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CLUSTER PROFILES OF THE DRINKING MOTIVES IN A SAMPLE OF FIREFIGHTERS AND EMTS

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CLUSTER PROFILES OF THE DRINKING MOTIVES IN A
SAMPLE OF FIREFIGHTERS AND EMTS

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
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DOCTOR OF PHILOSOPHY DISSERTATION

OF

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2020

ABSTRACT

Despite the extensive literature that exists on alcohol use, misuse, and drinking to cope, a drinking culture remains prevalent in occupations that experience high volumes of induced occupational stress and exposure to trauma. To our knowledge, patterns of alcohol use motives have never been characterized in a firefighter/emergency medical technician (FF/EMT) sample, nor have they been evaluated in the context of other relevant factors. The current study investigated the Drinking Motives Questionnaire-revised (DMQ-r) within a sample of FF/EMT who reported that they currently drink alcohol (N=183). This study sought to confirm the factor structure of the DMQ-r, identify empirically derived drinking motive cluster subtypes from the DMQ-r subscales, and examine differences among the resulting clusters. Analyses confirmed the original factor structure of the DMQ-r and revealed four clusters among the DMQ-r subscales. These clusters were labeled 1) Low Motives, 2) Average/Below Average Motives, 3) High Enhancement/Social Reinforcement; Low Coping/Conformity, and 4) High Motives; Highest Coping/Conformity. Clusters differed significantly on years of service, impulsivity and sensation seeking, tension reduction, social lubrication, and alcohol use, with the differences mainly being found between the Low Motives Cluster (Cluster 1) and High Motives Clusters (Clusters 3 & 4). Lower motivation for alcohol use, as demonstrated by the Low Motive Cluster, also indicated lower levels of alcohol consumption rates, whereas our highest motivational drinking patterns, as seen in both Cluster 3 and Cluster 4, indicated a level of high-risk alcohol consumption behavior. Results of a MANOVA on psychosocial variables aided the understanding of the drinking

patterns by cluster. For example, lower scores on both tension reduction and social lubrication were identified within the Low Motives cluster. Overall, this study provides an exploratory foundation for future research on these specific motive subtypes. These subtypes will enable researchers to develop tailored interventions that can help firefighters and EMTs with the underlying reasons they drink and move away from the more generalized approach to intervention assuming all firefighters and EMTs are drinking for the same reasons.

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Nobody has been more important to me in both the completion of this project and my entire academic career than the members of my family. I would like to thank my parents and brother, whose love, guidance, and prayers are with me in whatever I pursue in life. Most importantly, I want to thank my loving and supportive wife, Melissa, and my

three wonderful children, Tyler, Noah, and Caden, who provide unending inspiration for me to be a better husband, father, student, firefighter, and individual. Their mere existence has made me a better man. My life is and always will be devoted to you.

In 2001, I stepped through that apparatus door to the 45th training academy and have served, with all my might, as a firefighter, EMT-C, and Fire Investigator. Within that timeframe, I have had many incredible and joyful experiences as well as many sorrowful and traumatic ones. I have been blessed to have come this far in good physical and mental health. I can only hope that the content of this paper will enhance our understanding of the behavioral health conditions, risks, protective factors, and interventions that would aid in the health of my brothers and sisters and their resilience in the face of stress and trauma.

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CHAPTER 1

INTRODUCTION

The history of the fire service in the United States dates back to the 1600s, however, it was not until 1853 when Cincinnati, Ohio featured the first full-time paid fire department in the U.S. Since its inception, the fire service has been considered to be one of the most stressful occupations in the world. Most recently, in March of 2019, CNBC and CBS News ranked firefighting as the second most stressful job in the United States (Renzulli, 2019; Min, 2019). On a daily basis, the men and women of the fire service are exposed to a variety of stressors, including but not limited to, life threatening situations, structure and vehicle fires, hazardous materials incidents, large scale disasters, loss of human life, and injuries or death to children. With this exposure to continuous, and at times, significant traumatic stress, firefighters and emergency medical technicians (FFs/EMTs) face a variety of behavioral health risks and/or conditions, including but not limited to, alcohol use and misuse. Research has shown a clear link between stress and alcohol use and misuse within a FF/EMT population (Bing-Canar et al., 2019, Smith et al., 2019, Tomaka et al., 2017), with one specific motivation for consuming alcohol is drinking to cope (Bacharach et al., 2008).

Since the 1990s, research expanded to understand an individual's motivations to consume alcohol (Cooper, 1994) with several explanations underlying an individual's motivation to consume alcohol; however, little to no known research has examined the relationship between the drinking motives within a FF/EMT population beyond drinking

to cope. With such a large number of FFs/EMTs drinking alcohol in an unhealthy and often risky way, it is important to better understand the specific pattern and relationship between the motives that underlie drinking in this occupation. While some work has been done on the drinking motives themselves (Hasking et al., 2011; Hawn et al., 2018), no known work has been done to determine if this large group of drinkers in the FF/EMT occupation can be better understood by examining patterns within their motives to drink.

CHAPTER 2

REVIEW OF THE LITERATURE

Alcohol Use among FFs/EMTs

Numerous studies have examined the impact of various behavioral health risks and/or conditions existing within a population of FFs/EMTs (Bacharach et al., 2008; Gallyer et al., 2018; Haddock et al., 2012; Smith et al., 2019). Furthermore, it is widely known that this high-risk population is at an increased risk for developing both physical (i.e., cancer, lung disease, heart failure) and behavioral health outcomes (i.e., depression, PTSD, Substance Abuse Disorders). One particular issue, problematic alcohol use, has been identified as a reoccurring theme within a FF/EMT population throughout the late 1990s and presently into the twenty-first century (Bacharach et al., 2008; Boxer & Wild, 1995). Next, is a brief review of past research concerning alcohol use amongst FFs/EMTs.

In a large national study of career firefighters, Haddock et al. (2015) found that more than 85% of firefighters consume alcohol, nearly half drink to excess (i.e., three or

more drinks per day on average), and approximately one-third reported periodic heavy drinking when off duty (i.e., five or more drinks on an occasion). These results are consistent with previous research suggesting that first responders represent a particularly vulnerable population with regard to alcohol misuse and alcohol use disorder (AUD; Bartlett et al., 2019; Carey et al., 2011; Haddock et al., 2012; North et al., 2002; Piazza-Gardner et al., 2014), including alcohol abuse and dependence as defined by the Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition (Smith et al., 2019). Lifetime AUD prevalence rates of 47% have been documented among firefighters (North et al., 2002), in comparison to 29.1% reported for the general population (Grant et al., 2015).

In 2011, Carey et al. sampled 112 firefighters to assess for sleep problems, depression, and substance use. Although their study was limited by a small sample size, they found problematic drinking behavior existed in their sample as well (i.e., 58% reported binge drinking behavior; 14% reported hazardous drinking behavior, and 80% used alcohol with an average of > 10 drinks/wk). Although high-risk health behaviors that impact psychosomatic well-being were confirmed to exist in the firefighting profession, Carey et al. (2011) admitted there was still a need to explore further the inter-correlation relationships between these behaviors.

Although there is sufficient data indicating a problem of alcohol use within the fire service, the question still remains as to why. Presently, the examination of first responder behavioral health continues to be a source of discussion within the realm of substance abuse, in particular, alcohol use disorders (North et al., 2002). AUDs stemming

from frequent exposure to traumatic events continues to be examined and results replicated by researchers around the globe. When addressing exposure to traumatic events and its resulting affect, one of the most relevant topics and source of information pertaining to a firefighter population is the phenomena of occupational stress. A brief overview of occupational stress followed by its effect on a firefighters' drinking to cope is necessary to understand the connection between stress and alcohol use.

Stress and Alcohol Use

Occupational stress, or sometimes referred to as job-related stress, can be defined as a situation wherein job-related factors interact with the worker to change his or her psychological and/or physiological condition such that the person is forced to deviate from normal functioning (Singh et al., 2019). Occupational or work-related stress constitutes one of the most prevalent work-related health problems in Europe and around the world (Brookes et al., 2013). Occupational stress is known to contribute to a range of psychological, behavioral, and physical health problems (Corneil et al., 1999; Murphy et al., 1999); it is perhaps not surprising then, that firefighters have been shown to be at an increased risk for substance use disorders, depression, posttraumatic stress disorder (PTSD), and occupational burnout (Beaton & Murphy, 1993; Corneil et al., 1999). It is understood that firefighters face a significant amount of occupational stress. These men and women provide many essential public services, including responding to fires, medical emergencies, traffic accidents, and natural disasters. Attributable to the unique nature of their occupation, firefighters often report elevated levels of occupational stress (Beaton & Murphy, 1993; Corneil et al., 1999; Murphy et al., 1999). For example,

firefighters must cope with exposure to potentially traumatic events (e.g., recovering dead bodies, suicides, & deaths including children) on a regular basis (Beaton et al., 1996; Corneil et al., 1999; Murphy et al., 1999), and they are required to perform many physically and psychologically demanding tasks in dangerous and high-pressure situations such as suppressing fires, entering burning buildings to rescue trapped victims, and providing medical aid to seriously injured victims (Kimbrel et al., 2011). Research has offered a number of physiological explanations for the linkages between incident exposure, subsequent negative affect, and problematic drinking behaviors as an attempt to cope with stress and trauma (Bacharach et al., 2008).

The rates of alcohol use above have been linked, but not limited to, drinking to cope with the stress/distress of the occupation and it is important to note that several major theories view stress as a precipitant of Substance Use Disorders (SUDs; Lin et al., 2020). For example, the stress-coping model (Wills & Shiffman, 1985), tension-reduction model (Conger, 1956), and the self-medication model (Khantzian, 1987), all highlighted the use of substance as a maladaptive coping strategy in response to stress (Lin et al., 2020).

