectancy is likely or unlikely to happen when alcohol is consumed. The second step is to identify if that is a positive or negative expectancy of alcohol consumption. Both processes are examined through a Likert scale measurement ranging from disagree to agree and bad to good, respectively (Fromme et al., 1993). For the purposes of this study, only the first step of this questionnaire was assessed. The CEoA subscales have reliabilities ranging from $\alpha = .66$ to $\alpha = .84$ (Ham, Stewart, Norton, & Hope, 2005). Based on the present study, the reliability for each of the subscales ranged from $\alpha = .70$ to $\alpha = .88$. This instrument was used for the assessment questionnaire only.

3.5.6 Drinking Motives Questionnaire (DMQ)

The DMQ is a twenty item scale used to assess drinking motives. The four subscales of the instrument include Social, Coping, Enhancement, and Conformity. Items regarding Social drinking motives include “How often would you say you drink to be sociable?” Items regarding Coping drinking motives include “How often do you drink to forget your worries?” Items regarding Enhancement drinking motives include “How often do you drink because it’s exciting?” Items regarding Conformity or Peer Pressure drinking motives include “How often do you drink so you won’t feel left out?” The response scale ranges from “Never” to “Almost Always” (Cooper, 1994). All questions were assessed with reference to the last thirty days. The DMQ subscales have reliabilities ranging from $\alpha = .81$ to $\alpha = .87$ (Marten, Rocha, Martin, & Serrao, 2008). Based on the present study, the reliability for each of the subscales ranged from $\alpha = .71$ to $\alpha = .78$. This instrument was used for the assessment questionnaire only.

3.5.7 Balanced Inventory Of Desirable Responding (BIDR)

The BIDR scale is used to assess social desirability, defined as the need, “to obtain approval by responding in a culturally appropriate and acceptable manner,” (Crowne & Marlowe, 1960, p. 353). Specifically, this instrument examines whether participants are answering questions honestly or are answering in a way that would be more desirable or self-flattering. The scale is a forty item instrument with two subscales, Self-Deceptive Enhancement and Impression Management. Impression management reflects the cautious presentation of self to others. While Self-Deception reflects the propensity to provide believable self-reports that are consistently positive. Responses are given on a seven point rating scale with total scores ranging from 0-20 (Paulhus, 1988).

The scale items measure both desirable, but uncommon behaviors (e.g. I am a completely rational person) and undesirable, but common behaviors (e.g. Once in a while, I laugh at a dirty joke). Past research has found the scale to be moderately negatively correlated with self-report substance use measures (Groh, Ferrari, & Jason, 2009; Richards & Pai, 2003). The overall BIDR scale has a reliability of $\alpha = .83$ (Paulhus, 1991), while the Self-Deceptive Enhancement subscale has a reliability of $\alpha = .68$ and the Impression Management subscale has a reliability of $\alpha = .74$ (Li & Bagger, 2007). Based on the present study, the reliability for the Self-Deceptive Enhancement and Impression Management subscales were $\alpha = .74$ and $\alpha = .77$, respectively. This instrument was used for the assessment questionnaire only.

3.6 PROCEDURES

3.6.1 Recruitment

This study was conducted under the auspices of the El Paso Fire Department’s Training Academy. The training academy offers specialized training on a variety of topics three times a year. Traditionally, these training are reserved for firefighter continuing education (i.e. CPR renewal, Fire Safety Standards, etc.). All EP uniformed fire department employees are mandated to attend these

trainings in order to complete their quarterly training requirements. Training is provided in small classes of 20 to 30 firefighters at the Training Academy.

As part of the regular training cycle, the study investigator, Monks, was asked to prepare and conduct an alcohol risk reduction training for the EPFD in order to fulfill a mandatory training requirement for its employees. Five EPFD Chiefs as well as the director of the EPFD Human Resources agreed to allow Monks to collect self-report data and conduct a quasi-experimental study as part of the training. As part of this agreement, all firefighters would receive a version of alcohol risk reduction training, but that training would differ based on shift assignment.

The agreement also specified that Monks would be able to follow up (i.e., collect post-intervention data) with the firefighters. Specifically, the study investigator was allotted time during the third training cycle to collect follow-up questionnaires from the firefighters.

The agreement also required that all self-report data was to be kept anonymous as well as strictly confidential. As per the EPFD, no participant identifiers were to be collected. Any employee could opt out of the assessment, but the training portion of the session was to be mandatory to meet training requirements. Due to the nature of the study, the inclusion criteria only included being a current firefighter with the EPFD.

This requirement that data collection be kept anonymous had serious consequences for the design of the study. Due to the fact that we were unable to track participants by name or by unique identifier, we had to eschew the preferred within-subjects design for between subjects. Also, we were allowed only fifteen minutes to collect follow-up data during the third training cycle meaning that only a limited number of covariates could be considered for the post-test only design.

The study investigator was provided with an established training schedule for two four-month cycles, one for assessment and intervention and the other for follow-up data collection. This schedule allowed for groups of 20-30 firefighters from multiple fire stations across the city members, all from a

specific EPFD shift. Because the nature of the training setting prohibited random assignment of individuals to groups, assignment to intervention condition was done on a group level and consistent with the schedule of 24-hour shift assignments. Each of the three 24-hour shifts were assigned to receive one of the three intervention conditions arbitrarily. There were no a priori reasons to suspect that there would be differences between the 24-hour shifts. This arrangement allowed for all stations and all shifts to be represented relatively equally across intervention conditions, and not confounded with experimental condition. Each of the three interventions were delivered to twelve training groups per intervention condition. The twelve training groups, the 24-hour shift assignments, and the training schedule were dependent on the El Paso Fire Department and the investigator could not influence (i.e., bias) the group formation process.

3.6.2 General Intervention Procedures (All Participants)

The study was conducted as part of the regular training schedule for the EPFD. Such training occurs three times a year in four month intervals. As such, firefighters participated in training groups of 20-30 firefighters. Each training group contained members of a specific EPFD 24-hour shift and included firefighters from multiple fire stations across the city. Because the nature of the training setting prohibited random assignment of individuals to groups, assignment to intervention condition was done on a group level, consistent with the 24-hour shift assignments. Each of the three 24-hour shifts were assigned to receive one of the three intervention conditions arbitrarily. There were no a priori reasons to suspect that there would be differences between the 24-hour shifts. This arrangement allowed all stations and all shifts to be represented relatively equally across intervention conditions, and therefore was not confounded with experimental condition. Each of the three interventions were delivered to twelve training groups per intervention condition. The twelve training groups, the 24-hour shift assignments, and the training schedule were dependent on the El Paso Fire Department and the investigator had no influence (i.e., bias) the group formation process.

The study investigator and research assistants greeted firefighters upon arrival at the EPFD Training Academy, explained the purpose of the study, answered questions, and obtained informed consent. Once informed consent was obtained, participants were given the assessment questionnaire containing the measures described above. Because these instruments rely on self-report, to ensure a minimal level of bias, the study investigator stressed anonymity and confidentiality during all phases of the intervention. The importance of accuracy and truthfulness was also stressed to the participants at data collection times. The investigator used well-established instruments that have shown good reliability and validity (Babor & Del Boca, 1992). Additionally, the Balanced Inventory of Desirable Responding Scale (BIDR; Paulhus, 1991) was implemented in order to assess and potentially adjust for the participant's response bias.

Following completion of the assessment packet (30-60 minutes), and a short break, the intervention phase of the study commenced, the content of which was dependent on the condition to which each training group had been assigned. Sample cell size was closely monitored to ensure relatively equal distribution of participants in each cell. The organization of the nature of the established training groups helped ensure relatively equal sample sizes. Regardless of condition, the intervention took approximately one to two hours to complete. Table 1 outlines the specific intervention components in each cell. The study assigned firefighters to one of the three possible conditions based solely on current 24-hour shift assignments.

Table 1: General Study Design and Primary Components of Each Intervention Modality/Condition

		Intervention Condition		
		BASICS Psychoeducation with Personalized Normative Feedback	Personalized Normative Feedback	Control
Time	1	<ul style="list-style-type: none"> • Assessment • BASICS Psychoeducation • Personalized Normative Feedback (~2.5 hours) 	<ul style="list-style-type: none"> • Assessment • Personalized Normative Feedback (~1.5 to 2 hours) 	<ul style="list-style-type: none"> • Assessment • Standard Alcohol Education/DWI Prevention Presentation (~2.5 hours)
	2	<ul style="list-style-type: none"> • Assessment (15 min.) 	<ul style="list-style-type: none"> • Assessment (15 min.) 	<ul style="list-style-type: none"> • Assessment (15 min.)

At the conclusion of the intervention portion of the study, the investigator reviewed the procedures that were to be followed for the four month follow-up with the participants held during the next training cycle. Before being released, each firefighter was given a handout with contact information for the investigator, as well as various national, state, and local health resources that he or she may use if needed. The firefighters were then thanked for their attendance at the session and excused. Those firefighters receiving PNF forms and blood alcohol level cards were encouraged to keep their forms. Participants not wanting to keep their forms, however, were allowed to return them to the investigator for later shredding. This later procedure provided extra protection of anonymity if so desired by individual firefighters.

3.6.3 Peer Facilitator Training and Program Fidelity

The main advisor (Tomaka), committee member (Davis), and investigator (Monks) are trained and experienced in the implementation of the BASICS program. Over the course of the three years that

the past El Paso BASICS Program was functioning, they hosted and participated in three multi-day, onsite trainings. The first occurred at the initiation of our SAMHSA demonstration grant that funded the preliminary study described above, and it addressed the implementation of BASICS. This session was conducted by Dr. Arthur Blume (Blume & Marlatt, 2004; Blume and Marlatt, 2006) who was a Co-PI on our original SAMHSA application and later a consultant after leaving the UTEP mid-way through the project. The second, about 1 year later, was a review of BASICS with a greater emphasis on developing motivational interviewing skills, also conducted by Dr. Blume. The final training was conducted by Dr. Scott Walters (e.g., Walters & Neighbors, 2005), who also provided SAMHSA-sponsored consultation on PNF delivery as well as use of MI in the context of PNF delivery. In addition to these trainings, Dr. Blume served as a program fidelity consultant in which he reviewed audiotaped BASICS sessions and provided constructive feedback to BASICS facilitators. In addition to the study investigator, six undergraduate and graduate level research assistants attended and assisted with the interventions. While, they did not conduct the sessions, the research assistants were extensively trained in all study areas prior to the start of the study by the study investigator.

3.7 STUDY CONDITIONS

The procedures for the two experimental conditions (vs. control) were based on a past implementation of the BASICS program (with PNF) at UTEP (see Tomaka et al., 2012). Because the past implementation included all program components (i.e., BASICS Psychoeducation and Personalized Normative Feedback), the implementation of the quasi-experimental design was fairly straightforward, thereby avoiding the need to develop alternative interventions. All relevant materials and procedures for BASICS Psychoeducation and PNF had already been developed and implemented successfully by the study investigator as part of the original study (see Tomaka et al., 2012).

Each of the three 24-hour shifts were assigned to receive one of the three intervention conditions arbitrarily. There were no a priori reasons to suspect that there would be differences between the 24-

hour shifts. All 12 training groups assigned to Shift A received the Standard Alcohol Intervention Presentation, all 12 training groups assigned to Shift B received the BASICS Psychoeducation and PNF intervention, and all 12 training groups assigned to Shift C received the PNF Intervention.

3.7.1 Experimental Conditions

Both experimental conditions were conducted by the study investigator, Monks, using the principles and philosophy of motivational interviewing, an empathic counseling style that encourages open and direct communication regarding behavior change. The goal of motivational interviewing is to resolve ambivalence and build motivation for change (Miller & Rollnick, 2002). The investigator and participants work through a collaborative, non-judgmental, non-confrontational relationship in which the investigator helps to strengthen the participant's readiness and willingness to develop confidence and self-efficacy. The key of motivational interviewing is arriving at a place in which the participant is making a case for his/her lifestyle change (Miller & Rollnick, 2002).

For participants in the experimental conditions that provide PNF, study staff prepared and distributed the necessary feedback forms using a coat check procedure described below. Firefighters in the standard intervention condition did not receive PNF.

3.7.2 Coat Check Procedure To Assure Anonymity

Since it took several minutes to compile data and print PNF forms, participants gave their assessment packets to the investigator's research assistant as they completed them. Using duplicate raffle tickets, the assistant attached one ticket of the pair to the packet and gave the other ticket to the participant. The participant would then "claim" his/her feedback form after a scheduled break in the program. This exchange process and break time allowed the assistants to create PNF forms and distribute them to participants without the use of personally identifying information prior to the feedback portion of the intervention. Once the participant received the PNF form, the raffle tickets were disposed.

The use of raffle tickets and break period also allowed time for the assistant to create the forms while maintaining anonymity among the participants.

3.7.3 BASICS Psychoeducation + Personalized Normative Feedback

As noted above, BASICS is a harm reduction approach for risky alcohol use in which the ultimate goal is a reduction of adverse consequences from alcohol consumption by decreasing the incidence of binge drinking and related risk behaviors (Dimeff et al., 1999). The BASICS + PNF session that was used in the study was based on the past implementation of this program, which is highly consistent with Dimeff et al.'s recommendations and other research in this area (Baer et al., 1992; Kivlahan et al., 1990).

After completion of assessment instruments, participants assigned to the BASICS + PNF Condition participated in a one-hour session that had two specific content areas: "BASICS Psychoeducation" and PNF. The first portion of the session, the BASICS Psychoeducation, adhered to the ASTP curriculum and included use of handouts and power-point slides. Covered topics included education about physical and psychological effects of alcohol, descriptive norms regarding alcohol use, alcohol expectancies, drinking myths, drink refusal skills, harm reduction strategies, and gender differences.

The second portion of the session (i.e., PNF) focused on reviewing the participant's personalized normative feedback form based on the baseline assessment and functioned as a guide for discussion during the remainder of the session. The discussion topics included pros and cons of drinking behavior, personalized blood alcohol levels, social norms, alcohol expectancies, and alcohol-related problems. The investigator presented risk reduction options and possible goals to reduce heavy drinking and/or to drink more responsibly (Dimeff et al., 1999).

At the conclusion of the session, the study investigator reviewed the protocol of the follow-up session to occur in approximately four months from the intervention date with the participants. The

participants were thanked for their attendance at the session and given a reference sheet to various health agencies/organizations.

3.7.4 Personalized Normative Feedback Only Condition

After completion of the baseline assessment period, the investigator used the coat-check procedure while assessment results were compiled into the PNF form. Once the forms had been generated, the investigator conducted the group PNF session as described as the second portion of the BASICS Psychoeducation + PNF Condition. They did not participate, however, in the first portion of the BASICS Psychoeducation + PNF Condition session, specifically the portion of the session that focuses on the delivery of BASICS Psychoeducation. This PNF session focused on reviewing the participant's personalized normative feedback form based on the baseline assessment and functioned as a guide for discussion during the remainder of the session. The discussion topics included pros and cons of drinking behavior, personalized blood alcohol levels, social norms, alcohol expectancies, and alcohol-related problems. The investigator presented risk reduction options and possible goals to reduce heavy drinking and/or to drink more responsibly (Dimeff et al., 1999).

At the conclusion of the session, the study investigator reviewed the protocol of the follow-up session to occur in approximately four months from the intervention date with the participants. The participants were thanked for their attendance at the session and given a reference sheet to various health agencies/organizations.

3.8 CONTROL GROUP—STANDARD ALCOHOL INTERVENTION

Prior to approaching the study investigator to provide an alcohol risk reduction training, the EPFD had planned to provide a standard alcohol intervention/DWI presentation to the uniformed firefighters. This presentation was to be given by the El Paso Police Department. The Alcohol/DWI presentation is the standard presentation given to city employees, middle/high school students, and community organizations. Since the police officer was willing to give the presentation as part of the

study and his presentation was considered the standard alcohol intervention for the EPFD, it was used as the Control Group training.

After completing assessment packets, the control group had a short break and then received an alcohol intervention created and presented by the El Paso Police Department. This presentation includes some basic alcohol education, but with an emphasis on laws, policies and procedures, and information relevant to city of El Paso Employees. At the conclusion of the session, the study investigator reviewed the protocol of the follow-up session to occur in approximately four months from the intervention date with the participants. The participants were thanked for their attendance at the session and given a reference sheet to various health agencies/organizations.

3.9 FOLLOW-UP PROCEDURES

3.9.1 Four Month Post Intervention Follow-Up

Firefighters, regardless of condition, completed the follow-up assessment approximately four months after the intervention and as part of their next shift-based training cycle. Specifically, the study investigator attended the third EPFD training cycle for the year in order to disseminate and collect follow-up questionnaires. The study investigator was not blinded to condition when conducting follow-up procedures. Confidentiality and anonymity were again emphasized prior to disseminating the follow-up questionnaire.

In addition to the outcomes measures described above, questions were added to ensure that all participants included in the posttest analyses actually experienced their shift assigned intervention. For example, firefighters who experienced a shift change during the study period needed to be reassigned to the proper condition to which they were exposed. Three additional questions were asked on the follow-up assessment to determine if they were assigned to the appropriate follow-up and if not, were reassigned.

Past research in this area use one - two month follow-ups consistently, thus it was anticipated that a four month post intervention follow-up was appropriate for the study (Agostinelli et al., 1995; Borsari & Carey, 2000; Collins et al., 2002; Dimeff & McNeely, 2000; Doumas & Hannah, 2008; Juarez, Walters, Daughterty, & Radi, 2006; Kypri et al., 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006; Walters, 2000; Walters, Bennett, & Miller, 2000; Walters, Vader, & Harris, 2007) At the completion of the follow-up assessment, all participants were thanked for their time and attendance.

3.10 PARTICIPANT RETENTION

The study investigator followed the established EPFD training schedule in order to disseminate and collect the follow-up assessments. The follow-ups were scheduled for approximately four months post intervention. In the middle of the third month of follow up and not having the expected follow-up participants, the study investigator employed additional measures to ensure retention in the study. First, the investigator developed a comprehensive procedure for ensuring that each training group was given the opportunity to complete the follow-up within four months by going to each Battalion Station, regional main station, to disseminate and collect the follow-up questionnaires. Second, the investigator approached the Training Academy chief and training staff to explain the plan. The plan was approved and from that point on the study investigator and research assistants not only attended scheduled follow-up times, but also went to Battalion Stations during each shift. This accommodation was made for those who were unable to make their scheduled follow-up due to conflicting responsibilities.

The success of the participant retention was largely due to the emphasis the benefits of participating in the study to self and others as well as gratitude for participating during all participant interactions. In addition, the study investigator minimized participant burden and increased control during follow-up by remaining flexible and allowing participants to complete the follow-up assessments at their Battalion Stations. Given the follow-up scheduling modifications, the study maintained a 90% follow-up retention rate.

Chapter 4: Results

4.1 DATA MANAGEMENT AND PREPARATION

Prior to analysis, all study variables were examined for accuracy of data input using univariate descriptive statistics. Out-of-range values, implausible responses, and univariate outliers were noted and corrected by reexamining the raw data. Since a SPSS Missing Values Analysis (MVA) showed that all study variables had less than 5% of missing data, expectation maximization (EM) was used to impute missing values into the data set.

Total scores for two composite dependent variable scales were calculated including alcohol risk scores (i.e., the AUDIT) and alcohol-related problems (i.e., the RAPI). Because the distributions of AUDIT and RAPI scores were significantly skewed, logarithm transformations of both scores were completed. Two scales from the Daily Drinking Questionnaire – Mean Weekly Drinks and Mean Weekly Hours—were also skewed and similarly transformed. Measures of skewness for AUDIT scores (raw vs. transformed) changed from 1.42 to - .47, RAPI scores changed from 4.71 to 1.09, DDQ – Mean Weekly Drinks changed from 2.97 to - .09, and DDQ- Mean Weekly Hours changed from 3.29 to - .15.

