

1989

# The Influence Of Environmental, Cognitive, And Pharmacological Factors On Alcohol-related Behaviours

Stephen Walter Wigmore

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THE INFLUENCE OF ENVIRONMENTAL,  
COGNITIVE, AND PHARMACOLOGICAL FACTORS  
ON ALCOHOL-RELATED BEHAVIOURS

by

Stephen W. Wigmore

Department of Psychology

Submitted in partial fulfilment  
of the requirements for the degree of  
Doctor of Philosophy

Faculty of Graduate Studies  
The University of Western Ontario  
London, Ontario  
January, 1989

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## ABSTRACT

A variety of effects previously attributed to pharmacological properties of alcohol have been shown to result from cognitive factors. For example, subjects believing alcohol was consumed show greater craving for alcohol and consume more beverage than subjects believing alcohol was not consumed, regardless of whether these beliefs are accurate. This has been demonstrated using the balanced placebo design. Many researchers, however, have argued that these experiments should be conducted in a natural drinking environment to assess the external validity of previous laboratory findings, and to investigate possible interaction effects resulting from the presence of alcohol-associated environmental cues. This is important for clinical considerations, as treatment recommendations based on laboratory findings may be less relevant in the natural setting where the behaviour to be treated actually occurs.

To permit maximization of ecological validity in Study II, the drinking practices of undergraduate males were assessed in Study I. Results indicated that most often beer is consumed in on-campus bars, and that significant high levels of drinking and alcohol-associated problems were evident. In Study II, the balanced placebo experiment was conducted in an on-campus bar, and in a laboratory, thus permitting investigation of the relative influence of pharmacological, cognitive, and environmental variables on alcohol-related behaviour. Results

indicated that beverage consumption in the laboratory was primarily determined by subjects' beliefs regarding the alcohol content, but that subjects' reported beliefs had no effect on consumption in the barroom. In the barroom, subjects began drinking sooner, drank more, and neither beliefs nor actual alcohol content had any influence on drinking behaviour. Subjective drunkenness was influenced by beliefs and setting, while behavioural impairment was influenced by beliefs and alcohol content.

It was concluded that analogue alcohol studies can and should be replicated in natural drinking environments, as results and clinical implications may differ. These findings suggest that pharmacological, cognitive, and environmental variables interact in a complex manner to produce a variety of effects, and that of these variables, consideration of environmental influences in alcohol treatment programs may be critical to their success.

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## CHAPTER I

### General Introduction

Many researchers have demonstrated that a wide variety of behavioural, emotional, and physiological effects previously attributed to the pharmacological properties of alcohol can actually occur as a result of the mere belief that alcohol has been consumed (see Marlatt & Gordon, 1985). For example, alcoholics' and social drinkers' belief about what is being consumed, regardless of whether this is accurate, affects such variables as "craving" (Engle & Williams, 1972) and amount of beverage consumed (Marlatt, Demming, & Reid, 1973). These effects have been demonstrated using the Balanced Placebo Design, discussed in detail in the following chapter.

While these findings have contributed significantly to our understanding of many alcohol-related effects, this area of research has employed laboratory analogue procedures exclusively. Analogue procedures are indispensable for investigating specifically defined research questions under well-controlled conditions (Kazdin, 1980). However, the extent to which findings in a laboratory will generalize to the natural situation must be considered. Thus, it is argued that analogue studies should be designed to maximize external validity, provided that internal validity is not unduly sacrificed (Cook & Campbell, 1979; Kazdin, 1980). This issue is of particular relevance here because of the large body of literature emphasizing significant effects that alcohol-associated environmental stimuli have on such variables as "craving", amount of alcohol consumed, tolerance, withdrawal



distress, and physiological reactivity (e.g., Hinson & Siegel, 1980; Kaplan, Meyer, & Stroebe, 1983; Ludwig, Wikler, & Stark, 1974; Siegel, 1977). Because alcohol-associated environmental cues affect some of the same measures as those affected by subjects' beliefs (e.g., consumption, craving), it would seem important to investigate the effects of beliefs in the presence of alcohol-associated cues, as this would be analogous to the natural drinking situation.

As early as 1973, Marlatt et al. have recommended replication of research using the balanced placebo design in the natural drinking environment. This was suggested as being important for assessing the generalizability of laboratory findings, in addition to permitting investigation of the manner in which pharmacological, cognitive, and environmental variables interact to produce effects on alcohol-related behaviour. Investigating the influence of alcohol-associated environmental variables in balanced placebo research is also important for assessing the clinical relevance of findings, as alcohol consumption--the behaviour to be modified in alcohol treatment programs--naturally occurs in the presence of alcohol-associated cues. Since 1973 many other authors have recommended replication of balanced placebo experiments in the natural drinking environment (e.g., Berg, Laberg, Skutle, & Ohman, 1981; Billings, Weiner, Kessler, & Gomberg, 1976; Niaura, Rohsenow, Binkoff, Monti, Pedraza, & Abrams, 1988; Rohsenow & Marlatt, 1981; Sher, 1985; Strickler, Dobbs, & Maxwell, 1979).

The research in this thesis was developed in response to the continued and persistent demand for replication of balanced placebo research in the natural drinking environment. By developing an expanded version of the balanced placebo design, effects of pharmacological, cognitive, and environmental variables on alcohol-related behaviour were investigated.

## CHAPTER II

### The Balanced Placebo Design

#### Research Findings

An experimental design was developed in the 1960s by a group of researchers interested in assessing separately, and in combination, effects that result from actual drug ingestion, and those that result from expectations regarding drug ingestion (Lyerly, Ross, Krugman, & Clyde, 1963; Ross, Krugman, Lyerly, & Clyde, 1962). The design included the following four groups: 1) A Drug group, that received a specific pharmacological agent in capsule form and was given accurate instructions regarding effects usually produced by the drug, 2) a Placebo group, that was given the same instructions as the Drug group, but received an inert substance in capsule form, 3) a Drug Disguised group, that received the same drug as the Drug group, but was given no instructions regarding its effects, and 4) an Untreated group that received orange juice, but no capsule or instructions regarding drug effects.

By comparing results from the Drug Disguised group to those from the Untreated group on measures usually affected by the drug, it was possible to assess the influence of pharmacological factors in the absence of expectations regarding drug effects. Similarly, by comparing results of the Placebo group to those from the Untreated group, effects resulting solely from subjects' expectations regarding drug ingestion were assessed. Finally,

comparison of results from the Drug group to those obtained from the other three groups permitted evaluation of the combined contribution of pharmacological factors, and factors resulting from subjects' expectations regarding the drugs' effects.

Using an expanded version of this design, Ross and his colleagues studied a variety of drugs. For the purpose of illustration, results obtained from investigation of an "energizing" drug, amphetamine sulfate, will be presented. In this research, conducted at the domiciliary at the Veterans Administration Centre in Martinsburg, all subjects given capsules (i.e., Drug group, Placebo group, Drug Disguised group) were told they were receiving a medically well-known drug that was not harmful in any way, and that was commonly used with older people by doctors. Subjects in the Drug and Placebo groups were informed that they had ingested an energizing drug, while subjects in the Drug Disguised and Untreated groups received no information regarding drug effects. One hour following ingestion of capsules, or orange juice in the Untreated group, measures of subjects' mood (Ross et al., 1962) and motor performance (Lyerly et al., 1963) were recorded.

It was found that regardless of which was administered, amphetamine sulfate or an inert substance, subjects who believed they had ingested an energizing drug (i.e., Drug group and Placebo group) showed more "comfortable" mood scores (Ross et al., 1962) and more impaired motor performance (Lyerly et al., 1963), than did

subjects who received no instructions regarding probable drug effects (i.e., Drug Disguised group and Untreated group). These findings were the first to indicate that emotional and behavioural effects previously attributed to pharmacological properties of a drug could result from mere expectation about the effects of an ingested substance.

The foregoing experimental design was virtually overlooked until the early 1970's when it was employed by investigators interested in assessing the validity of the disease model of alcoholism. The disease model, proposed by Jellinek (1960), asserts that certain types of alcoholics reach a stage in their drinking history where ingestion of one alcoholic beverage is sufficient to produce "loss of control" drinking where contrary to the alcoholic's volition, more and more alcohol is consumed, "often with quite some difficulty and disgust" (Jellinek, 1960, p. 41). Adherents of the disease model have argued that "loss of control" drinking is primarily physiologically mediated, and various physiological mechanisms have been proposed (e.g., Jellinek, 1960; MacLeod, 1955; Marconi, Poblete, Palestini, Maya, & Bahamondes, 1970).

Engle and Williams (1972) were among the first to question Jellinek's theoretical position, suggesting that "loss of control" drinking was mediated primarily by psychological, rather than physiological factors. To investigate this hypothesis, they used an experimental design similar to the one described by Ross and

his colleagues, except that subjects were informed beverages administered did or did not contain alcohol. This design is most often referred to as the Balanced Placebo Design and is diagrammed in Figure 1.

Note that subjects were not told what effects to expect as a result of beverage consumption. This is presumably due to the wide availability of alcohol, and people's consequent familiarity with alcohol's effects. Although not always explicitly stated, or measured until recently (see Southwick, Steele, Marlatt, & Lindell, 1981), researchers in this area appear to assume that subjects hold specific expectations regarding the effects of alcohol.

In the Engle and Williams (1972) study, forty hospitalized alcoholic subjects were randomly assigned to one of the four cells of the Balanced Placebo Design. Subjects in the Told Alcohol/Given Alcohol group received one ounce of vodka in a strongly flavoured mixture, and were told that the mixture contained alcohol. Subjects in the Told Alcohol/Given No Alcohol group were also told that they had received vodka, but the mixture was in fact non-alcoholic. In both of these groups, subjects were informed that alcohol had been given as part of their treatment. Subjects in the Told No Alcohol/Given Alcohol group received the mixture containing one ounce of vodka, but were told they had ingested a vitamin tonic. Subjects in the Told No Alcohol/Given No Alcohol group received the non-alcoholic mixture, and were also told they had received a vitamin tonic. Pretesting had shown that the

Figure 1: Balanced placebo design

TOLD ALCOHOL

GIVEN ALCOHOL

YES

NO

YES

NO


presence or absence of vodka in the mixtures could not be detected on the basis of taste alone. Following administration of mixtures, which occurred at 7 a.m. on their fifth day of hospitalization, subjects in all groups were told that drinks of vodka could be requested before noon if they felt a stronger than usual desire for alcohol. Subjects were then asked to complete a questionnaire which involved rating their current strength of desire for alcohol.

The major finding of Engle and Williams' (1972) study was that alcoholics informed that they were consuming vodka, regardless of whether they had actually consumed vodka (i.e., groups Told Alcohol/Given Alcohol and Told Alcohol/Given No Alcohol) reported a significantly greater desire for alcohol than did subjects who were informed that they were consuming a vitamin tonic (i.e., groups Told No Alcohol/Given Alcohol, and Told No Alcohol/Given No Alcohol). Therefore, subjects' craving for alcohol increased due to their belief about the alcohol content of the mixture rather than due to any physiological effect.

In a similar experiment, Marlatt et al. (1973) used the Balanced Placebo Design (see Figure 1) to assess pharmacological effects, and effects resulting from subjects' beliefs regarding alcohol content, on alcohol consumption and posttest estimates of alcohol content. In this study, thirty-two male alcoholic subjects were randomly assigned to the four cells of the balanced placebo design, and 32 male social drinkers were also randomly assigned to the same four conditions to serve as controls.



The experiment was presented to subjects as a "taste rating" task in order to legitimize consumption of alcohol in a laboratory setting. Twenty minutes preceding the "taste rating" phase, subjects in the Given Alcohol conditions were given a primer dose of one ounce of vodka in five ounces of tonic, and subjects in the Given Tonic conditions were given primers of six ounces of tonic. Primers were offered as introductory samples of the beverage to be rated, and administered to test the hypothesis that "loss of control" drinking results following ingestion of a single alcoholic beverage.

In the "taste rating" phase, subjects were seated in a small room alone and presented with three decanters ostensibly containing three different brands of the type of beverage expected due to previous verbal instructions. They were asked to rate the three beverages using adjectives appearing in the window of a memory drum, and to "feel free to sample as much of each beverage as (needed) in order to arrive at a decision" (Marlatt et al., 1973, p. 236). All three decanters contained tonic for those subjects who were to receive non-alcoholic beverages (i.e., Told Alcohol/Given No Alcohol, Told No Alcohol/Given No Alcohol). Similarly, the three decanters contained vodka and tonic for those who were to receive alcohol (i.e., Told Alcohol/Given Alcohol, Told No Alcohol/Given Alcohol). The two drink recipes were selected to maximize the probability of deceiving subjects in the Told Alcohol/Given No Alcohol and Told No Alcohol/Given Alcohol groups, as in pre-testing it was determined that the two beverages were indiscriminable on the basis of taste alone.

The taste rating-task lasted for 15 minutes, although subjects were not informed of this beforehand because it might have influenced their beverage consumption. During this period, the subject's drinking behavior was observed through a one-way mirror. Immediately afterwards the experimenter entered and asked whether the subject thought there was alcohol in any of his drinks, and if an affirmative answer was given, a rating of alcohol content from 0 to 100 percent was requested. This was done to check whether subjects who did not receive what they were told had been successfully deceived.

Results of this study indicted that subjects who believed they had consumed vodka, regardless of whether they actually had (i.e., Told Alcohol/Given Alcohol group, and Told Alcohol/Given No Alcohol group), consumed significantly more beverage, than did subjects who believed they had consumed tonic (i.e., Told No Alcohol/Given Alcohol group, and Told No Alcohol/Given No Alcohol group). Therefore, in this experiment, the only significant determinant of subjects' levels of consumption was their belief regarding the alcohol content of the beverages. The actual beverage consumed had no effect on alcohol consumption.

It should be noted that administration of primer doses of the actual beverage to be received in the drinking phase may have confounded the results of the Marlatt et al. (1973) study. While the rationale for providing primer doses was described as permitting assessment of whether one drink would lead to "loss of control" drinking, the possible confounding of effects of primer

doses with effects of verbal instructions was not addressed. In spite of the above mentioned problem in the Marlatt et al. (1973) study, the findings of these first balanced placebo experiments suggested important theoretical and clinical implications. The fact that primer doses of alcohol did not produce "loss of control" drinking, and that craving and alcohol consumption were influenced by subjects' beliefs regarding the alcohol content of their beverages rather than by actual alcohol content, suggests that physiological effects of alcohol alone are unlikely to be responsible for increases in alcoholics' drinking behavior. Rather, it appears that psychological factors play a significant role in "loss of control" drinking. Therefore, in addition to casting doubt on the disease model of alcoholism, these findings suggest that factors other than pharmacological properties of alcohol are important. Specifically, these results suggest that what people are led to believe about the alcohol content of beverages is important in determining behaviour. Furthermore, these results suggest that abstinence may not be the only acceptable treatment goal, as would be indicated by the disease model. The finding that craving and alcohol consumption were primarily influenced by psychological rather than physiological factors suggests the possibility of reduced consumption or controlled drinking as representing potentially acceptable treatment goals.

Following the work of Engle and Williams (1972), and Marlatt et al. (1973), alcohol researchers reported a wide variety of

findings obtained using the balanced placebo design. It was found that mere expectation of receiving alcohol resulted in significantly increased aggressive behaviour among heavy drinking males (Lang, Goeckner, Adesso, & Marlatt, 1976), decreased situational anxiety and heart-rate among male social drinkers (Wilson & Abrams, 1977), increased laughter in response to humorous recordings among male social drinkers (Vuchinich, 1978), reduced subjective pain among male social drinkers (Cutter, Maloff, Kurtz, & Jones, 1976), and increased sexual responsiveness as measured by penile tumescence, among male social drinkers, to the viewing of erotic films (Wilson & Lawson, 1976) and to deviant sexual audiotapes portraying forcible rape and sadistic aggression (Briddell, Rimm, Caddy, Krawitz, Sholis, & Wunderlin, 1978). In addition, motor performance on a divided attention task was disrupted by both actual alcohol consumption, and the belief that alcohol had been consumed (Vuchinich & Sobell, 1978).

The vast majority of alcohol research using the balanced placebo design has used male subjects (Rohsenow & Marlatt, 1981). However, results of several studies using female subjects suggest that females respond differently than males on some measures. Wilson and Lawson (1978) found that female sexual responsiveness was more influenced by actual alcohol consumption, with reduced responding at higher doses, than by their beliefs regarding alcohol content. Furthermore, Abrams and Wilson (1979) found that in contrast to males, situational anxiety and heart-rate among female social drinkers increased when they believed that alcohol had been

consumed. Actual alcohol consumption had no effect. Thus, it is argued that males and females should be studied separately (Marlatt & Rohsenow, 1980).

#### Clinical Implications of Balanced Placebo Research

Marlatt and his colleagues (Marlatt, 1982; Marlatt & Donovan, 1981; Marlatt & George, 1984) have suggested that treatment implications of the above findings are clear. Because the cognition that alcohol has been consumed is sufficient to affect a variety of variables previously thought to be affected by alcohol itself, they recommend a cognitive-behavioural approach to treatment where positive expectations regarding the effects of alcohol are challenged (Marlatt & Donovan, 1981; Marlatt & George, 1984). It is suggested that effects obtained using the balanced placebo design result from subjects' expectations regarding alcohol's effects, so that when they believe they are consuming alcohol, subjects also believe they will feel more euphoric, less anxious, more sexual, etc. (Marlatt & Gordon, 1985). Direct assessment of subjects' expectations regarding the effects of alcohol consumption has shown that alcoholics and social drinkers anticipate euphoric affective consequences, and reduced tension and anxiety (Marlatt & Donovan, 1981). In a study by Southwick, Steele, Marlatt, and Lindell (1981), it was also found that students with a variety of drinking histories expected to feel increased "stimulation/perceived dominance", increased "pleasurable disinhibition", and increased "behavioural impairment" following consumption of moderate amounts of alcohol. Therefore, it is

argued that beverage consumption is increased when subjects believe they are consuming alcohol (Marlatt et al., 1973) because the majority of anticipated effects are positive. Brown, Goldman, Inn, and Anderson (1980) provide support for this position, demonstrating that alcohol consumption is partially determined by expectancies that it will lead to enhanced social and physical pleasure, enhanced sexual performance, increased confidence, pain reduction, and reduced tension.

Kirsch (1985), in a paper concerned with the role of response expectancy as a determinant of experience and behaviour, has argued that generation of changes in subjective experience by corresponding response expectancies is a basic psychological mechanism. He suggested that classical conditioning plays a role in the formation of response expectancies, but that the effects of conditioning trials are mediated by expectancy. In support of this, Kirsch (1985) cites evidence demonstrating that placebo responses generally mimic the effects of the active drug, but in cases where response expectancies are contrary to pharmacological effects of the active drug, subjects' responses to the placebo are consistent with their expectations. For example, the reaction time of subjects who drank decaffeinated (placebo) coffee was influenced in a manner similar to those who drank caffeinated coffee (Knowles, 1963). Thus, it was argued that the decaffeinated coffee acted as a CS for these regular coffee drinkers, eliciting conditioned responses which affected reaction time in a manner similar to the UCS (i.e., caffeinated coffee). However, in the experiment by

Wilson and Lawson (1976) mentioned earlier, consistent with common expectations (Brown et al., 1980), the belief that alcohol had been consumed resulted in increased arousal to erotic stimuli. This is contrary to the actual pharmacological effect of alcohol, which is to decrease sexual arousal (Farkas & Rosen, 1976; Rubin & Henson, 1976).

The treatment implication of the above formulation is that changing response expectancies should alter subjective experience and behaviour. In fact, there is considerable evidence that changing response expectancies is an effective treatment approach for the reduction of fear in phobias. Strategies designed to induce an expectancy of improvement, that have been used as control procedures in therapy outcome studies designed to evaluate the effectiveness of systematic desensitization, have been shown to be as effective as systematic desensitization (McReynolds, Barnes, Brooks, & Rehagen, 1973). There have been many other studies demonstrating that expectancy modification procedures are as effective at reducing fear as is systematic desensitization (e.g., Gatchel, Hatch, Maynard, Turns, & Taunton-Blackwood, 1979; Kirsch & Henry, 1977; Kirsch, Tennen, Wicklers, Saccone, & Cody, 1983).

Marlatt and his colleagues apply similar reasoning in developing their treatment strategies (Marlatt & Donovan, 1981; Marlatt & George, 1984). These authors contend that positive outcome expectancies regarding alcohol's effects develop early in a person's drinking history. There is evidence that desirable

effects do occur in the early stages of a drinking episode or early in an individual's drinking history (Marlatt & Donovan, 1981). However, there is also considerable evidence for delayed negative consequences. For example, there is evidence that at low doses alcohol produces desirable effects such as euphoria, but as consumption and time increases within a drinking episode the initial pleasant feelings are transformed to feelings of increased dysphoria (Marlatt & Donovan, 1981). Furthermore, as chronic use of alcohol develops, persons who used to feel more relaxed and less depressed following drinking, and who still anticipated feeling more relaxed and less depressed following drinking, actually experience just the opposite. This is probably due to the development of tolerance to the pharmacological properties of alcohol (Marlatt & Donovan, 1981).

Marlatt and George (1984) report that in "high-risk" situations where perceived self-efficacy is low, problem drinkers anticipate immediate positive effects of alcohol based on past experience, while ignoring the delayed negative consequences, and as a result consume alcohol as a means of coping. Therefore, education regarding immediate versus delayed effects of alcohol use is recommended in treatment, with a view toward reducing clients' positive outcome expectancies, and enhancing their awareness of delayed negative consequences.

#### Generalizability of Findings

Results of experiments using the balanced placebo design have cast doubt on the disease model of alcoholism, and suggest a



cognitive-behavioural approach to treatment where positive expectations regarding alcohol's ability to facilitate coping are modified. However, many authors have argued that the artificial nature of laboratory-based balanced placebo experiments limits the generalizability of findings (e.g., Berg, et al., 1981; Billings et al., 1976; Marlatt et al., 1973; Niaura et al., 1988; Rohsenow & Marlatt, 1981; Sher, 1985; Strickler et al., 1979). Marlatt et al. (1973), in reporting findings of one of the first balanced placebo experiments, stated that, "Although the findings reported are viewed as strong support for the role of cognitive factors in the determination of loss of control drinking, the limitations inherent in the present experimental situation should be systematically examined in order to assess the generalizability of these conclusions for drinking in more natural settings" (p. 240-241).

As early as 1956, Washburne cautioned researchers about the tendency to ignore important setting variables which help determine behaviour in situations where alcohol is used. By conducting alcohol experiments in laboratory settings, possible effects of the interaction of alcohol-associated environmental variables with factors studied in the laboratory are overlooked. This is potentially misleading, as the variables of primary clinical interest are those which have a significant impact on drinking in the natural situation (Berg et al., 1981). In fact, Berg et al. (1981) suggested that the majority of "expectancy" effects obtained using the balanced placebo design may be related to the

artificiality of the situation, rather than typical characteristics of drinking behaviour.

The fact that findings may vary as a function of setting was underscored in a study by Kalin, McClelland and Kahn (1965). These authors found that alcohol had no effect on social anxiety in a classroom discussion situation, but that alcohol did reduce anxiety in a party setting. Because of the potential influence of the environment, many authors have argued that balanced placebo experiments should be conducted in a naturalistic setting to assess the external validity of laboratory findings (e.g., Berg et al., 1981; Marlatt et al., 1973; Niaura et al., 1988). As Niaura et al. (1988) point out, "Laboratory experimental studies offer an advantage in terms of being able to identify, in a controlled fashion, those stimuli that provoke responses but may suffer from concerns about validity and generalizability" (p. 144).

In addition to criticism regarding the exclusive use of laboratory settings in balanced placebo experiments, Rohsenow and Marlatt (1981) have suggested that to enhance ecological validity, subjects should participate in a social setting. While most drinking occurs in social situations, in the vast majority of balanced placebo experiments subjects participate alone (Rohsenow & Marlatt, 1981).

There has been one balanced placebo experiment to date that used a "semi-naturalistic" setting, and included social interaction in the procedure (Berg et al., 1981). In this research, 12 alcoholics and 12 social drinkers participated in an experiment

conducted in the television room of a psychiatric clinic. This was suggested to be a more natural setting than a laboratory. A repeated measures version of the balanced placebo design was used such that each subject experienced each of the four conditions on alternating days over an eight day period (i.e., Told Alcohol/Given Alcohol, Told Alcohol/Given No Alcohol, Told No Alcohol/Given Alcohol, Told No Alcohol/Given No Alcohol). This design was chosen for ethical reasons, to minimize the number of alcoholic subjects required.

Subjects participated in groups of three, and these "triplets" knew each other before inclusion in the study. The experiment was conducted in early evening, and during participation subjects watched a soccer game on the television. As the amount of beverage consumed was a dependent variable, subjects were informed that it was up to them to decide how much to drink. A limit of 150 ml of 80 proof vodka was set for ethical reasons, although subjects were not informed of this beforehand. Sessions lasted 45 minutes, and in addition to amount of beverage consumed, dependent variables included observer ratings of mood states (e.g., anxiety, depression, elation), behavioural and physiological activation (e.g., psychomotor restlessness, tremor), and verbal behaviour. Self-reported anxiety was also measured, and ratings of subjective craving were obtained in an interview. Physiological measures included heart-rate and blood pressure.

Results indicated that the belief alcohol had been administered primarily determined beverage consumption among the alcoholic subjects. A similar effect on consumption was not obtained for the social drinkers. In addition, it was reported that alcoholics made more verbal statements referring to alcohol, showed greater behavioural activation, and reported greater anxiety when they received instructions that alcohol would be administered, regardless of whether this was accurate. Again, similar effects were not obtained with the social drinkers, which is contrary to results of studies reviewed earlier.

Although this study was the first to use a semi-naturalistic setting, and includes social interaction in the procedure, there are a number of problems with the design. First, the repeated measures design increases the likelihood of detecting deceptive instructions (Rohsenow & Marlatt, 1981), yet this issue was not addressed in the discussion, nor was data regarding the success of deception reported. This is important because it is the subjects' belief regarding alcohol content, as manipulated by verbal instructions, that is the cognitive variable of interest. Because the success of deceptive instructions was not assessed, it is unclear what beliefs individual subjects held.

Second, participation in triplets serves the function of providing a social situation, yet introduces a potential confound due to modelling effects among members of each triplet. Modelling effects on drinking behaviour have been demonstrated in several

experiments, where subjects seated with heavy drinking models increased their alcohol consumption, and subjects seated with light drinking or abstaining models decreased their consumption (e.g., Garlington & Dericco, 1977; Lied & Marlatt, 1979; Tomaszewski, Strickler, & Maxwell, 1980). Because modelling was not controlled for in the Berg et al. (1981) study, it is impossible to determine whether an individual's alcohol-related behaviour was influenced by the behaviour of fellow members of the triplet, or by the pharmacological and cognitive variables under investigation.

Third, beverage consumption was a dependent variable, yet actual beverage received was an independent variable. Because subjects drank differing amounts under the various conditions, it would be important to examine the correlations of amount consumed (and blood alcohol concentration in groups that received alcohol), with other measures. This would permit assessment of whether effects on other dependent variables were influenced by differences in beverage consumption and blood alcohol concentration across the pharmacological independent variable. Berg et al. (1981) did not address this issue.

Fourth, the usual drinking practices of subjects were not assessed, so it is impossible to know how close the TV room setting was to their natural drinking environments. It is obvious that consuming alcohol in any room located in a psychiatric clinic is fairly removed from the natural situation for the social drinkers who were not hospitalized, but rather recruited through personal contacts with the experimenters.

Finally, there was no laboratory setting control group in the Berg et al. (1981) study, so it was unclear whether effects obtained in the television room setting were due to the setting, or to methodological factors.

The present chapter has reviewed findings and clinical implications of laboratory research using the balanced placebo design. Because of criticism regarding the artificial nature of laboratory-based balanced placebo experiments, and recommendations for their replication in natural drinking environments, the following chapter will review studies investigating environmental determinants of alcohol-related behaviour.

## CHAPTER III

### Environmental Determinants of Alcohol-Related Behaviour

The present chapter reviews the literature relevant to environmental determinants of alcohol-related behaviour. Laboratory research investigating the influence of specific alcohol-associated cues is included, in addition to field research investigating drinking behaviour in the natural drinking environment. Clinical implications of the findings are also discussed.

#### Laboratory Research

In 1974, Miller, Hersen, Eilser, Epstein, and Wooten investigated the behavioural effects of presenting both alcoholics and social drinkers with alcohol-associated visual cues. They measured operant responding for alcohol reinforcement following presentation of cues, which included the physical presence of bottles of liquor, and pictures of alcoholic beverages. It was found that operant responding following cue presentation increased significantly among the social drinkers, but not among the alcoholics.

The authors hypothesized that social drinkers responded to alcohol-associated visual cues because they most often consume alcohol in the presence of such cues (e.g., rows of bottles, barroom, other patrons, music, etc.), while refraining from consumption in their absence. Alcoholics, on the other hand, typically do not confine their drinking to specific situations (Nathan & O'Brien, 1971). Therefore, because of consuming

alcohol in the presence of a smaller, more delimited, set of alcohol-associated cues, the authors suggested that cues serve as more powerful elictors of responses among social drinkers. Specifically, it was suggested that the alcohol consumption of social drinkers becomes conditioned to visual cues, which then act as discriminative stimuli for drinking.

Miller et al. (1974) also suggested that alcoholics in their study may have been unaffected by cue presentation due to their involvement in active treatment for alcoholism. To asses the potential influence of demand characteristics resulting from involvement in treatment, the authors suggested replication of the study using alcoholics who are not receiving treatment.

Kaplan et al. (1983), in a similar investigation, presented alcoholics and social drinkers with visual and olfactory alcohol-associated cues (i.e., sight and smell of beer) while measuring physiological arousal, desire to drink, and operant behaviour. In this study, alcoholics were detoxified, but not involved in active treatment for alcoholism. The authors found that all subjects reported an increased desire to consume alcohol following cue presentation. Additionally, alcoholic subjects showing significant psychogalvanic reactivity to the sight of beer cans were more likely to choose beer over lottery tickets as a reward on a subsequent operant task than subjects who did not show such reactivity. Mann et al. (1988) reported comparable findings in a similar experiment where alcoholics presented with the sight, smell and taste of beer showed increased self-reported craving for alcohol and significant psychophysiological changes.



Over the last few years, researchers have also used measures of salivation to investigate subjects' reactivity to alcohol-associated cues (Monti, Binkoff, Zwick, Abrams, Nirenberg, & Liepman, 1987; Pomerleau, Fertig, Baker, & Cooney, 1983) and have found that alcoholics demonstrate increased salivation following presentation of the sight and smell of alcoholic beverages. This effect has not been found among social drinkers (Monti et al., 1987), suggesting that salivation may be an important measure of alcoholics' reactivity to alcohol-associated cues.

In addition to the above studies using human subjects, Crowell, Hinson, & Siegel (1981) have provided evidence from the animal laboratory that demonstrates the role of conditioning effects in the development of tolerance to physiological effects of alcohol. In this series of experiments the role of predrug stimuli in tolerance to alcohol induced hypothermia was investigated. Two groups of rats received an alternating schedule of ethanol and saline injections. During tolerance development sessions, Group 1 received ethanol injections in a distinctive room, and saline injections in the colony room where they were housed, while Group 2 received ethanol injections in the colony room and saline injections in the distinctive room. Subsequently, all subjects received test injections of both ethanol and saline in both environments.

Results indicated that tolerance to the hypothermic effect of alcohol increased during tolerance development sessions, and

that tolerance exhibited was equivalent in subjects' respective ethanol administration environments. During test sessions, it was found that a low dose of ethanol in the distinctive room elicited a slight hyperthermic response in animals that previously received ethanol there, but a pronounced hypothermic reaction in subjects previously injected with ethanol in the colony room.

When administered saline in the distinctive room, rats previously injected with saline in this environment showed minimal thermic change, but rats previously injected with ethanol in this environment showed a pronounced hyperthermic response. Results of test sessions conducted in the colony room indicated a similar pattern of results.