Although the topic is far too extensive to elaborate on, understanding the biology of the stress response behind an individual's response to consume alcohol also should be briefly mentioned. The "fight or flight" response, first described by Walter Cannon in 1932, describes the physiological reaction in a human as a response to a perceived harmful event, attack, or threat to their survival. There is no denying that first responders face this "response" daily in their occupations. Accompanied by this exposure to

uncontrollable stress is fear. Fear prompts the release of corticotropin-releasing hormone (CRH), which in turn stimulates the release of proopiomelanocortin (POMC), a large molecule that is broken up into several parts including adrenocorticotrophic hormone (ACTH), which is responsible for the familiar “fight or flight” response. Furthermore, beta-endorphin, which may have the survival advantage of numbing pain in the organism, is attacked (Volpicelli et al., 1999). In order to condense and simplify, research has proposed that the link between incident exposure and drinking may be endorphin related (Volpicelli et al., 1999). Endorphins are neurochemicals which act on the opiate receptors in our brain and are responsible for reducing pain and boosting pleasure (Cafasso, 2017). Previous findings from such studies, such as Volpicelli and colleagues (1999), suggest that individuals who experience a traumatic event often experience a biochemical response of an endorphin release, which helps to numb the physical and emotional pain of the trauma (Bacharach et al., 2008). However, in order to replace the endorphin-based numbing effect after it has subsided, some individuals may turn to alcohol to cope with the ongoing stress and trauma. Therefore, people who either experience several traumatic events (e.g., first responders) or continually re-experience the same event (e.g., individuals diagnosed with PTSD), will drink to reproduce the numbing effects experienced with increased levels of endorphins (Volpicelli et al., 1999). Epidemiological evidence suggests that the job-related stressors impacting fire service personnel creates a heavy toll on their health, particularly in terms of an elevated occupational prevalence of PTSD, and many other adverse health outcomes (Beaton et al., 1996). There continues to be widespread agreement that certain coping responses are generally adaptive or

protective, while others, such as an over-reliance on alcohol, are maladaptive (Beaton et al., 1999), especially pertaining to traumatic experiences produced from high-risk occupations.

In 1985, the National Institute for Occupational Safety and Health (NIOSH) initiated a study of occupational stress among first responders at the request of the International Association of Fire Fighters (IAFF) (Boxer & Wild, 1993). In the years to follow, Boxer and Wild would end up sampling 145 first responders from the Cincinnati Fire Department in order to enumerate potential occupational stressors, assess psychological distress and problems with alcohol use, and determine whether a relationship existed between those variables and self-reported stressors. Their work can be considered ground-breaking in the topic of alcohol use and abuse within the fire service, in particular, their attempt at linking the role of stress (i.e., psychological distress) to alcohol abuse. Their results suggested that participants frequently experienced psychological distress (>33%), struggled with depression (33% at least mild depression), and suffered from possible or probable alcohol abuse (29%).

Alcohol Use as a Coping Mechanism

Although an important revelation was brought to the surface, Boxer and Wild's (1993) message of alcohol abuse seemed to dissipate until approximately fifteen years later when evidence supporting a mediating role of psychological distress in the trauma-problem drinking relationship had been continued in part by work done by Bacharach et al. (2018). Some research within high-stress occupations continued throughout the 1990s, such as the work of Kessler et al. (1995) and Bremner et al. (1996) performed on combat

survivors. Although neither of these studies necessarily focused on individuals who experience a traumatic incident during their work role, the framing of alcohol as a means by which to cope with critical incident-related distress was consistent with previous conventional models of work-related risk factors and employee problem drinking (Bacharach et al., 2008).

Bacharach et al. (2018) investigated this distress-mediated relationship between workplace critical incidents and problematic drinking behavior by sampling 1,481 firefighters from the New York City Fire Department (FDNY). The survey was administered approximately a year and a half following the tragic 9/11 terrorist attacks that struck the heart of the city. Three hundred forty-three NYC firefighters perished on that day, and since then, at least 200 have died from “Ground Zero” related illnesses. It was no surprise that in the wake of the terrorist attack, traumatic firefighter drinking and comorbidity had become commonplace. Bacharach et al. (2008) postulated several hypotheses, one in particular which measured the severity of distress symptomatology and predicted that distress would mediate the positive relationship between the intensity of workplace critical incidents and drinking to cope. Their results replicated earlier studies confirming the link between critical incidents, distress, and drinking to cope. At the time, although they used controlling measures with the firefighters they sampled, Bacharach et al. (2018) claimed that sampling NYC firefighters merely 18 months following the 9/11 incident may have been a limitation to their study. It can be agreed upon that not all incidents which are encountered by firefighters are to the magnitude of

9/11; however, it is important to reemphasize that exposure to critical incidents plays a pivotal role in maladaptive means of coping.

Despite clear theoretical linkages between firefighting, posttraumatic stress symptoms (PTSS), alcohol misuse, and maladaptive coping strategies, there continues to be gaps within the literature. Joe Tomaka and his colleagues (2017) attempted to rectify some of these omissions in our understanding of PTSS, alcohol misuse, and coping. In the end, they expressed their concern for necessary periodic screening for PTSS and at-risk drinking among employees within these high-risk and trauma exposed professions.

In 2018, Kim et al. conducted the first study to date that investigated the mediating role of perceived job stress and resilience in the association of trauma exposure with AUDs and depression in a sample of Korean firefighters. Their results demonstrated that PTSD, perceived job stress, and resilience can mediate the development of depression or AUDs following trauma exposure. Although protective factors and interventions will be discussed later, one crucial aspect of Kim et al.'s (2018) study was the mediating role of resilience on reported depression and AUDs. Efforts to increase individual resilience could help prevent these negative behavioral health conditions in a first responder population.

In 2019, researchers from the Trauma and Stress Studies Center sampled 654 Houston firefighters who endorsed exposure to potentially traumatic events and lifetime alcohol use in an attempt to explain the role impulsivity may have on a first responder's PTSS severity and alcohol consumption. Bartlett et al. (2019) hypothesized that firefighters with higher levels of PTSD symptomatology, who reported heightened

impulsivity, would manifest the highest levels of alcohol use severity. Their results confirmed their hypothesis and was the first study to provide a focused examination on impulsivity and its association between PTSD symptomatology and alcohol use among first responders.

Motives to Drink

As illustrated above, much research has shown the link between alcohol use, stress, and coping but it is important to understand that other drinking motives exist as well. Drinking motives have been identified as an important component in understanding why individuals choose to use alcohol (Martens, 2008). Cooper, Frone, Russell, and Mudar (1995) found that the desire to control negative affective states through drinking is a significant motive for alcohol use. This is consistent with literature demonstrating that, although there are other common drinking motives such as enhancement and social motives, drinking to cope is related to more drinking problems (Catanzaro & Laurent, 2004; Cooper et al., 1995; Grant et al., 2007; Hasking et al., 2011; McNally et al., 2003). Extant empirical work suggests that firefighters may resort to drinking in order to cope with job-related stress (Bacharach et al., 2008) and as mentioned previously, studies conducted on firefighters have found that alcohol use was one of the most frequently reported coping strategies for managing work-related stress (Pfefferbaum et al., 2002). A brief review of the most common assessment of motivational drinking as established by Cooper and her colleagues (1995) is discussed next.

In 1995, Cooper et al. developed a motivational model of alcohol use in which people were hypothesized to consume alcohol to regulate both positive and negative

emotion. In theory, individuals drink alcohol to control or impact the quality of their emotional mental condition. Specifically, individuals may use alcohol to either reduce negative affect when they are anxious or over-aroused, or to enhance positive affect when they are fatigued, under-aroused, or desire to enhance social occasions or interpersonal cohesion (Wills & Shiffman, 1985). In addition, Read et al. (2003) expanded this model to include social factors for alcohol consumption. In their research, they found that social reinforcement motives, combined with both enhancement and coping motives, played a role in the connection between social influence factors and alcohol use.

One of the most routinely used measures to examine drinking motives is the Drinking Motives Measure (DMM; Cooper, 1994; Cooper et al., 1992). The DMM was originally developed as a three-subscale measure that assessed social, enhancement, and coping motives for alcohol use. In a follow-up study, Cooper (1994) developed items to assess a second, negatively impacting reinforcing motive, conformity, because she believed that a desire to fit in with one's peers would be a strong motivating factor to choose alcohol among adolescents. The end result was The Drinking Motives Questionnaire-revised (DMQ-r; Cooper, 1994) which took into account all four motivations for drinking.

Enhancement Motives. Enhancement motives involve the strategic use of alcohol to increase positive affective states or emotional experiences. Drinking to enhance is therefore conceptualized as an appetitive process and as a behavior emitted to achieve a desired state or outcome rather than avoid or minimize an aversive one (Cooper et al.,

1995). In previous literature, salient predictors of enhancement motives were social lubrication outcome expectancies and impulsivity-sensation seeking measures. As performed in prior research, these constructs were also utilized in our study as variables to enhance our understanding of drinking motives. Impulsivity, which is defined as a general tendency to act without planning ahead and to seek out immediate gratification, has been thought to be related to all types of drinking motivations (Mackinnon et al., 2014), whereas sensation seeking represents the need for intense, novel, and exciting experiences (Zuckerman, 1994).

Coping Motives. Coping motives for alcohol consumption, or more commonly referred to as drinking to cope motivation, are presumed to operate on the principal of negative reinforcement and involve drinking to make one's negative feelings more tolerable (Cooper et al., 1992; Read et al., 2003). Notable predictors of drinking to cope motivation are negative affect and tension-reduction alcohol expectancies. Research has linked both negative affect (Cooper, 1994; Cooper et al., 1995, Read et al., 2003) and tension-reduction alcohol expectancies (Conger, 1956; Kushner et al., 1994) to alcohol use and misuse and can be considered important predictors of drinking to cope motivations; therefore, these variables were also utilized in this study.

Tension-reduction alcohol expectancies appeared to be more applicable to our study as opposed to negative affect. Tension-reduction theory (Conger, 1956) has been put forward as a model explaining alcohol use, which suggests that 1.) alcohol reduces tension states such as anxiety and 2.) alcohol is sought and consumed for its tension-

reducing properties (Kushner et al., 1994). Furthermore, tension-reduction alcohol expectancies have been demonstrated to be associated with problem drinking and individuals who possess these expectancies will be motivated to drink at times when they experience negative mood states (Kushner et al., 1994; Read et al., 2003). Also, research conducted on specific populations, such as FFs/EMTs, has linked stress, specifically occupational stress, with drinking to cope motivations for alcohol use (Corneil et al., 1999; Murphy et al., 1999).