Subscales for other study variables, Comprehensive Effects of Alcohol (CEoA; Fromme et al., 1993), Drinking Motives Questionnaire (DMQ; Cooper, 1994) and Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1991) were also calculated. CEoA subscales included Sociability, Tension Reduction, Liquid Courage, Sexuality, Cognitive and Behavioral Impairment, and Risks and Aggression. DMQ subscales included Social, Coping, Enhancement and Conformity. BIDR subscales included Self-Deceptive Enhancement and Impression Management.

Multivariate outliers were detected using the techniques outlined in Tabachnick and Fidell (2007). Twenty-one total participants (1% of the total sample) were excluded for having a Mahalanobis distance of 20.52 or greater. Most multivariate outliers were excluded for inconsistent reporting (i.e.

reporting a high AUDIT risk score while reporting zeros for daily drinking and other DDQ components) or for being “true” outliers (i.e. scoring high on some or all of the alcohol-related outcome variables).

4.2 DESCRIPTIVE STATISTICS AND PRELIMINARY ANALYSIS

Table 2 contains the descriptive statistics with means and standard deviations for all demographic variables at pre-test both overall and within each intervention condition. The pretest sample consisted of nearly 98% male participants with the majority of the sample (76%) reported being Hispanic or Latino. The mean age for the sample was nearly thirty-eight years old and the majority of the participants were non-ranking firefighters with an average of one hundred forty five service months (approximately twelve years). Analyses of variance revealed no significant differences for demographic variables across intervention conditions.

Table 2: Means and Standard Deviations for Demographic Variables Overall and By Intervention Condition at Pre-Test

	Intervention Condition							
	Education Control (n = 260)		BASICS (n = 241)		PNF (n = 230)		Total (N = 731)	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean/%</u>	<u>SD</u>
Age	38.24	7.54	37.61	8.59	37.15	8.12	37.69	8.08
Gender	1.02	.138	1.01	.111	1.03	.160	1.02 98%	.137
Hispanic	1.25	.432	1.20	.397	1.28	.449	1.24 76%	.427
Marital Status	.69	.47	.69	.46	.64	.48	.67 67%	.47
Rank	.71	.46	.72	.45	.76	.43	.73 73%	.45
Service Months	146.09	82.05	144.60	86.80	143.19	85.82	144.69	84.72

Note: No difference by condition for any listed variables; Gender was coded 1= Male, 2 = Female; Hispanic was coded 1 = Hispanic, 2 = Non-Hispanic; Marital Status was coded 1 = Married, 0 = Not Married; Rank was coded 0 = Officer, 1 = Non-Officer

Table 3 contains the same descriptive statistics at post-test. The post-test sample consisted of nearly 98% male participants with the majority of the sample (78%) reported being Hispanic or Latino. The mean age for the sample was thirty-eight years old and the majority of the participants were non-ranking firefighters with an average of one hundred forty six service months (approximately twelve years). As before, no significant differences for demographic variables were found across intervention conditions. As the samples are largely overlapping, post-test demographic data for both overall and condition specific were consistent with pre-test demographic data as shown above in Table 2.

Table 3: Means and Standard Deviations for Demographic Variables Overall and By Intervention Condition at Post-Test

	Intervention Condition							
	Education Control (n = 216)		BASICS (n = 226)		PNF (n = 210)		Total (N = 652)	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean/%</u>	<u>SD</u>
Age	38.71	7.40	37.43	8.46	38.05	8.14	38.05	8.02
Gender	1.01	.10	1.02	.13	1.03	.17	1.02 98%	.14
Hispanic	1.20	.40	1.21	.40	1.27	.44	1.22 78%	.42
Marital Status	.69	.46	.70	.46	.64	.48	.68 68%	.47
Rank	.71	.45	.72	.45	.72	.45	.72 72%	.45
Service Months	146.98	76.97	142.70	87.03	149.94	81.53	146.45	81.96

Note: No difference by condition for any listed variables; Gender was coded 1= Male, 2 = Female; Hispanic was coded 1 = Hispanic, 2 = Non-Hispanic; Marital Status was coded 1 = Married, 0 = Not Married; Rank was coded 0 = Officer, 1 = Non-Officer

Table 4 presents the means and standard deviations for the five alcohol-related outcome variables at both pre-test and post-test as well as F statistics and partial eta squared (η_p^2) effect sizes. Although untransformed means are presented, all ANOVAs results were based on logarithm transformed variables where appropriate. As shown, alcohol risk levels significantly decreased from pre-test to post-test, as did alcohol-related problems, mean drinking days per week, and mean drinking hours per week. Only mean drinking days per week did not significantly decrease. Partial eta squared effect sizes were small for all four outcome variables in which a significant decrease was found, suggesting that the overall changes were modest in magnitude.

Table 4: Means and Standard Deviations for Alcohol-Related Outcome Variables

Alcohol-Related Outcome	Pre-test (n = 731)		Post-test (n = 652)		<i>F</i>	η_p^2
	Mean	SD	Mean	SD		
Alcohol Risk Level Score of 8 or above (%)	6.21 33%	5.18	5.22 24%	4.52	10.41***	.007
Alcohol-Related Problems Score of 1 or more (%)	2.73 47%	5.60	2.13 40%	4.89	6.66**	.005
Mean Drinking Days/Week	1.94	1.59	1.79	1.62	3.17	.002
Mean Drinking Hours/Week	7.23	8.54	6.57	8.10	3.79**	.003
Mean Drinks/Week	10.15	12.65	8.13	11.41	10.04**	.007

Note: η_p^2 = Partial Eta Squared

Table 5 presents the means and standard deviations for drinking motives and alcohol expectancies at pre-test. Firefighters reported that the main motives for drinking were Social and Enhancement, respectively. They attested to alcohol making them more readily available to enjoy gatherings and celebrations as well as alcohol being central to their social lives (Drinking Motives – Social). They also reported that they drink because they like the way alcohol makes them feel and because it adds a sense of excitement to their lives (Drinking Motives - Enhancement). Firefighters also

reported that when they drink alcohol they expect to experience a reduction in tension and stress such as feeling more peaceful and relaxed (Alcohol Expectancy – Tension Reduction). Secondly, when drinking alcohol they also feel more social such as being more talkative, outgoing, and able to express one's feelings easier (Alcohol Expectancy – Sociability).

Table 5: Means and Standard Deviations for Drinking Motives and Alcohol Expectancies at Pre-Test

Alcohol-Related Variable	Mean	SD
Drinking Motives		
Social	2.97 _a	1.32
Enhancement	2.53 _b	1.25
Coping	1.68 _c	.86
Conformity	1.40 _d	.60
Alcohol Expectancies		
Tension Reduction	2.72 _a	.76
Sociability	2.69 _a	.74
Cognitive & Behavioral Impairment	2.53 _b	.71
Sexuality	2.17 _c	.78
Liquid Courage	2.16 _c	.77
Risks and Aggression	1.96 _d	.75
Negative Self Evaluation	1.79 _e	.68

N = 731; Note: Means within outcome category (Drinking Motives/Alcohol Expectancies) that do not share subscripts differ by $p < .001$

Table 6 presents the intercorrelations among the five alcohol-related outcome variables examined in this study at pre-test. AUDIT and RAPI instruments showed good reliability (shown along

the diagonal) with coefficient alphas ranging from .82 to .90. As expected, the five alcohol-related outcome variables were positively correlated with each other.

Table 6: Inter-Correlations Among Five Alcohol-Related Variables at Pre-Test

Alcohol-Related Outcome	1	2	3	4	5
1. Alcohol Risk Level (AUDIT)	(.82)	.61**	.85**	.80**	.65**
2. Alcohol-Related Problems (RAPI)		(.90)	.55**	.50**	.46**
3. Mean Drinks/Week				.95**	.81**
4. Mean Drinking Hours/Week					.81**
5. Mean Drinking Days/Week					

** $p < .01$, N=731

Table 7 presents the intercorrelations among the five alcohol-related outcome variables examined in this study at post-test. Again, AUDIT and RAPI instruments showed good reliability (shown along the diagonal) with coefficient alphas ranging from .80 to .92. As expected, the five alcohol-related outcome variables were positively correlated with each other.

Table 7: Inter-Correlations Among Five Alcohol-Related Variables at Post-Test

Alcohol-Related Outcome	1	2	3	4	5
1. Alcohol Risk Level (AUDIT)	(.80)	.56**	.81**	.75**	.63**
2. Alcohol-Related Problems (RAPI)		(.92)	.49**	.44**	.45**
3. Mean Drinks/Week				.95**	.82**
4. Mean Drinking Hours/Week					.82**
5. Mean Drinking Days/Week					

** $p < .01$, N=652

Table 8 presents the intercorrelations among the five alcohol-related outcome variables, as well as drinking motives, alcohol expectancies, and desirable responses at pre-test. There were several notable patterns in the correlation matrix. First, alcohol-related outcomes correlated with three of the four drinking motives subscales, Social, Coping, and Enhancement. Conformity as a drinking motive, while still showing a significantly positive correlation with alcohol-related outcomes, showed a slightly weaker correlation with the outcomes than the other drinking motives. This is consistent with the mean information provided in Table 5, with Conformity having the smallest mean of the four drinking motives. Secondly, the alcohol-related outcomes and alcohol expectancies correlations were smaller than the outcomes and drinking motives correlations. Finally, there were small associations between the Desirable Responses-Impression Management and outcomes. Self-Deceptive Enhancement was only correlated with Alcohol-Related Problems and Alcohol Risk Levels, but not with measures of consumption. At the most, social desirability accounts for only 4% of the variance for alcohol-related outcomes.

Table 8: Inter-Correlations Among Alcohol-Related Outcome Variables, Drinking Motives, Alcohol Expectancies, and Desirable Responses at Pre-Test

Study Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Alcohol Risk Level		.61**	.85**	.80**	.65**	.64**	.50**	.66**	.25**	.22**	.11**	.13**	.16**	-.18**	.06	-.04	-.11**	-.13**
2. Alcohol-Related Problems			.55**	.50**	.46**	.48**	.54**	.53**	.31**	.22**	.07	.22**	.20**	-.01	.20**	.12**	-.19**	-.18**
3. Mean Drinks/Week				.95**	.81**	.56**	.45**	.62**	.18**	.16**	.12**	.09*	.12**	-.22**	.00	-.08*	-.05	-.10**
4. Mean Drinking Hours/Week					.81**	.52**	.43**	.57**	.16**	.14**	.12**	.06	.09*	-.20**	-.03	-.09*	-.04	-.09*
5. Mean Drinking Days/Week						.40**	.41**	.48**	.13**	.13**	.12**	.07	.09*	-.15**	.02	-.08*	-.04	-.11**
6. Drinking Motives-Social							.52**	.71**	.44**	.42**	.23**	.28**	.36**	-.06	.19**	.02	-.15**	-.25**
7. Drinking Motives-Coping								.57**	.44**	.28**	.18**	.32**	.31**	.01	.28**	.17**	-.25**	-.21**
8. Drinking Motives-Enhancement									.30**	.35**	.23**	.30**	.35**	-.06	.19**	.02	-.01**	-.20**
9. Drinking Motives-Conformity										.26**	.06	.28**	.31**	-.11**	.30**	.25**	-.26**	-.22**
10. Alcohol Expectancies-Sociability											.49**	.63**	.60**	.27**	.48**	.21**	-.13**	-.19**
11. Alcohol Expectancies-Tension Reduction												.30**	.30**	.19**	.10**	-.04	.03	-.15**
12. Alcohol Expectancies-Liquid Courage													.63**	.37**	.75**	.42**	-.17**	-.27**
13. Alcohol Expectancies-Sexuality														.31**	.54**	.32**	-.22**	-.28**
14. Alcohol Expectancies-Cognitive & Behavioral Impairment															.50**	.50**	-.18**	-.14**
15. Alcohol Expectancies-Risks & Aggression																.60**	-.24**	-.24**
16. Alcohol Expectancies-Negative Self Evaluation																	-.31**	-.16**
17. Desirable Responses- Self Deceptive Enhancement																		.37**
18. Desirable Responses-Impression Management																		

* $p < .05$, ** $p < .01$, N=731

Table 9 presents correlations between demographic variables and alcohol-related outcome variables at post-test. Marital status was significantly negatively correlated with all five of the alcohol-related outcome variables. Age was also significantly negatively correlated with alcohol risk levels, alcohol related problems, mean weekly drinking hours and mean weekly drinks. These correlations suggested that for firefighters being married and being older can both function as protective factors to alcohol risk, alcohol problems, and alcohol consumption. Demographic variables, gender, rank, and self-reporting Hispanic or Non-Hispanic were not significantly correlated with any of the five alcohol-related outcome variables.

Table 9: Correlations Among Demographic Variables With Alcohol-Related Outcome Variables at Post-Test

Alcohol-Related Outcome	Demographic Variables				
	Gender	Age	Hispanic	Marital Status	Rank
Alcohol Risk Level	.04	-.16***	.06	-.19***	.03
Alcohol-Related Problems	.02	-.12**	-.01	-.17***	.04
Mean Drinks/Week	.00	-.11**	-.07	-.17***	.04
Mean Drinking Hours/Week	.02	-.10**	-.07	-.17***	.04
Mean Drinking Days/Week	.01	-.07	-.02	-.13***	.02

** $p < .01$, *** $p < .001$, N=652, Gender was coded 1= Male, 2 = Female; Hispanic was coded 1 = Hispanic, 2 = Non-Hispanic; Marital Status was coded 1 = Married, 0 = Not Married; Rank was coded 0 = Officer, 1 = Non-Officer

4.3 PRIMARY ANALYSES

Recall that this study examined the relative effectiveness of three alcohol interventions on alcohol risk levels, alcohol-related problems, and alcohol consumption. Specifically, this study examined the effectiveness of BASICS and PNF alcohol risk reduction interventions compared to a

control condition that emphasized basic alcohol education and laws and policies surrounding DWI in a sample of 740 firefighters. Recall also that in order to assure anonymity of responding at both points in time, this study used a panel design (Shadish et al., 2002) that included two waves of between-subjects data collection. Accordingly, a series of two-way ANOVAs were conducted using a 3 X 2 between-subjects design, with Intervention Condition (Control, BASICS, and PNF) and Time (pre-test and posttest) as independent variables and alcohol risk levels, alcohol-related problems, mean weekly drinks, mean weekly drinking hours, and mean weekly drinking days as the five primary dependent variables. Support for the hypotheses would be evidenced by significant Intervention Condition by Time interactions such that participants in the BASICS and PNF conditions would report lower drinking related outcomes, but only at post-test. All effects were examined at $\alpha = .01$ to control for inflated experiment-wise alpha due to multiple statistical tests. These hypotheses were also tested with Multivariate Analysis of Variance as described in the Secondary Analysis Section.

The first analysis was a 3 X 2 Intervention Condition by Time ANOVA with alcohol-risk level (logarithm transformed AUDIT scores) as the dependent variable. Results of this analysis revealed only a significant main effect for Time, as shown in Table 10. This analysis suggested that alcohol risk levels decreased from pre-test to post-test, in general, and that this effect was uniform across all three conditions. Partial eta squared effect size suggested that these changes were small in magnitude.

Table 10: Effects for Intervention Condition and Time on Alcohol Risk Level

Intervention Condition	Time		
	Pre-Test Mean (SD)	Post-Test Mean (SD)	\bar{X} Mean (SD)
Education Control	.70 (.37)	.65 (.36)	.68 (.36)
BASICS	.74 (.32)	.69 (.32)	.72 (.32)
Personalized Normative Feedback	.76 (.36)	.68 (.36)	.73 (.36)
\bar{X}	.73 (.35)	.67 (.34)	.71 (.35)

Analysis of Variance for Alcohol Risk Level

Source	<i>df</i>	<i>F</i>	<i>p</i>	η_p^2
Condition (C)	2	2.41	.090	.003
Time (T)	1	10.88	.001	.008
C x T	2	.23	.793	.000

A parallel 3 X 2 analysis was conducted with alcohol-related problems (logarithm transformed RAPI scores) as the dependent variable. This analysis showed significant main effects for Intervention Condition and for Time, but no Intervention Condition by Time interaction. As shown in Table 11, the main effect for Intervention Condition revealed that those participants in the PNF Intervention Condition had the greatest alcohol-related problems averaged across pre-test and post-test, and those in the Control condition had the lowest alcohol-related problems with those receiving the BASICS intervention fall in between. Post hoc pairwise comparisons suggested that the Control group and the PNF group significantly differed, while those in the BASICS condition did not differ from the other groups. The main effect for Time suggested that, across conditions, alcohol-related problems decreased from Time 1 to Time 2. Like for the alcohol risk level analysis, partial eta squared effect sizes were small for both Condition and Time main effects. That the condition effect was consistent across time suggests pre-existing differences between the two groups, relative differences that remained at post-test despite overall declines.

Table 11: Effects for Intervention Condition and Time for Alcohol Related Problems

Intervention Condition	Time		\bar{X}
	Pre-Test	Post-Test	
	Mean (SD)	Mean (SD)	Mean (SD)
Education Control	.29 (.40)	.22 (.34)	.26 (.37)
BASICS	.32 (.41)	.29 (.39)	.31 (.40)
Personalized Normative Feedback	.36 (.43)	.30 (.41)	.33 (.42)
\bar{X}	.33 (.41)	.27 (.38)	.30 (.40)

Analysis of Variance for Alcohol Related Problems

Source	<i>df</i>	<i>F</i>	<i>p</i>	η_p^2
Condition (C)	2	4.52	.011	.007
Time (T)	1	7.03	.008	.005
C x T	2	.469	.626	.001

A parallel analysis 3 X 2 was conducted with mean weekly drinks as (logarithm transformed DDQ Drinks per Week scores) as the dependent variable. Results of this analysis revealed only a significant main effect for Time, as shown in Table 12. This analysis suggested that mean weekly drinks decreased from pre-test to post-test. The lack of a C x T Interaction suggested that the effect was uniform across all three conditions. Again, partial eta squared effect size suggested these changes across Time were small in magnitude.

Table 12: Effects for Intervention Condition and Time on Drinks Per Week

Intervention Condition	Time		\bar{X}
	Pre-Test Mean (SD)	Post-Test Mean (SD)	
Education Control	.74 (.52)	.66 (.51)	.71 (.52)
BASICS	.79 (.48)	.70 (.48)	.75 (.48)
Personalized Normative Feedback	.82 (.52)	.73 (.51)	.78 (.52)
\bar{X}	.78 (.51)	.70 (.50)	.74 (.51)

Analysis of Variance for Drinks Per Week

Source	<i>df</i>	<i>F</i>	<i>p</i>	η_p^2
Condition (C)	2	2.58	.076	.004
Time (T)	1	10.35	.001	.007
C x T	2	.005	.995	.000

A parallel 3 X 2 analysis was conducted with mean weekly drinking hours (logarithm transformed DDQ Drinking Hours per Week scores) as the dependent variable. This analysis showed a significant main effect for Intervention Condition and Time using conventional significance levels (i.e. $p < .05$), but not for the purposes of this study. As shown in Table 13, the main effect for Intervention Condition revealed that those participants receiving PNF had the greatest mean weekly drinking hours whereas those in the Control condition had the lowest mean weekly drinking hours scores with those participants receiving the BASICS intervention falling in between. Post hoc pairwise comparisons revealed that the Control group and the PNF group significantly differed, while those in the BASICS condition were related to both groups. The main effect for Time suggested that overall mean weekly drinking hours scores decreased from Time 1 to Time 2. That the Intervention Condition effect was consistent across time suggests pre-existing differences between the two groups, relative differences that remained at post-test despite overall declines. Again, partial eta squared effect sizes were small for both Intervention Condition and Time main effects.

