WOMEN'S DRINKING IN THE U.S. ARMED FORCES: SOCIODEMOGRAPHIC, CONTEXTUAL FACTORS AND ALCOHOL CONSUMPTION

by

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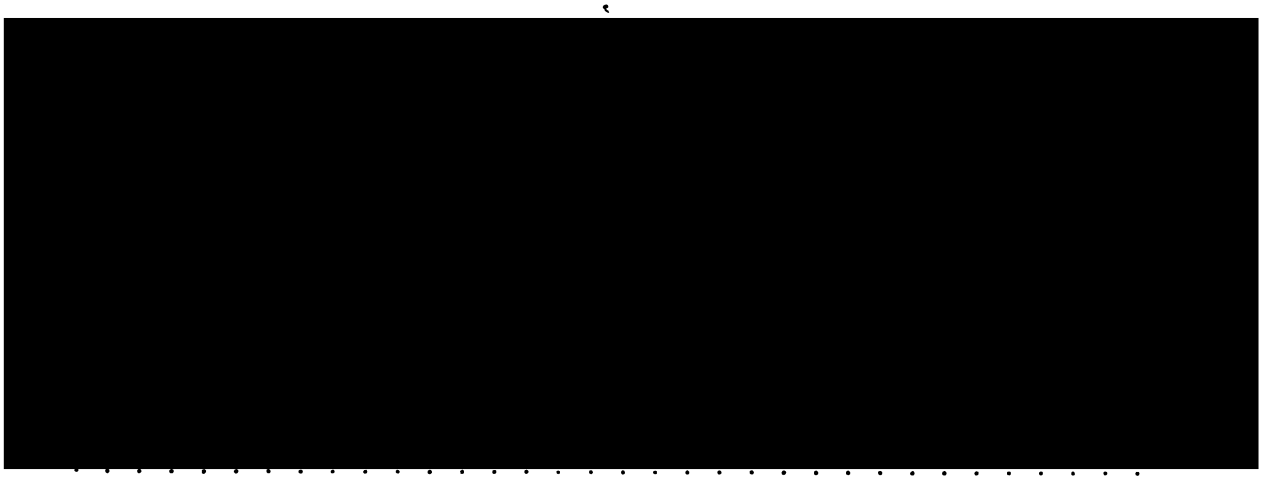

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PREFACE

As I began the work on this study I was questioned by curious colleagues both inside and outside of the armed forces as to the substantive area of my study. From colleagues outside the armed forces I received a great deal of validation that the armed forces was a excellent context to conduct a study concerning alcohol consumption. The perception of these colleagues was that the armed forces is a "wet culture". In other words, the perception was that in the armed forces alcohol was consumed frequently by a majority of the population. Many of these colleagues had personal experiences or knowledge based on experiences with persons who had served in the armed forces. Additionally there are several popular media images of the typical use of alcohol in the armed forces. On television, the medical staff of "MASH" are seen as distilling alcohol and consuming it regularly and "China Beach" presents the personnel routinely socializing over a drink and/or using it to cope with personal crises. Furthermore, the most recent references to alcohol consumption in the armed forces was seen as the U.S. troops returned from Operation Desert Storm. One group of soldiers who were interviewed by the television news crews discussed their surprise at how well they had gotten along without drinking alcohol in a country where alcohol consumption was prohibited. These images may suggest that alcohol is very much a part of the armed forces context.

Interestingly, most of my colleagues within the armed forces with whom I discussed my proposed research did not share the view that the armed forces was a "wet culture". Moreover, they generally felt that a study of women's drinking in the armed forces was not important as there

was little alcohol consumption occurring among women. They indicated surprise that I would think this to be an important question.

Interesting! I questioned whether these colleagues had become so desensitized by the norms of alcohol consumption that they did not perceive drinking to be frequent? The perception of my armed forces colleagues was not one which I shared. A fascinating phenomenon which I had observed in the armed forces was several women who had served more that 20 years in the armed forces developed alcohol-related problems which interfered with their ability to perform their jobs. I questioned whether this was just coincidental or whether the development of alcohol-related problems was related to some aspect of affiliation with the armed forces.

The most recent studies of alcohol consumption in the armed forces have focused on the prevalence, sociodemographic correlates, drinking motivation factors, beliefs about drinking, and the extent of problem drinking that occurs in this context. These studies surveyed armed forces personnel (Department of Defense personnel) world-wide. They were sought by policy makers to evaluate the effectiveness of programs aimed at reducing alcohol consumption, as well as the use of unprescribed substances. Given these purposes, gender specific analyses -- aside from prevalence data on level of alcohol consumption (abstainer, light/infrequent, moderate, moderate/heavy, heavy) -- were not conducted. Hence, little is known about women's alcohol consumption in the armed forces.

The primary question of this study surrounds the contextual influence of the armed forces on women's alcohol consumption. Since the world-wide surveys of armed forces personnel has previously collected data related to contextual influences using secondary data analysis as the

method for this study seemed a pragmatic and economical method. Two waves of the studies, specifically the crossectional surveys collected in 1985 and 1988, are used in these analyses and are described in detail in Chapter 3. Use of these surveys permits description of the socio-demographic correlates of alcohol consumption, as well as analysis of occupational influences on level of alcohol consumption of women in the armed forces.

ACKNOWLEDGEMENTS

As I have struggled with conducting this research, the scholarship, generosity, and support I have received from my dissertation committee--Drs. Jane Lipscomb, Kaye Fillmore, and Patricia Underwood--have been more than instrumental in bringing this dissertation to fruition.

Dr.Lipscomb's expertise in epidemiology and questions on methodology were always instructive and intellectually challenging, prompting continuous reappraisal of the analyses conducted for achieving maximal results from the data.

Through many hours of consultation, Dr. Fillmore assisted me in conceptualizing the framework and the data analysis plan for this dissertation. She shared her eminence and expertise in the alcohol field affording me entré to occupational alcohol scholars and their works both published and unpublished which enhanced identification of the most current works in this area. She also very generously offered the support of the staff of the Alcohol Research Group at the University of California at San Francisco, where she serves as the principal investigator, in assisting me to refine my work and also providing statistical consultation.

Dr. Underwood, who served as my academic advisor over the three years I studied at the University of California at San Francisco, has been the mainstay in my progression through doctoral study. I was determined to complete this dissertation in three years and "Pat's" willingness to support me in attaining this goal made it possible. She possesses an extraordinary talent for articulating the disorganized thoughts and ideas into a conceptual model. Without her unfailing support, guidance and

prodding during those times I felt overwhelmed and/or exhausted this would have been a considerably more painful process.

Aside from all of the instruction, support, and direction I have gained from each of these eminent scholars, I have learned that the essence of scholarship is sharing one's scientific acumen to advance knowledge generation. As a budding scientist, this is a very important lesson to learn and an even more important value to assimilate. Mere words cannot sufficiently express my indebtedness to each of them.

Others were generous with both their time and talents making the completion of this dissertation less painful. I especially want to thank Victor Leino and Steve Preston for their willingness to share their statistical expertise. Without this support this project would have been considerably more expensive in terms of time and finances.

ABSTRACT

WOMEN'S DRINKING IN THE U. S. ARMED FORCES:

SOCIODEMOGRAPHIC, CONTEXTUAL FACTORS AND ALCOHOL CONSUMPTION

Mozettia H. Henley

Alcohol consumption among members of the U.S. Armed Forces has persistently been found to be significantly higher than in the general population. Further, the alcohol consumption of women in this context is also significantly higher than that of women in the general population (Bray, Petersen, & Marsden, 1991). Yet little is known about women's alcohol consumption in the armed forces. The study begins to fill the gaps in knowledge about women drinking in this context.

A unique feature of this study is that it is one of the first to examine women's alcohol consumption in occupations. Occupations within the armed forces that are comprised of proportionally higher male incumbents (traditionally male occupations) are compared to occupations comprised of proportionally higher female incumbents (traditionally female occupations) examining the differences between these two groups in level of alcohol consumption.

This study uses a secondary analysis methodology examining the women respondents (N=3071) of the 1985 and 1988 world-wide Department of Defense personnel surveys that examined substance use and health behaviors among this population. Specifically, the prevalence and sociodemographic correlates of level of alcohol consumption, the relationship between problem drinking and level of alcohol consumption, and the relationship of

contextual factors, including type of occupation, to level of alcohol consumption among these women are examined.

The findings suggest that among women in the U.S. Armed Forces: (1) level of alcohol consumption is inversely related to age, (2) significant positive relationships were found for the sociodemographic factors of marital status, ethnicity, and military rank (social status) related to level of alcohol consumption, (3) contextual beliefs influence the level of alcohol consumption, and (4) although type of occupation (predominantly male versus predominantly female) is not significantly related to level of alcohol consumption, the risk of being a heavier drinker is increased among those women in predominantly male occupations.

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CHAPTER ONE

INTRODUCTION

Both the areas of women's alcohol consumption and alcohol consumption in occupations are relatively new domains of research. This study will add to the body of knowledge in both areas by studying the drinking practices of women in the armed forces.

Background of the Problem

The study of women's alcohol consumption did not become an area of focused scientific inquiry until the 1970s. This limited research identifies both similarities and differences in alcohol consumption among men and women (Celantano & McQueen, 1984; Hilton & Clark, 1987; Wilsnack, Wilsnack, & Klassen, 1984). The drinking patterns of men and women differ in that more women abstain from alcohol than men and the proportion of men who drink heavily is significantly higher than among women. A significant age cohort relationship with alcohol consumption is found among both women and men (i.e., age is inversely related to alcohol consumption for both men and women). While other demographic variables have been examined for both women and men, their relationship to alcohol consumption is not as clear.

The age cohort relationship in the examination of alcohol consumption in the armed forces is very important since alcohol consumption of members of the armed forces does not change along the same age trajectory as does the drinking of the civilian population (i.e.,

service members drink at greater quantities at older ages than civilians [Bray, Marsden, & Wheeless, 1989b]). This finding suggests that the occupational context of the armed forces may also be a variable that influences the level of alcohol consumption.

The investigations of alcohol consumption in occupations, regardless of gender, are limited. The intersect between occupational factors and alcohol consumption behaviors has recently become targeted for investigation by the National Institute for Alcoholism and Alcohol Abuse (NIAAA). Interestingly this shift in emphasis in understanding drinking behaviors in not a new one, but rather a revival of a neglected theoretical perspective directing the investigation of alcohol consumption in the population. Following the classic work of Jellinek (1946), which established the disease concept of alcoholism in both the popular and scientific domains, investigations of the context of work focused on the individual and individual differences in the development of alcohol problems. These works eventually evolved into policy emphasizing screening for alcohol problems among workers paying little attention to the potential contribution of the work place context to the development of alcohol problems. Prior to the Modern Alcoholism Movement (defined by the scientific and public acceptance of the disease concept of alcoholism), research focused on factors within the context of the work place which contributed to alcohol consumption. This movement was pivotal in shifting attention away from examination of factors in the workplace context and onto factors within the individual which made him/her more likely to become alcoholic. Also this emphasis ignored normative practices and other characteristics of occupations which may have implications for alcohol consumption among workers. The contemporary change in emphasis

(returning to examination of factors in the work place context) will contribute to understanding how institutions help create, exacerbate or ameliorate alcohol-related problems and their sequelae.

Recent research in the area of alcohol consumption among workers is limited and the conceptual perspectives that have emerged do not add clarity to understanding the relationship of heavy alcohol consumption to the context of the work place. Hence, examination of contextual factors within the work place would be useful in explicating these relationships. Study of women in the armed forces offer an opportunity to both examine drinking practices among groups of women and the influence of occupation on these drinking practices.

Statement of the Problem

Virtually nothing is known about women's alcohol consumption in the armed forces occupations with the exception of non-gender specific data available on the topic from three world-wide surveys of Department of Defense personnel (Bray et al., 1983; Bray et al., 1986; Bray et al., 1989a). In these armed forces analyses, males and females were combined and gender specific correlations on the variables examined were not evaluated. Only prevalence data on level of consumption were reported by gender.

The armed forces is generally thought to be a "wet culture" where alcohol is consumed frequently and in large quantities (Cosper, 1979; Hollinger, 1988; Trice & Sonnensthul, 1988). The frequency of occasions for alcohol consumption are numerous and constitute important work-related norms and traditions (Purisch, 1976). In this occupational culture there would seem to be an esteem for the use of alcohol because it provides the

"worker" with a shared history and fosters cohesive relation-ships through alcohol's use (Ingraham, 1984). In fact, surveys have consistently found a higher prevalence of drinkers and more heavy drinkers in the armed forces among both men and women than in the general population, supporting the suggestion that occupational context influences the level of alcohol consumption.

The lack of attention to drinking patterns of women in the armed forces may be explained by the belief that "alcoholism" is a man's disease and the armed forces is a man's occupation. Yet prevalence data shows that women in the armed forces drink more heavily than do women in the general population and have more problem drinking (Bray et al., 1989b). It is impossible to further compare women in the armed forces and women in the general population or women in other occupations since only prevalence data is available for women's alcohol consumption in the armed forces.

Purpose of the Study

This study will investigate the relationship between women's membership in the armed forces and alcohol consumption. This will be accomplished by a secondary analysis of the women in the 1985 and 1988 world-wide surveys of armed forces personnel. This will include:

(1) analyzing sociodemographics (namely, age, marital status, race, and education) of women in the armed forces samples as well as the relationships of these variables to level of alcohol consumption and problem drinking (defined as lost productivity and experiencing negative consequences). These findings will be contrasted against the literature pertaining to women's alcohol consumption in the general population;

(2) investigating the relationship of type of job or occupation (i.e., those jobs with proportionally higher numbers of males to females or traditionally male versus those with proportionally higher numbers of females to males or traditionally female) to level of alcohol consumption; and

(3) investigating the relationship of contextual factors, including the beliefs and perceptions concerning alcohol use in this context to level of alcohol consumption.

The following hypotheses are posed:

(1) The age cohort relationship to level of alcohol consumption among women in the armed forces will not follow the same trajectory as women in the general population (i.e, the women in the armed forces will continue to drink at higher levels at older ages than women in the general population and the number of abstaining women at older ages will be fewer than in the general population);

(2) the relationship of level of alcohol consumption among women having jobs in occupations which are characterized by proportionally higher male incumbents will consume alcohol at higher levels than women in jobs that are characterized by proportionally higher female incumbents; and

(3) the relationship of contextual factors, including the beliefs and perceptions of these women pertaining to alcohol consumption in the context of the armed forces, will be statistically significantly related to their level of alcohol consumption.

Significance of the Study

This analysis will markedly expand current knowledge concerning women's alcohol consumption in the armed forces and will afford some comparison of women's alcohol consumption in the armed forces with that of women in the general population. Additionally, it is unique in that it examines contextual factors as they relate to alcohol consumption as well as contextual factors which are perceived as influencing alcohol consumption. This will be one of the first studies to examine occupational contextual factors and their relationship to women's alcohol consumption.

This analysis is also unique in sample size (N=3071) and the variety of occupational categories examined. Further, the women in these surveys hold positions in a wide array of occupational categories, many of which are nontraditional occupations for women when compared to the general population (i.e., it will be one of the first studies to examine the alcohol consumption of women in jobs which have traditionally been considered male occupations).

This study is significant in that it is one of the first to describe the prevalence of alcohol consumption and the incidence of problem drinking in this population. Because women are more vulnerable than men in the development of acute and chronic physical complications of alcohol consumption (i.e., women develop physical complications over a shorter period of time and after consuming smaller volumes of alcohol than men) (Frezza et al., 1990; Hill, 1982; Nanji & French, 1987) and, since the women in the armed forces drink more than women in the general population, they are at higher risk for developing physical complications from alcohol consumption. This may suggest an occupational hazard for these women as

well as the need for prevention programs which would address the women in this population.

This study is significant to nursing in that it reiterates the importance of evaluating alcohol consumption in health assessments. Although women drink less than men, they develop problems faster than men and with a smaller volume of alcohol. This suggests that women who drink less than "heavily" may have health problems related to alcohol consumption. Furthermore, if the data supports either of the hypotheses that the women in occupations characterized by proportionately higher males drink more than other women or that the context is significantly related to heavier drinking, then it could be suggested that women should be evaluated for the potential contribution of their alcohol consumption to potential health problems.

CHAPTER TWO

REVIEW OF THE LITERATURE

Prior to the 1970s, there had been surprisingly few studies that investigated factors in the occupational environment contributing to alcohol consumption or alcohol problems among workers. Compounding this deficit was the paucity of studies investigating alcohol consumption among women workers and women's alcohol consumption generally. Not until the 1970s did women's alcohol consumption in the general population become an area of focused inquiry. Therefore there is no extant conceptual framework or theory to undergird the study of women's alcohol consumption in the armed forces. This review of the literature takes a broad approach examining literature from four domains: (1) extant occupational/alcohol theories, (2) contextual characteristics of alcohol consumption in the armed forces, (3) the literature related to women's alcohol consumption in the general population as well as occupations, and (4) women's roles and alcohol consumption in the armed forces. These four domains will be used in developing a conceptual framework for understanding alcohol consumption among women in armed forces occupations.

The last section of this chapter will briefly review two areas of methodological literature related to this study. These two areas focus on two major criticisms of alcohol studies and because of the controversial nature of both of these areas they are addressed herein. Specifically these literature pertain to (1) the validity of self-reports in the study of alcohol use and (2) the measurement of alcohol consumption in general population studies.

Extant Occupational/Alcohol Theories

Few social scientists have investigated and developed postulates involving the work place as a significant factor in the development of drinking problems. However conceptual classifications related to alcohol use in occupations have evolved which are widely varied in their perspectives pertaining to the intersect between alcohol consumption and work place factors. Further the conceptual orientations in the existing literature primarily relate to the development of alcoholism as a disease. Briefly discussed here they are: levels of social control (Cosper, 1979; Parker & Brody, 1982; Trice & Sonnensthul, 1988); alienation (Seeman & Anderson, 1983; Trice & Sonnensthul, 1988); social availability (Parker & Brody, 1982) occupational or work place subculture (Cosper, 1979; Cosper & Hughes, 1982; Hollinger, 1988; Parker & Brody, 1982; Trice & Sonnensthul, 1988), self-selection (Cosper, 1979; Plant, 1979), structural strain (Cosper, 1979; Hollinger, 1988), and importation (Hollinger, 1988).

These perspectives have evolved out of a small body of research which has centered on occupations but has reduced the question of alcohol consumption in occupations to a narrow focus and misses the development of a framework considering the dynamic nature of the relationships between man and his environment. The diversity of perspectives which have been identified are not clearly demarcated and the potential for overlap is obvious.

The social control perspective postulates that employees are placed at high risk for alcoholism because there is limited social control over alcohol abuse. High-risk characteristics include unsupervised or limited supervision in the position, independent positions, positions where

performance has low visibility, and positions calling for frequent shift changes, travel or relocation and frequent changes in supervisor.

The alienation and structural strain perspectives postulates that when jobs lack creativity, variety, independent judgement or intrinsic satisfaction, self estrangement and a sense of powerlessness result, which is relieved through the use of alcohol. Structural strain perspectives refer to the stress associated with work and, like the alienation theories, it is thought that workers attempt to find release from the stresses and tensions at work through the use of alcohol.

Social availability is another theory advanced in the occupational alcoholism literature. Here it is argued that participation in work or leisure activities with a heavy drinking group is the key determinant of an individual's alcohol consumption. The social availability perspective is extended in the theories pertaining to the occupational or work place subculture. In the occupational subculture perspective it is theorized that some occupations possess a high degree of group solidarity and informal social cohesion (Cosper, 1979) which are significantly correlated with heavy drinking and drinking problems (Trice & Sonnensthul, 1988). Trice and Sonnensthul (1988) offer examples where alcohol is used by management in conflict resolution by providing an occasion for two clashing employees to get drunk. The shared experience of a hangover the following morning is thought to promote increased cooperation and communication. Another example offered is that of an occupation where drinking after work in a usual bar for union members served as a "bulletin board for unemployed union members" as well as a place to relax after work. Another notable aspect of this perspective is offered by Cosper (1979) who points out that in "marginal" occupations (occupations which

hinder interaction with persons not affiliated with the occupation, e.g., policemen), drinking is a large part of the social and work life and drinking conforms to the "local custom". In the occupational subcultures perspective, social drinking, originating in leisure time, can lead to either active or passive tolerance for drinking peers, and diminished social control in the work place (Hollinger, 1988).

The self-selection perspective posits that individuals who are heavy drinkers select occupations which are more tolerant of heavy drinking--occupations even offering some protection from the consequences of heavy drinking (Plant, 1979).

The final perspective used in the occupational alcohol literature is that of importation. This perspective presumes alcohol consumption and problems in the work place reflect the norm, values and distribution of the substance in the society at large.

In evaluating this variety of perspectives, it is simple to envision more than one operating in any given occupational context. However, since research in this arena has been seriously limited, it would be premature to conclude that one or another perspective might be more significantly related to alcohol consumption and problems. This is particularly significant in considering alcohol consumption in armed forces occupations.

An Appraisal of the History and Contextual Characteristics of Alcohol Consumption in the U.S. Armed Forces: from the American Revolution to the Present

The use of mind-altering substances has long been and continues to be an area of interest, particularly how it effects members of the U. S. Armed Forces. The period following the Vietnam Conflict heralded the beginnings of deliberate efforts to examine the use of substances in the U. S. Armed Forces. Substances were being abused during the Vietnam Conflict in epidemic proportions and the rate of medical evacuation for U. S. substance abuse casualties at the close of the conflict severely hampered the effectiveness of military units (Jones & Johnson, 1975).

Since the Vietnam conflict period, the Department of Defense (DOD) has seriously appraised the prevalence of substance use and abuse by commissioning cross-sectional studies of military personnel world-wide on a recurring basis (every three years). One main aspect of this research has concentrated on determining prevalence rates, correlates of the effect of mind-altering substances on readiness, and examination of the effect of policy changes aimed at reducing substance use within the armed forces. Across each wave of the studies the prevalence of non-prescription drug use has drastically decreased, however the prevalence of alcohol use has persistently been found to be higher in the armed forces than in the civilian population. This persistent finding raises a critical question. Do the culturally normative practices in the armed forces promote alcohol consumption?

While prevalence studies exist, there have been few studies which have investigated the relationship of alcohol consumption as a cultural phenomenon in the U.S. Armed Forces. The use of alcohol in the armed

forces has a long and important traditionally normative value dating to the inception of the army in the American Revolution. The cultural context in which alcohol consumption occurs in the armed forces will be reviewed and presented historically. Further, current perspectives and research on alcohol consumption as it pertains to the armed forces will then be presented.

In the American Revolutionary Army

Tracing alcohol consumption in the U.S. Armed Forces to the inception of military service in Colonial America, reveals that its use mirrored alcohol consumption in the U.S. population as a whole at that time. Generally thought to be "God's good creature" by the colonists, it was also believed to have many useful properties for the health and welfare of the soldiers. The goodness of alcoholic beverages was believed to lie in its medicinal, stimulant and social properties.

Lender and Martin (1982) report that in colonial America alcohol use was thought to be positive and without negative consequences or sequela (although excessive drinking was thought of as gluttony and consequently frowned upon). They estimate the per capita alcohol consumption of the average American over 15 years of age in the 1790s was ". . . just under six gallons of absolute alcohol each year . . . . The modern average is less than 2.9 gallons per year" (p. 14). Most drinking occurred outside the home or work and was confined primarily to taverns, which served a variety of practical social needs.

Often the first structures erected in colonial America, the tavern served as the community meeting place, a rallying point for the militia and also as recruiting headquarters for the Continental Army. The militia

drills are reported as little more than social gatherings which were barely sober and where drinking alcohol was the central focus.

> An eighteenth-century Virginia militia commander recalled that "for several years" he frequently gave his men alcohol [after a drill] and that afterward "they would . . . come before his door and fire guns in a token of their gratitude, and then he would give them punch 'til they dispersed. (Lender & Martin, 1982, p.12).