Social Reinforcement Motives. Social reinforcement motives involve drinking alcohol for social purposes, such as to enhance the enjoyment of a social occasion, to facilitate social interaction, or to partake in a shared social activity (Cooper, 1994). Although no study, to our knowledge, has examined social reinforcement motives among FFs/EMTs, these motives are believed to play a central role in alcohol consumption amongst this population. In the world of the fire service, firefighting is an occupation with characteristics such as close quarter living and/or camaraderie. For instance, firefighters spend many hours in their assigned stations and during these hours they perform activities together such as cooking for an evening meal or exercising with each other. Spending many hours together creates a social bond between many of the members. This bond is commonly known within the fire service as “brotherhood.” Traditionally, brotherhood signifies what one is willing to do for their brother (i.e., FF/ EMT colleague). It is a solemn oath to face danger and fear and possibly give one's life, if necessary, for their brother. It is not a matter of receiving, but a matter of giving. It is not a matter of avoiding personal accountability, rather a matter of accepting responsibility

(Crosby, 2007). Many firefighters continue this social bonding after their shift has ended; and given the fact that the concept of brotherhood is deeply rooted in the common experience of individuals within the fire service, research examining social reinforcement motives and other social influence correlates in this population constitutes an important focus. It is possible that due to this social bond, one's drinking behavior may be affected by their social or peer influences.

As used by Read et al. (2003), a notable variable linked with social reinforcement drinking motives was alcohol offers (AO). AO, as defined here, is simply a measure of direct and explicit offers to use alcohol such as being offered a drink (Read et al., 2003).

Conformity Motives. Conformity motives, which are defined as external/negative drinking motives, were originally described as drinking in response to social pressures (Cooper, 1994). Conformity motives have had inconsistent results with weak predictive power of alcohol use. However, drinking to conform is primarily responsive to external social pressures to drink (Cooper, 1994) and had appeared to be applicable to a fire service population. In our study, we attempted to design a new measure to understand conformity motives in a firefighter population by make use of the previously mentioned historical construct of "brotherhood." A silent/unexpressed goal was also to create a new and measurable variable which could be utilized for future research. Derived from the research of McMillan and Chavis (1986), we created a new measure of sense of community, which we called "sense of brotherhood." Taking into account the inconsistent results in prior literature pertaining to conformity motives, we attempted to accurately

explain and enhance our perception of conformity drinking motives in a FF/EMT population with our newly constructed “brotherhood” variable. A brief description of the sense of community variable and its transition into our “brotherhood” variable is explained next.

Sense of community (SOC), often referred to as psychological sense of community, has been predominantly associated with the McMillan and Chavis (1986) model. Alternative conceptions and measures notwithstanding, the Sense of Community Index (SCI) or some adaptation of it, has been utilized by much of the empirical work used to measure SOC (Peterson et al., 2008). The SCI was intended to be an assessment of four dimensions of SOC as articulated in McMillan and Chavis’ (1986) model. In 2008, Peterson et al. shortened the scale to eight items which contained a more condensed, yet still reliable measurement of these four dimensions of one’s sense of community. These dimensions include 1.) needs fulfillment (i.e., a perception that members’ needs will be met by the community), 2.) group membership (i.e., a feeling of belonging or a sense of interpersonal relatedness), 3.) influence (i.e., a sense that one matters, or can make a difference, in a community and that the community matters to its members), and 4.) emotional connection (i.e., a feeling of attachment or bonding rooted in a members’ shared history, place or experience; Peterson et al., 2008).

In our particular study, the wording for each item was slightly changed to address the population of interest. For example, an original item would say, “I feel connected to this neighborhood.” The wording for our study said, “I feel connected to this

brotherhood.” This adjustment in wording is assumed to be more applicable to firefighters. Brotherhood, now a measurable variable within a first responder population, could be an important future construct of usable value within the fire service. Furthermore, it is believed, that a measurement of brotherhood could enhance the understanding of drinking within the firefighter population in our study.

The present study begins to fill this gap in the literature by utilizing a FF/EMT sample to address these three study aims: (1) confirm the factor structure of the Drinking Motives Questionnaire-Revised (DMQ-r), (2) identify drinking motive cluster subtypes, and (3) examine demographic and psychosocial differences across the resulting cluster subtypes.

CHAPTER 3

METHODOLOGY

Cross-sectional data analyses were utilized to address the research questions of the current study. The University of Rhode Island's Institutional Review Board approved all procedures and surveys for human subjects' protections for the current study (IRBNet ID# 849127-3). Permission to conduct the study was also granted by representatives from the fire department's administration staff and the union membership (i.e., firefighters/EMTs). All analyses for this study were conducted in SAS (SAS Institute, 2018) and SPSS (IBM Corp, 2019).

Participants

Participants were firefighters/EMTs (FF/EMTs) selected from a career fire department located in the northeastern United States. As a part of a cross-sectional study of alcohol use, 225 FFs/EMTs, were recruited in the spring of 2016. Participants with a significant amount of missing data ($n=20$) were removed from the sample, leaving $N=205$. Lastly, since the current study examined alcohol use motives, only participants who indicated any quantity of drinking consumption were retained in the sample. After removing non-drinkers ($n=22$) from the data, the remaining sample size was $N=183$. Table 1 shows the demographic characteristics of the final sample: 176 males (96.2%) and 7 females (3.8%). Participants were an average of 43.6 ($SD = 9.4$) years of age. The majority of participants, approximately 82.5%, were White/Caucasian, while approximately 4.4% identified as Hispanic/Latino and approximately 4.4% as Black/

African American. Four participants (2.2%) identified as American Indian or Alaskan Native. One participant (0.5%) identified as Asian/Pacific Islander. Five individuals (0.49%) did not answer the ethnic background question. The average number of years of service for participants working as a career FF/EMT on that particular fire department was 17 ($SD = 9.5$). Lastly, 154 (84.2%) participants reported being in a relationship, and 29 (15.8%) reported being single. Demographic variables are listed in Table 1.

Table 1
Sample Demographics

<i>Variable</i>	<i>N</i>	<i>%</i>
Gender		
Female	7	3.8%
Male	176	96.2%
Race		
White/Caucasian	151	82.5%
Hispanic/Latino	8	4.4%
Black/African-American	8	4.4%
Native American	4	2.2%
Asian	1	0.5%
Preferred not to answer/Other	5	2.7%
Relationship Status		
Married	108	59%
Divorced & now single	5	2.7%
Divorced & in a new relationship	15	8.2%
Separated	2	1.1%
In a domestic partnership or civil union	5	2.7%
Single, but cohabiting with a significant other	24	13.1%

Single, never married	24	13.1%
	Mean	(SD)
Age	43.6	9.40
Years of Service	17.04	9.54

Procedure

Participants were contacted initially by the fire department’s email server during the spring of 2016 and were invited to complete a confidential survey of FF/EMT health behaviors. All participants provided informed consent and then completed a battery of questionnaires (See Appendix A). The survey remained open to be completed by members for a period of two months.

Measures

The measures that were used in the analyses described below were employed in a three-step procedure. Below is the description of all variables collected for this study. The full survey can be found in Appendix A.

Demographics

Age, gender, ethnicity, and length of time on the fire department (years of service) were collected via single item measures.

Relationship Status

Relationship status was measured by a single item measure which asked for participants to identify their relationship status with eight distinct options. The following items were the options available to identify with: 1.) married, 2.) widowed, 3.) divorced and now single, 4.) divorced and in a new relationship, 5.) separated, 6.) in a domestic partnership or civil union, 7.) single, but cohabiting with a significant other, and 8.) single, never married. With the intention to dichotomize relationship status into a more condensed and measurable item, the original relationship status variable was separated into categories of “single” or “in a relationship.”

Drinking Motives

The Drinking Motives Questionnaire-revised (DMQ-r; Cooper, 1994) is a 20-item self-report questionnaire designed to assess the four drinking motives in Cooper's model: Social (e.g., “To be sociable.”), Enhancement (e.g., “Because it's exciting.”), Coping (e.g., “To forget your worries.”), and Conformity (e.g., “Because your friends pressure you to drink.”). Participants were asked to estimate frequency of drinking for each listed reason, considering all occasions the individual has consumed alcohol, on a scale ranging from 1 (almost never/never) to 5 (almost always/always). Each 5-item subscale was summed and the mean total score used in the analyses. The mean total score of the subscales were enhancement 2.46 ($SD = 0.92$), coping 1.72 ($SD = .76$), social reinforcement 3.01 ($SD = 0.89$) and conformity 1.34 ($SD = 0.52$). Internal consistency reliability for the

drinking motives were good for all four subscales {enhancement ($\alpha=0.832$), coping ($\alpha=0.82$), social reinforcement ($\alpha=0.838$), and conformity ($\alpha=0.761$)}.

Impulsivity/Sensation Seeking. Impulsivity, which is defined as a general tendency to act without planning ahead and to seek out immediate gratification, has been thought to be related to all types of drinking motivations (Mackinnon et al., 2014). Impulsivity-sensation seeking was measured by a 19-item personality trait measure, assessed with a true-false format by the Impulsivity/Sensation Seeking Scale (ImpSS; Zuckerman, 1994). Items include “I usually think about what I am going to do before doing it” and “I like to have new and exciting experiences and sensations even if they are a little frightening.” Sensation seeking represents the need for intense, novel, and exciting experiences (Zuckerman, 1994). Both constructs, impulsivity and sensation seeking, have often been conceptually linked and associated with increased alcohol use (cf. Mackinnon et al., 2014) and were considered relevant in a firefighter population. Coefficient alpha was 0.81 in a college sample from previous research (Read et al., 2003). In this study, however, when calculated as a complete scale for this sample, coefficient alpha was 0.667, indicating less, yet acceptable internal consistency. Furthermore, if considering both constructs, impulsivity and sensation seeking separately as subscales, internal consistency drastically declines for both impulsivity ($\alpha=0.38$) and sensation seeking ($\alpha=0.522$). Therefore, the full scale was utilized for this present study and items from each respective scale were summed for use in the analyses.

Social Lubrication. Social lubrication expectancies are beliefs that alcohol use will enhance social situations and make them more enjoyable (Read et al. 2003). Social lubrication is an 8-item scale devised by Sher, Walitzer, Wood, and Brent (1991). Items include “Drinking makes any celebration more enjoyable” and “Drinking makes me feel cool.” Response options range from 0 (not at all) to 4 (a lot). The five items representing social lubrication were summed and the average of the items was used in the analyses. Coefficient alpha for this variable in this sample was ($\alpha=0.881$).