Table 13: Effects for Intervention Condition and Time on Drinking Hours Per Week

Intervention Condition	Time		\bar{X}
	Pre-Test	Post-Test	
	Mean (SD)	Mean (SD)	Mean (SD)
Education Control	.66 (.47)	.61 (.47)	.64 (.47)
BASICS	.72 (.43)	.66 (.45)	.69 (.44)
Personalized Normative Feedback	.74 (.46)	.70 (.48)	.72 (.47)
\bar{X}	.70 (.45)	.66 (.47)	.68 (.46)

Analysis of Variance for Drinking Hours Per Week

Source	<i>df</i>	<i>F</i>	<i>p</i>	η_p^2
Condition (C)	2	4.22	.015	.006
Time (T)	1	4.03	.045	.003
C x T	2	.028	.972	.000

A parallel 3 X 2 analysis was conducted with mean weekly drinking days as the dependent variable. This analysis showed a main effect for Condition. No effect was found for Time nor the anticipated Condition by Time interaction. As shown in Table 14, the main effect for Condition revealed that those participants receiving PNF had the greatest mean weekly drinking days scores whereas those in the Control condition had the lowest mean weekly drinking days scores with those receiving the BASICS intervention falling in between. Post hoc pairwise comparisons revealed that while the BASICS group and the PNF group did not significantly differ, both groups differed from the Control group. Again, partial eta squared effect sizes suggested that Condition differences were small in magnitude.

Table 14: Effects for Intervention Condition and Time for Drinking Days Per Week

Intervention Condition	Time		\bar{X}
	Pre-Test Mean (SD)	Post-Test Mean (SD)	
Education Control	1.74 (1.49)	1.52 (1.38)	1.64 (1.44)
BASICS	1.95 (1.54)	1.82 (1.63)	1.89 (1.59)
Personalized Normative Feedback	2.15 (1.71)	2.02 (1.80)	2.09 (1.75)
\bar{X}	1.94 (1.59)	1.79 (1.62)	1.87 (1.61)

Analysis of Variance for Drinking Days Per Week

Source	<i>df</i>	<i>F</i>	<i>p</i>	η_p^2
Condition (C)	2	9.33	.000	.013
Time (T)	1	3.50	.062	.003
C x T	2	.098	.907	.000

4.4 SECONDARY ANALYSES

Four secondary analyses were conducted in addition to the primary analyses. The first was a multivariate analysis of variance examining all five dependent variables (alcohol risk level, alcohol-related problems, mean weekly drinks, mean weekly drinking hours, and mean weekly drinking days) coordinately in the same analysis. These dependent variables were measured across two time periods, pre-test (initial assessment) and post-test (four month follow-up), and assessed between-subjects. The second was a series of analysis of covariance conducted to examine if controlling for Age and Marital Status affected the results of the primary analyses. Next, hierarchal multiple regression analyses were performed to explore how drinking motives and alcohol expectancies contribute to alcohol-related outcomes at pretest. Finally, a series of mediational analyses examined the roles of drinking motives and alcohol expectancies on alcohol-related outcomes.

4.4.1 Multivariate Analyses Of Variance

A 3 X 2 between subjects MANOVA was conducted using Intervention Condition and Time as independent variables and five alcohol-related outcomes as dependent variables. The MANOVA was

used in order to decrease potential Type 1 errors and increase power to detect effects in the data that were not revealed in the primary analysis. Tabachnick and Fidel (2007) report that MANOVA is at times used to identify effects that are not able to be detected with simple univariate tests. Results of the MANOVA revealed a significant multivariate main effect for Intervention Condition, Wilks' $\lambda = .979$, $F(10, 2746) = 3.0$, $p < .001$, $\eta_p^2 = .011$, and a significant multivariate effect for Time, Wilks' $\lambda = .984$, $F(5, 1373) = 4.51$, $p < .001$, $\eta_p^2 = .016$, but no Intervention Condition by Time interaction, $F < 1$. As described above, univariate ANOVA's were significant for the Intervention Condition main effect for alcohol-related problems and mean drinking days per week, and for the Time main effect for alcohol risk levels, alcohol-related problems, and mean drinks per week. Overall, the results of the MANOVA confirmed the results of the univariate ANOVAs described in the Primary Analysis.

4.4.2 Analyses Of Covariance

To examine if adjusting for Age and Marital Status affected the results of the primary analysis, a series of one-way between subjects ANCOVAs were conducted using Condition as the independent variable and five alcohol-related outcomes at post-test as dependent variables. These analyses used only the post-test data because of the nature of the between subjects design. Recall that due to the need for anonymity, the data was not linked from pre-test to post-test, and results could only be examined at Time 2. The covariates were chosen for two reasons. First, they were collected at the same time as the dependent variables and, second, they correlated with the majority of the dependent variables making them appropriate candidates for ANCOVA (Tabachnick & Fidell, 2007). Covariate correlations are shown above in Table 9.

The first analysis was a one-way between subjects ANCOVA with alcohol-risk level (logarithm transformed AUDIT scores) as the dependent variable and Age and Marital Status as the covariates. Results of this analysis revealed no effect for Condition. Parallel analyses for alcohol-related problems (logarithm transformed RAPI scores), mean weekly drinks (logarithm transformed DDQ-Drinks per

Week scores), and mean weekly drinking hours (logarithm transformed DDQ- Drinking Hours per Week scores) also revealed no effect for Condition. The lack of condition effects may be due the loss of power since only the post-test data was examined in this analysis. Also, the act of removing the effect of the covariates, Age and Marital Status, may have eliminated the effects seen in the primary analysis. Finally, a parallel analysis was conducted using mean drinking days as the dependent variable, but only Marital Status as a covariate since age did not correlate with mean drinking days. Results of this analysis revealed a significant main effect for Condition, $F(2, 651) = 4.71, p < .01$. Simple contrasts revealed that the Control group (mean = 1.52) and the PNF group (mean = 2.02) significantly differed, while those in the BASICS condition (mean = 1.82) did not differ from controls. However, only 1% ($\omega^2 = .01$) of the total variance in mean drinking days was accounted for by the three levels of Condition controlling for the effect of the firefighter's marital status.

4.4.3 Hierarchal Multiple Regression Analyses

The hierarchal multiple regression analyses were conducted to explore how drinking motives and alcohol expectancies contribute to the alcohol-related outcomes at pre-test. Past research has shown these variables to be potential predictors of alcohol use (Cooper, Frone, Russell, & Mudar, 1995; Read, Wood, Kahler, Maddock, & Palfai, 2003). For these analyses, two specific hypotheses were tested. First, these analyses examined how drinking motives contributed to the prediction of alcohol-related outcomes. Second, these analyses examined how alcohol expectancies contributed to the prediction of alcohol-related outcomes. Both sets of analyses controlled for age and/or marital status. Tables 15 and 16 summarize the results of these analyses.

For these analyses, age and marital status were entered on the first step. As expected for both analyses, age and/or marital status contributed to the prediction of alcohol-related outcomes among firefighters. For the first analysis, drinking motives were entered on the second step and contributed significantly to the prediction of alcohol-related outcomes. The specific drinking motives, Social,

Coping, and Enhancement were significant predictors of all of the five alcohol-related outcomes. Conformity was only a significant predictor for Mean Weekly Drinks, Mean Weekly Drinking Hours, and Mean Weekly Drinking Days. The adjusted R^2 values ranging from .26 to .45 indicate that approximately 26% to 45% of the variability in alcohol-related outcomes is predicted by drinking motives.

For the second analysis, alcohol expectancies were entered on the second step and contributed significantly to the prediction of alcohol-related outcomes. The specific alcohol expectancy domain, Cognitive/Behavioral Impairment, was a significant predictor for all of the five alcohol-related outcomes. Sociability was only a significant predictor for Alcohol Risk Level. The adjusted R^2 values ranging from .06 to .10 indicate that approximately 6% to 10% of the variability in alcohol-related outcomes is predicted by alcohol expectancies.

Table 15: Summary of Hierarchical Multiple Regression Analysis for Demographic and Drinking Motive Variables Predicting Alcohol-Related Outcomes

	Alcohol Risk Level	Alcohol- Related Problems	Mean Weekly Drinks	Mean Weekly Drinking Hours	Mean Weekly Drinking Days
Variable	β	β	β	β	β
Step 1					
Age	-.16***	-.14***	-.11**	-.07	-.02
Marital Status	-.16***	-.19***	-.14***	-.16***	-.13***
R^2	.07	.07	.04	.04	.02
$F(2,728)$	25.35***	27.84***	15.00***	14.13***	7.37***
Step 2					
Age	-.01	-.03	.02	.06	.08
Marital Status	-.08**	-.10***	-.07	-.09**	-.07
Drinking Motives					
Social	.33***	.11**	.28***	.27***	.14**
Coping	.13***	.30***	.13***	.14***	.21***
Enhancement	.37***	.25***	.38***	.34***	.31***
Conformity	-.07	.04	-.12***	-.12***	-.12**
R^2 Change	.45	.32	.40	.35	.26
$F(4, 724)$	168.54***	92.78***	128.06***	101.47***	65.26***

Note: N = 731, ** $p < .01$, *** $p < .001$.

Table 16: Summary of Hierarchical Multiple Regression Analysis for Demographic and Alcohol Expectancy Variables Predicting Alcohol-Related Outcomes

	Alcohol Risk Level	Alcohol- Related Problems	Mean Weekly Drinks	Mean Weekly Drinking Hours	Mean Weekly Drinking Days
Variable	β	β	β	β	B
Step 1					
Age	-.16***	-.14***	-.11**	-.07	-.02
Marital Status	-.16***	-.19***	-.14***	-.16***	-.13***
R^2	.07	.07	.04	.04	.02
$F(2,728)$	25.35***	27.84***	15.00***	14.13***	7.37***
Step 2					
Age	-.09	-.08	-.05	-.02	.04
Marital Status	-.16***	-.18***	-.13***	-.16***	-.13***
Alcohol Expectancy					
Sociability	.18***	.10	.12	.11	.08
Tension	.05	-.00	.08	.09	.10
Reduction					
Liquid Courage	.01	.06	.04	.05	-.01
Sexuality	.08	.07	.08	.05	.06
Cog./Beh. Impair	-.27***	-.14**	-.29***	-.26***	-.23***
Risks/Aggression	.04	.07	.00	-.03	.08
Neg. Self-Eval	.01	.07	-.01	-.01	-.05
R^2 Change	.09	.06	.10	.08	.06
$F(7, 721)$	10.80***	6.64***	11.25***	9.41***	7.22***

Note: N = 731, ** $p < .01$, *** $p < .001$

4.4.4 Mediation Analyses

In alcohol research, alcohol expectancies and drinking motives are often analyzed and treated as determinants of alcohol-related outcomes (Kuntsche, Knibbe, Engels, & Gmel, 2007). However, several researchers have examined the relationships between both of these individual concepts and their independent contribution to alcohol-related outcomes (Cooper et al., 1995; Kuntsche et al., 2007; Hasking, Lyvers, & Carpio, 2011; Read et al., 2003). Alcohol expectancies are described as people's beliefs about the effects of alcohol, while drinking motives are considered to be the value one holds for the effects they desire from consumption, thus their motivation to drink. Based on the motivational model of alcohol use (Cox & Klinger, 1988, 1990), drinking motives are thought to be the final step in choosing to consume alcohol (proximal influences) while alcohol expectancies are described as distal influences (Kuntsche et al., 2007).

Thus, the final set of analyses examined whether drinking motives mediate the effects of alcohol expectancies on alcohol-related outcomes. The theoretical model being tested is that alcohol expectancies lead to drinking outcomes via their effects on the more proximal variable, drinking motives. This model has been tested in several studies (Hasking et al., 2011; Kuntsche et al., 2007). Kuntsche and colleagues (2007) examined the relationship between domain specific alcohol expectancies and alcohol use using domain specific drinking motives as mediators. Findings suggested that alcohol expectancies associated with tension reduction and alcohol use were partially mediated by coping motives, alcohol expectancies associated with sociability and alcohol use were mediated by social motives, and that enhancement motives mediated the relationship between "positive change" and "improved ability" expectancies and alcohol use. Overall, Kuntsche and colleagues (2007) concluded that drinking motives are the most proximate influence to alcohol consumption and can mediate the relationship between alcohol expectancies and alcohol use. While this study employed another measure of alcohol expectancies than the present study, the study investigator determined that the model itself

was appropriate to be tested and linked expectancies with appropriate corresponding motives. For example, expectancies for tension reduction were hypothesized to be more closely related to drinking to cope whereas expectancies for sociability were hypothesized to be more closely linked to social motives. SPSS AMOS was used to test a series of specific models linking expectancies with corresponding motives. These models are displayed in Figures 1 - 4.

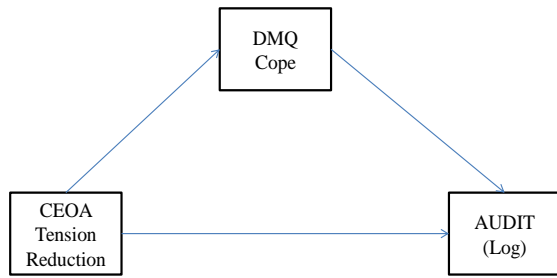


Figure 1a. Model of direct and indirect effects of Tension Reduction Alcohol Expectancies and Drinking to Cope on AUDIT Risk Level

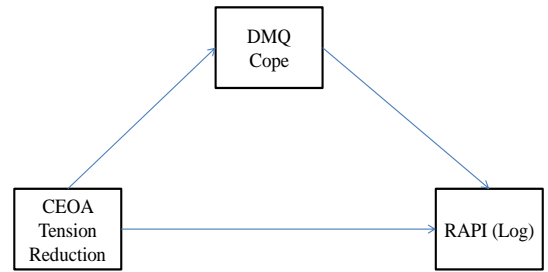


Figure 1b. Model of direct and indirect effects of Tension Reduction Alcohol Expectancies and Drinking to Cope on RAPI Alcohol-Related Problems

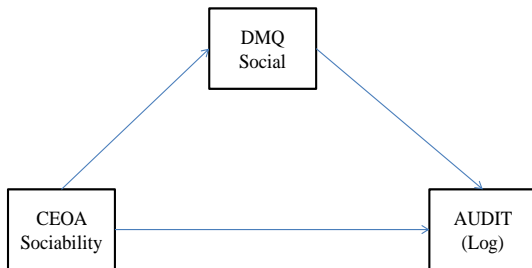


Figure 2a. Model of direct and indirect effects of Sociability Alcohol Expectancies and Drinking to be Social on AUDIT Risk Level

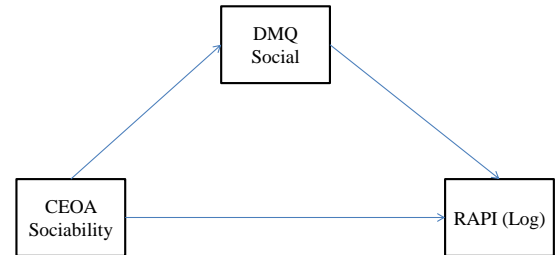


Figure 2b. Model of direct and indirect effects of Sociability Alcohol Expectancies and Drinking to be Social on RAPI Alcohol-Related Problems

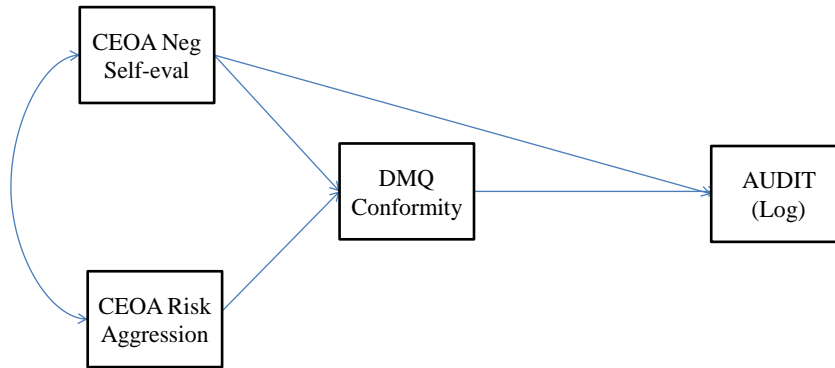


Figure 3a. Model of direct and indirect effects of Negative Self-Evaluation and Risk/Aggression Alcohol Expectancies and Drinking to Conform on AUDIT Risk Level

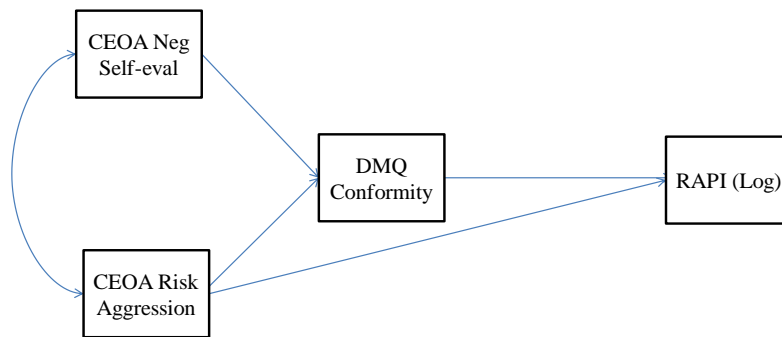


Figure 3b. Model of direct and indirect effects of Negative Self-Evaluation and Risk/Aggression Alcohol Expectancies and Drinking to Conform on RAPI Alcohol-Related Problems

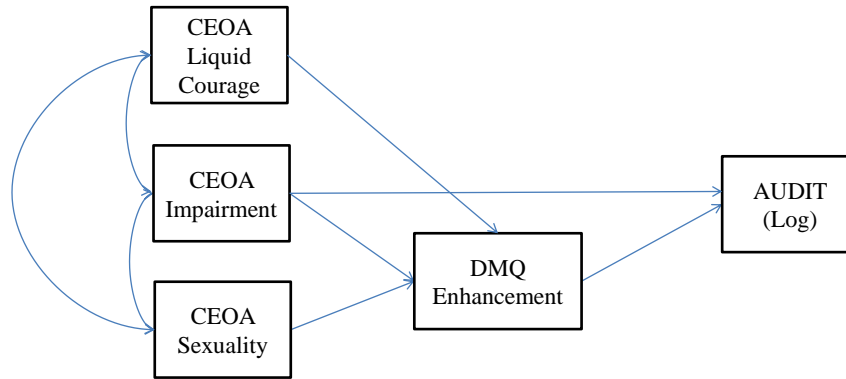


Figure 4a. Model of direct and indirect effects of Liquid Courage, Cognitive/Behavioral Impairment, and Sexuality Alcohol Expectancies and Drinking for Enhancement on AUDIT Risk Level

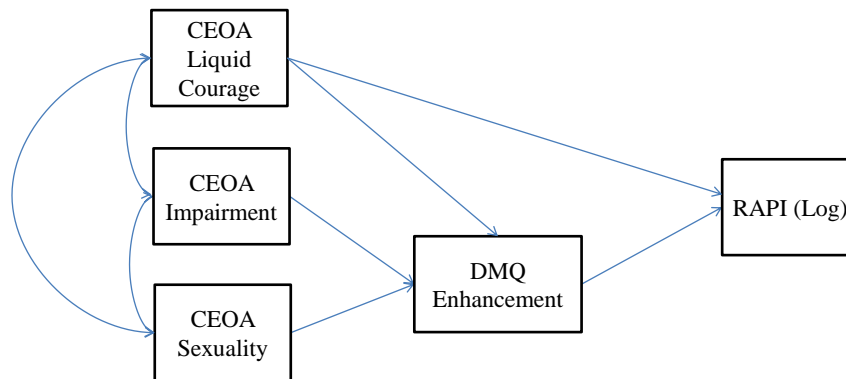


Figure 4b. Model of direct and indirect effects of Liquid Courage, Cognitive/Behavioral Impairment, and Sexuality Alcohol Expectancies and Drinking for Enhancement on RAPI Alcohol-Related Problems

Results of these analyses are found in Figures 5 – 8. Chi square values, as estimates of goodness of fit, were calculated omitting the direct paths for the simple three variable models. All but one model showed a good fit to the data and produced non-significant chi-square values. Only the model for sociability showed poor fit at $\chi^2 = 4.1, p > .04$. As shown in Figure 5, drinking to cope mediated the relationship between tension reduction and alcohol risk levels and alcohol-related problems. This mediational model accounted for 25% and 30% of the variance in alcohol risk levels and alcohol-related problems, respectively. Figure 6 displays the mediational model for sociability expectancies and alcohol-related outcomes with drinking to be social as the mediator. Again, this mediational model predicted 41% and 23% of the variance in alcohol risk levels and alcohol-related problems, respectively. As shown in Figure 7, drinking to conform mediated the relationship between negative self-evaluation and risk and aggression expectancies and alcohol-related outcomes. This mediational model accounted for 8% and 11% of the variance in alcohol risk levels and alcohol-related problems, respectively. Although the mediational path was significant, the fit of this model was improved by including a direct effect of negative self-evaluation on alcohol risk levels and a direct effect of risk and aggression on alcohol-related problems. Figure 8 presents the mediational model for liquid courage, cognitive and behavioral impairment, and sexuality expectancies and alcohol-related outcomes with drinking for enhancement as the mediator. This mediational model predicted 46% and 28% of the variance in alcohol risk levels and alcohol-related problems, respectively. Like the prior model, although the mediational path was significant, the fit of this model was improved by including a direct effect of cognitive and behavioral impairment on alcohol risk levels and a direct effect of liquid courage on alcohol-related problems.