These findings show that tolerance to the hypothermic effect of ethanol does not result solely from repeated exposure to the drug. Because tolerance was only displayed when animals were tested in their respective ethanol-associated environments, the role of environmental cues in the development of tolerance is clear. Specifically, the environmental specificity of tolerance results because cues that signal ethanol administration produce a drug-compensatory conditioned response.

Drug-compensatory CRs have been demonstrated by several authors investigating conditioning effects in the development of tolerance to the hypothermic effect of alcohol (Le, Poulos, & Cappell, 1979; Mansfield & Cunningham, 1980). Using the above paradigm, drug compensatory CRs have also been demonstrated using

morphine (Siegel, Hinson, & Krank, 1981), and pentobarbital (Hinson, Poulos, & Cappell, 1982).

The literature reviewed above demonstrates that exposure to environmental cues previously associated with alcohol consumption produces increased self-reported craving, increased operant responding for an alcohol reward, and physiological changes in both alcoholics and social drinkers. In addition, evidence from the animal laboratory suggests that presentation of alcohol-associated environmental cues results in classically conditioned drug-compensatory responses, which may play a role in the development of tolerance to the pharmacological effects of alcohol. The following section reviews papers suggesting that effects resulting from exposure to alcohol-associated cues are cognitively mediated.

In 1974, Ludwig, Wikler, and Stark published a classic paper concerned with investigating the determinants of relapse in alcoholics. They suggested that the major determinant of relapse was "craving", defined as representing the cognitive correlate of a "subclinical, conditioned withdrawal syndrome" (p. 539), that could be produced by appropriate interoceptive and exteroceptive stimuli. Initiation of "craving" was regarded as leading to alcohol acquisition behaviour.

Interoceptive stimuli referred to the pharmacological actions of alcohol on visceral and cerebral neuronal receptors. According to their theory, a small dose of alcohol could act as

an "appetizer" which stimulates, but does not suppress, desire for alcohol. Under appropriate conditions, it was suggested that the first drink could become chain-conditioned to the sequence of responses demonstrated in previous drinking episodes. Thus, by means of conditioning, the first drink could lead to a full blown drinking episode. However, the authors suggested that appropriate exteroceptive stimuli were also necessary to produce craving and alcohol seeking behaviour.

Exteroceptive stimuli, defined as a variety of environmental conditions previously associated with drinking, were also regarded as necessary for elicitation of "craving". It was hypothesized that, "Just as salivation and increased appetite or hunger can be evoked by the sight of food, a conditioned withdrawal syndrome with associated craving may result whenever the alcoholic passes a bar, sees other people drinking, or encounters cues relevant to previous drinking practices." (Ludwig et al., 1974, p. 539).

While appropriate interoceptive and exteroceptive stimuli were regarded as being necessary for elicitation of craving and alcohol acquisition behaviour, the authors suggested that because "craving" represents a conditioned "cognitive labelling process", manipulation of the subject's mental set (e.g., false research instructions), would serve to alter or distort expression of normal craving and drinking behaviour. Thus, the theoretical model emphasizes the importance of the interaction between pharmacological factors (i.e., interoceptive stimuli),

environmental factors (i.e., exteroceptive stimuli), and cognitive factors (i.e., mental set).

Based on the above theoretical formulation, specific hypotheses were advanced. First, a low dose of alcohol, as compared to a high dose or no alcohol, should produce greater craving and alcohol acquisition behaviour due to an "appetizer effect". Second, an appropriate drinking situation conducive to natural cognitive labelling should produce greater craving than an inappropriate drinking situation. Third, maximal expression of craving and alcohol acquisition behaviour should be elicited by the combination of appropriate interoceptive stimuli (low dose) and exteroceptive stimuli (natural drinking setting). The authors designed the following experiment to test their hypotheses.

Subjects were hospitalized, detoxified alcoholics who were informed that the study involved investigation of "'alcoholism through the administration of sedative, stimulant, and alcohol-like drugs', any of which might be given during any of the three scheduled sessions" (Ludwig et al., 1974, p. 541). In fact no sedatives or stimulants were given. Independent variables in the 2 x 3 factorial design were two exteroceptive stimuli conditions (i.e., label and non-label groups), and three alcohol-dose conditions (i.e., placebo, low-dose alcohol, high-dose alcohol). The label (L) group received their preferred liquor (amount disguised) and mixer, and a quart of their preferred liquor was within easy view and reach. This condition

was designed to maximize exteroceptive stimuli associated with prior drinking. The non-label (NL) group received comparable amounts of ethyl alcohol in an artificially sweetened mixer, and a quart of water was in view. This condition was designed to minimize exteroceptive stimuli associated with prior drinking. Subjects in placebo conditions received 5 ml of 100% ethyl alcohol floated on top of 10 oz of the respective mixers. In all cases, no further instructions regarding the content of administered beverages were given. All subjects participated in a laboratory setting.

Dependent measures included subjective craving, operant responding for alcohol or money (subject's choice), and various physiological and neurophysiological measures taken at various points during the three and one half hour experimental session.

The major findings of the study supported their hypotheses. Subjects in the Label/Low Dose condition demonstrated the greatest craving and alcohol acquisition behaviour. The authors concluded that the "first drink" consumed in a setting conducive to appropriate "cognitive-labelling" (i.e., craving) results in continuation of further drinking. Thus, rather than experimentally manipulating cognitive set by means of research instructions, the authors took the position that cognitive set is directly influenced by environmental cues, and regarded the environmental manipulation (i.e., label/non-label) as resulting in manipulation of cognitive labelling. Additionally, they argued

that this process could be regarded as "conditioned" because abstinent alcoholics have been repeatedly exposed to cycles of drinking, withdrawal symptoms, and suppression of these symptoms through further drinking, all in temporal contiguity with specific labels.

Marlatt and Gordon (1985) have also proposed that alcohol-related conditioning effects are cognitively mediated. However, their theory differs from that of Ludwig et al. (1974). While Ludwig et al. (1974) suggested that craving represents the cognitive correlate of an aversive "subclinical conditioned withdrawal syndrome", Marlatt and Gordon (1985) argued that alcohol-associated cues elicit "conditioned positive outcome expectancies or craving" (p. 144). They suggested that conditioned craving responses are appetitive or positive, rather than aversive, and that exposure to alcohol-associated cues elicits positive expectations regarding the drug's effects, and therefore, increased desire for the drug. However, their model, while acknowledging the potential role of conditioning effects in alcohol-related behaviour, generally downplays the importance of environmental cues.

Pomerleau (1981) has also proposed a cognitive-response formulation, suggesting that conditioned stimuli (i.e., environmental cues associated with drug ingestion) elicit various respondents (CRs) which then serve as discriminative stimuli for drug ingestion (operant response). Under this model, craving, or desire to drink, is thought to represent the cognitive integration of these respondents.

### Field Studies

Strickler, Dobbs, and Maxwell (1979) have argued that although laboratory research provides considerable valuable information regarding the controlling influences of a variety of variables on drinking behaviour, the degree to which these data generalize to drinking in a natural setting is unknown. To investigate this question, Strickler et al. (1979) designed an experiment comparing the extent to which drinking behaviour in the laboratory was similar to drinking behaviour in a natural drinking environment.

Sixteen male undergraduates, defined as heavy social drinkers, participated in pairs in two 50 minute ad-libitum drinking sessions, one in a laboratory and one in a popular off-campus bar. To control for differences in alcohol consumption based on cost of the drinks, half of the subject pairs in each setting paid for their drinks, and half did not. Various drinking topography measures were recorded, and results indicated that participation in the barroom setting was associated with significant increases in both amount consumed and rate of drinking. It was also found that beverage payment reduced the number of sips taken in both settings. The authors concluded that generalization from laboratory findings to drinking behaviour in natural settings is tenuous. Furthermore, replication of analogue studies in natural settings was recommended to circumvent problems of ecological validity, and to assess the influence of naturally occurring variables on drinking behaviour.



Billings, Weiner, Kessler, and Gomberg (1976) reached similar conclusions based on the findings of their research. They compared drinking behaviour in a "semi-naturalistic" laboratory setting containing carpeting, armchairs, and a bar, to drinking behaviour in an actual barroom setting. Eighteen male social drinkers, assigned to the laboratory setting, participated in three one-hour ad libitum drinking sessions in groups of three, all accompanied by their wives. Barroom data were collected by means of participant observation, using 49 patrons of city bars as subjects. Their regular drinking practices were similar to those of the laboratory subjects. Various drinking topography measures were recorded, and results indicated that barroom patrons consumed their drinks more quickly than did laboratory subjects. It was concluded that unqualified generalization of findings from "semi-naturalistic" laboratory settings to in vivo drinking was not supported.

In 1983, Harford reported questionnaire data in support of the relationship between environment and drinking behaviour. From a sample of 717 Boston residents, they found that males consumed more alcohol in bars than at home, restaurants, or other settings, and drank more in the company of friends, than in the company of parents, a spouse, or other relatives.

In general, results of studies comparing drinking behaviour in natural drinking environments to drinking behaviour in laboratory, "semi-naturalistic", and family settings has shown that alcohol consumption is greater in the natural setting (i.e.,

barroom). Therefore, it is argued that laboratory analogue studies should be replicated in natural settings to enhance ecological validity, and to permit investigation of the role of environmental factors. Yet, to date, no laboratory alcohol experiment has been replicated in a natural drinking environment. This should be of particular concern to the discipline of clinical psychology, as drinking in the natural environment represents the exact problem behaviour to be modified in treatment. It is therefore critically important to determine the manner in which various factors influence drinking behaviour as it naturally occurs.

#### Clinical Implications

It is clear that the precise nature of the role of conditioned responses in contributing to alcohol appetitive behaviour is incomplete (Mann et al., 1988; Monti et al., 1987; Pomerleau et al., 1983). However, general clinical implications of the above findings are clear. Whether the goal of treatment is to reduce the intensity of CRs, compensatory CRs, operant responding in the presence of discriminative stimuli, and/or cognitive representations of conditioned responses, extinction training has been indicated as a potentially important component of treatment. More specifically, treatment programs that include procedures which result in the extinction of physiological and cognitive responses elicited by cues associated with alcohol use are indicated. Therefore, patients should be presented with relevant alcohol-associated environmental cues in treatment,

while refraining from alcohol consumption. Otherwise, while patients may report little desire for alcohol in a treatment facility where there are few cues to activate craving, returning to the pretreatment environment, which contains many alcohol-associated cues, will undoubtedly elicit conditioned responses leading to craving and alcohol-seeking behaviour (e.g., Poulos et al., 1981).

## CHAPTER IV

### Replication of the Balanced Placebo Design Experiment in a Natural Drinking Setting

The foregoing review argues strongly for replication in the natural environment of laboratory analogue research in general, and balanced placebo experiments in particular. Replication of balanced placebo experiments in the natural environment would permit assessment of the generalizability of laboratory findings, in addition to investigation of interactions between environmental factors, and factors studied in the laboratory. Because understanding of variables contributing to drinking behaviour may enhance development of effective treatment programs, it is important to investigate the role of variables influencing drinking behaviour as it naturally occurs. Especially in view of recent evidence that, "treatments for alcohol problems with demonstrated enduring effectiveness do not exist, regardless of treatment orientation or treatment goals" (Riley, Sobell, Lao, Sobell, & Klajner, 1987, p. 107).

While Berg et al. (1981) attempted to address this issue by conducting a balanced placebo experiment in a semi-naturalistic setting, methodological flaws in their design made it difficult to draw firm conclusions from the results. Furthermore, Billings et al. (1976) demonstrated that drinking behaviour in an actual barroom setting was significantly different from drinking behaviour in a "semi-naturalistic" setting, suggesting that findings of experiments using semi-naturalistic settings are also subject to concerns about external validity.

It is unclear why, fifteen years after Marlatt et al. (1973) originally recommended it, an experiment using the balanced placebo design has not been replicated in the natural drinking environment. Practical difficulties associated with conducting research in an actual barroom setting may have been partly responsible, as support from bar management and staff would be required, in addition to a bar where much of the subjects' natural drinking occurred. However, the obstacles did not appear to be insurmountable, so the present research was designed in response to the many recommendations for replication of previous laboratory analogue research using the balanced placebo design.

Several issues were of critical importance in the overall development of the study. First, preliminary investigation of the drinking practices and alcohol-related problems of the proposed subject population was believed to be important for development of an ecologically valid "natural drinking environment" condition.

A second issue involved the decision of which dependent measures to include in the balanced placebo experiment. Dependent measures used in previous research could be broadly divided into two categories. First, there have been studies which treat beverage consumption as a dependent measure (e.g., Berg et al., 1981; Marlatt et al., 1973). Second, there have been studies using measures that could be categorized as involving alcohol-related behaviour commonly believed to be affected by

alcohol consumption (i.e., expectancies). Examples could include pleasurable disinhibition, aggression, and behavioural impairment.

Beverage consumption is argued here to be the most clinically relevant dependent variable, as this is the behaviour to be modified in treatment. Understanding of the manner in which beverage consumption is affected by the independent variables is therefore relevant to development of clinical strategies for influencing drinking behaviour. This variable is also of primary interest because cognitively oriented researchers, and researchers investigating environmental determinants of alcohol-related behaviour, have both investigated effects on beverage consumption. This commonality is important for making predictions about the interaction of cognitive and environmental variables, and for possible integration of the two models. As Niaura et al. (1988) have argued, a focus on different phenomena and different theoretical languages can make integration of cognitive and environmental models difficult.

While it is possible to include dependent measures from both categories in the same study (e.g., Berg et al., 1981), and this has actually been recommended by Marlatt (Marlatt et al., 1973), the possible problem with this was discussed earlier. Effects on dependent measures such as pleasurable disinhibition and behavioural impairment may be due to differences in the level of the independent variable if standard doses are not administered in Given Alcohol conditions. This, of course, would become a

more serious problem as variability in alcohol consumption increases.

In the present research, a decision to include dependent measures from both categories was reached. This was to allow for maximum efficiency in information gathering, as the period of time experimentation in a natural drinking setting would be permitted was predicted to be understandably limited. However, it was planned to address the problem of varying consumption by conducting correlational analysis to determine the extent to which differences in the level of the pharmacological variable may have influenced the findings.

An expanded version of the balanced placebo design was developed in this study, which included three independent variables in a 2 x 2 x 2 factorial design--the pharmacological variable (Given Alcohol versus Given No Alcohol), the cognitive variable (Belief Alcohol was consumed versus Belief No Alcohol was consumed), and the environmental variable (Laboratory setting versus Barroom setting). This design is diagrammed in Figure 2. Planned dependent measures included beverage consumption with additional drinking topography measures. Measurement of desire or craving for alcohol was also planned, as "craving" has been studied by researchers from both cognitive and environmental orientations. Measures of "stimulation/perceived dominance", "pleasurable disinhibition", and "behavioural impairment", were also included as these variables have been demonstrated to represent common expectancies regarding the effects of alcohol consumption (Southwick et al., 1981). Finally, measures of

**Figure 2: The expanded balanced placebo design**

**BARROOM**

GIVEN ALCOHOL	TOLD ALCOHOL	
	YES	NO
YES		
NO		

**LABORATORY**

GIVEN ALCOHOL	TOLD ALCOHOL	
	YES	NO
YES		
NO		



subjective intoxication, and estimates of the alcohol content of beverages, were taken to determine the effectiveness of verbal instructions intended to manipulate subjects' beliefs regarding the content of their beverages. Physiological measures were not taken because apparatus and measurement procedures required would detract from ecological validity in "natural drinking environment" conditions.

Based on the findings of previous research, a number of predictions about the influence of the independent variables on dependent measures could be made. First, with regard to alcohol consumption and craving, it would be expected that in the laboratory setting, the belief that alcohol had been consumed would be associated with greater consumption and craving, while the belief that dealcoholized beverages had been consumed would be associated with less consumption and craving. The pharmacological variable would be expected to have no effect on alcohol consumption or craving (Engle & Williams, 1972; Marlatt et al., 1973). However, in the barroom setting, one could expect that, first, overall beverage consumption and craving would be greater than overall beverage consumption and craving in the laboratory, due to previous findings that the presence of alcohol-associated cues increased both craving (e.g., Kaplan et al., 1983) and alcohol consumption (e.g., Strickler et al., 1979). Second, while instructions that dealcoholized beverages are being administered results in decreased beverage consumption and craving in the laboratory, in the barroom this effect would

be predicted to diminish due to the countervailing influence of environmental cues. Thus, a setting x instructions interaction effect on amount consumed and craving would be expected, such that Told No Alcohol instructions in the laboratory would reduce consumption and craving to a greater extent than in the barroom, where alcohol-associated environmental cues have the effect of increasing craving and consumption.

With regard to "Stimulation/Perceived Dominance", measured on a scale comprised of bipolar adjective pairs including active/passive, loud/quiet, wide awake/sleepy, alert/dull, aggressive/unaggressive, etc., several predictions could also be made. First, alcohol consumption at low doses has been shown to have a stimulating effect. Respiration, heart-rate, alpha wave activity, and reaction time have been shown to increase, while blood pressure, heart-rate variability, and body temperature decrease (Niaura et al., 1988). Thus, regardless of setting or belief regarding alcohol content, one could expect that actual alcohol consumption would result in increased "Stimulation/Perceived Dominance". It could also be expected that "Stimulation/Perceived Dominance" would be greater in Told Alcohol conditions than in Told No Alcohol conditions because previous research has demonstrated that the expectation of receiving alcohol has resulted in increases on measures that subjects' hold positive expectations about alcohol's ability to influence (Marlatt & Rohsenow, 1980). It would be difficult to generate clear predictions for environmental effects

on this variable. Similar predictions could be made for the "Pleasurable Disinhibition" scale comprised of bipolar adjective pairs including relaxed/tense, uninhibited/inhibited, more sexual/less sexual, etc.

On the "Behavioural Impairment" measure, findings of research conducted by Vuchinich and Sobell (1978) suggest that motor performance is disrupted by both the belief that alcohol has been consumed and actual alcohol consumption. Therefore, one could predict that subjects who believed alcohol was consumed, who actually consumed alcohol, or both, would show greater behavioural impairment than subjects who neither consumed alcohol, nor believed they consumed alcohol. With regard to effects of the environment, Siegel's (1977) model may predict that conditioned responses compensatory to the pharmacological effects of alcohol elicited in the barroom conditions would result in cue-induced tolerance, and therefore, less behavioural impairment. However, clear predictions cannot be made because there is no direct evidence that these effects occur in social drinkers at relatively low doses of alcohol. With regard to the subjective drunkenness measure, similar reasoning could be applied. See Table 1 for a summary of the predictions outlined above.

The research that follows consists of two studies. The first was designed as a preliminary investigation of the drinking practices and alcohol-related problems of a sample of undergraduate males at the University of Western Ontario, as similar individuals were intended for use as subjects in the

Table 1

Predicted Outcome of Study II

Dependent Variable	Independent Variable			Setting	Bar
	Beverage	Instructions			
	Alcohol	No Alcohol	No Alcohol	Laboratory	Bar
1) Alcohol Consumption	No effect.	Consumption greater in Told Alcohol conditions	Consumption greater in barroom conditions. Interaction of setting and instructions, such that differences in consumption between Told Alcohol and Told No Alcohol in the Laboratory is greater than in the Barroom. Due to countervailing influence of cues in bar on Told No Alcohol instructions.	Laboratory	Bar
2) Craving	No effect.	Craving greater in Told Alcohol Conditions.	Craving greater in barroom conditions. Interaction of setting and instructions, such that difference in craving between Told Alcohol and Told No Alcohol in the Laboratory is greater than in the Barroom. Due to countervailing influence of cues in bar on Told No Alcohol instructions.	Laboratory	Bar

Dependent Variable	Independent Variable			Setting	
	Beverage	Instructions	Laboratory		
	Alcohol	No Alcohol	Alcohol	No Alcohol	Bar
3) Stimulation/ Perceived Dominance	Greater in Given Alcohol conditions.	Greater in Told Alcohol conditions.	Greater in Told Alcohol conditions.	Unclear.	
4) Pleasurable Disinhibition	Greater in Given Alcohol conditions.	Greater in Told Alcohol conditions.	Greater in Told Alcohol conditions.	Unclear.	
5) Behavioural Impairment	Greater in Given Alcohol conditions.	Greater in Told Alcohol conditions.	Greater in Told Alcohol conditions.	Unclear, possibly less in Barrooms conditions due to conditioned compensatory responses.	
6) Subjective Drunkness	Greater in Given Alcohol conditions.	Greater in Told Alcohol conditions.	Greater in Told Alcohol conditions.	Unclear, possibly less in Barrooms conditions due to conditioned compensatory responses.	

second study. The second study represents the primary focus of this thesis, and uses the expanded balanced placebo design (see Figure 2) to investigate the influences of pharmacological, cognitive, and environmental variables on alcohol-related behaviour.

## CHAPTER V

### Study I: Undergraduate Drinking Practices

The present study was undertaken to assess the drinking practices of first year male undergraduates enrolled in Social Sciences at the University of Western Ontario. This was done to provide information regarding the natural drinking experiences of these individuals for the purpose of enhancing ecological validity in the design of Study II, as this population would form the subject pool.

#### Method

##### Questionnaire Development

The Drinking Practices Survey (see Appendix 1) was developed following a review of existing instruments designed to investigate the drinking habits of college and university students (Cahalan, Cisin, & Crossley, 1969; Engs, 1977; Gonzalez, 1980; Wanberg, Horn, & Foster, 1980). Sections on alcohol consumption, reasons for drinking, and consequences of drinking were incorporated into the Drinking Practices Survey. In addition, several sections were developed to investigate previously unexplored areas.

First, the extent of control that students exercise over their own drinking was thought to be a potentially useful area of inquiry. For example, it seemed possible that students might engage in excessive drinking because they cannot resist friends' urging to keep drinking, they feel obligated to buy another round, they lack skills for moderating alcohol consumption, etc. Thus, questions

were included to provide information regarding the extent to which students engage in drinking when they would actually prefer to stop.

Second, information was gathered regarding students' assistance-seeking behaviour and preferences for alcohol interventions. While some of this information is not directly relevant to this thesis, it was gathered to provide a fuller understanding of the alcohol-related behaviour of this population, and is presented in Appendix II, which includes the complete set of data gathered in Study I.

#### Validity of self-reported alcohol-related behaviour

Whether self-reports of alcohol consumption levels and consequences of drinking are valid has been the subject of considerable investigation. Establishment of the validity of self-reports has been accomplished by means of comparisons with collateral reports, official records, laboratory tests, and behavioural observations. First, information from collateral sources (i.e., friends, relatives) has consistently shown that self-reports are reasonably valid measures of alcohol consumption and consequences of drinking among alcoholics. For example, Guze, Tuason, Stewart, and Picken (1963) in one of the first such studies found 74% agreement between alcoholics and their relatives on self-reported drinking behaviour. More recently, McCrady, Paolino, and Longabaugh (1978) found 84% agreement between collaterals and patients on scales of alcohol use, and 84% agreement on scales measuring serious consequences of drinking (e.g., blackouts, missed work) at posttreatment follow-up. Miller, Crawford, and Taylor (1979) reported similar results where self-reported alcohol



consumption was in 79% agreement with collateral reports at treatment follow-up. Finally, Maisto, Sobell, and Sobell (1979) collected post-hospitalization data for 52 alcoholics and their collaterals, and found correlations of .97 for days hospitalized, .82 for days drunk, .81 for days abstinent, .49 for days of limited drinking, and .46 for days jailed.

Comparison of self-reported alcohol-related behaviour among alcoholics with official records has also shown reasonable validity of self reports (e.g., Cooper, Sobell, Sobell, & Maisto, 1981; Sobell & Sobell, 1978; Sobell & Sobell, 1975). For example, Cooper et al. (1981) reported correlations ranging from .73 to .94 for days in hospital; and days in residential treatment among alcoholic patients.

Laboratory reports of BAC, and urine alcohol content, when compared with self-report data, have also shown reasonably valid self-reports of alcohol consumption, with disagreements being divided between underreporting (e.g., Sobell, Sobell, & Vanderspek, 1979), and overreporting (Midanik, 1982), with more underreporting overall (see Polich, 1982).

Finally, and most relevant to the subject population used in this study, behavioural observations have been used to investigate the validity of social drinkers' self-reported alcohol-related behaviour. For example, Harford, Dorman, and Feinhandler (1976) interviewed patrons in bars about their recent drinking behaviour. Self-report data were compared to direct observations of their alcohol consumption made three to seven days previously. Of the 85 subjects, 54% remembered the exact number and type of drinks, 21%

underreported by only one drink, and 9% overreported by only one drink. Furthermore, in a large validation study of student drinking and other drug use, results supported the view that self-reports of drinking behaviour are valid measures of actual drinking behaviour (Single, Kandel, & Johnson, 1975). Thus, the majority of the evidence suggests that self-reports of alcohol-related behaviour provide fairly accurate information.

### Subjects

Subjects were 80 male undergraduates enrolled in introductory psychology at the University of Western Ontario. This sample comprised approximately 10% of the total population of 823 male, first-year Social Sciences undergraduates. Each subject received one research credit for participating, and approximately 40 minutes were required to complete the questionnaire.

A sample of 45 female undergraduates enrolled in first-year psychology at the University of Western Ontario was also included in the study. However, no data from the sample is reported in the thesis because male subjects were used exclusively in Study II.

### Results

Results that are relevant to this thesis are reported below (see Appendix II for the complete data set).

#### 1) Alcohol Consumption

Ninety-nine percent of subjects reported drinking alcohol at least once a month, and this finding is consistent with the results

of many other studies of student drinking (e.g., Whole College Catalogue About Drinking, 1976). Additionally, most subjects reported that they began drinking at age 15 or 16 (48.8%).

With regard to the frequency of alcohol consumption, 76.3% of the sample reported drinking between one and four times per week. More specifically, 31.3% reported drinking one or two times per week, 18.8% reported drinking two or three times per week and 26.2% reported drinking three or four times per week. Eleven percent of the sample reported drinking "nearly every day" or every day.

With regard to the amount of alcohol consumed, 71.4% of subjects reported consuming five or six bottles of beer "nearly every time" or "more than half the time", on a five point scale with "less than half the time", "once in a while", and "never", as remaining alternatives. Fifty-five percent of subjects reported drinking more than 14 alcoholic beverages per week, and 27% reported drinking 28 or more alcoholic beverages per week.

#### ii) Drinking Practices

In response to the question, "When you drink alcohol which type of alcohol are you most likely to consume?", 71% of the subjects chose beer. Twenty-two percent of subjects selected liquor in response to the above question, and 5% chose wine. Thus, it appears that beer is the beverage of choice among these subjects.

With regard to preferred drinking location, subjects were asked to indicate on a five-point scale how often they go to a variety of settings. Response alternatives were, 1) nearly every time, 2) more than half the time, 3) less than half the time, 4) once in a while,

and 5) never. Table 2 summarizes the results. From this, it appears that the on-campus bars are the preferred location for drinking, followed by private residence, and off-campus bars. Note that these individuals indicate rarely drinking alone.

Using the same five-point scale as above, subjects were also asked how often they consume alcohol at various times of day. Results are summarized in Table 3. As might be expected, evening drinking was most commonly reported, followed by afternoon drinking. Additionally, these individuals indicate rarely drinking in the morning.

#### iii) Drinking Problems

There were a variety of questions included in the Drinking Practices Survey that provided information on alcohol-associated problems. Results from the Consequences of Drinking section are presented in Table 4. It is clear from this data that significant negative consequences have been experienced by a considerable proportion of the subjects. For the purpose of summarizing the results, percentages of subjects responding sometimes, most of the time, or always will be presented. These were choices on the five point scale: 1) always, 2) most of the time, 3) sometimes, 4) rarely, and 5) never.

Under "educational consequences", 34% of subjects reported skipping class after drinking, 33% reported missing classes because of hangovers, and more seriously, 12% attributed receiving lower grades to their drinking.

Table 2

Drinking Location


---

<u>Location</u>	<u>Response</u> (% choosing 1 or 2 on scale)
On-campus bar	43
Friend's place/Your place	39
Off-campus bar	26
Restaurant	11
At home alone	3

---

Scale: 1) Nearly every time; 2) More than 1/2 the time;  
3) Less than 1/2 the time; 4) Once in a while; 5) Never.

Table 3

Time of Drinking


---

<u>Time</u>	<u>Response</u>	
	<u>% choosing 1 or 2 on scale</u>	<u>% choosing 1, 2, or 3 on scale</u>
Before noon	3	3
At noon	1	11
Early afternoon	4	22
Late afternoon	12	40
Early evening	40	84
Late evening	80	89

---

Scale: 1) Nearly every time; 2) More than 1/2 the time;  
3) Less than 1/2 the time; 4) Once in a while; 5) Never.

Table 4

Consequences of Drinking


---

<u>Item</u>	<u>Response</u>
<u>Educational Consequences</u>	
Skipping class after drinking	34
Miss class because of hangover	33
Lower grades	12
<u>Drinking and Driving</u>	
Arrested driving while intoxicated	1.7*
Driving after drinking	29/54*
Drinking while driving	20/41*
<u>Legal Consequences</u>	
Fights	15/40*
Property damage	11/42*
Arrested	10/27*
<u>Sexual Consequences</u>	
Detracted from sexual enjoyment	21/46*
Sexual inadequacy	5/27*
Unwanted sex	13/42*
<u>Psychosocial Consequences</u>	
Conflicts with opposite sex friends	11
Conflicts with same sex friends	6
Failure to remember behavior	22
Regrettable behavior	30

---

Data are percent reporting indicated consequence at least sometimes in the previous six months (at least "rarely" where marked with an asterisk).

Scale: 1) Always; 2) Most of the time;

3) Sometimes; 4) Rarely; 5) Never.

Results of questions related to drinking and driving indicated that two subjects had been arrested for drunk driving, 29% reported driving after drinking, and 20% reported drinking while driving. Other legal (or potentially legal) consequences included getting into fights (15%), property damage (11%), and getting into trouble with the law (10%).

Under sexual consequences, 21% of subjects reported that drinking had detracted from their sexual performance and enjoyment. Five percent reported that drinking had prevented them from having sex, and 13% reported that drinking had resulted in them having sex when they really didn't want to. Other psychosocial consequences of alcohol consumption included conflicts with opposite sex friends (11%), conflicts with same sex friends (6%), and engaging in regrettable behaviour (30%). Finally, 22% of subjects reported failing to remember what happened while drinking.

In addition to the Consequences of Drinking section of the questionnaire, a variety of other questions provided information on alcohol-associated problems. Under the section assessing perceived extent of control over drinking behaviour, subjects were asked to respond to the following questions on the five-point scale: 1) nearly every time, 2) more than half the time, 3) less than half the time, 4) once in a while, and 5) never. When asked "When you go out drinking, how often do you spend more money than you wanted to?", 57% of subjects reported more than half the time or nearly every time. Twenty-five percent of subjects reported staying at the bar

longer than they wanted to nearly every time, or more than half the time. Twenty-seven percent of subjects indicated that nearly every time, or more than half the time, they would go drinking if asked by friends, even if they had not been thinking of going drinking. Finally, 13% of subjects reported that nearly every time, or more than half the time, it is difficult to stop drinking once they have had a few drinks.

Subjects were also asked about reasons for continuing to drink when they might otherwise feel like quitting. The most common responses were, "It's your turn to buy another round" (36% responded nearly every time or more than half the time), "Friends urge you to stay" (35% responded nearly every time or more than half the time), "Date wants to stay longer" (33% responded nearly every time or more than half the time), and "You are waiting for a ride home" (29% responded nearly every time, or more than half the time).

A section on strategies for controlling drinking was also included in the questionnaire to gain some understanding of what students may do "when they are at a bar or party and want to stop drinking". Percentages of subjects responding "nearly every time" or "more than half the time" are reported for the following strategies: 1) Keep drinking anyway (19%), 2) Decrease rate of drinking (54%), 3) Switch to a drink with less alcohol (27%), 4) Switch to a non-alcoholic beverage (39%), 5) Leave (12%).

Finally, to further assess the extent of alcohol-associated problems among these individuals, subjects were asked questions about their perceived need for assistance with drinking problems.