Tension-Reduction. As mentioned previously, tension-reduction theory (Conger, 1956) has been put forward as a model explaining alcohol use, which suggests that 1.) alcohol reduces tension states such as anxiety and 2.) alcohol is sought and consumed for its tension-reducing properties (Kushner et al., 1994). Furthermore, tension-reduction alcohol expectancies have been demonstrated to be associated with problem drinking and individuals who possess these expectancies will be motivated to drink at times when they experience negative mood states (Kushner et al., 1994; Read et al., 2003). Tension-reduction alcohol expectancies is a 9-item scale devised by Sher, Walitzer, Wood, and Brent (1991). Items include “Drinking helps me forget problems at work” and “Drinking helps me to feel better when I am down.” Response options range from 0 (not at all) to 4 (a lot). The five items representing tension reduction were summed and the average of the items was used for the analyses. Coefficient alpha for this scale was ($\alpha=0.908$).

Occupational Stress

The Sources of Occupational Stress-14 (SOOS-14) has been previously used within a similar population (Kimbrel et al., 2011; Stanley et al., 2018; VanderVeen et al., 2012) and was most relevant to this study. The original Sources of Occupational Stress (SOOS) scale assessed occupational stressors specific to firefighters and emergency response personnel (Beaton & Murphy, 1993). The revised SOOS-14, devised by Kimbrel et al. (2011), is a more practical, reliable, and valid measure of occupational stress and the brevity of the SOOS-14 renders it more manageable than the full 57-item version. Items include “How bothered are you about having a poor diet while eating at the station?” and “How bothered are you about exposure to anxious or overly demanding coworkers or administrators?” Response options range from 1 (not at all bothered) to 5 (extremely bothered). All 14 items were summed and the average of the items was used in the analyses. Previously, the internal consistency coefficients for two separate studies were sufficient for the shortened SOOS-14 version ($\alpha=.82$; $\alpha=.86$: Kimbrel et al., 2011). Based upon practicality, the SOOS-14 was also utilized in this study. Coefficient alpha for this study was ($\alpha=0.866$).

Alcohol Offers

As used by Read et al., 2003, a notable predictor of social reinforcement drinking motives was alcohol offers (AO). As previously mentioned, AO, as defined here, is simply a measure of direct and explicit offers to use alcohol such as being offered a drink (Read et al., 2003). Alcohol offers are assessed with 4 items that assess the frequency the

participant has been given or offered a drink without requesting one or has been given unwanted refills. Items include “How many times have you been given a drink without asking for it?” and “How many times has someone filled up your drink without asking you if you wanted it filled up?” Response options range from 0 (1-2 times) to 4 (10 or more times). Alcohol offers represent a more direct form of social pressure that may uniquely motivate drinking behaviors (Wood et al., 2001). Coefficient alpha for this measure has shown to be 0.88 in a college sample (Read et al., 2003). Coefficient alpha for this measure in the current study was ($\alpha=0.873$), which was virtually identical to that from Read et al., 2003.

Sense of Brotherhood

As a reminder, in our study, we attempted to design a new construct to apply to a firefighter population by making use of the previously mentioned historical construct of “brotherhood.” It was an attempt to create a new and measurable variable which could be utilized for future research. So, derived from the research of McMillan and Chavis (1986), we created a new measure of sense of community (i.e., sense of brotherhood) which was used to measure a firefighter’s affiliation with the brotherhood.

As mentioned previously, the wording for each item within the scale was slightly changed to address the population of interest in an attempt to measure the construct “sense of brotherhood” as opposed to the original scale’s measurement of “sense of community.” Response options range from 1 (Strongly disagree) to 5 (strongly agree). It is hypothesized that if the mean score is 3, then the participant would have a neutral stance of where he/she feels connected to their brotherhood. The closer the mean score is

to 5, the stronger the connection to brotherhood, whereas the closer the mean score is to 1, the lesser the connection to brotherhood. Cronbach's alpha for the overall BSCS in previous research showed good internal consistency of 0.92, with alphas for the subscales as 0.86 for needs fulfillment, 0.94 for group membership, 0.77 for influence, and 0.87 for emotional connection (Peterson et al., 2008). However, the current research wanted to avoid the use of only two items per subscale and thus, for this study, the overall BSCS scale was used with Cronbach's alpha being 0.924. This was almost identical to the overall internal consistency found in prior research.

Alcohol Use

The Daily Drinking Questionnaire-revised (DDQ-r) consists of a shortened version of the DDQ designed to measure volume, quantity and frequency of alcohol consumption (Collins et al., 1985). The DDQ-r asks participants to estimate average alcohol consumption for each day of the week during the previous 30 days (Kivlahan et al., 1990). The DDQ-r also evaluates the participant's number of drinks and hours of drinking for each day of the week on both a typical drinking week and a heavy drinking week. Typically, this variable has been used as a single manifest variable, however, theoretically and visually, the DDQ-r divides alcohol use into four categories/variables (typical drinks per week, typical hours per week, heavy drinks per week, and heavy hours per week). Both internal consistency for the whole scale ($\alpha=0.948$) and internal consistency for all four sub-categories, typical drinking ($\alpha=0.826$), typical hours ($\alpha=0.804$), heavy drinking ($\alpha=0.849$), and heavy hours ($\alpha=0.855$) were good. Refer to

Table 2 for a depiction of the means, standard deviations, and ranges of all the continuous variable used in the current study.

Table 2.

Ranges, Means, and Standard Deviations for All Scales

<i>Variable</i>	<i>N</i>	<i>Possible Range</i>	<i>Sample Range</i>	<i>Mean</i>	<i>SD</i>
Years of service	183	1 - 42	2 - 37	17.04	9.54
Impulsivity/Sensation Seeking	183	0 - 19	2 - 16	9.93	3.22
Social Lubrication	183	0 - 32	0 - 24	6.52	5.88
Tension Reduction	183	0 - 36	0 - 34	9.05	7.07
Occupational Stress	183	14 - 70	14 - 67	36.77	10.27
Brotherhood	183	1 - 5	1 - 5	3.9	0.853
Alcohol Offers	183	0 - 20	0 - 16	6.91	4.29
Drinks/typical week	183	0 - 63	1.5 - 52.5	12.23	10.45
Hours/typical week	183	0 - 63	0 - 45	10.45	8.11
Drinks/heavy week	183	0 - 63	0 - 63	17.03	13.63
Hours/heavy week	183	0 - 63	0 - 63	14.11	11.59

Psychosocial variables in previous research

Overall, the means in this sample for all variables appear to be higher than what has been reported in other studies that have used these measures (Read et al., 2003; Sher et al., 1991; Stanley et al., 2018). These studies have been conducted with college students and the mean total scores on these psychosocial variables were as follow: impulsivity/sensation seeking [8.99 ($SD=4.41$)], tension reduction [7.98 ($SD = 6.43$)],

and social lubrication [7.45 ($SD = 5.93$)]. Sources of occupational stress [24.57 ($SD = 10.33$)] has been conducted on a first responder population.

Lastly, the criteria for high-risk alcohol use among adults has been demonstrated at 14 drinks per week for males and 7 drinks per week for females (NIAAA, 2009). Male participants in our study reported consuming approximately 11 drinks on a typical week and approximately 15.3 drinks on a heavy week over the past 30 days. Women reported consuming 7.4 drinks per week on a typical week and 13 drinks per week on a heavy week.

Analyses

Aim 1. Confirm the factor structure of the DMQ-r.

Analysis. A Principal Components Analysis (PCA) was conducted to establish the factor structure of the 20-item motive scale. While it was expected that the original four subscales (social, enhancement, coping, and conformity) would emerge, this step was the first thorough examination of the drinking motives measure within a population of firefighters and EMTs.

Aim 2. Identify drinking motive cluster subtypes.

Analysis. Cluster analysis was used to uncover subgroups (profiles) among the individuals in relation to their drinking motives.

Aim 3. Examine demographic and psychosocial differences across the resulting cluster subtypes.

Analysis. Inferential statistics were used to compare the formed clusters to other psychosocial variables that were not included in the clustering process (i.e., alcohol

expectancies, sense of brotherhood, sources of occupational stress, alcohol consumption, etc.). Cross tabulations analysis, multivariate analysis of variance (MANOVA), and analysis of variance (ANOVA), were conducted with the clusters depending on the variable types.

CHAPTER 4

FINDINGS

Aim 1. Confirm the factor structure of the DMQ-r.

Due to a limitation in the size of the sample, the sequential approach to measurement developed was not utilized, however, a thorough examination of the DMQ-r and a Principal Components Analysis (PCA) were conducted to establish the factor structure of the 20-item motive scale. As previously stated, while it was expected that the original four subscales (social, enhancement, coping, and conformity) would emerge, this step was the first thorough examination of the drinking motives measure within a population of firefighters and EMTs.

Principal Component Analysis

Using the Eigenvalue cutoff rule (Kaiser rule), scree plot, parallel analysis and subjectively evaluating the variance explained, the number of components retained was four. Although a fifth eigenvalue was above the cutoff value of 1, this fifth component only explained 5.7% more of the data. Contrarily, using parallel analysis, the number of components suggested to retain was three. However, due to the explainability of a 4-

component (i.e., factor) solution as opposed to a 5 or a 3-component solution, it was decided to keep consistent with theory and retain four components. The four subdomains were named to coincide with previous research as “Enhancement Motives,” “Coping Motives,” “Social Reinforcement Motives,” and “Conformity Motives.” It is important to note, that all items within the scale loaded on the intended subdomain with the exception of item #15 (Because you feel more self-confident and sure of yourself). Table 3 shows the eigenvalues and the percentage of variance explained. Figure 1 illustrates the scree plot and Table 4 shows the factor loadings of the DMQ-r after Varimax rotation. The resulting subscales were utilized in the remaining analyses.

Table 3.
DMQ-r Principal Components Analysis Eigenvalues

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	6.599	32.997	32.997
2	2.658	13.29	46.286
3	1.866	9.328	55.614
4	1.302	6.511	62.126
5	1.148	5.742	67.868
6	0.777	3.885	71.752
7	0.74	3.7	75.453
8	0.657	3.285	78.738
9	0.542	2.708	81.446
10	0.533	2.667	84.112
11	0.487	2.433	86.545
12	0.455	2.277	88.822

13	0.422	2.11	90.932
14	0.389	1.945	92.877
15	0.314	1.57	94.448
16	0.273	1.363	95.81
17	0.249	1.243	97.054
18	0.215	1.077	98.131
19	0.196	0.979	99.11
20	0.178	0.89	100

Figure 1.