One of the largest institutional consumers of whiskey was the Continental Army which provided a whiskey ration of 4-6 ounces daily to each soldier. The ration was thought to serve several important purposes; it was believed to keep the soldiers healthy in the face of harsh service conditions, serve as a morale booster, and was used as a reward for service and comfort after the loss of a battle. Use of alcohol as a reward is documented after the loss of the battle of Germantown in 1777 at which time the Continental Congress shipped an extra 30 casks of whiskey in addition to the normal ration, in recognition of the troops' performance (Lender & Martin, 1982).

As a morale booster and also as a health promotion resource, earlier, the Continental Congress of 1775, fixed the army ration at one quart of spruce beer or cyder per day. Despite the fixing of federal rations, the individual colonies set the alcohol ration to levels which were felt to be more appropriate, e.g., in 1776, the state of Maryland fixed the alcohol ration to 1 1/2 pints of rum per day and Pennsylvania fixed the ration at one quart of small beer per man per day (Cherrington, 1920).

Although the liquor ration was thought to serve many useful purposes, alcohol consumption by the soldiers presented problems. Lender and Martin (1982) cite two such incidents. In the first, as General Washington retreated across the Delaware River in 1776, one of his patrols

found a barrel of whiskey and drank it to prevent the enemy from finding it. Their resulting drunkenness initiated concerns about their ability to defend their rear boundary. The second occurred in 1781 as the Continental Army drove the British from an encampment. The soldiers of the Continental Army looted and drank the British rum they found, becoming so drunk they were unable to hold off the British counterattack.

Despite the generous liquor ration provided for the soldiers, they also purchased cheap whiskey from the sutlers (merchants who followed the troops selling supplies not provided by the Army). The combined effect of these two sources of supply resulted in excessive drunkenness, which took a toll on military efficiency. Efforts to reduce the excessive use of alcohol included: threats of punishment with twenty lashes, changing the liquor ration to a less potent substance like beer or cider and prohibition of liquor sales by the sutlers. The success of these policies are unknown.

In 1777, Benjamin Rush, an early temperance advocate, joined the Army Medical Department as physician general and was the third ranking in this department. Hawke's (1971) biography of Rush's life, reveals the concerns Rush had about the health and welfare of the Continental Army. The two major health problems he found were intractable dysentery and excessive alcohol consumption. He voiced his concerns about the extent of the alcohol consumption problem seen within the highest ranks six days after the battle at Germantown when he visited General Washington. Following that visit, he complained that General Washington was surrounded by incompetents and indicated his concerns about the pervasive excessive consumption of alcohol among his staff and wrote:

> . . . [Nathaneal Greene] . . . a sycophant to the general, timid, speculative, without enterprise; [General Sullivan] a

> proud, vain, lazy, ignorant drunkard; [and the once admired Adam Stephen who turned up drunk at the battle of Germantown] now a sordid, boasting, cowardly sot. (Hawke, 1971, pp. 206-207).

To rectify this problem, he suggested that the army purge itself of these drunkards.

Since Rush's observations of these officers occurred shortly after the defeat at Germantown, and the Congress had sent extra whiskey rations to assuage the soldiers after that defeat, it would seem that his thoughts on the excessive quantities of alcohol consumed was not the shared opinion of the government. Rush tenaciously pursued his concerns about the intemperate use of alcohol and prepared a manual challenging the opinion that liquor was beneficial in warding off the ill effects of the extreme cold or heat that the soldiers faced. He argued that alcohol increased the physical hardship due to weather extremes and voiced his belief that most of the fevers, fluxes, and jaundices found in military hospitals were in part related to the large quantities of alcohol consumed by the soldiers (Wilkerson, 1966, p. 43).

Rush's challenges to the popular dictum that alcohol use was essentially totally beneficial continued, and he was the first American to posit alcohol to be an addictive agent which could lead to progressive deterioration of physical, moral, and mental health. However, his message did little to change the drinking behavior of the majority of the people at that time and the liquor ration in the armed forces continued to flourish.

On the Frontier

Following the Revolutionary War, the tradition of the liquor ration persevered in the armed forces as soldiers were dispatched to the frontier

with the nation's westward expansion. One of the easiest products to transport was whiskey and the demand for it on the frontier was high. Early migrants to the west used alcohol for medicine, relaxation and amusement in their lonely and hostile environment. This was also the case in the armed forces. Reflective of an earlier period, Winkler (1968) reports that the factors which promoted alcohol consumption in the frontier army forts included the prevailing beliefs that alcohol was important to the health, morale, and welfare of the troops. In 1794, the Congress authorized the President of the United States to increase the whiskey ration to one gill (4 ounces) daily. As was seen in the Revolutionary War, alcohol consumption was not without problems. The primary problem on the frontier was one of discipline.

The army forts on the frontier were isolated and the soldiers used alcohol as a diversion: ". . . many soldiers learned to quench thirst, subdue hunger, and otherwise obliterate their misery with whiskey" (Winkler, 1968, p. 428). The daily liquor ration was supplemented by purchases from the sutlers (post traders) who set up trade at every garrison. Winkler (1968) reports that greatest and most persistent discipline problem on the frontier was the intemperate use of alcohol, legally issued by the military and supplemented by purchases from the sutlers. He refers to a commandant at a Nebraska fort who reported the guardhouse was crowded and court martials frequent from violations of whiskey use. It was estimated that 20% of the deaths reported by the frontier garrisons could be attributed to excessive drinking.

> The soldiers were often men who had enlisted because they were unable to get along in the east. Not likely to be particularly temperate in their habits, they found that in the west certain kinds of behavior were overlooked if they performed their duties acceptably. (Winkler, 1968, p. 429).

The role of the sutlers to the military forces on the frontier was highly significant. They provided access to supplies or items soldiers desired for their personal comfort which were not included in army rations (Innis, 1984). These traders stocked items which were felt to be appealing to the prospective customer and their inventory resembled that of a general store. Although the sutlers contributed to the drinking problems seen on the frontier and their elimination could have reduced the problems, they were conceived to be a "necessary evil". An indispensable function they served is exemplified in an agreement they made with the government, to act as bankers to the citizens and soldiers of the garrison. Furthermore, they were authorized to pay the troops when weather or other conditions prevented the paymaster from getting through to the forts.

In 1799, as a part of the Army Reorganization Act, the government of the United States did take measures to reduce alcohol consumption in the armed forces by eliminating the liquor ration except where it was a part of the soldier's enlistment contract and in the case of fatigue or other extraordinary occasions. The catalyst for this change is not clear, however the subsequent actions of the Congress are indicative of conflicting attitudes related to the usefulness of alcoholic beverages for the soldier, persisting throughout the Temperance Movement. These policy changes were summarized by Cherrington (1920) and included: (1) In 1801, the 7th U.S. Congress withdrew the option of one quart of beer in Navy rations instead of 1/2 pint of spirits. (2) In 1802, Congress restored the spirit ration to the army and doubled the amount of the ration to one gill per man per day. (3) In 1804, Congress provides that an equivalent of malt liquor or wine may be substituted for spirits in the Army at

certain seasons of the year. (4) In 1820, the ration was stopped for the Army but continued in the Navy until 1862. (5) Also in 1820, the Commissary General of Substinence wrote a letter to dispense with the spirit ration and offered troops a contract price of money instead. During the period when the Temperance Movement was gaining momentum, the Army became officially dry (1901-1934).

The policy changes centralizing around the liquor ration served to eventually discontinue the rationing practice. While the pressures for policy changes stemmed from the Temperance Movement, a powerful grass-roots political factor of the times, the Navy continued the ration into the Civil War sanctioning alcohol consumption on board ship until 1914.

During the Civil War

The primary substance problem during the Civil War was morphine rather than alcohol. The Temperance Movement had been successful in reducing alcohol consumption in the armed forces, however at least one important general officer during the Civil War is documented as having a problem with alcohol. Dorsett (1983) reports General Ulysses S. Grant, a West Point graduate, had a long history of problematic alcohol consumption prior to the Civil War and had been relieved of a regular army commission because of his drinking. Apparently recognizing his problem, Grant later became a member of the Sons of Temperance, a forerunner of the Alcoholics Anonymous. Grant did not totally abstain from using alcoholic beverages and it is reported that he occasionally relapsed into his old habit. However, his relapses were considered defensible, and largely accounted for by military duty which deprived him of his family: "In other words, Grant did drink but he had a good excuse" (Dorsett, 1983, p. 44). The

effect of Grant's drinking on his ability to command does not seem to have been detrimental. Accordingly, Dorsett (1983) states that:

> . . . he was seldom drunk unless there was a lull in the battle, usually after the pressure was behind him. Paradoxically, Grant was the great military leader . . . in part because he suffered from alcoholism. This disease had such an impact on Grant's personality that it became a factor in his military success. (p. 46).

Specifically what this author means by the effect of alcohol on Grant's personality which caused him to become a military success is not delineated. However, the work of John Keegan (1984) offers some insight, adding another dimension to the heretofore discussed rationale for the large amount of alcohol consumed by the armed forces by arguing that drinking seems both an inseparable part of the preparation for battle itself as it depresses the self-protective reflexes, and also induces the appearance and feeling of courage. Helmer (1975) offers support for this argument:

> During the Civil War a mixture of narcotics and alcohol known as Hosteller's Bitters[1] did double duty as a remedy for dysentery and a disinhibiting agent or relaxant on official issue to the troops before a battle. It was a variant of the traditional double-or-triple rations of spirits issued to soldiers before a fight, at least through World War I. (p.128).

Although the sanction for alcohol consumption changed during the Civil War as a result of the Temperance Movement, it is apparent that the consensus of the military leaders was belief that alcohol consumption or a variant on alcohol was a significant factor for the health and welfare of the soldier.

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[1]Quinones (1983) describes Hosteller's Bitters (47% alcohol by volume) as a patent medication that was also used by temperance advocates to ward off the effects of the environment.

Literature discussing alcohol in the armed forces became less prolific as the Temperance Movement gained momentum, with the exception of a discussion of the discontinuation of the wine mess in the Navy. Baldwin (1958) presents a historical analysis of the use of alcohol in the Navy and a discussion of the uproar created by the end of the wine mess custom on floating vessels. In April 1914, Secretary of the Navy, Josephus Daniels, under President Woodrow Wilson, issued General Order 99 which eliminated the officers' wine mess (the wine mess was perceived by officers to be one of the few amenities offered aboard ship). The wine mess was supposed to be stocked with only wine and beer. However this was not always strictly adhered to and the mess contained distilled beverages as well. Daniels perceived the wine mess to be a double standard since enlisted men were forbidden to consume any alcoholic beverages aboard ship. Liquor aboard ships, in many forms, had been a U.S. naval custom since the early days of the windship. General order 99 went into effect 1 July 1914. On the prior evening Baldwin (1958) documents that the Atlantic fleet threw "a smoker", depleting the remaining stock of the wine mess aboard those ships.

Not until the repeal of Prohibition were officer's clubs and stores at naval shore stations permitted to sell liquor and enlisted men permitted to purchase beer. During World War II (WWII) and the Korean War, as well as during the decade of the 1950s, liquor was stocked in small quantities aboard ships in the custody of the medical officers to be used for medicinal purposes only: "The medicinal use of spirits found particular therapeutic values during WWII--particularly aboard aircraft carriers and submarines to lessen shock or reduce tension of pilots after 'tough' missions or in submarine crews long exposed to enemy action" (Baldwin, 1958, p. 91).

During the World Wars

Helmer's (1975) review of the literature on the use of mind altering substances by servicemen in the U.S. armed forces includes reports of studies pertaining to alcohol and drug use in WWI and WWII. Most of these studies were retrospective, and used incarcerated populations of deserters, prisoners and psychiatric populations as respondents. During WWI, there seems to have been relatively little substance use in the Allied Expeditionary Forces. A summary report issued in 1920 testified that among the neuropsychiatric cases handled by the medical corps, less than 5% were classified as inebriate by reason of either drugs or alcohol, but Helmer believes the report minimized the proportion of cases.

In WWII, a primary issue for the armed services was marijuana use, believed by some military leaders to be at the crux of discipline problems. However, " . . . the semiofficial journal, Military Surgeon, dismissed concern about marijuana as groundless and stated that the drug was no more harmful than tobacco and relatively trivial in it's effects" (cited in Helmer, 1975, p. 132). Also cited is a study which examined 310 enlisted men who were veterans of WWII. The chief reason given by them for marijuana use was to escape the strain of war.

Much of the literature concerning the role of alcohol in the military during WWII reflected the belief of the nascent Modern Alcoholism Movement- a movement, both scientific and popular, claiming that alcoholism was inherently an individual problem (Jellinek, 1946). In this context, not surprisingly, Harrison (1944), explicitly stated that alcohol consumption is an individual characteristic and that there are no peculiarities inherent in the Navy environment which could cause a soldier to drink excessively or become addicted to alcohol, and discussed

environmental policies exercised by the Navy to reduce alcohol consumption. Myerson (1942), writing from the perspective of a military surgeon at an induction station, indicated that drinking men, though presenting a potential for problems in the armed forces, were fundamentally normal and able to perform the duties of soldier successfully.

Berlien (1944), writing from the Army perspective, maintained that the Army viewed inebriety among soldiers as an undesirable habit. Unlike Harrison, he reports there are men who increase their drinking after entering military service and as an effect of military service. The reasons he gives are: younger men entering the military have a new found freedom from parental authority, the also experience peer pressure to keep up with the other fellows; alcohol was a source of courage and allayed anxiety, it provided a distraction from loneliness; and those with personality defects prior to entering the military tended to drink more. He maintained that if leaders provided good examples with respect to moderate drinking and if sufficient emotional and physical outlet opportunities were made available, alcohol consumption could be controlled.

In the Vietnam Conflict

During the Vietnam conflict there were significant problems with substance abuse. Heroin and marijuana were readily accessible in Vietnam and the use of these substances among U.S. armed forces was regarded as problematic. There were reports that there were more casualties due to narcotics than to combat. Keegan (1984) discusses the use of substances in Vietnam by the American forces:

> Alcohol, as we know, depresses the self-protective reflexes, and so induces the appearance and feeling of courage. Other drugs reproduce this effect . . . the American Army's widespread addiction in Vietnam . . . is seen, if not as natural, certainly as a time honored response to the uncertainties with which racks the soldier. (p. 326).

Jones and Johnson (1975) and Hoiberg (1980) report the problems with substances were greatest among soldiers in support rather than in direct combat roles. In a retrospective study of a cohort of all of the men who enlisted in the Navy in 1966, Hoiberg (1980) found the non-hostile duty assignment group and the non-Vietnam assigned group had the highest number of hospitalizations for stress-related diagnoses.

Jones and Johnson (1975) discuss the differences in the emotional stressors that caused psychiatric casualties in Vietnam. They found that casualties sustained by soldiers in direct combat roles were more likely to be related to combat fatigue and that the casualties related to support or non-combat roles were highly related to alcohol and drug abuse. The explanation given is that the non-combatants who became casualties were suffering from disorders of loneliness and the high prevalence of alcoholism was a disorder thought to be related to dependency deprivation. As such, boredom was the enemy and alcohol and drugs were the methods used to cope with the situation. Other factors related to increased alcohol consumption included: a combination of the hot temperature of the area and consumption of canned beverages (specifically beer since it was more readily available than soda); ". . . group permissiveness towards many forms of behavioral license permitted in war" (p. 55); and a considerable amount of leisure time.

The year 1970 was the beginning of what became an enormous increase in the evacuation of drug abuse casualties from the area. The primary method of handling drug abuse patients (identified through positive

urinalysis) was to evacuate them to a stateside treatment facility. This policy emerged into an "evacuation syndrome" with most of the patients becoming casualties on the basis of the urine screening test. The numbers of soldiers involved in this "syndrome" has been paralleled to the loss of manpower due to "war neurosis" in the early part of WWII when the numbers of men being separated from military service for psychiatric conditions equalled the numbers being drafted.

This historical review of the literature has discussed the role of alcohol as well as other substances in the U.S. Armed Forces specifically during combat situations. An appraisal of the history of the role of alcohol in the armed forces suggests four recurring themes as primary functions from the Colonial period through the Vietnam Conflict: (1) Alcohol used as a "tonic" to assuage the personal deprivations of military service, e.g., dislocation from family and familiar surroundings, spartan living conditions, exposure to harsh climatic conditions, and as a critical element in promoting social conviviality among geographically mobile individuals; (2) the role of alcohol in fortification (both before and after) the battle; (3) its use as an reward for service; and (4) its role in relaxation in leisure time.

Prior to the Temperance Movement, alcohol was viewed as an essential element for the health and welfare of the soldiers and was provided daily in the form of a ration. The societal pressures exerted by the Temperance Movement was the catalyst ending the liquor ration in the armed forces. While alcohol was no longer legally issued, it's consumption continued to be a normative practice in the general population and the military. Popular and scientific conceptions of deviant alcohol use up to and including the WWII period took into account that some people drank more

heavily than others but this behavior was not used to exclude potential servicemen. In order to manage the potential for problems with excessive alcohol consumption, the services developed programs to promote responsible drinking on the part of the soldiers.

The problems of substance use and abuse were most intense in the armed forces during the Vietnam Conflict. Both alcohol and narcotics were implicated in reducing the effectiveness of American troops during this conflict, but narcotics were more readily available and were perceived to be the greater problem in comparison to alcohol. Nonetheless, the factors related to the soldiers' use of narcotics and alcohol were the same; substances were used by the soldiers to cope with the vagaries and vicissitudes of war. The data elicited from the substance abuse casualties of this conflict added a new dimension to the knowledge of substance use and abuse in the armed forces, namely that the noncombatant soldier, serving in support roles, exhibited the highest prevalence of substance abuse problems. Boredom, loneliness and dependence deprivation were provided as the explanations. Whether these factors are related to the excessive alcohol consumption in similar roles in the armed forces or at other historical periods is not indicated in the literature. Neither is there a discussion of the "meaning" of the noncombatant role to the soldier or how the noncombatant role and its features of loneliness, boredom, or dependency deprivation may be related to substance abuse. These are questions which remain unanswered.

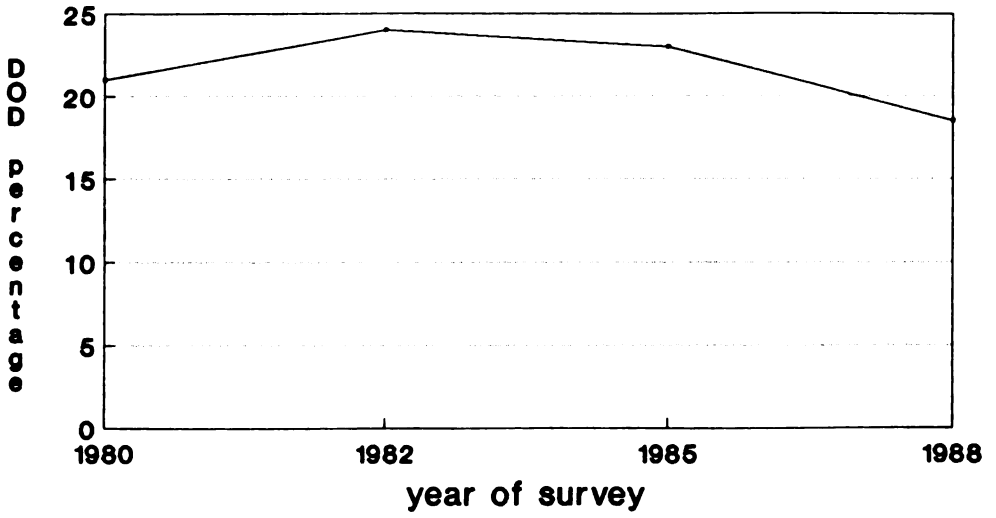
Current Alcohol Consumption in the U.S. Armed Forces.

News reports regarding the number of evacuations from Vietnam for narcotic addiction were a matter of concern for the American public. The

services responded to the public outcry by investigating the problem within their respective service branch (Kolb & Gunderson, 1977; Polich, 1981; Polich & Orvis, 1979; Purisch, 1974; Schuckit & Gunderson, 1974a; Schuckit & Gunderson, 1974b; Schuckit & Gunderson, 1974c; Schuckit & Gunderson, 1975). The methodologies and measurements used in these studies did not permit comparative analysis of the extent of the problems across the Department of Defense (DOD). In 1978, the U.S. Congress held hearings to investigate the nature of the problem in the armed forces (Drug Abuse in the Military, 1978). During these hearings, it became apparent that a clear picture of the nature of the problem of substance use and abuse in the services was not emerging.

As a result of these hearings, the Congress commissioned a world-wide survey across all branches of the services. The objective was to provide a more accurate representation of the use of alcohol and non-prescription drugs in the armed forces and to analyze the effectiveness of DOD policy aimed at reducing substance use. Since the first study, subsequent surveys, conducted approximately every three years also examine substance use in the armed forces (Bray et al., 1983; Bray et al., 1986; Bray et al., 1989a).

Each of these studies measured the prevalence of alcohol consumption using a topology which respectively classified respondents drinking levels. Other data collected included alcohol or drug related adverse or negative effects, sociodemographic correlates and psychological/ sociological variables. Figure 1 summarizes the trends in heavy alcohol consumption of servicemen 30 days prior to the study since 1980. The services are collapsed together as all DOD military personnel world-wide rather than reported separately.

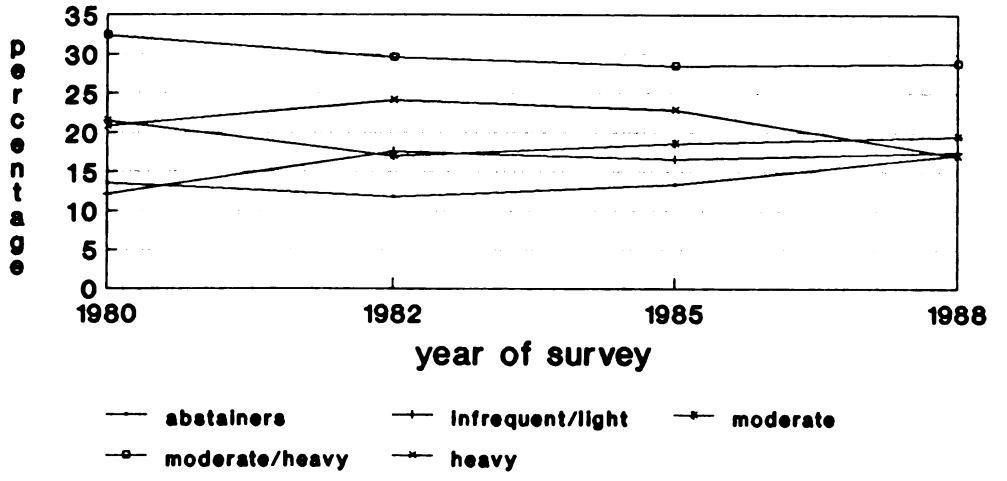


adapted from Bray, et al., 1989.

Figure 1. Trends in heavy alcohol consumption in the past 30 days.