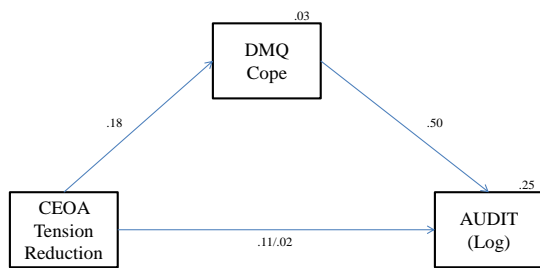


Figure 5a. Direct and indirect effects of Tension Reduction Alcohol Expectancies and Drinking to Cope on AUDIT Risk Level
 $\chi^2 = .265$, $df = 1$, ns

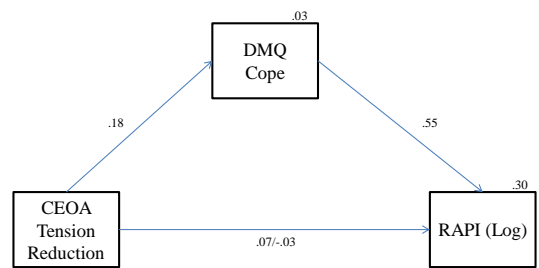


Figure 5b. Direct and indirect effects of Tension Reduction Alcohol Expectancies and Drinking to Cope on RAPI Alcohol-Related Problems
 $\chi^2 = .765$, $df = 1$, ns

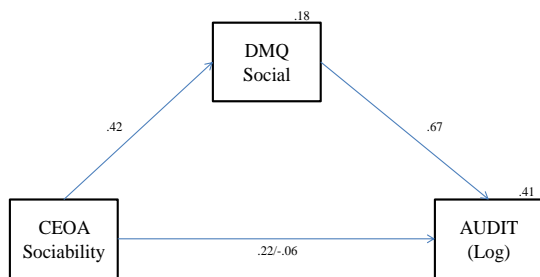


Figure 6a. Direct and indirect effects of Sociability Alcohol Expectancies and Drinking to be Social on AUDIT Risk Level
 $\chi^2 = 4.1$, $df = 1$, ns

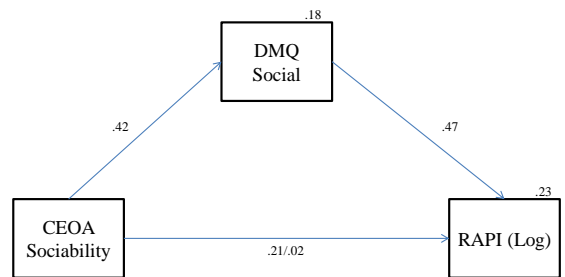


Figure 6b. Direct and indirect effects of Sociability Alcohol Expectancies and Drinking to be Social on RAPI Alcohol-Related Problems
 $\chi^2 = .2$, $df = 1$, ns

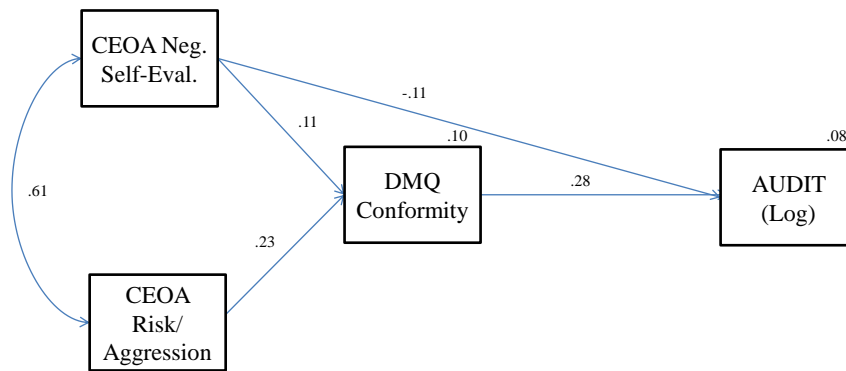


Figure 7a. Direct and indirect effects of Negative Self-Evaluation and Risk/Aggression Alcohol Expectancies and Drinking to Conform on AUDIT Risk Level
 $\chi^2 = 2.6$, $df = 1$, ns

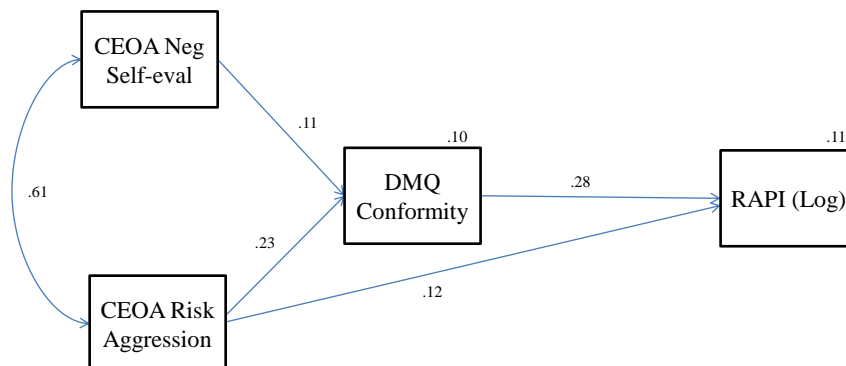


Figure 7b. Direct and indirect effects of Negative Self-Evaluation and Risk/Aggression Alcohol Expectancies and Drinking to Conform on RAPI Alcohol-Related Problems
 $\chi^2 = .309$, $df = 1$, ns

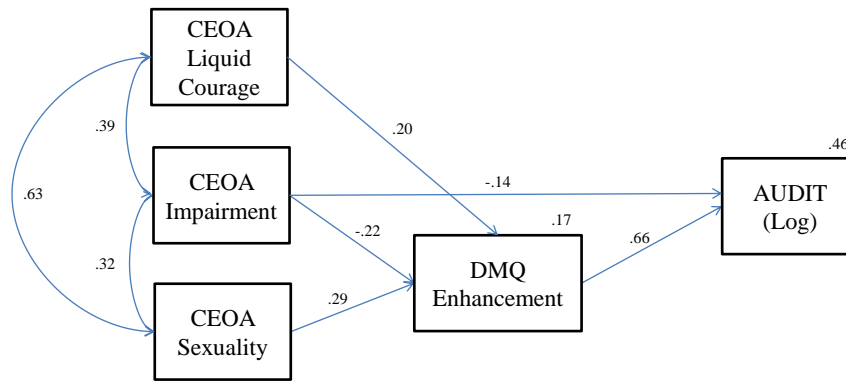


Figure 8a. Direct and indirect effects of Liquid Courage, Cognitive/Behavioral Impairment, and Sexuality Alcohol Expectancies and Drinking for Enhancement on AUDIT Risk Level
 $\chi^2 = 1.6$, $df = 2$, ns

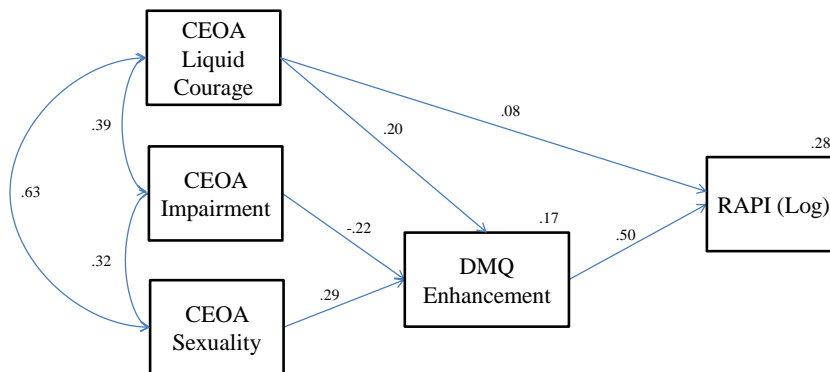


Figure 8b. Direct and indirect effects of Liquid Courage, Cognitive/Behavioral Impairment, and Sexuality Alcohol Expectancies and Drinking for Enhancement on RAPI Alcohol-Related Problems
 $\chi^2 = 1.1$, $df = 2$, ns

Chapter 5: Discussion

5.1 OVERVIEW

This study examined the effectiveness of two brief, theory-based, motivational interventions on alcohol risk levels, alcohol-related problems, and alcohol consumption in a population of firefighters in comparison to a standard educational control. To do so, this study employed a 3 X 2 fully between-subjects quasi-experimental post-test only design using an independent post-test sample (Shadish et al., 2002) that crossed three levels of alcohol intervention with two time points. Outcome measures were collected at assessment (pre-test) and four months following the intervention (post-test).

Seven hundred and forty firefighters received one of three alcohol-risk reduction interventions that was delivered as part of their regular training schedule: BASICS Psychoeducation + PNF, PNF alone, and a Standard Alcohol and DWI Education presentation (control). In all three conditions, firefighters completed assessment measures, received one of three interventions (in groups of 20-30), and completed a follow-up questionnaire approximately four months later. The study investigator conducted the two experimental conditions (i.e., BASICS Psychoeducation + PNF and PNF alone), whereas a police officer/trainer conducted a standard alcohol and DWI education presentation developed by the El Paso Police Department.

A series of two-way ANOVAs and ANCOVAs, as well as a MANOVA, assessed differences in alcohol-risk level, alcohol-related problems, and alcohol consumption from assessment to follow-up. None of these approaches provided support for the main study hypothesis that firefighters in the two experimental conditions (i.e., BASICS Psychoeducation + PNF and PNF alone) would show greater decreases in alcohol-related outcomes than the Control condition. Instead, the results suggested modest decreases in alcohol-related outcomes that were relatively equal across all three conditions. Specifically, results suggested consistent reductions for three of five measures including alcohol risk

levels, alcohol-related problems, and mean drinks per week, and less consistent changes in mean drinking days and drinking hours per day. Effect sizes for these changes were generally small in magnitude.

The results also suggested overall differences between conditions, regardless of time, for two measures. Specifically, those participants receiving PNF only had the greatest alcohol-related problems, and greatest mean drinking days per week, compared with those in the Control condition who had the lowest alcohol-related problems, with those receiving the BASICS Psychoeducation + PNF intervention falling in between. That these condition effects were consistent across time suggests pre-existing differences between the two groups, relative differences that remained at post-test despite overall declines.

Although the results failed to support the hypothesis that the brief theory-based interventions would be more effective than an educational control condition, the results of this study are positive from a public health perspective. Specifically, the results suggest that a variety of brief interventions (approximately 2 hours) can significantly reduce alcohol consumption and related negative outcome four months following that single experience among firefighters. To put that in perspective, assuming immediate intervention effects, the combined interventions resulted in an average decline of two drinks per week. Multiplying that difference by the 740 firefighters across 16 weeks, suggests that the interventions resulted in the consumption of 23,680 fewer drinks by firefighters over that period. Similar estimates suggest 7,814 fewer hours, or 326 fewer days, spent drinking, and the prevention of an estimated 444 alcohol-related problems. The lack of between-group differences, however, means that alternative explanations, such as historical trends or maturational processes are equally plausible.

5.2 LACK OF DIFFERENTIAL EFFECTIVENESS OF THE BRIEF THEORY-BASED INTERVENTIONS

As described above, although study results revealed an overall decrease in alcohol-related outcomes among firefighters, the two experimental conditions were no more effective than the

educational control condition. The following sections discuss some of the reasons why the theory-based interventions were not differentially effective than the educational control. Included are reasons why the theory-based interventions were less than effective and reasons why the educational control condition may have been unexpectedly effective.

5.2.1 Aspects Of The Participants

One reason why the theory-based interventions may have not been differentially effective is the nature of the participants in this study compared to the majority of BASICS/PNF studies. As described above, the BASICS curriculum, including use of PNF, was developed for a very specific audience: heavy drinking college students (Dimeff et al., 1999). Indeed, multiple studies in this group have demonstrated its superiority in reducing alcohol-related outcomes over a variety of control conditions including assessment only controls (Baer et al., 2001; Bosari & Carey, 2000; Marlatt et al., 1998; Roberts, Neal, Kivlahan, Baer, & Marlatt, 2000), and standard educational interventions such as the one used in this study (Murphy et al., 2001). Moreover, although brief interventions, have reduced alcohol risk behaviors in some community-based populations (Longabaugh et al., 2001; Monti et al., 2007), the BASICS curriculum per se, has never been provided to firefighters, who may differ from college students in many important respects. These differences include some obvious demographic differences, such as age and marital status; however, they may also include less obvious differences, such as the nature of the person who chooses the firefighting occupation.

Regarding demographics, the mean age of firefighters in this study was 38, and 67% were married; the majority of entering college students are 15-23 and approximately 6% are married (U.S. Census Bureau, 2012). One of the reasons cited for the effectiveness of the BASICS approach is that it helps promote safety and encourages maturing-out of a heavy drinking lifestyle (Dimeff et al., 1999). Indeed, such maturation is thought to occur naturally as students graduate and assume new roles and responsibilities such as careers and families. Based on the age, marital status, and drinking patterns of

the firefighters in this study, it is possible that they may have passed the natural maturation phase, and as a consequence, have considerably longer histories and more habitual patterns of alcohol-related behavior—patterns that were particularly resistant to the BASICS/PNF approach. As such, an approach that focuses on harm reduction through a maturation phase of life may not be the best for this population. For the vast majority of these firefighters, drinking has become a way of life and, as discussed below, the profession itself appears to promote a social culture of drinking. Indeed, whereas college students anticipate and eventually leave this type of culture, firefighters remain enmeshed in it.

Regarding personality, differences in the nature of firefighters versus college students also cannot be ruled out. Firefighting, and rescue work in general, attracts specific types of individuals such as sensation seekers (Jensen, 2005) as well as those that are fearless, low in communion, openness, and agreeableness (Fannin & Dabbs, 2003), and with higher levels of extraversion (Wagner, 2005). These personality traits, specifically sensation seeking, have been related to alcohol use (Donohew et al., 1999; Monks et al., 2010; Newcomb & Earleywine, 1996; Zuckerman, 1994). In addition to predisposing one to greater alcohol consumption, such traits may also make one less likely to respond to interventions that call on endorsement of alcohol moderation and safety. While these dispositions were not examined in the current study, anecdotal evidence suggests that many of the firefighters fit the extraverted, sensation-seeking profile. For example, during the control condition presentation, several firefighters would get a “thrill” from viewing photographs of alcohol-induced vehicle accidents and fatalities. During the majority of the sessions, firefighters would discuss the adrenaline rush they experience from their professional duties and how they understand why people, including family and friends, perceive their need to put themselves in danger as abnormal. This possibility suggests the need for further research examining the role of personality on alcohol use and related behaviors among firefighters.

It is also possible, but less plausible, that the theory-based interventions failed to produce enhanced effects because these approaches may not be as effective among Hispanic populations. As

noted, 76% of this sample was Hispanic and this explanation would suggest that ethnicity moderates the effect of these interventions, such that the approach is less effective in Hispanic populations. Although ethnicity moderation is possible, recent research suggests that it is less plausible than other explanations. Specifically, new research suggests that BASICS and its components are effective interventions among predominantly Hispanic college students (Tomaka, Palacios, & Morales-Monks, 2011; Tomaka et al., 2012).

All the arguments presented so far are based on the premise that, for various reasons, the theory-based interventions were not as effective as they have been in past studies among college students. However, one could argue that the critical question is not so much why were theory-based interventions less effective than expected, but why was the educational intervention equally successful, when such approaches have not been in past studies and samples. Asked this way, the question becomes why did firefighters respond positively to an educational approach when college students typically have not.

One potential difference between firefighters and college students is overall respect for and responsiveness to authority. Specifically, although firefighters may be extraverted and sensation seeking, they also work in a hierarchical, para-military environment that demands respect for authority. Meanwhile, college students live in an environment that is more egalitarian and which openly questions authority. Indeed, manuals on BASICS explicitly say that college students do not respond well to an authoritarian approach and that facilitators should conduct such interventions in a non-authoritarian manner (Dimeff et al., 1999). Thus, having an authority figure provide a fact-based educational session, normally a negative experience for college students, may have been a positive, or at least expected, experience for firefighters, who then heeded its advice.

This explanation, specifically, that the theory-based interventions were no more effective than the educational condition, because firefighters responded surprisingly well to the control condition, fits the results well. Recall that all three conditions resulted in reductions in alcohol-related outcomes and

that these effects were small relative to effect size conventions. Indeed, small effect sizes have been the norm in alcohol intervention research, as evidenced by a meta-analysis of these specific types of theory-based interventions (Carey, Scott-Sheldon, Carey, & DeMartini, 2007).

In summary, a variety of participant aspects, specifically how they differ from more typical college student samples, may have contributed to the observed pattern of effects. These differences include demographics such as age, marital status, and ethnicity as well as differences in personality such as extraversion and sensation seeking. These participant differences may have resulted in decreased effectiveness of the theory-based interventions. Conversely, taking a more traditional training approach for firefighters (i.e. authoritarian) may have resulted in the surprising effectiveness of educational intervention in this population. These effects combined to render all effects modestly, yet equally, effective.

5.2.2 Aspects Of The Intervention Approach

A second set of potential reasons why the interventions did not differ in their overall effectiveness, with all three showing small effects, may relate to the way the theory-based interventions were implemented to fit the needs and requirements of the EPFD Training Academy. Specifically, BASICS and PNF sessions are traditionally provided individually (Dimeff et al., 1999; Murphy et al., 2001) and occasionally in a small group setting (Baer, Kivlahan, Fromme, & Marlatt, 1989, Kivlahan et al., 1990; Tomaka et al., 2012). This format allows sufficient opportunities for participants to share, engage, and discuss the presented information. The more intimate setting also allows for the maintenance of a non-judgmental and non-authoritarian approach—important considerations when working with college students.

As described above, the present study made several modifications to this procedure, changes that were necessitated by the need to conform to the Fire Department Training Cycle, which sent groups of twenty to thirty firefighters to each intervention session. As such, the facilitator conducted the

intervention with a much larger group than those in past research, potentially affecting the quality and impact of the intervention in several important ways.

First, the format limited the interaction between the participant and the facilitator. Such interaction is important, particularly during the PNF portion of the intervention, for several reasons. At the most basic level, it allows the facilitator to know whether the targets understand the information and feedback she presented and it allows her to respond to individual questions. Individual or small group interaction also allows the facilitator to make a more personal connection with individuals. Establishing rapport is essential in brief motivational interventions because it makes participants more receptive to the information presented and to the facilitator's suggestions for change.

Conversely, a large group setting creates opportunities for unguided discussion and unanticipated disruptions. For example, several firefighters, known as "bravado drinkers" in alcohol research, would disrupt conversations and manipulate discussion time by making jokes about drinking and/or jovially dismissing the negative normative comparisons made in their personal feedback (Dimeff et al., 1999). These bravado disruptions may have lessened the impact of the intervention by reducing perceptions, among everyone in the session, that their behavior is outside the norm, critical for PNF interventions to work. More generally, they may have prompted participants to dismiss the seriousness of the issue and importance of reducing alcohol-related risk behaviors. Although, the facilitator would redirect such conversations, these disruptions still altered the group dynamic in potentially significant and unfavorable ways.