Scree plot of the DMQ-r Principal Components Analysis

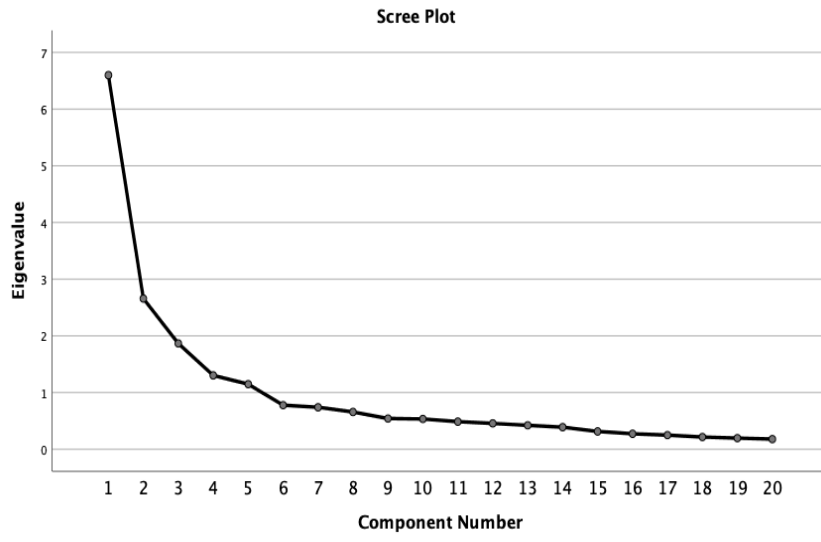


Table 4.

DMQ-r Principal Components Analysis Factor Loadings

Item	Social Reinforcement ($\alpha=0.838$)	Enhancement ($\alpha=0.832$)	Conformity ($\alpha=0.761$)	Coping ($\alpha=0.82$)
Because it makes social gatherings more fun.	0.813	0.310	0.076	0.095
Because it improves parties and celebrations.	0.757	0.416	0.041	0.069

To be sociable.	0.686	-0.071	0.157	0.155
Because it helps you to enjoy a party.	0.630	0.268	0.180	0.199
To celebrate special occasions with friends.	0.619	0.408	-0.028	0.022
Because you like the feeling.	0.189	0.822	-0.022	0.214
Because it gives you a pleasant feeling.	0.327	0.775	-0.094	0.167
To get high.	0.017	0.683	0.226	0.083
Because it's fun.	0.470	0.669	0.029	0.053
Because it's exciting.	0.194	0.608	0.282	0.042
So you won't feel left out.	0.191	0.141	0.774	0.024
To be liked.	0.183	0.095	0.774	0.082
To fit in with the group you like.	0.312	0.104	0.685	0.122
So that others won't kid you about not drinking.	-0.080	-0.089	0.599	0.140
Because your friends pressure you to drink.	-0.131	0.121	0.597	0.206
Because you feel more self-confident and sure of yourself.	0.490	0.086	0.520	0.217
To forget about your problems.	0.171	0.112	0.214	0.818
Because it helps when you feel nervous or depressed.	0.155	0.047	0.161	0.823
To forget your worries.	0.081	0.047	0.149	0.149
To cheer up when you are in a bad mood.	0.081	0.288	0.075	0.075

Aim 2. Identify drinking motive cluster subtypes.

As has been done with other large homogenous samples (Johnson et al., 2006; Norman et al., 1998; Paiva et al., 2014; Santiago-Rivas et al., 2012; Velicer et al., 2007)

cluster analysis was used to uncover subgroups (profiles) among the individuals in relation to their drinking motives. At first glance of the drinking motives, we can evaluate the means, frequencies, ranges, etc., of our drinking motives, however, does that, in fact, portray an accurate depiction of a FFs/EMTs motives to drink? It is believed that these motives, individually, failed to explain the differences amongst a firefighter's motivational alcohol use. Due to this, it was thought that some combination (profiles/ clusters) may shed some light on differences within this sample.

Cluster Analysis

As there is no definitive procedure for determining the number of clusters, several methods were used. While Ward's method of clustering has been found to be one of the better clustering methods (Norman et al., 1998), both the Algorithm for Cluster Establishment (ACE) and Ward's minimum variance clustering were used to determine and form the number of clusters. Several indices were used to determine the number of clusters: the pseudo F (Calinski & Harabasz, 1974), t , and the cubic clustering criteria. Furthermore, a visual inspection of the dendrogram, the shape and configuration of the cluster profiles, level (the mean score of the case over all the variables) and scatter (the standard deviation of the scores) of the profiles were also employed. Upon examining all indices, the decision for the quantity of clusters was between 3 and 4 clusters. As mentioned previously, subjectivity is a component of cluster selection when conducting this type of analysis. Due to the fact that a fourth cluster appeared to add a significant and meaningful dimension to the study, it was decided to retain a four-cluster solution. The four clusters were labeled: 1) Low Motives (lowest scores on all four motives), 2)

Average-Below Average Motives (consistently average or below average on all motives),

3) High Enhancement/Social Reinforcement; Low Coping/Conformity (high on

enhancement and social motives but lower on coping and conformity, and 4) High

Motives; Highest Coping/Conformity (high on all motives and highest cluster reporting

coping and conformity). Figures 2 and 3 illustrate the three and four cluster solutions.

Figure 2.

Three cluster drinking motives solution

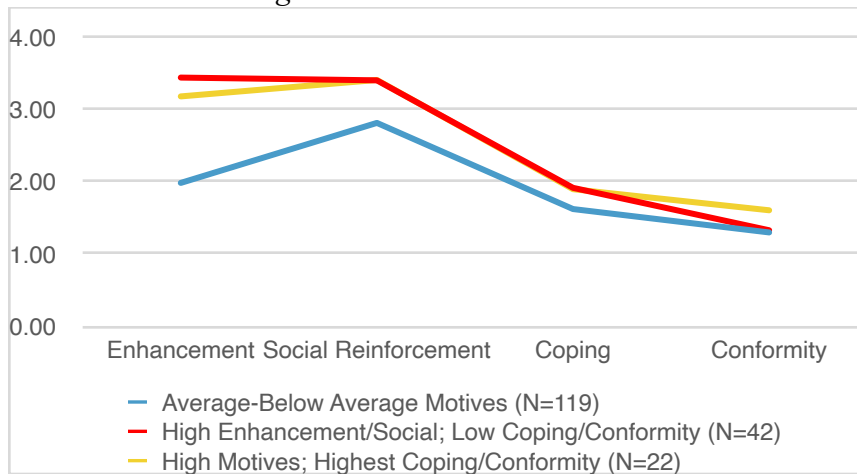
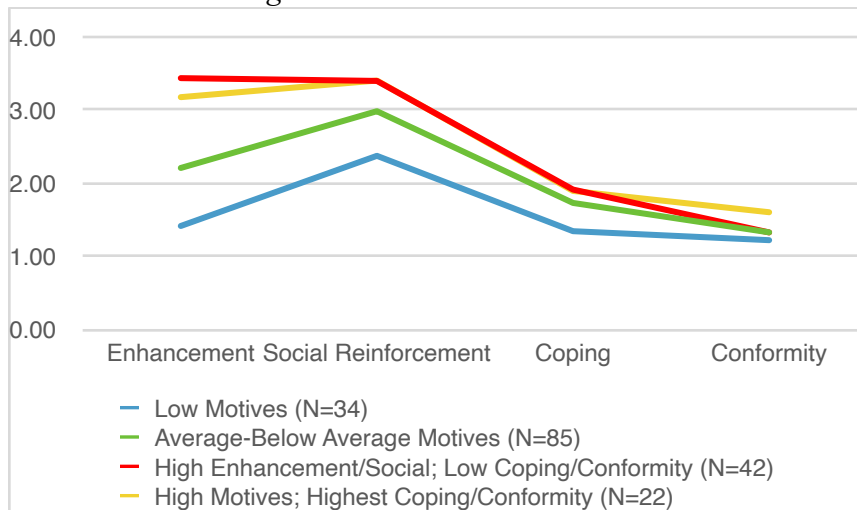


Figure 3

Four cluster drinking motives solution



Aim 3. Examine demographic and psychosocial differences across the resulting cluster subtypes.

The aim of cluster analysis is often not simply to form a taxonomy, but to see if the groups identified are associated with an external variable(s) (Clatworthy et al., 2005). To examine this, inferential statistics were utilized to compare the formed clusters (i.e., groups) on variables that were not included in the clustering process (i.e., demographics, consumption per week, alcohol expectancies, sources of occupational stress and sense of brotherhood). Chi-square tests, a multivariate analysis of variance (MANOVA), and analysis of variances (ANOVAs) were conducted with the clusters depending on the variable types.

Demographics

Gender. A chi-square test of independence showed that there was no significant association between gender and cluster, $\chi^2(3, N=183) = 3.428, p > .05$. See Table 5.

Ethnicity. A chi-square test of independence showed that there was no significant association between race and cluster, $\chi^2(18, N=183) = 7.317, p > .05$. See Table 5.

Relationship status (single vs. non-single). A chi-square test of independence showed that there was no significant association between relationship status and cluster, $\chi^2(3, N=183) = 2.514, p > .05$. See Table 5.