When asked if they felt there was a need for some type of service to help students with alcohol-related problems, 37% responded "definitely", and an additional 37% responded "probably". Also, ten percent of subjects responded that their level of drinking was creating "somewhat of a problem", and 16% responded that "maybe a few" people thought they had a drinking problem.

### Discussion

#### i) Ecological Validity

Results of Study I indicated that the majority of subjects most often drink beer as compared to wine and liquor, and that on-campus bars and pubs are the preferred drinking location. Additionally, few subjects reported drinking at home alone, but rather most alcohol consumption occurred in a social context. Very few subjects reported drinking in the morning, although many reported drinking in the afternoon, less than half the time, and as might be expected, subjects reported drinking in the evening most often.

The above information is necessary for designing an ecologically valid balanced-placebo experiment. Even though most balanced-placebo experiments use vodka and tonic mixtures (Rohsenow & Marlatt, 1981), in this case it would seem most appropriate to use beer and dealcoholized beer as experimental beverages. Given that beer is the alcoholic beverage with which subjects are most familiar, one can be more confident that findings from an experiment using this beverage are relevant to the natural drinking situation. Whether this issue should be of concern in the interpretation of previous studies is unclear, as subjects' drinking practices have not usually been assessed.

With regard to drinking setting, the barroom was assumed to be the most probable location for alcohol consumption in discussion of the ecological validity issue in previous chapters. When directly assessed in Study I, this was found to in fact be the case. However, more specifically, for this population on-campus bars were found to be more often frequented than off-campus bars, and more often frequented than private residences or restaurants. Therefore, while any of these locations would undoubtedly be more naturalistic than a laboratory, the on-campus bar appears to be the best choice for conducting the balanced placebo experiment in an ecologically valid setting.

The data reported here also indicate that subjects rarely drink alone. Therefore, while the majority of balanced placebo experiments involve solitary participation (Rohsenow & Marlatt, 1981), the ecologically valid situation for these subjects would involve participation in a social context. Again, whether this issue should be of concern in the interpretation of previous studies is unclear because subjects usual drinking habits have not been assessed. Possibly, when the experiment is conducted with alcoholics, solitary participation is less of a problem, as this population is known to drink alone more often than non-alcoholics (Nathan & O'Brien, 1971).

Finally, it seems that afternoons, or preferably evenings, would be the best times to conduct Study II as these subjects rarely drink in the morning.

ii) Alcohol-Associated Problems

The findings of Study I suggest that a significant proportion of subjects experience negative educational, legal, and psychosocial consequences as a result of their alcohol consumption. Furthermore, relatively high levels of alcohol consumption were reported, and many subjects seemed to perceive themselves as being frequently ineffective at controlling their drinking. Also, 74% of subjects reported that services to help students with alcohol-related problems were probably, or definitely, needed, and 10% reported that their own level of drinking was creating "somewhat of a problem". The results of Study I are comparable to those of similar studies of student drinking which show similar levels of alcohol-related problems on college campuses (e.g., Barnes, Sokolow, & Welte, 1981; Scheller-Gilkey, Gomberg, & Clay, 1979; Whole College Catalogue About Drinking, 1976).

## CHAPTER VI

### Study II: The Balanced Placebo Design in a Natural Setting

#### Method

Pharmacological, cognitive, and environmental variables are known to interact in the drinker's natural experience with alcohol (Ludwig & Wikler, 1974; Rohsenow & Marlatt, 1981; Sher, 1985) yet the effects of these variables have never been studied in combination. To address this concern Study II was designed to simultaneously investigate the effects of pharmacological (alcohol vs. no alcohol), cognitive (belief that alcohol has or has not been consumed), and environmental (laboratory vs. barroom setting) variables on alcohol-related behaviour and emotional responding among heavy drinking male undergraduates at U.W.O.

Findings of Study I were incorporated in the design of Study II to enhance ecological validity. Therefore, regular beer and dealcoholized beer were selected as beverages, subjects participated in a social activity during the experiment, and subjects assigned to barroom conditions participated in an on-campus bar where much of their natural drinking occurred.

#### Subjects

Eighty-four male undergraduates, 19 years of age or older, who had been drinking legally for at least four months, and who drank at least 12 drinks per week on average, with a minimum of

two drinking occasions per week, were recruited from the first-year psychology subject pool at the University of Western Ontario (UWO). Subjects mean age was 19.7 years (range 19-23 years). They drank an average of 6.8 drinks per occasion (range: 3.5 - 12.5 drinks/occasion) with an average of 2.9 occasions per week (range: 2-4.5 occasions/week). The mean number of drinks per week was 19.9 (range: 12-45 drinks/week).

Subjects in this study met or exceeded minimum requirements for various definitions of "heavy social drinker". For example, Collins, Parks, and Marlatt (1985) defined heavy social drinkers as individuals who have an average of 12 or more drinks per week, and this was based on a shortened version of the widely used Drinking Practices Questionnaire developed by Cahalan, Cisin, and Crossley (1969). Similarly, the above criterion exceeded the minimum requirements for the less precise definition of "heavy drinker" offered by Southwick et al. (1981) which states, "drink nearly every day or weekly, often 5 or more drinks each time" (p. 715).

The most common location for drinking was the bar, with 76% of subjects reporting that this was their usual drinking setting. The remainder of subjects reported the bar as being their second most common drinking location, with pubs, parties, or residence being reported as the most common location. Beer was by far the beverage of choice among these individuals, with 95% of subjects reporting that beer was their preferred alcoholic beverage. Remaining subjects stated liquor as their first

preference, although beer was consumed regularly as their second choice.

Finally, data pertaining to drinking history revealed that subjects had consumed alcoholic beverages on a regular basis for an average of 3.4 years, with a range of 1-8 years.

To recruit subjects, a notice was posted in the psychology department at the UWO advertising a study concerned with investigating the effects of several variables on alcohol consumption. It also stated that subjects may or may not receive alcoholic beverages. Interested "male regular social drinkers" were asked to telephone the experimenter to obtain further information and arrange a suitable time (see Appendix III). This way, heavy social drinkers were not required to identify themselves by signing a posted sheet. As do all subject pool members, individuals selected received course credits for their participation.

On the telephone potential subjects were asked their age, average number of drinking occasions per week, and average number of drinks per occasion. The minimum criterion for participation was an average of 12 drinks per week. If this criterion was not met, the individual was thanked for calling and informed that his drinking practices did not match those of interest for this study. If a person met, or exceeded, the above criterion (approximately 80% of the callers met the criterion), he was asked what drinking locations were usual for him, and how long he had been drinking on a regular basis (see Appendix IV for the

telephone interview schedule). Potential subjects were then required to verbally complete the "Checklist of Contraindications of Consumption of Alcohol for Research Purposes" (see Appendix V), and evidence of contraindications for alcohol consumption led to rejection from the study. Potential subjects then verbally completed the Brief Mast (See Appendix VI), and those scoring six or more were rejected from the study, as such scores suggest that involvement with alcohol has become clinically significant (Pokorny, Miller, & Kaplan, 1972). Finally, potential subjects were asked whether they were trying, or had ever tried, to stop drinking alcohol, or cut down on consumption. If so, they were also rejected from the study.

Individuals rejected because their involvement with alcohol appeared to be problematic were informed of assistance available at Student Health Services, or the Student Counselling Centre. Only one subject was actually rejected and informed of services. This individual scored 9 on the Brief Mast due to previous hospitalization because of drinking, being arrested for drunk driving, and indicating that friends or relatives did not think he was a normal drinker. The hospitalization had apparently resulted from injuries sustained in a fall while quite intoxicated.

Persons who met the criteria for participation and who provided no evidence of contraindications for alcohol consumption were scheduled for participation at a time of their convenience. Experimental sessions took place on weekday afternoons beginning at either 1:00 p.m. or 3:00 p.m. and ran from January to April,

1986. While evening time slots would have further enhanced ecological validity, the on-campus bars were too busy during the evenings for management to permit the use of space in the bar for experimental sessions.

Subjects were instructed to refrain from consuming alcoholic beverages on the day of the study and to eat lunch approximately 90 minutes before the scheduled time. They were also instructed to leave their vehicles at home and all subjects were offered transportation to the study. Rides home were also offered to all subjects. Finally, subjects were asked to bring photo identification to prove age of majority, and informed that signatures would be required on each page of the above screening instruments (see Appendix V and VI). They were then asked for their names and informed that these would not be attached to any data collected, thus ensuring confidentiality.

#### APPARATUS

An A.L.E.R.T. (Alcohol Level Evaluation Roadside Tester) Model J3A roadside screening device manufactured by Alcohol Countermeasure Systems Inc. was used for the purpose of measuring subjects' blood alcohol concentration (BAC). This device provides readings in mg % (milligrams of alcohol in 100 milliliters of blood) and is accurate to within + 10% at 100 mg %. To provide a frame of reference, individuals obtaining BAC's in excess of 80 mg% can be charged with impaired driving in Ontario.

It should be noted that the Alert device malfunctioned for a substantial period during the course of experimentation.



Therefore, BACs for all subjects were estimated using the procedure recommended by McKim (1986) which involves calculation of BAC based on amount of absolute alcohol consumed and subjects' body weights.

### Settings

i) Laboratory: The laboratory setting was located in the Social Sciences Centre at the UWO. It was carpeted with drapes on the windows, and contained a coffee table, couch, chair, end table, and floor plant. There was also a one-way mirror covered by curtains which were open approximately 25 cm. during experimental sessions to permit observation from the adjacent room.

ii) Barroom: The Elbow Room, a popular on-campus bar, was used as the barroom setting. This was arranged by meeting with the bar manager who was supportive of research on alcohol-related behavior that is conducted in natural drinking settings. His conviction that external validity is maximized under such conditions led him to permit the experimenter to use space in the bar, and to involve waiters and waitresses in the procedure to ensure as natural a situation as possible. The Elbow Room also supplied much of the regular beer used in the study free of charge.

The Elbow Room is located in the University Community Centre which is adjacent to the Social Sciences Centre and the two buildings are joined by a short tunnel. The Elbow Room is licensed to hold 250 patrons, and has darkened lighting, wooden

tables, a small stage, and a video screen. Waitresses and waiters serve the drinks, and food is also available.

#### Beverage Selection

Real beer and de-alcoholized beer were chosen as beverages to enhance ecological validity. Cox and Klinger support the use of beer and "near beer" in balanced placebo experiments, demonstrating that subjects could not reliably discriminate between the two. In this research, Carling's "Black Label" brand (five percent alcohol x volume) was selected as the regular beer because bar management indicated that it was their least popular brand. It was thought that this would increase the probability of successful deception as subjects would be less likely to question the alcohol content of a beverage with which they were not familiar than they would a brand they have previously consumed. With regard to de-alcoholized beer, pretesting involved selection of the beer that tasted "most like their regular brand" in a blind rating test by a group of 8 male associates at UWO who were regular beer drinkers, some of whom were similar in age to the subjects. Results indicated that a mixture of 50 percent by volume Europa brand de-alcoholized beer (less than one half percent alcohol x volume) and 50 percent by volume St. Christopher's brand de-alcoholized beer (less than one half percent alcohol x volume) was the closest to approximating the taste and consistency of regular beer. Europa has a frothy consistency but slightly more malty flavour than regular beer and St. Christopher's tastes very much like regular beer with a

watery consistency. The 50/50 mixture seemed to balance these factors, resulting in a beverage that was much like regular beer.

### Procedure

Assignment of each subject to one of the eight cells of the expanded balanced placebo design was done prior to the subject's arrival at the experimenter's office in the Social Sciences Centre. The eight groups in the  $2 \times 2 \times 2$  factorial design (see Figure 2) included: 1) Told Alcohol/Given Alcohol/Lab, 2) Told Alcohol/Given No Alcohol/Lab, 3) Told No Alcohol/Given Alcohol/Lab, 4) Told No Alcohol/Given No Alcohol/Lab, 5) Told Alcohol/Given Alcohol/Bar, 6) Told Alcohol/Given No Alcohol/Bar, 7) Told No Alcohol/Given Alcohol/Bar, and 8) Told No Alcohol/Given No Alcohol/Bar.

Subjects who chose Monday, Tuesday, or Wednesday time slots over the telephone were automatically scheduled to participate in the barroom setting, as bar management reported that Thursday and Friday afternoons were too busy for them to give up tables for this purpose. A minimum of eight subjects per group, who believed verbal instructions, was set. Therefore, once a particular group had reached the minimum it was closed, and remaining groups were left open to assignment of subjects. Beyond these restrictions, assignment to groups was completely random. Once all groups had reached the minimum of eight subjects, remaining subjects were randomly assigned to conditions.

The minimum of eight subjects per condition was chosen on the basis of past research using the balanced placebo design, as this number has previously provided sufficient statistical power

to detect group differences (e.g., Marlatt et al., 1973). While consideration was given to conducting power analysis (Cohen, 1969), this was not done due to the pioneering nature of this research and consequent difficulty in specifying the size of the effect sought.

i) Pretest

Upon arrival at the office, each subject was greeted by a male research assistant who had been briefed by the experimenter beforehand regarding which setting to use, and what instructions to give the subject regarding the type of beverages to be received. The research assistant checked each subject's photo identification and gave him a copy of an "Information to Participants" form which outlined the experimental procedure (see Appendix VII). The subject was then required to review and sign each page of the questionnaires completed over the telephone, and a "Consent to Participate" form was signed (see Appendix VIII). Following this, the subject's BAC was measured to determine whether he had been drinking alcohol beforehand. The subject would have been dismissed if his BAC exceeded zero, but no subject had a BAC greater than zero. The subject was then asked to complete the Present Feelings Questionnaire, an instrument designed to permit evaluation of changes in subjective feelings over the course of the experiment (see Appendix XIV). The Present Feelings Questionnaire will be described in detail in the section on dependent measures.

### ii) Setting Manipulation

Following the pretest procedures, each subject was accompanied to his predetermined setting by the research assistant who stated, "Please come with me. We're going to a laboratory down the hall." or, "Please come with me. We're going to the Elbow Room." The research assistant then picked up a box of "Trivial Pursuit" cards and a folder containing a random numbers table and various questionnaires to be used later in the experiment, and walked with the subject to the appropriate setting while engaging in light conversation about the university, weather, or sports events.

Subjects participating in the laboratory setting were seated on the couch with a coffee table in front of them and the research assistant sat facing the one way mirror at right angles to the subject. Subjects participating in the Elbow Room were seated with the research assistant wherever a free table could be found, but preferentially sat as close to the bar as possible. The research assistant did not permit other patrons to sit at their table during the session.

### iii) Expectancy Manipulation

As mentioned previously, the research assistant was briefed before each experimental session and instructed whether to inform the subject that he would receive alcoholic or non-alcoholic beverages. However, to increase the probability of successful deception, an apparently random selection procedure is recommended (Rohsenow & Marlatt, 1981). Therefore, once seated in the setting, the research assistant would say, "as you

probably know, random assignment to groups is very important in psychological research to ensure that various experimental groups are equal on average. So, I will consult my random numbers table to determine whether you will receive regular beer or de-alcoholized beer." The subject was then instructed to choose a number between 1 and 100, and the research assistant searched the table, which consisted of two columns of 50 numbers, each in random order. The columns were labelled "A" and "B". When a subject's choice was found the research assistant would show him the table and say, "Oh, column \_\_\_\_, that means you get \_\_\_\_\_." Thus, the predetermined instruction selection appeared to be random.

iv) Beverage Manipulation

With regard to the manner of beverage presentation, Rohsenow and Marlatt (1981) recommend that beverages should be poured in front of subjects from commercially labelled bottles that correspond to the instructions. Physical evidence provided by substituted beverage containers in deception conditions corroborates the research assistant's verbal instructions, thereby enhancing credibility. Therefore, subjects in Told Alcohol/Given Alcohol groups received two 341 ml bottles of Carling's Black Label beer simultaneously, while subjects in Told No Alcohol/Given No Alcohol groups received two 341 ml Europa bottles containing the mixture of 50 percent Europa brand de-alcoholized beer and 50 percent St. Christopher's brand de-alcoholized beer. Subjects in Told Alcohol/Given No Alcohol groups received two Carling's Black Label bottles containing the

de-alcoholized beer mixture, and subjects in the Told No Alcohol/Given Alcohol groups received two Europa bottles containing Carling's Black Label brand regular beer. Thus, the bottles presented were consistent with instructions given regarding the type of beer to expect. All beverages were chilled beforehand.

In the laboratory setting, once the research assistant had consulted his random numbers table and informed the subject about which type of beer he would receive, the subject was left for a moment while the research assistant excused himself to get the beverages. The research assistant received a tray of four chilled bottles of beer from the experimenter, who was waiting in the adjacent observation room. Two of these bottles were for the research assistant and were labelled in the same manner as those for the subject, but in all cases, for obvious reasons, the research assistant's bottles contained de-alcoholized beer. These were placed on a paper towel so they could be differentiated from those given to the subject. There were also two glasses on the tray.

In the Elbow Room, once the research assistant had informed the subject about which type of beer he would receive, a waiter or waitress was summoned and four "Black Label" or "Europa" were ordered. Meanwhile, the experimenter had entered the bar through a back door and placed four bottles of beer intended for the session in a refrigerator. Elbow Room staff had been previously introduced to both the experimenter and research assistant, and were aware that the beverages would be prepared by the

researchers for experimental sessions. Therefore, once beer had been ordered by the research assistant, the waiter or waitress would receive four bottles from the experimenter who was standing behind the bar acting as staff. The waiter or waitress was instructed about which two bottles of beer to give the subject at this point. When drinks arrived, the research assistant paid staff to make the situation seem as natural as possible. Money was returned to the experimenter after each session.

In all cases, regardless of setting, the research assistant was unaware of the actual alcohol content of the beverages served.

v) Drinking Phase

Regardless of setting, once seated with drinks on the table, the research assistant would say, "We'll start with these two each. Please consume your drinks in any manner you choose." From then on, the research assistant would closely follow a subject's drinking behavior. That is, shortly after a subject poured his beer, the research assistant would do likewise. Then, sip by sip, the research assistant would keep pace with the subject. This was to control for modelling effects, as it has been demonstrated that subjects will increase their rate of consumption when seated with a fast drinking model, and will decrease their rate of consumption when seated with a slow or non-drinking model (Garlington & Dericco, 1977; Lied & Marlatt, 1979; Tomaszewski, Strickler, & Maxwell, 1980). In this research, the intention was to obtain a sample of subjects' natural drinking behavior under each condition. Being accompanied by the similarly-aged research assistant also



contributed to making the drinking phase as natural as possible, as first year undergraduates typically drink in social environments (Wigmore & Hinson, 1986).

To permit social interaction between the research assistant and subject that was standard from subject to subject, the game "Trivial Pursuit" was employed during the drinking phase. This game includes cards with six questions and answers per card to be used in a board game format where correct answers allow players to advance. Topics for these questions include science, entertainment, sports, history, geography, and art and literature. The research assistant familiarized subjects with the intended procedure by explaining that they would take turns asking each other all questions per card on alternating cards to "give them something to do while drinking." Therefore, the actual game was not played, and competition was kept to a minimum. The research assistant was instructed to answer about the same number of questions correctly as the subject and to keep social interaction from subject to subject as similar as possible.

In addition to permitting standard social interaction during the drinking phase, use of "Trivial Pursuit" cards provided a distracting task. This is important, as Rohsenow and Marlatt (1981) provided evidence that the subject's belief in verbal instructions was affected by the task undertaken during participation. Subjects engaged in stimulating, distracting tasks (e.g., social interaction, watching erotic films) were more likely to believe instructions, than were subjects engaged in

more passive tasks (e.g., filling out a checklist). The authors suggest that subjects told they are receiving alcohol attribute internal sensations to intoxication, thus enhancing their belief in instructions, while subjects told they are receiving dealcoholized beverages attribute internal sensations to the distracting task. Because there are two possible sources of arousal, subjects may attribute internal sensations to the source congruent with instructions. However, if alcohol is perceived as the only possible source of arousal, as may be the case when passive tasks are employed, subjects in Told Alcohol/Given No Alcohol conditions (see Figure 2) may become suspicious due to the lack of internal sensations. On the other hand, subjects in Told No Alcohol/Given Alcohol conditions may not believe instructions due to the occurrence of internal sensations, which they may attribute to alcohol consumption since an alternative explanation may be lacking.

The drinking phase lasted 30 minutes. Subjects were not informed of this beforehand because it may have influenced their drinking behavior. Therefore, once 30 minutes had elapsed, the research assistant stated, "Please set your drinks aside. The drinking phase is over." Subjects were then informed that Trivial Pursuit questions would be continued for another 15 minutes. This was to allow BACs to rise for subjects who had consumed alcohol. Subjects who consumed two bottles of beer before 30 min had elapsed were informed that no further beverages would be provided. In such cases, the 15 min BAC elevation period began from the time the second beer was finished. At the

end of this period subjects were again administered the Present Feelings Questionnaire, in addition to a questionnaire designed to assess the credibility of deception (see Appendix X). This questionnaire required subjects to indicate the percentage of alcohol they thought their beer contained, and to rate their level of intoxication by marking a line anchored by "completely sober" at one end, and "extremely drunk" at the other. Subjects were then accompanied by the research assistant back to the office where they originally met.

vi) Final Phase

During the final phase, subjects were asked by the research assistant to complete a shortened version of the the Drinking Practices Survey (see Appendix XI). This questionnaire took approximately 20 minutes to complete, and was administered only to occupy subjects' time while their BACs diminished. No data from this questionnaire are reported in this thesis because many of the subjects were mildly intoxicated when completing it. When this was finished, subjects were introduced to the experimenter and the research was fully explained. They were also given a copy of a debriefing sheet (see Appendix XII) which further elaborated on the purpose and nature of the research. Subjects were then informed of which experimental condition they had been assigned to, any questions were answered, and BACs were measured. If a subject's BAC was less than 30 mg% he was given a ride home. Otherwise, he was asked to wait until the BAC was less than this criterion. When the ALERT device was inoperative, the decision regarding whether subjects' BACs were below the

criterion of 30 mg%, and therefore permitted to leave, was based on an estimation procedure recommended by McKim (1986). He reported that BAC diminishes at the rate of 15 mg% per hour.

Because the method of this study involved administration of alcohol, and deception, the research proposal was submitted to the U.W.O. Health Sciences Standing Committee on Human Research for ethical review. Approval documentation is included in Appendix XIII.

### Dependent Measures

#### 1) Self Report Measures

In balanced placebo experiments, the belief that alcohol has, or has not, been consumed is manipulated, leaving expectancies held regarding specific effects of intoxication implicit. However, to facilitate understanding of the role of drinking expectancies on behavior, several investigators have attempted to identify the content of specific expectations (Brown et al., 1980; Southwick et al., 1981).

In the most comprehensive study, Southwick et al. (1981) began their investigation by administering an open-ended pilot questionnaire designed to obtain the dimensions of expectancies in various situations among college social drinkers. Responses were rewritten in trait or behavioral terms to form the final questionnaire. For example, the statement, "using alcohol in a social situation makes me feel more relaxed" would be converted to the bipolar adjective pair, "relaxed/tense". In total, thirty-seven such pairs were generated and placed on five point bipolar scales. These scales were given to 253 undergraduate

subjects, who were asked to indicate how alcohol affected them on the dimensions listed--first after consuming a moderate amount of alcohol, and second, after consuming "too much" alcohol. Results were factor analyzed, and three factor solutions were identified for each level of consumption. These were virtually identical for each level and readily interpretable. Factors were labelled "stimulation/perceived dominance" (e.g., loud/quiet, active/passive, excited/calm), "pleasurable disinhibition" (e.g., relaxed/tense, elated/depressed, outgoing/reserved, and "behavioral impairment" (e.g., clumsy/coordinated, rude/polite) (see Appendix XIV for all scale items). Scales corresponding to each factor were formed, and reliability coefficients for the scales (having 13, 14, and 10 items respectively) estimated by Cronbach's alpha were all .80 or above.

The above work suggested a means of assessing, in the present experiment, whether changes expected as a result of moderate alcohol consumption were influenced by mere belief that alcohol had been consumed, by the presence of environmental cues previously associated with alcohol consumption, or by both. By anchoring linear scales with the bipolar adjective pairs (see Guilford, 1954), and asking subjects to indicate on a 10 cm line joining each pair how they feel at the time the item is completed, their present feelings on the various expectancy dimensions were assessed. Hence, the instrument was called the Present Feelings Questionnaire. Measurement of changes in subjects' self reported feelings on these dimensions over the course of the experiment was accomplished by repeated

administration of the Present Feelings Questionnaire.

Finally, to assess subjects' craving for alcohol, an item was included that was anchored by "no desire for an alcoholic beverage" at one end, and "extreme desire for an alcoholic beverage" at the other, as similar measures have been used in previous research (e.g., Mann et al., 1988).

ii) Behavioural Measures

Because the focus of this thesis entails investigation of the effects of the independent variables on beverage consumption, the amount of beverage consumed was the behavioural measure of primary interest. However, various other drinking topography measures were also recorded, to be analyzed separately.

Therefore, during the drinking phase, subjects were observed by the experimenter who recorded the following data: 1) "time to first sip", following placement of bottles on the table, 2) number of sips from first bottle, 3) time required to consume first bottle (if applicable), 4) time between completion of the first bottle and the start of consumption of the second bottle, (if applicable), 5) number of sips of second bottle (if applicable), and 6) time required to consume second bottle (if applicable) (see Appendix XV).

In the laboratory setting, subjects were observed through the one-way mirror, while in the bar setting, subjects were observed unobtrusively from vantage points selected on the basis of the seating arrangement for a particular session. In all cases, once subjects left a setting, the volume of remaining beer

was measured using a 500 ml graduated cylinder. This volume was used to calculate the amount of beverage consumed during the drinking phase.

## CHAPTER VII

### Results

#### Verbal Instructions

Those individuals who reported believing that their beverages contained between 4-5 % alcohol/volume on the posttest questionnaire were regarded as reporting that they had consumed regular beer. Subjects who reported believing that their beverages contained between 0-2% alcohol/volume were regarded as reporting that they had consumed dealcoholized beer. No subject reported believing that the beer contained between 2-4% alcohol/volume. Table 5 shows the proportion of subjects in each group who reported believing the instructions. Chi-square analysis revealed no significant differences in the proportion of subjects per group who reported believing instructions ( $X^2 = 0.13, .N.S.$ ).

#### Data Analysis

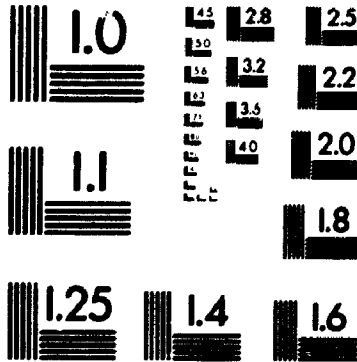
The effect of subjects' beliefs regarding the alcohol content of administered beverages is under investigation in the present research. This belief is manipulated by verbal instructions, which were effective in 85% of cases. However, 15% of subjects did not believe verbal instructions, rendering data from them difficult to interpret (Rohsenow & Marlatt, 1981). For example, it was not determined when they became suspicious, or why they did not believe instructions (e.g., two subjects did not believe accurate



Table 5  
Number of Subjects Who Believed Instructions/Total Number of Subjects Per Cell

	LABORATORY		BAR	
	Told Alcohol	Told No Alcohol	Told Alcohol	Told No Alcohol
Given Alcohol	10	10	8	8
	<hr/>	<hr/>	<hr/>	<hr/>
	10	15	8	10
Given No Alcohol	10	9	8	8
	<hr/>	<hr/>	<hr/>	<hr/>
	11	12	10	8

# 2



instructions). Because it is the effect of the subject's belief, as manipulated by verbal instructions, that is of interest, it has been recommended that data from non-believers be dropped from the analysis (e.g., Higgins & Marlatt, 1975; Rohsenow & Marlatt, 1981; Sutker, Allain, Brantley, & Randall, 1982). Therefore, to facilitate clear interpretation of results, the primary analysis in this thesis was conducted on data from subjects who reported believing verbal instructions regarding the alcohol content of administered beverages. Analysis including data from all subjects is presented in Appendix XVI.

While the above internal analysis was chosen for the reasons stated, there are several potential problems that need to be addressed. First, it is possible that systematic self-selection to conditions occurred because different types of subjects were more or less likely to believe instructions in particular conditions. For example, relatively heavy drinkers may be more likely than relatively light drinkers to suspect deception in the Told No Alcohol/Given Alcohol conditions due to their greater experience with alcohol. On the other hand, it is possible that relatively light drinkers would be more suspicious than relatively heavy drinkers in the Told Alcohol/Given No Alcohol conditions due to their lower tolerance to the pharmacological effects of alcohol, and consequent higher probability of expecting to detect pharmacological effects of alcohol at relatively low doses. If this situation occurred, a greater number of frequent drinkers

would be left in Told Alcohol conditions. Because greater frequency of drinking would theoretically lead to stronger conditioned responses to alcohol-associated environmental cues, these individuals would be expected to show greater effects in barroom conditions, thus leading to difficulty interpreting results.

To address this potential problem, the drinking practices of subjects in various conditions were examined. Subjects' average number of drinks per week, and number of years of regular drinking were possible contributors to self-selection bias by virtue of affecting subjects' ability to detect deception in specific conditions. Therefore, data gathered during the telephone interview regarding these variables were subjected to analysis. Additionally, subjects' body weights were also potential contributors to self-selection bias because lighter persons achieve higher blood alcohol concentrations than heavier persons at equal doses. This could also lead to differences in ability to detect deception in specific conditions. Therefore, data on subjects' body weights were also analyzed. Table 6 presents the cell means for these three variables.

Three-way analysis of variance was conducted with the average number of drinks per week as the dependent variable, and beverage, setting and instructions as the independent variables. Subjects included in the main analysis were included in this analysis. Results indicated no significant differences across conditions. Table 7 presents the analysis of variance table.

Three-way analysis of variance was also conducted with the number of years of regular drinking as the dependent variable,

Table 6

Characteristics of Subjects Included in Main Analysis

	<u>LABORATORY</u>			
	Told Alcohol Given Alcohol (n=10)	Told Alcohol Given No Alcohol (n=10)	Told No Alcohol Given Alcohol (n=10)	Told No Alcohol Given No Alcohol (n=9)
$\bar{x}$ Drinks/Week	21.40	19.15	22.08	21.00
$\bar{x}$ Years Drank Regularly	3.55	2.65	3.40	2.67
$\bar{x}$ Weight (lbs)	178.2	166.4	168.1	165.0

	<u>BARROOM</u>			
	Told Alcohol Given Alcohol (n=8)	Told Alcohol Given No Alcohol (n=8)	Told No Alcohol Given Alcohol (n=8)	Told No Alcohol Given No Alcohol (n=8)
$\bar{x}$ Drinks/Week	20.28	16.41	18.78	19.41
$\bar{x}$ Years Drank Regularly	4.50	3.19	3.06	3.56
$\bar{x}$ Weight (lbs)	173.6	168.5	168.6	166.3

**Table 7**  
**Analysis of Group Differences in Average Number of Drinks per Week (ANOVA)**

<b>Source of Variation</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Significance of F</b>
<b>Main Effects</b>					
BEVERAGE	48.739	1	48.739	.794	.376
INSTRUCTIONS	18.566	1	18.566	.303	.584
SETTING	83.275	1	83.275	1.357	.248
<b>2-Way Interactions</b>					
BEVERAGE x INSTRUCTIONS	31.724	1	31.724	.517	.475
BEVERAGE x SETTING	.001	1	.001	.000	.996
INSTRUCTIONS x SETTING	1.246	1	1.246	.020	.887
<b>3-Way Interactions</b>					
BEVERAGE x INSTRUCTIONS x SETTING	12.134	1	12.134	.198	.658
RESIDUAL	3865.025	63	61.350		
TOTAL	4062.097	70	58.030		

using the same independent variables as the previous analysis. Results indicated no significant differences across conditions (see Table 8). Finally, similar analysis using body weight as the dependent variable revealed no significant differences (see Table 9).

The above results indicate that subjects included in the main analysis did not differ significantly across conditions on the average number of drinks per week, years of regular drinking, or body weight.