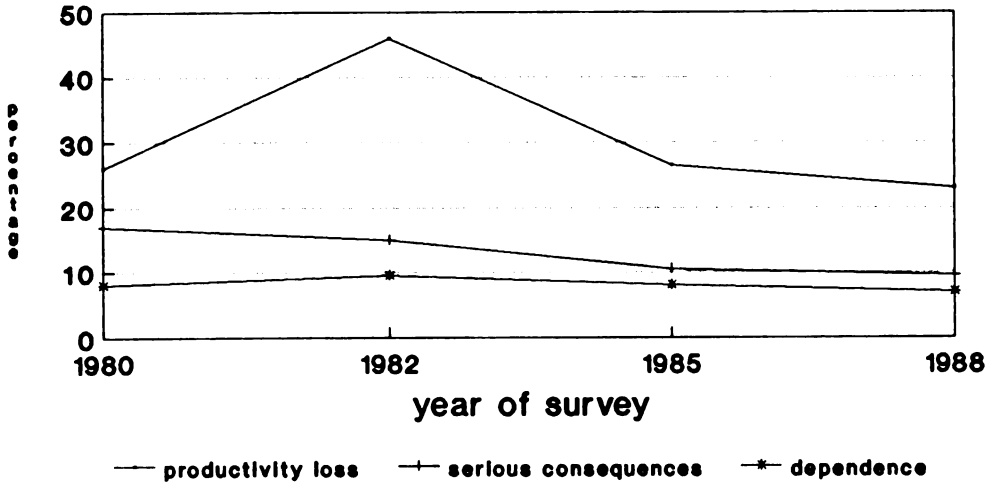
There has been a downward trend in the percent of personnel classified as heavy drinkers since the studies were initiated. These trends are believed to be related to policy changes aimed at decreasing alcohol consumption (e.g., health promotion and deglamorization of alcohol). There is also a noticeable decline in the overall heavy alcohol drinking levels displayed in Figure 1. There has been an increase in the number of abstainers and a decrease in the number of heavy drinkers (Figure 2). The numbers of infrequent/light drinkers and moderate to heavy drinkers has remained fairly consistent across the waves of the studies. However the number of moderate drinkers, though dropping between 1980 and 1982, has continued to increase from 1982-1988.

A decline in the number of negative consequences associated with alcohol consumption has also been observed (Figure 3). Negative consequences of alcohol consumption were measured on three levels: serious consequences (alcohol-related disciplinary action, 3 or more days lost at work due to alcohol use, alcohol-related accidents, spouse left as a



adapted from Bray, et al., 1989

Figure 2. Trends in level of alcohol consumption during the past 30 days.



adapted from Bray et al., 1989

Figure 3. Negative consequences of alcohol use in DOD, 1980-1988.

result of respondents drinking, driving while intoxicated [DWI] arrest and other arrests, fights); productivity loss (late for work, leaving work early, drunk on duty); and dependence (no memory of events, shakes uncontrollably; couldn't stop drinking until drunk). There was a sharp increase in the amount of lost productivity in 1982 to 45% which is correlated to a peak in alcohol consumption in the DOD. After 1982, there is a downward trend in alcohol consumption in the armed forces and a corresponding decrease in the negative consequences of alcohol consumption (Figure 2).

One of the strongest predictors for alcohol consumption which was identified in the 1988 world-wide survey was that of drinking motivation. The drinking motivation index used in the study was constructed of seven items assessing reasons for drinking: (1) to be friendly or social, (2) to forget my worries, (3) to relax, (4) to cheer me up when I am in a bad mood, (5) to help me when I am depressed or nervous, (6) to help me when I am bored or have nothing to do, (7) to increase my self-confidence. In regression analysis, the drinking motivation variables were associated with an increase of 13% in the probability of heavy drinking. This is a large statistical effect and suggests that military personnel who use alcohol to satisfy their personal, social and recreational needs are more likely to be heavy drinkers.

Unlike most alcohol prevalence studies in the general population was the puzzling finding that heavy drinking was highly prevalent among older military respondents as compared to most general population studies that found heavy drinking to decrease with increasing age (Hilton & Clark, 1987; Weschler, 1978). This deserves consideration particularly if those subjects who were also older have been in the service longer and if

alcohol consumption in the occupation of the armed forces is considered to be a part the normative practices of that subculture. In this case, such a finding would support the proposition that this environment encourages and condones heavy drinking.

Alcohol consumption among the military has been compared to surveys of the civilian population (National Institute of Alcoholism and Alcohol Abuse, 1987; Hilton & Clark, 1987). Noteworthy is that the percentage of drinkers and heavy drinkers is generally higher among military personnel than civilians. However the difference in the sociodemographics and measurement methods make comparison between the two populations difficult and caution must be exercised in interpreting the results.

Alcohol Consumption in the U.S. Armed Forces as Normative Behavior.

Explanations concerning the normative practices of alcohol consumption can be found in anecdotal literature, NCO (noncommissioned officer) and officer guides, formal organizational traditions and research reports. In the anecdotal literature, Retired Captain Joseph Purisch, founder of the respected Long Beach (California) Naval Medical Center alcohol rehabilitation program, describes drinking practices in one segment of the services:

> In Naval Aviation, we drink according to the following customs: We drink at happy hour, after a good flight, after a bad flight, and after a near midair collision (to calm our nerves). To celebrate our first solo flight we traditionally present our instructor with a bottle of his favorite liquor, and if we successfully bail out of a crippled airplane we express our thanks to the lifesaving parachute rigger with a bottle of his favorite spirits. We drink when we get our wings, when we get promoted (wetting down parties), when we get passed over (to alleviate our depression), at formal dining-ins, change of command ceremonies, chief's initiations, and at "Beef and Burgundy Night". At birthday balls we drink our door prize if we have the lucky ticket. When a diver inspects the hull of the ship we give him medicinal brandy,

> and we prescribe the same treatment for "exposure to the elements" if a man falls overboard and is fished out of the Caribbean on a hot day in July. A night carrier landing usually rates medicinal brandy, dispensed by the well-meaning flight surgeon. We "hail and farewell" frequently, and the first liquid that wets the bow of any newborn ship at it's christening is champagne. Thus, we drink from enlistment to retirement and from teenhood to old age. (Purisch, 1976, p.1655).

Another account of the normative practice of alcohol consumption discusses military personnel finding themselves in a catch-22 being tacitly expected to drink heavily as validation of the male macho image and being severely punished should they display problems associated with excessive alcohol consumption (Salute to, 1987).

The NCO Guide (Cragg, Perez, & Kates, 1989) and Officer's Guide (Crocker, 1988) are unofficial publications for these two army leader groups that have been published since 1930. Their purpose is to serve as guides and references for NCO's and officers respectively, providing practical advise and guidance for military leaders. The contents cover the essentials of both official and social skills and knowledge which would be useful in successfully integrating in the organization of the armed forces. In discussions of the use of alcohol, these publications emphasize the officer and NCO roles of leadership as providing models for subordinates. In neither of these guides is drinking viewed as a behavior to be avoided. Rather, it is recognized to be behavior that will likely occur but both publications advise against the behavior becoming a problem.

One official social function described in these guide books is the "dining-in", a custom dominated by drinking. The dining-in is a formal dinner for members of the military organization or unit and provides an opportunity for the officers or the NCO's (depending upon which group is

sponsoring the activity) to meet socially as a means of building unit esprit (cohesiveness). The custom originated from the 18th Century British army officers mess (dinner). At that time, the army was mobile and without permanent quarters, taking shelter for the evening in whatever accommodations they could find (usually a tavern). This became the central meeting place for the "dining-in" of officers and was particularly useful because officers of large units might not normally come into contact with one another on a day-to-day basis. The dining-in which has evolved in the U.S. armed services differs from it's British counterpart in that it is a formal occasion with the black tie uniform being the required uniform. It has a formal protocol and specifies rules to be adhered to. These rules are entirely centralized around the method of toasting. Toasts are offered and the officers attending provide the evenings entertainment. It is expected that officers come prepared with a toast, offering the toast to stimulate the evening entertainment. As in 18th Century England, the focus of these events is to build esprit among the soldiers over a drink.

Ingraham (1984) conducted an ethnographic study of the life of enlisted men living in the barracks which examined the use of alcohol as a cultural phenomenon. He identified the occasions for drinking, both sanctioned and unsanctioned. The sanctioned occasions included drinking in the context of battalion organization days, company parties and picnics, easing interpersonal tension among unit members, drinking at outdoor athletic contests, and the availability of beer in the barracks for other drinking occasions. Unsanctioned drinking included drinking on duty, the availability of wine or liquor in the barracks for informal drinking occasions, and drinking involving physical assault, property destruction, and creating public disturbance.

He also observed three drinking patterns which occurred outside the barracks. These patterns were; (1) recreational drinking, (2) affirmational drinking, and (3) ceremonial drinking. Alcohol served several basic normative functions. It was the catalyst for sanctioned activities whose purpose was to promote unit cohesion and esprit de corps. The function of alcohol in the organization days, parties, picnics and athletic events was that of reward. As a stress reducer, in interpersonal tensions, it played an important role in relaxation in the barracks.

The occasions of unsanctioned drinking where alcohol is consumed on duty occurs during those times when there are long stretches of inactivity and supervision is minimal. Wine and liquor in the barracks was common and was easily concealed, but rowdy parties occurred infrequently. The drinking patterns that occurred outside of the barracks all shared the primary function of providing the participants with a tradition and a history of common experience that gave a sense of depth to their relationships. Drinking contributed to the feelings of shared history, group solidarity, and provided one of the few opportunities to express dependence and nurturance (e.g., putting a buddy to bed after a drinking bout).

Ingraham's observations of the reasons for drinking among this population of enlisted soldiers bear remarkable similarity to the functions of drinking which were enumerated from the history of alcohol use in the armed forces. Here also alcohol is used to: assuage the personal deprivations of service (e.g., boredom, dislocation from familiar supports), reward for service, and relax. There are two new aspects added from this study. These are the functions of building cohesion and building relationships.

A resounding theme throughout the normative practice of alcohol consumption is that of cohesion and building interpersonal relationships. Henderson (1985) highlights the significance of cohesion to the performance of military units and argues against those authors (unspecified) that suggest cohesion can be replaced by alternative sources of motivation and control (from patriotism to drugs), questioning assertions that drugs be seriously considered as an alternative form of motivation in view of the expected loss of social support on the modern battlefield. These quotations unfortunately are the only reference this writer makes to alcohol use. However, they suggest that there are those within the armed forces who believe that the practice of alcohol consumption has a very useful purpose to people in this social and occupational domain.

Throughout the history, as well as in the modern armed forces, alcohol consumption has shown several consistent purposes in the occupational context. It has consistently been used to assuage the personal deprivations of loss of creature comforts, lack of shelter from inclement weather, and separation from usual social supports. Alcohol has been used as a source of motivation and courage in the face of battle and for relaxation after the battle. It even found sanction in the armed forces during the Temperance Movement in the medicinal form of Hosteller's Bitters. It has been valued as one of the social amenities expected by the soldier and also a catalyst for developing cohesion and esprit de corps among the troops.

The disease concept of alcohol is the dominant paradigm in this society's approach to alcohol problems and it's influence is clearly seen in the manner in which alcohol use and abuse is approached in the armed

forces. The primary recognition of the problems associated with alcohol on individuals is it's effect unit performance. In this vein, Army Regulation 600-85 states:

> The use of alcohol is legal and socially acceptable, but it should not become the purpose or focus of any military social activity. Abuse or excessive use of alcohol will not be condoned or accepted as part of any military tradition, ceremony, or event. (cited in Cragg, Perez, & Kates, 1989).

The 1988 world-wide survey of DOD personnel found a statistically significant correlation between alcohol use and the belief that there is a positive climate in the military for obtaining help with alcohol problems, as well as the belief that negative consequences will not result from heavy drinking (Bray et al., 1989a). These associations have implications to the environmental context of the armed forces, supporting the hypothesis that this environment is accepting of drinking, even heavy drinking. Research on military alcohol consumption has established baseline data on a number of variables. However, it has not examined causal models which might test the contribution of the occupational or environmental context to the persistent finding that alcohol consumption in the armed forces is higher than in the general population. The armed forces has recognized that the "glamorization" of alcohol within the context of the armed forces is a factor contributing to alcohol consumption. Future research examining normative practices and factors within the environmental context which promote heavy drinking would be useful in understanding this contextual phenomenon.

Women's Alcohol Consumption in the General Population and Working Women in the General Population

Before directing our attention to the specific analysis of occupational/alcohol theory related to women in occupations, it is

important to assess the literature on drinking among women in general. In the 1970s, women's alcohol consumption patterns in the general population were targeted by the National Institute for Alcohol Abuse and Alcoholism (NIAAA) as an area needing specific research. The primary impetus behind this initiative was that it was thought that since women's roles were dramatically changing (e.g, greater number had entered the work place), so would their drinking patterns. Several issues operating societally, in the 1970s, are thought to have influenced the research focus of women's alcohol use. These included: (1) the emergence of the nascent women's movement shifted public attention to women's issues in general, (2) the new widespread interest in the fetal alcohol syndrome and it's alleged dramatic effects on the newborns of women who excessively used alcohol during their pregnancies, and (3) a number of reports in the popular and scientific literature indicating that women's alcohol consumption was increasing (Wilsnack & Beckman, 1984).

Fillmore (1984) provides a historical examination of the research in the area of women and alcohol consumption, discussing shifts in the research paradigms that have occurred in explicating women's alcohol consumption in the general population. The early methods and measures employed in investigations of alcohol consumption were biased in their sample selection finding women to be underrepresented in heavy drinking populations. Consequently, it was thought they did not have alcohol problems of the magnitude (compared to men) to warrant closer investigation. Due quite simply to the insufficiency of sample size, alcohol problems research became a domain confined to the study of men.

Two theories emerged in both the popular and scientific literature pertaining to women's alcohol consumption in the 1970s. The convergence

theory posited that women's alcohol consumption was increasing, reaching the same levels as the consumption of men. In contrast, the hidden alcoholic theory posited that women's alcohol consumption was invisible since much of women's drinking occurred at home.

The earliest reviews of the literature examined both the convergence and hidden alcoholics theoretical perspectives concerning women's alcohol consumption (Ferrence, 1980; Fillmore, 1984). The evidence modestly supported the convergence theory particularly among the younger female population (ages 20-29), but there was no such support among women of older ages suggesting that a cohort effect might be operating in the population. There was no support found for the hidden alcoholic theory.

To overcome the biases of earlier non-representative studies or representative studies of the general population which had not contained sufficient numbers of women for investigation, epidemiological methodologies were employed using general population and household surveys to determine prevalence rates. These more recent epidemiological studies examined women's alcohol consumption patterns in the general population (Celantano & McQueen, 1984; Hilton & Clark, 1987; Weschler, 1978; Wilsnack, Wilsnack & Klassen, 1984). Together they suggest that more women in the aggregate abstain from alcohol than men and that the proportion of men who drink heavily is significantly higher than women and there is a clear age cohort effect for women's drinking patterns. Further, there has been no significant change in women's patterns over approximately 15 year period of time (Hilton & Clark, 1987; Wilsnack, Wilsnack, & Klassen, 1984).

Demographic factors related to women's level of alcohol consumption include age, marital status, and educational status. The level of alcohol

consumption among women is inversely related to age (i.e., younger women (20-30) drink more and the level of consumption decreases with age with more light and abstaining women in the older age groups) (Celantano & McQueen, 1984; Hilton & Clark, 1987; Weschler, 1978; Wilsnack, Wilsnack, & Klassen, 1984). Younger women also experience more adverse consequences (social and behavioral problems) of alcohol consumption (Wilsnack, Klassen, & Wilsnack, 1986).

Women who are unmarried, divorced or separated, as well as women cohabiting and having a heavy drinking partner, are found to drink at higher levels (Wilsnack, Wilsnack, & Klassen, 1984) and the proportion of heavy drinkers are found highest among the divorced and separated (Weschler, 1978). Fewer women who have never married are likely to be abstainers (Hilton & Clark, 1987). Married women are more likely to show signs of problem drinking if they are full-time paid employees in contrast to housewives and unmarried women who are employed in full-time work roles (Wilsnack & Cheloha, 1987). Widows are found to be predominantly abstainers or light drinkers; married women are found to be predominantly light and moderate drinkers; separated and divorced women are found to report heavier drinking than other groups, and never married women are found to have the greatest proportion of heavy drinkers (Celantano & McQueen, 1984).

The relationship between women's alcohol consumption and educational status has not been as consistent across studies as other demographic characteristics. Celantano and McQueen (1984) found college educated women were more likely than other women to be drinkers and women not completing high school to have higher rates of escape drinking. Wilsnack, Klassen, and Wilsnack (1986) found the heaviest alcohol consumption levels

among those women with less than a high school education. The relationship between income and alcohol consumption among women suggests that those in the lower income categories are significantly more likely to be abstainers (Celantano & McQueen, 1984). The converse was found in a large sample in which women with higher than the mean income were the most likely to be abstainers (Hilton & Clark, 1987). A last finding concerning women's alcohol consumption is an important one. The frequency of drinking occasions is the best predictor of alcohol problems among a number of predictors examined (Parker & Brody, 1982).

Alcohol Consumption among Working Women in the General Population

As one embarks upon a study of women's alcohol consumption as related to occupations, there are major limitations in the available literature. First, as has already been mentioned, the study of women alcohol consumption did not become an area of focused scientific inquiry until the 1970s. Second, investigations of alcohol consumption in occupations, regardless of gender, are limited. Following the classic work of Jellinek which established the disease concept of alcohol in both the scientific and popular domains, investigations of the context of work focused on the individual and individual differences in the development of alcohol problems. These works eventually evolved into policy emphasis on screening for alcohol problems among workers, paying little attention to the potential contribution of the work place context to the development of alcohol problems. This emphasis ignored normative practices and other characteristics of occupations which may have implications for alcohol consumption among workers. Given that both the areas of women and alcohol consumption and occupations and alcohol consumption are relatively new

domains of research investigation, it is not surprising that there is a scarcity of literature related to this topic.

Two studies were located which have directly examined the alcohol consumption patterns of women in occupations (Schuckit & Gunderson, 1974b; Parker, Kaelber, Harford, & Brody, 1983); neither are representative of the U.S. general population and both samples were quite small. Parker et al. (1983) investigated metropolitan workers in Detroit while Schuckit and Gunderson (1975) investigated women in the Navy and Marine Corps. Both studies find the highest prevalence of heavy alcohol consumption among younger women and a higher prevalence of problem drinkers among those women of lowest status. Parker et al. (1983) also found that the proportion of working women who abstained from alcohol in the blue-collar occupation was much lower than in other general population surveys and rates of alcohol dependence were greater among the less educated.

Drinking patterns and employment status among women have also been investigated in several general population surveys (Celantano & McQueen, 1984; Parker, Parker, Wolz, & Harford, 1980; Parker & Brody, 1982; Wilsnack & Cheloha, 1987; Wilsnack, Wilsnack, & Klassen, 1984). These data suggest that younger women drink more than older women and are less likely to be abstainers, and women employed outside the home drink significantly more with a large proportion being moderate/heavy drinkers (Celantano & McQueen, 1984). As previously reviewed, it has also been found that women aged 21-34 are more likely to have alcohol problems if they are full-time paid employees rather than housewives, and unmarried women with full-time employment are more likely than married women to engage in problem drinking (Wilsnack & Cheloha, 1987). Further, women with paying jobs are not as likely to drink at higher levels, moderate

drinking was more common with women employed part-time (Wilsnack, Wilsnack, & Klassen, 1984).

The data from these studies of women's drinking in occupations is severely limited. Basically, the data has examined the level of alcohol consumption of employed women. None of these studies have examined the relationship of the type of occupation to women's drinking and are consequently narrow in explicating how employment and or type of occupation influences women's level of alcohol consumption. This is an area needing further research.

Women's Roles and Women's Alcohol Consumption in the U.S. Armed Forces

Prior to the inception of the All-Volunteer Forces, the U.S. Armed Forces had been thought to be the last bastion of an all male occupation. Although this was not the actual situation, women possessed low visibility in this occupation. The armed forces occupations are thought to be nontraditional occupations for women. Considering the proportion of women employed in these occupations compared to men, it can be argued that these occupations are indeed nontraditional for women.

The persistent finding of the world-wide studies indicating alcohol to be consumed more heavily in the armed forces (Bray et al., 1989) suggest women in these occupations will be exposed to a heavy drinking culture. Further, as suggested by the normative practices in the armed forces surrounding alcohol consumption, women in these occupations may be at risk for excessive alcohol consumption. Yet, other factors which may contribute to increasing these women's alcohol consumption is the gender related harassment and conflicts women experience.

The experience of women historically suggests the changing roles of women throughout their participation in the armed forces has been controversial and rife with gender related conflicts. This section of the chapter appraises both the changing roles of women in the armed forces and the prevalence of the alcohol consumption for women in the armed forces compared to that of women in the general population. Finally, a conceptual framework explaining women's alcohol consumption is developed.

Women's Occupational Roles in the U.S. Armed Forces

Although military service is generally considered a male domain, women have served in the U.S. Armed Forces since the Revolutionary War- a fact notably overlooked by the general populace. Many women have served as invisible soldiers, volunteering their efforts to insure the success of the nation in times of mobilization and preparation for national defense. Women were sanctioned as part of the armed forces and systematically recruited when male recruits were insufficient, when wars were prolonged, or when casualties mounted.

Since the inception of the All Volunteer Force (AVF), the numbers of women serving has increased and there has been continual controversy and ambivalence, both internal and external to the U.S. Armed Forces, about women's roles as soldiers, centering on the propriety of women serving in role's that have historically been exclusively reserved for men. This controversy may be summarized as follows: What does service in the armed forces imply and who is eligible for that service?

All citizens of the U.S. think of military service as an opportunity to participate in service to their country and any exclusion from this opportunity is tantamount to disenfranchisement. The history of the U.S.

Armed Forces is rife with examples of disenfranchisement of specific groups to this privilege (Moskos, Schexnider, Smith, & Wilkins, 1989). The last group to be afforded the privilege of service in the armed forces are women.

The roles in which women have served have been shaped by factors that were operating within the society at large. Women have served in both "sanctioned" and "unsanctioned" roles in the U. S. Armed Forces since the Revolutionary War. There is evidence women serving in unsanctioned roles, in which women disguised themselves as men to be accepted in the armed forces (Holm, 1982; Rustad, 1982; Wheelwright, 1989). Historians documenting these cases concur that these women saw their service in the armed forces as a way of legitimizing themselves as partners in the society, their overriding rationales being access to the power and privileged afforded to males only not necessarily associated with concerns relating to the defense of their country. The first formal legitimization of women's service in the armed forces was in the role of nurse during the Spanish American War. The role of nurse, a role which is considered to be women's work in the general population, has been the most accepted role for women in the armed forces. The roles expansion of women in the armed forces has mirrored the role expansion which occurred in the society. But women's service during the national mobilization periods from the Spanish American War through World War II (WWII) has largely been minimized as they were not granted full military status and they received no military rank nor equal pay which are the benefits normally associated with military service. Following WWII, major social changes both within and outside of the military which included subjecting female enlistees to greater scrutiny than males (gossip surrounding women in the Women's Army

Auxiliary Corps [WAAC] which lead to subjecting women to morality screening)[2], increased competition in the marketplace for women workers, and disinterest in retention of women in the active armed forces constrained women's increased participation. The creation of All-Volunteer Forces was the next social force which formally expanded the service of women in the armed forces and heralded the current controversy surrounding the appropriateness of women's service in the U.S. armed forces.

The All-Volunteer Forces

As the Vietnam Conflict came to a close, President Nixon, in response to the U.S. public's denouncements of the nation's involvement in Vietnam, ended the draft and, consistent with this perception of the national interests and values, the All-Volunteer Forces Army (AVF) was created. These interests and values were fueled by the mantle of suspicion surrounding the conscription practices then extant, permitting waiver of service to the more privileged of the population, with subsequent drafts occurring disproportionately among the poor and the ethnic minority populations. Furthermore, the public had grown

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[2]Treadwell (1954) enumerates the gossip and rumors these women were often the subject of:

> (1) WAACs solicited and engaged in sex acts in public places; (2) WAACs were issued prophylactics and were required to carry them whenever they left the barracks; (3) WAACs were recruited to serve as sexual outlets for frustrated military males; (4) many of the WAACs had gonorrhea, immoral WAACs infected many of the men; (5) WAACs joined the service to meet other lesbians and to engage in homosexual orgies; (6) WAACs were drunks and brawled in bars; (7) WAACs who were not sexually active were rejected by Army physicians; (8) WAACs had to have large breasts and other anatomical specifications; (9) WAACs were immoral in conduct and appearance; (10) WAACs impeded the combat readiness of the Army. (cited in Rustad, 1982, p. 32)

increasingly disappointed with involvement in a conflict whose goals were obscure. The change to an AVF also occurred at the time when requirements for manpower in the services were increasing in response to increased constabulatory requirements world-wide. Conscription was not supported by the general public and answers to questions about how to obtain the needed personnel to fulfill national defense objectives seemed to find a solution in the Equal Rights Amendment (ERA). With the anticipated ratification of the ERA, the number of women recruits was targeted for renewed attention. Two other trends in the population lent support for renewed attention to the roles women might serve in the armed forces: the changing roles of women in the labor force and a dwindling cohort of 18-year-old males.