Table 5.
Demographic Chi-Square Results

		Cluster 1 Low Motives (N=34)	Cluster 2 Average-Below Average Motives (N=85)	Cluster 3 High Enhance/Social; Low Coping/Conform (N=42)	Cluster 4 High Motives; Highest Coping/Conformity (N=22)	Chi-Square Test
		n (%)	n (%)	n (%)	n (%)	
Gender	Female	0 (0%)	4 (4.7%)	1 (2.4%)	2 (9.1%)	$\chi^2(3) = 3.428, p = 0.33$
	Male	34 (100%)	81 (95.3%)	41 (97.6%)	20 (90.9%)	
Relationship Status	Single	3 (8.8%)	17 (20%)	6 (14.3%)	3 (13.6%)	$\chi^2(3) = 2.541, p = 0.47$
	In a relationship	31 (91.2%)	68 (80%)	36 (85.7%)	19 (86.4%)	
Race	Non-White	6 (17.6%)	15 (17.6%)	9 (21.4%)	2 (9.1%)	$\chi^2(3) = 1.529, p = 0.68$
	White	28 (82.4%)	70 (82.4%)	33 (78.6%)	20 (90.9%)	

Multivariate Analysis of Variance

A MANOVA was run to examine associations between all continuous variables and cluster types. The results of the MANOVA showed a statistically significant multivariate effect [$F(33, 498.609) = 2.194, p < .0005$; Wilk's $\Lambda = 0.671$, partial $\eta^2 = 0.125$]. This significant F indicates that there is a significant difference amongst our clusters on a linear combination of our psychosocial and alcohol use variables. The multivariate $\eta^2 = 0.125$ indicates that approximately 12.5% of multivariate variance of the psychosocial and alcohol use variables are associated with the cluster designation. Considering that the MANOVA was significant, we then examined the univariate ANOVA results.

Follow-up ANOVA results

Years of Service. An ANOVA was conducted to compare a firefighter's years of service and cluster to evaluate if there existed any group differences between clusters based on a firefighter's years of service. Results indicated there was a significant effect of years of service and cluster ($F(3,179) = 3.194, p < .05, \eta^2 = .051$). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 1 (Low Motives), ($M = 20.88, SD = 8.7$) was significantly higher than Cluster 4 (High Motives; Highest Coping/Conformity) ($M = 13.68, SD = 8.638$). However, no other group differences were significant between the other clusters. See Table 6.

Impulsivity/Sensation Seeking. An ANOVA was conducted to compare a firefighter's impulsivity and sensation seeking by cluster to evaluate if there existed any group differences between clusters based on a firefighter's impulsivity and sensation seeking. Results indicated there was a significant difference on impulsivity/sensation seeking by cluster ($F(3,179) = 5.744, p < .05, \eta^2 = .088$). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 3 (High Enhancement, Social Reinforcement; Low Coping/Conformity) was significantly lower than all other clusters See Table 6.

Tension Reduction. An ANOVA was conducted to compare a firefighter's tension reduction by cluster to evaluate if there existed any group differences between clusters based on a firefighter's tension reduction scores. Results indicated there was a significant effect of tension reduction by cluster ($F(3,179) = 9.955, p < 0.001, \eta^2 = .143$).

Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 1 (Low Motives) was significantly lower than all other clusters. See Table 6.

Social Lubrication. An ANOVA was conducted to compare a firefighter's social lubrication by cluster to evaluate if there existed any group differences between clusters based on a firefighter's social lubrication scores. Results indicated there was a significant effect of social lubrication by cluster ($F(3,179) = 8.537, p < 0.001, \eta^2 = .125$).

Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 1 (Low Motives) ($M = 2.97, SD = 3.27$) was significantly lower than all other clusters. See Table 6.

Drinks per week on a typical week. An ANOVA was conducted to compare a firefighter's consumption of alcohol in regard to the quantity of drinks per week on a typical week by cluster to evaluate if there existed any group differences in drinks per week between clusters. Results indicated there was a significant effect of the quantity of drinks per week by cluster ($F(3,179) = 3.605, p < 0.05, \eta^2 = .057$). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 1 (Low Motives) ($M = 8.191, SD = 8.961$) was significantly lower than Cluster 3 (High Enhancement/Social Reinforcement; Low Coping/Conformity) ($M = 15.857, SD = 12.495$). See Table 6.

Hours per week on a typical week. An ANOVA was conducted to compare a firefighter's consumption of alcohol in regard to the amount of time drinking per week on a typical week by cluster. Results indicated there was a significant difference on the amount of time drinking per a typical week by cluster ($F(3,179) = 3.556, p < 0.05, \eta^2 = .057$).

squared=.056). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 1 (Low Motives) ($M = 6.779$, $SD = 6.884$) was significantly lower than Cluster 3 (High Enhancement/Social Reinforcement; Low Coping/Conformity) ($M = 12.655$, $SD = 8.725$). See Table 6.

Drinks per week on a heavy week. An ANOVA was conducted to compare a firefighter's consumption of alcohol in regard to the quantity of drinks per week on a heavy week by cluster. Results indicated there was a significant difference of the quantity of drinks per week in a heavy drinking week by cluster ($F(3,179) = 8.893$, $p < 0.05$, $\eta^2 = .076$). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 1 (Low Motives) ($M = 11.206$, $SD = 12.748$) was significantly lower than Cluster 3 (High Enhancement/Social Reinforcement; Low Coping/Conformity) ($M = 22.786$, $SD = 15.095$). See Table 6.

Hours per week on a heavy week. An ANOVA was conducted to compare a firefighter's consumption of alcohol in regard to the amount of time drinking per week on a heavy week by cluster. Results indicated there was a significant difference on the amount of time drinking per heavy week by cluster ($F(3,179) = 4.067$, $p < 0.05$, $\eta^2 = .064$). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Cluster 1 (Low Motives) ($M = 9.971$, $SD = 13.038$) was significantly different from Cluster 3 (High Enhancement/Social Reinforcement; Low Coping/Conformity) ($M = 18.774$, $SD = 12.947$). See Table 6.

Table 6.
ANOVA results

	Cluster 1 Low Motives (N=34)	Cluster 2 Average- Below Average Motives (N=85)	Cluster 3 High Enhance/Social Low Coping/Confor m (N=42)	Cluster 4 High Motives; Highest Coping/ Conformity (N=22)	ANOVA	Tukey Results
	M (sd)	M (sd)	M (sd)	M (sd)		
Years of Service	20.88 (8.7)	17.11 (9.9)	15.57 (9.2)	13.68 (8.6)	F (3, 179)= 3.19, p=.025	1 > 4
Impulsivity/Sensation Seeking	10.85 (3.5)	10.02 (3.2)	8.36 (2.7)	11.14 (2.9)	F (3, 179)=5.74, p=.001	3 < 1, 2, 4
Tension Reduction	4.5 (5.2)	8.67 (6.6)	12.52 (6.1)	10.91 (9.0)	F (3, 179)=9.96, p=.000	1 < 2, 3, 4
Social Lubrication	2.97 (3.3)	6.19 (5.7)	8.88 (5.5)	8.82 (7.6)	F (3, 179)=8.54, p=.000	1 < 2, 3, 4
Sources of Occupational Stress	35.79 (9.8)	36.64 (10.7)	39.29 (9.2)	34 (10.7)	F (3, 179)=1.49, p=.218	ns
Brotherhood	4.01 (0.79)	3.89 (0.84)	3.82 (0.93)	3.97 (0.88)	F (3, 179)=0.37, p=.773	ns
Alcohol Offers	5.77 (4.7)	6.66 (3.92)	7.55 (4.5)	8.02 (4.4)	F (3, 179)=2.04, p=.110	ns
Drinks per typical week	8.19 (8.96)	12.34 (9.97)	15.86 (12.5)	11.16 (8.1)	F (3, 179)=3.61, p=.015	1 < 3
Hours per typical week	6.78 (6.8)	10.71 (7.8)	12.66 (8.7)	10.93 (8.5)	F (3, 179)=3.556, p=.016	1 < 3
Drinks per heavy week	11.21 (12.8)	16.62 (12.7)	22.79 (15.1)	16.59 (12.0)	F (3, 179)=4.893, p=.003	1 < 3
Hours per heavy week	9.97 (13.0)	13.88 (10.1)	18.77 (12.95)	12.48 (9.4)	F (3, 179)=4.067, p=.008	1 < 3

CHAPTER 5

CONCLUSION

Discussion

This study replicated prior research demonstrating the DMQ-r as a valid, reliable, and applicable scale to assess drinking motives and extended previous literature on drinking motives within a firefighter/EMT population by utilizing cluster analysis to devise clusters using all four drinking motives. Furthermore, demographic and psychosocial differences in these clusters were examined. The findings build on those of Cooper et al.'s (1995) and helped to delineate associations among psychosocial antecedents and drinking motives in a FF/EMT sample.

A confirmatory examination of the twenty items within the Drinking Motives Questionnaire-revised provided evidence that the four-component solution was a good fit to the data. The original four drinking motives subscale names were retained and were labeled "Enhancement Motives," "Coping Motives," "Social Reinforcement Motives," and "Conformity Motives." All items within the scale loaded on the intended subdomain with the exception of one item (Because you feel more self-confident and sure of yourself).

Utilizing this valid drinking motives measure, our findings identified a four-cluster solution. These clusters were labeled (1) Low Drinking Motives (18.6%), (2) Average-Below Average Drinking Motives (46.4%), (3) High Enhancement/Social

Reinforcement; Low Coping/Conformity (23%), and (4) High Motives; Highest Coping/Conformity (12%).

The Low Motives Cluster (Cluster 1) was characterized by below average scores on all drinking motive subdomains. This pattern indicates that there is a group of firefighters/EMTs that appear to be far less motivated to drink based on the four drinking motives subscales. Most importantly, this cluster seemed to be somewhat shielded or protected from the heavier drinking habits that can be observed within the other clusters. Cluster 1 (Low Drinking Motives) had the lowest consumption scores on all five alcohol consumption variables. This is not to say that Cluster 1 (Low Drinking Motives) doesn't consume alcohol. In fact, they drink fairly regularly with a consumption rate of approximately 8.2 drinks/week on a typical week of drinking and 11.2 drinks/week on a heavy week of consumption. However, they are drinking less than all three clusters, particularly Clusters 3 and 4. These differences in drinking bring to light the question of what might be responsible for the lower drinking rates among the Low Motives cluster. An analysis of cluster differences on demographic and psychosocial variables that might account for differences was conducted to better understand these drinking motives clusters. The idea was to better understand if there are protective factors that exist within this group that shelter them from heavier alcohol use. Are there external factors that can be changed or adjusted to provide a much-needed intervention for this high-risk population? We do not see demographic differences on gender, relationship status, or ethnicity across the clusters but the Low Motives cluster (Cluster 1) did have significantly more years of service on the job with an average of almost twenty-one years

of service compared to Cluster 2 (Average-Below Average Drinking Motives) = 17.1, Cluster 3 (High Enhancement/Social Reinforcement; Low Coping/Conformity) = 15.5, and Cluster 4 (High Motives; Highest Coping/Conformity) = 13.7. This may indicate that a level of experience as a firefighter, an understanding of the emotional distress that may accompany this profession, as well as, simply age/maturity of an individual may help protect a FF/EMT from certain poor behavioral health outcomes. Group differences pertaining to years of service could also be attributable to a cohort effect, since years of services is most likely connected to individuals being the same age, born around the same time period, and may have had similar life experiences. A cohort effect cannot be ruled out and should be investigated further in future studies.