To further address the issue of self-selection bias, the mean number of drinks per week, years of regular drinking, and body weight of subjects who believed instructions were compared to the corresponding means for subjects who did not believe instructions. Means are presented in Table 10. Pairwise  $t$ -tests indicated no significant difference between the two groups on average number of drinks per week ( $t_{(82)} = .008$ , n.s.), years of regular drinking ( $t_{(82)} = 0.92$ , n.s.), or body weight ( $t_{(82)} = 1.08$ , n.s.). Thus, "non-believers" do not appear to differ from "believers" on variables potentially relevant to influencing the success of deceptive verbal instructions.

Finally, Table 11 presents cell means for believers and non-believers to permit more detailed inspection of the data. Because the number of subjects per cell who did not believe instructions was quite small statistical analysis was not done. However, consistent self-selection bias is not apparent from inspection of the data.

Table 8

Analysis of Group Differences in Years of Regular Drinking (ANOVA)

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	6.263	1	6.263	2.876	.095
INSTRUCTIONS	1.776	1	1.776	.815	.370
SETTING	3.816	1	3.816	1.752	.190
<b>2-Way Interactions</b>					
BEVERAGE x INSTRUCTIONS	4.379	1	4.379	2.010	.161
BEVERAGE x SETTING	1.067	1	1.067	.490	.487
INSTRUCTIONS x SETTING	1.424	1	1.424	.654	.422
<b>3-Way Interactions</b>					
BEVERAGE x INSTRUCTIONS x SETTING	3.689	1	3.689	1.694	.198
RESIDUAL	137.213	63	2.178		
TOTAL	159.366	70	2.277		



**Table 9**  
**Analysis of Group Differences in Body Weight (ANOVA)**

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	893.578	1	893.578	2.289	.135
INSTRUCTIONS	348.237	1	348.237	.892	.349
SETTING	1.582	1	1.582	.004	.949
<b>2-way Interactions</b>					
BEVERAGE x INSTRUCTIONS	37.812	1	37.812	.097	.757
BEVERAGE x SETTING	.690	1	.690	.002	.967
INSTRUCTIONS x SETTING	29.032	1	29.032	.074	.786
<b>3-way Interactions</b>					
BEVERAGE x INSTRUCTIONS x SETTING	150.245	1	150.245	.385	.537
RESIDUAL	24596.650	63	390.423		
TOTAL	26041.718	70	372.025		

Table 10

Characteristics of Believers and Non-Believers  
of Instructions

---

	<u>Believed Instructions</u>	
	<u>YES</u> (n=71)	<u>NO</u> (n=13)
$\bar{x}$ ( $\pm$ S.E.M.) Drinks per week	19.9 ( $\pm$ 0.9 )	19.3 ( $\pm$ 2.3 )
$\bar{x}$ ( $\pm$ S.E.M.) Years drank regularly	3.3 ( $\pm$ 0.19)	3.0 ( $\pm$ 0.31)
$\bar{x}$ ( $\pm$ S.E.M.) Weight (lbs)	169.3 ( $\pm$ 2.3 )	162.7 ( $\pm$ 4.8 )

---

Table 11

Characteristics of Believers and Non-Believers of Instructions per Cell

	LABORATORY			
	Told Alcohol		Told No Alcohol	
	Believers (n=10)	Non- Believers (n=0)	Believers (n=10)	Non- Believers (n=5)
Given Alcohol				
$\bar{x}$ drinks/week	21.4	---	22.1	17.8
$\bar{x}$ years drank regularly	3.5	---	3.4	2.1
$\bar{x}$ weight (lbs)	177.7	---	168.1	172.2
Given No Alcohol				
$\bar{x}$ drinks/week		(n=1)	(n=9)	(n=3)
$\bar{x}$ years drank regularly	19.2	30.1	21.0	12.3
$\bar{x}$ weight (lbs)	2.6	2.5	2.7	4.75
	166.4	153.0	165.0	172.0
	BARROOM			
	Told Alcohol		Told No Alcohol	
	Believers (n=8)	Non- Believers (n=0)	Believers (n=8)	Non- Believers (n=2)
Given Alcohol				
$\bar{x}$ drinks/week	20.3	---	18.9	22.0
$\bar{x}$ years drank regularly	4.5	---	3.0	2.5
$\bar{x}$ weight (lbs)	173.6	---	168.6	150.0
Given No Alcohol				
$\bar{x}$ drinks/week		(n=0)	(n=8)	(n=0)
$\bar{x}$ years drank regularly	16.4	16.8	19.4	---
$\bar{x}$ weight (lbs)	3.2	4.3	3.6	---
	168.4	153.3	166.3	---

Taken together, the above findings indicate that systematic self-selection to conditions based on differences in usual alcohol consumption, drinking history, and body weight is unlikely to have occurred.

A second potential problem results from the possibility that subjects who are more aware of internal sensations may be more suspicious than those who are not. If so, it would be difficult to generalize findings beyond suggestible, or less sensitive, types of individuals. While data addressing this issue were not gathered in this study, the vast majority of subjects did believe verbal instructions, and therefore, findings would probably generalize to the majority of individuals. Furthermore, discussion with "non-believers" during the debriefing period indicated that subjects become suspicious for a wide variety of reasons. For example, there were several regular Black Label drinkers who became suspicious because, while the beverage tasted like beer, it did not taste like Black Label. Some subjects, in particular those who did not believe accurate instructions, reported being suspicious of any psychological research due to their knowledge of the common use of deception in experimental designs. Also, several subjects became suspicious when they saw the form asking them to indicate the alcohol content of their beverages.

As a final point, the pattern of results did not change, regardless of whether all subjects were included in the analysis, except where effects of subjects' beliefs occurred. This makes

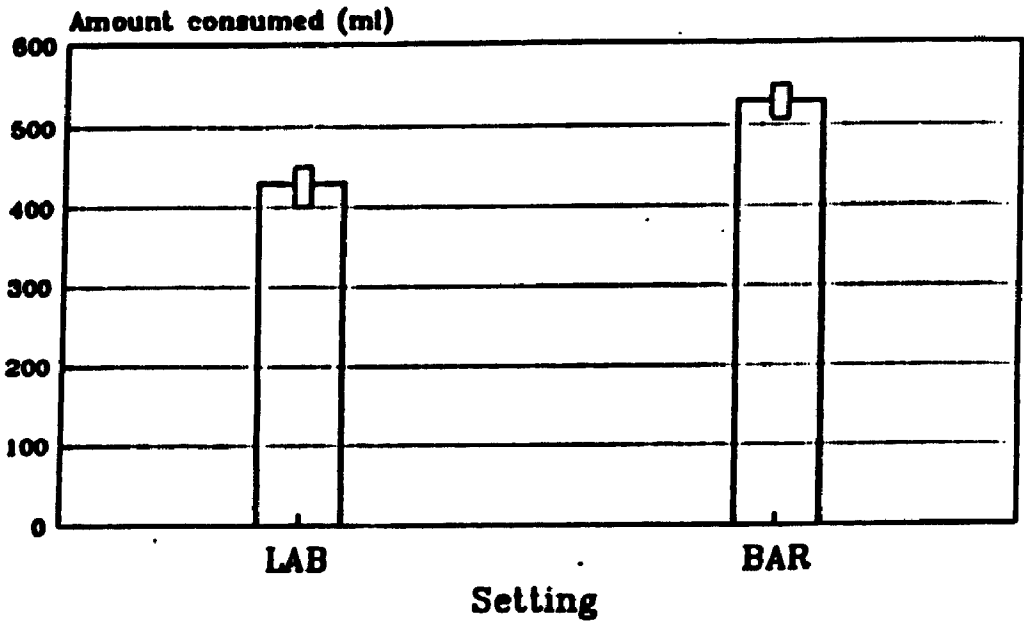
sense, as subjects who were Told Alcohol but believed they were drinking no alcohol, and subjects who were Told No Alcohol but believed they were drinking alcohol, might have been more appropriately reassigned to the groups consistent with their beliefs, as this was the variable of interest. However, because their beliefs changed at various points during the experiment such assignment would still lead to confusion in interpretation of results. Therefore, it is argued that the analysis conducted here is most appropriate when all factors are taken into consideration.

#### Behavioural Measures

The amount of beverage consumed variable was entered in a three-way analysis of variance (ANOVA) with beverage, setting, and instructions as the independent variables (SPSSX, 1986, p. 450). Results indicated a main effect of setting ( $F(1,63) = 10.549, p = .002$ ) demonstrating that, overall, subjects participating in the barroom setting consumed significantly more of their beverages ( $\bar{X} = 528.8$  ml) than did subjects participating in the laboratory setting ( $\bar{X} = 425.6$  ml) (see Figure 3). The ANOVA table is presented in Table 12. Results also indicated a main effect of instructions ( $F(1,63) = 4.980, p = .029$ ) demonstrating that, overall, subjects who believed they had consumed real beer drank significantly more of their beverages ( $\bar{X} = 506.6$  ml) than did subjects who believed they had consumed dealcoholized beer ( $\bar{X} = 436.7$  ml) (see Figure 4).

Results of the ANOVA also revealed a significant setting x instructions interaction effect ( $F(1,63) = 3.978, p = .05$ ). This pattern of results justified pairwise comparisons within these

**Figure 3: Main effect of setting on amount consumed**



**Figure 4: Main effect of instructions on amount consumed**

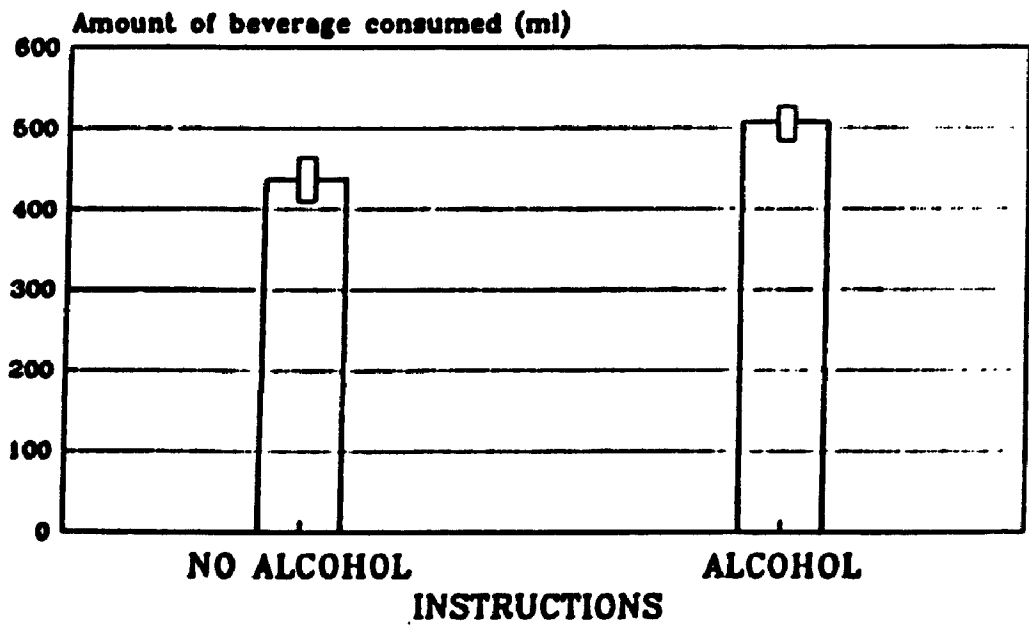


Table 12

Main Effects of Setting and Instructions on Alcohol Consumption, and  
an Interaction Effect of Setting x Instructions on Alcohol Consumption

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	520.008	1	520.008	0.029	0.866
SETTING	190200.453	1	190200.453	10.549	0.002
INSTRUCTIONS	89783.343	1	89783.343	4.980	0.029
<b>2-Way Interactions</b>					
BEVERAGE x SETTING	658.811	1	658.811	0.037	0.849
BEVERAGE x INSTRUCTIONS	29.557	1	29.557	0.002	0.968
SETTING x INSTRUCTIONS	71716.843	1	71716.843	3.978	0.050
<b>3-Way Interactions</b>					
BEVERAGE x SETTING x INSTRUCTIONS	5170.936	1	5170.936	0.287	0.594
RESIDUAL	1135896.689	63	18030.106		
TOTAL	1491407.859	70	21305.827		

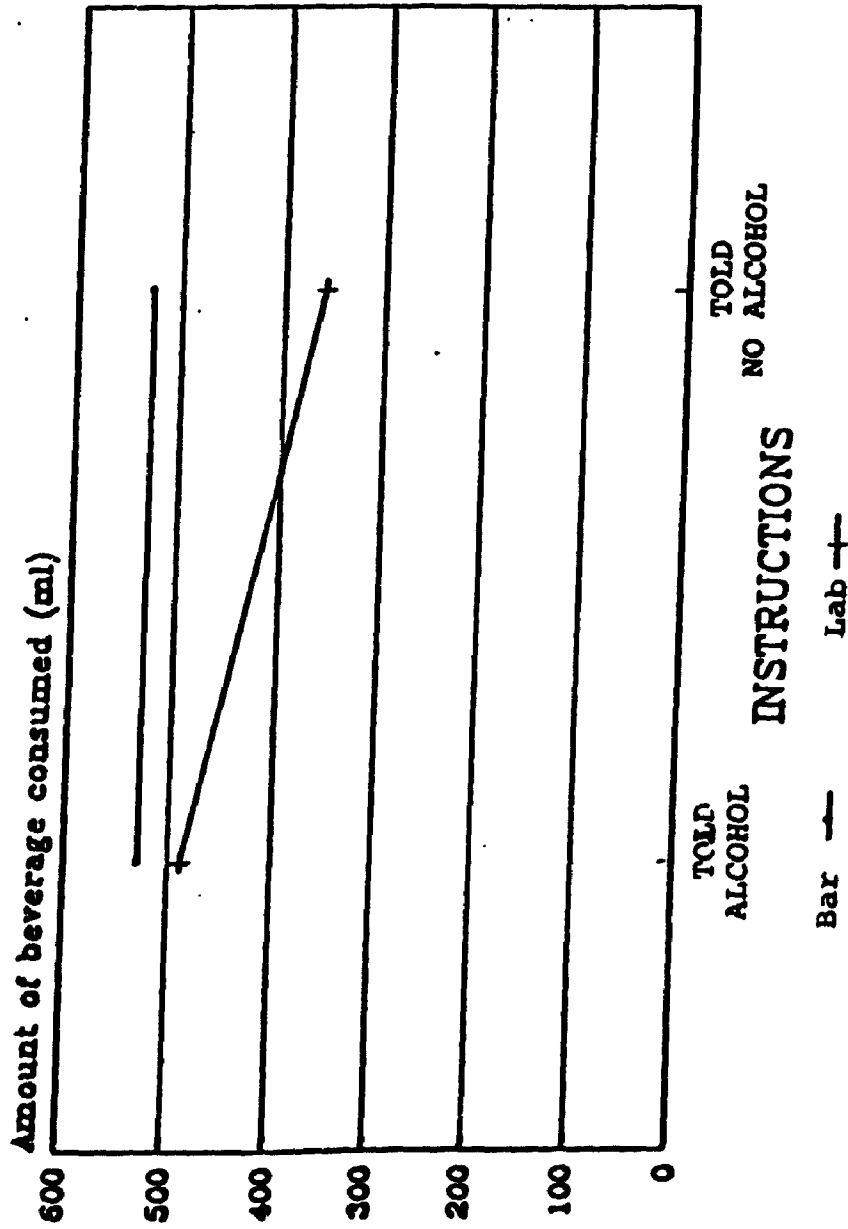
levels. As there were four planned comparisons of interest the Dunn method was used (Marascuilo & Serlin, 1988). Comparison of mean alcohol consumption in the Told Alcohol/Lab condition ( $\bar{X} = 488.5$  ml) with mean alcohol consumption in the Told No Alcohol/Lab condition ( $\bar{X} = 359.5$  ml) indicated that subjects in the Told Alcohol/Lab condition drank significantly more beverage than did subjects in the Told No Alcohol/Lab condition, regardless of the beverage received ( $t(1,63) = 3.00, p < .05$ ). This result is presented in Figure 5, and replicates previous findings obtained using the balanced placebo design in laboratory settings (Marlatt & Gordon, 1985). That is, alcohol consumption is influenced by subjects' beliefs regarding the alcohol content of their beverages, rather than the actual alcohol content.

In contrast to the above, comparing mean alcohol consumption in the Told Alcohol/Bar condition ( $\bar{X} = 529.3$  ml) to mean alcohol consumption in the Told No Alcohol/Bar condition ( $\bar{X} = 528.4$  ml) revealed no significant difference ( $t(1,63) = .019, n.s.$ ). This finding indicates that instructions regarding beverage content did not significantly influence alcohol consumption in the barroom setting (see Figure 5).

Using the Dunn method, pairwise comparisons of mean alcohol consumption in the Told Alcohol/Lab condition ( $\bar{X} = 488.5$  ml) with mean alcohol consumption in the Told Alcohol/Bar condition ( $\bar{X} = 529.3$  ml) revealed no significant difference ( $t(1,63) = 0.91, n.s.$ ), while pairwise comparison of mean alcohol consumption in the Told No Alcohol/Lab condition ( $\bar{X} = 359.5$  ml) with mean alcohol



Figure 5: Interaction of setting and instructions on amount consumed



consumption in the Told No Alcohol/Bar condition ( $X = 528.4$  ml) revealed a significant difference ( $t(1,63) = 3.71, p < .01$ ) (see Figure 5). These results indicate that subjects who believed they were consuming real beer drank similar amounts in the laboratory and barroom settings, while subjects who reported believing they were consuming dealcoholized beer in the laboratory setting drank significantly less beverage than did subjects who reported believing they were drinking dealcoholized beer in the barroom setting.

In addition to data on alcohol consumption, complete sets of data for the time to first sip variable and the total number of sips variable were recorded. These variables were entered in separate analyses of variance with beverage, setting and instructions as independent variables (SPSSX, 1986, p. 476). Univariate tests of significance revealed a significant effect of setting on the time to first sip variable ( $F(1,63) = 4.81, p = .033$ ) (see Table 13), indicating that subjects participating in the barroom setting began drinking sooner ( $x = 0.81$  min) than did subjects participating in the laboratory setting ( $x = 1.59$  min). A univariate F-test showed no significant difference on the total number of sips variable ( $F(1,63) = 1.88, N.S.$ ).

Table 13

Main Effect of Setting on the Time to First Sip

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Univariate F-test with (1,63) D.F.

<u>Variable</u>	<u>Hypoth. SS</u>	<u>Error SS</u>	<u>Hypoth. MS</u>	<u>Error MS</u>	<u>F</u>	<u>Significance of F</u>
Time to First Sip	8.614	126.412	8.112	1.417	4.812	.033

---

### Self-Report Measures

#### 1) Present Feelings Questionnaire

Pretest scores on the Present Feelings Questionnaire were analysed to determine reliability of the Stimulation/Perceived Dominance, Pleasurable Disinhibition, and Behavioural Impairment scales. Reliability coefficients for the scales, estimated by Cronbach's alpha, were .67, .76, and .70 respectively. These coefficients from the present sample of 84 heavy drinking undergraduate males compare to .81, .82, and .80 respectively, when the scales were originally constructed using a five-point scale and a sample of 253 undergraduates, comprised of 121 females, and 104 males whose drinking habits varied from abstinence to heavy drinking (Southwick et al., 1981). Smaller alphas in the present study probably result from the smaller sample size, and more restricted range of alcohol consumption among these subjects.

#### Analysis of Variance

To determine whether changes on the Stimulation Perceived Dominance, Pleasurable Disinhibition, and Behavioural Impairment scales of the Present Feelings Questionnaire were differentially influenced by the independent variables-- beverage, setting, and instructions, separate analysis of variance with pretest scores as covariates was conducted (SPSSX, 1986, p. 544). Two subjects per scale did not provide a full data set due to missed items, and were therefore excluded from the analysis.

Posttest scores on the Stimulation/Perceived Dominance scale of the Present Feelings Questionnaire were entered into an analysis of variance with Beverage, Instructions, and Setting as independent variables, and pretest scores on the Stimulation/Perceived Dominance scale as covariates. Results indicated no significant differences among the conditions, and are presented in Table 14.

Pleasurable Disinhibition scores were analysed in similar fashion, and results indicated a significant beverage x setting interaction ( $F(1,60) = 4.76, p = .033$ ). Table 15 presents the ANCOVA results. The four adjusted posttest means (see Table 16) were compared using the Newman-Keuls Multiple-Range test (Marascuilo & Serlin, 1988), and results indicated no significant differences among the means. Therefore, the trend seems to indicate that subjects who received alcohol in the bar (i.e., Given Alcohol/Bar) experienced greater pleasurable disinhibition than did subjects who received alcohol in the lab (i.e., Given Alcohol/Lab), as lower scores indicate greater pleasurable disinhibition. However, it appears that further investigation is required to make any conclusive statement.

Analysis of variance on posttest scores from the Behavioural Impairment scale was also conducted, with pretest scores on the Behavioural Impairment scale as covariates. Results indicated a significant beverage x instructions interaction ( $F(1,60) = 5.05, p = .028$ ). Table 17 presents the ANCOVA results.

**Table 14**  
**Analysis of Covariance Stimulation/Perceived Dominance Scores**

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	15475.68	1	15475.68	1.648	.204
SETTING	40.72	1	40.72	.004	.948
INSTRUCTIONS	45.64	1	45.64	.005	.945
<b>2-Way Interactions</b>					
BEVERAGE x SETTING	8485.96	1	8485.96	.903	.346
BEVERAGE x INSTRUCTIONS	3838.88	1	3838.88	.409	.525
SETTING x INSTRUCTIONS	2195.12	1	2195.12	.234	.631
<b>3-Way Interactions</b>					
BEVERAGE x SETTING x INSTRUCTIONS	6710.06	1	6710.06	.714	.401
RESIDUAL	563584.533	60	9393.076		
TOTAL	694698.812	68	10216.159		

**Table 15**  
**Beverage x Setting Interaction on the Pleasurable Disinhibition Scale (ANCOVA)**

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	205.13	1	205.13	0.041	0.840
SETTING	9129.07	1	9129.07	1.838	0.180
INSTRUCTIONS	4964.56	1	4964.56	0.999	0.321
<b>2-way Interactions</b>					
BEVERAGE x SETTING	23628.26	1	23628.26	4.76	0.033
BEVERAGE x INSTRUCTIONS	243.41	1	243.41	0.05	0.826
SETTING x INSTRUCTIONS	9770.66	1	9770.66	1.97	0.166
<b>3-way Interactions</b>					
BEVERAGE x SETTING x INSTRUCTIONS	6134.79	1	6134.79	1.24	0.27
RESIDUAL	298025.56	60	4967.09		
TOTAL	580632.20	68	8538.71		

Table 16

Mean Scores and Adjusted Mean Scores ( )  
on the Pleasurable Disinhibition Scale

	LABORATORY		BAR	
	Pretest	Posttest	Pretest	Posttest
Given Alcohol	503.1 n = 20	499.7 (509.9)	532.3 n = 15	455.4 (449.8)
Given. No Alcohol	559.4 n = 18	500.4 (480.2)	493.8 n = 16	478.8 (494.0)



**Table 17**  
**Beverage x Instructions Interaction on the Behavioral Impairment Scale (ANCOVA)**

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	4412.99	1	4412.99	0.94	0.336
SETTING	9351.24	1	9351.24	1.99	0.163
INSTRUCTIONS	10564.05	1	10564.05	2.25	0.139
<b>2-Way Interactions</b>					
BEVERAGE x SETTING	1468.77	1	1468.77	0.31	0.578
BEVERAGE x INSTRUCTIONS	23685.89	1	23685.89	5.05	0.028
SETTING x INSTRUCTIONS	9334.33	1	9334.33	1.99	0.163
<b>3-Way Interactions</b>					
BEVERAGE x SETTING x INSTRUCTIONS	670.11	1	670.11	1.43	0.707
RESIDUAL	281275.09	60	4687.92		
TOTAL	566279.07	68	8327.63		

The four adjusted posttest means (see Table 18) were compared using the Newman-Keuls Multiple-Range test (Marascuilo & Serlin, 1988), and results indicated that the mean score of the Told No Alcohol/Given No Alcohol condition was significantly greater than each of the mean scores of the Told Alcohol/Given Alcohol, Told Alcohol/Given No Alcohol, and Told No Alcohol/Given Alcohol conditions ( $p < .05$ ). Because lower scores indicate greater behavioural impairment, these results show that, regardless of setting, subjects who were either given alcohol, told alcohol, or both, reported experiencing greater behavioural impairment than did subjects who were both given no alcohol and told no alcohol.

ii) Craving Measures

Subjects' posttest scores on the scale ranging from 0 to 100, anchored by "no desire for an alcoholic beverage", and "extreme desire for an alcoholic beverage", respectively, were entered in 3-way analysis of variance with pretest scores as covariates. Results indicated no significant differences among these scores. The ANCOVA results are presented in Table 19.

iii) Subjective Drunkenness

Subjects responses to the question, "On a scale from 0 to 100, with 0 indicating complete sobriety and 100 indicating extreme drunkenness, how drunk do you feel right now?", were entered in a 3-way ANOVA with beverage, setting, and instructions as independent variables. The ANOVA table is presented in Table 20.

Results indicated a significant main effect of instructions ( $F(1,69) = 11.36, p = .001$ ). These results are presented in

Table 18

Mean Scores and Adjusted Mean Scores ( ) on the  
Behavioural Impairment Scale

	GIVEN ALCOHOL		GIVEN NO ALCOHOL	
	Pretest	Posttest	Pretest	Posttest
Told Alcohol	641.7	599.3	630.0	573.0
	n = 18	(588.7)	n = 15	(581.7)
Told No Alcohol	666.9	604.6	634.2	638.8
	n = 17	(588.7)	n = 16	(644.8)

**Table 19**  
**Analysis of Covariance on Craving Scores**

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	0.09	1	0.09	0.00	0.985
SETTING	73.89	1	73.89	0.29	0.590
INSTRUCTIONS	816.57	1	816.57	3.25	0.077
<b>2-Way Interactions</b>					
BEVERAGE x SETTING	898.32	1	898.32	3.57	0.064
BEVERAGE x INSTRUCTIONS	2.50	1	2.50	0.01	0.921
SETTING x INSTRUCTIONS	175.74	1	175.74	0.70	0.407
<b>3-way Interactions</b>					
BEVERAGE x SETTING x INSTRUCTIONS	635.85	1	635.85	2.60	0.112
RESIDUAL	15346.18	61			
TOTAL	24097.37	69			

**Table 20**  
**Main Effects of Setting and Instructions on Subjective Drunkenness (ANOVA)**

<u>Source of Variation</u>	<u>Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Significance of F</u>
<b>Main Effects</b>					
BEVERAGE	88.08	1	88.08	1.162	0.285
SETTING	329.71	1	329.71	4.351	0.041
INSTRUCTIONS	861.31	1	861.31	11.366	0.001
<b>2-Way Interactions</b>					
BEVERAGE x SETTING	26.68	1	26.68	0.352	0.555
BEVERAGE x INSTRUCTIONS	0.39	1	0.39	0.005	0.943
SETTING x INSTRUCTIONS	13.38	1	13.38	0.177	0.676
<b>3-Way Interactions</b>					
BEVERAGE x SETTING x INSTRUCTIONS	54.11	1	54.11	0.714	0.401
RESIDUAL	4698.13	62	75.78		
TOTAL	6093.27	69	88.31		

Figure 6. The mean score for condition Told Alcohol was 16.28, while the mean score for condition Told No Alcohol was 9.21, indicating that those subjects in either setting who believed they had consumed alcohol, regardless of whether they actually had, reported feeling more intoxicated than did subjects who did not believe they had consumed alcohol.

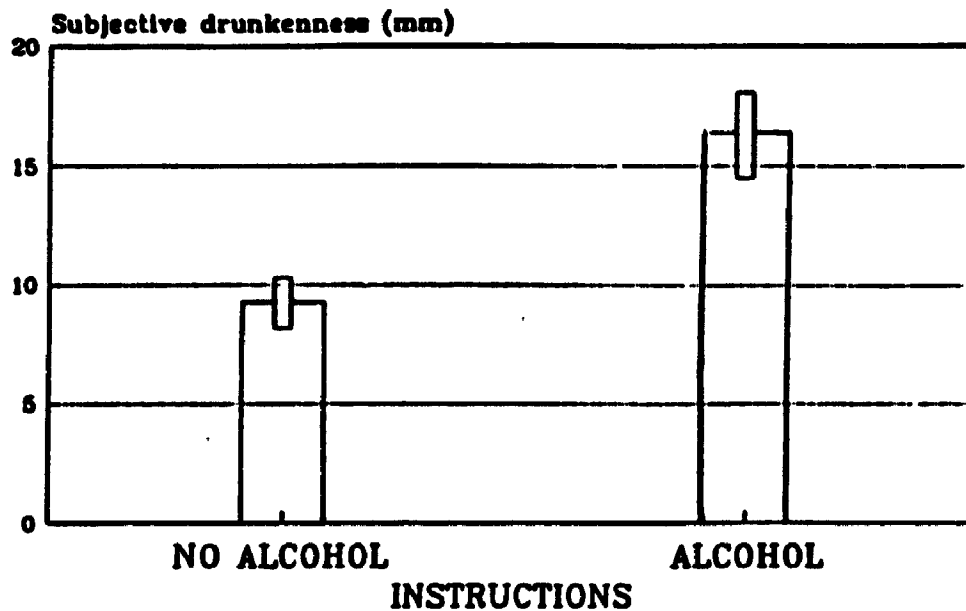
A significant main effect of setting was also indicated ( $F(1,69) = 4.35, p = .041$ ). These results are presented in Figure 7. The mean score for subjects in the laboratory setting was 14.95, while the mean score for subjects in the barroom setting was 10.34, indicating that subjects participating in the laboratory setting reported feeling more intoxicated than did subjects participating in the barroom setting, regardless of which beverage or instructions they received.

#### Difference in Blood Alcohol Concentration and Amount Consumed:

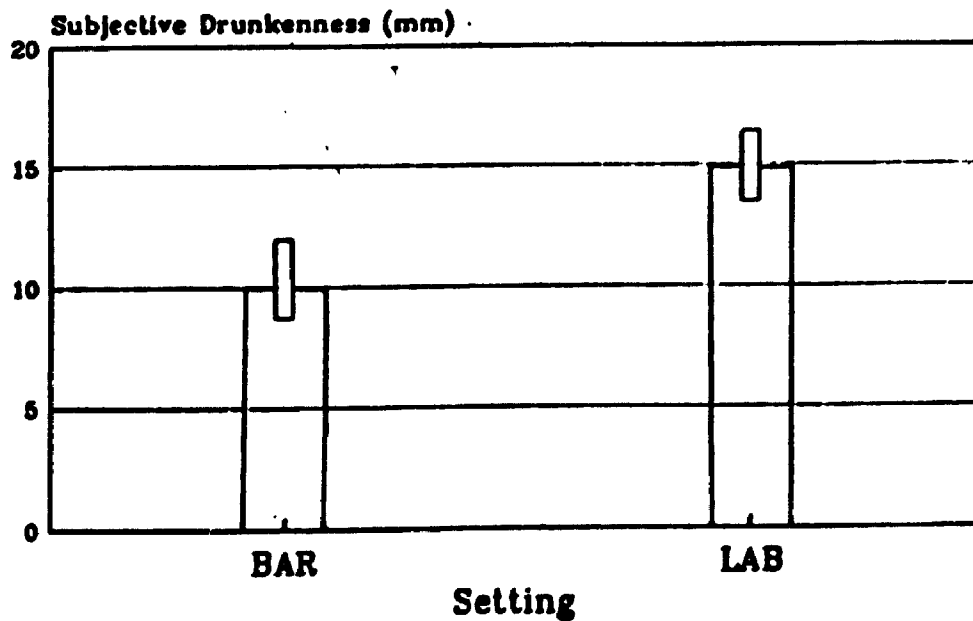
##### The Effect on Subjective Measures

While beverage consumption and self-report have previously been treated as dependent measures in the same experiment (Berg et al., 1981; Marlatt et al., 1973), the potential influence that differences in beverage consumption and blood alcohol concentration (BAC) may have on self-report measures has not been addressed. This is viewed as being particularly important, however, to determining whether effects obtained on self-report measures are due to manipulation of the independent variables, or to differences in amount of beverage consumed or BAC. Therefore, correlational

**Figure 6: Main effect of instructions on subjective drunkenness**



**Figure 7: Main effect of setting on subjective drunkenness**



analysis and where appropriate, analysis of covariance, were conducted to address this issue.

i) Blood Alcohol Concentration Data

Before presentation of the following analysis, inclusion of data on BACs obtained in the present research was felt to be important to facilitate understanding of effects that might be anticipated due to differences in this variable. First, BACs obtained in previous research using the balanced placebo design have ranged from 30 mg% to 100 mg% (Marlatt & Rohsenow, 1980). BACs estimated in the present study fell within this range, as the mean BAC for subjects in groups receiving alcohol was 31.4 mg%. Means for groups Told Alcohol/Given Alcohol/Bar, Told No Alcohol/Given Alcohol/Bar, Told Alcohol/Given Alcohol/Lab, and Told No Alcohol/Given Alcohol/Lab were 31.6, 34.9, 31.6, and 28.8 mg%, respectively. The range was from 16.6 mg% to 40.0 mg%. At these BACs, subjects may experience lowered alertness and a pleasant euphoric feeling (Blum, 1984). This level of intoxication would not lead to gross behavioural impairment.