Since the 1980s, there has been a fair amount of literature generated to argue the appropriateness or inappropriateness of the role of women in the armed forces. Much of the literature is in the sociological historical form (Goldman, 1977; Holm, 1982; Mitchell, 1989; Quester, 1982; Segal, 1982; Segal & Segal, 1983; Steihm, 1989; Tuten, 1982). Moreover, several authors have reviewed the pivotal studies conducted by the separate services within the Department of Defense concerning this issue (Mitchell, 1989; Steihm, 1989). Not all of these literatures have supported increasing the roles and service of women in the U.S. armed forces.

The public, the military, and Congressional reaction to increases in the numbers of women serving in the armed forces has been mixed and primarily related to appropriateness of women serving in "combat" roles. The public's interpretation of women in the armed forces is synonymous with women serving in direct combat roles (Segal & Segal, 1983). Also, much of the ambivalence concerning women's roles in the armed forces is reflected in the lack of national consensus on the ERA.

President Carter, an advocate of the ERA, was also a proponent of increasing the ceiling of females in the armed forces. In the early years of his administration, facing two national crises, he expected to require a build-up of military forces. A contingency plan for mobilization was considered necessary and, once again, an appeal was being considered to be made for conscription. The difference in this conscription appeal from previous ones is that women would be registered for the draft. This appeal suggested to many the potential impact of the Equal Rights Amendment. It's implications for equality for service in the armed forces (including assignment to "male roles in combat") were unfathomable for many special interest groups and representatives of the armed forces. Historically, women had served in roles which were basically aligned with the types of roles women held in the civilian work force. Notably, although the numbers of women in the civilian labor force in the early 1970s had increased, they continued to be found primarily in traditionally female occupations. The idea of exposing women to "combat", a traditionally male domain, was considered untenable. After input from special interest groups on both sides of the issue, the draft bill that was subsequently enacted by Congress in 1980 excluded women (Segal & Segal, 1983; Steihm, 1989).

Previously, when the numbers of service members were inadequate to meet the national defense plans, women had been considered as a viable resource to meet the need for additional personnel. In this instance, the social climate was different. Within the armed forces, the concern has centered on whether women would degrade the combat effectiveness of military units. Many military leaders believed this to be the case (Mitchell, 1989). Yet, a review of public opinion concerning this

question conducted by the Roper Center for Public Opinion Research from 1940-1980 indicates the public has generally favored women serving in the armed forces except during the Korean War (Segal & Segal, 1983). More recently, a 1982 National Opinion Research Center poll investigated public support for women in specific armed forces jobs. They found:

> . . . 84 percent . . . supported keeping or increasing the proportion of women in the services, and 94 percent approved of American nurses in a combat zone. The approval rate for military women in combat support jobs was equally high: 83 percent as military truck mechanics and 73 percent a jet transport pilots. Concerning military jobs specifically involving offensive combat roles, 62 percent supported the idea of women serving as jet fighter pilots, 59 percent as missile gunners, 57 percent as crew members on a combat ship, and 35 percent as participants in hand-to-hand combat. (Becraft, 1989, p. 35).

The results of this surveys are quite interesting since none of the offensive combat roles surveyed are now open to women and the armed forces have staunchly held that women are unsuited for these roles.

The women who comprise today's armed forces hold a variety of values and attitudes about military service. Several qualitative studies have consistently found women in today's armed forces believe they were generally not well received in their assignments when serving in non-traditional roles (Rogan, 1981; Rustad, 1982; Schneider & Schneider, 1988). Sherwood (1989) presents the statistical trends of women serving on active duty since 1965 (Table 1). The total number of women serving on active duty has increased from 1.2% in 1965 to 10.6% in 1988. The largest increase has occurred in the Air Force followed by the Army. The Marine Corps has maintained that fewer of it's occupational titles are appropriate for women. There have also been events both within and outside of the armed forces which have influenced the participation of women. Steihm (1989) summarizes these events which are listed in Table 2.

Table 1

Statistical Trends of Women Serving in the U.S. Armed Forces

	June 1965	June 1970	June 1975	June 1980	June 1985	June 1988
Air Force						
# women in the force	8,418	13,654	30,213	60,369	70,061	75,006
% of women	1.1%	1.7%	5.0%	10.9%	11.7%	13.1%
women officers	4,100	4,667	4,981	8,493	11,927	12,906
% officers	3.1%	3.6%	4.7%	8.7%	11.0%	12.4%
Army						
# women in the force	12,326	16,724	42,295	69,338	79,247	83,969
% of women	1.3%	1.3%	5.4%	9.0%	10.2%	11.0%
women officers	3,806	5,248	4,594	7,609	10,828	11,764
% officers	3.4%	3.1%	4.5%	7.7%	9.9%	11.1%
Navy						
# women in the force	7,862	8,683	21,174	34,980	52.603	54,455
% of women	1.2%	1.3%	4.0%	6.7%	9.3%	9.4%
women officers	2,601	2,888	3,676	4,877	6,913	7,287
% officers	3.3%	3.6%	5.6%	7.7%	9.9%	10.1%
Marines						
# women in the force	1,581	2,418	3,186	6,706	9,695	9.624
% of women	0.8%	0.9%	1.8%	3.6%	4.9%	4.9%
women officers	140	299	345	487	654	667
% officers	0.8%	1.2%	1.9%	2.7%	3.2%	3.3%
Total DOD women						
# women in the force	30,610	41,479	96,868	171,418	211,606	223,054
% of women	1.2%	1.4%	4.6%	8.4%	9.9%	10.6%
women officers	10,647	13,102	13,596	21,466	30,322	32,624
% officers	3.1%	1.2%	4.6%	7.7%	9.8%	10.8%

They indicate the ambivalence concerning women's roles both expanding and restricting the roles women would serve in the armed forces. Using a cohort analysis methodology, Steihm (1989) discusses the impact of societal and military institutional changes which appear in Table 2 and that occurred during the period of study, on the enlisted women of today's armed forces (some experiences and assumptions about the impact on women officers are likely quite similar). She identified eight cohorts of women using their experiences to describe the shaping of their values as soldiers. All of the women who comprised the cohorts had an opportunity to do regular (as opposed to auxiliary or temporary) service. Cohort analysis is especially suited to this research question because, as a

Table 2

Events Affecting Women's Service in the Military

1967	Some restrictions on careers for military women are removed under P. L. 90-130.
1970	Two Army women become generals.
1972	Quigley and Zumwait emphasize equality for Navy women. Equal Rights Amendment (ERA) is passes in Congress.
1973	The Geneva Peace Treaty is signed. The All-Volunteer Force become official. Frontiero v. Richardson gives military women dependency benefits.
1974	P. L. 93-290 voids age differential for enlistment.
1975	The Defense Department ends involuntary discharge for pregnancy.
1976	The first women enter the military academies as cadets.
1977	The Army approves integrated basic training.
1978	Owens v. Brown decision permits Navy women to go to sea. The Women's Army Corps is abolished.
1980	Draft registration for men is reinstated.
1981	Goldberg v. Rostker decision declares men-only draft constitutional.
1982	ERA fails ratification. Resegregation of Army basic training is announced.
1983	Pentagons Women's Corridor is dedicated. Marine base in Beirut bombed and U. S. troops invade Grenada.
1985	A defense authorization bill mandates the Air Force to increase accessions of women.

tool, it more than adequately distinguishes between the groups with respect to their attitude and opinion of military service. A summary description of Steihm's findings, distinguishing the cohorts follows.

Cohort I (1952-1955) (N=4)[3]: These women entered the armed forces in 1952 but only four of them remained on active duty in 1980. Their rank gave them visibility and influence. They had responded to Korean War recruitment appeals and elected to reenlist in a peace-time military supported by a male-only draft. The women accepted the terms laid out in PL 625. They did not serve in combat, remained childless and in many cases were single.

Cohort II (1956-1959) (N=12): These women also accepted the terms of P.L. 625, but entered the armed forces in peacetime to a women's component reduced in size by one-fourth. These women also had high visibility based on attained rank.

Cohort III (1960-1963)(N= 40): These women also accepted the same rules and circumstances of the earlier cohorts studied and about 40 remained on active duty in 1980 with an average rank of E-7. They were volunteers who met higher enlistment standards than men and accepted both career limitation and childlessness: "Women's programs were tenuous and women miliary leaders feared making waves might result in ending the programs" (p. 36). The jobs women held during this time were concentrated in the clerical and medical career fields.

Cohort IV (1964-1967) (N=100): These women were volunteers during the Vietnam War. In 1967, Congress removed some of the restrictions on women's service (P. L. 90-130 principally removed the ceiling the number of women officers promotions and removed the two percent ceiling on enlisted women). During this time the numbers of enlisted women increased.

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[3]The numbers (N=) appearing in parenthesis in this cohort explanation are approximations taken from Table 1. The author did not provide numbers of women in these cohorts in her report.

Cohort V (1968-1971)(N=130): The new enlistees in this group were in the best position to benefit from some of the changes that would be affecting women in the armed forces. These women were new enough to the military that they would have no vested interests in the extant women's military culture. They had voluntarily served during the Vietnam war and seen positive cues being given concerning the future role of women in the armed forces.

Cohort VI (1972-1975)(N=96,800): The absolute numbers of women tripled in this cohort, and one in thirty new recruits were female, increasing to one in thirteen by 1976. The ERA had passed both houses of Congress. These women entered the armed forces along with the inception of the AVF and a period of rapid expansion of roles for women in the armed forces as the Army, Air Force and Navy were instructed to double their size of women by 1977. During this period the services opened more occupational fields to women and talked positively about their integration. Discriminatory personnel policies effecting women were also being challenged. In the litigation of Frontiero v. Richardson (1973), the Supreme Court ruled women could receive the same dependency entitlement as those offered for dependents of servicemen. Furthermore, the Department of Defense (DOD) made discharge for pregnancy voluntary. The pregnancy decision affected the cohorts differently. Cohorts IV and V were over twenty six years old and not necessarily interested in taking advantage of it. Later cohorts could assume it was natural for a young woman to get pregnant and then decide to work or quit.

Cohort VII (1976-1979)(N=171,000): ROTC and the service academies now accepted women; and the Air Force joined the Navy and Army in providing pilot's training. The Women's Army Corps was abolished as full integration of women into the armed forces was anticipated. An

unforeseeable result of this has been the abolition of women's support systems. The ruling on Owens v. Brown (1978) decreed that women could no longer be excluded from sea duty. This meant senior women were also eligible and were assigned to supervisory roles. As full integration was implemented, women were expected to perform many of their activities like and with men. Many women found themselves in jobs that were too physically demanding, and others discovered they disliked their new assignments. Still others found they were not well received by the males in the units they were assigned to.

Cohort VIII (1980-1986)(N=211,600): The women of this cohort, as well as cohorts VI and VII, were different from all the other cohorts examined. They knew nothing of past restrictions and only of the AVF. This was the beginning of the "pause" in women's recruitment in the armed forces. The administration of President Reagan, under pressures from leaders within the armed forces, ordered a reassessment of women in the services. The women of this cohort represent the bulk of women on active duty today. Their expectation is to have the same options available to them as males (military careers, spouses and children).

Mitchell (1989) and Steihm (1989) discuss the studies which were conducted by the services in response to the "pause" in women's recruitment evaluating the effect of women on readiness. The tenaciously defended opinion of military leaders was that the presence of women detracted from readiness and placed an additional burden on men to behave in chivalrous ways in the context of the combat environment. In particular these studies focused on the following factors as part of their investigations: (1) physical strength; (2) pregnancy; (3) effectiveness under the ardors of long training exercises; (4) welfare of dependent

children of women soldiers; (5) retention; (6) loss of time on duty for child care and injuries related to the rigors of labor intensive jobs; and (7) acceptance of women soldiers by male soldiers. Additionally, the services maintained that women have a preference for traditionally female jobs and the expense of modifying the services to accommodate women's special needs (separate housing, uniforms, health care) was not cost effective. Noteworthy is that all of the factors investigated were related to gender differences between men and women seemed to be redundant of the provisions of P. L. 625 and it's biases against maternal responsibility. However, the services were not effective in demonstrating that women were less capable than men to perform the nontraditional combat support jobs they held or that providing for their special needs was less expensive than competing for young males in the job marketplace. Studies conducted external to the services confirmed the findings of armed forces studies which suggested that women could perform the jobs; women were not found to degrade unit readiness, and, in the field environment, the accommodation of women's needs basically meant being courteous and respecting personal privacy for the use of bathing and latrine facilities (Devilbiss, 1985; Moskos, 1985; Safilios-Rothschild, 1978). These external studies also observed that women felt they must "prove" themselves to be accepted by their male contemporaries, were generally accepted, but believed they were not as likely to be promoted as males.

Critical results from the armed forces studies centralize around definitions of the differences between direct combat and non-direct combat jobs (combat support and service support jobs). All jobs within the armed forces were classified according to the likelihood that the incumbent would be exposed to direct combat. The major limitation to this

classification was the assumption that women assigned to combat support roles would not be subject to direct fire or assume direct combat roles. Consequently, many women may be placed in the precarious situation of being in a combat zone without having adequate training to respond to the potentialities of this situation. To date the services continue to maintain that women's roles should not be expanded to include direct combat roles and it is expected that this argument will not be settled until there is a combat situation where women prove themselves.

Yet the military's reaction to women in "combat support" roles is exemplified in the recent military offensive activities of Operation Just Cause in Panama. In this context, a female U. S. Army officer who took control of an "enemy" stronghold was refused consideration for a military decoration (medal) recognizing her achievement because, while classified in a non-combatant occupation, she was performing direct combat actions. Following the Panama invasion, the performance of women received much favorable attention in the news. Consequently, women's groups advocating expanded roles for women in the armed forces called upon the Army for a trial period of women serving in direct combat roles. The request was not seriously considered.

The most recent public controversy surrounding women in the armed forces is the mobilization of U.S. forces to the Middle East as a part of Operations Desert Shield and Desert Storm. During the early days of the mobilization effort, much of the media attention was on the fact that wives, mothers and grandmothers were being sent to war. Here again it was being suggested that gender was the primary factor which was being ignored when women were sent to "war". The outcome of the war in the Middle East has effected the controversy both within and outside of the armed forces

surrounding the appropriateness of women to serve in military occupational roles. Since the end of the conflict many of the old controversies have been resurrected and the Congress is hearing testimony arguing both sides of the women in the armed forces controversy.

Since the inception of the AVF, in the early 1970s, the women who volunteered to serve in the armed forces were generally one year older than their male counterparts, white and married. As a group, they surpass male recruits in educational attainment (more likely to be high school graduates) and score ten points higher on standardized tests for entrance. These women have raised the quality of the armed forces, equalized the racial mix of the services and had a lower attrition rate. Enlistment standards for females have been higher than those of males since the Korean Conflict. Whether the earlier female enlistees set the standard for successful service cannot be determined from the literature; nonetheless current potential female enlistees are expected to meet higher enlistment standards than males and are recruited in smaller numbers. Certainly a part of the reason for the requirement for fewer women enlistments is their exclusion from some occupations.

Exclusion of females from participating in the armed forces fluctuates based on internal policies in contrast to objective criteria set for males. Steihm (1989) summarizes the policies which have evolved over a five year period, from 1982 through 1987:

> Events from 1982 to the present suggest that the relationship between women and the military continues to be problematic. Thus, DOD opened a "Women's Corridor" in the Pentagon, the Army reopened thirteen MOS to women and sent women to Grenada, but slacks became "unauthorized" for women Marines except under specified circumstances. In 1984, the Secretary of Defense announced the creation of a task force on Equity for Women, but the Navy announced that a civilian engineer would not be allowed to go on sea trials of her own work . . . . In 1985, the Marines began weapons training for women, but the Air Force set recruitment goals for women so low that Congress mandated new goals in the defense authorization bill. In 1986, the Army opened some 10,000

> slots in forward support battalions to women, but the Secretary of the Navy John Lehman reneged on what women thought was a commitment to permit women on "mobile logistics support force vessels" by reclassifying those vessels as "other combatant". In 1987, the Navy froze women's assessions; the next day the Secretary of Defense rescinded the freeze.
>
> Such oscillations in policy have two negative effects. First, they make women feel unappreciated and unsure about their future. This hurts morale. Second, policies lose their legitimacy when they appear to be more responsive to officials' opinions than to evidence, logic, or agreed-upon assumptions. (pp. 66-67).

There has been controversy surrounding women throughout their service in the U.S. Armed Forces. During the war years, prior to the Civil War, women's service was not sanctioned, yet women did serve masquerading as men. This service was primarily enacted to gain access to the rights and privileges of males. This historical theme can be observed 135 years later in the creation of the All-Volunteer Forces, in which women in the armed forces are continuing to battle for the rights and privileges accessible to men.

The Spanish American War delineated the first formal permanent roles for women's service as nurses. These roles were determined to be "women's work" since men who had been engaged in carrying them out were not believed to be effective. In the intervening years prior to the AVF, mechanization and the industrialization of America changed the face of women's work and the women who did serve during those years served in roles ascribed to be "appropriate" for women. Not withstanding, had there been another way to fill the personnel requirements to support the war effort women would likely not have been used at all. Historical records dramatically document that the services responded out of frustration and desperation in using women to assist in the mission of supporting the allies abroad.

The Women's Armed Forces Act of 1948 heralded formal acceptance of women in the armed forces but it also initiated discriminatory practice towards women that have yet to be reversed. Subsequent actions and examinations of women in the armed forces have focused on the difference in gender between men and women and the appropriateness of women to assume roles in realms other than "women's work", identifying sex roles and physical differences as indicators for not expanding utilization of women in a wider range of occupations. However, the public, since World War II, as reflected in a number of public opinion polls, has not been fully supportive of this opinion (Rustad, 1982).

The AVF was created at the time when the Equal Rights Amendment (ERA) was under consideration for ratification. National defense activities which were operating simultaneously required an increase in active duty personnel. Because the AVF had not been in existence long enough to have changed the numbers of active personnel and there was a dwindling cohort of eighteen-year-old males, drafting both men and women was considered as a stop gap measure. Here the services position of the untenable nature of women's service seemed to gain support since this consideration was generally accepted as the major impediment to the ratification of the ERA. The outcome of this discussion was the elimination of the draft and plans to increase the participation of women from the two percent ceiling to twelve percent in 1986 (Steihm, 1989).

With the election of President Reagan, a "pause" was ordered to study the increase of women in the armed forces. The Army conducted the majority of these studies and the results were not conclusive in demonstrating women could not perform duties in jobs other than "women's work". The major contribution of these studies was a definition of combat

and combat support jobs, a reclassification of some jobs from combat to combat support, and the exclusion of women from combat jobs.

It is becoming increasingly recognized that the difficulty in this reclassification is the proximity of the physical location of these combat support positions from the actual engagement of conflict. As exemplified in Panama, women in combat support roles were in direct fire positions and their actions were questioned when acting in less than a passive manner. It was also exemplified during Operation Desert Storm where women soldiers were taken as prisoners of war. This restriction and definition of women's appropriate roles remains the major controversy affecting women in the armed forces. The number of women has continued to increase and at a higher rate than that of men, since the AVF inception. The objective of access to the jobs which afford women greater mobility in the work force has been realized to some extent. However, the perception of women's roles for a 135 year period of history in the armed forces of the United States continue to reflect inequality. The NCO Guide (a guide book written for enlisted military leaders) suggests this inequality is condoned within the armed forces (Cragg, Perez, & Kates, 1989); and advises the leaders of enlisted troops concerning the management of women in their units. They expound upon the inherent organizational harassment and discrimination that women are exposed to as members of this traditionally male bastion and suggest strategies for amelioration of the derisive impact of male attitudes towards female soldiers.

Despite this inequality, personnel statistics generally demonstrate that after the initial enlistment/obligation is served, those men and women who remain on active duty show very low attrition rate through twenty years of active service. This seems to imply that "socialization"

has occurred in this occupational context which accounts for continuation in active military service. Since, prevalence studies in the armed forces have demonstrated that alcohol consumption is persistently higher in this context than in the civilian population; and anecdotal as well as scientific literature suggest a highly esteemed role for alcohol in fostering cohesive relationships. A pertinent question is whether women's alcohol consumption in this occupational context is influenced by membership in the occupation. Unfortunately, little is known about women's alcohol consumption in the armed forces.

As discussed earlier, studies which have examined women's alcohol consumption in the U.S. armed forces have provided only estimates of drinking levels and no other information is available concerning the alcohol consumption of these women. These studies uses a topology of drinking categories: abstainer, light/infrequent, moderate, moderate/heavy, and heavy[4] (Bray et al. 1983, Bray et al., 1986, Bray et al., 1989a). Table 3 presents the findings of the world-wide surveys over a six-year period from 1982-1988 and compares prevalence data for both men and women in the armed forces. The findings of the 1988 study indicate that heavy drinking among the men and women in the armed forces has been steadily declining. A decreasing trend in the average daily amount of ethanol consumed by military personnel is also evident: 1.48 ounces in 1980 to 0.96 ounces in 1988, a decrease of 35%. Furthermore it is found

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[4]This topology defines: (1) An abstainer as on who drinks once a year of less. (2) Those in the light/infrequent category drink once a month at the most and 1-4 drinks per occasion. (3) Those in the moderate category drink (a) at least once a week and 1 drink/occasion, (b) 3-4 times a month and 2-4 drinks per occasion. (4) Those in the moderate/heavy category drink at least once/week and 2-4 drinks per occasion or 3-4 times a month and $\geq$ 5 drinks per occasion. (5)Those in the heavy category drink at least once a week and $\geq$5 drinks/occasion.

Table 3

Trends in Levels of Alcohol Consumption among Men and Women in the Armed Forces, 1982-1988

	1982		1985		1988	
	(M)	(F)	(M)	(F)	(M)	(F)
abstainer	11.4	15.4	13.6	18.2	16.3	24.7
light/ infrequent	16.8	26.1	15.7	24.9	16.3	26.9
moderate	16.5	21.6	18.0	24.7	19.5	19.0
moderate/ heavy	29.9	25.9	28.9	23.9	29.6	22.4
heavy	25.4	11.0	24.4	8.3	18.3	7.1

that 83% of military personnel are current drinkers with about 2/3 being moderate to heavy drinkers and 8.2% heavy drinkers during 1988. The proportion of abstainers among both the men and the women has increased over the measurement period, particularly among women. The greater proportion of women in the light/infrequent drinking category over the measurement period indicate that women's drinking hasremained relatively constant in this category. While moderate drinking among males has increased, there is no definite trend for women's drinking in this category. In the moderate/heavy drinking category, men's drinking has remained relatively constant and the trend for women has displayed a slow decline from 29.9% in 1982 to 22.4% in 1988. Heavy drinking among both men and women has shown a steady decline. Despite the decline in alcohol consumption demonstrated by these surveys, the men and women of this occupation continue to drink more heavily than the general population.

Correlates of alcohol consumption were also investigated in these studies. However, males and females were combined in these analyses. Since much research has clearly demonstrated that there are significant

differences between the drinking patterns of men and women, much is lost in determining how women's alcohol consumption differs from that of men in the armed forces.