Cluster 1 (Low Drinking Motives) had the lowest scores on both tension reduction and social lubrication alcohol outcome expectancies, suggesting that this group did not feel the need to drink to reduce negative affect. As a reminder, questions asked for the tension reduction measure are “Drinking helps me forget problems at work” and “Drinking helps me to feel better when I am down.”

Social lubrication alcohol expectancies, on the other hand, appear to describe an individual who drinks due to low self-esteem or low self-efficacy. Social lubrication items ask an individual certain questions pertaining to whether they drink to “feel sexy,” “feel less shy,” or “feel cool.” According to our data, Cluster 1 (Low Drinking Motives) also appears to have strongest self-esteem/self-efficacy, if lower social lubrication scores also reflects higher self-esteem/self-efficacy.

Although the Low Drinking Motive cluster (Cluster 1) was noticeably different from the other clusters in these important ways, this was not the only noticeable difference discovered between groups. Cluster 3 (High Enhancement/Social Reinforcement; Low Coping/Conformity) and Cluster 4 (High Motives; Highest Coping/Conformity), our two highest clusters pertaining to drinking motive scores, also showed the highest levels of alcohol consumption rates, in particular, Cluster 3 (High Enhancement/Social Reinforcement; Low Coping/Conformity). Cluster 3 (High Enhancement/Social reinforcement; Low Coping/Conformity) had the highest alcohol consumption rates and highest alcohol expectancy scores and it could be hypothesized these elevated levels of alcohol use, combined with high motivations to drink, in particular drinking to cope with stress, places Cluster 3 in a dangerous category of high-risk drinking. Are they seeking other means to cope with their stress and in order to produce the numbing effects that alcohol may bring? Are their highest levels of social lubrication and social reinforcement motives to drink indicative of an individual with low self-esteem out to “party” their sorrows away? This inquiry must not stop here. Since the early 1990s, Boxer and Wild started the investigation into first responder’s alcohol use and misuse, and it is apparent that, almost thirty years later, this high-stressed population continues its fight with behavioral health outcomes such as heavy drinking.

The current data enriches our understanding of drinking to cope motivations among firefighters/EMTs and additionally reinforces the expectation that coping motives for alcohol use are prevalent in this population which is not always found in other convenience samples (e.g., Read et al., 2003). Firefighters are exposed to potentially

serious stressors on a daily basis and drinking to cope motivations can be differentiated by cluster. FFs/EMTs drinking behaviors are somewhat unique in comparison to many other occupations. Accordingly, our FF/EMT data supports the inclusion of negative emotional factors and the concept of drinking to cope in this population.

Our findings, however, also point to the possibility that FF/EMT alcohol use may be more directly related to positive reinforcement/social motives than to negative reinforcement motives, a conceptualization that needs to be further researched. Higher levels of alcohol consumption were found within the clusters that had the highest motives in general, but particularly pertaining to their enhancement and social reinforcement motives.

Limitations

The present study has limitations. First, the exclusive reliance on self-report measures may have led to social desirability bias. Disclosing substance use/misuse/consumption may be a sensitive issue for firefighters/EMTs, although this was offset somewhat by the fact that anonymity was guaranteed. The data shows that participants were willing to disclose this information, but as recruitment materials mentioned what information would be collected, some FF/EMTs may have chosen to not participate based on these sensitive topics being surveyed. Firefighters/EMTs may also desire to answer any questionnaire in a more courageous and noble fashion in order to appear as honorable or respectable and not as an individual “weak” or “unable to handle the stresses of the occupation.” Second, the cross-sectional design of this study prohibits interpretations

about causality. Future research should include longitudinal designs to address this issue and better answer causal questions. Longitudinal studies are crucial in determining the stability of the drinking motive clusters over time and could reveal interesting variability in drinking motives over time. Third, we were limited by our sample size and its characteristics. The size of the sample was below that recommended for a cluster analysis and the variability within the sample may have been too selective. Our sample consisted of one career fire department, in one area of the county, with mostly white/Caucasian male participants. Acquiring a sample from multiple departments, both volunteer and career, with more diverse attributes, would enhance generalizability in future research. It is important to note that there exists another significant limitation when sampling a single fire department and such a limitation is the lack of equality between males and females (e.g., 176 vs 7 in our study). Therefore, the results of any analyses conducted on gender differences are insignificant. However, it is important to note, that although gender differences cannot be accurately portrayed, some important insights were extracted from the data. Lastly, these FF/EMT data offers some insight into etiological pathways to alcohol use in professional FFs/EMTs but also indicates challenges in measurement and theory that need to be further examined.

Future Directions and Recommendations

There was an inclusion of three exogenous variables (occupational stress, sense of brotherhood, and relationship status) in the present study which had not been examined before in this context. Although these variables did not significantly differentiate between clusters, it is suggested that future research may desire to re-examine these variables in

other contexts and within other FF/EMT samples. These variables (e.g., sources of occupational stress) have been utilized before in prior research and demonstrated to produce valuable information pertaining to the overall behavioral health of FFs/EMTs.

Although no significant differences were found on occupational stress, brotherhood, and alcohol offers by cluster, some trends in the data show that the Low Motives cluster (Cluster 1) reported lower numbers of alcohol offers and less occupational stress. Larger samples may help uncover differences that this study could not. Occupational stress and brotherhood may be difficult to differentiate subgroups within a firefighter/EMT population due to the fact that these variables may have a restricted range, since occupational stress and sense of closeness to one's brotherhood may be high for all FFs/EMTs. In spite of some limitations and lack of significance in this sample, these variables may yet prove important within this population and should continue to be included in future studies.

Alcohol abuse is most certainly a behavioral risk; however, firefighters are at a higher risk for other behavioral health conditions as well. Over the last several decades, researchers have uncovered several behavioral health conditions predominant in a first responder population (e.g., PTSD, depression, and suicidal ideation). Future studies conducted on motivational alcohol use within a FF/EMT population should include measures of other behavioral health risks and/or conditions. Adding any other measure of behavioral health risks and/or conditions would aid in the overall behavioral health picture of our first responders.

The identified typologies uncovered in this study may be useful for future research conducted with firefighter populations or for any occupation that holds similar characteristics (e.g., paramilitary, brotherhood mentality, high stress). The uncovered drinking motive clusters can be useful in targeting firefighters for prevention or understanding the treatment needs of this high-risk population. For example, the transdiagnostic approach to treatment may be warranted for firefighters who have higher motives to drink. The transdiagnostic approach focuses on identifying the common and core maladaptive, temperamental, psychological, cognitive, emotional, interpersonal, and behavioral processes that underpin a broad array of diagnostic presentations (Harvey et al., 2004) and tailor these factors in treatment (Barlow et al., 2004). With this approach in mind, some research has also suggested that interventions, such as mindfulness-based or acceptance-based approaches, can help with individuals who have strong coping motives to drink and have experienced trauma or posttraumatic stress (Vujanovic et al., 2011).

Although drinking to cope motives have been a common theme throughout the literature, our sample appears to have a stronger motivation to drink based upon their social interactions/reinforcements. It is possible that one way to lessen a firefighter's alcohol consumption is by educating and training firefighters towards healthier, lower risk drinking behavior. Social norms interventions may be one possible solution to consider.

Social norms theory describes situations in which individuals incorrectly perceive the attitudes and/or behaviors of peers and other community members (in this case “the

brotherhood”) to be different from their own when in fact they are not (Berkowitz, 2005). A phenomenon, referred to as pluralistic ignorance (Miller & McFarland, 1991), explains how this misperception causes individuals to overestimate problem/risky behaviors and/or underestimate healthy/protective ones. The objective of social norms interventions is to correct these misperceptions of all community members (in this case FFs/EMTs) whether they actually engage in the problem behavior or not. This type of intervention is not limited to current/active firefighters but can be also be utilized with new cadets preparing to join the fire service. Healthy behavior can start from the beginning as opposed to waiting until the problem exists and interventions are necessary; however, with the conclusion of this study, we are beginning to understand the different motivational drinking profiles that exist within this population.

Conclusions

Using a cluster analysis approach, this study added to the literature on drinking motives within a firefighter/EMT population. We helped identify FFs/EMTs drinking motive typologies and their associations with numerous demographic and psychosocial variables as well as alcohol consumption rates. The Low Motives cluster (Cluster 1) composed of FFs/EMTs who appear to have certain protective characteristics associated with their health behaviors. Further, the drinking motive profiles of the “High Enhancement/Social Reinforcement; Low Coping/Conformity” cluster (Cluster 3) indicated FFs/EMTs at risk for experiencing stress differently and engaging in unhealthy behaviors. The identification of these drinking motive profiles in relation to a FFs/EMTs

alcohol consumption behaviors is an extremely important first step in uncovering the nature behind drinking behaviors in this population. It is also an important step in continuing research in this field and developing preventive interventions that our first responders most definitely need.

The fire service has a long history of tradition, heritage, and pride. It is also with great pride that the researcher in charge of this study can claim to have been a part of this incredible organization for almost the past twenty years beginning on March 19, 2001. This study has opened the door for more research in this area and will hopefully help fellow members of this courageous profession whose profession is ultimately to help others. As this research shows, unfortunately these men and women often sacrifice so much more than others see, including their own health in relation to alcohol use and other unintended behavioral consequences.