These BACs fall at the low end of the usual range due to ethical considerations, as the UWO Health Sciences Standing Committee on Human Research required that subjects' BACs not exceed the legal limit for driving of 80 mg%. Consumption of three bottles of beer within an hour by a male weighing less than 68 kg (150 lbs) would result in a BAC exceeding 80 mg%. Therefore, a maximum of two bottles of beer was chosen.



ii) Beverage x Setting Interaction on the Pleasurable Disinhibition Scale

To investigate whether the obtained beverage x setting interaction on the Pleasurable Disinhibition scale was influenced by differences in amount of beverage consumed, partial correlational analysis was conducted (SPSSX, 1986, p.648 ) to determine whether posttest scores on the pleasurable disinhibition scale were correlated with amount of beverage consumed, regardless of alcohol content. Pretest scores on the pleasurable disinhibition score were partialled out to control for pretest differences among subjects on this measure. Results indicated a significant negative correlation ( $r = -.2184$ ,  $p = .037$ , one-tailed), suggesting that pleasurable disinhibition scores decreased (indicating greater pleasurable disinhibition) as amount of beverage consumed increased. Thus, it appears that for the beverage x setting interaction on the pleasurable disinhibition scale, amount of beverage consumed was a potential confounding variable.

The above problem was addressed statistically by performing analysis of covariance with beverage, setting, and instructions as independent variables, and pretest pleasurable disinhibition scores and amount consumed as covariates. Results indicated a significant beverage x setting interaction ( $F(1,63) = 4.88$ ,  $p = .031$ ), suggesting that even when subjects are statistically equated for amount consumed, the effect persists. In fact, the pattern of

adjusted posttest means in this analysis was similar to the pattern of adjusted posttest means in the previous analysis that excluded amount consumed as a covariate. However, as in the previous analysis, results of comparison of the four adjusted posttest means using the Newman-Keuls Multiple-Range Test (Marascuilo & Serlin, 1988) revealed no significant differences.

To investigate whether the obtained beverage x setting interaction on the pleasurable disinhibition scale was influenced by differences in subjects' BACs in groups where alcohol was given, the correlation between pleasurable disinhibition scores and BAC was examined. Pretest scores on this scale were partialled out to control for pretest differences among subjects on this measure. Results indicated a significant correlation ( $r = .4304$ ,  $p = .006$ , one-tailed) showing that greater pleasurable disinhibition was associated with higher blood alcohol concentration.

Taken together, results of the above analysis suggest that subjects who consumed greater amounts of their beverages, and who obtained higher BACs in groups where alcohol was given, experienced greater pleasurable disinhibition. However, when amount of beverage consumed was entered as an additional covariate in the analysis of covariance, the pattern of results did not change. This suggests that the obtained beverage x setting interaction effect was not due to the influence of differences in the amount of beverage consumed. Nevertheless, significant differences in adjusted posttest means were not obtained, suggesting that further work is required to make a definitive statement regarding the possible nature of the effect. Finally, the significant

correlation between BAC and pleasurable disinhibition suggests that administration of standard doses of alcohol in alcohol conditions would permit clearer interpretation of the effects of alcohol vs. no alcohol on the pleasurable disinhibition measure. As mentioned previously, this was not done in this study because alcohol consumption was the dependent measure of primary interest.

iii) Beverage x Instructions Interaction on the Behavioural Impairment Scale

To investigate whether the obtained beverage x instructions interaction on the behavioural impairment scale was influenced by differences in amount of beverage consumed, the correlation between behavioural impairment and amount of beverage consumed was examined. Pretest scores on this scale were partialled out to control for pretest differences among subjects on this measure (SPSSX, 1986, p. 648). Results indicated a significant negative correlation ( $r = -.2145$ ,  $p = .039$ , one-tailed) suggesting that greater beverage consumption was associated with greater self-reported behavioural impairment, as lower scores indicate greater impairment. Therefore, for the beverage x instructions interaction on the behavioural impairment scale, amount of beverage consumed was a potentially confounding variable.

The above problem was addressed statistically by performing analysis of covariance with beverage, setting, and instructions as independent variables, and pretest behavioural impairment scores and amount consumed as covariates. Results indicated a significant beverage x instructions interaction ( $F(1,63) = 4.83$ ,  $p = .032$ ). The pattern of adjusted means did not differ from the previous

analysis which excluded amount consumed as a covariate, and post hoc comparisons using the Newman-Keuls Multiple-Range Test (Marascuilo & Serlin, 1988) indicated the same pattern of results. The mean score of the Told No Alcohol/Given No Alcohol group was significantly greater than the mean scores of the Told Alcohol/Given Alcohol, Told Alcohol/Given No Alcohol, and Told No Alcohol/Given Alcohol groups ( $p < .05$ ). This suggests that subjects who were either given alcohol, told alcohol, or both, reported greater behavioural impairment than did subjects who neither received nor were told they were receiving alcohol, even when differences in the amount of beverage consumed were statistically controlled for. Therefore, the obtained beverage x instructions interaction on the behavioural impairment scale was not due to the influence of differences in the amount of beverage consumed.

To investigate whether the obtained beverage x instructions interaction on the behavioural impairment scale was influenced by differences in subjects' BACs in groups where alcohol was given, the correlation between behavioural impairment scores and BAC was examined. Pretest scores on this scale were partialled out to control for pretest differences among subjects on this measure. Results indicated no significant correlation ( $r = -.1458$ , n.s.).

Taken together, the above analyses suggest that the beverage x instructions interaction on the behavioural impairment scale was due to manipulation of the independent variables, rather than due to differences in amount of beverage consumed, or differences in BACs among subjects who received alcohol.

iv) Main Effects of Setting and Instructions on Subjective Drunkenness

The main effect of instructions on subjective drunkenness indicated that subjects who believed they were consuming alcohol reported greater drunkenness than did subjects who believed they were drinking dealcoholized beer. However, because subjects who believed they were consuming alcohol consumed more of their beverages than did subjects who believed they were consuming dealcoholized beer, one could argue that differences in amount of beverage consumed contributed to producing the effect, rather than manipulation of the independent variable. To address this problem the correlation between amount consumed and subjective drunkenness was examined. Results indicated no significant correlation ( $r = .1417$ , n.s.). Additionally, analysis of covariance with amount consumed as a covariate was conducted, and the pattern of results did not change from the previous analysis. Self-reported subjective drunkenness was greater among subjects who believed they were consuming alcohol (adjusted  $x = 16.3$ ) than among subjects who believed they were consuming dealcoholized beer (adjusted  $x = 9.1$ ) ( $F(1,66) = 10.49$ ,  $p = .002$ ).

The correlation between subjective drunkenness and BAC among subjects who received alcohol was also examined, and no significant correlation was indicated ( $r = .1233$ , n.s.). This suggests that differences in subjects' blood alcohol concentration were not responsible for the obtained effects.

For the main effect of setting on subjective drunkenness, it is also unlikely that differences in amount of beverage consumed,

or BAC among subjects who received alcohol, were responsible for the obtained effect. Not only were there no significant correlations between the dependent measure and amount of beverage consumed or BAC, but greater subjective drunkenness was reported in the laboratory setting where lower beverage consumption scores and BACs were obtained.

## CHAPTER VIII

### Discussion

#### General Conclusions

In this thesis, investigation of the effect of the interaction between pharmacological, cognitive, and environmental variables on alcohol-related behaviour resulted in a number of significant findings. Most importantly, subjects not only began drinking sooner and consumed significantly more of their beverages in the barroom setting, but their reported beliefs regarding alcohol content, while primarily influencing beverage consumption in the laboratory, did not significantly influence beverage consumption in the more natural barroom situation. That is, verbal instructions that non-alcoholic beverages were administered resulted in reduced beverage consumption in the laboratory, but this manipulation had no effect on beverage consumption in the natural drinking environment.

The findings of this research support a number of important general conclusions. This is the first demonstration that a balanced placebo experiment can be conducted in the subjects' natural drinking environment, underscoring the fact that practical obstacles to replication of laboratory analogue experiments in the natural environment can be overcome. Second, the demonstration of significant differences in findings depending upon the setting in which the experiment is conducted argues for more replication of laboratory analogue research in natural settings. Such investigation permits evaluation of the

external validity of laboratory findings, in addition to investigation of possible interaction effects resulting from environmental influences. This point is particularly relevant for balanced placebo research, as concerns about generalizability of findings and possible interaction effects were expressed from the very beginning (Marlatt et al., 1973).

In the case of alcohol research, a third general conclusion is supported. The clinical implications of research conducted in natural drinking environments are directly relevant to development of effective treatment programs, as this is the setting in which the behaviour to be modified in treatment occurs. Given overwhelming evidence in support of the role of environmental cues in determining drinking behaviour, it is critically important to not overlook environmental influences, as these can interact with other variables to produce very different effects from those obtained in the laboratory.

#### Predicted vs. Actual Outcome

In the introductory chapters specific predictions regarding the outcome of Study II were made. First, greater beverage consumption was predicted to occur among subjects in Told Alcohol/Lab conditions than in Told No Alcohol/Lab conditions as this has been found in previous laboratory-based balanced placebo experiments. This effect was replicated in Study II. Second, it was predicted that effects of Told No Alcohol instructions would be diminished in the barroom setting due to the countervailing influence of alcohol-associated environmental cues. This



prediction was also supported, as a significant setting x instructions interaction effect on the amount consumed variable was obtained. This effect demonstrated that, in contrast with results obtained in the laboratory, verbal instructions regarding alcohol content given in the bar had a diminished influence on beverage consumption.

Finally, greater overall consumption was predicted to occur in the barroom setting as opposed to the laboratory setting. While this effect was obtained, it was due to the fact that Told No Alcohol instructions resulted in reduced consumption in the laboratory, but not in the bar. Comparison of amount consumed in the Told Alcohol/Lab condition with amount consumed in the Told Alcohol/Bar condition revealed no significant difference. However subjects in the Told Alcohol/Bar condition did consume an average of 30.8 ml more beverage than did subjects in the Told Alcohol/Lab condition, and while this difference was not statistically significant, it was proportionally identical to the analogous, and statistically significant difference reported in the Strickler et al. (1979) study. Because Strickler et al. (1979) used approximately twice as many subjects as were used in Study II, it is possible that with a greater number of subjects and consequently increased statistical power, this difference would have been significant in the present research.

Predictions identical to those for the amount consumed variable were made for the craving variable. However, no statistically significant differences were obtained. Possibly a

different measure of this variable would have revealed the predicted effects. However, it is also possible that subjects' craving in the various conditions was similar by virtue of being in an experiment concerned with alcohol consumption, and actual consumption of beer and "beer-like" beverages.

With regard to Present Feelings Questionnaire measures, greater Stimulation/Perceived Dominance was predicted in Given Alcohol vs. Given No Alcohol conditions, and in Told Alcohol vs. Told No Alcohol conditions, yet no statistically significant effects were obtained. It is unclear why this outcome occurred.

Similar predictions to those above were made for the Pleasurable Disinhibition Scale. While contrast analysis revealed no significant differences, a significant Beverage x Setting interaction effect was revealed in the analysis of covariance. While any statements regarding this trend must be tentative, the obtained result suggested that Pleasurable Disinhibition increases when alcohol is consumed in the barroom, but not when alcohol is consumed in the laboratory. Verbal instructions in this study did not appear to influence the Pleasurable Disinhibition variable.

With regard to the Behavioural Impairment Scale, predictions based on previous research findings (Vuchinich & Sobell, 1978) were supported. Behavioural Impairment scores were greater in Told Alcohol/Given Alcohol, Told Alcohol/Given No Alcohol, and Told No Alcohol/Given Alcohol conditions, than in Told No Alcohol/Given No Alcohol conditions, suggesting that behavioural

impairment is influenced by beliefs regarding alcohol content, and by actual alcohol content. However, the hypothesized setting effect was not obtained on this measure, suggesting that participation in the barroom did not result in lower mean Behavioural Impairment scores than in the laboratory. This outcome was predicted on the basis of Seigel's (1977) compensatory response model. In view of the above, it was interesting that the same prediction on the Subjective Drunkenness measure was supported, demonstrating that subjects in the laboratory conditions reported greater Subjective Drunkenness than did subjects in the barroom conditions. Assessment of what criteria subjects use to determine their subjective reports of drunkenness may resolve this apparent discrepancy.

#### Theoretical Interpretations

With regard to specific effects obtained in this thesis, there are a number of possible theoretical interpretations. While the present research was not designed to differentiate between various theoretical accounts, the following section will discuss the manner in which various theories may, or may not help account for the findings.

First of all, one might argue that due to the presence of drinking patrons in the barroom, modelling effects may account for increased consumption, and the lack of group differences, by overriding the effect of instructions (Hendricks, et al., 1978; Lied & Marlatt, 1979; Tomaszewski et al., 1980). However,

Bandura (1977) has demonstrated that a necessary prerequisite for modelling effects is attention to the model. In this study one could argue that subjects were sufficiently engaged in the distracting task of playing "trivial pursuit" and socializing with the research assistant that it would have been difficult for them to attend to the drinking behaviour of other patrons. Observation of subjects during experimental sessions indicated that subjects were fully engaged in this activity, as they were alternatively occupied with reading "Trivia" questions to the research assistant, and focussing on questions directed to them. Additionally, the research was designed to prevent modelling effects by virtue of interaction with the research assistant, as the research assistant closely followed the drinking behaviour of subjects. Therefore, it is unlikely that modelling effects could account for these results.

One could also argue that a ceiling effect accounted for the finding that verbal instructions did not influence the amount of beverage consumed in the barroom setting. This could have occurred for two reasons. First, it may have been possible that subjects suppressed their rate of consumption of the second beverage, thinking that this was all that was available. However, the instruction, "We'll start with these two." did not indicate that further drinks would not be available. Therefore, it is unlikely that subjects slowed their consumption for this reason. Second, it may have been possible that more subjects in the Told Alcohol/Bar condition finished their two beverages within the 30 minute drinking phase, than did subjects in the

Told No Alcohol/Bar condition, but due to greater variability in the Told Alcohol/Bar condition, the means were not different. This would suggest that had there been more beverage available, overall consumption in the Told Alcohol/Bar condition may have exceeded overall consumption in the Told No Alcohol/Bar condition. However, this was not the case, as only two subjects in the Told Alcohol/Bar condition actually finished both beverages, while three subjects in the Told No Alcohol/Bar condition finished both beverages. This finding, in addition to the fact that only 12 subjects in total finished both beverages (most at the end of the 30 minute period) and were evenly distributed across conditions, suggests that a ceiling effect did not account for the failure of verbal instructions to influence beverage consumption in the bar.

While modelling and ceiling effects probably do not explain the finding that subjects' reported beliefs regarding alcohol content were a significant determinant of beverage consumption in the laboratory setting, but not in the barroom setting, classical conditioning might account for this result. For subjects in this study, alcohol-associated environmental cues (e.g., darkened lighting, the bar, waiters and waitresses, other drinking patrons, loud music, etc.) had been reliably paired with alcohol consumption over time. Therefore, such stimuli could function as a CS, invoking CRs that have the effect of increasing an individual's consumption. Empirical support for this position was reviewed earlier (e.g., Hinson & Siegel, 1982; Kaplan et al., 1983; Pomerleau et al., 1983). Possibly, conditioning effects in

the barroom setting override effects of the instructional variable by virtue of exerting a more powerful influence over drinking behaviour. If so, one would expect effects of the instructional variable to be more readily detectable in the laboratory environment where alcohol-associated cues are not present. Findings that subjects began drinking sooner in the barroom setting, and overall, consumed more of their beverages than did subjects participating in the laboratory setting, is also consistent with a classical conditioning analysis.

While there is prior evidence of alcohol-associated cues producing physiological changes, craving, and increased consumption (e.g., Ludwig et al., 1974; Miller et al., 1974), it would be difficult to determine the exact nature of the proposed classical conditioning effects. For example, findings of the present study showed that, overall, subjects participating in the laboratory setting reported feeling greater drunkenness than did subjects participating in the barroom setting. This finding is consistent with Siegel's (1977) compensatory response model, as subjects in the laboratory were not exposed to alcohol-associated environmental cues, and may therefore have felt greater drunkenness because classically conditioned compensatory responses were not invoked.

However, using the same reasoning, reported "behavioural impairment" would be expected to be less in the barroom setting than in the lab. This was not the case. While predictions, based on previous research findings with human subjects, that behavioural impairment would be influenced by actual alcohol

consumption or the belief that alcohol had been consumed, were supported, there was no evidence that setting affected this variable. Possibly, "drunkenness" and "behavioural impairment" represent different theoretical constructs. In the present research, the concept of "drunkenness" was not assessed, as this item was intended merely as an indication of whether subjects believed verbal instructions regarding alcohol content.

A second possibility is that in the "behavioural impairment" domain, behavioural and/or physiological measures may be required to detect conditioning effects. Also, higher doses of alcohol than those used in this research may be required to reveal conditioned tolerance to pharmacologically induced behavioural impairment. Finally, alcohol-experienced subjects with greater conditioning histories than those used in this thesis may be required.

In addition to determining appropriate measures, doses of alcohol, and subjects, there is a fundamental problem in determining whether proposed conditioned responses among humans are compensatory to the pharmacological effects of alcohol. To do so, one would need to assess subjects' responses to alcohol on their first drinking occasion. That is, it would be impossible to determine whether compensatory responses had developed as a result of classical conditioning in alcohol-experienced subjects because initial responses to alcohol would be unknown. Clearly, measuring responses among alcohol-naive first-time drinkers would be practically difficult and ethically questionable.

In addition to classical conditioning, operant conditioning could also account for the finding that subjects' reported beliefs regarding alcohol content were not an effective determinant of beverage consumption in the barroom setting. Possibly, the bar functions as a discriminative stimulus ( $S^D$ ) for increased beverage consumption because such behaviour in similar settings has been reinforced in the past for example by increased "pleasurable disinhibition". Therefore, even though the vast majority of subjects in Told No Alcohol/Bar conditions reported believing they were drinking a non-alcoholic beverage, stimulus generalization could account for their relatively high levels of consumption. That is, subjects may react to being in a barroom with a frothy beverage in a manner corresponding to similar past experiences, due to previous reinforcement, even though verbal instructions indicate the situation is somewhat different by virtue of consuming dealcoholized beer.

While classical and operant conditioning theory may account for the finding that subjects' reported beliefs regarding beverage alcohol content did not influence consumption in the barroom setting, it is also possible that conditioning factors interact with cognitive factors to produce the effects obtained. That is, alcohol-associated cues in the barroom setting may be a more natural, and more powerful, substitute for affecting cognitions than are verbal instructions. Thus, artificial instructions in the laboratory may serve the function of inducing expectancies similar to those induced naturally by alcohol-associated environmental cues. Whether self-reported



belief that de-alcoholized beer was consumed in the bar should be affected by proposed cue induced expectancies is unclear. Possibly, skeptical subjects in Told No Alcohol/Bar conditions reported believing the research assistant's instructions due to self-presentational concerns. Baumeister (1982), in a comprehensive review of the literature pertaining to self-presentation, concluded that individuals have two main self-presentational goals. These are pleasing the audience that is present, and constructing a general public self. Therefore, in the present case, skeptical subjects in the barroom may have reported believing the research assistant's instructions to please him, and to present themselves as being agreeable, compliant subjects.

The idea that environmental cues in the barroom setting may influence subjects' beliefs, thereby affecting consumption, is consistent with Ludwig's model (Ludwig et al., 1974). Ludwig argued that appropriate exteroceptive stimuli (i.e., barroom setting) influence mental set (i.e., subjects' beliefs), which influences both craving and alcohol seeking behaviour. Current theorizing in the literature pertaining to factors influencing alcohol-related behaviour is also consistent with this formulation (e.g., Cooper, Russell, & George, 1988; Niaura et al., 1988; Vuchinich & Tucker, 1988). While the various theories differ in emphasis and perspective, the commonality involves consideration of the manner in which cognitive and environmental variables interact to influence alcohol consumption.

For example, Vuchinich and Tucker (1988) suggest that accurate understanding of drinking in the alcohol abuser's natural drinking environment is a cardinal task for any approach to investigation of factors influencing drinking behaviour. Their theory suggests that relapse is related to the availability of reinforcers other than alcohol, the perceived effectiveness of alcohol as an alternate reinforcer, and the availability of alcohol in the abuser's environment. Specifically, it is argued that minimal constraints on access to alcohol coupled with a lack of alternative reinforcers leads to heightened preference for alcohol consumption. Thus, while cognitive and behavioural coping skills may provide access to alternative reinforcement, they argue that understanding of environmental influences on access to alcohol and availability of alternative reinforcement is critical to a fuller understanding of the relapse process, and therefore to development of effective treatment programs.

Cooper, Russell, and George (1988) provide data indicating that a combination of strong positive expectancies regarding alcohol's ability to facilitate coping, and the use of avoidant styles of coping with emotion, leads to alcohol use and abuse. Furthermore, they found that individual's holding strong positive expectancies and who drink to cope, not only drink more, but also experience greater alcohol-related problems. However, they suggest that expansion of the model to include consideration of environmental factors as precipitants of relapse, and potential moderating variables, might also be usefully explored. Thus, it is suggested that a model integrating cognitive and environmental

viewpoints may result in development of more effective treatment programs.

The theoretical formulation of Niaura et al. (1988) further illustrates the current focus on integration of cognitive and environmental viewpoints. These authors cite evidence demonstrating cognitive responses to cue exposure. In a study by Cooney, Gillespie, Baker, and Kaplan (1987), alcohol-associated cues produced, among alcoholics, reports of increased physical symptoms, guilt, and hopelessness about ability to resist temptations to drink. Furthermore, Cooney, Baker, Pomerleau, and Josephy (1984) found that alcoholics who expected more pleasurable disinhibition and stimulation from alcohol salivated more in response to alcohol-related olfactory cues. These findings suggest that positive outcome expectancies for alcohol use are related to stronger cue reactivity in alcoholics. Niaura et al. (1988) further suggested that cue reactivity interferes with an individual's ability to perform coping skills that have already been acquired. In support of this, results of a study by Binkoff, et al. (1984), indicated that greater salivary reactivity to alcohol cues was associated with less skillful responses in a drink-refusal role-play, but only when alcohol was present in the role-play situation. Thus, it was argued that without modification of reactivity to alcohol-associated environmental cues, cognitive and behavioural skills acquired in treatment may be disrupted in the natural drinking environment, thus leading to relapse.

The research in this thesis clearly supports current recommendations regarding the necessity of considering the role of cognitive and environmental variables in combination. The pattern of results indicates that alcohol-associated environmental cues primarily determine time to first sip and alcohol consumption, in addition to influencing self-reported drunkenness. The reported belief that alcohol had or had not been consumed influenced alcohol consumption in the laboratory, but not in the more natural barroom setting, and also influenced subjective drunkenness, such that subjects who believed they had consumed alcohol reported greater drunkenness than did subjects who believed they had consumed dealcoholized beverages. Finally, behavioural impairment was influenced by both actual beverage consumption, and the belief that alcohol had been consumed, regardless of setting. Thus, all three independent variables, influence various aspects of alcohol-related behaviour in a complex manner. However, environmental factors, regardless of the exact mechanism, appear to exert the most powerful influence over beverage consumption, the variable most directly relevant to clinical considerations. Therefore, enhanced treatment strategies may result from more precise understanding of the manner in which alcohol-related cues affect alcohol-related cognitions and behaviour.

#### Clinical Implications

Taken together, findings in this thesis and previous research (e.g., Hinson & Siegel, 1982; Kaplan et al., 1983; Ludwig et al., 1974; Pomerleau et al., 1983) have shown that

environmental stimuli can play a significant role in the development and maintenance of alcohol-related problems by means of influencing emotional responding, feelings of intoxication, and withdrawal distress, in addition to increasing consumption, craving, and tolerance. Therefore, it would seem wise to include careful consideration of these factors in the development of alcohol treatment programs. Unfortunately, this appears to have rarely been the case.

Many alcohol treatment programs are residentially based (Ogborne, in press), and as argued before, by treating alcohol problems in isolation from alcohol-associated environmental stimuli, one overlooks the probability that, when faced with such stimuli following treatment, patients are likely to experience increased craving for alcohol, thereby increasing the probability of relapse (Hinson & Siegel, 1982).

The few studies that have evaluated the effectiveness of extinguishing cue-induced craving by exposure to relevant stimuli provide some very encouraging data. For example, Hodgson and Rankin (1976) carefully assessed environmental stimuli that triggered relapse in an alcoholic patient, and found that, for this patient, the most significant cue was the drink itself. Therefore, supervised exposure to this cue was accomplished by giving the patient a priming dose of alcohol. Following this, the method of response prevention was used by having the patient retire to his room for one hour to read and listen to music while the psychologist intermittently took measures of mood, subjective

estimates of tremor, and desire to drink. Afterwards, response prevention was supervised by other staff. Over time, the patient's desire for alcohol, and reports of subjective distress, gradually diminished, and the patient learned that expectations of severe, unpleasant consequences were invalid, suggesting that cue exposure also provides a learning experience that modifies expectations.

Over a period of only four weeks, the behavioural analysis and treatment were completed. Results of six month follow-up indicated that the patient, who had previously consumed alcohol daily for a period of three years, only drank on six occasions, and was able to stop the following day. The authors concluded that "cue exposure" is an approach that should be considered in the treatment of alcohol problems.

Blakey and Baker (1980) reported similar findings using the method of "cue exposure" in the treatment of six alcoholic patients. During behavioural analysis, these authors found that cues such as the smell, taste, and sight of alcohol, the sight of a favorite bar, drinking partners, and most commonly, being in a barroom setting, all contributed to craving for alcohol and relapse. Therefore, patients were exposed to cues most relevant to them and prevented from drinking alcohol by means of supervision. Five of the six patients were accompanied to favorite bars, and permitted to drink soft drinks only. Results at nine month follow-up indicated that five of the six patients had remained abstinent during this time, and reported that craving for alcohol had significantly diminished.

The authors attributed the effectiveness of the cue-exposure approach to several factors. They suggested that classically conditioned responses to environmental CS's had been extinguished, and that reinforcement of alternative behaviour in the presence of the bar, which was also conceptualized as a discriminative stimulus for alcohol consumption, contributed to treatment effectiveness. They also suggested that eventual lack of desire to drink in the bar could be explained, in operant terms, as representing extinction of conditioned emotional responses by virtue of non-reinforcement in the presence of relevant discriminative stimuli (e.g., the bar). In addition, patients were also conceptualized as having been reinforced for self-control behaviour and development of strategies to cope with alcohol-associated stimuli. Finally, invalidation of cognitive expectations that patients would lose control in the presence of alcohol-related cues was hypothesized to contribute to successful outcome. Regardless of the specific contribution of these factors, and perhaps others, the effectiveness of the approach indicated that further work in this area is warranted.

Niaura et al. (1988) have also recommended "in vivo" cue exposure as a component of treatment programs for alcohol-related problems. Furthermore, they suggested that skills training components of treatment programs be conducted in the natural drinking setting in the presence of substance use cues. This may provide protection from the disruptive effects of cue exposure on the performance of acquired skills, as patients would have practiced skills in the environment in which they are required.

While the present research was not directly concerned with alcoholism, or the treatment of alcohol problems, the results are certainly in keeping with the above emphasis regarding the importance of the interaction of cognitive and environmental factors in determining alcohol-related behaviour.

#### Limitations and Future Directions

At present, the findings reported here can only be generalized to a heavy drinking, male undergraduate population willing to participate in this type of research. Using the expanded balanced placebo design, it would be interesting to investigate a wider range of subjects and measures to provide more complete understanding of the phenomena under study.

With regard to choice of subjects, comparison of light drinkers, heavy drinkers, and alcoholics may provide useful information about the relative effects of the independent variables among these populations. Possibly, differences in drinking practices influence the extent to which particular variables exert their effects. For example, one might expect a "light" drinker to be less affected by alcohol-associated environmental cues than a "heavy" drinker, because of the latter's more extensive exposure to cues. Given differences mentioned earlier between the responses of male and female subjects in balanced placebo experiments, it would also be interesting to investigate the manner in which females with various drinking histories are affected by the independent variables.



Due to the use of deceptive instructions in balanced placebo research, it would also be important to investigate the influence of individual differences in suggestibility on outcome. Assessment of whether subjects believed verbal instructions regarding alcohol content was the sole indicator of suggestibility in the present research. More thorough investigation of this variable may lead to improved understanding of the manner in which individual differences in suggestibility influence susceptibility to effects of the independent variables.

The experimental method could be further modified to include pretest assessment of individual expectations regarding the effects of alcohol. This would permit more refined analysis of the effects of the independent variables on dependent measures.

In addition to the above, other modifications to the method could further enhance ecological validity. First, subjects in the barroom participated on Monday, Tuesday, and Wednesday afternoons, while previous surveys indicated that undergraduate males typically drink later in the week during the evening (Wigmore & Hinson, 1986). Because subjects in the laboratory participated later in the week, the laboratory and barroom differences may have been more pronounced if better control over the time factor had been possible. Furthermore, conducting sessions in the evening would have enhanced ecological validity. In fact, the time variable is worthy of investigation in its own right, and could be easily incorporated into the design. To further enhance ecological validity, a longer drinking phase and higher doses of alcohol could be used, permitting more thorough

analysis of effects of the independent variables over the course of a typical drinking episode. Finally, to control for possible ceiling effects mentioned earlier and improve ecological validity, a third bottle of dealcoholized beer could be placed beside subjects during the drinking phase and labelled in a manner corresponding to the first two beverages. This way, subjects would have no reason to assume that beverages were not available ad lib, yet a limit on alcohol consumption could be imposed. The potential problem with this, however, involves the possibility that subjects consuming real beer for the first two may notice the taste change and question the credibility of verbal instructions.

In summary, the expanded balanced placebo design developed in this thesis could be used to investigate a wide variety of questions, as potential variations in the parameters chosen here are many. Further investigation of combined effects of various independent variables on alcohol-related dependent measures appears warranted, as a variety of factors interact to produce effects on alcohol-related behaviour in the natural drinking situation. Understanding of the manner in which these factors exert their influence on drinking behaviour is critical to the development of effective intervention programs.