The large group format also limited the ability of the facilitator to employ several MI techniques and strategies, aspects that may be essential to the intervention's effectiveness. For example, the large group format may have prevented the development of discrepancies between desired and current drinking behavior. Developing discrepancy is particularly important during the presentation of PNF, when facilitators employ this technique to create motivation for change and use this motivation to set

personal goals aimed at moderating their drinking. Larger groups, such as those in the present study, limited individual discussion of personalized normative feedback and prevented the facilitator from reviewing the PNF information with each participant. Even though, the facilitator encouraged discussion by reiterating confidentiality throughout the intervention process, firefighters were still hesitant to discuss their PNF results and reluctant to develop and express personal goals in the group.

A third modification was to the typical recruitment process. As mentioned earlier, most screening and brief intervention programs are designed as targeted interventions. This means that there is a qualification process in which “at-risk” drinkers are detected and then approached to participate in an intervention at some later time and those who are abstainers, light/moderate drinkers as well as more problematic drinkers (i.e., those with possible alcohol dependence) are excluded. Since, the EPFD wanted all uniformed firefighters to complete some form of training (i.e., intervention), this meant that the groups of participants had mixed drinking levels including those that did not consume at a risky levels or did not consume at all. Thus, roughly 67% of the sample was not in need of the targeted intervention. Such inclusion of low-risk and non-drinkers may have made it difficult to detect large intervention effects, since many would have very low or no risk at baseline. Unfortunately, the study design provided no means of excluding such individuals from the analyses and limiting such analyses of pre- to post-intervention differences in the alcohol-related outcomes for the remaining 34% of “at-risk” drinkers—the group for whom the theory-based interventions were developed.

Fourth, the large group setting and the combining of multiple types of drinkers in each session may have prevented the creation of a teachable moment among participants. A teachable moment refers to a specific time when an individual may be more receptive to suggestions to modify his or her behavior (Miller & Rollnick, 2002). For example, a person recently hospitalized for alcohol poisoning may be more receptive to suggestions to cut down. Similarly, a phone call informing a student that she screens positive for inclusion in an alcohol risk-reduction program, may also be more open to calls for

moderation. Teachable moments help an individual move quickly from a state of precontemplation to contemplation or action. In the BASICS/PNF intervention, several aspects of PNF, particularly unflattering comparisons, in many ways helps create a teachable moment by making the individual feel outside the norm (Dimeff et al., 1999).

Both the large group setting and mixed drinking levels may have contributed to the loss of teachable moments in the present study. Specifically, because of the presence of inappropriate jokes and class disruptions, the group setting may have destroyed any opportunity the facilitator had to create teachable moments among those needing them. Similarly, the inclusion of non- or light/moderate drinkers, in an intervention designed for those with significant alcohol misuse, may have had the same detrimental effect. As described, all uniformed firefighters were required to attend their normally scheduled training session regardless of whether they might benefit from alcohol intervention, or had any stake in the topic. As such, the lack of a qualification process might have disrupted a natural tendency to question one's alcohol use in response to screening positive for an alcohol risk-reduction program. Again, lacking the teachable moment, or "tap on the shoulder," may have restricted many firefighters from advancing beyond precontemplation (Dimeff et al., 1999; Miller & Rollnick, 2002).

Finally, there are several other less plausible reasons why the intervention approach used in the present study may have resulted in decreased effectiveness. Each is less plausible than those discussed above based on theoretical and/or empirical grounds. One example is the single session format. As described above, the study investigator modified the prescribed two-session BASICS curriculum into a single session format. Traditionally, the first portion of the intervention, BASICS Psychoeducation, is provided only for participants to return in two weeks and receive the second portion, PNF (Dimeff et al., 1999). Due to time constraints, both portions were administered during the scheduled training session for the BASICS Psychoeducation + PNF condition. It is possible that this modification affected the study outcomes in this setting by not allowing the firefighters to process the information received prior

to being provided with personalized feedback. Arguing against this interpretation, however, are studies demonstrating the effectiveness of a single-session approach (Murphy et al., 2001; Tomaka et al., 2012).

Another unlikely, but possible explanation was the mandated nature of the intervention. Recall that although participants were not required to participate in the research aspects of the intervention, *per se*, they were required to attend the training aspect of the intervention in order to satisfy departmental requirements. Thus, firefighters voluntarily completed assessment questionnaires, yet were required to stay for the alcohol risk-reduction training portion of the interventions. Mandating this intervention, particularly for those likely to be precontemplative regarding alcohol-behavior change, may have created a defensive, antagonistic, or dismissive attitude in firefighters. Thus, making them less likely to engage in the intervention activities and reducing their potential impact. However, there are theoretical and empirical reasons why this explanation is unlikely, the former reflecting the fact that the BASICS/PNF approach has been designed with this concern in mind. On the theoretical side, recognizing that participants may have been “required” to participate, the approach emphasizes the need to maintain the non-judgmental, non-authoritarian, non-evaluative, and non-confrontational approach (Dimeff et al., 1999). On the empirical side, research has shown that brief motivational interventions can be effective even among individuals mandated to participate (Bosari & Carey, 2005; White et al., 2006; White et al., 2007).

5.2.3 Aspects Of The Experimental Design

Aspects of the experimental design may have also contributed to the observed pattern of results. Recall that the EPFD required maximal confidentiality and anonymity in order to approve the present study and failure to abide by this request would have prevented the research component of the project. Confidentiality and anonymity were also desired by the investigator in order to obtain the most accurate and honest responses regarding alcohol-related behaviors from a population that was potentially sensitive about revealing personal information. These concerns complicated the study in many ways,

most notably in the dissociation of pre- and post-test responses, the main strength of within-subjects designs. Instead, the present study employed a between-subjects panel design for examining anticipated behavior change over time. Even though the two panels/groups of firefighters were significantly overlapping, statistically, they were analyzed as separate groups. This had several consequences including the inability to reduce measurement error (due to subjects), to apply pretest covariates in the analyses, and to identify, and potentially eliminate subgroups of participants. This latter aspect is particularly important because it meant that all firefighters, including abstainers, were necessarily included in all analyses of change over time, even though most had little or no room for improvement (i.e., a potential floor effect).

Interestingly, despite these design limitations, the results still showed significant changes in alcohol-related outcomes with effect sizes mirroring past studies in this area. These patterns suggest the possibility that intervention effects were stronger among heavier drinkers, that is, the people for whom these interventions are appropriate. However, because their changes are averaged alongside those showing little to no change, the overall effects are smaller in magnitude.

5.3 THE FIREFIGHTER CULTURE

One final population-related issue that potentially affected the overall success of the interventions and the sizes of the observed effects is the social environment, or culture, of the firefighting profession. Consistent with film and television accounts of the profession (e.g., “Backdraft” and “Rescue Me”), El Paso firefighters appear to inhabit a social milieu of alcohol use and misuse. During sessions, firefighters spoke freely of their after-shift gatherings at bars, clubs, and house parties, even to the extent of inviting the study investigator and research assistants to participate in them. Moreover, the theory-based interventions asked firefighters to share information regarding their alcohol use and related behavior often leading to discussions that linked alcohol use to the profession itself, with certain shifts, stations, and officers being described as more permissive than others. Although many

parroted the idea that alcohol consumption was a freely made personal choice, they also described pervasive pressure to consume in order to gain approval and acceptance in their interpersonal work relationships. For example, several individuals recounted that, after fighting a fire, the group will drink together to celebrate victory over the fire and the saving of lives, or to console themselves after a loss. They also reported that the amount of alcohol consumed after a shift was proportional to the stress and trauma experienced on the shift. Indeed, not only was there was a deep sense of camaraderie in these groups, but alcohol appeared to be the social glue of these relationships.

The nature of firefighting, the social and cultural functions that alcohol consumption serves in it, and firefighters' acceptance of this lifestyle as normal, all suggest that this population may be particularly resistant to all forms of change efforts. This may be particularly true for change efforts, like those used in the present study, that are directed more at individual motivation for change. By not acknowledging broader social and cultural influences, the brief motivational interventions may not have been as effective as initially anticipated. As such, approaches aimed at the broader social environment and firefighting culture, or even the policy environment, may be necessary for reducing alcohol misuse in this this population.

5.4 SECONDARY ANALYSES: DRINKING MOTIVES AND ALCOHOL EXPECTANCIES

Secondary analyses examined the role of drinking motives and alcohol expectancies on alcohol-related outcomes. Recall that all four drinking motives, Social, Enhancement, Coping, and Conformity were significantly correlated with the alcohol-related outcomes in this study. Examination of mean levels of motivation showed that firefighters were mainly motivated to drink for social and enhancement reasons. Specifically, they reported that alcohol use was central to their social lives including gatherings and celebrations and that alcohol use enhanced their experiences, adding a sense of excitement and a “buzz” or “high” sensation. A similar examination of alcohol expectancies showed that Sociability, Tension Reduction, Liquid Courage, Sexuality, Cognitive and Behavioral Impairment, and Negative

Self Evaluation were significantly correlated with the alcohol-related outcomes. The exception, Risk & Aggression only correlated with Alcohol-Related Problems. Analysis of mean expectancy levels suggested that firefighters predominantly expected alcohol consumption to produce a reduction in tension and an increased sense of sociability (i.e. being more talkative, outgoing, and increased ability to express one's feelings).

The hierarchal multiple regression analyses found that while controlling for age and marital status, Social, Coping, and Enhancement drinking motives independently predicted all five of the examined alcohol-related outcomes. A parallel analysis suggested that only one negative alcohol expectancy, Cognitive/Behavioral Impairment, independently and negatively predicted the five alcohol-related outcomes. This lack of results for expectancies is consistent with research indicating that expectancies frequently do not contribute strongly to the prediction of consumption levels (Borsari & Carey, 2000). However, the present results are consistent with research on drinking motives, showing that these variables tend to more strongly predict drinking levels (Cooper, 1994).

Mediational analyses further explored the role of drinking motives and alcohol expectancies on alcohol-related outcomes. Alcohol expectancies are described as people's beliefs about the effects of alcohol, whereas drinking motives are considered to be the value one holds for the effects one desires from consumption, thus their motivation to drink. Based on the motivational model of alcohol use (Cox & Klinger, 1988, 1990), drinking motives are thought to be the final step in choosing to consume alcohol (i.e., a more proximal influences) whereas alcohol expectancies are described as distal influences (Kuntsche et al., 2007). The mediational models for this study were based on the premise that alcohol expectancies are more distal to and drinking motives are more proximal to alcohol-related outcomes with drinking motives functioning as mediators to the alcohol expectancy/alcohol-related outcome relationship.

Results suggested that drinking to cope mediated the relationship between tension reduction and alcohol risk levels and alcohol-related problems. More simply, firefighters who drank with the expectancy that alcohol would reduce their tension were motivated to drink for coping purposes, providing support for the motivational model of alcohol use. The motivational model of alcohol use was also supported by results showing that drinking to be social (motive) mediated the effect of sociability expectancies on alcohol-related outcomes. Similarly, drinking to conform (motive) mediated the relationship between both negative self-evaluation and risk and aggression expectancies and alcohol-related outcomes. Finally, the relationship between liquid courage, cognitive and behavioral impairment, and sexuality expectancies and alcohol-related outcomes was mediated by drinking for enhancement (motive). As described, these mediational analyses tested the theoretical model that alcohol expectancies lead to drinking outcomes via their effects on the more proximal variable, drinking motives. Although this model that has mainly been used to explain drinking by adolescents and college students (Hasking et al., 2011; Kuntsche et al., 2007), the present results suggest that these hypotheses also describe the drinking behavior of firefighters.

5.5 CONSISTENCY WITH PAST LITERATURE

Overall, past literature has confirmed the effectiveness of the intervention approaches used in this study in the college student population. Specifically, BASICS Psycho-education + PNF is classified as a NIAAA Tier 1 alcohol intervention for this population in part because several randomized controlled experiments have shown brief interventions using this approach to reduce alcohol consumption and related problems, and to do so for periods ranging from 6 weeks (Murphy et al., 2001) to four years (Baer et al., 2001). These findings have been tested against no-intervention controls (Borsari & Carey, 2000; Marlatt et al., 1998) and educational controls (Murphy et al., 2001). This approach has also been tested in various groups of college students including fraternity members (Larimer et al., 2001) and mandated students (Borsari & Carey, 2005). Overall, these studies confirm

the effectiveness of the BASICS approach to brief intervention.

Past literature has also confirmed the effectiveness of the PNF intervention approach in the college student population. PNF as a stand-alone intervention has also shown effective in reducing alcohol consumption and related risks among college students and has done so using a variety of formats including standard mail delivery (Collins et al., 2002), the internet (Neighbors et al., 2004), and face-to-face as part of a brief intervention (Dimeff & McNeely, 2000; Riper et al., 2009; Walters & Neighbors, 2005). PNF has been shown to be an effective intervention for reducing consumption for periods ranging from one to six months (Dimeff & McNeely, 2000; Neighbors et al., 2004) and more effective than no-intervention controls (Agostinelli et al., 1995; Collins et al., 2002; Lewis et al., 2007; Neighbors et al., 2004).

Past literature has also suggested that the effectiveness of these interventions, measured in alcohol-related outcome changes over time, provide small to moderate effect sizes. As discussed above, the results of the present study suggested modest decreases in alcohol-related outcomes that were relatively equal across all three conditions, including the control condition, for three of five measures including alcohol risk levels, alcohol-related problems, and mean drinks per week and less consistent changes in mean drinking days and drinking hours per day. Effect sizes for these changes were generally small in magnitude, yet in this type of research, small to moderate effects sizes are the norm at six weeks (Borsari & Carey, 2000; Collins et al., 2002) to six months post intervention (Murphy et al., 2001). Specifically, a recent meta-analysis of various alcohol intervention outcomes showed an average effect size of .20 (Cohen's *d*; Riper et al., 2008). Based on conventions, this effect is in the small range (Tabachnick & Fidell, 2007), similar to the effect sizes for the present study.

Overall, the present study was consistent with past research, in some respects but not others. It was consistent in that both theory based interventions, BASICS Psychoeducation + PNF and PNF alone, were successful in reducing alcohol-related outcomes. Additionally, changes in alcohol-related

outcomes consistently fall in the small to medium effect size. Thus, in some respects, this study was consistent with past research on BASICS and PNF. However, it was inconsistent with past research in that BASICS Psychoeducation + PNF and PNF alone were not more effective at reducing alcohol-related outcomes than an educational control. The failure to document greater effectiveness of these approaches relative to controls, indicates considerable inconsistency with past results.

5.6 LIMITATIONS OF THE STUDY

There were also several limitations to consider in this study, many of which have been discussed above in relation to the observed pattern of results. Intervention fidelity was a strength of the study in terms of the investigator's training and ability to maintain consistency across intervention sessions (see below). However, intervention fidelity may also be seen as a limitation due to the modifications that we made to the intervention approach. Specifically, the use of large groups of firefighters and the inclusion of abstainer and light/moderate drinkers may have negatively affected the fidelity of the interventions. Thus, the first limitation of the present study was the use of large groups. While brief interventions have been conducted in small group settings (mean participants = 10; Carey et al., 2007), they are traditionally conducted one-to-one and were not developed for large groups. In the present study, firefighters attended interventions in existing training groups ranging from twenty to thirty participants at one time. As discussed above, the size of the groups hindered participation in the PNF intervention as well as the PNF portion of the larger BASICS Psychoeducation + PNF intervention. The lack of one-on-one discussion time prevented personal goal setting and lessened general interaction with the facilitator. The function of the brief motivational intervention, specifically the PNF component, is to create a discussion that leads to contemplation of behavior change. As discussed above, the lack of such discussion may have compromised the effectiveness of the intervention.

A second potential limitation was the mandatory attendance requirement allowing for mixed levels of drinkers (i.e. abstainers, light/moderate drinkers) in the intervention. As described earlier,

although completion of the assessment and follow-up questionnaires was voluntary, participation in the training/intervention was required. Such mandated participation may have affected the results and the intervention fidelity. As described above, however, past research suggests that the approach taken in the present study can be effective even among those mandated to the intervention (Bosari & Carey, 2005; White et al., 2006; White et al., 2007).

A third limitation of the study may have been the timing of the interventions. Specifically, during the course of the eight months of the study, the City of El Paso was in renegotiation with the El Paso Fire Department. This led to “conspiracy theories” surrounding the project and the investigator spent a portion of her time debunking myths of her association with the EPFD and more generally, with the City of El Paso. Several firefighters vocalized that the investigator and her assistants were functioning as “spies” to hinder their new contracts and that the health assessment data would be used to renegotiate contracts in the City’s favor. Indeed, a small number of firefighters opted out of the research completely believing that the assessments would fall in the hands of the authorities in the department. While the investigator addressed these concerns openly and honestly, they may have been a significant limitation to the collection of data. However, as described above, the alcohol-related outcome data and desirable responding data did not suggest widespread dishonesty or impression management influences on drinking outcomes.

A fourth limitation was the use of a different presenter for the Control condition than the other conditions. As discussed above, an El Paso police officer conducted the training for the Control condition, whereas the study investigator conducted the trainings for both of the experimental conditions. The differences in trainers, such as gender, level of authority, a sense of brotherhood among employees of the EPFD and EPPD, as well as other differences, may have lead to different processes underlying the changes seen among the different conditions.

Like most research in this field, a limitation of this study included the reliance of self-report methods. In particular, reports of alcohol and substance use may have questionable reliability and validity. Specifically, participants may understate use, be dishonest, or otherwise be inaccurate in their reporting of these behaviors. However, research has shown that there is little basis for this concern with participants being forthright in reporting use when compared to clinical measures (Brown, Kranzler, & Del Boca, 1992; Del Boca & Noll, 2000; Rutherford, Cacciola, Alterman, McKay, & Cook, 2000). Even so, as a precaution, the present study used well-established instruments that have shown good reliability and validity (Babor & Del Boca, 1992) and examined the degree to which alcohol-related outcomes correlated with social desirability. As mentioned above, associations were small between the measures of social desirability and alcohol-related outcomes suggesting that there were no widespread problems with the firefighter's self-reports of alcohol-related outcomes and other variables.

Perhaps the main limitation of this study was the between-subject panel study design. Recall that for anonymity and confidentiality purposes, pre- and post-data were collected independently in a between-subjects fashion. This led to several statistical limitations, most notably the inability to examine covariates, the incapacity to examine subgroups of participants who were more or less suited for this type of intervention, and the inability to examine pre-test drinking levels as potential moderators of the intervention's effectiveness.

5.7 STRENGTHS OF THE STUDY

There were several strengths to consider in this study. First and foremost, this is one of the largest studies of municipal firefighters. With 740 participants in the first panel and 664 in the second, this study examined nearly 90% the El Paso uniformed firefighter population of 828. Based on the assumption that all participants that completed post-intervention follow-up also completed the pre-intervention assessment, the attrition rate for this study was 10%.

Secondly, the study also provided a community service to the EPFD. Across eight months, firefighters received an evidence-based alcohol intervention to fulfill their required training hours and a current health assessment of the department. The reductions in alcohol-related outcomes, though statistically small, were considerable when viewed from a public health perspective, providing a significant contribution to our community.

A third strength was intervention fidelity. Specifically, the procedures in this project were based on the UTEP BASICS Program in which the study investigator was trained and employed with for four years. These experiences led to understanding the importance of maintaining consistency and fidelity of the intervention across sessions. To do so, the study investigator was present for every intervention and explained the project and consent form process. The investigator also conducted every BASICS Psycho-education+ PNF and PNF only intervention and collected every post-intervention follow-up. Moreover, the six student assistants were trained in each area of the project by the investigator.

A final strength was the inclusion of indices of social desirability, specifically Self-Deceptive Enhancement and Impression Management. Recall that associations were small between the measures of social desirability and alcohol-related outcomes. These small and sometimes non-significant associations suggest that the firefighter's reports of alcohol-related outcomes and other variables were not unduly influenced by social desirability concerns nor self-deceptive practices.