The probability of being a heavy drinker is significantly more likely among military personnel who are single, male, with no more than a high school education, who are more highly motivated to drink and believe negative consequences will not result from heavy drinking. A higher daily average of alcohol consumption was predicted for single black males who were in the Army or Marines (in contrast to the Navy and Air Force), who had a high school education or less, who were highly motivated to drink, engaged in fewer positive health practices, who believed the military would help soldiers with drinking problems and had favorable beliefs and attitudes towards drinking.

Although few military personnel were found to drink alcohol within two hours before going to work, during work or a work break or during lunch, ten percent of military personnel engage in one or more of these behaviors. This practice can impair overall productivity. The percentage of moderate/heavy to heavy drinkers was most significantly and directly related higher levels of stress at work. Over one-fifth of all service personnel reported experiencing some productivity loss as a result of drinking and approximately one in 20 respondents exhibited symptoms of alcohol dependence during the 12 months preceding the 1988 study.

It is impossible to determine the degree to which the findings of the study are generalizable to women in the armed forces. Further, to presume the drinking of women in the armed forces is equivalent to that of men would be unwise based on previous knowledge of women alcohol consumption generally.

Since only prevalence data is available concerning women's alcohol consumption in the armed forces, comparison of the drinking of women in the armed forces and women in the general population is essentially not possible. However, one study has examined the alcohol consumption of women in the armed forces with that of women in the general population in 1985. Using data from the 1985 National Household Survey on Drug Abuse and the data from the 1985 world-wide survey of DOD personnel, the researchers standardized and compared the alcohol use data of both men and women in the armed forces to that of men and women in the general population on prevalence and negative consequence variables (Bray et al., 1989b). The findings related to women (Table 4) suggest more armed forces women use alcohol and twice as many armed forces women drink heavily than women in the general population.

Table 4

Comparison of Armed Forces and General Population Women's Alcohol Consumption

	General Population	Armed Forces
Any alcohol consumption	63.5	79.0
Heavy alcohol consumption	3.3	6.3
Any negative consequences	22.5	44.6
Number of negative consequences	0.59	1.11*

This study also compared negative consequences of alcohol consumption and found that women in the armed forces are twice as likely to experience any negative consequences of alcohol use as women in the general population and that the number of negative consequences are statistically significant as well as almost twice that of women in the general population. So what is it about the women in the armed forces that accounts for this

difference in drinking. The major thesis of the study is the context of the armed forces esteems and values alcohol consumption for building cohesive relationships and where alcohol consumption is closely tied to its norms and traditions.

Conceptual Framework

The concepts of alcohol consumption, women in the U.S. Armed Forces and the context of the armed forces are used in development of a conceptual framework for this study. These concepts and their conceptual definitions follow.

Alcohol Consumption

Conceptual definition. The amount of alcohol consumed.

Operational definition. A typology used in the 1985 and 1988 survey of Department of Defense personnel which measures reported alcohol consumption in one of five levels as either: abstainer--drink once a year or less; light/infrequent--drink 1-4 drinks 1-3 times per month; moderate--drink (a) 1 drink at least once weekly, (b) 2-4 drinks 2-3 times per month, or (c) $\geq$ 5 drinks once or more a month or less; moderate/heavy--drink 2-4 drinks at least once a week, or $\geq$5 drinks 2-3 times per month; and heavy--drink $\geq$ 5 drinks at least once a week. These measurements use both the reported quantity and frequency of occasions of consumption to determine level of alcohol consumption.

Women in the U. S. Armed Forces

Conceptual definition. Women who are serving on active duty in the U.S. Armed Forces and thus possess occupational roles within the U.S. Armed Forces.

Operational definition. Participants in either the 1985 or 1988 survey of substance use of active duty personnel world-wide in the Department of Defense. Survey questionnaires, reported gender, demographic variables (age, education level, marital status, military rank, and education level), negative drinking consequences, and drinking motivation.

The Context of the U.S. Armed Forces

Conceptual definition. The four branches of the U. S. Armed Forces (Army, Air Force, Marines, Navy), where the use of alcohol is frequent and closely tied to the norms and traditions of the armed forces and which is thought to be an occupational context which esteems and values the use of alcohol for building cohesive relationships (esprit de corps).

Operational definition. The questionnaire used in both the 1985 and the 1988 world-wide surveys of Department of Defense personnel included items which asked respondents about the occupational context of the armed forces and whether they perceived a relationship between alcohol consumption and the context of the armed forces. These questions would be used to measure the strength and direction of the perceptions of members in the armed forces related the context of the armed forces and to their alcohol consumption.

Assumptions

These literature reviews suggest the following global assumption: Women in armed forces occupations, (a) experience the stress of continually having to prove themselves, are marginally accepted and powerless, and (b) who are exposed to numerous occasions for drinking

would be expected to drink more heavily and less likely to be abstainers than women in the general population.

This study will be conducted using secondary data analyses of existing world-wide cross-sectional armed forces data for the surveys conducted in 1985 and 1988 examining the relationships of sociodemographic and contextual factors related to service in the armed forces for women with respect to their levels of alcohol consumption. These factors include examination of job type (traditional roles for women vs. non-traditional roles for women), as well as demographic variables--all potentially related to level of alcohol consumption among women serving in armed forces occupations. This study would ultimately contribute to literature concerned with contextual effects (herein specified as occupational status and work roles) as well as literature concerned with gender differences related to alcohol consumption.

Related Methodological Issues Pertaining to This Study

The primary research method used in this study is secondary data analysis. However, the original surveys from which the data analysis are obtained used a social epidemiological method which is similar to other studies which have examined alcohol consumption in the general population. The two major criticisms of this method in the study of alcohol consumption are (1) the validity of self-reports, and (2) the reliability of measurements of alcohol consumption in the general population. These two criticisms will be briefly addressed.

The Validity of Self-Reports in Alcohol Research

There exists a large body of literature concerning the validity of self-reports of alcohol consumption. Recent reviews (Midanik, 1982; Midanik, 1988; Polich, 1982) address the widely held assumption that the heaviest drinkers in the population will under report their alcohol consumption as a function of the denial thought to be inherent in alcoholism. However, these reviews have not found conclusive evidence supporting this assumption.

Unquestionably, assessment of validity measures determines whether confidence can be placed in the data generated by the study. The methods used to test the validity of self reports of alcohol consumption use concurrent criterion-oriented validity (confirmatory data) to evaluate if the data obtained from self-reports is accurate. Midanik (1988), discusses the criterion used by these confirmatory reports as "more is better". This means that researchers assume that the source (subject or confirmatory report) which provides a higher estimate of alcohol consumption is the better source of data.

Concurrent criterion-oriented measures of validity include collateral reports (comparison of reports of significant others), diaries (either prospective or retrospective recording of one's drinking over a specified period of time), official reports (arrests related to drinking, hospital records), interviewing methods (using methods originating in other fields, primarily psychology, to obtain better measures of alcohol use), laboratory reports (breath test validating drinking in the past 24 hours; urine screening; blood tests to identify biological markers for heavier drinking; sweat patch to determine amount of alcohol consumed in one week); and combinations of above. These methods of confirming self-

reports seek assurance that there is "absolute" validity of the data obtained. However, this "absolute" criterion has not been borne out in the literature reviews.

Often what occurs is that the highest quantity reported is used as the criterion to the measure drinking (or alternatively, number of alcohol related problems). This is consistent with the assumptions surrounding the disease concept of alcohol where the possibility of the subjects over-reporting their drinking are generally not considered a realistic option (Midanik, 1982). Collateral reports have generally demonstrated agreement with subjects and no consistent direction of error has been established (Polich, 1982; Midanik, 1982; Midanik, 1988). Midanik (1988) cites seven studies evaluating collateral reports since 1982. She points out that the findings and conclusions of these studies range from having no confidence in the accuracy of self-reports to assurance of complete accuracy.

Each of the concurrent criterion-oriented validity methods indicated above carry its own set of problems. The emergent more pertinent question for determining the validity of self reports of alcohol consumption methods relates to the optimal context in which respondents provide the most accurate answers to questions about alcohol consumption.

Consistent with this reasoning, Midanik (1988) refers to several different interview techniques which have been used in alcohol studies with respect to the issue of validity. She found the following: 1) Computer assisted interviews yield higher overall amounts of alcohol consumed or no difference in overall amounts reported compared to face-to-face interviews. 2) Randomized response interviews yield considerably higher estimates of drinking and the number of drinks per week. 3) Bogus pipeline interviews (involving convincing the subjects that their

questionnaire responses will be cross checked with a physiological test) yield higher reported alcohol use than those in the non-bogus pipeline group.

She further finds that although data obtained from laboratory tests are usually assumed to be more accurate. Their use raises numerous issues. For instance, the absorption and distribution of alcohol throughout the body, as well as metabolism, will be affected by weight, gender, liver damage, and the amount of alcohol consumed during a specific period of time. The specificity and sensitivity of the test must be evaluated with respect to the length of time that it accurately validates specific drinking behavior. Consideration of the expense and intrusiveness of the laboratory procedures must be accounted for as well.

These reviews suggest that validity of self-reports of alcohol use is not an "either or" question but a complex one. The question of validity can be conceptualized as a question of utility. Contingent on the purpose for which the data are obtained, the question as validity may be viewed on multiple levels. In social epidemiological research of alcohol use, self reports provide access to data about patterns of drinking beyond abstinence and enable explanation and prediction of future drinking behavior. They also can provide data on how the individual perceives his/her drinking.

Measuring Alcohol Consumption and Alcohol Problems in General Population Studies

A brief overview of the conceptual and methodological issues pertinent to measuring alcohol consumption and alcohol problems in general population studies is presented. For a more comprehensive review of this literature, the reader is referred to Room (1977, 1989, 1990).

The scientific tradition in studies of alcohol use in general populations employs survey and epidemiological methods, describing the demographics, prevalence of drinking patterns and correlates of the tangible consequences of alcohol consumption. The study of alcohol problems is a complex area which has clearly been influenced by the manner in which the problems are conceptualized. In this context, Room (1989) discusses the phenomenon of "governing images", describing how the entire range and character of alcohol problems are conceptualized. The nucleus of the governing image of alcohol problems in the U.S. over the past 40-plus years, has been the disease concept of alcoholism. The disease concept, fathered by E. M. Jellinik, was fueled by the strong negative societal reactions to the Temperance Movement and Prohibition. It asserts that alcoholism is a result of the individual's loss of control over his drinking and his capacity to manage his day to day affairs. Emerging from this thinking were two different categorizations of drinkers--those who were alcoholics and those who were normal drinkers. This emphasis, adopted by some segments of the scientific and medical community as well as the general populace, fostered analyses with the objective of estimating the extent of drinking and heavy drinking in general populations.

The use of survey research to investigate drinking patterns and problems is primarily a phenomenon of the past 30 years (Room,1979), immensely expanding the knowledge of drinking patterns and practices in a relatively short span of time. International discussions among "alcohololologists" surrounding the measurement of drinking patterns have lead to two major strategies in asking questions about alcohol consumption (Room, 1990). The first is to ask respondents to list all of their recent

drinking occasions, denoting the amount consumed on each occasion. The second is to ask respondents to summarize their current drinking patterns. In the United States, the favored strategy is the second.

Prior to the 1950s, general population surveys were limited to making simple distinctions between abstainers and drinkers. They were primarily descriptive, providing the distribution in the population on drinking patterns (abstention versus drinking) and differences between subgroups on sociodemographic characteristics. The modern North American tradition began with Straus and Bacon's (1953) study Drinking in College (cited in Room, 1990). Their approach for measuring patterns of drinking was to ask questions for each type beverage consumed (wine, beer, and spirits), its frequency of use and the average amount usually consumed at a sitting. This approach advanced access to specific quantity data.

The next major shift in the tradition of questioning was focused among the San Francisco Bay Area studies in the 1960s. These studies asked for each beverage type, it's frequency of use as well as the proportion of drinking occasions on which one or two drinks, three or four drinks and five or more drinks were consumed. This method further refined access to quantity data. Those using this approach were critical of the "usual quantity" approach, pointing out that someone who drinks small amounts frequently and larger amounts infrequently might accurately report the quantity "usually" consumed but also might over or under report the actual quantity consumed. This method of asking proportions of drinking occasions on which particular quantities were consumed led to the tradition in alcohol studies of defining dimensions of quantity of drinking for each beverage type which were basically measured unidimensionally or multidimensionally. The unidimensional measure is a

computation of the total volume of absolute ethanol consumed using the components of quantity and volume-variability reported in the surveys. The multidimensional measures also examined the components of quantity, volume, and variability to compute a component score. A typology of alcohol consumption is then determined generally ranging from abstainer to heavy-frequent drinker. The multidimensional component scores have been criticized because they are not sufficiently sensitive to accurately summarize differences in patterns of alcohol consumption (e.g., they tend to give greater weight to quantity than to frequency of drinking, placing infrequent drinkers in the heavy category). Nonetheless, volume variability measures are useful ways of describing drinking patterns in a population.

Also in the early 1960s, other changes occurred in alcohol survey methods. First, attention shifted from merely partitioning the general population by drinking patterns to also measuring drinking-related problems and their correlates. Researchers operationalized alcohol problem measures with dimensions reflecting the significant of the amounts and occasions of alcohol consumption and alcohol's attribution to the problem.

The primary approach in general population surveys has been to ask the respondents about their experience with the problem and it's attribution to their own drinking (Room, 1989). In the early survey techniques, much emphasis was placed on asking questions indicative of dependence, loss of control over drinking, and symptoms thought to reflect dependence. This focus came to be viewed as too narrow and a disaggregated approach to the study of alcohol problems was subsequently widely adopted. This perspective is a departure from the thinking that

alcohol problems are a manifestation of underlying alcoholism. It acknowledges that many of the social, physical, and mental problems the individual may experience associated with alcohol consumption are not necessarily directed linked to alcohol dependence (e.g., accidents, violence).

Room (1989) classifies the "primary" alcohol related problems seen at the individual level into four major types: (1) physical consequences of drinking, (2) mental and existential, (3) causality, and (4) social demeanor and role performance. He points out that each of these major types has a different theoretical location, raising distinctly different problems of method and measurement. In general population surveys, these have emerged as questioning concerning tangible consequences (verifiable by other sources). Respondents have been asked about the problems they experience related to their drinking. For validation of the data obtained--validation is believed necessary since denial, a symptom of "alcoholism", is presumed to be operating-- surveys have also questioned significant others to validate responses and ascribe the use of alcohol to the problem.

The second shift was related to increasing disquiet with an upper category of drinking which started as low as five drinks. Studies which reinterviewed samples using an upper category of 12 drinks or more, found that a considerable proportion of those originally reporting five or more drinks were drinking at higher levels. Furthermore, when this upper category of questions was added to surveys, the overall average of drinking was raised by 16% (Room, 1990). In 1975, surveys began asking questions about the number of days of drinking at a particular level and some asked about the frequency of drinking greater than five drinks per

occasion, specifying specific numbers of drinks. These measures were expected to advance a clearer estimation of the level of heavy drinking which was occurring in the samples.

Despite these methodological advances, by 1972, the National Institute for Alcoholism and Alcohol Abuse (NIAAA) had determined that the usual quantity formulation was a sufficient estimate of problem drinking. Interestingly, the influence of this focus of the NIAAA seems to have prodded the reversion in alcohol research to usual quantity questions in general population surveys, reflecting the influence of this treatment/monitoring emphasis rather than refining general population estimates of heavy alcohol consumption. The implications of a low quantity measure (starting at five drinks) seems clearly reflective of the "governing image" of alcohol consumption in the U.S. and the attendant temperance and prohibitionistic reasoning (Room, 1989). Hence, the measures which have evolved in the measurement of alcohol consumption and alcohol problems do not provide completely clear relationships between level of alcohol consumption and the development of alcohol problems.

CHAPTER THREE

METHODOLOGY

This investigation will use a secondary analysis method to examine the relationship between sociodemographic and contextual characteristics of women in the armed forces and their alcohol consumption. The data which constitute this study's population are two waves of cross-sectional studies collected in 1985 and 1988 by the Research Triangle Institute (RTI). The RTI surveyed armed forces personnel world-wide concerning their use of alcohol, drugs, tobacco use, negative consequences of alcohol and drug use, participation in health behaviors and their knowledge of AIDS (Bray, et al., 1985; Bray et al., 1989a). For the purpose of this study, only the data related to women's alcohol use will be analyzed.

The female personnel participating in the studies represent each branch of the armed forces world-wide (Army, Air Force, Marines, and Navy). These women personnel answered the same survey questionnaire as male participants in the study. When the data was originally analyzed pertaining to the women participants in the studies, the only variables selected for description was their level of drinking. Since there is such a paucity of studies concerning women's alcohol consumption in general populations as well as their alcohol consumption in occupations, this secondary data analysis will make a significant contribution to knowledge of women's alcohol consumption in general.

This study will examine the sociodemographic variables of age, marital status, ethnicity, education, and rank for their relationship to level of alcohol consumption. Further it will examine the relationship

between the type of job, the context of the armed forces and level of alcohol consumption among these women.

The methodology used in the collection of the data by the RTI staff for both waves of the cross-sectional studies of 1985 and 1988 will be described in detail. However, this discussion is preceded by a brief discussion of the methodological advantages and disadvantages of secondary data analysis as a research method. The final section of this chapter will present the plan for the secondary analysis.

Secondary Analysis of Survey Data: Methodological Advantages and Disadvantages

Secondary analysis of primary data offers potentially rich resources for the investigation of social phenomena through the application of creative analytic techniques. Primary data collected, using a survey methodology, typically gathers a broad range of information on a variety of topics (demographics, attitudes, perceptions, behaviors, etc.). Following data collection, the investigator codes, sorts and analyzes the data with respect to the questions for which the survey was constructed. Yet, the facilities for the data are not limited to it's uses in the primary survey analysis. Secondary analysis expands the facility of the primary data in new ways that are envisioned by the secondary analyst.

Hyman (1972) and Kiecolt and Nathan (1985) discuss the secondary analysis method as a means of effectively expanding theory development and substantive knowledge. As an analytic method, it affords the examination of a diverse array of concrete indicators, assorted manifestations of beliefs or attitudes and the types and numbers of observations, covering them more adequately and in a wider variety of social conditions. It also

permits combining data from different surveys, creating new variables and increasing the numbers of observations.

A variety of projects can be accomplished with the precollected primary data. Secondary analysis can: (1) reveal aspects of a research problem that require elaboration, (2) provide access to groups that need to be oversampled, and (3) demonstrate rationale for hypothesis revision and/or the need to refine and improve existing measures. Generally, the product of secondary analysis is a more comprehensive and definitive study, broadening the empirical basis of knowledge and theory.

In the process of conducting a secondary analysis, the analyst takes extant observations from the primary study and fits them into a larger conceptual domain of investigation. Typically, the secondary analyst is forced to think broadly and abstractly, finding overarching concepts or categories within which the specific variables of interest can be located. The analyst envisions questions arising from the primary survey and uses indicators in the survey relative to the questions, endowing them with new meaning and relevance for the concepts of interest. In this creative endeavor, the analyst uses ingenuity and caution but avoids imbuing the data with more meaning than is actually available. The types of research designs within which secondary analysis can be applied are not restrictive (e.g., trend, cohort, time-series, and comparative). Additionally, existing data can be combined with other types of data to investigate a problem more thoroughly.

As a method, secondary analysis offers enormous advantages to the researcher including (1) access to large national samples that would be difficult for the researcher to gather alone. (2) savings in resources (e.g., less money, less time, and fewer personnel), (3) avoidance of the

intrusion of a new survey on a population of interest, and (4) use of data not yet analyzed.

There are also limitations to this methodology. The most serious is a lack of knowledge of errors which occurred in the original data collection. The secondary analyst should be quite familiar with the data collection method used in the primary survey to soundly appraise errors in the data. Additional problems occur when the survey procedure followed is not sufficiently documented to enable appraisal. Trivial sources of error, such as sampling design, can be magnified when the survey is put to other than it's original use and such errors may be compounded by combining surveys. The primary survey should be selected based on the quality and accuracy of the procedures used, or with plan to attenuate the potential problems.

Another limitation concerns the time involved in obtaining data from archives which can ultimately delay new analyses. Since primary researchers are sometimes hesitant to share their data, as reputations are made by publishing work from a controlled body of data, problems of access can be monumental. Once the data are obtained, the researcher must know exactly what he/she is analyzing. Complete and accurate documentation of the data file is required. Usually complete data documentation in codebooks, sequentially listing the variables in the file as well as description and their assigned weights, will be provided.

Furthermore, surveys rarely contain all the variables of interest to the secondary researcher, and when they do, there may be too few indicators of the concept for reliable measurement. In this case he/she must "make do" with measures that are not those precisely desired. The converse occurs with an abundance of indicators or variables. In this

case the investigator is required to construct an index of indicators. No research method is without limitations. Despite those enumerated, secondary analysis is a valuable way of expanding the development of knowledge.

Description and Critique of the Methodology of the 1985 and 1988 World-wide Surveys of Department of Defense (DOD) Personnel with Specific Emphasis on Alcohol Use

Sampling Design of the 1985 and 1988 RTI Surveys

The sampling designs of both waves of these studies is basically the same. However, there are several refinements in sampling which occurred with the 1988 survey. One refinement in the sampling design was in relaxing the precision requirement for junior ranking service members. In the 1985 design, the DOD required a population parameter estimate to have a coefficient variation of 0.05 or less to insure precision representation across all ranks. The subsequent sample design optimizations demonstrated that precision levels of estimates for senior non commissioned officers (NCO), warrant officers and senior officers caused the minimum precision requirements for other reporting groups to be exceeded substantially, and the precision requirements were relaxed in those groups.

The eligible population was defined as all active duty personnel except recruits, service academy students, persons away without official leave (AWOL) and persons who were in the process of permanently changing station (PCS) at the time of the data collection. Recruits and service academy personnel are members of the active duty force which have essentially not served in the armed forces. The exclusion of service members who were in PCS status was not determined to be a factor that

would bias the study results. PCS moves are random and alcohol use behavior of these personnel was assumed to be similar to that of the other personnel represented in the survey. For the 1988 survey, a data file was created from a version of the active duty military personnel file maintained by the Defense Manpower Data Center and was the sole source for construction of the first stage sampling frame. This file contained all the data needed for the construction of the first stage sampling frame geographical areas, including zip codes, and APO/FPO numbers.

The studies used a stratified two stage, two phase sampling design. In the first phase, the first and second stage sampling frames were selected. The first stage sampling frame accounted for 2,068,650 (98.72%) of the eligible active duty personnel and was stratified into geographically proximal organizational units within each service by broadly defined geographical regions in the world. A total of 605 first stage sampling units were constructed averaging 3,419 active duty personnel in each. Sixty three of the first stage units were selected in the sample. The second stage sample consisted of 25,547 personnel in 1985 and 26,526 in 1988 (Table 5).

Table 5

Allocation of the Sample in the 1985 and 1988 Surveys

	1985	1988
Army	9,008	9,375
Navy	6,648	7,106
Air Force	6,942	7,114
Marine Corps	2,949	2,931
TOTAL	25,547	26,526

The geographical regions were the Americas (Alaska, Canada, Continental United States, Greenland, Iceland, Antigua, Bermuda, Cuba, Diego Garcia, Panama, and Puerto Rico), North Pacific (Republic of Korea, Mainland Japan, and Okinawa), Other Pacific (Australia, Canton Enderbury, Gilbert Ellice, Guam, Hawaii, Johnston Atoll, Midway, Pacific Trust, Philippines and Wake), and Europe (Belgium, Egypt, Greece, Italy, Egypt, North Africa, Portugal, Saudi Arabia, Spain, Sicily, Turkey, United Kingdom and West Germany).

The second stage sampling frames were lines on the personnel roster of the organizational units selected during the first stage which were stratified into six pay grade groups (E1-E4, E5-E6, E7-E9, W1-W4, O1-O3, O4-O10). This sample was selected with equal probability and without replacement.