**APPENDICES**

SECTION IDEMOGRAPHIC INFORMATION

- 1) Age: [ ] [ ]
- 2) Sex: male [ ] 1  
female [ ] 2
- 3) What is your marital status?
- 1 [ ] married      4 [ ] divorced  
2 [ ] common-law    5 [ ] widowed  
3 [ ] separated      6 [ ] never married
- 4) Are there any children living with you?
- 1 [ ] Yes      2 [ ] No
- 5) In what year of undergraduate studies are you now enrolled?
- 1 [ ] first      2 [ ] second      3 [ ] third      4 [ ] fourth  
5 [ ] fifth or more
- 6) Please indicate your present faculty (department):
- Faculty of Arts
- 1 [ ] Classical Studies  
2 [ ] English  
3 [ ] Languages (includes French, German, Russian, Spanish, Italian)  
4 [ ] Philosophy  
5 [ ] Visual Arts
- Faculty of Science
- 6 [ ] Mathematics  
7 [ ] Health Sciences (includes Biochemistry, Genetics, Microbiology  
and Immunology, Pharmacology and Toxicology, Physiology)
- 8 [ ] Anatomy  
9 [ ] Astronomy  
10 [ ] Chemistry  
11 [ ] Computer Science  
12 [ ] Geology  
13 [ ] Geophysics  
14 [ ] Physics  
15 [ ] Plant Sciences  
16 [ ] Statistical and Actuarial Sciences  
17 [ ] Zoology
- Faculty of Social Sciences
- 18 [ ] Anthropology  
19 [ ] Economics  
20 [ ] Geography  
21 [ ] History

- 22 [ ] Political Science  
 23 [ ] Psychology  
 24 [ ] Sociology
- 25 [ ] Faculty of Physical Education  
 26 [ ] Faculty of Music  
 27 [ ] Faculty of Education  
 28 [ ] Faculty of Engineering Science  
 29 [ ] Faculty of Law  
 30 [ ] Faculty of Medicine  
 31 [ ] School Journalism  
 32 [ ] School of Dentistry  
 33 [ ] School of Library and Information Science  
 34 [ ] School of Business Administration  
 35 [ ] Other \_\_\_\_\_  
 (specify)

7) How would you rate your performance in university?

- 1 [ ] outstanding    2 [✓] above average    3 [ ] average  
 4 [ ] below average

8) Has your performance in university been:

- 1 [ ] much better than expected  
 2 [ ] better than expected  
 3 [✓] as well as expected  
 4 [ ] worse than expected  
 5 [ ] much worse than expected

9) Where were you born?

- |                              |                                  |
|------------------------------|----------------------------------|
| 1 [ ] Ontario                | 16 [ ] West Germany              |
| 2 [ ] Quebec                 | 17 [ ] East Germany              |
| 3 [ ] New Brunswick          | 18 [ ] Italy                     |
| 4 [ ] Nova Scotia            | 19 [ ] Spain                     |
| 5 [ ] Prince Edward Island   | 20 [ ] Portugal                  |
| 6 [ ] Newfoundland           | 21 [ ] South Africa              |
| 7 [ ] Manitoba               | 22 [ ] Africa                    |
| 8 [ ] Saskatchewan           | 23 [ ] Caribbean                 |
| 9 [ ] Alberta                | 24 [ ] China                     |
| 10 [ ] British Columbia      | 25 [ ] Middle-East               |
| 11 [ ] Northwest Territories | 26 [ ] India                     |
| 12 [ ] Yukon Territory       | 27 [ ] Indo-China                |
| 13 [ ] United States         | 28 [ ] Pakistan                  |
| 14 [ ] United Kingdom        | 29 [ ] Indonesia                 |
| 15 [ ] Poland                | 30 [ ] Other: _____<br>(specify) |

- 10) To which ethnic or cultural group did you or your ancestors belong on first coming to this continent? (Check more than one if appropriate)

- |                |                       |
|----------------|-----------------------|
| 1 [ ] English  | 10 [ ] Jewish         |
| 2 [ ] French   | 11 [ ] Chinese        |
| 3 [ ] Irish    | 12 [ ] East Indian    |
| 4 [ ] Scottish | 13 [ ] Afro-Caribbean |
| 5 [ ] German   | 14 [ ] Spanish        |
| 6 [ ] Italian  | 15 [ ] South American |
| 7 [ ] Ukranian | 16 [ ] Native Indian  |
| 8 [ ] Dutch    | 17 [ ] Other: _____   |
| 9 [ ] Polish   | (specify)             |

- 11) What religion were you brought up in?

- |                      |                          |
|----------------------|--------------------------|
| 1 [ ] Roman Catholic | 9 [ ] Ukranian Catholic  |
| 2 [ ] United Church  | 10 [ ] Pentecostal       |
| 3 [ ] Anglican       | 11 [ ] Jehovah's Witness |
| 4 [ ] Presbyterian   | 12 [ ] Mennonite         |
| 5 [ ] Lutheran       | 13 [ ] Islam             |
| 6 [ ] Baptist        | 14 [ ] No Religion       |
| 7 [ ] Greek Orthodox | 15 [ ] Other: _____      |
| 8 [ ] Jewish         | (specify)                |

- 12) If your present practicing religion is different from above please specify.

Present religion \_\_\_\_\_

- 13) How important is religion to you?

- 1 [ ] very important  
 2 [ ] moderately important  
 3 [ ] mildly important  
 4 [ ] not important

- 14) Does your religion prohibit the use of alcohol?

- 1 [ ] yes  
 2 [ ] no

SECTION IIALCOHOL CONSUMPTION

In this section we would like to ask you about your alcohol consumption.

- 1) Please check the statement below that best describes how often you have any kind of drink containing alcohol (wine, beer, liquor).
- 1  3 or more times a day
  - 2  2 times a day
  - 3  once a day
  - 4  nearly every day
  - 5  3-4 times a week
  - 6  1-2 times a week
  - 7  2-3 times a week
  - 8  about once a month
  - 9  less than once a month but at least once a year
  - 10  less than once a year or never

If you checked "9" or "10", please go to Part B.  
Otherwise, please complete Part A.

PART A

- 1) Not counting small sips, at what age did you start drinking alcoholic beverages?

age level

- 2) When you drink alcohol which type of alcohol are you most likely to consume?

- 1  wine
- 2  beer
- 3  liquor (rye, gin, rum, etc.)

Wine

- 3) Think of all the times you have had wine recently. When you drink wine, how often do you have as many as 5 or 6 glasses?

- 1  nearly every time
- 2  more than half the time
- 3  less than half the time
- 4  once in a while
- 5  never

- 4) When you drink wine, how often do you have three or four glasses?

- 1  nearly every time
- 2  more than half the time
- 3  less than half the time
- 4  once in a while
- 5  never

- 5) When you drink wine, how often do you have one or two glasses?
- 1  nearly every time
  - 2  more than half the time
  - 3  less than half the time
  - 4  once in a while
  - 5  never

Beer

- 6) Think of all the times you have had beer recently. When you drink beer, how often do you have as many as five or six bottles or glasses?
- 1  nearly every time
  - 2  more than half the time
  - 3  less than half the time
  - 4  once in a while
  - 5  never
- 7) When you drink beer, how often do you have three or four bottles or glasses?
- 1  nearly every time
  - 2  more than half the time
  - 3  less than half the time
  - 4  once in a while
  - 5  never
- 8) When you drink beer, how often do you drink one or two bottles or glasses?
- 1  nearly every time
  - 2  more than half the time
  - 3  less than half the time
  - 4  once in a while
  - 5  never

Liquor

- 9) Think of all the times you have had drinks containing liquor recently. When you have them, how often do you have as many as five or six drinks? ("doubles" count as two)
- 1  nearly every time
  - 2  more than half the time
  - 3  less than half the time
  - 4  once in a while
  - 5  never
- 10) When you have drinks containing liquor, how often do you have three or four drinks?
- 1  nearly every time
  - 2  more than half the time
  - 3  less than half the time
  - 4  once in a while
  - 5  never



11) When you have drinks containing liquor, how often do you have one or two drinks?

- 1  nearly every time
- 2  more than half the time
- 3  less than half the time
- 4  once in a while
- 5  never

12) Has your drinking changed over the last six months?

- 1  drinking less now
- 2  drinking more now (please go to question 14)
- 3  no change over last six months (please go to question 15)

13) If your drinking has decreased over the last six months, please indicate for which of the following reasons. (please skip question 14)

- 1  close friend or spouse did not drink
- 2  it was affecting my health
- 3  joined A.A. or treatment program
- 4  had a bad experience because of drinking
- 5  it was a source of conflict with family or friends
- 6  didn't drink much and decided to quit
- 7  it was too expensive
- 8  thought I could use my time better
- 9  it was affecting my studying or work
- 10  close friend or spouse told me they thought I had a drinking problem
- 11  it was interfering with my physical fitness program
- 12  religious reasons
- 13  no particular reason
- 14  other: \_\_\_\_\_

(please explain)

14) If your drinking has increased over the last six months, please indicate for which of the following reasons.

- 1  drinking helps me to relax
- 2  I become more sociable
- 3  it helps me forget about my worries
- 4  it relieves boredom
- 5  I drink more because of loneliness
- 6  I become less inhibited
- 7  Most of my friends drink
- 8  drinking increases my self-confidence
- 9  drinking is my reward for a hard day's work
- 10  it helps relieve the pressures of school
- 11  other: \_\_\_\_\_

(please explain)

15) In relation to your peers, do you feel that your present level of drinking is:

- 1  much higher than average
- 2  somewhat higher than average
- 3  about average
- 4  somewhat lower than average
- 5  much lower than average

16) Do you feel that your present level of drinking is a problem for you?

- 1  no
- 2  somewhat
- 3  yes

17) Have your attitudes toward drinking changed drastically over the past:

6 months \_\_\_\_\_?  
month \_\_\_\_\_?

If so, more or less favourably?, and Why?

If you answered Part A, please skip Part B and go to section III.

PART B

1) What experience with alcohol have you had?

- 1  drink occasionally
  - 2  never drank
  - 3  used to drink
- ) Please go to section III

2) At what age did you start to drink?

at age [ ] [ ]

3) About how often did you usually drink?

- 1  3 or more times a day
- 2  2 times a day
- 3  once a day
- 4  nearly every day
- 5  3-4 times a week
- 6  1-2 times a week
- 7  2-3 times a month
- 8  about once a month

4) About how many drinks did you have at a time?

- 1  one
- 2  two or three
- 3  four or five
- 4  six or seven
- 5  more than that

5) What did you usually drink? (Check one only)

- 1  beer
- 2  wine
- 3  liquor or mixed drinks
- 4  other
- 5  it varied

6) Were there any particular reasons why you stopped drinking?

- 1  close friend or spouse did not drink
- 2  it was affecting my health
- 3  joined A.A. or treatment program
- 4  had a bad experience because of drinking
- 5  it was a source of conflict with family or friends
- 6  didn't drink much and decided to quit
- 7  it was too expensive
- 8  thought I could use my time better
- 9  it was affecting my studying or work
- 10  close friend or spouse told me they thought I had a drinking problem
- 11  it was interfering with my physical fitness program
- 12  religious reasons
- 13  no particular reason
- 14  other: \_\_\_\_\_

(please explain)

SECTION IIICONSUMPTION OF DRUGS OTHER THAN ALCOHOL

1) In the past 6 months, have you ever used drugs other than alcohol for non-medical purposes?

- 1  Yes (If "yes", please complete questions 2, 3 and 4 below)  
 2  No (If "no" and you also answered Part B, you are finished.  
 Thank you for your cooperation. If "no", but you answered Part A, please go to section IV).

2) How often during the past 6 months have you used any of the following drugs? (For each drug listed at the left, please circle the appropriate number under the columns on the right.)

	Not at all	Once	A few times	Monthly	Weekly	Almost daily	Daily
Cannabis (marijuana, hashish)	1	2	3	4	5	7	8
Tranquilizers (e.g., valium)	1	2	3	4	5	7	8
Stimulants (amphetamines)	1	2	3	4	5	7	8
Cocaine	1	2	3	4	5	7	8
Hallucinogens (e.g., LSD, peyote)	1	2	3	4	5	7	8
Sedatives (e.g., quaaludes)	1	2	3	4	5	7	8
Opiates (e.g., heroin, demerol)	1	2	3	4	5	7	8

3) In relation to your peers, do you feel that your present level of use of drugs other than alcohol is:

- 1 [ ] much higher than average
- 2 [ ] somewhat higher than average
- 3 [ ] about average
- 4 [ ] somewhat lower than average
- 5 [ ] much lower than average

4) Do you feel that non-medical drug use is a problem for you?

- 1 [ ] No
- 2 [ ] Somewhat
- 3 [ ] Yes

SECTION IVDRINKING PRACTICES

In this section we would like to ask you about some of your drinking practices.

- 1) When you drink alcohol, how often do you go to each of the following places? (For each location listed at the left, please circle the appropriate number under the columns on the right.)

	<u>Nearly every time</u>	<u>More than half the time</u>	<u>Less than half the time</u>	<u>Once in a while</u>	<u>Never</u>
A pub or bar <u>on</u> campus.	1	2	3	4	5
A pub or bar <u>off</u> campus.	1	2	3	4	5
Either a friend's place or your place.	1	2	3	4	5
At home alone.	1	2	3	4	5
A restaurant	1	2	3	4	5
Other: _____ (specify)	1	2	3	4	5

- 2) When you go drinking, how often do you begin at each of the following times?

	<u>Nearly every time</u>	<u>More than half the time</u>	<u>Less than half the time</u>	<u>Once in a while</u>	<u>Never</u>
Before noon.	1	2	3	4	5
At noon.	1	2	3	4	5

Early afternoon (1:00-2:00 p.m.)	1	2	3	4	5
Late afternoon (3:00-6:00 p.m.)	1	2	3	4	5
Early evening (6:00-8:00 p.m.)	1	2	3	4	5
Late evening (after 8:30 p.m.)	1	2	3	4	5

3) When you go out drinking, how often do you spend more money than you wanted to?

- 1 [ ] nearly every time
- 2 [ ] more than half the time
- 3 [ ] less than half the time
- 4 [ ] once in a while
- 5 [ ] never

4) How often are you the person to "round up" some friends to go out drinking?

- 1 [ ] nearly every time
- 2 [ ] more than half the time
- 3 [ ] less than half the time
- 4 [ ] once in a while
- 5 [ ] never

5) If you were not thinking of going drinking, how likely would you be to go drinking if asked by a friend or friends?

- 1 [ ] extremely likely
- 2 [ ] very likely
- 3 [ ] somewhat likely
- 4 [ ] not very likely
- 5 [ ] not likely at all

6) When you go out drinking, how often do you stay at the bar longer than you wanted to?

- 1 [ ] nearly every time
- 2 [ ] more than half the time
- 3 [ ] less than half the time
- 4 [ ] once in a while
- 5 [ ] never

- 7) There are several reasons why you might continue to drink even when you might otherwise feel like quitting. Listed below, on the left, are several possibilities. Please indicate how often you would stay longer than desired for each of these reasons by circling the appropriate number under the columns on the right. If you include any reasons "other" than those listed, please circle the appropriate number on the right as well.

	<u>Nearly every time</u>	<u>More than half the time</u>	<u>Less than half the time</u>	<u>Once in a while</u>	<u>Never</u>
It's your turn to buy another round.	1	2	3	4	5
Your friends urge you to stay.	1	2	3	4	5
You are waiting for a ride home.	1	2	3	4	5
Your date wants to stay longer.	1	2	3	4	5
You are too drunk to drive.	1	2	3	4	5
You are too drunk to get up and leave.	1	2	3	4	5
Other: _____					
_____	1	2	3	4	5
(please explain)					
Other: _____					
_____	1	2	3	4	5
(please explain)					



- 8) When you want to stay at a bar or party but you want to stop drinking, how often do you do each of the following?

	<u>Nearly every time</u>	<u>More than half the time</u>	<u>Less than half the time</u>	<u>Once in a while</u>	<u>Never</u>
Keep drinking anyway.	1	2	3	4	5
Decrease your rate of drinking.	1	2	3	4	5
Switch to a drink with less alcohol.	1	2	3	4	5
Switch to a non-alcoholic beverage.	1	2	3	4	5
Leave.	1	2	3	4	5

- 9) How often has your schoolwork (e.g., assignments, marking, teaching) suffered as a result of going out drinking or being hung-over?

- 1 [ ] nearly every time  
 2 [ ] more than half the time  
 3 [ ] less than half the time  
 4 [ ] once in a while  
 5 [ ] never

- 10) Approximately what percentage of your leisure activity involves drinking?

- 1 [ ] 80-100%  
 2 [ ] 60-79%  
 3 [ ] 40-59%  
 4 [ ] 20-39%  
 5 [ ] 0-19%

- 11) Is drinking making your campus life happier?

- 1 [ ] always  
 2 [ ] most of the time  
 3 [ ] sometimes  
 4 [ ] rarely  
 5 [ ] never

12) Do you stop drinking before you get drunk?

- 1  always
- 2  most of the time
- 3  sometimes
- 4  rarely
- 5  never

13) Once you have had one or two drinks, is it difficult to stop drinking?

- 1  always
- 2  most of the time
- 3  sometimes
- 4  rarely
- 5  never

14) Do you tend to drink alcohol fairly quickly?

- 1  always
- 2  most of the time
- 3  sometimes
- 4  rarely
- 5  never

15) Do you avoid talking to others about your drinking?

- 1  always
- 2  most of the time
- 3  sometimes
- 4  rarely
- 5  never

16) If you have ever attempted to cut down on your alcohol consumption, how difficult was it?

- 1  extremely difficult
  - 2  very difficult
  - 3  somewhat difficult
  - 4  not very difficult
  - 5  not difficult at all
  - 6  I have never tried to reduce my alcohol consumption.
- ) If you answered 1, 2, or 3,  
) please indicate why in the  
) space provided below.

17) Do your friends joke about your drinking?

- 1  a lot
- 2  sometimes
- 3  never
- 4  unsure

18) Do you think other people feel you have a drinking problem?

- 1  yes
- 2  maybe a few
- 3  no
- 4  unsure

19) Has anyone ever suggested that you seek help for a drinking problem?

1  yes

2  no

20) Have you ever sought help for a drinking problem?

1  yes

2  no

21) Do most of your friends drink?

1  yes

2  no

22) Do you have any friends or relatives who you think might have a drinking problem?

1  yes

2  no

23) Have you ever suggested that a friend or relative seek help for a drinking problem?

1  yes

2  no

24) How likely would you be to suggest that a friend or relative contact an alcohol and/or substance use related service if you felt that they had a drinking problem?

1  extremely likely

2  very likely

3  somewhat likely

4  not very likely

5  not likely at all

- 25) Listed below are several reasons people might give for not suggesting that a friend or relative seek help for a drinking problem. If you knew someone who you thought had a drinking problem but you did not make such a suggestion, please indicate how influential you think each of these reasons would be by circling the appropriate number under the columns on the right.

	Very influ- ential	Moder- ately influ- ential	Some- what influ- ential	Not very influ- ential	Not influ- ential at all
I am not sure of what type of help to suggest.	1	2	3	4	5
I am not sure how to approach someone about their drinking.	1	2	3	4	5
I don't feel it's any of my business.	1	2	3	4	5
I'm not sure how to identify when someone might need help.	1	2	3	4	5
I don't want to offend anyone.	1	2	3	4	5
I don't feel it would do any good.	1	2	3	4	5
I think I may have a drinking problem myself.	1	2	3	4	5
Other: _____ (please specify)	1	2	3	4	5

- 26) If you thought drinking was interfering with your (or a friend's) school work or social life and decided to do something about it, what services on campus do you think could be of assistance? (List as many as you can think of.)
- 27) What services off campus do you think could be of assistance? (List as many as you can think of.)
- 28) Do you feel that there is a need for some type of service to help students with alcohol and/or drug abuse problems?
- 1  definitely
  - 2  probably
  - 3  uncertain
  - 4  no

- 29) Please indicate the degree of interest you would have in each of the following types of alcohol and/or substance use related services by circling the appropriate number under the columns on the right.

	Extremely interested	Very inter- ested	Somewhat interested	Slightly interested	Not at all interested
Information Services	1	2	3	4	5
Religiously Affiliated Services	1	2	3	4	5
Hotline	1	2	3	4	5
Medical and Psychiatric Services	1	2	3	4	5
Counseling	1	2	3	4	5
On-Campus Treatment	1	2	3	4	5
Off-Campus Treatment	1	2	3	4	5
Courses or Programs on Constructive Drug Use	1	2	3	4	5
Educational Presentations and Workshops	1	2	3	4	5
Other: <hr/>	1	2	3	4	5

30) How likely would you be to contact an alcohol and/or substance use related service if you felt that you had a drinking problem?

- 1  extremely likely
- 2  very likely
- 3  somewhat likely
- 4  not very likely
- 5  not likely at all

31) Listed below are several reasons people might give for not seeking help for a drinking problem. If you felt that you might have a drinking problem but you were reluctant to seek help, please indicate how important each of the following reasons would be.

	Extremely important	Very impor- tant	Somewhat important	Not very impor- tant	Not impor- tant at all
I would be unsure how to make the initial contact with a treatment service.	1	2	3	4	5
I am not sure what treatment actually involves.	1	2	3	4	5
I believe treatment necessarily involves periods of hospitalization.	1	2	3	4	5
I would be embarrassed.	1	2	3	4	5
It would be difficult to accept that I had a drinking problem.	1	2	3	4	5
Treatment would be too disruptive in my life because of the time involved.	1	2	3	4	5
I believe it would be my own responsibility to deal with a drinking problem.	1	2	3	4	5

SECTION VREASONS FOR DRINKING

How often do you drink for the following reasons?

<u>Reasons for Drinking</u>	Always	Most of the time	Sometimes	Rarely	Never
To get along better on dates.	1	2	3	4	5
To relieve stress or tension.	1	2	3	4	5
To relieve boredom.	1	2	3	4	5
Sociability.	1	2	3	4	5
For aches and pains.	1	2	3	4	5
Enjoyment of taste.	1	2	3	4	5
In order not to be shy.	1	2	3	4	5
For a sense of well-being.	1	2	3	4	5
As an aid in forgetting disappointments.	1	2	3	4	5
To get high.	1	2	3	4	5
To get drunk.	1	2	3	4	5
Because it is expected by peers.	1	2	3	4	5
It helps me cope with problems.	1	2	3	4	5
To celebrate a special occasion.	1	2	3	4	5
To get along better in a group.	1	2	3	4	5
It increases my self- confidence.	1	2	3	4	5
It helps when things get me down.	1	2	3	4	5
To heighten sexual experience.	1	2	3	4	5
To help me get to sleep at night.	1	2	3	4	5
I become less inhibited.	1	2	3	4	5



SECTION VICONSEQUENCES OF DRINKING

In this section we would like to ask you about some possible consequences of drinking.

- 1) To the best of your recollection indicate the extent to which you have experienced each of the following consequences following drinking during the past six months.

	Always	Most of the time	Sometimes	Rarely	Never
I have had a hangover.	1	2	3	4	5
I have gotten nauseated and vomited from drinking.	1	2	3	4	5
I have driven a car when I had too much to drink.	1	2	3	4	5
I have drunk while driving.	1	2	3	4	5
I have been arrested for drunk driving.	1	2	3	4	5
I have skipped a class after drinking.	1	2	3	4	5
I have missed a class because of a hangover.	1	2	3	4	5
I have received a lower grade because of drinking too much.	1	2	3	4	5
I have gotten into a fight after drinking.	1	2	3	4	5
I have damaged property after drinking.	1	2	3	4	5
Drinking has detracted from my sexual performance and enjoyment.	1	2	3	4	5
Drinking has prevented me from having sex.	1	2	3	4	5

	Always	Most of the time	Sometimes	Rarely	Never
Drinking has resulted in my having sex when I really didn't want to.	1	2	3	4	5
I have gotten into trouble with the law because of drinking.	1	2	3	4	5
I was involved in some type of accident after drinking.	1	2	3	4	5
I did not remember what happened while I was drinking.	1	2	3	4	5
I have done something after drinking which I later regretted.	1	2	3	4	5
My drinking has caused conflicts with close friends of the same sex.	1	2	3	4	5
My drinking has caused conflicts with close friends of the opposite sex.	1	2	3	4	5
My drinking has damaged other friendships.	1	2	3	4	5
I have lost a job because of drinking.	1	2	3	4	5
I have gone without other things because of the cost of alcohol.	1	2	3	4	5
I have lost a girl/boyfriend due to drinking.	1	2	3	4	5
I have been injured as a result of drinking.	1	2	3	4	5
I have not felt like doing anything productive the following day.	1	2	3	4	5

SECTION VII

This is a series of questions about the use of alcoholic beverages. What beverages people drink, how much, and how often. Please check the statement that best applies to you, or write in the answer.

1. How often do you usually drink beer?

- |   |   |
|---|---|
| <input type="checkbox"/> daily                | <input type="checkbox"/> once a month           |
| <input type="checkbox"/> 3 or 4 times a week  | <input type="checkbox"/> 3 or 4 times a year    |
| <input type="checkbox"/> twice a week         | <input type="checkbox"/> twice a year           |
| <input type="checkbox"/> once a week          | <input type="checkbox"/> once a year            |
| <input type="checkbox"/> 3 or 4 times a month | <input type="checkbox"/> I have tried beer;     |
| <input type="checkbox"/> twice a month        | <input type="checkbox"/> but I don't drink beer |
|   | <input type="checkbox"/> never had beer         |

\*\*\*\*\*

2. Think of all the times you have had beer recently. When you drink beer, how much beer do YOU USUALLY DRINK each time?

CANS OR GLASSES?

- |                            |                            |                             |                                      |
|----------------------------|----------------------------|-----------------------------|--------------------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13          |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14          |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15          |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 8 | <input type="checkbox"/> 12 | <input type="checkbox"/> More? _____ |

How many?

I don't drink beer

\*\*\*\*\*

3. Each time you drink beer, what is the MOST YOU DRINK?

CANS OR GLASSES?

- |                            |                            |                             |                                      |
|----------------------------|----------------------------|-----------------------------|--------------------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13          |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14          |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15          |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 8 | <input type="checkbox"/> 12 | <input type="checkbox"/> More? _____ |

How many?

I don't drink beer

4. About HOW OFTEN do you drink this much beer?

- |   |  |
|---|--|
| <input type="checkbox"/> daily                | <input type="checkbox"/> twice a month       |
| <input type="checkbox"/> 3 or 4 times a week  | <input type="checkbox"/> once a month        |
| <input type="checkbox"/> twice a week         | <input type="checkbox"/> 3 or 4 times a year |
| <input type="checkbox"/> once a week          | <input type="checkbox"/> twice a year        |
| <input type="checkbox"/> 3 or 4 times a month | <input type="checkbox"/> once a year         |

I don't drink beer

5. How often do you usually have wine, or a punch containing wine?

- |   |   |
|---|---|
| <input type="checkbox"/> daily                | <input type="checkbox"/> once a month           |
| <input type="checkbox"/> 3 or 4 times a week  | <input type="checkbox"/> 3 or 4 times a year    |
| <input type="checkbox"/> twice a week         | <input type="checkbox"/> twice a year           |
| <input type="checkbox"/> once a week          | <input type="checkbox"/> once a year            |
| <input type="checkbox"/> 3 or 4 times a month | <input type="checkbox"/> I have tried wine;     |
| <input type="checkbox"/> twice a month        | <input type="checkbox"/> but I don't drink wine |
|   | <input type="checkbox"/> never had wine         |

\*\*\*\*\*

6. Think of all the times you have had wine recently. When you drink wine, how much wine or a punch containing wine do YOU USUALLY DRINK each time?

GLASSES?

- |                            |                            |                             |                                      |
|----------------------------|----------------------------|-----------------------------|--------------------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13          |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14          |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15          |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 8 | <input type="checkbox"/> 12 | <input type="checkbox"/> More? _____ |
- How many?
- I don't drink wine

7. Each time you drink wine or a punch containing wine, what is the MOST YOU DRINK?

GLASSES?

- |                            |                            |                             |                                      |
|----------------------------|----------------------------|-----------------------------|--------------------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13          |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14          |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15          |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 8 | <input type="checkbox"/> 12 | <input type="checkbox"/> More? _____ |
- How many?
- I don't drink wine

8. About HOW OFTEN do you drink this much wine?

- |   |  |
|---|--|
| <input type="checkbox"/> daily                | <input type="checkbox"/> twice a month       |
| <input type="checkbox"/> 3 or 4 times a week  | <input type="checkbox"/> once a month        |
| <input type="checkbox"/> twice a week         | <input type="checkbox"/> 3 or 4 times a year |
| <input type="checkbox"/> once a week          | <input type="checkbox"/> twice a year        |
| <input type="checkbox"/> 3 or 4 times a month | <input type="checkbox"/> once a year         |

I don't drink wine

9. How often do you usually have drinks containing whiskey or liquor (such as martinis, manhattans, highballs, or straight drinks)?

- |   |  |
|---|--|
| <input type="checkbox"/> daily                | <input type="checkbox"/> once a month  |
| <input type="checkbox"/> 3 or 4 times a week  | <input type="checkbox"/> 3 or 4 times a year                                     |
| <input type="checkbox"/> twice a week         | <input type="checkbox"/> twice a year  |
| <input type="checkbox"/> once a week          | <input type="checkbox"/> once a year   |
| <input type="checkbox"/> 3 or 4 times a month | <input type="checkbox"/> I have tried whiskey and liquor; but I don't drink them |
| <input type="checkbox"/> twice a month        | <input type="checkbox"/> never had whiskey or liquor                             |

\*\*\*\*\*

10. Think of all the times you have had drinks containing whiskey or liquor recently. When you drink whiskey or liquor, how much do YOU USUALLY DRINK each time.

DRINKS?

- |                            |                            |                             |                                      |
|----------------------------|----------------------------|-----------------------------|--------------------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13          |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14          |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15          |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 8 | <input type="checkbox"/> 12 | <input type="checkbox"/> More? _____ |
- How many?

I don't drink whiskey or liquor

11. Each time you drink whiskey or liquor, what is the MOST YOU DRINK?

DRINKS?

- |                            |                            |                             |                                      |
|----------------------------|----------------------------|-----------------------------|--------------------------------------|
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 | <input type="checkbox"/> 9  | <input type="checkbox"/> 13          |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 | <input type="checkbox"/> 10 | <input type="checkbox"/> 14          |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 7 | <input type="checkbox"/> 11 | <input type="checkbox"/> 15          |
| <input type="checkbox"/> 4 | <input type="checkbox"/> 8 | <input type="checkbox"/> 12 | <input type="checkbox"/> More? _____ |
- How many?

I don't drink whiskey or liquor

12. About HOW OFTEN do you drink this much whiskey or liquor?

- |   |  |
|---|--|
| <input type="checkbox"/> daily                | <input type="checkbox"/> twice a month       |
| <input type="checkbox"/> 3 or 4 times a week  | <input type="checkbox"/> once a month        |
| <input type="checkbox"/> twice a week         | <input type="checkbox"/> 3 or 4 times a year |
| <input type="checkbox"/> once a week          | <input type="checkbox"/> twice a year        |
| <input type="checkbox"/> 3 or 4 times a month | <input type="checkbox"/> once a year         |

I don't drink whiskey or liquor

THANK YOU FOR YOUR COOPERATION!

## APPENDIX II

### SECTION I

#### DEMOGRAPHIC INFORMATION (NUMBERS = ABSOLUTE FREQUENCY)

- 1) Age: [ ] [ ] **MODE = 19**
- 2) Sex: male [ ] **80**  
female [ ] **2**
- 3) What is your marital status?
- |                  |                     |
|------------------|---------------------|
| 1 [0] married    | 4 [0] divorced      |
| 2 [2] common-law | 5 [1] widowed       |
| 3 [0] separated  | 6 [7] never married |
- 4) Are there any children living with you?
- |           |          |
|-----------|----------|
| 1 [3] Yes | 2 [7] No |
|-----------|----------|
- 5) In what year of undergraduate studies are you now enrolled?
- |                     |              |             |              |
|---------------------|--------------|-------------|--------------|
| 1 [ ] first         | 2 [7] second | 3 [3] third | 4 [ ] fourth |
| 5 [ ] fifth or more |              |             |              |
- 6) Please indicate your present faculty (department):
- Faculty of Arts
- |  |
|--|
| 1 [ ] Classical Studies  |
| 2 [2] English  |
| 3 [ ] Languages (includes French, German, Russian, Spanish, Italian) |
| 4 [ ] Philosophy   |
| 5 [ ] Visual Arts  |
- Faculty of Science
- |   |
|---|
| 6 [ ] Mathematics   |
| 7 [8] Health Sciences (includes Biochemistry, Genetics, Microbiology and Immunology, Pharmacology and Toxicology, Physiology) |
| 8 [ ] Anatomy   |
| 9 [ ] Astronomy   |
| 10 [8] Chemistry  |
| 11 [3] Computer Science   |
| 12 [ ] Geology  |
| 13 [ ] Geophysics   |
| 14 [ ] Physics  |
| 15 [1] Plant Sciences   |
| 16 [ ] Statistical and Actuarial Sciences   |
| 17 [ ] Zoology  |
- Faculty of Social Sciences
- |                     |
|---------------------|
| 18 [ ] Anthropology |
| 19 [19] Economics   |
| 20 [2] Geography    |
| 21 [4] History      |

- 22 [3] Political Science  
 23 [5] Psychology  
 24 [1] Sociology
- 25 [4] Faculty of Physical Education  
 26 [ ] Faculty of Music  
 27 [ ] Faculty of Education  
 28 [1] Faculty of Engineering Science  
 29 [ ] Faculty of Law  
 30 [ ] Faculty of Medicine  
 31 [ ] School Journalism  
 32 [ ] School of Dentistry  
 33 [ ] School of Library and Information Science  
 34 [ ] School of Business Administration  
 35 [14] Other \_\_\_\_\_  
 (specify)

7) How would you rate your performance in university?