Appendix A

1. What is your age?

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 to 74
- 75 or older

2. What is your gender?

- Male
- Female
- Other

3. What is your ethnicity? (Please select all that apply.)

- American Indian or Alaskan Native
- Asian or Pacific Islander
- Black or African American
- Hispanic or Latino
- White / Caucasian
- Prefer not to answer
- Other (please specify)

4. How many years have you served on the Fire Department?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21 or more years

5. Which of the following best describes your current relationship status?

- Married
- Widowed
- Divorced and now single
- Divorced and in a new relationship
- Separated
- In a domestic partnership or civil union
- Single, but cohabiting with a significant other
- Single, never married

6. How often do you discuss or have you considered divorce, separation, or terminating your relationship?

- All the time
- Most of the time
- More often than not
- Occasionally
- Rarely
- Never

7. In general, how often do you think that things between you and your partner are going well?

- All the time
- Most of the time
- More often than not
- Occasionally
- Rarely
- Never

8. Do you confide in your mate?

All the time
Most of the time
More often than not
Occasionally
Rarely
Never

9. Please choose the answer which best describes the degree of happiness, all things considered, of your relationship.

Perfect
Extremely happy
Very happy
Happy
A little unhappy
Fairly unhappy
Extremely unhappy

INSTRUCTIONS: The following is a list of reasons that some people give for drinking alcohol. Thinking of all the times you drink, how often would you say that you drink for each of the following reasons? If you have never consumed alcohol, please indicate reasons that would be important to you if you did drink.

10. To forget your worries.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

11. Because your friends pressure you to drink.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

12. Because it helps you to enjoy a party.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

13. Because it helps when you feel nervous or depressed.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

14. To be sociable.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

15. To cheer up when you are in a bad mood.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

16. Because you like the feeling.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

17. So that others won't kid you about not drinking.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

18. Because it's exciting.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

19. To get high.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

20. Because it makes social gatherings more fun.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

21. To fit in with the group you like.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

22. Because it gives you a pleasant feeling.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

23. Because it improves parties and celebrations.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

24. Because you feel more self-confident and sure of yourself.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

25. To celebrate special occasions with friends.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

26. To forget about your problems.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

27. Because it's fun.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

28. To be liked.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

29. So you won't feel left out.

Almost never/never
Some of the time
Half of the time
Most of the time
Almost always/always

INSTRUCTIONS:

Please base your answers around the past three months.

30. How many times have you been offered a drink?

- Never
- 1-2 times
- 3-5 times
- 6-9 times
- 10 or more times

31. How many times have you been given a drink without asking for it?

- Never
- 1-2 times
- 3-5 times
- 6-9 times
- 10 or more times

32. How many times has someone filled up your drink without asking you if you wanted it filled up?

- Never
- 1-2 times
- 3-5 times
- 6-9 times
- 10 or more times

33. How many times has someone bought you a drink without you asking for it?

- Never
- 1-2 times
- 3-5 times
- 6-9 times
- 10 or more times

INSTRUCTIONS: Read each of the following statement and decide whether it is true as applied to you or false as applied to you. If a statement is true or mostly true, as applied to you, mark the true response "T". If a statement is false or not usually true, as applied to you, mark the false response "F". There are no right or wrong answers and no trick questions.

34. I tend to begin a new job without much advance planning on how I will do it.

True
False

35. I usually think about what I am going to do before doing it.

True
False

36. I often do things on impulse.

True
False

37. I very seldom spend much time on the details of planning ahead.

True
False

38. I like to have new and exciting experiences and sensations even if they are a little frightening.

True
False

39. Before I begin a complicated job, I make careful plans.

True
False

40. I would like to take off on a trip with no preplanned or definite routes or timetable.

True
False

41. I enjoy getting into new situations where you can't predict how things will turn out.

True
False

42. I like doing things just for the thrill of it.

True
False

43. I tend to change interests frequently.

True
False

44. I sometimes like to do things that are a little frightening.

True
False

45. I'll try anything once.

True
False

46. I would like the kind of life where one is on the move and traveling a lot, with lots of change and excitement.

True
False

47. I sometimes do “crazy” things just for fun.

True
False

48. I like to explore a strange city or section of town by myself, even if it means getting lost.

True
False

49. I prefer friends who are excitingly unpredictable.

True
False

50. I often get so carried away by new and exciting things and ideas that I never think of possible complications.

True
False

51. I am an impulsive person.

True
False

52. I like “wild” uninhibited parties.

True
False

INSTRUCTIONS: The following list describes some effects of alcohol. Because alcohol affects people in different ways, we would like to know which of these effects you experience when you drink alcohol. Based on your own drinking experience, indicate how much you expect each of these effects when drinking alcohol. (if you have never consumed alcohol, indicate how you might expect alcohol to affect you if you had several drinks.)

53. Drinking helps me relax.

Not at all
A little bit
Somewhat
Quite a bit
A lot

54. Drinking helps me forget problems at work.

Not at all
A little bit
Somewhat
Quite a bit
A lot

55. Drinking helps me feel better about myself.

Not at all
A little bit
Somewhat
Quite a bit
A lot

56. Drinking helps me forget my worries.

Not at all
A little bit
Somewhat
Quite a bit
A lot

57. Drinking helps me feel more relaxed about sex.

Not at all
A little bit
Somewhat
Quite a bit
A lot

58. Drinking makes me feel more sexy.

Not at all
A little bit
Somewhat
Quite a bit
A lot

59. Drinking makes me do some things better.

Not at all
A little bit
Somewhat
Quite a bit
A lot

60. Drinking makes me feel less shy.

Not at all
A little bit
Somewhat
Quite a bit
A lot

61. Drinking makes it easier to find the right words when I talk to people.

Not at all
A little bit
Somewhat
Quite a bit
A lot

62. Drinking makes me feel more romantic.

Not at all
A little bit
Somewhat
Quite a bit
A lot

63. Drinking helps me to fit in better with the people around me.

Not at all
A little bit
Somewhat
Quite a bit
A lot

64. Drinking makes me feel better when I'm feeling down.

Not at all
A little bit
Somewhat
Quite a bit
A lot

65. Drinking helps me relax when I'm tense.

Not at all
A little bit
Somewhat
Quite a bit
A lot

66. Drinking makes me feel cool.

Not at all
A little bit
Somewhat
Quite a bit
A lot

67. Drinking helps me to calm down when I'm angry.

Not at all
A little bit
Somewhat
Quite a bit
A lot

68. Drinking helps me deal with boredom.

Not at all
A little bit
Somewhat
Quite a bit
A lot

69. Drinking helps me express my opinions and ideas better.

Not at all
A little bit
Somewhat
Quite a bit
A lot

INSTRUCTIONS:

Please indicate how you feel, particularly how bothered you are, about each question as it pertains to your experience at the station. For example, how bothered are you about having a poor diet while eating at the station? Are you not at all bothered, slightly bothered, somewhat bothered, very bothered, or extremely bothered? Please mark one answer.

70. Poor diet.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

71. Discrimination based on gender, ethnicity, or age.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

72. Exposure to anxious or overly demanding coworkers or administrators.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

73. Financial strain due to inadequate pay.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

74. Bothered by not being able to predict or control events.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

75. Concerns about not knowing the latest technology.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

76. Thoughts about past run(s) that have been particularly upsetting/disturbing.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

77. Observing negative effects of stress on coworkers, e.g., illness, alcohol abuse, and
burnout.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

78. Dislike of routine paperwork.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

79. Working with a substandard co-employee on emergency incidents or situations.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

80. Conflicts with coworkers and team members.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

81. Disruption of sleep.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

82. Feelings of isolation from family due to work demands and stress.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

83. Concerns about serious personal injury/disablement/death due to work.

Not at all bothered
Slightly bothered
Somewhat bothered
Very bothered
Extremely bothered

INSTRUCTIONS:

The following items are questions regarding Brotherhood. Traditionally, brotherhood signifies what one is willing to do for their brother. It is a solemn oath to face danger and fear and even give one's life, if necessary, for their brother. It is not a matter of receiving but a matter of giving. It is not a matter of avoiding personal accountability, rather a matter of accepting responsibility.

84. I can get what I need out of this brotherhood.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

85. This brotherhood helps me fulfill my needs.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

86. I feel like a member of the brotherhood.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

87. I belong to this brotherhood.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

88. I have a say about what goes on in this brotherhood.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

89. People in this brotherhood are good at influencing each another. I feel connected to this brotherhood.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

90. I feel connected to this brotherhood.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

91. I have a good bond with others in this brotherhood.

Strongly agree
Somewhat agree
Neither agree nor disagree
Somewhat disagree
Strongly disagree

INSTRUCTIONS FOR RECORDING DRINKING DURING A TYPICAL WEEK IN THE CALENDAR BELOW, PLEASE FILL-IN YOUR DRINKING RATE AND TIME DRINKING DURING A TYPICAL WEEK IN THE LAST 30 DAYS. First, think of a typical week in the last 30 days you. (Where did you live? What were your regular weekly activities? Where you working or going to school? Etc.) Try to remember as accurately as you can, how much and for how long you typically drank in a week during that one month period? For each day of the week in the calendar below, fill in the number of standard drinks typically consumed on that day in the upper box and the typical number of hours you drank that day in the lower box.

92. In a typical week for the last 30 days, how many alcoholic drinks do you have for each particular day of the week.

Rows—Zero drinks, 1-2 drinks, 3-4 drinks, 5-6 drinks, 7-8 drinks, 9 or more drinks

Columns—Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

93. In a typical week for the last 30 days, how many hours do you consume alcohol for each particular day of the week?

Rows—Zero drinks, 1-2 drinks, 3-4 drinks, 5-6 drinks, 7-8 drinks, 9 or more drinks

Columns—Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

INSTRUCTIONS FOR RECORDING DRINKING FOR YOUR HEAVIEST DRINKING WEEK IN THE CALENDAR BELOW, PLEASE FILL-IN YOUR DRINKING RATE AND TIME DRINKING DURING YOUR HEAVIEST DRINKING WEEK IN THE LAST 30 DAYS. First, think of your heaviest drinking week in the last 30 days. (Where did you live? What were your regular weekly activities? Where you working or going to school? Etc.) Try to remember as accurately as you can, how much and for how long did you drink during your heaviest drinking week in that one month period? For each day of the week in the calendar below, fill in the number of standard drinks consumed on that day in the upper box and the number of hours you drank that day in the lower box.

94. During your heaviest drinking week over the last 30 days, how many alcoholic drinks do you have for each particular day of the week.

Rows—Zero drinks, 1-2 drinks, 3-4 drinks, 5-6 drinks, 7-8 drinks, 9 or more drinks

Columns—Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

95. During your heaviest drinking week over the last 30 days, how many hours do you consume alcohol for each particular day of the week?

Rows—Zero drinks, 1-2 drinks, 3-4 drinks, 5-6 drinks, 7-8 drinks, 9 or more drinks

Columns—Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

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