5.8 DIRECTIONS FOR FUTURE RESEARCH

There are several directions for future research based on the findings of this study. Primarily, one can examine explanations for why the study hypothesis was not shown in this study. Although the main study hypothesis regarding enhanced effectiveness of the theory-based interventions relative to the educational control, was not shown, it is impossible to determine if this lack of success was due to relative ineffectiveness of the experimental conditions, the unexpected effectiveness of the educational control condition, or whether such changes were artifacts of history, maturation, or testing. For

example, a good deal of the discussion has suggested that all three interventions were successful in reducing drinking levels, producing overall small effects consistent with past research. However, from an experimental design perspective, it is reasonable to question the internal validity of this conclusion. Alternative explanations for the conclusion that all three interventions were successful are readily available. For example, history, maturation, and reactive effects of testing, or some combination of them (see Shadish et al., 2002), are equally plausible, and perhaps more parsimonious explanations. Further research, specifically with additional control groups, is necessary to determine the best explanation. Such control groups might include an assessment-only control groups or more elaborate experimental designs.

In terms of the study intervention approach, future research might benefit from a more targeted study for “at-risk” firefighters. For example, a more traditional screening and qualification approach could be used to eliminate abstainers, light/moderate drinkers, and those with potential dependence, thus allowing the theory-based intervention to be tested in the population for which they were intended. Additionally, future research would benefit from examining these theory-based interventions with smaller groups or ideally one-on-one sessions. More importantly in terms of study design, future investigations should link pre- and post- test data. This would allow for a more thorough examination of the data, including a reduction in measurement error, the ability to use covariates in the analysis, and the ability to examine subgroups of participants (i.e. more and less moderate drinkers).

Another approach to future research would be the examination of other potential alcohol interventions that would be more beneficial and conducive to the social and cultural environment of firefighters. While other research has not specifically endorsed a type of intervention for firefighters, in the future, the study investigator would be able to take the experience of working directly with firefighters and more closely modify and/or develop a more firefighter targeted alcohol intervention. This type of intervention might include an individual level approach, like the one employed here, but

might also include a focus on the social environment, including permissive norms and the drinking culture, as well as address specific drinking motives and alcohol expectancies that were most strongly related to firefighter's alcohol related-outcomes.

5.9 SUMMARY AND CONCLUSIONS

This study examined the effectiveness of two brief motivational interventions on alcohol risk levels, alcohol-related problems, and alcohol consumption in a population of 740 firefighters in comparison to a standard educational control. In all three conditions, firefighters completed assessment measures, received one of three interventions, and completed a follow-up questionnaire within four months post-intervention. None of the statistical analyses provided support for the main study hypothesis that firefighters in two experimental conditions would show greater decreases in alcohol-related outcomes than the control condition. Instead, the results suggested modest decreases in alcohol-related outcomes that were relatively equal across all three conditions. Specifically, results suggested consistent reductions for three of five measures including alcohol risk levels, alcohol-related problems, and mean drinks per week and less consistent changes in mean drinking days and drinking hours per day. Effect sizes for these changes were small in magnitude, consistent with other research in this area.

Although the results failed to support the hypothesis that the brief interventions would be more effective than an educational control condition among firefighters, the results of this study are positive from a public health perspective. Specifically, the results suggest that a variety of brief interventions can significantly reduce alcohol-related outcomes four months following a single alcohol intervention. However, further research is needed to rule out alternative explanations for the results.

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Appendix A: Informed Consent

University of Texas at El Paso (UTEP) Institutional Review Board
Informed Consent Form for Research Involving Human Subjects

Protocol Title: A Comparison of the BASICS Harm Reduction Approach and Personalized Normative Feedback for Reducing Alcohol-Related Behaviors among Firefighters

Principal Investigator: Stormy Morales-Monks, Ph.D.- C, MPH, CHES

UTEP: Interdisciplinary Health Sciences Ph.D. Program

1. Introduction

You are being asked to take part voluntarily in the research project described below. Please take your time making a decision and feel free to discuss it with your friends and family. Before agreeing to take part in this research study, it is important that you read the consent form that describes the study. Please ask the study researcher or the study staff to explain any words or information that you do not clearly understand.

2. Why is this study being done?

You have been asked to take part in a research study that accompanies one of your mandatory training sessions as a member of the El Paso Fire Department. The goal of this study is to determine the most effective ways to help firefighters moderate their alcohol use and avoid alcohol-related problems.

Approximately eight hundred and fifty firefighters will be enrolling in this study conducted at the El Paso Fire Department Training Academy.

You are being asked to be in the study because you are a member of the El Paso Fire Department.

If you decide to enroll in this study, your involvement will last about eight months, the length of two EPFD training cycles.

3. What is involved in the study?

If you agree to take part in this study, the research team will ask you to fill out several questionnaires before participating in one of three alcohol education sessions. Which education session you receive will be determined by the shift assignment you have through the fire department.

This form asks that you complete the questionnaires before your session and that you complete a subset of the measures in approximately four months, when you attend your next training session. As part of the educational session you may receive information on alcohol and its effects, information on the legal consequences of alcohol use, and feedback regarding your personal use of alcohol.

We are asking you to fill out our questionnaires twice, once today, and again in four months, so we can see if the educational sessions are useful for helping firefighters avoid problems related to alcohol use.

The first meeting will take between 2.5 to 3.5 hours.

Group #1: You will first complete a packet of questionnaires concerning your alcohol use and related beliefs and behaviors. You will then listen to a presentation about alcohol use and alcohol-related problems, specifically DWI/DUIs. This training will be given by the El Paso Police Department.

Group #2: You will first complete a packet of questionnaires concerning your alcohol use and related beliefs and behaviors. You will then view a PowerPoint presentation about alcohol use and alcohol-related problems and discuss your personalized feedback form that has information about your alcohol use and alcohol-related problems.

Group #3: You will first complete a packet of questionnaires concerning your alcohol use and related beliefs and behaviors. You will then discuss your personalized feedback form that has information about your alcohol use and alcohol-related problems.

At the start of your next regularly scheduled training session, we will ask you to repeat some of questionnaires to see how your beliefs and behaviors may have changed. This meeting will take place during your next training cycle approximately four months after the first meeting.

4. What are the risks and discomforts of the study?

There are no known risks associated with this research. However, talking about alcohol use and related problems can make some people emotionally upset. If you get upset with anything we talk about, you can choose not to talk about it anymore.

5. What will happen if I am injured in this study?

The University of Texas at El Paso and its affiliates do not offer to pay for or cover the cost of medical treatment for research related illness or injury. No funds have been set aside to pay or reimburse you in the event of such injury or illness. You will not give up any of your legal rights by signing this consent form. You should report any such injury to Stormy Morales-Monks at 915-276-5665 and to the UTEP Institutional Review Board (IRB) at (915-747-8841) or irb.orsp@utep.edu.

6. Are there benefits to taking part in this study?

There will be no direct benefits to you for taking part in this study. This research may help you to understand about alcohol and how it affects your body. You will also learn how to moderate your alcohol use, and how to avoid experiencing alcohol-related problems.

7. What other options are there?

You have the option not to take part in this study. There will be no penalties involved if you choose not to take part in this study.

8. Who is paying for this study?

There is no internal or external funding for this study.

9. What are my costs?

There are no direct costs. You will be responsible for travel to and from the research site and any other incidental expenses.

10. Will I be paid to participate in this study?

You will not be paid for taking part in this research study.

11. What if I want to withdraw, or am asked to withdraw from this study?

Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you do not take part in the study, there will be no penalty.

If you choose to take part, you have the right to stop at any time. However, we encourage you to talk to a member of the research group so that they know why you are leaving the study. If there are any new findings during the study that may affect whether you want to continue to take part, you will be told about them.

The researcher may decide to stop your participation without your permission, if he or she thinks that being in the study may cause you harm or is causing you to become emotionally upset.

12. Who do I call if I have questions or problems?

You may ask any questions you have now. If you have questions later, you may call Stormy Morales-Monks at 915-276-5665 or email her at stormym@miners.utep.edu.

If you have questions or concerns about your participation as a research subject, please contact the UTEP Institutional Review Board (IRB) at (915-747-8841) or irb.orsp@utep.edu.

13. What about confidentiality?

Your participation in this study is anonymous. You will not be asked to provide any personally identifying information to the research team on any of the forms. None of the information you provide will identify you by name. There will be no way to link any of responses to you. All records will be kept in a secure office on the UTEP campus.

14. Mandatory reporting

If information is revealed about child abuse or neglect, or potentially dangerous future behavior to others, the law requires that this information be reported to the proper authorities.

15. Authorization Statement

I have read each page of this paper about the study (or it was read to me). I know that being in this study is voluntary and I choose to be in this study. I know I can stop being in this study without penalty. You can request a copy of this consent form now and can get information on results of the study later if I wish.

Participant Name: _____ Date: _____

Participant Signature: _____ Time: _____

Consent form explained/witnessed by: _____

Signature

Printed name: _____

Date: _____ Time: _____

Appendix B: Assessment Questionnaire

Health Assessment

Demographics

1. What is your age?
_____ (years)
2. Are you Hispanic or Latino?
☐ Yes
☐ No
3. Which one of these groups would you say best represents your race?
☐ White
☐ Black or African American
☐ Asian
☐ Native Hawaiian or Other Pacific Islander
☐ American Indian or Alaska Native
☐ Other [specify] _____
4. Are you currently?
☐ Married
☐ Divorced
☐ Widowed
☐ Separated
☐ Never married/Single
☐ Cohabiting
☐ Other
5. What is your sex?
☐ Male
☐ Female
6. Approximately, how long have you been a firefighter?
_____ (years)
_____ (months)
7. What is your rank?
☐ Firefighter
☐ Driver
☐ Lieutenant
☐ Captain
☐ Chief
8. What is your current shift assignment?
☐ A
☐ B
☐ C
☐ Not on Shift Assignment

AUDIT

The following questions are about the last 3 months:

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 of 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 or almost daily
4.	How often during the last 3 months have you found that you were not able to stop drinking once you had started?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
5.	How often during the last 3 months have you failed to do what was normally expected from you because of drinking?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6.	How often during the last 3 months 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 or almost daily
7.	How often during the last 3 months have you had a feeling of guilt or remorse after drinking?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8.	How often during the last 3 months have you been unable to remember what happened the night before because you had been drinking?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9.	Have you or has someone else been injured as a result of your drinking?				
	No	Yes, but not in the last 3 months		Yes, during the last 3 months	
10.	Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?				
	No	Yes, but not in the last 3 months		Yes, during the last 3 months	

RAPI

How many times did the following things happen to you while you were drinking alcohol or because of your alcohol use during the last three months?

No.	Response (Number of Times)	Never	1-2	3-5	6-10	10+
1.	<i>In the last three months, how often have you felt that you not able to do your homework or study for a test?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<i>In the last three months, how often have you got into fights, acted bad or did mean things with other people (friends, relatives, strangers)?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<i>In the last three months, how often have you missed out on other things because you spent too much money on alcohol?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<i>In the last three months, how often have you went to work or school high or drunk?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<i>In the last three months, how often have you caused shame or embarrassment to someone?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<i>In the last three months, how often have you neglected your responsibilities?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<i>In the last three months, how often have you relatives avoided you?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<i>In the last three months, how often have you felt that you needed more alcohol than you used to use in order to get the same effect?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<i>In the last three months, how often have you tried to control your drinking by trying to drink only at certain times of the day or certain places?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<i>In the last three months, how often have you had a withdrawal symptom, that is, felt sick because you stopped or cut down on drinking?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	<i>In the last three months, how often have you noticed a change in your personality?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	<i>In the last three months, how often have you felt that you had a problem with alcohol?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	<i>In the last three months, how often have you missed a day (or part of a day) of school or work?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	<i>In the last three months, how often have you tried to cut down or quit drinking?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	<i>In the last three months, how often have you suddenly found yourself in a place that you could not remember getting to?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	<i>In the last three months, how often have you passed out or fainted suddenly?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	<i>In the last three months, how often have you had a fight, argument, or bad feelings with a friend?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	<i>In the last three months, how often have you had a fight, argument, or bad feelings with a family member?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	<i>In the last three months, how often have you kept drinking when you promised yourself not to?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20.	<i>In the last three months, how often have you felt you were going crazy?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	<i>In the last three months, how often have you had a bad time?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	<i>In the last three months, how often have you felt physically or psychologically dependent on alcohol?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	<i>In the last three months, how often have you was told by a friend or neighbor to stop or cut down on drinking?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DDQ-Modified

For each day of the week, fill in both the number of drinks consumed and the number of hours you typically drink. Please be sure to fill out the information regarding your gender, weight, and height.

- For the past month, please fill in a number for each day of the week indicating the *typical number of drinks* you usually consume on that day, and the *typical number of hours* you usually drink on that day.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
# drinks							
# hours							

Weight _____ Height _____ Gender _____

2.	Think of the occasion you drank the most this past month. How much did you drink?									
	0	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18 19+
3.	On a given weekend evening, how much alcohol do you typically drink? Estimate for the past month .									
	0	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18 19+
4.	How often in the past month did you drink alcohol?									
	I do not drink at all.	About once a month.	Two or three times a month.	Three or four times a month.	Nearly every day.	Once a day or more				

CEoA

This questionnaire assesses *what you would expect* to happen if you were under the influence of alcohol. Mark a response from (1) disagree to (4) agree, depending on whether or not you would expect the effect to happen to you if you were under the influence of alcohol. These effects will vary depending upon the amount of alcohol you typically consume.

This is not a personality assessment. We want to know what you would expect to happen if you were to drink alcohol, not how you are when you are sober.

No.	If I were under the influence of alcohol:	Disagree	Slightly Disagree	Slightly Agree	Agree
1.	I would be outgoing	1	2	3	4
2.	My senses would be dulled	1	2	3	4
3.	I would be humorous	1	2	3	4
4.	My problems would seem worse	1	2	3	4
5.	It would be easier to express my feelings	1	2	3	4
6.	My writing would be impaired	1	2	3	4
7.	I would feel sexy	1	2	3	4
8.	I would have difficulty thinking	1	2	3	4
9.	I would neglect my obligations	1	2	3	4
10.	I would be dominant	1	2	3	4
11.	My head would feel fuzzy	1	2	3	4
12.	I would enjoy sex more	1	2	3	4
13.	I would feel dizzy	1	2	3	4
14.	I would be friendly	1	2	3	4
15.	I would be clumsy	1	2	3	4
16.	It would be easier to act out my fantasies	1	2	3	4
17.	I would be loud, boisterous, or noisy	1	2	3	4
18.	I would feel peaceful	1	2	3	4
19.	I would be brave and daring	1	2	3	4
20.	I would feel unafraid	1	2	3	4
21.	I would feel creative	1	2	3	4
22.	I would be courageous	1	2	3	4
23.	I would feel shaky or jittery the next day	1	2	3	4
24.	I would feel energetic	1	2	3	4
25.	I would act aggressively	1	2	3	4
26.	My responses would be slow	1	2	3	4
27.	My body would be relaxed	1	2	3	4
28.	I would feel guilty	1	2	3	4
29.	I would feel calm	1	2	3	4
30.	I would feel moody	1	2	3	4
31.	It would be easier to talk to people	1	2	3	4
32.	I would be a better lover	1	2	3	4
33.	I would feel self-critical	1	2	3	4
34.	I would be talkative	1	2	3	4
35.	I would act tough	1	2	3	4
36.	I would take risks	1	2	3	4
37.	I would feel powerful	1	2	3	4
38.	I would act sociable	1	2	3	4

DMQ

Here is a list of reasons people give for drinking alcoholic beverages. Using the response categories below, please indicate how often you drink for each of the following reasons. There are no right or wrong answers to these questions. We just want to know about the reasons why you usually drink when you do.

1 Never	2 Almost never	3 Some of the time	4 About half of the time	5 Most of the time	6 Almost always
1. _____	How often do you drink because you like the feeling?		11. _____	How often would you say you drink to fit in with a group you like?	
2. _____	How often do you drink to forget your worries?		12. _____	How often do you drink because it makes social gatherings more fun?	
3. _____	How often do you drink because your friends pressure you to drink?		13. _____	How often do you drink because it gives you a pleasant feeling?	
4. _____	How often do you drink because it help you enjoy a party?		14. _____	How often do you drink because you feel more self-confident or sure of yourself?	
5. _____	How often do you drink because it's exciting?		15. _____	How often do you drink to be liked?	
6. _____	How often do you drink because it helps you when you feel depressed or nervous?		16. _____	How often do you drink because it's fun?	
7. _____	How often do you drink so that others won't kid you about not drinking?		17. _____	How often do you drink because it improves parties and celebrations?	
8. _____	How often would you say you drink to be sociable?		18. _____	How often do you drink to forget about your problems?	
9. _____	How often do you drink to get high?		19. _____	How often do you drink so you won't feel left out?	
10. _____	How often do you drink to cheer up when you're in a bad mood		20. _____	How often do you drink to celebrate a special occasion with friends?	

BIDR

Write a number beside each statement to indicate how much you agree with it.

1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7	
Not True	Somewhat True
	Very True
_____ 1. My first impressions of people usually turn out to be right.	_____ 21. I sometimes tell lies if I have to.
_____ 2. It would be hard for me to break any of my bad habits.	_____ 22. I never cover up my mistakes.
_____ 3. I don't care to know what other people really think of me.	_____ 23. There have been occasions when I have taken advantage of someone.
_____ 4. I have not always been honest with myself.	_____ 24. I never swear.
_____ 5. I always know why I like things.	_____ 25. I sometimes try to get even rather than forgive and forget.
_____ 6. When my emotions are aroused, it biases my thinking.	_____ 26. I always obey laws, even if I'm unlikely to get caught.
_____ 7. Once I've made up my mind, other people can seldom change my opinion.	_____ 27. I have said something bad about a friend behind his or her back.
_____ 8. I am not a safe driver when I exceed the speed limit.	_____ 28. When I hear people talking privately, I avoid listening.
_____ 9. I am fully in control of my own fate.	_____ 29. I have received too much change from a salesperson without telling him or her.
_____ 10. It's hard for me to shut off a disturbing thought.	_____ 30. I always declare everything at customs.
_____ 11. I never regret my decisions.	_____ 31. When I was young I sometimes stole things.
_____ 12. I sometimes lose out on things because I can't make up my mind soon enough.	_____ 32. I have never dropped litter on the street.
_____ 13. The reason I vote is because my vote can make a difference.	_____ 33. I sometimes drive faster than the speed limit.
_____ 14. My parents were not always fair when they punished me.	_____ 34. I never read sexy books or magazines.
_____ 15. I am a completely rational person.	_____ 35. I have done things that I don't tell other people about.
_____ 16. I rarely appreciate criticism.	_____ 36. I never take things that don't belong to me.
_____ 17. I am very confident of my judgments.	_____ 37. I have taken sick-leave from work or school even though I wasn't really sick.
_____ 18. I have sometimes doubted my ability as a lover.	_____ 38. I have never damaged a library book or store merchandise without reporting it.
_____ 19. It's all right with me if some people happen to dislike me.	_____ 39. I have some pretty awful habits.
_____ 20. I don't always know the reasons why I do the things I do.	_____ 40. I don't gossip about other people's business.