- 1 [1] outstanding    2 [21] above average    3 [10] average  
 4 [10] below average

8) Has your performance in university been:

- 1 [1] much better than expected  
 2 [4] better than expected  
 3 [24] as well as expected  
 4 [42] worse than expected  
 5 [8] much worse than expected

9) Where were you born?

- |                              |                                  |
|------------------------------|----------------------------------|
| 1 [58] Ontario               | 16 [ ] West Germany              |
| 2 [4] Quebec                 | 17 [ ] East Germany              |
| 3 [ ] New Brunswick          | 18 [ ] Italy                     |
| 4 [ ] Nova Scotia            | 19 [ ] Spain                     |
| 5 [ ] Prince Edward Island   | 20 [ ] Portugal                  |
| 6 [ ] Newfoundland           | 21 [ ] South Africa              |
| 7 [1] Manitoba               | 22 [ ] Africa                    |
| 8 [ ] Saskatchewan           | 23 [ ] Caribbean                 |
| 9 [ ] Alberta                | 24 [1] China                     |
| 10 [2] British Columbia      | 25 [ ] Middle-East               |
| 11 [ ] Northwest Territories | 26 [ ] India                     |
| 12 [ ] Yukon Territory       | 27 [ ] Indo-China                |
| 13 [4] United States         | 28 [1] Pakistan                  |
| 14 [6] United Kingdom        | 29 [ ] Indonesia                 |
| 15 [ ] Poland                | 30 [3] Other: _____<br>(specify) |

10) To which ethnic or cultural group did you or your ancestors belong on first coming to this continent? (Check more than one if appropriate)

- |  |   |
|--|---|
| 1 <input checked="" type="checkbox"/> English  | 10 <input type="checkbox"/> Jewish                  |
| 2 <input checked="" type="checkbox"/> French   | 11 <input checked="" type="checkbox"/> Chinese      |
| 3 <input checked="" type="checkbox"/> Irish    | 12 <input type="checkbox"/> East Indian             |
| 4 <input checked="" type="checkbox"/> Scottish | 13 <input type="checkbox"/> Afro-Caribbean          |
| 5 <input checked="" type="checkbox"/> German   | 14 <input type="checkbox"/> Spanish                 |
| 6 <input checked="" type="checkbox"/> Italian  | 15 <input type="checkbox"/> South American          |
| 7 <input checked="" type="checkbox"/> Ukranian | 16 <input type="checkbox"/> Native Indian           |
| 8 <input type="checkbox"/> Dutch               | 17 <input checked="" type="checkbox"/> Other: _____ |
| 9 <input checked="" type="checkbox"/> Polish   | (specify)   |

11) What religion were you brought up in?

- |  |   |
|--|---|
| 1 <input checked="" type="checkbox"/> Roman Catholic | 9 <input type="checkbox"/> Ukranian Catholic        |
| 2 <input checked="" type="checkbox"/> United Church  | 10 <input type="checkbox"/> Pentecostal             |
| 3 <input type="checkbox"/> Anglican                  | 11 <input type="checkbox"/> Jehovah's Witness       |
| 4 <input checked="" type="checkbox"/> Presbyterian   | 12 <input type="checkbox"/> Mennonite               |
| 5 <input checked="" type="checkbox"/> Lutheran       | 13 <input checked="" type="checkbox"/> Islam        |
| 6 <input checked="" type="checkbox"/> Baptist        | 14 <input type="checkbox"/> No Religion             |
| 7 <input type="checkbox"/> Greek Orthodox            | 15 <input checked="" type="checkbox"/> Other: _____ |
| 8 <input type="checkbox"/> Jewish                    | (specify)   |

12) If your present practicing religion is different from above please specify.

Present religion \_\_\_\_\_.

13) How important is religion to you?

- 1  very important  
 2  moderately important  
 3  mildly important  
 4  not important

14) Does your religion prohibit the use of alcohol?

- 1  yes  
 2  no



SECTION IIALCOHOL CONSUMPTION (NUMBERS = RELATIVE FREQUENCY (PERCENT)), UNLESS OTHERWISE INDICATED.

In this section we would like to ask you about your alcohol consumption.

- 1) Please check the statement below that best describes how often you have any kind of drink containing alcohol (wine, beer, liquor).

- 1  3 or more times a day  
 2  2 times a day 1.2  
 3  once a day 2.5  
 4  nearly every day 7.5  
 5  3-4 times a week 26.2  
 6  1-2 times a week 31.3  
 7  2-3 times a week 18.8  
 8  about once a month 6.3  
 9  less than once a month but at least once a year 1.2  
 10  less than once a year or never 2.5

If you checked "9" or "10", please go to Part B.  
 Otherwise, please complete Part A.

PART A

- 1) Not counting small sips, at what age did you start drinking alcoholic beverages?

MODE = 15  
 age level [ ] [ ]

- 2) When you drink alcohol which type of alcohol are you most likely to consume?

- 1  wine 5  
 2  beer 71.4  
 3  liquor (rye, gin, rum, etc.) 22.1

Wine

- 3) Think of all the times you have had wine recently. When you drink wine, how often do you have as many as 5 or 6 glasses?

- 1  nearly every time 8.8  
 2  more than half the time 11.2  
 3  less than half the time 20.0  
 4  once in a while 27.5  
 5  never 26.2

- 4) When you drink wine, how often do you have three or four glasses?

- 1  nearly every time 13.7  
 2  more than half the time 12.5  
 3  less than half the time 22.5  
 4  once in a while 27.5  
 5  never 15.0

5) When you drink wine, how often do you have one or two glasses?

- 1 [ ] nearly every time 43.8  
 2 [ ] more than half the time 21.2  
 3 [ ] less than half the time 7.5  
 4 [ ] once in a while 19.8  
 5 [ ] never 8.8

#### Beer

6) Think of all the times you have had beer recently. When you drink beer, how often do you have as many as five or six bottles or glasses?

- 1 [ ] nearly every time 39.0  
 2 [ ] more than half the time 32.5  
 3 [ ] less than half the time 13.0  
 4 [ ] once in a while 7.9  
 5 [ ] never 7.8

7) When you drink beer, how often do you have three or four bottles or glasses?

- 1 [ ] nearly every time 30.7  
 2 [ ] more than half the time 32.0  
 3 [ ] less than half the time 20.0  
 4 [ ] once in a while 10.7  
 5 [ ] never 6.7

8) When you drink beer, how often do you drink one or two bottles or glasses?

- 1 [ ] nearly every time 50.7  
 2 [ ] more than half the time 8.0  
 3 [ ] less than half the time 17.3  
 4 [ ] once in a while 22.7  
 5 [ ] never 1.3

#### Liquor

9) Think of all the times you have had drinks containing liquor recently. When you have them, how often do you have as many as five or six drinks? ("doubles" count as two)

- 1 [ ] nearly every time 21.3  
 2 [ ] more than half the time 25.3  
 3 [ ] less than half the time 21.3  
 4 [ ] once in a while 18.7  
 5 [ ] never 13.3

10) When you have drinks containing liquor, how often do you have three or four drinks?

- 1 [ ] nearly every time 17.8  
 2 [ ] more than half the time 16.4  
 3 [ ] less than half the time 39.7  
 4 [ ] once in a while 12.3  
 5 [ ] never 13.7

11) When you have drinks containing liquor, how often do you have one or two drinks?

- 1 [ ] nearly every time 32.9  
 2 [ ] more than half the time 26.0  
 3 [ ] less than half the time 12.3  
 4 [ ] once in a while 24.7  
 5 [ ] never 4.1

12) Has your drinking changed over the last six months?

- 1 [ ] drinking less now 23.7  
 2 [ ] drinking more now (please go to question 14) 35.5  
 3 [ ] no change over last six months (please go to question 15) 40.8

13) If your drinking has decreased over the last six months, please indicate for which of the following reasons. (please skip question 14)

- 1 [1] close friend or spouse did not drink  
 2 [3] it was affecting my health  
 3 [0] joined A.A. or treatment program  
 4 [3] had a bad experience because of drinking  
 5 [2] it was a source of conflict with family or friends  
 6 [0] didn't drink much and decided to quit  
 7 [6] it was too expensive  
 8 [5] thought I could use my time better  
 9 [2] it was affecting my studying or work  
 10 [1] close friend or spouse told me they thought I had a drinking problem  
 11 [3] it was interfering with my physical fitness program  
 12 [0] religious reasons  
 13 [3] no particular reason  
 14 [ ] other: \_\_\_\_\_  
 (please explain)

14) If your drinking has increased over the last six months, please indicate for which of the following reasons.

- 1 [9] drinking helps me to relax  
 2 [12] I become more sociable  
 3 [4] it helps me forget about my worries  
 4 [7] it relieves boredom  
 5 [2] I drink more because of loneliness  
 6 [5] I become less inhibited  
 7 [15] Most of my friends drink  
 8 [3] drinking increases my self-confidence  
 9 [3] drinking is my reward for a hard day's work  
 10 [9] it helps relieve the pressures of school  
 11 [ ] other: \_\_\_\_\_  
 (please explain)

15) In relation to your peers, do you feel that your present level of drinking is:

- 1  much higher than average 2.6
- 2  somewhat higher than average 16.9
- 3  about average 44.2
- 4  somewhat lower than average 26.0
- 5  much lower than average 10.4

16) Do you feel that your present level of drinking is a problem for you?

- 1  no 87.0
- 2  somewhat 10.4
- 3  yes 2.6

17) Have your attitudes toward drinking changed drastically over the past:

6 months \_\_\_\_\_?  
month \_\_\_\_\_?

If so, more or less favourably?, and Why?

If you answered Part A, please skip Part B and go to section III.

PART B

ABSOLUTE FREQUENCY-SECTION BASED ON ONLY 1 SUBJECT.

- 1) What experience with alcohol have you had?
  - 1  drink occasionally
  - 2  never drank
  - 3  used to drink) Please go to section III
  
- 2) At what age did you start to drink?

at age ( ) ( ) .
  
- 3) About how often did you usually drink?
  - 1  3 or more times a day
  - 2  2 times a day
  - 3  once a day
  - 4  nearly every day
  - 5  3-4 times a week
  - 6  1-2 times a week
  - 7  2-3 times a month
  - 8  about once a month
  
- 4) About how many drinks did you have at a time?
  - 1  one
  - 2  two or three
  - 3  four or five
  - 4  six or seven
  - 5  more than that
  
- 5) What did you usually drink? (Check one only)
  - 1  beer
  - 2  wine
  - 3  liquor or mixed drinks
  - 4  other
  - 5  it varied
  
- 6) Were there any particular reasons why you stopped drinking?
  - 1  close friend or spouse did not drink
  - 2  it was affecting my health
  - 3  joined A.A. or treatment program
  - 4  had a bad experience because of drinking
  - 5  it was a source of conflict with family or friends
  - 6  didn't drink much and decided to quit
  - 7  it was too expensive
  - 8  thought I could use my time better
  - 9  it was affecting my studying or work
  - 10  close friend or spouse told me they thought I had a drinking problem
  - 11  it was interfering with my physical fitness program
  - 12  religious reasons
  - 13  no particular reason

SECTION IIICONSUMPTION OF DRUGS OTHER THAN ALCOHOL

- 1) In the past 6 months, have you ever used drugs other than alcohol for non-medical purposes?

57.5 1 [ ] Yes (If "yes", please complete questions 2, 3 and 4 below)  
 42.5 2 [ ] No (If "no" and you also answered Part B, you are finished.  
 Thank you for your cooperation. If "no", but you answered Part A, please go to section IV).

- 2) How often during the past 6 months have you used any of the following drugs? (For each drug listed at the left, please circle the appropriate number under the columns on the right.)

	Not at all	Once	A few times	Monthly	Weekly	Almost daily	Daily
Cannabis (marijuana, hashish)	7.0 1	14.0 2	39.5 3	18.6 4	11.6 5	7.0 7	2.3 8
Tranquilizers (e.g., valium)	97.2 1	2.8 2	∅ 3	∅ 4	∅ 5	∅ 7	∅ 8
Stimulants (amphetamines)	40.0 1	25.0 2	17.5 3	10.0 4	5.0 5	2.5 7	∅ 8
Cocaine	75.0 1	19.4 2	5.5 3	∅ 4	∅ 5	∅ 7	∅ 8
Hallucinogens (e.g., LSD, peyote)	88.6 1	2.9 2	5.7 3	2.9 4	∅ 5	∅ 7	∅ 8
Sedatives (e.g., quaaludes)	97.1 1	2.9 2	∅ 3	∅ 4	∅ 5	∅ 7	∅ 8
Opiates (e.g., heroin, demerol)	100 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 7	∅ 8

3) In relation to your peers, do you feel that your present level of use of drugs other than alcohol is:

- 1 [ ] much higher than average 4.4  
2 [ ] somewhat higher than average 11.1  
3 [ ] about average 26.7  
4 [ ] somewhat lower than average 28.9  
5 [ ] much lower than average 28.9

4) Do you feel that non-medical drug use is a problem for you?

- 1 [ ] No 95.6  
2 [ ] Somewhat 4.4  
3 [ ] Yes  $\phi$

SECTION IVDRINKING PRACTICES

In this section we would like to ask you about some of your drinking practices.

- 1) When you drink alcohol, how often do you go to each of the following places? (For each location listed at the left, please circle the appropriate number under the columns on the right.)

	<u>Nearly every time</u>	<u>More than half the time</u>	<u>Less than half the time</u>	<u>Once in a while</u>	<u>Never</u>
A pub or bar <u>on</u> campus.	13.3	29.3	24.0	25.3	8.0
A pub or bar <u>off</u> campus.	6.5	19.5	29.9	39.0	5.2
Either a friend's place or your place.	5.3	34.2	28.9	28.9	2.6
At home alone.	1.3	1.3	5.3	30.7	61.3
A restaurant	2.7	8.0	14.7	68.0	6.7
Other: _____ (specify)					

- 2) When you go drinking, how often do you begin at each of the following times?

	<u>Nearly every time</u>	<u>More than half the time</u>	<u>Less than half the time</u>	<u>Once in a while</u>	<u>Never</u>
Before noon.	1.3	1.3	0	22.4	75.0
At noon.	1.3	0	9.2	50.0	39.5



Early afternoon (1:00-2:00 p.m.)	0	4.2	18.1	50.0	27.8
Late afternoon (3:00-6:00 p.m.)	1.4	11.0	27.4	52.1	8.2
Early evening (6:00-8:00 p.m.)	10.4	28.6	45.5	14.3	1.3
Late evening (after 8:30 p.m.)	32.0	48.0	9.3	5.3	5.3

3) When you go out drinking, how often do you spend more money than you wanted to?

- 1 [ ] nearly every time 19.5
- 2 [ ] more than half the time 37.7
- 3 [ ] less than half the time 22.1
- 4 [ ] once in a while 11.7
- 5 [ ] never 9.1

4) How often are you the person to "round up" some friends to go out drinking?

- 1 [ ] nearly every time 5.2
- 2 [ ] more than half the time 18.2
- 3 [ ] less than half the time 27.3
- 4 [ ] once in a while 39.0
- 5 [ ] never 10.4

5) If you were not thinking of going drinking, how likely would you be to go drinking if asked by a friend or friends?

- 1 [ ] extremely likely 6.5
- 2 [ ] very likely 20.8
- 3 [ ] somewhat likely 58.4
- 4 [ ] not very likely 10.4
- 5 [ ] not likely at all 3.9

6) When you go out drinking, how often do you stay at the bar longer than you wanted to?

- 1 [ ] nearly every time 10.4
- 2 [ ] more than half the time 14.3
- 3 [ ] less than half the time 35.1
- 4 [ ] once in a while 28.6
- 5 [ ] never 11.7

- 7) There are several reasons why you might continue to drink even when you might otherwise feel like quitting. Listed below, on the left, are several possibilities. Please indicate how often you would stay longer than desired for each of these reasons by circling the appropriate number under the columns on the right. If you include any reasons "other" than those listed, please circle the appropriate number on the right as well.

	<u>Nearly every time</u>	<u>More than half the time</u>	<u>Less than half the time</u>	<u>Once in a while</u>	<u>Never</u>
It's your turn to buy another round.	18.2	18.2	13.0	35.1	15.6
Your friends urge you to stay.	3.9	31.2	40.3	16.9	7.8
You are waiting for a ride home.	10.4	18.2	18.2	20.8	67.5
Your date wants to stay longer.	5.2	27.3	22.1	26.0	19.5
You are too drunk to drive.	14.5	5.3	10.5	28.9	40.8
You are too drunk to get up and leave.	8.1	2.7	4.1	17.6	67.6
Other: _____ _____					
(please explain)					
Other: _____ _____					
(please explain)					

- 8) When you want to stay at a bar or party but you want to stop drinking, how often do you do each of the following?

	Nearly every time	More than half the time	Less than half the time	Once in a while	Never
Keep drinking anyway.	4.1	14.9	25.7 3	31.1	24.3
Decrease your rate of drinking.	18.9	35.1	14.9 3	20.3	10.8
Switch to a drink with less alcohol.	8.1	18.9	13.5	23.0	36.5
Switch to a non-alcoholic beverage.	24.7	14.3	15.6	24.7	20.8
Leave.	2.7	9.3	18.7	45.3	24.0

- 9) How often has your schoolwork (e.g., assignments, marking, teaching) suffered as a result of going out drinking or being hung-over?

- 1 [ ] nearly every time 0  
 2 [ ] more than half the time 5.2  
 3 [ ] less than half the time 22.1  
 4 [ ] once in a while 48.1  
 5 [ ] never 24.7

- 10) Approximately what percentage of your leisure activity involves drinking?

- 1 [ ] 80-100% 1.3  
 2 [ ] 60-79% 15.6  
 3 [ ] 40-59% 20.8  
 4 [ ] 20-39% 27.3  
 5 [ ] 0-19% 35.1

- 11) Is drinking making your campus life happier?

- 1 [ ] always 5.2  
 2 [ ] most of the time 13.0  
 3 [ ] sometimes 62.3  
 4 [ ] rarely 13.0  
 5 [ ] never 6.5

Table 6

Characteristics of Subjects Included in Main Analysis

	LABORATORY			
	Told Alcohol Given Alcohol (n=10)	Told Alcohol Given No Alcohol (n=10)	Told No Alcohol Given Alcohol (n=10)	Told No Alcohol Given No Alcohol (n=9)
$\bar{X}$ Drinks/Week	21.40	19.15	22.08	21.00
$\bar{X}$ Years Drank Regularly	3.55	2.65	3.40	2.67
$\bar{X}$ Weight (lbs)	178.2	166.4	168.1	165.0

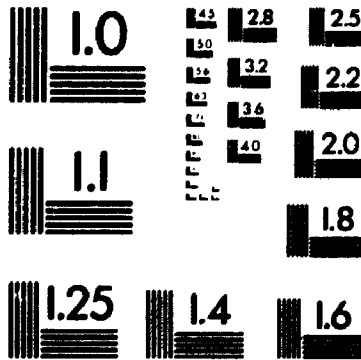
  

	BARROOM			
	Told Alcohol Given Alcohol (n=8)	Told Alcohol Given No Alcohol (n=8)	Told No Alcohol Given Alcohol (n=8)	Told No Alcohol Given No Alcohol (n=8)
$\bar{X}$ Drinks/Week	20.28	16.41	18.78	19.41
$\bar{X}$ Years Drank Regularly	4.50	3.19	3.06	3.56
$\bar{X}$ Weight (lbs)	173.6	168.5	168.6	166.3

# 3

# of/de

# 3



- 12) Do you stop drinking before you get drunk?
- 1 [ ] always 5.3  
 2 [ ] most of the time 25.0  
 3 [ ] sometimes 46.1  
 4 [ ] rarely 21.1  
 5 [ ] never 2.6
- 13) Once you have had one or two drinks, is it difficult to stop drinking?
- 1 [ ] always 2.6  
 2 [ ] most of the time 10.5  
 3 [ ] sometimes 31.6  
 4 [ ] rarely 34.2  
 5 [ ] never 21.1
- 14) Do you tend to drink alcohol fairly quickly?
- 1 [ ] always 15.8  
 2 [ ] most of the time 27.6  
 3 [ ] sometimes 44.7  
 4 [ ] rarely 7.9  
 5 [ ] never 3.9
- 15) Do you avoid talking to others about your drinking?
- 1 [ ] always 1.3  
 2 [ ] most of the time 6.6  
 3 [ ] sometimes 10.5  
 4 [ ] rarely 34.2  
 5 [ ] never 47.4
- 16) If you have ever attempted to cut down on your alcohol consumption, how difficult was it?
- 1 [ ] extremely difficult  $\phi$  ) If you answered 1, 2, or 3,  
 2 [ ] very difficult 1.3 ) please indicate why in the  
 3 [ ] somewhat difficult 11.8 ) space provided below.  
 4 [ ] not very difficult 14.5  
 5 [ ] not difficult at all 39.5  
 6 [ ] I have never tried to reduce my alcohol consumption. 32.9
- 17) Do your friends joke about your drinking?
- 1 [ ] a lot 6.6  
 2 [ ] sometimes 27.6  
 3 [ ] never 57.9  
 4 [ ] unsure 7.9
- 18) Do you think other people feel you have a drinking problem?
- 1 [ ] yes  $\phi$   
 2 [ ] maybe a few 15.8  
 3 [ ] no 77.6  
 4 [ ] unsure 6.6

19) Has anyone ever suggested that you seek help for a drinking problem?

- 1  yes 1.3  
2  no 98.7

20) Have you ever sought help for a drinking problem?

- 1  yes 1.3  
2  no 98.7

21) Do most of your friends drink?

- 1  yes 94.5  
2  no 5.5

22) Do you have any friends or relatives who you think might have a drinking problem?

- 1  yes 38.7  
2  no 61.3

23) Have you ever suggested that a friend or relative seek help for a drinking problem?

- 1  yes 26.7  
2  no 73.3

24) How likely would you be to suggest that a friend or relative contact an alcohol and/or substance use related service if you felt that they had a drinking problem?

- 1  extremely likely 14.7  
2  very likely 34.7  
3  somewhat likely 37.3  
4  not very likely 10.7  
5  not likely at all 2.7

17.

- 25) Listed below are several reasons people might give for not suggesting that a friend or relative seek help for a drinking problem. If you knew someone who you thought had a drinking problem but you did not make such a suggestion, please indicate how influential you think each of these reasons would be by circling the appropriate number under the columns on the right.

	Very influ- ential	Moder- ately influ- ential	Some- what influ- ential	Not very influ- ential	Not influ- ential at all
I am not sure of what type of help to suggest.	2.8	9.9	32.4	32.4	22.5
I am not sure how to approach someone about their drinking.	10.0	24.3	30.0	27.1	8.6
I don't feel it's any of my business.	4.2	18.3	28.2	35.2	14.1
I'm not sure how to identify when someone might need help.	1.4	19.7	25.4	36.6	16.9
I don't want to offend anyone.	8.5	31.0	21.1	26.8	12.7
I don't feel it would do any good.	2.8	9.9	18.3	33.8	35.2
I think I may have a drinking problem myself.	1.4	1.4	5.7	12.9	78.6
Other: _____ (please specify)					



26) If you thought drinking was interfering with your (or a friend's) school work or social life and decided to do something about it, what services on campus do you think could be of assistance? (List as many as you can think of.)

27) What services off campus do you think could be of assistance? (List as many as you can think of.)

28) Do you feel that there is a need for some type of service to help students with alcohol and/or drug abuse problems?

1	<input type="checkbox"/>	definitely	36.8
2	<input type="checkbox"/>	probably	36.8
3	<input type="checkbox"/>	uncertain	25.0
4	<input type="checkbox"/>	no	1.3

19.

- 29) Please indicate the degree of interest you would have in each of the following types of alcohol and/or substance use related services by circling the appropriate number under the columns on the right.

	Extremely interested	Very inter- ested	Somewhat interested	Slightly interested	Not at all interested
Information Services	6.7	34.7	30.7	22.7	5.3
Religiously Affiliated Services	0	5.4	24.3	20.3	50.0
Hotline	10.7	26.7	25.3	24.0	13.3
Medical and Psychiatric Services	9.3	26.7	28.0	25.3	10.7
Counseling	10.7	38.7	29.3	13.3	8.0
On-Campus Treatment	12.0	28.0	33.3	17.3	9.3
Off-Campus Treatment	8.0	24.0	22.7	37.3	8.0
Courses or Programs on Constructive Drug Use	10.8	21.6	24.3	24.3	18.9
Educational Presentations and Workshops	8.1	24.3	27.0	27.0	13.5

Other:

\_\_\_\_\_  
(please specify)

30) How likely would you be to contact an alcohol and/or substance use related service if you felt that you had a drinking problem?

- 1 [ ] extremely likely 13.2  
 2 [ ] very likely 22.4  
 3 [ ] somewhat likely 50.0  
 4 [ ] not very likely 10.5  
 5 [ ] not likely at all 3.9

31) Listed below are several reasons people might give for not seeking help for a drinking problem. If you felt that you might have a drinking problem but you were reluctant to seek help, please indicate how important each of the following reasons would be.

	Extremely important	Very important	Somewhat important	Not very important	Not important at all
I would be unsure how to make the initial contact with a treatment service.	4.1	21.9	41.1	20.5	12.3
I am not sure what treatment actually involves.	2.7	26.0	35.6	23.3	12.3
I believe treatment necessarily involves periods of hospitalization.	5.6	15.5	16.9	31.0	31.0
I would be embarrassed.	23.3	23.3	30.1	13.7	9.6
It would be difficult to accept that I had a drinking problem.	23.3	27.4	27.4	15.1	6.8
Treatment would be too disruptive in my life because of the time involved.	4.1	16.4	37.0	24.7	17.8
I believe it would be my own responsibility to deal with a drinking problem.	9.6	20.5	34.2	19.2	16.4

SECTION VREASONS FOR DRINKING

How often do you drink for the following reasons?

Reasons for Drinking

	Always	Most of the time	Sometimes	Rarely	Never
To get along better on dates.	1.3	13.0	42.9	22.1	20.8
To relieve stress or tension.	3.9	18.2	42.9	18.2	16.9
To relieve boredom.	1.3	22.1	27.3	28.6	20.8
Sociability.	14.3	46.8	28.6	3.9	6.5
For aches and pains.	2.6	2.6	10.4	26.0	58.4
Enjoyment of taste.	14.3	50.6	26.0	5.2	3.9
In order not to be shy.	3.9	10.4	27.3	20.8	37.7
For a sense of well-being.	1.3	7.8	13.0	41.6	36.4
As an aid in forgetting disappointments.	1.3	9.1	29.9	31.2	28.6
To get high.	7.8	24.7	31.2	18.2	18.2
To get drunk.	9.1	19.5	36.4	23.4	11.7
Because it is expected by peers.	1.3	6.5	23.4	32.5	36.4
It helps me cope with problems.	0	5.2	13.0	39.0	42.4
To celebrate a special occasion.	13.0	46.8	37.7	2.6	0
To get along better in a group.	3.9	20.8	31.2	32.5	11.7
It increases my self- confidence.	1.3	10.4	19.5	44.2	24.3
It helps when things get me down	1.3	7.8	20.8	39.0	31.2
To heighten sexual experience.	1.3	6.5	16.9	27.3	48.1
To help me get to sleep at night.	0	5.2	14.5	26.0	54.3
I become less inhibited.	2.6	18.4	28.9	26.3	23.7

SECTION VICONSEQUENCES OF DRINKING

In this section we would like to ask you about some possible consequences of drinking.

- 1) To the best of your recollection indicate the extent to which you have experienced each of the following consequences following drinking during the past six months.

	Always	Most of the time	Sometimes	Rarely	Never
I have had a hangover.	39.	17.1	44.7	23.7	10.5
I have gotten nauseated and vomited from drinking.	0	0	14.5	47.4	38.2
I have driven a car when I had too much to drink.	0	1.3	27.6	25.0	46.1
I have drunk while driving.	0	1.3	18.4	21.1	59.2
I have been arrested for drunk driving.	0	0	0	2.7	97.3
I have skipped a class after drinking.	0	3.9	30.3	27.6	38.0
I have missed a class because of a hangover.	2.6	2.6	27.6	25.0	42.0
I have received a lower grade because of drinking too much.	0	0	11.8	31.6	56.6
I have gotten into a fight after drinking.	0	0	14.5	25.0	60.5
I have damaged property after drinking.	0	2.6	7.9	31.6	57.9
Drinking has detracted from my sexual performance and enjoyment.	1.3	2.6	17.1	25.0	53.9
Drinking has prevented me from having sex.	0	2.7	2.7	21.3	73.3

	Always	Most of the time	Sometimes	Rarely	Never
Drinking has resulted in my having sex when I really didn't want to.	0	2.6	10.4	28.6	58.4
I have gotten into trouble with the law because of drinking.	0	0	10.4	16.9	72.7
I was involved in some type of accident after drinking.	0	0	2.6	10.5	86.6
I did not remember what happened while I was drinking.	0	2.6	19.5	40.3	37.7
I have done something after drinking which I later regretted.	0	3.9	26.0	50.6	19.5
My drinking has caused conflicts with close friends of the same sex.	0	0	6.5	29.9	63.6
My drinking has caused conflicts with close friends of the opposite sex.	0	0	10.5	39.5	50.4
My drinking has damaged other friendships.	0	0	3.9	26.0	70.1
I have lost a job because of drinking.	0	1.3	0	1.3	97.4
I have gone without other things because of the cost of alcohol.	1.3	3.9	19.5	27.3	48.1
I have lost a girl/boyfriend due to drinking.	0	0	2.6	5.2	92.2
I have been injured as a result of drinking.	0	2.5	8.8	18.2	70.1
I have not felt like doing anything productive the following day.	1.2	20.0	41.3	21.2	13.2

SECTION VII

This is a series of questions about the use of alcoholic beverages. What beverages people drink, how much, and how often. Please check the statement that best applies to you, or write in the answer.

1. How often do you usually drink beer?

- |                                 |                                |
|---------------------------------|--------------------------------|
| <u>8.8</u> daily                | <u>3.7</u> once a month        |
| <u>27.5</u> 3 or 4 times a week | <u>1.2</u> 3 or 4 times a year |
| <u>31.3</u> twice a week        | <u>2.5</u> twice a year        |
| <u>13.7</u> once a week         | <u>0</u> once a year           |
| <u>2.5</u> 3 or 4 times a month | <u>0</u> I have tried beer;    |
| <u>5.0</u> twice a month        | but I don't drink beer         |
|                                 | <u>0</u> never had beer        |

\*\*\*\*\*

2. Think of all the times you have had beer recently. When you drink beer, how much beer do YOU USUALLY DRINK each time?

CANS OR GLASSES?