In Phase 2, a subsample of non-respondents from the first phase of sampling were selected. The subsample was comprised of persons who were on leave, in the hospital, on temporary duty, at sea or deployed in the field, incarcerated, or available but absent during the Phase 1 survey sessions. This subsample was used to account for nonresponse bias. The response rates for the two surveys were 80% and 81.4% respectively.

Data Collection Procedure for Both Surveys

Phase 1 data collection in both studies was conducted by field teams at each installation during in-person group sessions. In order to facilitate data collection, a Headquarters Liaison Officer (HLO) was appointed for each Service in Washington, D.C. and a Military Liaison Officer (MLO) was appointed at each participating installation.

The responsibilities of the HLO were: (1) to generate support for the survey by sending a series of notifications to the appropriate command levels; (2) obtain MLO name and addresses for the RTI staff; (3) monitor the production of computer generated sample lists; (4) work with the RTI staff to coordinate the scheduling of the survey and necessary preparations for the survey administration at the selected installations.

Prior to the arrival at the installations where the surveys were to be administered, the MLO was responsible for: (1) storing the survey instruments, (2) receiving the sample personnel lists; (3) notifying sample personnel of their selection for the survey; (4) scheduling the survey sessions for the field team visit (group sessions); and (5) monitoring and ensuring attendance of selected personnel at the survey sessions and documentation the reasons for nonattendance.

The Phase 1 data were collected in the survey sessions at the selected installations by ten, two person RTI field teams. Before data were collected, the field team leader was trained in two one day training sessions and subsequently trained his or her team assistant. The major responsibilities of the field team were to: (1) establish itineraries consistent with MLO recommendations; (2) coordinate preparations with the MLO at the installation; (3) ship completed survey forms to the National Computer Systems for scoring; and (4) report to the RTI staff the completion of the survey at each site. There were five field teams assigned to the Americas region, one to the North Pacific, two to the Other Pacific region and two to the Europe region.

During the Phase 1 survey administrations, the team members described the purpose of the study, informed the participants of the voluntary nature of the study, assured the respondents of their anonymity

and described the correct procedure for using the optical mark questionnaire. The participants took an average of 50 minutes to complete the questionnaire. The naval personnel that were aboard ships and inaccessible to field teams self-administered the survey coordinated by MLO's.

While present at the first stage units, the team members attempted to survey all eligible subjects. A roster was prepared documenting whether selected subjects attended the survey session and as well as why subjects were absent if they did not attend. At the close of the site visit, the team inventoried the completed questionnaires, contrasted the inventory with documented counts of personnel completing the questionnaires, and packed the questionnaires for shipment. The questionnaires were sent to National Computer Systems for the optical scan processing.

Phase 2 data collection in both the 1985 and 1988 surveys consisted of mailing questionnaires to nonrespondents who were selected for Phase 1. Each of these subjects received a packet in the mail which included a cover letter from RTI explaining the importance and purpose of the study, a blank questionnaire (precoded to identify the first stage sampling unit and the study phase), and a business reply envelope for returning the completed questionnaire.

Survey Response Rates

The data pertaining to response rate is important in assessing non-response bias. In both the 1985 and 1988 world-wide surveys, additional rates were calculated to address reliability issues in conducting the studies. These included response rate, availability rate, and completion rate. Only the data on the response rate will be presented here.

The response rate was defined as the rate of usable questionnaires obtained from the eligible subjects for each phase of data collection. The response rate among subjects who were eligible during that actual survey period for each branch of the armed forces is shown in Table 6. Selected sample subjects might become ineligible due to PCS, death, AWOL or because they were unknown. Those subjects determined ineligible were excluded from the response rate calculation.

Table 6

Response Rates Percentages among the Eligible Subjects for the 1985 and 1988 World-Wide Surveys of DOD Personnel

	1985	1988
Army	79.0	82.9
Navy	74.8	76.1
Marine Corps	76.8	76.8
Air Force	89.1	86.2
TOTAL	80.4	81.4

The 1985 and 1988 Survey Tools Used in the DOD Personnel World-wide Surveys of Alcohol Consumption

The data collection instrument used in both the 1985 and 1988 studies was a survey questionnaire. The major advantage the instrument offered was its consistency and comparability across these studies. This is not typically the case in alcohol prevalence studies in the general population. Rather, in epidemiological alcohol research a major weakness is found in the disparate data collection tools and measurements which consequently do not permit generalization and/or comparison of findings across populations.

The survey questionnaires used in the analyses follow the American tradition in alcohol studies. They ask questions about the volume, frequency, and variability of types of alcoholic beverage. From these questions a score was computed, indicating level of drinking in a typology which classifies individual drinking levels as either abstainer, light drinker, moderate drinker, moderate/heavy drinker and heavy drinker.[1] Questions were also asked about the respondents perception of problems associated with their alcohol consumption on physical, mental and emotional, social and role performance variables. Additional variables collected are armed forces contextual variables which have been hypothesized to be associated with drinking behavior,

The questionnaire used in the 1985 and 1988 surveys was a refinement of both the earlier 1980 and 1982 studies. In 1982, RTI conducted the study for the first time, carrying out pilot tests to examine the reliability and validity of the survey instrument. The pilot tests examined (1) the adequacy of the item response alternatives; (2) the adequacy of item wording and item formatting; and (3) the expected relationships among items (Bray, et al, 1983). It was demonstrated that overall item distribution, theoretical direction of selected correlations, and informal debriefings of participants provided little evidence for major restructuring of the survey instrument. The minor changes made were to correct problems identified in item formatting/wording and to enhance item clarity.

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[1] This typology classifies five drinking levels as: abstainer- drink once a year or less; infrequent/light category drink 1-4 drinks 1-3 times per month; moderate category drink (a) 1 drink at least once weekly, (b) 2-4 drinks 2-3 times per month, or (c) $\geq$ 5 drinks once or more a month; moderate/heavy category drink 2-4 drinks at least once a week, or $\geq$5 drinks 2-3 times per month; heavy category drink $\geq$ 5 drinks at least once a week.

Each subsequent wave of the study modified the questionnaire to meet new study objectives. However, the questions related to alcohol consumption used essentially the same methodological and measurement strategies.

The survey instrument developed was a self administered questionnaire designed for optical mark reader scoring. The instrument assessed (1) the prevalence of alcohol and drug use during periods of thirty days and twelve months; (2) the negative effects of substance use (e.g., work impairment, physical damage, social disruption, and dependence); (3) prevalence of tobacco use (especially cigarettes); health behaviors and attitudes; (4) reasons for and the context of use and nonuse of substances; and (5) demographic characteristics of the respondents.

Data Analysis Plan

This investigation uses secondary analysis as the method to examine the sociodemographic and contextual characteristics of women's drinking in the U.S. Armed Forces. The data related to the variables of interest (Table 7) were extracted from archival data obtained from the 1985 and 1988 world-wide surveys of Department of Defense personnel conducted by Research Triangle Institute (RTI). The number of female subjects in the 1985 sample was 1324 and in the 1988 sample was 1747 (total of 3071 respondents). Two statistical analysis programs were used in the data analysis (SAS and SPSS-PC); both of these programs treated missing data differently consequently the number of responses (N) for the variables differ depending on the statistical program used. The analyses appraise sociodemographic correlates of level of alcohol consumption and further appraise contextual relationships to levels of alcohol consumption among the women in the samples.

Table 7

Variables List

Age
- •17-20
- •21-30
- •31-40
- •>41

Marital Status
- •married
- •separated
- •divorced
- •widow
- •single

Educational Status
- •did not complete high school
- •GED or ABE certificate
- •high school graduate
- •trade or technical school graduate
- •some college but not a four year degree
- •4 year degree
- •graduate or professional study but not graduated
- •graduate or profession; degree

Ethnicity
- •White
- •Black
- •Hispanic
- •Other

Level of alcohol consumption
- •Abstainer
- •Light/infrequent
- •Moderate
- •Moderate/heavy
- •Heavy

Branch of service
- •Army
- •Air Force
- •Navy
- •Marines

Geographical region of assignment
- •Americas
- •North Pacific
- •Other Pacific
- •Europe

Military rank
- •E1-E4
- •E5-E6
- •E7-E9
- •W1-W4
- •01-03
- •04-06

Occupational specialty
Officer
- •Health Car Officers
- •Tactical Operations Officers
Enlisted
- •Infantry, Seamanship and Gun Crew Specialists
- •Health Care Specialists

Drinking partners
- •spouse or person I date
- •alone
- •with close military friends only
- •with close friends including civilians
- •with co-workers
- •with acquaintances or strangers

Drinking locations
- •at home
- •enlisted, NCO or officers clubs
- •off base residences of friends
- •on base residences of friends
- •civilian bar, tavern, nightclub or lounge
- •driving around or sitting in a car
- •outdoors at sporting events or picnics

Drinking on the job or during lunch break

Lost productivity
- •hurt on the job because of drinking
- •late for work or left early because of drinking, hangover, or illness caused by drinking
- •didn't come to work because of drinking, hangover, or illness caused by drinking
- •worked below normal level of performance because of drinking, hangover, or illness caused by drinking
- •was drunk or high while working
- •was called in during off-duty hours and reported drunk or high from alcohol
- •was unable to concentrate on my work because of drinking
- •paid less attention to my supervisor because of drinking

Negative consequences
- •I had an illness that kept me from work a week or longer
- •I didn't get promoted when I should have
- •I got a lower score on an efficiency report than I expected
- •I received UCMJ punishment
- •I was arrested for a driving violation _ times in the past 12 months
- •I was arrested for an incident not related to drinking _ times in the past 12 months

Negative consequences (continued)
- •I spent time in the jail, stockade or brig _ times in the past 12 months
- •I was hurt in an accident (any kind) _ times in the past 12 months
- •I caused an accident where someone else was hurt or property damaged _ times in the past 12 months
- •I hit my spouse or the person I date _ times in the past 12 months
- •I hit my child(ren) for a reason other than discipline(spanking) _ times in the past 12 months

- I got into a fight where I hit someone other than a member of my family _ times in the past 12 months
- My spouse threatened to leave me _ times in the past 12 months
- My spouse left me _ times in the past 12 months
- I had heated arguments with family or friends
- I had trouble on the job
- I was involved in a motor vehicle accident
- I had a health problem
- I drove unsafely
- I neglected my family responsibilities
- I had serious money problems
- I had trouble with the police
- I found it harder to handle my problems
- I has to have emergency medical help
- I got into a loud argument in public

Beliefs about drinking in the military context

- drinking is part of the military
- drinking is about the only recreation available on this post
- at parties and social occasions everyone is encouraged to drink
- the number of happy hours on this installation makes drinking easy
- disciplinary action will be taken against any person identified as having a drinking problem
- seeking help for a drinking problem will damage one's career

Drinking motivation

- to be friendly or social
- to forget my worries
- to relax
- to help cheer me up when in a bad mood
- when depressed of nervous
- to help with boredom
- to increase my self confidence

Hypotheses

Hypothesis 1

The age cohort relationship to level of alcohol consumption among women in the armed forces will not follow the same trajectory as women in the general population (i.e., the women in the armed forces will continue to drink at higher levels and older ages than women in the general population and the number of abstaining women in the general population will be fewer than in the general population).

Analysis plan for hypothesis 1. To conduct descriptive analysis of the sociodemographics and the age cohort relationship with level of drinking and problem drinking of the women in these samples.

Since sociodemographics have been found to be related to level of alcohol consumption, these data would enable us to make inferences about the drinking of women in the armed forces as compared to current knowledge of sociodemographic variables for women in the general population. Demographic variables to be used as descriptive as well as control factors

are: (1) marital status, (2) race, (3) age cohort, (4) educational level, and (5) military rank. Specifically, the age cohorts to be used in this analysis are: (a) 17-20, (b) 21-30, (c) 31-40, (d) >41.

This analysis would also provide data on level of alcohol consumption and incidence of problem drinking heretofore unknown about the women in this occupation. Level of consumption alone does not reveal substantive information about how drinking effects these women. Examination of indices of problem drinking will provide more specific data.

Research question. What is the sociodemographic composition of the respondents in these surveys and is there a significant difference in the sociodemographics on level of drinking?

Descriptive statistics on each of the sociodemographic variables identified above will be presented. Each of these variables will be cross tabulated with level of alcohol consumption to analyze this relationship. Level of alcohol consumption will be assessed by a typology developed by RTI. After evaluation of the tests of significance a decision will be made as to whether or not the samples can be combined without loss of robustness of statistical analysis and also affording broader examination of additional variables.

This analysis will examine the relationship between level of alcohol consumption and indices of problem drinking among these women. Problem drinking is operationally defined using principal components factor analysis and varimax rotation developing four scales from questions within the original questionnaire which will serve as indices for lost productivity, social/interpersonal consequences, physical consequences and cognitive/performance consequences.

Hypothesis 2

The relationship of contextual factors, including beliefs and perceptions of these women pertaining to alcohol consumption in the context of the armed forces will be statistically significantly related to their level of alcohol consumption.

Analysis plan for hypothesis 2. This analysis will address contextual factors peculiar to armed forces occupations and their relationship to alcohol consumption. These analyses include examination of the following variables with alcohol consumption: (a) geographical area of assignment, (b) branch of service, (c) motivation for drinking, (d) with whom and where drinking takes place, and (e) beliefs about drinking in the military context.

Research questions include:

(1) Is there a difference in the prevalence of drinking patterns among women assigned to specific geographical regions?

There has consistently been found that the level of alcohol consumption among military personnel varies by area of geographical assignment (Bray et al, 1989a). This analysis will use univariate analysis to examine drinking levels of armed forces women in four geographical locations (The Americas, North Pacific, other Pacific and Europe) for differences in women's alcohol consumption related to geographical assignment.

(2) What do the respondents report as their motivation for drinking? Descriptive statistics will be used to examine the drinking motivation reported by the women in these samples.

(3) With whom and where do the women do their drinking? This question begins to examine the relationship of the occupational context to alcohol consumption. Descriptive analysis will be conducted, examining where and with whom the women respondents do most of their drinking.

Hypothesis 3

Women having jobs in occupations characterized by proportionally higher males will consume alcohol at higher levels than women in jobs characterized by proportionally higher females.

Analysis plan for hypothesis 3. To conduct a descriptive analysis of alcohol consumption in the various occupations women hold in the armed forces.

The Department of Defense has classified each occupational specialty in the armed forces in a typology which places occupational roles into primary function. This typology further differentiates officer from enlisted specialties. A description of the typology for both the officer and enlisted ranks, as well as the distribution of male to female ratios in these occupational categories appears in Table 8. These data are approximations obtained from graphs reporting personnel strength. Data obtained for the secondary analyses, as well as the occupations typologies for armed forces occupations across all ranks, will be used to identify those occupational categories which are proportionally higher males versus those which are proportionally higher female. Although the armed forces is dominated by men, there are several occupations where females, are proportionally higher or are more likely to be held by women.

There were several factors believed to be related to what was considered to be an increase in the alcohol consumption of women in the general population. Many of these factors were thought to be related to work and included: the increase of women entering the work force (Parker et al., 1980) and the increase in women entering traditionally male occupations (Parker et al., 1980; Wilsnack & Wilsnack, 1990); and increased alcohol consumption as a response to the stress of harassment

Table 8

Percentages of Males and Females on Active Duty in the Various Occupations of the Armed Forces

Enlisted occupations					Officer occupations				
1985 n=(M)1,649,233 (F) 179,049 1988 n=(M)1,629,698 (F) 188,998	1985		1988		1985 n=(M)278,754 1988 (F) 30,319 1988 n=(M)272,322 (F) 32,651	1985		1985	
	(%M)	(%F)	(%M)	(%F)		(%M)	(%F)	(%M)	(%F)
inf/gun crew	15	2	16	3	gen/execs	1.5	.5	1.5	.5
elect/repair	9	4	9.5		tact ops	36.5	6	36	8
commo/intel	8	11	9	12	intel	5	6	4	5
med/den	8	12	5	14	eng/maint	13	9	17	10.5
tech	3	3	2.5	2	sci/prof	8	5	6	5
supt & admin	13	37	14	36	medical	9	38	10	40
mechan repair	21	8	22	8	admin	12	21	8.5	15
crafts	4	2	4	1	supply/log	6	6.5	7	9
service/supply	9	9	9	10	indiv	9	6	10	7
individuals	10	12	9	9					

Enlisted Occupation Groups
Infantry, Gun Crew & Seamanship
Electronic Equipment Repair
Communications & Intelligence
Medical & Dental
Technical Specialist
Functional Support & Administration
Electrical/Mechanical Equipment Repair
Crafts
Service & Supply
Individuals

Officer Occupation Groups
General Officer and Executive
Tactical Operations
Intelligence
Engineering & Maintenance
Scientific & Professional
Medical
Administrative
Supply & Logistics
Individuals

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women experienced from males on the job (Wilsnack & Wilsnack, 1990). None of these factors have yielded tangible evidence concerning the relationship of women's alcohol consumption to work. This analysis would be one of the first which will examine women's alcohol consumption in occupations which are traditionally believed to be the domain of males and also one of the first to compare women's alcohol consumption in those occupational categories within the armed forces which are characterized as occupied by higher proportions of males compared to those which are characterized as occupied by higher proportions of females.

Research questions include:

(1) Is there a significant difference in women' drinking levels related to type of occupation held? (i.e., Do those women who work in occupations which are proportionally predominately male drink significantly more than the women who work in occupations which are comprised of greater proportions of women?)

Four occupations from the DOD typology which classifies each occupational specialty into primary function will be selected for comparison. The selection is based on the proportion of males to females in the occupations as well as DOD statistics (Military Women, 1986; Military Women, 1989). Of the occupations selected, two are enlisted occupations (i.e., health care specialists[2] and infantry, gun crew, and seamanship[3]) and two are officer occupations (i.e., health care[4] and tactical operations[5]). These occupations were selected because each represents an occupational category which is occupied by either proportionally higher males or females within both the officer and enlisted ranks structure.

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[2] The occupational category, health care specialists, includes specialists in inpatient care and treatment, ancillary medical support, and also in technical and related medical and dental services, administration and/or logistics.

[3] The occupational category infantry, gun crews, and seamanship specialists, includes individual weapon specialists and crew-served artillery specialists, armor and amphibious crewmen, and specialists in combat engineering and seamanship.

[4] The occupational category health care officers, include physicians, dentists, nurses, veterinarians, biomedical sciences and allied health officers, and health services administration officers.

[5] Tactical operations officers include the occupations of pilots (fixed wing fighter and bomber pilots, other fixed-wing pilots, and helicopter pilots) and crews (aircraft crews, ground and naval arms, and missiles support and command) and operations staff officers (combat, intelligence and operations staff).

Logistic regression will be used to examine the relationship of occupational category to level of alcohol consumption (binary dependent variable i.e., abstainers,light/infrequent versus moderate, moderate/ heavy, heavy). The sociodemographic variables of age, ethnicity, marital status, military rank, branch of service, education level will be used as control variables. These control variable will be entered into the model along with occupational category.

Logistic regression directly estimates the probability of an event and permits inferences about the factors affecting a probability in the context of a multivariate model. In logistic regression, the model's parameters are estimated using the maximum likelihood method. Because logistic regression is a nonlinear model, an iterative algorithm is necessary for parameter estimation.

(2) What do respondents report as their beliefs and perceptions about drinking in the armed forces?

(3) Is there a relationship between respondents beliefs about drinking in the armed forces and their reported drinking level?

(4) How does respondents belief and perceptions about drinking in the armed forces effect their level of alcohol consumption?

These three analyses will also use a logistic regression model to analyze to relationship of respondents beliefs and perceptions to reported level of alcohol consumption.

CHAPTER FOUR

RESULTS

Hypothesis 1

The age cohort relationship to level of alcohol consumption among women in the armed forces will not follow the same trajectory as women in the general population (i.e., the women in the armed forces will continue to drink at higher levels and older ages than women in the general population and the number of abstaining women in the general population will be fewer than in the general population).

The results of this analysis provides provides data on the sociodemographic composition of the two surveys used, the relationship of sociodemographics to level of alcohol consumption and incidence of problem drinking heretofore unknown about the women in this occupation. Further since level of consumption alone does not reveal substantative information about how drinking effects these women indices of problem drinking were examined.

The sociodemographic variables examined are (1) marital status, (2) education level, (3) age, (4) ethnicity, and (5) military rank. The findings of the univariate analysis conducted for each of these variables as well as for five levels of alcohol consumption for the women in both the 1985 and 1988 surveys are shown in Table 9. Significance tests of sample differences for the sociodemographic and level of alcohol consumption variables are also presented.

Table 9

Comparison of the Women in the 1985 and 1988 Surveys on Sociodemographic Variables

	1985 (N=1324)		1988 (N=1747)		Combined 1985 & 1988 (N=3054)		Tests of sample differences
	f	%	f	%	f	%	
Marital Status							p= .012
Married	636	48.2	895	51.6	1531	50.1	
Separated	68	5.2	78	4.5	146	4.8	
Divorced	148	11.2	211	12.1	359	11.8	
Widow	4	0.3	3	0.2	7	0.2	
Single	461	34.9	539	30.9	1000	30.9	
Education Level							p= .327
Not high school graduate	4	0.3	5	0.3	9	0.3	
GED	25	1.9	30	1.7	55	1.8	
High school graduate	431	32.7	492	28.4	923	30.2	
Trade/Technical school	35	2.7	66	3.8	101	3.3	
Some college	514	38.9	705	40.7	1219	39.9	
Baccalaurate graduate	155	11.7	198	11.4	353	11.6	
Graduate study	68	5.2	89	5.1	157	5.1	
Graduate degree	88	6.7	149	8.6	237	7.8	
Age Cohorts							p= .000
17-20	112	8.5	139	8.0	251	8.2	
21-30	833	63.1	912	52.6	1745	57.1	
31-40	326	24.7	589	34.0	915	30.0	
41-50	46	3.5	86	5.0	132	4.3	
>50	3	0.2	8	0.5	11	0.4	
Ethnicity	916	69.4					p= .000
White	299	22.7	1072	61.8	1988	65.1	
Black	62	4.7	450	26.0	749	24.5	
Hispanic	43	3.3	124	7.2	186	6.1	
Other			88	5.1	131	4.3	
Military Rank							p= .001
E1-E3	450	34.1	513	29.3	963	31.5	
E4-E6	522	39.5	659	38.0	1181	38.7	
E7-E9	93	7.0	205	11.8	298	9.7	
W1-W4	13	1.0	17	1.0	30	>1	
01-03	156	11.8	197	11.4	353	11.5	
04-010	86	6.5	143	8.2	229	7.5	
Drinking level							p= .000
Abstainer	257	19.5	423	24.4	680	22.3	
light/infrequent	358	27.1	505	29.1	863	28.3	
moderate	468	35.5	552	31.8	1020	33.4	
moderate/heavy	185	14.0	217	12.5	402	13.2	
heavy	52	3.9	37	2.1	89	2.9	

Mann Whitney tests of significance of sample means for military rank, marital status, ethnicity.
Chi-square tests of significance of sample median for education level and drinking level.

Statistically significant differences between the two sampling waves were found for all of the variables examined except education level. The changes observed in these data are consistent with existing knowledge of the sociodemographic changes in the structure of women in who serve in the armed forces. The findings also indicate that more women were married in 1985 and there are higher proportions of Hispanic women.

Consumption levels significantly differed between the two waves. Notably, the percentage of abstainers increased and the percentage of heavy drinkers decreased in 1988. These findings reflect those found in the general population at large (Hilton & Clark, 1984; Wilsnack, Wilsnack & Klassen, 1984).

Despite the statistically significant differences found between the samples, the decision was made to combine the samples. This decision took into account sample size (i.e., with samples of this size, significant differences would more likely occur) as well as naturally occurring changes in the context of the armed forces and in the society at large.