Appendix C: Follow-up Questionnaire

Health Questionnaire: Follow-Up

1. What is your age?
_____ (years)
2. Are you Hispanic or Latino?
☐ Yes
☐ No
3. Which one of these groups would you say best represents your race?
☐ White
☐ Black or African American
☐ Asian
☐ Native Hawaiian or Other Pacific Islander
☐ American Indian or Alaska Native
☐ Other [specify] _____
4. Are you currently?
☐ Married
☐ Divorced
☐ Widowed
☐ Separated
☐ Never married/Single
☐ Cohabiting
☐ Other
5. What is your sex?
☐ Male
☐ Female
6. Approximately, how long have you been a firefighter?
_____ (years)
_____ (months)
7. What is your rank?
☐ Firefighter
☐ Driver
☐ Lieutenant
☐ Captain
☐ Chief
8. What is your current shift assignment?
☐ A ☐ B ☐ C ☐ Not on Shift Assignment (40 hr./wk. employee)
9. Have you had a shift assignment change in the last four months? Yes No
10. If you answered "Yes" to experiencing a shift change in the last four months, what shift were you assigned to?
☐ A ☐ B ☐ C ☐ Not on Shift Assignment (40 hr./wk. employee)

AUDIT

The following questions are about the last 3 months:

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 of 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 or almost daily
4.	How often during the last 3 months have you found that you were not able to stop drinking once you had started?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
5.	How often during the last 3 months have you failed to do what was normally expected from you because of drinking?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6.	How often during the last 3 months 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 or almost daily
7.	How often during the last 3 months have you had a feeling of guilt or remorse after drinking?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8.	How often during the last 3 months have you been unable to remember what happened the night before because you had been drinking?				
	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9.	Have you or has someone else been injured as a result of your drinking?				
	No	Yes, but not in the last 3 months		Yes, during the last 3 months	
10.	Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?				
	No	Yes, but not in the last 3 months		Yes, during the last 3 months	

RAPI

How many times did the following things happen to you while you were drinking alcohol or because of your alcohol use during the last three months?

No.	Response (Number of Times)	Never	1-2	3-5	6-10	10+
1.	<i>In the last three months, how often have you felt that you not able to do your homework or study for a test?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<i>In the last three months, how often have you got into fights, acted bad or did mean things with other people (friends, relatives, strangers)?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<i>In the last three months, how often have you missed out on other things because you spent too much money on alcohol?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<i>In the last three months, how often have you went to work or school high or drunk?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<i>In the last three months, how often have you caused shame or embarrassment to someone?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<i>In the last three months, how often have you neglected your responsibilities?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<i>In the last three months, how often have you relatives avoided you?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<i>In the last three months, how often have you felt that you needed more alcohol than you used to use in order to get the same effect?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<i>In the last three months, how often have you tried to control your drinking by trying to drink only at certain times of the day or certain places?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<i>In the last three months, how often have you had a withdrawal symptom, that is, felt sick because you stopped or cut down on drinking?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	<i>In the last three months, how often have you noticed a change in your personality?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	<i>In the last three months, how often have you felt that you had a problem with alcohol?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	<i>In the last three months, how often have you missed a day (or part of a day) of school or work?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	<i>In the last three months, how often have you tried to cut down or quit drinking?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	<i>In the last three months, how often have you suddenly found yourself in a place that you could not remember getting to?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	<i>In the last three months, how often have you passed out or fainted suddenly?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	<i>In the last three months, how often have you had a fight, argument, or bad feelings with a friend?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	<i>In the last three months, how often have you had a fight, argument, or bad feelings with a family member?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	<i>In the last three months, how often have you kept drinking when you promised yourself not to?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20.	<i>In the last three months, how often have you felt you were going crazy?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	<i>In the last three months, how often have you had a bad time?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	<i>In the last three months, how often have you felt physically or psychologically dependent on alcohol?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	<i>In the last three months, how often have you was told by a friend or neighbor to stop or cut down on drinking?</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DDQ-Modified

For each day of the week, fill in both the number of drinks consumed and the number of hours you typically drink.

Please be sure to fill out the information regarding your gender, weight, and height.

1. For the past month, please fill in a number for each day of the week indicating the *typical number of **drinks*** you usually consume on that day, and the *typical number of **hours*** you usually drink on that day.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
# drinks							
# hours							

Weight_____ Height_____ Gender_____

2.	Think of the occasion you drank the most this past month. How much did you drink?									
	0	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18 19+
3.	On a given weekend evening, how much alcohol do you typically drink? Estimate for the past month .									
	0	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18 19+
4.	How often in the past month did you drink alcohol?									
	I do not drink at all.	About once a month.	Two or three times a month.	Three or four times a month.	Nearly every day.	Once a day or more				

Appendix D: BASICS Psychoeducation + PNF Presentation

WELCOME TO ALCOHOL RISK REDUCTION TRAINING

Shift B



WHAT IS ALCOHOL?

- Alcohol is a central nervous system depressant.
 - It slows down the nervous system resulting in slower cognitive and motor processing.
- Has a calming → depressing emotional effect
 - In small amounts → Relaxation
 - In large amounts → Depression

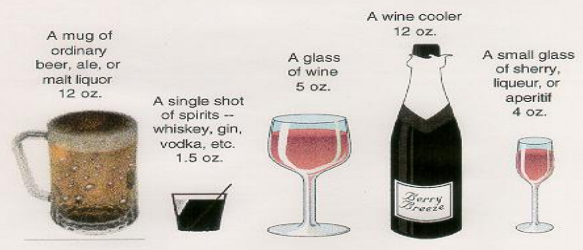


WHAT KIND OF DRINKING IS BEST?

- If you choose not to drink, that is great.
- **Research shows: Moderation is important**
 - Is a middle road between abstinence and overdrinking
 - Balances enjoyment of alcohol with little risk of problems
- In small amounts, alcohol can have pleasurable effects.
 - "More is better" does not apply to alcohol
 - Accidents, hangovers, sickness, relationship problems, etc.

A "STANDARD DRINK"

A standard drink contains ½ ounce of pure ethyl alcohol.



WHAT TYPES OF DRINKS DO YOU USUALLY HAVE?

WHAT IS "TYPICAL" DRINKING BEHAVIOR FOR FIREFIGHTERS?

- What is your typical drinking pattern?
- The research shows:
 - Firefighters drink similarly to the general population
 - 50% lifetime alcohol use disorders
 - 29% - current problems with alcohol use
 - 5% - of firefighters are heavy/binge drinkers
 - Average firefighter drinks 5.8 standard drinks per week
 - Coping Method
 - Linked to poor job performance

SOBERING UP MYTHS

- | | |
|------------------|-------------------------------------|
| ✓ Olive Oil/Milk | • Does not moderate effects |
| ✓ Coffee | • Awake and still drunk |
| ✓ Cold shower | • Cold and still drunk |
| ✓ Exercising | • Does not sweat it out faster |
| ✓ Menudo | • Hung over but well-fed |
| ✓ Vomiting | • Alcohol has already been absorbed |

GENDER DIFFERENCES



- Women do not metabolize alcohol as quickly as men
- Body fluid and enzyme differences
- Physiological reactions to the effects of drinking are different
- Perception of social cues are different
- Women are more vulnerable to intoxicating effects during the luteal phase

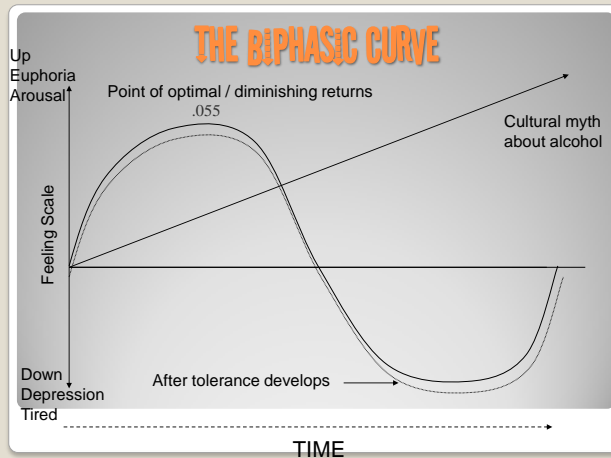
BLOOD ALCOHOL LEVEL (BAL, BAC)

- It is a ratio of alcohol to blood in the bloodstream, it means milligrams of alcohol in the body per 1000 milliliters of blood.
- Factors that affect BAL
 - The AMOUNT you drink
 - The SPEED at which you drink
 - Your WEIGHT
 - Your GENDER

Blood Alcohol Content	Effects of this blood level in the body
.02%	Begin to feel relaxed, but reaction time declines
.04%	Feeling of relaxation
.06%	Impacts on the brain's ability to process information
.08%	Decrease in motor coordination, nausea
.10%	Evident deterioration in cognitive judgment and motor coordination
.15%	Person is at risk for "blacking" out
.30%	A lot of individuals fall into a coma some die
.45%	Considered a lethal dose

BIPHASIC EFFECTS OF ALCOHOL

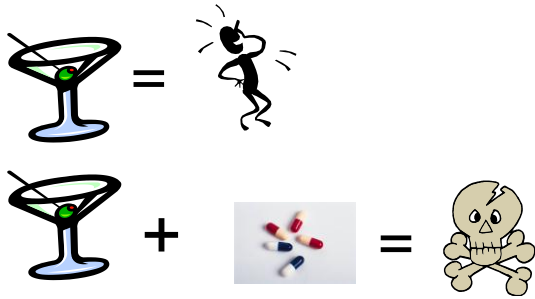
- When you first start drinking, you will start feeling enthusiastic and euphoric.
- As your blood alcohol level goes up the negative experiences will overcome the positive ones.
 - you will start feeling tired, slow, and unsteady
- You will not get the buzz back by drinking more. You will likely feel worse if you over drink.
 - especially the next day!



ALCOHOL TOLERANCE

- Tolerance means that over time you would need to drink more alcohol to get the same positive effects.
 - you have to drink a lot more to feel good
- Tolerance results in increased negative health risks because the body doesn't recognize when it has had enough alcohol.
- The only way to lower tolerance is to drink less or stop altogether.

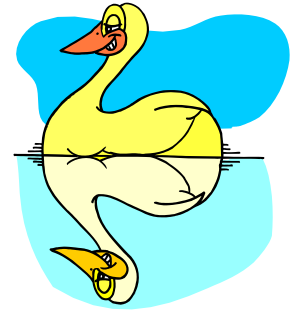
POTENTIATION



THE COMBINATION OF ALCOHOL AND COCAINE IS THE MOST COMMON TWO-DRUG COMBINATION THAT RESULTS IN DRUG-RELATED DEATHS.

CROSS-TOLERANCE

- If you develop tolerance for one substance, you also usually have tolerance for similar substances



BEER GOGGLES



- Alcohol myopia means being near-sighted because of drinking too much alcohol.
- Drinking too much results in a narrow focus: "here and now."
- Lack of concern for future consequences of your words and actions.



Have you ever done something you regretted while you were drinking?

THE BALANCED PLACEBO DESIGN STUDY

Subject Expects

	Alcohol	Tonic
Alcohol	1	2
Tonic	3	4

Guess what happened?

THE BALANCED PLACEBO STUDY RESULTS

Four Conditions Subjects:

- Expected and received alcohol.
- Expected tonic water but received alcohol.
- Expected alcohol but received tonic water.
- Expected tonic water and received it.

Subjects reactions:

- They reacted as experimenters expected. Louder, talkative and flirtatious
- Did not show any social effects even though they drank alcohol.
- They acted intoxicated. Louder, talkative and flirtatious
- They stayed quiet, did not show a lot of socialization.



WHY CHANGE?

What I like about drinking

- Relax and forget about the day
- Feel high, forget about worries
- Being with my friends
- Like the taste

Reasons to moderate

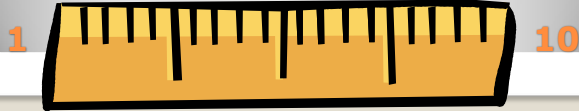
- To feel better in the morning
- Trouble remembering things
- Good for my health
- My work suffers
- Family worries that I drink too much

• Does anything about my drinking behavior need to change?

- 1 = Not at all
- 10 = Total turn around

• How confident am I that I can make a change?

- 1 = Not confident at all
- 10 = Completely confident



PERSONALIZED NORMATIVE FEEDBACK

Consider how drinking has affected you personally

Personalized Feedback for Firefighter

Your Drinking Patterns

☒ Frequency and Quantity of Consumption
☒ Percentile Comparison
☒ Blood Alcohol Content

☒ Drinking and Social Norms
☒ Alcohol and Weight
☒ Alcohol and the Financial Costs

According to the information you gave us, the number of occasions you drank (frequency) was: **3 days a week**
 The average amount you drank on each occasion (quantity) was: **3.0 drinks**
 Your **percentile rank** (comparing your drinking pattern to that of other adults) is: **73.5**

Based on your typical drinking pattern in one week, we estimate that in the last year:
 you drank a total of **470 drinks**
 you drank on **42% of all days**
 you spent about **10.0 hours** under the influence
29.13 24-hour days

Your typical (average) blood alcohol level (BAL) was: **0.05**
 Your highest (peak) blood alcohol level (BAL) was: **0.10**

Effects on the body

0.04-0.05%	Slight impairment of reasoning and memory, slowing of reaction, better or exaggerated emotional intensity
0.05%	Speech incoherent, decreased motor function, slowed vision and reaction time
0.10%-0.15%	Significant impairment of motor coordination and loss of good judgment
0.15%-0.20%	Great motor impairment, slurred speech, blurred vision, major loss of balance
0.20%-0.25%	Complete incoordination, human test failure, appearance of "stag drunk"
0.25%-0.30%	All mental, physical, and sensory functions severely impaired. Can be fatal and choke if vomit
0.30%-0.35%	Brain impaired heart rate and breathing, loss of consciousness can occur
0.40%-0.45%	Fatal dose. Death if vomit and possible death due to respiratory arrest

This is how long it would take for your typical (average) BAL to return to 0: **2.2 hours**
 This is how long it would take for your highest (peak) BAL to return to 0: **3.3 hours**

Drinking Norms

Comparison of your Drinking Patterns to Actual Norms

Frequency: **3 days a week**
 Quantity: **3.0 drinks**
 Peak BAL: **0.10**

Social Norms Summary Chart

Where do you stand?

Percentage of Adults who drink MORE: **25%**
 Percentage of Adults who drink LESS: **75%**

Most adults overestimate the actual drinking norms for adults their age.

Alcohol and Weight

How indicated that in a typical week you are getting the following amount of calories from alcohol: **1600 calories**

This is equal to:

- 2.4 hamburgers or
- 4.2 slices of pizza or
- 7.3 drinks or
- 8.2 cans of soda

Based on this amount of calories from alcohol you may have gained about: **0.4 pounds this week alone**
 (2000 calories = 1 pound weight gain)

To expend this number of calories each week it would require: **217 minutes of brisk walking or**
163 minutes of circuit training

Alcohol and the Financial Cost

Based upon your typical quantity and frequency of alcohol use, you are typically spending the following, depending on your choice of alcohol:

\$34.72/week **\$138.88/month** **\$1686.56/year**

Based upon the total cost of alcohol per year this is equal to:

- 266 movie tickets
- 66 romantic dinners for two
- 24 pairs of jeans
- 2 years of cell service

Blood Alcohol Level Card

BAL Chart for: **Firefighter** Wt. **200** Sex **M**

# of Drinks	1	2	3	4	5	6	7	8	9	10
1	0.009									
2	0.018	0.018	0.009							
3	0.027	0.043	0.027	0.011						
4	0.036	0.058	0.052	0.036	0.020	0.004				
5	0.045	0.077	0.077	0.061	0.045	0.029	0.013			
6	0.054	0.100	0.102	0.086	0.070	0.054	0.038	0.022	0.006	
7	0.063	0.123	0.127	0.111	0.095	0.079	0.063	0.047	0.031	0.015
8	0.072	0.146	0.152	0.136	0.120	0.104	0.088	0.072	0.056	0.040
9	0.081	0.169	0.177	0.161	0.145	0.129	0.113	0.097	0.081	0.065
10	0.090	0.192	0.202	0.186	0.170	0.154	0.138	0.122	0.106	0.090
11	0.099	0.215	0.227	0.211	0.195	0.179	0.163	0.147	0.131	0.115
12	0.108	0.238	0.252	0.236	0.220	0.204	0.188	0.172	0.156	0.140
13	0.117	0.261	0.277	0.261	0.245	0.229	0.213	0.197	0.181	0.165
14	0.126	0.284	0.302	0.286	0.270	0.254	0.238	0.222	0.206	0.190
15	0.135	0.307	0.327	0.311	0.295	0.279	0.263	0.247	0.231	0.215
16	0.144	0.330	0.352	0.336	0.320	0.304	0.288	0.272	0.256	0.240
17	0.153	0.353	0.377	0.361	0.345	0.329	0.313	0.297	0.281	0.265
18	0.162	0.376	0.402	0.386	0.370	0.354	0.338	0.322	0.306	0.290
19	0.171	0.399	0.427	0.411	0.395	0.379	0.363	0.347	0.331	0.315
20	0.180	0.422	0.452	0.436	0.420	0.404	0.388	0.372	0.356	0.340

NOTE: YELLOW numbers reflect risk for DUI, RED indicate at risk for blackout and other serious consequences. Numbers greater than .3 indicate risk of alcohol poisoning and death.

Lifestyle

Risks

☒ Alcohol-Related Consequences
☒ Beliefs about Alcohol and Related Effects
☒ Tips to Stay in Charge of Your Drinking

Alcohol-Related Consequences

You told us that the following alcohol related consequences had occurred in the prior 3 months:

Specific Consequences

- Missed a day (or part of a day) of school or work
- Got into fights, acted bad or did mean things to others
- Caused shame or embarrassment to someone
- Neglected your responsibilities

Number of Negative Alcohol-Related Consequences

Consequences: **11**

You can minimize the negative effects of alcohol by choosing to drink less or not at all.

Consider how you drink: More is better. More alcohol may not give you what you want. The more and faster that you drink, the less you will experience the happy effects and the more you will experience the negative effects.

Beliefs about Alcohol and its Effects

You listed the following alcohol effects as "Easy to Occur" when you consume alcohol:

- I would feel moody
- I would take risks
- I would be outgoing
- My senses would be dulled
- My problems would seem worse
- It would be easier to express my feelings

Research suggests that many of the social effects of alcohol are based on myths, placebo effects, and the expectations we bring to the drinking situation.

Tips to Stay in Charge of Drinking

These are some strategies you might use to reduce the negative effects of drinking.

- ◆ Decide how much you can drink in a set amount of time.
- ◆ Serving size matters—because it's beer it does not have less alcohol.
- ◆ One serving equals—12oz beer, 4oz wine, 1oz shot of liquor.
- ◆ Keep track of how many drinks you are having.
- ◆ Know your limits.
- ◆ Determine, in advance, not to exceed a set number of drinks.
- ◆ Switch between alcoholic and non-alcoholic beverages.
- ◆ Choose not to drink.
- ◆ Drink an alcohol look alike (non-alcoholic beer, punch, juice, or water).
- ◆ Pace your drinks to 1 or fewer per hour.
- ◆ Avoid drinking games.
- ◆ Avoid slamming drinks.
- ◆ Use a designated driver.
- ◆ Have someone you can call in case no one can drive.
- ◆ Call a taxi.

Thank you for participating in our study!!!

TRAINING SUMMARY

- **IF YOU WANT TO REDUCE YOUR DRINKING**
 - KNOW HOW MUCH YOU ARE DRINKING
 - FIND PLACES TO CUT BACK
 - PLAN AHEAD
 - STICK TO YOUR PLAN
 - DON'T WORRY IF YOU SLIP; SIMPLY RETURN TO THE PLAN NEXT TIME
- **IF YOU DO NOT WANT TO REDUCE, TRY TO DRINK MORE SAFELY USING THE RECOMMENDATIONS OF THIS TRAINING**

THANK YOU!