Descriptive Analysis of the Sociodemographics of the 1985 and 1988 Surveys and Sociodemographics by Level of Alcohol Consumption in the Combined Data Set

The combined surveys illustrate that 50% of the women were married, 70% of the women were educated beyond high school and more than 20% had a bachelors degrees or higher (Table 9). More than half of the women were under thirty years of age and are predominantly white. Seventy-nine percent of the women are in the enlisted ranks and approximately half of the women are moderately or heavier drinkers. Table 10 displays the five levels of drinking, including abstainers by age, education, ethnicity,

Table 10

Sociodemographics by the Five Levels of Drinking

	abstainers total N=680 %= 22		light/ infrequent total N=863 %= 28		moderate total N=1020 %= 34		moderate/ heavy total N=402 %= 13		heavy total N=89 %= 3		total (N)
	f	%	f	%	f	%	f	%	f	%	
Age p= .005											
	67	27	54	21	86	34	32	13	12	5	251
17-20	345	20	483	28	614	35	234	14	60	3	1736
21-30	219	24	283	31	285	31	114	12	14	1	915
31-40	49	34	40	30	35	24	13	9	3	2	140
<41											
Education Level p=.002											
<high school/GED	18	28	15	23.5	15	23.5	13	20	3	5	64
High school	218	25	237	24	300	25	125	22	43	4	923
Trade/Tech or some college	286	22	373	28	443	34	180	14	38	3	1320
4 year degree	91	26	102	29	116	33	42	12	2	<1	353
Graduate study	27	17	56	36	57	36	16	10	1	1	157
Graduate degree	40	17	80	34	89	37	26	11	2	1	237
Ethnicity p=.041											
White	351	18	567	28	710	36	302	15	58	3	1988
Black	226	33	206	29	228	32	66	2	24	3	750
Hispanic	58	30	53	27	49	25	23	12	3	6	186
Other	46	35	37	28	33	25	11	8	4	3	131
Rank p= .000											
Enlisted	556	23	674	28	792	32	332	13	88	4	2442
Officer	1114	70	185	12	217	14	65	4	1	<1	1582
Warrant	10	33	4	13	11	38	5	17	-	-	80
Marital Status p= .000											
Married	384	25	494	32	456	30	171	11	26	2	1531
Separated	29	20	29	20	59	40	23	16	6	4	146
Divorced	66	18	102	28	132	37	48	13	11	3	359
Widow	2	29	3	43	0	-	1	16	1	14	7
Single	198	20	233	22	368	37	156	16	45	5	1000

* p values are chi squares tests of significance for demographics by drinking levels

military rank and marital status. Table 11 displays the same cross-tabulations excluding abstainers. Study of these two tables indicates that when abstainers are included and excluded, heavy drinking declines with age, a finding in accordance with existing literature.

Table 11

Sociodemographics by Five Levels of Alcohol Consumption Excluding Abstainers

	light/ infrequent total N=863	moderate total N=1020	moderate/ heavy total N=402	heavy total N=89	total (N)
Age	%	%	%	%	
17-20	29	47	17	7	184
21-30	35	44	17	4	1391
31-40	41	41	16	2	699
>41	46	37	14	3	94
Education level					
<HS/GED	33	33	28	6	46
High school	34	42	18	6	705
Trade/Tech or Some college	36	43	17	4	1034
Bachelor's degree	39	44	16	1	262
Graduate study	43	44	12	1	130
Graduate degree	41	45	13	1	197
Ethnicity					
White	35	43	18	4	1637
Black	39	43	13	5	524
Hispanic	42	38	18	2	128
Other	43	39	13	5	85
Military Rank					
Enlisted	36	42	17	5	1886
Officer	40	46	14	<1	486
Warrant	20	55	25	-	20
Marital Status					
Married	43	40	15	2	1147
Separated	25	50	20	5	117
Divorced	35	45	16	4	293
Widow	60	-	20	20	5
Single	29	46	19	6	802

There is no discernible pattern for abstinence among age cohort except that the younger (17-20) and the older groups (>41) are slightly over-represented.

Education levels suggest an inverse relationship to drinking level. For each of the categories of drinking, as education level increases, level of drinking decreases. When abstainers are included, women educated beyond a bachelor's degree (i.e., graduate study or graduate degree) are more likely to be drinkers (fewer abstainers) but more of them drink at the light/infrequent and moderate levels than in the heaviest drinking categories.

Ethnic differences are pronounced with respect to abstinence. White women are less likely to abstain than other groups which is also in accordance with existing literature. When abstainers are included in the calculations, white women are slightly more likely to be moderate/heavy and heavy drinkers. However, when abstainers are excluded, these differences disappear for the most part, suggesting when women do drink there are not pronounced differences in the "heavier drinking" categories.

There is a dramatic difference between those of the officer vs. enlisted and warrant military ranks. Seventy percent of the officers reported they abstained in contrast to 23% of the enlisted and 33% of the warrant ranks. This is a surprising finding and may be related to education level. Since officers are required to be college educated this may account for the marked difference in abstinence among officers and other ranks. Further, when abstainers are included or excluded, only those of the enlisted ranks are categorized as heavy drinkers (5%).

Marital status differences suggest that those who are single are more likely to drink and to drink heavily than those who are married when both abstainers are included and excluded. Further, all of those in the not married classification (widow, separated, divorced) or not living with a spouse are more likely to be drinkers and to drink heavier than those who are married and living with a spouse.

Problem Drinking and Level of Alcohol Consumption

In the original surveys, the researchers asked several questions related to the respondents experience of negative consequences in the past 12 months. For the purpose of this analysis the responses to some of these questions were used to develop four scales (Table 10) to serve as

indices of problem drinking. The questions used in the physical consequences scale and the cognitive/performance scale asked the number of times these consequences were experienced in the past 12 months. The questions in the social/interpersonal and the lost productivity scales asked the number of times these consequences were experienced related to alcohol consumption in the past 12 months.

Conceptually, the scales were developed to serve as four constructs which would function as an index of each of the four consequences. Principal components factor analysis with varimax rotation was conducted to examine construct validity as well as provide an index of reliability. Factor analysis, as a means of assessing both construct validity and reliability, is often used in constructing multiple item scales in the social sciences (Carmines & Zeller, 1979).

Initially, all 33 of the variables were placed into the factor analysis and eight factors were extracted. For comparison, four scales were conceptually constructed and entered in a separate analysis. The conceptually created scales yielded higher Cronbach's alphas than the eight factors created by the SPSS-PC program. The results of the conceptually constructed four scale factor analysis is presented in Table 12. The two scales with the lowest reliability were those measuring physical consequences and cognitive/performance problems.

Table 12

Reliability Analysis for Indices of Problem Drinking

	# of items	Cronbach's alpha	mean inter-item correlation
lost productivity consequences	8	.859	.482
physical consequences	3	.406	.192
social interpersonal consequences	16	.702	.178
cognitive performance consequences	6	.430	.126

number of responses = 3000

The questions used in constructing the scales are presented in Figure 4. Since the physical consequences and cognitive performance consequence scales did not inquire if the consequence was experienced specifically related to alcohol consumption, the data in these instances should be viewed with caution. Conceptually, the questions used to assess physical consequences were viewed as the individual passively experiencing these consequences. The social/interpersonal scale examines the experience of these consequences which effect both the individual, her personal relationships and potentially the society. The cognitive/ performance consequences measure as the individuals performance and judgement being effected. The lost productivity consequence were taken from a scale in the questionnaire which specifically asked about consequences expressly experienced related to alcohol consumption and work.

Physical consequences
- I had an illness that kept me from duty a week or longer
- I was hurt in an accident (any kind)
- I had health problems

Social/interpersonal consequences
- I received UCMJ punishment
- I was arrested for an incident not related to driving
- I spent time in the jail or stockade
- I caused an accident where someone else was injured or property damaged
- I had serious money problems
- I had trouble with the police
- I found it harder to handle my problems
- I had to have emergency medical help (for any reason)
- I got into a loud argument
- I hit my spouse or person I date
- I hit my child(ren) for a reason other than discipline (spanking)
- I got into a fight where I hit someone other than my family
- My spouse threatened to leave me
- My spouse left me
- I neglected my family responsibilities
- I had heated arguments with family or friends

Cognitive/performance consequences
- I was involved in a motor vehicle accident
- I drove unsafely
- I was arrested for a driving violation
- I didn't get promoted when I should have
- I got a lower score on an efficiency report than I expected
- I had trouble on the job

Lost productivity consequences
- I was hurt in an on-the-job accident because of my drinking
- I was late for work or left work early because of my drinking, a hangover or an illness caused by my drinking
- I did not come to work at all because of a hangover, an illness, or a personal accident caused by drinking
- I worked below my normal level of performance because of drinking, a hangover, or an illness caused by drinking
- I was drunk or "high" while working because of my drinking
- I was called in during off-duty hours and reported to work feeling drunk or high from alcohol
- I was less able to concentrate on my work because of my drinking
- I paid less attention to my supervisor because of my drinking

Figure 4. Items combined from 1985 and 1988 surveys used in scale construction.

One way ANOVA (analysis of variance) using SPSS-PC was conducted to examine the mean differences of the indices of problem drinking as related to level of alcohol consumption (Table 13). Each of the indices measures the mean number of times problem drinking consequences were experienced during the past twelve months by drinking level. The analysis suggest that the mean number of negative consequences on each level are significantly different at the .05 level on each of the indices. However this may reflect the large sample size rather than a meaningful difference in consequences by consumption level for most scales. This applies to all indices except physical consequences. Here, the mean number of consequences in the light/infrequent and the moderate drinking level are not significantly different.

Overall, the mean scores on each of the indices of problem drinking suggest that despite level of alcohol consumption problem drinking consequences are experienced. It also suggests the mean scores in each of the indices increases as the level of alcohol consumption increases and that the index in which the most negative consequences are experienced is in lost productivity. This finding is consistent with the world-wide surveys for DOD personnel where the percentage of personnel experiencing lost productivity was higher than the other indices of problem drinking (Bray et al., 1989a). Moreover, these findings support the disaggregated perspective in viewing the consequences of drinking as not necessarily related to alcohol dependence or to heavy drinking. Rather these drinking consequences are suggested as related to any alcohol consumption as consequences occur at all levels of alcohol consumption.

Table 13

Indices of Problem Drinking by Level of Alcohol Consumption

Drinking level by physical consequences (3 item scale)

	Drinking level	possible scores	$\bar{X}$	se	F
(L/I)	light/infrequent	≤ 3= 0 times	4.0	.045	.0001
(M)	moderate	≤ 6= 1 time	4.06	.044	
(M/H)	moderate/heavy	≤ 9= 2 times	4.25	.078	
(H)	heavy	≤12= 3 or more times	4.61	.215	

Drink level by cognitive and performance consequences (12 item scale)

	Drinking level	possible scores	$\bar{X}$	se	F
(L/I)	light/infrequent	≤ 6= 0 times	7.35	.061	.0000
(M)	moderate	≤12= 1 time	7.54	.060	
(M/H)	moderate/heavy	≤18= 2 times	7.93	.102	
(H)	heavy	≤24= 3 or more times	8.74	.346	

Drink level by social/interpersonal consequences (16 item scale)

	Drinking level	possible scores	$\bar{X}$	se	F
(L/I)	light/infrequent	≤16= 0 times	18.47	.110	.0000
(M)	moderate	≤32= 1 time	18.93	.117	
(M/H)	moderate/heavy	≤48= 2 times	19.85	.190	
(H)	heavy	≤64= 3 or more times	21.63	.840	

Drink level by lost productivity consequences (8 item scale)

	Drinking level	possible scores	$\bar{X}$	se	F
(L/I)	light/infrequent	≤ 8= 0 times	8.24	.047	.0000
(M)	moderate	≤16= 1 time	8.62	.078	
(M/H)	moderate/heavy	≤24= 2 times	10.42	.226	
(H)	heavy	≤32= 3 or more times	14.37	1.101	

* possible scores are derived from the number of items in the scale multiplied by the data codes used to represent the number of times the respondent experienced the consequence in the past 12 months (i.e., 1 x the # of items in the scale = 0 times in the past 12 months, 2 x the number of items in the scale= 1 time in the past 12 months, etc).

Contextual Factors Related to Alcohol Consumption in the Armed Forces: Geographical Location and Branch of Service

Both geographical location of assignment and branch of service have been suggested by previous studies to be related to level of drinking. Whether this is also applicable to women's drinking in the armed forces has not been investigated. The findings presented in Table 14 concur with these previous studies among DOD personnel. Specifically, when assignment

Table 14

Percentage of Women Drinkers in Each Level of Alcohol Consumption by Geographical Assignment and Branch of Service

	light/ infrequent total N=863 total %=28	moderate total N=1020 total %=34	moderate/ heavy total N=402 total %=13	heavy total N=402 total %=13	total (N)
	%	%	%	%	
Region					
Americas	40	42	16	2	1228
North Pacific	33	44	19	4	253
Other Pacific	33	44	19	4	424
Europe	32	44	17	7	469
Branch of service					
Army	38	43	15	4	686
Navy	35	42	19	4	778
Marines	38	38	20	4	130
Air Force	36	45	16	3	780

is outside of the Americas the percentage of heavy drinking among women doubles. When assignment is in Europe, the percentage more than triples. These findings strongly suggest that a "heavy drinking" context is implied in influencing the drinking levels of women.

Heavy drinking in each of the branches of service is the same except in the Air Force where the percentage is slightly smaller. The "heaviest drinkers" (moderate/heavy and heavy levels combined) are among women in the Navy and Marine Corps.

Drinking motivation. Heavy drinking has been persistently found to be higher in the armed forces than in the civilian population. Motivation for drinking may offer some clues as to these differences. Drinking motivation assesses respondents' reports of the importance of their reasons for drinking (Table 15). The two most important reasons for drinking are to relax (65%) and to be friendly or social (45%) in this analysis. These findings concur with other findings where drinking to relax and drinking to be friendly or social are among the most frequently

Table 15

Drinking Motivation Responses

	not important (n)	%	important (n)	%
to be friendly or social	1332	55	1104	45
to forget my worries	1821	79	491	21
to relax	827	35	1543	65
to cheer me up	1836	80	467	20
when depressed or nervous	1807	79	492	21
when bored	2016	88	281	12
to increase my self confidence	2066	90	230	10

stated reasons for drinking in the general population (Alcocer, 1979; Cahalan, Cisin, & Crossley, 1969; Johnson, Schwitters, Wilson, Nagoshi, & McClearn, 1985). The least important reasons for drinking are to increase self confidence and when bored.

Most frequent drinking companions and locations. In both the 1985 and the 1988 surveys, respondents were questioned concerning the location of most frequent drinking and most frequent drinking companions in the past thirty days. The wording of the questions and the available responses were different in the surveys, preventing direct comparison of the responses to these items. The surveys differed in that respondents could make multiple selections in the 1985 survey. However in 1988 only one selection on each of the variables was permitted. The frequency and percentages for each of the responses is found in Tables 16, 17, 18, and 19.

Table 16

1985 Survey Responses of Locations Where Respondents Drank Most Often in the Past 30 Days

	% < monthly	% 1-3 days/month	% 1-2 days/week	% 3-4 days/week	% 5-7 days/week
Home	51	28	19	9	7
NCO/Officers Club	61	26	9	3	<1
On base residences	77	16	3	2	<1
Off base residences	68	24	6	2	<1
Bar	61	26	10	2	<1
Car	80	8	7	2	2
Outdoor events	80	15	3	<1	<1

Table 17

1985 Survey Responses of Most Frequent Drinking Companions in the Past 30 Days

	% < monthly	% 1-3 days/month	% 1-2 days/week	% 3-4 days/week	% 5-7 days/week
spouse/date	41	30	18	7	4
alone	60	22	11	4	3
Close military friends	56	26	11	5	2
close friends including civilians	60	27	9	2	1
co-workers	66	24	7	2	1
acquaintances or strangers	91	7	1	<1	<1

Table 18

1988 Survey Responses of Who Respondents Drank with Most Often in the Past 30 Days

	frequency	percent of survey
with spouse of person she dates	551	44
close friends including civilians	300	24
close friends military only	178	14
co-workers	103	8
none of the above	63	5
alone	42	3
strangers or aquaintances	22	2

Table 19

1988 Survey Responses of Where Respondents Drank Most Often in the Past 30 Days

	frequency	percent of survey
home	527	42
civilian bar	246	20
Officer/NCO club	189	15
off base residences of friends	144	11
none of the above	84	7
on base residences of friends	38	3
outdoor events	28	2
while driving or sitting in a car	4	<1

The most consistent finding across the surveys was that the majority of women reported doing most of their drinking and their most frequent drinking (number of occasions) at home. In 1985, 9% reported drinking at home 3-4 days a week, and 7% reported drinking at home between 5-7 days per week. In 1988, 42% of the women reported drinking at home most often. The second place most often selected in 1985 and also in 1888 was a

civilian bar followed by the Officer/NCO clubs located on military installations. A surprising finding in the 1985 survey is that 2% of the sample drank between 5-7 days a week while driving or sitting in a car.

The responses to the question concerning drinking companions were more widely divergent between the two waves of surveys than those related to drinking locations. In both waves the most frequent drinking companion was the respondent's spouse or date. In the 1985, survey drinking more frequently occured with close military friends and alone than with the other choices. A change occurs in the 1988 survey with more of the drinking occuring with close friends, including civilians, as well as with close friends, including military. This may suggest more social drinking was occuring in 1988.

Beliefs about Drinking in the Armed Forces Context

The analysis of respondents beliefs about drinking in the armed forces included abstainers in the analysis (Table 20). More than one-fourth of the sample agree that drinking is part of being in the armed forces and 34% agree that drinking is encouraged at parties and social occasions. Fifty-eight percent of the sample agree that disciplinary action will be taken if one is identified as having a drinking problem and 66% disagreeing that seeking help for a drinking problem will damage one's career.

Women's Alcohol Consumption in U.S. Armed Forces Occupations

Four occupations from the DOD typology which classifies each occupational specialty into primary function were selected for comparison.

Table 20

Beliefs about Drinking in the Military Context

	don't know no opinion		disagree		agree	
	f	%	f	%	f	%
drinking is part of being in the military	163	5	2063	68	807	27
drinking is about the only recreation available	188	6	2473	82	365	12
at parties or social occasions everyone is encouraged to drink	357	11	1676	55	1010	34
the # of happy hours makes drinking easy	1014	33	1140	38	874	29
disciplinary action will be taken if one is identified as having a drinking problem	250	8	1035	29	1747	58
seeking help for a drinking problem will damage one's career	278	9.1	1998	66	747	25

The selection was based on the proportion of males to females in the occupations and DOD statistics (Military Women, 1986; Military Women, 1989). Of the four occupations selected, two are enlisted occupations (i.e., health care specialists [HCS] and infantry, gun crew, and seamanship [IGS]) and two are officer occupations (i.e., health care [HC] and tactical operations [TO]). These occupations were selected because each represents an occupational category with either proportionally higher males or females within both the officer and enlisted ranks structure. Table 21 presents the four occupational categories selected as well archival data for these four occupations. The table presents the percentage of males and females corresponding to the years of the waves of the world-wide substance use surveys of DOD personnel. Although the table demonstrates a slight increase in the percentage of females in ecah of the occupational catagories selected, these occupations continue to be dominated by one gender versus the other in both years. In this analysis

Table 21

DOD Percentages of Males and Females in 1988 for the Four Occupational Categories Selected

	1985 (M)	1985 (F)	1988 (M)	1988 (F)
Health Care Officers (N)	25,088	11,521	27,232	11,521
(%)	9	38	10	40
Tactical Operations Officers (N)	101,745	1,819	98,036	2,621
(%)	36	6	36	8
Health Care Specialists (N)	247,385	3,581	81,485	26,459
(%)	8	12	5	14
Infantry, gun crew and seamanship (N)	131,939	21,486	260,752	5,670
(%)	15	2	16	3
Total DOD personnel 1985 Officers (Male) 278,754 (Female) 30,319 Total 309,073 1985 Enlisted (Male) 1,649,233 (Female) 179,049 Total 1,828,282			1988 Officers (Male) 272,322 (Female) 32,651 Total 304,973 1988 Enlisted (Male) 1,629,698 (Female) 188,998 Total 1,818,696	

health care officers and health care specialists represent the proportionally higher female predomiantly female) occupations and infantry, seamanship and gun crews and tactical operations officers represent the proportionally higher males occupations (predomantly male).

Table 22 presents a description of the sociodemographics, branch of service and level of alcohol consumption of the total subsample of women in the four occupational categories selected. This comparison to the total combined 1985 and 1988 samples suggest that this smaller percentage of the subsample have acheieved less than a bachelor's degree (75% in combined sample and 22% in the four occupation subsample), that women in the Army are overrepresented and that officers are overrepresented.

Table 22

Description of the Subsample of the Women Incumbents in the Four Occupational Categories Selected

total N=618	%
Age	
mean = 30.05	100
Ethnicity	
White	68
Non White	32
Marital status	
Not married	50
Married	50
Branch of service	
Army	47.5
Navy	20
Marine Corps	>1
Air Force	32
Occupational group	
Higher proportion of males	13.5
Higher proportions of females	86.5
Education level	
Less than 4 years of college	22
More than 4 years of college	78
Rank	
Enlisted	60
Officer	40
Level of alcohol consumption	
Abstainer	24
Light	34
Moderate	31
Moderate/heavy	9
Heavy	1

Descriptive analysis of level of alcohol consumption among women who drink in each of the occupational categories are presented in Table 23. A limitation in these comparisons is sample size, specifically the tactical officer category. Since there are only nineteen women in this category the comparisons to this category should be viewed with caution.

In both officer and enlisted occupations, which are characterized by predominantly females, 10% more of the women are light/infrequent drinkers than occupations which are characterized by predominantly males.

Table 23

Percentage of Women in Each Drinking Level by the Four Occupational Groups of Interest

total N=472	infrequent/ light	moderate	moderate/ heavy	heavy	Total
Tactical Officers					
N	6	10	1	0	17
%	36	59	6	0	100
Health Care Officers					
N	85	80	17	0	182
%	46	44	9	0	100
Health Care Specialists					
N	106	83	29	5	223
%	47	37	13	2	100
Inf/Gun/ Seamanship					
N	18	19	9	4	50
%	36	38	18	8	100

Among officers, level of alcohol consumption by predominantly female versus predominantly male occupation is not as clearly discernible as among the enlisted. Among the enlisted occupations, those in predominantly higher females occupations are more likely to be infrequent/light drinkers than in the predominantly male occupations and women in the later group are four times more likely to drink heavily than in the former. There are no heavy drinkers among the officer women in either the occupations characterized as proportionally higher females or proportionally higher males. Earlier, in the descriptive analyses of the combined samples, only a very small percentage of the sample of women officers drank heavily therefore it is not surprising that no heavy drinking women officers are found in either of the two officer occupations selected. The finding that the percentage of moderate/heavy drinking of women in the health professionals is higher than tactical operations women is a surprising one however sample size may be a relevant function of this finding.

Beliefs about Drinking

In the section, as above, only those women who drink were considered. Furthermore the sample size among the TO occupational category may be too small to demonstrate meaningful results. Nonetheless,among the officer occupational groups, 41% of those in the predominantly male occupations and 25% of those in the predominantly female occupations believe that drinking is part of the military (Table 24). These differences are not found among the enlisted in which both occupational categories reflect that of the predominantly female occupations of the officers. This suggests that the effect may be contributed, not only by the dominance of the males in the occupation, but also by rank (social status). There is little difference in the belief that alcohol is encouraged at social occasions or that alcohol is the only recreation available among the officer categories but higher percentages of the predominantly higher male enlisted occupations believe this to be the case. Twice as many health care officers (predominantly female occupation) believe that the number of happy hours make drinking easy than among the tactical officer occupation. However there is not difference among the enlisted occupations.

A slightly larger percent of health care officers believe that seeking help will damage one's career and a smaller percent of health care officers believe that disciplinary action will be taken if one is identified as having an alcohol problem. These tendencies are in the opposite direction in the enlisted comparison.

Table 24

Responses of the Four Occupational Groups on Contextual Beliefs

	Part of military	Only recreation	Encouraged at social occasions	# of happy hours	Disciplinary action	Seeking help
Tactical Officers (N=17)						
% Disagree	53	95	71	47	30	59
% Agree	41	0	24	12	64	30
Health Care Officers (N=182)						
% Disagree	72	93	65	51	41	53
% Agree	25	3	26	25	52	36
Infantry, Seamanship & Gun Crew (N=50)						
% Disagree	70	57	41	41	40	68
% Agree	24	34	27	27	53	24
Health Care Specialists (N=223)						
% Disagree	70	82	58	50	36	78
% Agree	22	16	32	30	60	12

Prediction of Level of Alcohol Consumption by Occupational Category, Sociodemographics and Beliefs about Alcohol Consumption in the Context of the Armed Forces

The major purpose of this analysis is to examine the relationship of occupational category (proportionally higher males and proportionally higher female incumbents) to level of alcohol consumption, Three logistic regression models were developed to examine the effect of sociodemographics, membership in occupational category and belief about drinking in the armed forces context in the prediction of level of alcohol consumption. In none of the three analyses was occupational category significantly associated with level of alcohol consumption.

A binary dependent variable for level of alcohol consumption was used as (0)= abstainer, light/infrequent drinkers and (1)= moderate, moderate/heavy, and heavy drinkers. The numbers in the parenthesis

indicate the codes used in the analysis. The decision to group the levels of alcohol consumption as presented is based on the notion that abstainers and light/infrequent drinkers are more like each other than any of the other drinkers. This is also suggested for the three levels of heavier alcohol consumption. As indicated, abstainers were included in the analysis changing the number of respondents in the samples from 472 to 595[1].

This analysis included both the sociodemographic variables which were to be used as controls and the occupational categories. Backwards step wise procedure was employed to eliminate extraneous variables (not statistically significant) with the goal of preventing over specification the model and loss of statistical power. In the second analysis, the independent variables related to respondent's beliefs about drinking in the context of the armed forces were added to those variables remaining after the initial backwards step wise regression. The occupational category variable was also included in this model. For the final analysis, an interaction terms was added to the model examining the interaction between respondent's beliefs and occupational category.

The results of the first analysis are presented in Table 25. The independent variables used in the model and their coding scheme are: Age (17-20)=1, (21-30)=2, (31-40)=3, (>41)=4; Marital status (Not married=0), (Married=1); Educational status (4 year or greater=0) (<4 year degree=1); Ethnicity (non-white=0) (white=1); Branch of Service (Army=1) (Navy=2) (Marine=3) (Air Force=4); Pay group (officer=0) (enlisted-1); and

[1]In the tables used in these analyses the sample size changes when abstainers are include or excluded. They also change when the belief variable are used in the analyses because 23 cases were not included in the analysis since they possessed unusable data.

Table 25

Results of Step 1 of Logistic Regression #1

	Beta	Wald	Significance	Odds Ratio
Age	-.4721	13.0032	.003	0.6237
Marital Status	.2353	7.6882	.0056	1.2653
Education	-.1402	1.3881	.2387	0.8692
Ethnicity	-.4847	6.1524	.0131	0.7443
Branch of service				
Army	-.1649	.1870	.6654	0.8490
Navy	-.1095	.0751	.7832	1.1157
Marines	-.0750	.0047	.9452	0.9277
Pay Group	-.1439	1.6891	.1937	0.8660
Occupational category	.1570	1.3657	.2425	1.1710
Constant	1.1866	10.4885	.0012	

Model Chi square significant at .0000

Occupational category (proportionally higher female=0) (proportionally higher male=1). The coding of the variable remained the same throughout the three logistic regression analyses.

As previously indicated, backwards step wise regression was used in this model to eliminate extraneous variables. On the last step three variables remained in the model (Table 26). Branch of service, educational level, occupational category and pay group were not found to be significantly related to heavier drinking in this regression model.

The odds ratio suggest that as age increases, the risk of being a heavier drinkers significantly decreases 28% every ten years, being

Table 26

Remaining Variable after Backwards Step Wise Regression in Model 1

	Beta	Wald	Significance	Odds Ratio
Age	-3.771	11.1849	.0008	.6858
Marital status	.2426	8.3759	.0038	1.2745
Ethnicity	-.3161	11.6715	.0006	.7290
Constant	.4726	2.6292	.1049	

married compared to not being married significantly increases the risk of being a heavier drinker by 27%, and being white compared to being non-white significantly reduces the risk of being a heavier drinker by 27%.

For the second model, the variables indicating beliefs about drinking in the armed forces were added to the three variables which remained after the backwards step wise logistic regression procedure in the first analysis (Table 27).

The coding for each of the belief variables is : don't know/no opinion=0, disagree=1 and agree=2. The don't know/no opinion group was used as the reference group in the logistic regression analysis primarily because of the change in the sample size when they were excluded. Of major concern was the potential loss of statistical precision in the analysis with the loss of cases. In addition to the demographic variables of age, marital status and ethnicity, three of the belief variables were significant on heavier drinking in this analysis. The addition of belief to the model modified the risk estimates for age from from a decrease of 28% to 30% with each level of age used in the model, being married compared to not being married increased the risk of heavier drinking 22%

Table 27

Results of Logistic Regression Model #2 Analyzing the Relationship Between Demographics, Beliefs about Alcohol Consumption in the Armed Forces and Occupational Category

		Beta	Wald	Significance	Odds Ratio
Age		-.3523	8.0724	.0045	.7031
Marital Status		.1996	4.9769	.0257	1.2209
Ethnicity		-.2903	8.2611	.0041	.7480
Occupational category(1)		.0641	.2428	.6222	1.0662
Drinking is			10.0100	.0067	
part of the	(1)disagree	.3771	1.3998	.2368	1.4580
military	(2)agree	-.5009	7.3193	.0068	.6060
Drinking is the			2.0308	.3623	
only recreation	(1)disagree	-.4124	1.5522	.2128	.6621
available	(2)agree	.0526	.0673	.7953	1.0541
At social occasions			1.0669	.5866	
drinking is	(1)disagree	-.1932	.8922	.3449	.8243
encouraged	(2)agree	.1308	.8534	.3556	1.1397
The number of happy			23.7724	.0000	
hours makes	(1)disagree	-.2493	3.3679	.0665	.7794
drinking easy	(2)agree	.6072	23.7182	.0000	1.8354
Disciplinary action			2.0061	.3668	
will be taken	(1)disagree	-.1977	.7466	.3875	.8206
	(2)agree	.2106	1.8874	.1695	1.2344
Seeking help for			.5530	.7661	
alcohol problems	(1)disagree	.0299	.0174	.8949	1.0304
will damage career	(2)agree	-.0900	.3684	.5439	.9104
Constant		.5507	2.2222	.1360	

Model Chi Square significance level = .0000

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compared with 27% without the belief variable. The risk of heavy drinking associated with being white compared to being nonwhite remained at a reduction of 26%. For those respondents who agreed with the statement that drinking is part of the military compared to those with no opinion, the risk of heavier drinking was significantly decreased 40%. For those respondents who disagreed that the number of happy hours makes drinking

easy, the risk of being a heavier drinker decreased 22%. However, for those respondents who agreed that the number of happy hour makes drinking easy, the risk of being a heavier drinker was increased by 83%.

The final model developed examined if an interaction between membership in occupational groups and beliefs about drinking in the armed forces were related to drinking level (Table 28). In this model the demographics of age, marital status and ethnicity and the belief status, ethnicity and drinking beliefs (i.e., drinking is part of the military and the number of happy hours makes drinking easy) are again found to besignificantly related to heavier drinking. Also in this analysis the occupation variable is not significant, either alone or in interaction with any of the belief variables.

The odds ratios of all of these variables changed only slightly when the interaction terms were added to the model. The risk of heavier drinking with age decreased 2%, the risk for married compared to not married women increased 1% and the risk for white compared to non-white women decreased 2%. Overall, these three logistic regression analyses suggest that in addition to demographics, beliefs about drinking in the context of the armed forces are more significantly related to level of alcohol consumption than type of occupation (i.e., predominantly male versus predominantly female occupations).

Table 28

Results of Logistic Regression Model #3 Analyzing Demographics, Beliefs about Alcohol Consumption in the Armed Forces and Interaction Between Occupational Category and Beliefs about Alcohol Consumption in the Armed Forces

	Beta	Wald	Significance	Odds Ratio
Age	-.3737	8.7693	.0031	.6882
Marital Status	.2108	5.3726	.0205	1.2346
Ethnicity	-.3092	8.8905	.0029	.7340
Occupational category(1)	1.1330	.2352	.6277	3.1050
Part of the military		5.4524	.0655	
disagree(1)	4.6344	.5337	.4651	102.9689
agree(2)	-2.6904	.7178	.3969	.0679
Only recreation available		1.6944	.4284	
disagree(1)	-2.7289	.4080	.5320	.0653
agree(2)	1.1061	.2660	.6060	3.0226
Encouraged at social occasions		.4632	.7933	
disagree(1)	.1047	.0692	.7925	1.1104
agree(2)	.0634	.0710	.7899	1.0654
# of happy hours		18.8412	.0001	
disagree(1)	-.4652	3.9075	.0481	.6280
agree(2)	.8625	18.8162	.0000	2.3690
Disciplinary action		1.2895	.5248	
disagree(1)	-.3674	.5866	.4438	.6926
agree(2)	.0549	.0352	.8511	1.0565
Seeking help		1.0139	.6023	
disagree(1)	-.0375	.0098	.9212	.9632
agree(2)	-.1579	.4483	.5031	.8540
Interactions				
OccupXpart of military		.6510	.7222	
disagree(1)	4.5810	.5214	.4702	97.6164
agree(2)	-2.3505	.5479	.4592	.0953
OccupXonly recreation		.5078	.7758	
disagree(1)	-2.4250	.3222	.5703	.0885
agree(2)	1.1137	.2697	.6035	3.0456
OccupXencouraged at social occ.		1.0842	.5815	
disagree(1)	.3788	.9083	.3406	1.4605
agree(2)	-.0867	.1325	.7158	.9169

	Beta	Wald	Significance	Odds Ratio
Occup#f happy				
hours		2.6522	.2655	
disagree(1)	-.2799	1.4179	.2338	.7558
agree(2)	.3093	2.4018	.1212	1.3625
OccupXdisciplinary				
action		4.0481	.1321	
disagree(1)	-.1440	.0902	.7639	.8659
agree(2)	-.2423	.6895	.4063	.7848
OccupXseeking				
help		.3562	.8368	
disagree(1)	-.0885	.0544	.8156	.9153
agree(2)	-.0578	.0602	.8061	.9438
Constant	1.9164	.5636	.4527	

Model Chi square .0000

CHAPTER FIVE

CONCLUSION

Discussion

The question, "Does occupational context influence level of alcohol consumption among women in the armed forces?", is the major focus of this study and is examined from several directions. This is one of the first studies which examines women's alcohol consumption in an occupation traditionally believed the domain of males. It is also one of the first to compare women's alcohol consumption in occupational categories within the armed forces. First, it describes the demographics of the sample, the demographic correlates of level of alcohol consumption, as well as the relationship of level of alcohol consumption to problem drinking. Second, it describes the relationship of contextual factors (i.e., drinking motivation and beliefs about the drinking context of the armed forces) and their relationship to level of alcohol consumption. Lastly, it examines the relationship of demographics, beliefs about drinking in the context and type of occupation (predominantly male or predominantly female) to level of alcohol consumption. Overall the results of these analyses suggest that demographics and contextual beliefs do influence level of alcohol consumption.

Since virtually nothing is known about women's drinking in the armed forces the results of this study provides data describing the demographic correlates of women's alcohol consumption which were heretofore unknown. The hypothesis that women in the armed forces would drink more heavily and at older ages than women in the general population was not tested in

analysis. Although this analysis did not make any direct comparison of general population samples to armed forces women samples there is evidence which suggests that more women in the armed forces drink and drink more heavily than women in the general population women. Further this drinking and heavy drinking continues at older ages (Bray, Marsden, & Peterson, 1991). The findings of the descriptive analysis on age and prevalence of drinking level do suggest that the age relationship to level of alcohol consumption follows a similar trajectory to that of women in the general population. As with the women in general population studies, drinking decreases with age and, at the same time abstinence increases.

The relationship of women's level of alcohol consumption to the demographics of education level, marital status, and social class are not as clear as the age relationship in the general population literature. However some similarities were found in the findings of this study and findings from the general population literature on these demographic variables. This study suggests that women with less than a college education are among the heaviest drinkers which is similar to the findings of Wilsnack, Wilsnack, and Klassen (1986). Hilton and Clark (1987) found that women with higher mean incomes were more likely to be abstainers. In this analysis a striking finding was 70% of women officers reporting abstinence. The descriptive findings also suggest that women in a not married status are over-represented as moderate/heavy and heavy drinking --a finding echoing other studies (Celantano & McQueen, 1984; Wilsnack, Wilsnack, & Klassen, 1984). However, the most astonishing finding of the logistic regression suggests that when the demographics of age and ethnicity are controlled for, being married increases the risk of being a heavier drinker. The findings of the descriptive analyses related to

drinking locations and drinking companions may suggest some argument for this surprising finding. In the descriptive analyses, the place respondents reported drinking most often was at home and their most frequently reported drinking companion was their spouse or person dating. Taken together these findings may be suggestive of differences in drinking behavior among the married and not married women in these analyses that may account for the increased risk among married women. This is an area for further investigation.

Problem drinking was found among women at all the levels of alcohol consumption. On each of the indices of problem drinking, the mean score of each index suggests women who drink have experienced at least one problem drinking consequence in the past 12 months. It is generally assumed that it is the heaviest drinkers that will experience negative consequences related to alcohol consumption. However in this analysis, regardless of level of alcohol consumption women reported having experienced problem drinking consequences.

The number of negative alcohol-related consequences was low in this sample and averaging less than one per year for all level of drinking suggesting that problem drinking is an infrequent occurrence among women in the armed forces. Yet problem drinking consequences occur despite level of alcohol consumption. Whether this is also a finding consistent with general population studies of women's problem drinking is beyond the scope of this study. However standardized comparison of the problem drinking between armed forces women and general population women does suggest that the experience of negative consequences is more pronounced and statistically significant among women in the armed forces (Bray et al., 1989b).

Most of the problem drinking occurs in the area of lost productivity, a finding of practical importance to the armed forces for several reasons. First, with a mission of readiness to respond to the national call for offensive and/or defensive forces spontaneously, lost productivity related to alcohol consumption impedes the ability to meet its readiness requirement. Second, it may suggest that alcohol consumption is accepted as part of the military context.

Factors examined in the context of the armed forces and their relationship to level of alcohol consumption include geographical location of assignment, most frequent drinking locations and drinking companions, beliefs and perceptions about alcohol use in the context, and type of occupation. Overall the analysis of these contextual variables suggest there is a relationship between contextual variables and level of alcohol consumption.

When geographical assignment is outside the Americas, heavy drinking doubles and, when in Europe, it triples. These findings are consistent with the world-wide survey findings where the percentage of DOD personnel who drink and drink heavily increases when assignment is outside the Americas. Assignment outside the Americas may be experienced as a personal deprivation since service members separated from familiar cultural surroundings. Further Europe is generally considered to be a "wet" culture where alcoholic beverages are readily available. The availability of alcohol as well may account for the increased drinking among women.

The literature related to drinking in the armed forces suggests that drinking serves the important function in military life of building cohesiveness and esprit de corps among service members. If this is

accurate then it might be expected that the persons and places with which drinking would occur most often are between members of the armed forces. However among the respondents in both of the waves of the studies used in this analysis (1985 and 1988 world-wide surveys) the most consistent location where respondents most frequently drank was at home and the most frequent drinking companion is a spouse/date. Thereafter there is a marked difference in respondents choice of particularly drinking companions between the two sampling waves. In 1985 the respondents report a greater proportion of drinking between service members. However there was no striking difference in the drinking levels of these women between the two waves of the surveys.

In the combined samples when respondents were asked about their beliefs about alcohol consumption in the armed forces, 27% reported that drinking is part of military life. Thirty-four percent believed that at parties and social occasions everyone is encouraged to drink and 29% believed that the number of happy hours makes drinking easy. None of the beliefs were compared to level of alcohol consumption in the total combined samples. However when these beliefs were examined in a multiple logistic model among the four occupational groups selected for analysis, two of these beliefs (drinking is part of the military and the number of happy hours makes drinking easy) were significantly related to alcohol consumption when controlling for demographics.

Interestingly, for those respondents that agreed that drinking is part of the military, the risk of being a heavier drinker was reduced. This suggests that for those women, the acknowledgement of a heavy drinking context serves as a preventive measure related to heavier drinking. Having the belief that drinking is part of the military may

lead respondents to be concerned about the culture and intentionally drink less or abstain.

Decreasing the number of happy hours has been recognized by the armed forces to be important in reducing alcohol consumption among service members. Policy emphases have been on "deglamorizing" alcohol within the armed forces and reducing the availability of inexpensive alcoholic beverages on installations. These policies are identified as a primary reason for the downward trend in level of alcohol consumption in the armed forces since 1979. Despite the armed forces policy towards reducing alcohol consumption, the drinking of these women continues to be significantly influenced by their perception of alcohol's availability and inherent place in the context. So much so that agreement with the belief that the number of happy hours makes drinking easy increases the risk of heavy drinking 83% compared to respondents who have no opinion.

The logistic regression analyses which examined armed forces women's drinking in the four occupational categories selected found no significant relationship between occupational categories and heavier alcohol consumption when controlling for demographic variables. These analyses did suggest that beliefs about the context of the armed forces as well as the demographic factors of age, marital status and ethnicity are significantly related to heavier alcohol consumption.

Descriptive analysis of the four occupational groups seemed to lend support for the hypothesis that women in jobs which are characterized as predominantly male will consume alcohol at higher levels than those which are predominantly female. Enlisted women who drink and are in occupations which are characterized as predominantly male (ISG) do drink more heavily than enlisted women in occupations characterized by as predominantly

female (HCS). The finding that the percentage of moderate/heavy drinking of women in the health professions (18%) is three times higher than tactical operations officers (6%) is a surprising one however sample size may be a relevant function of this finding. Yet, whether this could be related to the question of "substance" use among health care professionals can also be speculated. In recent years the problem of substance use among health care professionals in the general population has gained attention. The prevalence of substance abuse within the health professions is unknown since study populations have been limited to treatment populations, yet chemical dependency is believed to be the leading occupational hazard for health professionals (Gallegos, Viet, Wilson, Porter, & Talbott, 1988). Additionally the prevalence of specifically alcohol consumption in the health professional is less clear. The difference in the percentage of moderate/heavy drinkers in these two occupational categories may be a reflection of the drinking among health professionals generally.

Although these descriptive analyses suggest that a greater percentage of women in predominantly male occupations drink at higher levels in logistic regression analysis these relationships were not statistically significant when demographics were controlled for.

Beliefs held concerning alcohol consumption in the context of the armed forces were found to be more significant than type of occupation to heavier drinking. This is an important finding which supports the social availability perspective offered in the occupational alcohol literature (Parker & Brody, 1982). In this perspective, it is argued that participation in work or leisure activities with a heavy drinking group is the key determinant of an individual's alcohol consumption. The social

availability perspective is extended in the occupational subculture perspective which theorizes that some occupations possess a high degree of group solidarity and informal social cohesion which are significantly correlated with heavy drinking (Cosper, 1979) and social drinking which originates in leisure time can lead to active or passive tolerance for drinking peers and diminished social control in the work place (Hollinger, 1988). Clearly, the findings of this analysis indicate that the social availability of alcohol in this context is the most significant variable associated with heavier alcohol consumption.

Significance

This study is significant in that it is the first which examines women's alcohol consumption in the U. S. Armed Forces providing baseline data on the prevalence and contextual characteristics related to their drinking. The findings of this study are similar to findings for armed forces personnel generally suggesting the following for female members of the armed forces: for both men and women, alcohol consumption is inversely related to age, both report relieving stress or relaxation as the dominant motivation for drinking, and both report the most frequently reported indicator of problem drinking is lost productivity.

The findings of these analyses add to the occupational alcohol literature by suggesting that the context of the armed forces is significantly related to heavier drinking and that occupational type (predominantly male or predominantly female) is not significantly related to heavier alcohol consumption. In this context alcohol consumption across occupational groups is more significant than alcohol consumption within the various occupational groups.

Limitations

The examination of level of alcohol consumption among women in occupations which are predominantly male versus predominantly female was a major hypothesis of this study. However this hypothesis was not supported. The limitation of this study is the use of four occupationally categories rather than all twenty of the possible categories. In all of the occupational categories which are predominantly male, the numbers of women incumbents in the available survey data representing these occupations were small, therefore these analyses must be viewed with caution. The two predominantly male occupations selected were chosen because of the total sample sizes represented. Because the sample size of the Tactical Officer (TO) group was quite small it did not offer confident analysis results. The officer group of the predominantly male occupational category (TO) may have contained some intervening variables which could not be controlled for in this analysis. These women are incumbents in aviation occupations where restrictions on alcohol consumption would be more likely due to the nature of their work.

It was posited from the conceptual framework that women experiencing the stress of continually having to prove themselves, being marginally accepted and powerless with exposure to numerous occasions for drinking would be expected to drink more heavier than general population women. The occupational alcohol perspective of alienation and structural strain were suggested to be critical in this proposition. However the study variables available for secondary analysis were not well suited to specifically examine these occupational alcohol conceptual perspectives. Although the conceptual perspectives of alienation and structural strain are suggested to be operating in the finding that alcohol consumption is

used by 65% of the sample to relax, specifically what the respondents are indicating as a meaning as "relaxing" is speculative. Further no analyses in this study investigated a relationship between drinking motivation and level of alcohol consumption. This type of analysis in future studies would be helpful in understanding the relationship of these variables as they relate to occupation and level of alcohol consumption.

Implications for Nursing

The notion that women do not drink as much as men and, consequently, will not experience health problems related to their alcohol consumption is a prevalent one. Although drinking among women is lower than that of men, women develop health related problems when they drink smaller quantities and less frequently than men. This suggests that women who drink less than "heavily" may develop problems related to alcohol consumption.

In this study, the occasions for drinking in this context are perceived to be numerous by the respondents. There is also an implied social value for alcohol consumption in this context which might lead nurses to develop a tolerance for alcohol consumption which ignores the possible impact of drinking on one's physical health. As discussed in the preface to this study, most of my colleagues with which I discussed the substantive area of the study were surprised that I thought it was a useful area. They did not agree that women in the armed forces consumed alcohol to any significant degree. This suggests that health appraisals of the relationship of alcohol consumption to physical "problems" among women may be a neglected area in clinical practice in the armed forces.

Future Research

Because there is so little literature on women's alcohol consumption in the armed forces and women's alcohol consumption in occupations future study of women's alcohol consumption in the armed forces could investigate the relationship of type of occupation to level of alcohol consumption more broadly. This study examined only four of the possible twenty occupational categories in the armed forces. A study examining type of occupation more broadly might aid in understanding how type of occupation influences alcohol consumption. Additionally, development of and administration of a tool which would examine the work related postulates of alcohol consumption would also be useful in understanding how occupation influences the alcohol consumption of women in this context.

The availability of alcohol is suggested in this study to be significantly related to level of alcohol consumption. Since the occasions for alcohol consumption are assumed to be numerous in this context it might be useful to examine the number of work related occasions (formal and informal) women participate in and its relationship to level of alcohol consumption. Finally, since the amount of drinking and heavy drinking is higher when assignment is outside the Americas examination of the contextual and personal factors (motivations) for drinking in these geographical locations would be useful in understanding how geographical location influences level of alcohol consumption.

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