Appendix E: PNF Presentation



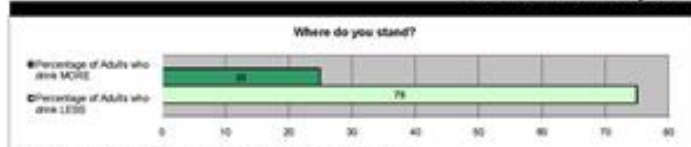
Blood Alcohol Level Card

BAL Chart for: **Firefighter** Wt. **200** Sex **M**

# of Drinks	1	2	3	4	5	6	7	8	9	10
1	0.009									
2	0.034	0.018	0.002							
3	0.059	0.043	0.027	0.011						
4	0.084	0.068	0.052	0.036	0.020	0.004				
5	0.109	0.093	0.077	0.061	0.045	0.029	0.013			
6	0.134	0.118	0.102	0.086	0.070	0.054	0.038	0.022	0.006	
7	0.159	0.143	0.127	0.111	0.095	0.079	0.063	0.047	0.031	0.015
8	0.184	0.168	0.152	0.136	0.120	0.104	0.088	0.072	0.056	0.040
9	0.209	0.193	0.177	0.161	0.145	0.129	0.113	0.097	0.081	0.065
10	0.234	0.218	0.202	0.186	0.170	0.154	0.138	0.122	0.106	0.090
11	0.259	0.243	0.227	0.211	0.195	0.179	0.163	0.147	0.131	0.115
12	0.284	0.268	0.252	0.236	0.220	0.204	0.188	0.172	0.156	0.140
13	0.309	0.293	0.277	0.261	0.245	0.229	0.213	0.197	0.181	0.165
14	0.334	0.318	0.302	0.286	0.270	0.254	0.238	0.222	0.206	0.190
15	0.359	0.343	0.327	0.311	0.295	0.279	0.263	0.247	0.231	0.215
16	0.384	0.368	0.352	0.336	0.320	0.304	0.288	0.272	0.256	0.240
17	0.409	0.393	0.377	0.361	0.345	0.329	0.313	0.297	0.281	0.265
18	0.434	0.418	0.402	0.386	0.370	0.354	0.338	0.322	0.306	0.290
19	0.459	0.443	0.427	0.411	0.395	0.379	0.363	0.347	0.331	0.315
20	0.484	0.468	0.452	0.436	0.420	0.404	0.388	0.372	0.356	0.340

NOTE: YELLOW numbers reflect risk for DUI, RED indicate at risk for blackout and other serious consequences. Numbers greater than .3 indicate risk of alcohol poisoning and death.

Social Norms Summary Chart



Most adults overestimate the actual drinking norms for adults their age.

Alcohol and Weight

You indicated that in a typical week you are getting the following amount of calories from alcohol: **1109 calories**

This is equal to:

2.4 hamburgers or



4.2 slices of pizza or



7.3 donuts or



9.2 cans of soda



Based on this amount of calories from alcohol you may have gained about: **8.4 pounds this week alone**
(3500 calories = 1 pound weight gain)

To expend this number of calories each week it would require: **217 minutes of brisk walking or**

103 minutes of circuit training



Alcohol and the Financial Cost

Based upon your typical quantity and frequency of alcohol use, you are typically spending the following, depending on your choice of alcohol:

\$34.72/week

\$128.88/month

\$1996.56/year

Based upon the total cost of alcohol per year this is equal to:

208 movie tickets



58 romantic dinners for two



75 pairs of jeans



7 years of cell service



Lifestyle



Risks

- ☒ Alcohol-Related Consequences
- ☒ Beliefs about Alcohol and Related Effects
- ☒ Tips to Stay in Charge of Your Drinking

Alcohol-Related Consequences

You told us that the following alcohol related consequences had occurred in the prior 3 months:

Specific Consequences

- ① Missed a day (or part of a day) of school or work
- ② Got into fights, acted bad or did mean things to others
- ③ Caused shame or embarrassment to someone
- ④ Neglected your responsibilities



You can minimize the negative effects of alcohol by choosing to drink less or not at all.

Consider how you drink: More is not better. More alcohol may not give you what you want. The more and faster that you drink, the less you will experience the happy effects and the more you will experience the negative effects.

Beliefs about Alcohol and its Effects

You listed the following alcohol effects as "Likely to Occur" when you consume alcohol:

- ☒ I would feel moody
- ☒ I would take risks
- ☒ I would be outgoing
- ☒ My senses would be dulled
- ☒ My problems would seem worse
- ☒ It would be easier to express my feelings

Research suggests that many of the social effects of alcohol are based on myths, placebo effects, and the expectations we bring to the drinking situation.

Tips to Stay in Charge of Drinking

These are some strategies you might use to reduce the negative effects of drinking.

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- ◆ Know your limits
- ◆ Determine, in advance, not to exceed a set number of drinks.
- ◆ Switch between alcoholic and non-alcoholic beverages.
- ◆ Choose not to drink.
- ◆ Drink an alcohol look alike (non-alcoholic beer, punch, juice, or water).
- ◆ Pace your drinks to 1 or fewer per hour.
- ◆ Avoid drinking games.
- ◆ Avoid slamming drinks.
- ◆ Use a designated driver.
- ◆ Have someone you can call in case no one can drive.
- ◆ Call a taxi.

Thank you for participating in our study!!!

Appendix F: El Paso Police Department Presentation

AGENDA

- 0.7 SECONDS / VIDEO
- INTRODUCTION
- PRESENTATION
- QUESTIONS
- PRATICAL EXERCISE - FATAL VISION
- DEATH OF AN INNOCENT / VIDEO

D.W.I.

VS.

PUBLIC INTOXICATION

INTOXICATED

DEFINITION:

A. Not having the normal use of Mental or Physical faculties by reason of the introduction of:

- Alcohol,
- A controlled substance,
- A drug / or Dangerous drug,
- A combination of 2 or more of the above or any other substance into the body; or...

B. Having a Blood Alcohol Concentration (B.A.C.) of .08 or more.

What is a Drug?

- Any substance, when taken into the human body, that affects the way the mind and body works. For our purposes, the ability of the person to operate a motor vehicle

Central Nervous System (CNS) Depressants

Typically slows down the brain's function.

Most commonly abused: **Alcohol**

Indicators of impairment:

Uncoordinated	Drunk like behavior
Sluggish	Thick slurred speech
Disoriented	Drowsiness
Droopy eyes	Fumbling

Central Nervous System (CNS) Stimulants

Accelerates the body. Speeds up the heart rate as well as other functions of the body.

Most commonly abused: **Cocaine**

Indicators of impairment:

Restlessness	Body Tremors
Excited	Euphoric
Talkative	Exaggerated Reflexes
Anxiety	Grinding Teeth
Insomnia	Increased Alertness
Dry Mouth	Irritability

PUBLIC INTOXICATION

Penal Code Offense 49.02

A PERSON COMMITS AN OFFENSE IF THE PERSON APPEARS IN A PUBLIC PLACE WHILE INTOXICATED TO A DEGREE THAT THE PERSON MAY ENDANGER THE PERSON OR ANOTHER.

DRIVING WHILE INTOXICATED

(D.W.I.)

PENAL CODE OFFENSE 49.04

A PERSON COMMITS AN OFFENSE WHEN A PERSON IS INTOXICATED WHILE OPERATING A MOTOR VEHICLE IN A PUBLIC PLACE.

STATISTICS

D.W.I. Arrests

1998	3398
1999	3131
2000	3676
2001	3561
2002	3755
2003	3774
2004	3701
2005	4028
2006	3223
2007	2935
2008	2905

STATISTICS

Average age of the D.W.I. Driver:

21 – 35 y.o.a.

70% First time offenders

Which means...Possibly first time CAUGHT..!

FATALITIES STATISTICS

1998	58 / 24
1999	59 / 28
2000	63 / 35
2001	59 / 27
2002	70 / 28
2003	51 / 19 (lowest percentile 43%)
2004	42 / 22
2005	53 / 33 (62%)
2006	46 / 28
2007	58 / 29
2008	56
2009	65
2010	61 to 12/11/10 12:24 hours

CONSEQUENCES

CRIME

PUNISHMENT

Public Intoxication

Fine (up to \$500.00) or jailed

Class "C" Misdemeanor

D.W.I.

1st Ofns

3 – 180 days in jail **(and/or)**

Class "B"

Up to \$2000.00 fine,

Loss of DL up to a year,

\$1000.00 annual fee for three (3)

years (see surcharges)

**

Minimum 6 days confinement if found with open container at time of arrest.

Consequences

Crime	Punishment
DWI 2 nd Ofns Class "A"	Up to \$4000.00 fine (and/or) One month to a year in jail Loss of DL up to 2 years
DWI 3 rd Ofns 3 rd Degree Felony	Up to \$10,000 fine (and/or) Two to ten years in prison Loss of DL up to 2 years

After two or more DWI convictions in five years, motorists must install a special (Breathalyzer) ignition switch that prevents the vehicle from being operated if they have been drinking.

CONSEQUENCES

CRIME	PUNISHMENT
Intoxication Assault	2 – 10 years State Prison
Felony 3 rd Degree	Up to \$10,000 Fine Causes Serious Injury to another
Intox. Manslaughter	2 - 20 Years in State Prison
Felony 2 nd Degree	Up to \$10,000 Fine D.W.I. AND CAUSES DEATH TO ANOTHER

MINORS

Minor(s) in Possession

21 Years of age to DRINK, PURCHASE, ATTEMPT TO PURCHASE, OR POSSESS ANY ALCOHOL by any means.

DWI for Minor(s)

A Minor operates a Motor Vehicle with "ANY" detectable amount of alcohol in their system. Offense carries a first time offense of a fine not to exceed \$500.00

ARTICLE 15

● Field Grade Article 15

Lt. Col. / Major - Battalion Commander

- Reduction of
 - One grade for E5 and E6
 - One or more grade for E4 and below
- Forfeiture of ½ month's pay for 2 months
- 45 days of Extra Duty; 60 days of Restriction (45 days if combined)
- Oral and/or Written Reprimand

ARTICLE 15

● Summarized Article 15

- 14 days of Extra Duty; 14 days of Restriction
- Oral and/or Written Reprimand
- Not entitled to defense counsel

Additional Expectations

- General Officer Memoranda of Reprimand
“GOMOR”

– Issued by Post CG

Lose driving privileges one year on post

- If caught driving on post, suspended for 5 years.

How About Motorcycles

2004 Nationwide: 4008 Motorcycle fatalities
Up 89 % since 1997

2004 Nationwide: Sale of Motorcycles purchased
734,000 / 1995 – 230,000

Why the increase?

Rollback of mandatory helmet law
Gas prices

What has happened?

Increase in Inexperienced bikers riding
powerful machines

Helmets: On or Off

Transportation code 661.003

(a) A person commits an offense if the person:

- (1) Operates or rides as a passenger on a motorcycle on a public street or highway; and
- (2) is not wearing protective headgear that meets safety standards adopted by the department.

(b) A person commits an offense if the person:

- carries on a motorcycle on a public street or highway a **Passenger** who is not wearing protective headgear that meets safety standards...

** Exceptions:

- 21 years of age; and
- successfully completed a motorcycle operator training and safety course, or was covered by a health insurance plan providing the person (operator or passenger) with at least \$10,000 in medical benefits

ADDITIONAL OFFENSES

Driving While Intoxicated with Child Passenger

PC 49.045

(a) A person commits an offense if:

- (1) The person is intoxicated while operating a motor vehicle in a public place (D.W.I.); and
- (2) The vehicle being operated by the person is occupied by a passenger who is **younger than 15 years of age.**

(b) This offense is a **STATE JAIL FELONY.**

MOST FREQUENTLY ASKED QUESTION

Possession of Alcoholic Beverage in Motor Vehicle “THE OPEN CONTAINER LAW”

PC 49.031

A person commits an offense if the person knowingly possesses an open container;

...means a bottle, can, or other receptacle that contains any amount of alcoholic beverage and that is open, that has been opened, that has a broken seal, or the contents of which are partially removed,

in a **PASSENGER AREA** of a motor vehicle that is on a public roadway, regardless of whether the vehicle is being operated or is stopped or parked.

“Points to Ponder”

As of September 1, 2003, certain offenses carry an Automatic Surcharge for Three years, including:

DWI-related offenses,

\$1,000 per year for first offense

\$2,000 per year if the court reports an alcohol concentration of .16 or more

\$1,500 per year for a second conviction within the three-year period

No insurance, driving while license suspended - \$ 250.00
and driving without a license - \$ 100.00

ALTERNATIVES TO DRINKING AND DRIVING

Choose a Driver that elects not to DRINK -

**** Designated Driver ****

Know what you are DRINKING

Know what and HOW much is in your drink

SET a LIMIT and STICK TO IT

(Plan ahead to stop after a certain # of Drinks)

DRINK SLOWLY – SIP DO NOT GULP!!

EAT before and as you drink – Food in the stomach slows down
(but does not stop) the absorption of alcohol into your system.

Be Honest and Mature – Know what YOU are doing!!

2-6 ADA Battalion Safety Pledge For Life

I _____, have received the safety briefing on DWI / Drug awareness, Suicide Prevention, and Risk Management. I will always take care of my family, my comrades and myself. I will not drink and drive nor will I let any of my loved ones or my friends do the same. Risk Assessment / Management will be my watchword. I will absolutely take no unnecessary risk that may endanger my life or the lives of other around me. I will always calculate the risks before executing the task at hand and reduce / eliminate those risks. I am empowered to stop any unsafe act and will do so to prevent injury or death. I will always "Set the Standard", because I know and understand the standard on and off duty.

This is my pledge!

Signature: _____ Date: _____

2-6 ADA Battalion Safety Pledge For Life

The Battalion Taxi Fund is available at the Battalion HQ
Building 1023 Chaffee Road, Fort Bliss
(915)568-1806

Taxi Service:
Sun City Cab Company (915) 544-2211
Checker Taxi Cab Company (915)532-2626

Safety Briefing Points:
Zero Tolerance for Drug Use, BWI/DUI, Domestic Violence

Additional Talking Points:
Use of Seatbelts, Motorcycle Safety, Water Safety, Firearms Safety, Safe Sex,
Valid Auto Insurance, Juarez Pass Requirements, and Mileage Pass

Appendix G: El Paso Fire Department Letter of Support

Dedicated to Outstanding Customer Service for a Better Community
SERVICE SOLUTIONS SUCCESS



March 29, 2011

Ms. Lorraine Torres, MS, MT(ASCP), CLS(NCA)
Chair, Institutional Review Board
Clinical Laboratory Science Program Director
College of Health Sciences
University of Texas at El Paso
El Paso, Texas 79968

Dear Ms. Torres:

The El Paso Fire Department (EPFD) is enthusiastic about partnering with the University of Texas at El Paso and Stormy Morales-Monks on her dissertation project entitled, "A Comparison of the BASICS Harm Reduction Approach and Personalized Normative Feedback for Reducing Alcohol-Related Behaviors Among Firefighters". This project is designed to examine the effectiveness of two brief motivational interventions on alcohol risk levels, alcohol-related problems, and alcohol consumption among a sample of firefighters and compare them with a standard educational intervention.

We agree that this project will not only serve as Ms. Morales-Monks dissertation project, but that she will provide our firefighters with alcohol risk reduction training. We have agreed that she and her assistants will provide this training for the EPFD training cycle which begins in May 2011. Furthermore, we have agreed that as part of the research, Ms. Morales-Monks will collect data of particular interest to the fire department. This needs assessment data and research specific data will be available to the EPFD at our request. As a principal partner, the EPFD will assist in project activities, such as providing space at the EPFD Training Academy and allotted time during the second and third training cycle for her research endeavors. Ms. Morales-Monks and her assistants will volunteer their time and efforts to complete the training for our firefighters as well as her own research. No financial agreements have been made with Ms. Morales-Monks or any other UTEP entity.



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Emma Acosta

District 4
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District 5
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District 6
Eddie Holguin Jr.

District 7
Steve Ortega

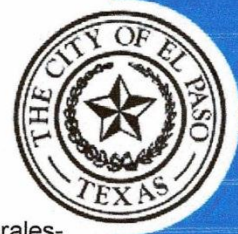
District 8
Beto O'Rourke

City Manager
Joyce A. Wilson

Fire Chief
Otto Drozd III

CITY OF EL PASO

Page 2 of 2



We look forward to participating in collaborative efforts with UTEP and Ms. Morales-Monks to reduce alcohol risk levels, alcohol-related problems, and alcohol consumption patterns among our firefighters. We believe that this innovative opportunity will be mutually beneficial to our fire department as well as to the UTEP Interdisciplinary Health Sciences Ph.D. Program and Ms. Morales-Monks. We hope that the EPFD and UTEP can build a working relationship and that UTEP may be considered a local resource in the future.

Sincerely,


Otto Drozd III
Fire Chief

CC: Alan Parsons, Fire Training Chief
Calvin Shanks, Fire Marshall

Mayor
John F. Cook

City Council

District 1
Ann Morgan Lilly

District 2
Susie Byrd

District 3
Emma Acosta

District 4
Carl L. Robinson

District 5
Rachel Quintana

District 6
Eddie Holguin Jr.

District 7
Steve Ortega

District 8
Beto O'Rourke

City Manager
Joyce A. Wilson

Fire Chief
Otto Drozd III



Appendix H: Referral Sheet

Alcohol Risk Reduction Training Referral Sheet

Thank you for your participation in the alcohol risk reduction training. Because we did not take any personal identifying information, we are unable to provide personal referrals. However, the following is a list of local, state, and national providers that may be of interest to you. If you have any questions regarding the training itself, please feel free to contact Stormy Monks.

- **Center for Employee Assistance (provides free, confidential, counseling/help to EPFD firefighter's and immediate family members): 915-544-7980 or 800-642-1152**
- Alcoholics Anonymous (El Paso): 915-757-3327 or 915-562-4295 or 915-595-9940
- Al-Anon/Alteen: 800-356-9996
- Al-Anon Family Groups, Inc.: 800-344-2666
- The Alcohol & Drug Addiction Resource Center: 800-390-4056
- Alcohol Abuse and Crisis Intervention: 800-234-0246
- Alcohol and Drug Abuse Helpline and Treatment: 800-234-0420
- Alcohol Hotline Support & Information: 800-331-2900
- American Trauma Society: 800-556-7890
- Center on Family Violence (24-hour Hotline): 915-593-7300
- Texas Council on Family Violence: 800-525-1978
- Compulsive Gambling Hotline: 410-332-1111
- Grief Recovery Helpline: 800-445-4808
- National Council on Sexual Addiction/Compulsivity: 800-321-2066
- National Center for Post-Traumatic Stress Disorder: 802-296-6300
- National Child Abuse Hotline: 800-4-A-CHILD (422.4453)
- Narcotics Anonymous (El Paso): 915-875-4725
- National Rape Crisis Hotline: 800-656-4673
- National Drug Information Treatment and Referral Hotline: 800-662-HELP (4357)
- National Domestic Violence/Child Abuse/ Sexual Abuse: 800-799-SAFE (7233)
- National Association of Anorexia Nervosa & Associated Disorders: 847-831-3438
- National Mental Health Association: 800-969-6642
- National AIDS Hotline: 800-342-AIDS (2437)
- National Sexually Transmitted Disease Hotline: 800-227-8922
- Relapse Prevention Hotline: 800-RELAPSE

Vita

Stormy M. Morales-Monks entered the Interdisciplinary Health Sciences Ph.D. Program at The University of Texas at El Paso in the fall of 2006. She successfully defended her dissertation on November 19, 2012. Her prior academic experiences include a Bachelor of Science in Health Science with a minor in Community Health Education from The University of Texas at El Paso awarded in the fall of 2003 and Master of Public Health in Community Health Education with a minor in Border Health Issues from New Mexico State University awarded in the spring of 2006. Morales-Monks is also a Certified Health Education Specialist.

During the course of her Ph.D. studies, she worked as an Alcohol Intervention Coordinator for the El Paso BASICS Program and a Research Associate under the direction of her main advisor, Dr. Joe Tomaka. As a researcher, she has been part of several collaborative studies in public health and health sciences. Specifically, her doctoral research has focused on drug and alcohol addiction and related risk behaviors. Her primary research interest is examining the effectiveness of various alcohol intervention models among various populations including college students and firefighters.

Morales-Monks presented her research at various national conferences including the Society of Behavioral Medicine and Society of Personality and Social Psychology annual conferences. She also authored several publications focusing on alcohol research, sexual victimization, self-esteem, and risky lifestyle behaviors. During the course of her dissertation studies she combined both community service and research, specifically providing alcohol interventions to the El Paso Fire Department. Moreover, she engaged in mentoring undergraduate and master level students and is an active participant in a collaborative research group through the Department of Public Health Sciences.

This dissertation was typed by Stormy M. Monks.