- |               |               |                |                            |
|---------------|---------------|----------------|----------------------------|
| <u>6.3</u> 1  | <u>15.0</u> 5 | <u>5.0</u> 9   | <u>0</u> 13                |
| <u>3.7</u> 2  | <u>12.5</u> 6 | <u>10.0</u> 10 | <u>0</u> 14                |
| <u>15.0</u> 3 | <u>2.5</u> 7  | <u>0</u> 11    | <u>1.2</u> 15              |
| <u>10.0</u> 4 | <u>10.0</u> 8 | <u>2.5</u> 12  | <u>1.2</u> More? <u>17</u> |
- How many?

5.0 I don't drink beer

\*\*\*\*\*

3. Each time you drink beer, what is the MOST YOU DRINK?

CANS OR GLASSES?

- |              |               |                |                                      |
|--------------|---------------|----------------|--------------------------------------|
| <u>0</u> 1   | <u>2.5</u> 5  | <u>5.0</u> 9   | <u>3.7</u> 13                        |
| <u>3.7</u> 2 | <u>5.0</u> 6  | <u>8.8</u> 10  | <u>6.3</u> 14                        |
| <u>2.5</u> 3 | <u>3.7</u> 7  | <u>1.2</u> 11  | <u>3.7</u> 15                        |
| <u>5.0</u> 4 | <u>12.5</u> 8 | <u>16.2</u> 12 | <u>14.7</u> More? <u>RANGE 16-36</u> |
- How many?

5.0 I don't drink beer

4. About HOW OFTEN do you drink this much beer?

- |                                 |                                 |
|---------------------------------|---------------------------------|
| <u>0</u> daily                  | <u>11.2</u> twice a month       |
| <u>2.5</u> 3 or 4 times a week  | <u>25.0</u> once a month        |
| <u>2.5</u> twice a week         | <u>16.2</u> 3 or 4 times a year |
| <u>10.0</u> once a week         | <u>11.2</u> twice a year        |
| <u>2.5</u> 3 or 4 times a month | <u>8.8</u> once a year          |

5.0 I don't drink beer

5. How often do you usually have wine, or a punch containing wine?

<u>0</u> daily	<u>20.0</u> once a month
<u>0</u> 3 or 4 times a week	<u>18.8</u> 3 or 4 times a year
<u>2.5</u> twice a week	<u>8.8</u> twice a year
<u>6.3</u> once a week	<u>2.5</u> once a year
<u>17.7</u> 3 or 4 times a month	<u>7.5</u> I have tried wine;
<u>17.5</u> twice a month	but I don't drink wine
	<u>2.5</u> never had wine

\*\*\*\*\*

6. Think of all the times you have had wine recently. When you drink wine, how much wine or a punch containing wine do YOU USUALLY DRINK each time?

GLASSES?

<u>16.2</u> 1	<u>6.3</u> 5	<u>0</u> 9	<u>0</u> 13
<u>31.3</u> 2	<u>2.5</u> 6	<u>1.2</u> 10	<u>0</u> 14
<u>17.5</u> 3	<u>1.2</u> 7	<u>0</u> 11	<u>0</u> 15
<u>11.2</u> 4	<u>3.7</u> 8	<u>0</u> 12	<u>0</u> More?

How many? \_\_\_\_\_

8.8 I don't drink wine

7. Each time you drink wine or a punch containing wine, what is the MOST YOU DRINK?

GLASSES?

<u>6.3</u> 1	<u>13.7</u> 5	<u>3.7</u> 9	<u>1.2</u> 13
<u>6.3</u> 2	<u>11.2</u> 6	<u>6.3</u> 10	<u>0</u> 14
<u>12.5</u> 3	<u>1.2</u> 7	<u>0</u> 11	<u>2.5</u> 15
<u>15.0</u> 4	<u>7.5</u> 8	<u>1.2</u> 12	<u>1.2</u> More? <u>17</u>

How many? \_\_\_\_\_

8.8 I don't drink wine

8. About HOW OFTEN do you drink this much wine?

<u>0</u> daily	<u>5.0</u> twice a month
<u>1.2</u> 3 or 4 times a week	<u>20.0</u> once a month
<u>0</u> twice a week	<u>27.5</u> 3 or 4 times a year
<u>2.5</u> once a week	<u>13.7</u> twice a year
<u>5.0</u> 3 or 4 times a month	<u>15.0</u> once a year

8.8 I don't drink wine



9. How often do you usually have drinks containing whiskey or liquor (such as martinis, manhattans, highballs, or straight drinks)?

0 daily  
0 3 or 4 times a week  
12.5 twice a week  
21.2 once a week  
12.5 3 or 4 times a month  
15.0 twice a month

13.7 once a month  
10.0 3 or 4 times a year  
1.2 twice a year  
1.2 once a year  
8.8 I have tried whiskey and liquor; but I don't drink them  
3.7 never had whiskey or liquor

\*\*\*\*\*

10. Think of all the times you have had drinks containing whiskey or liquor recently. When you drink whiskey or liquor, how much do YOU USUALLY DRINK each time.

DRINKS?

3.7 1      15.0 5      1.2 9      0 13  
12.5 2      13.7 6      3.7 10      0 14  
12.5 3      3.7 7      1.2 11      2.5 15  
11.2 4      6.3 8      0 12      0 More?

How many? \_\_\_\_\_

12.5 I don't drink whiskey or liquor

11. Each time you drink whiskey or liquor, what is the MOST YOU DRINK?

DRINKS?

1.2 1      8.8 5      1.2 9      3.7 13  
5.0 2      11.2 6      15.0 10      2.5 14  
1.2 3      2.5 7      3.7 11      3.7 15  
3.7 4      13.7 8      7.5 12      3.7 More?

How many? 20 + 25

12.5 I don't drink whiskey or liquor

12. About HOW OFTEN do you drink this much whiskey or liquor?

0 daily  
0 3 or 4 times a week  
2.5 twice a week  
3.7 once a week  
6.3 3 or 4 times a month

13.7 twice a month  
20.0 once a month  
27.5 3 or 4 times a year  
8.8 twice a year  
6.3 once a year

12.5 I don't drink whiskey or liquor

THANK YOU FOR YOUR COOPERATION!

## APPENDIX III

### Notice

#### Alcohol Study

This study is concerned with investigating the effects of several variables on alcohol consumption. As a subject you may or may not receive alcoholic beverages. If you are a male regular social drinker, 19 years of age or older, and you wish to participate for 3 credits, please call: 432-8418, any evening to obtain further information and arrange a suitable time. Ask for Steve.

APPENDIX IV

Telephone Information

- 1) AGE: \_\_\_\_\_.
- 2) AVG. n of occasions/week: \_\_\_\_\_.
- 3) AVG. n of drinks/occasion: \_\_\_\_\_.
- 4) Where do you usually drink? \_\_\_\_\_.
- 5) What do you usually drink? \_\_\_\_\_.
- 6) How long have you been drinking? \_\_\_\_\_.

APPENDIX V

Subject No. \_\_\_\_\_

**Checklist of Contraindications of Consumption  
of Alcohol for Research Purposes**

**Age:**

**Sex:**

**Weight:**

**Height:**

**Body Frame Size:** Small  
Medium  
Large

**Examiner:**

- 2 -

MEDICAL HISTORY

Circle One Answer

- |    |  |     |    |
|----|--|-----|----|
| 1. | Do you have any complaints at present?           | YES | NO |
|    | If YES, give more information.                   |     |    |
| 2. | Are you presently being treated by a physician?  | YES | NO |
|    | If YES, for what disorder? List symptoms:        |     |    |
| 3. | Are you taking medication?                       | YES | NO |
|    | What medication, and for what reason?            |     |    |
| 4. | Past illnesses: (If YES, elaborate)              |     |    |
|    | a) accidents                                     | YES | NO |
|    | b) surgery                                       | YES | NO |
|    | c) stomach or duodenal ulcers                    | YES | NO |
|    | d) vomiting of blood                             | YES | NO |
|    | e) cirrhosis of/fatty liver or jaundice          | YES | NO |
|    | f) pancreatitis and/or diabetes                  | YES | NO |
|    | g) neuritis (especially legs)                    | YES | NO |
|    | h) heart and/or blood pressure                   | YES | NO |
| 5. | <u>General Health</u>                            |     |    |
|    | a) Are you in good health?                       | YES | NO |
|    | b) Do you sleep well?                            | YES | NO |
|    | c) Do you have a general feeling of well-being?  | YES | NO |
|    | d) Any problems regarding reactivity to alcohol? | YES | NO |

- 3 -

**FUNCTIONAL INQUIRY** (If YES, elaborate)**1. CNS Function:**

- |    |  |     |    |
|----|--|-----|----|
| a) | Do you have headaches?   | YES | NO |
| b) | Do you have convulsions?   | YES | NO |
| c) | Do you have dizziness?   | YES | NO |
| d) | Do you have blackouts?   | YES | NO |
| e) | Do you get numbness and/or trembling<br>in any part of the body?                 | YES | NO |
| f) | Do you stagger when you walk? (When<br>not under influence of drugs or alcohol.) | YES | NO |

**2. Gastrointestinal:**

- |    |  |     |    |
|----|--|-----|----|
| a) | Do you have nausea or vomiting?                | YES | NO |
| b) | Do you have abdominal pain or tenderness?      | YES | NO |
| c) | Do you have a good appetite?                   | YES | NO |
| d) | Do you have bleeding from the mouth or rectum? | YES | NO |

**3. Cardiovascular/Respiratory:**

- |    |  |     |    |
|----|--|-----|----|
| a) | Do you have unusual shortness of breath?   | YES | NO |
| b) | Do you have pains in chest: (i) at rest?   | YES | NO |
|    | (ii) exertion?                             | YES | NO |
| c) | Do you cough sputum? (If YES, colour)      | YES | NO |
| d) | Do you smoke? (If YES, what and how much?) | YES | NO |

**DRINKING AND DRUG TAKING HISTORY** (If YES, elaborate)

- |    |  |     |    |
|----|--|-----|----|
| 1. | Are you taking any medication or drugs at present? | YES | NO |
| 2. | How much coffee/tea do you take daily? _____       | YES | NO |

- 4 -

3. With specific relation to drinking behaviour (i.e., while under the influence of alcohol)
- |    |   |     |    |
|----|---|-----|----|
| a) | vomiting of blood                                 | YES | NO |
| b) | abdominal pain                                    | YES | NO |
| c) | diarrhea and/or rectal bleeding                   | YES | NO |
| d) | jaundice and/or liver problem                     | YES | NO |
| e) | headaches/convulsions/blackouts                   | YES | NO |
| f) | pancreatitis                                      | YES | NO |
| g) | numbness, weakness, tingling (especially in legs) | YES | NO |
| h) | bizarre behaviours                                | YES | NO |
| i) | unusual mental changes                            | YES | NO |
4. Contraindications:
- |    |  |     |    |
|----|--|-----|----|
| a) | Have you ever been advised not to drink alcohol?                         | YES | NO |
| b) | History of any of the above symptom consequences when consuming alcohol? | YES | NO |

## APPENDIX VI

### The Brief Mast

#### Questions

- |   |        |       |
|---|--------|-------|
| 1. Do you feel you are a normal drinker?  | YES(0) | NO(2) |
| 2. Do friends or relatives think you are a normal drinker?  | YES(0) | NO(2) |
| 3. Have you ever attended a meeting of Alcoholics Anonymous?  | YES(5) | NO(0) |
| 4. Have you ever lost friends or girlfriends/ boyfriends because of drinking?   | YES(2) | NO(0) |
| 5. Have you ever gotten into trouble at work because of drinking?   | YES(2) | NO(0) |
| 6. Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?     | YES(2) | NO(0) |
| 7. Have you ever had delirium tremors (D.T.s), severe shaking, heard voices or seen things that weren't there after heavy drinking? | YES(2) | NO(0) |
| 8. Have you ever gone to anyone for help about your drinking?   | YES(5) | NO(0) |
| 9. Have you ever been in the hospital because of drinking?  | YES(5) | NO(0) |
| 10. Have you ever been arrested for drunk driving or driving after drinking?  | YES(2) | NO(0) |



## APPENDIX VII

### Information for Participants

You will be asked to sign a medical consent form and a "consent to participate" form, your blood alcohol concentration (B.A.C.) will be measured using an non-invasive A.L.E.R.T. device, and you will be required to complete the Present Feelings Questionnaire. The research assistant will then accompany you to a different setting and determine by means of a random number table whether you will be assigned to the group receiving alcohol. You will then receive two drinks to begin with (either regular beer, or de-alcoholized beer) and the research assistant will receive two drinks as well. While you consume your drinks in any manner you choose, the research assistant will engage you in a game of Trivial Pursuit, and several measures of drinking topography will be recorded. Following this you will again be required to complete the Present Feelings Questionnaire, and then accompanied back to the setting where you originally met the research assistant. At this point you will be introduced to the experimenter and asked to complete a Drinking Styles Questionnaire, the experiment will be explained fully, and your B.A.C. will be measured. If your B.A.C. is sufficiently low, you will be driven home. Otherwise, you may be required to wait a little longer until your B.A.C. has sufficiently diminished. In this experiment there is the possibility of an innocent deception which will in no way increase the risk to you.

If, after leaving the experiment, questions or concerns come to mind, don't hesitate to call S. Wigmore at 432-8418. Also bear in mind that you may refuse to answer any questions or withdraw from the experiment at any time without penalty, but you will be required to remain in the company of the experimenter until your B.A.C. is low enough for you to be driven home. Finally, please be advised that consent forms and medical checklists will be stored in a locked file, and that your name will not appear on any questionnaires or data sheets. As a subject you will remain completely anonymous, and all records will be disposed of two years after publication of the results.

APPENDIX VIII

Alcohol Study

CONSENT TO PARTICIPATE IN THE STUDY EXAMINING  
THE EFFECTS OF COGNITIVE AND ENVIRONMENTAL  
VARIABLES ON SOCIAL DRINKING

I, \_\_\_\_\_, of \_\_\_\_\_,  
agree to take part in the study relating to the examination of the effects of  
cognitive and environmental variables on social drinking. I have read and  
understand the requirements, procedures, and conditions of the study. I also  
understand that I may be asked to consume quantities of alcohol. I understand  
that I should not participate in the study if I am on any medication,  
or suffer from diabetes or stomach ulcers, or there is a legal restriction  
upon my use of alcohol. I will receive 3 Psychology 020 lab credits. I  
recognize that I am not obligated to participate, and that I may refuse to  
participate at any time without loss of credits. I understand that the  
results of the tests to be given are for research purposes only, and that  
individual test scores will remain confidential.

I accept the conditions that I will not drive, or consume any further  
alcohol, for 2-3 hours from the time I'm returned home from the research  
setting, and that I will leave the research premises only when it is deemed  
safe to do so by the research personnel.

Date: \_\_\_\_\_ Signature: \_\_\_\_\_

APPENDIX IX

PRESENT FEELINGS QUESTIONNAIRE

The following scales are intended to measure your feelings at the time this questionnaire is completed. Each scale has an adjective at one end, and an adjective of opposite meaning at the other end, e.g.,

0 \_\_\_\_\_ 100  
relaxed \_\_\_\_\_ tense

For each item please think about the times when you feel at one extreme, and the times you feel at the opposite extreme. Then indicate your current feelings by placing an "X" along the line. For example, if you currently feel extremely tense, you might mark the line like this:

0 \_\_\_\_\_ X \_\_\_\_\_ 100  
relaxed \_\_\_\_\_ tense

If, on the other hand, you currently feel quite relaxed, you might mark the line like this:

0 X \_\_\_\_\_ 100  
relaxed \_\_\_\_\_ tense

---

---

WORD PAIRS

1. 0 \_\_\_\_\_ 100  
emotional \_\_\_\_\_ unemotional

2. 0 \_\_\_\_\_ 100  
active \_\_\_\_\_ passive

3. 0 \_\_\_\_\_ 100  
inefficient \_\_\_\_\_ efficient

4. 0 \_\_\_\_\_ 100  
more sexual \_\_\_\_\_ less sexual

5. 0 \_\_\_\_\_ 100  
loud \_\_\_\_\_ quiet

6. 0 \_\_\_\_\_ 100  
clumsy \_\_\_\_\_ coordinated

7. 0 \_\_\_\_\_ 100  
unafraid \_\_\_\_\_ afraid

- 2 -

8.  $\frac{0}{\text{restless}} \text{-----} \frac{100}{\text{peaceful}}$
9.  $\frac{0}{\text{poor concentration}} \text{-----} \frac{100}{\text{good concentration}}$
10.  $\frac{0}{\text{sociable}} \text{-----} \frac{100}{\text{unsociable}}$
11.  $\frac{0}{\text{self confident}} \text{-----} \frac{100}{\text{unsure}}$
12.  $\frac{0}{\text{outgoing}} \text{-----} \frac{100}{\text{reserved}}$
13.  $\frac{0}{\text{daring}} \text{-----} \frac{100}{\text{cautious}}$
14.  $\frac{0}{\text{indiscrete}} \text{-----} \frac{100}{\text{discrete}}$
15.  $\frac{0}{\text{unself-conscious}} \text{-----} \frac{100}{\text{self-conscious}}$
16.  $\frac{0}{\text{wide awake}} \text{-----} \frac{100}{\text{sleepy}}$
17.  $\frac{0}{\text{rude}} \text{-----} \frac{100}{\text{polite}}$
18.  $\frac{0}{\text{stressed}} \text{-----} \frac{100}{\text{unstressed}}$
19.  $\frac{0}{\text{talkative}} \text{-----} \frac{100}{\text{reticent}}$
20.  $\frac{0}{\text{impatient}} \text{-----} \frac{100}{\text{patient}}$

- 3 -

21.  $\frac{0}{\text{careless}} \text{-----} \frac{100}{\text{careful}}$
22.  $\frac{0}{\text{satisfied}} \text{-----} \frac{100}{\text{frustrated}}$
23.  $\frac{0}{\text{excited}} \text{-----} \frac{100}{\text{calm}}$
24.  $\frac{0}{\text{slow responses}} \text{-----} \frac{100}{\text{quick responses}}$
25.  $\frac{0}{\text{shy}} \text{-----} \frac{100}{\text{unshy}}$
26.  $\frac{0}{\text{self-accepting}} \text{-----} \frac{100}{\text{self-critical}}$
27.  $\frac{0}{\text{dominant}} \text{-----} \frac{100}{\text{submissive}}$
28.  $\frac{0}{\text{defiant}} \text{-----} \frac{100}{\text{obedient}}$
29.  $\frac{0}{\text{interested}} \text{-----} \frac{100}{\text{bored}}$
30.  $\frac{0}{\text{secure}} \text{-----} \frac{100}{\text{insecure}}$
31.  $\frac{0}{\text{no desire}} \text{-----} \frac{100}{\text{extreme desire}}$   
 for an alcoholic beverage for an alcoholic beverage
32.  $\frac{0}{\text{unconcerned}} \text{-----} \frac{100}{\text{concerned}}$   
 about the outcome of a task about the outcome of a task





APPENDIX XI

DRINKING PRACTICES SURVEY - SHORT FORM

1) ALCOHOL CONSUMPTION

Age: \_\_\_\_\_ Weight: \_\_\_\_\_  
(please indicate lbs. or kg.)

How long have you been drinking alcoholic  
beverages on a regular basis?

\_\_\_\_\_   
(please indicate in months)

This is a series of questions about the use of alcoholic beverages. What beverages people drink, how much, and how often. Please check the statement that best applies to you, or write in the answer.

When people drink, they often have a usual amount that they will consume; and a greater than usual amount to be consumed only on certain occasions. The following series of questions begins by asking about your usual amount, and then asks about your greater than usual amount (if it differs from your usual amount) for each type of alcoholic beverage (i.e., beer, wine, and liquor). NOTE: Many people have, on rare occasions, consumed a personal maximum (or "record amount") in excess of their typical greater than usual amount. In this questionnaire when you are asked about your greater than usual amount, this does not refer to your "record amount."

BEER

- 1) a) Think of all the times you have had beer recently. When you drink beer, how much do you usually drink each time?

12 oz (341 ml) Bottles or Glasses

1 _____	5 _____	9 _____	13 _____
2 _____	6 _____	10 _____	14 _____
3 _____	7 _____	11 _____	15 _____
4 _____	8 _____	12 _____	_____ more? _____ how many?

(99) \_\_\_\_\_ I don't drink beer

- b) Do you usually drink:

1 [ ] regular beer (i.e., 5 percent alcohol by volume or more)  
2 [ ] light beer (i.e., 4 percent alcohol by volume or less)

- 2) How often do you drink your usual amount of beer as indicated in question 1a?

1 _____ daily	7 _____ once a month
2 _____ 3 or 4 times a week	8 _____ 3 or 4 times a year
3 _____ twice a week	9 _____ twice a year
4 _____ once a week	10 _____ once a year
5 _____ 3 or 4 times a month	11 _____ never drink beer
6 _____ twice a month	



ALCOHOL CONSUMPTION

Age: \_\_\_\_\_

Weight: \_\_\_\_\_  
(Please indicate lbs. or kg.)

How long have you been drinking alcoholic beverages on a regular basis?

(Please indicate in months) \_\_\_\_\_

This is a series of questions about the use of alcoholic beverages. What beverages people drink, how much, and how often. Please check the statement that best applies to you, or write in the answer.

When people drink, they often have a usual amount that they will consume; and a greater than usual amount to be consumed only on certain occasions. The following series of questions begins by asking about your usual amount. The amount for each type of alcoholic beverage (i.e., beer, wine, and liquor).  
NOTE: Many people have, on rare occasions, consumed a personal maximum (or "record amount") in excess of their typical greater than usual amount. In this questionnaire when you are asked about your greater than usual amount, this does not refer to your "record amount."

BEER

1) a) Think of all the times you have had beer recently. When you drink beer, how much do you usually drink each time?

- |      |  |
|------|--|
|      | 12 oz (341 ml) Bottles or Glasses                    |
| 1    | _____  |
| 2    | _____  |
| 3    | _____  |
| 4    | _____  |
|      | 5 _____  |
|      | 6 _____  |
|      | 7 _____  |
|      | 8 _____  |
|      | 9 _____  |
|      | 10 _____   |
|      | 11 _____   |
|      | 12 _____   |
| (99) | _____ I don't drink beer _____ more? _____ how many? |

b) Do you usually drink:

- 1  regular beer (i.e., 5 percent alcohol by volume or more)  
2  light beer (i.e., 4 percent alcohol by volume or less)

2) How often do you drink your usual amount of beer as indicated in question 1a?

- |   |       |                     |    |       |                     |
|---|-------|---------------------|----|-------|---------------------|
| 1 | _____ | daily               | 7  | _____ | once a month        |
| 2 | _____ | 3 or 4 times a week | 8  | _____ | 3 or 4 times a year |
| 3 | _____ | twice a week        | 9  | _____ | twice a year        |
| 4 | _____ | once a week         | 10 | _____ | more                |

- 3) When you drink your greater than usual amount of beer, how much do you end up drinking?

12 oz (341 ml) Bottles or Glasses

1 _____	5 _____	9 _____	13 _____
2 _____	6 _____	10 _____	14 _____
3 _____	7 _____	11 _____	15 _____
4 _____	8 _____	12 _____	_____ more? _____ how many?

(98) \_\_\_\_\_ I never drink more than  
my usual amount of beer

(99) \_\_\_\_\_ I don't drink beer

- 4) About how often do you drink the amount of beer indicate in question 3?

1 _____ daily	7 _____ once a month
2 _____ 3 or 4 times a week	8 _____ 5 or 6 times a year
3 _____ twice a week	9 _____ 3 or 4 times a year
4 _____ once a week	10 _____ twice a year
5 _____ 3 or 4 times a month	11 _____ once a year
6 _____ twice a month	12 _____ never drink beer
	(98) _____ I never drink more than my usual amount of beer

WINE

- 5) Think of all the times you have had wine recently. When you drink wine, how much do you usually drink each time?

5 oz (142 ml) Glasses of Wine (10-12% alcohol)

1 _____	5 _____	9 _____	13 _____
2 _____	6 _____	10 _____	14 _____
3 _____	7 _____	11 _____	15 _____
4 _____	8 _____	12 _____	_____ more? _____ how many?

(99) \_\_\_\_\_ I don't drink wine

- 6) How often do you drink your usual amount of wine as indicated in question 5?

1 _____ daily	7 _____ once a month
2 _____ 3 or 4 times a week	8 _____ 3 or 4 times a year
3 _____ twice a week	9 _____ twice a year
4 _____ once a week	10 _____ once a year
5 _____ 3 or 4 times a month	11 _____ never drink wine
6 _____ twice a month	

- 7) When you drink your greater than usual amount of wine, how much do you usually end up drinking?

5 oz (142 ml) Glasses of Wine (10-12% alcohol)

1 _____	5 _____	9 _____	13 _____
2 _____	6 _____	10 _____	14 _____
3 _____	7 _____	11 _____	15 _____
4 _____	8 _____	12 _____	_____ more? _____ how many?

(98) \_\_\_\_\_ I never drink more than  
my usual amount of wine

(99) \_\_\_\_\_ I don't drink wine

- 8) About how often do you drink the amount of wine indicated in question 7?

1 _____ daily	7 _____ once a month
2 _____ 3 or 4 times a week	8 _____ 5 or 6 times a year
3 _____ twice a week	9 _____ 3 or 4 times a year
4 _____ once a week	10 _____ twice a year
5 _____ 3 or 4 times a month	11 _____ once a year
6 _____ twice a month	12 _____ never drink wine
	(98) _____ I never drink more than my usual amount of wine

LIQUOR

- 9) a) Think of all the times you have had liquor recently. When you drink liquor, how much do you usually drink each time?

1½ oz (43 ml) Shots of Liquor (40% alcohol)

1 _____	5 _____	9 _____	13 _____
2 _____	6 _____	10 _____	14 _____
3 _____	7 _____	11 _____	15 _____
4 _____	8 _____	12 _____	_____ more? _____ how many?

(99) \_\_\_\_\_ I don't drink liquor

- b) Do you usually drink liquor:

1 [ ] in a mixed drink

2 [ ] straight or "on the rocks"

- 10) How often do you drink your usual amount of liquor as indicated in question 9 a)?

1 _____ daily	7 _____ once a month
2 _____ 3 or 4 times a week	8 _____ 3 or 4 times a year
3 _____ twice a week	9 _____ twice a year
4 _____ once a week	10 _____ once a year
5 _____ 3 or 4 times a month	11 _____ never drink liquor
6 _____ twice a month	

11) When you drink your greater than usual amount of liquor, how much do you usually end up drinking?

1½ oz (43 ml) Shots of Liquor (40% alcohol)

- |         |         |          |                             |
|---------|---------|----------|-----------------------------|
| 1 _____ | 5 _____ | 9 _____  | 13 _____                    |
| 2 _____ | 6 _____ | 10 _____ | 14 _____                    |
| 3 _____ | 7 _____ | 11 _____ | 15 _____                    |
| 4 _____ | 8 _____ | 12 _____ | _____ more? _____ how many? |

(98) \_\_\_\_\_ I never drink more than my usual amount of liquor

(99) \_\_\_\_\_ I don't drink liquor

12) About how often do you drink the amount of liquor indicated in question 11?

- |                              |  |
|------------------------------|--|
| 1 _____ daily                | 7 _____ once a month   |
| 2 _____ 3 or 4 times a week  | 8 _____ 5 or 6 times a year                                  |
| 3 _____ twice a week         | 9 _____ 3 or 4 times a year                                  |
| 4 _____ once a week          | 10 _____ twice a year  |
| 5 _____ 3 or 4 times a month | 11 _____ once a year   |
| 6 _____ twice a month        | 12 _____ never drink liquor                                  |
|                              | (98) _____ I never drink more than my usual amount of liquor |

2) DRINKING PRACTICES

In this section we would like to ask you about some of your drinking practices.

1) Approximately what percentage of your leisure activity involves drinking?

- 1 [ ] never
- 2 [ ] 1-19%
- 3 [ ] 20-39%
- 4 [ ] 40-59%
- 5 [ ] 60-79%
- 6 [ ] 80-100%

2) If you were not thinking of going drinking, approximately what percentage of the time would you decide to go anyway if asked by a friend or friends?

- 1 [ ] never
- 2 [ ] 1-19%
- 3 [ ] 20-39%
- 4 [ ] 40-59%
- 5 [ ] 60-79%
- 6 [ ] 80-100%

- 3) When you go out drinking, approximately what percentage of the time do you spend more money than you wanted to?

1 [ ] never  
 2 [ ] 1-19%  
 3 [ ] 20-39%  
 4 [ ] 40-59%  
 5 [ ] 60-79%  
 6 [ ] 80-100%

- 4) Approximately what percentage of the time has your school-work (e.g., assignments, marking, teaching) suffered as a result of going out drinking or being hung-over?

1 [ ] never  
 2 [ ] 1-19%  
 3 [ ] 20-39%  
 4 [ ] 40-59%  
 5 [ ] 60-79%  
 6 [ ] 80-100%

- 5) When you go out drinking, approximately what percentage of the time do you stay at the bar or pub longer than you wanted to?

1 [ ] never  
 2 [ ] 1-19%  
 3 [ ] 20-39%  
 4 [ ] 40-59%  
 5 [ ] 60-79%  
 6 [ ] 80-100%

- 6) When you go out drinking, approximately what percentage of the time do you drink more than you wanted to?

1 [ ] never  
 2 [ ] 1-19%  
 3 [ ] 20-39%  
 4 [ ] 40-59%  
 5 [ ] 60-79%  
 6 [ ] 80-100%

- 7) Do you wish that your overall level of drinking was less?

1 [ ] always  
 2 [ ] most of the time  
 3 [ ] sometimes  
 4 [ ] rarely  
 5 [ ] never

- 8) Are you concerned about using too much alcohol?

1 [ ] not at all concerned  
 2 [ ] slightly concerned  
 3 [ ] somewhat concerned  
 4 [ ] moderately concerned  
 5 [ ] very concerned

- 9) When you want to stay longer at a bar or party, but you don't want to become any more intoxicated than you already are, approximately what percentage of the time would you do each of the following.

	<u>Never</u>	<u>1-19%</u>	<u>20-39%</u>	<u>40-59%</u>	<u>60-79%</u>	<u>80-100%</u>
Not really change anything. Continue drinking as you have done all along.	1	2	3	4	5	6
Decrease your rate of drinking.	1	2	3	4	5	6
Switch to a drink with less alcohol.	1	2	3	4	5	6
Switch to a non-alcoholic beverage.	1	2	3	4	5	6
Stop drinking altogether.	1	2	3	4	5	6
Leave.	1	2	3	4	5	6
Other _____	1	2	3	4	5	6

(please specify)

- 10) Approximately what percentage of the time do you stop drinking before you get drunk?

- 1 [ ] Never  
 2 [ ] 1-19%  
 3 [ ] 20-39%  
 4 [ ] 40-59%  
 5 [ ] 60-79%  
 6 [ ] 80-100%

- 11) Once you have had one or two drinks, approximately what percentage of the time do you end up drinking more than you intended to?

- 1 [ ] Never  
 2 [ ] 1-19%  
 3 [ ] 20-39%  
 4 [ ] 40-59%  
 5 [ ] 60-79%  
 6 [ ] 80-100%

12) Approximately what percentage of the time do you tend to drink alcohol quickly to intensify the effects.

- 1 [ ] Never
- 2 [ ] 1-19%
- 3 [ ] 20-39%
- 4 [ ] 40-59%
- 5 [ ] 60-79%
- 6 [ ] 80-100%

13) Think about the rate at which your friends drink. In relation to them do you drink:

- 1 [ ] much slower
- 2 [ ] somewhat slower
- 3 [ ] about the same rate
- 4 [ ] somewhat faster
- 5 [ ] much faster

14) If you have ever attempted to cut down on your alcohol consumption, how difficult was it?

- 1 [ ] I have never tried to reduce my alcohol consumption
- 2 [ ] not difficult at all
- 3 [ ] not very difficult
- 4 [ ] somewhat difficult
- 5 [ ] moderately difficult
- 6 [ ] very difficult

15) Do you think your friends joke about your drinking too much?

- 1 [ ] unsure
- 2 [ ] never
- 3 [ ] sometimes
- 4 [ ] a lot

16) Do you think other people feel you have a drinking problem?

- 1 [ ] unsure
- 2 [ ] no
- 3 [ ] maybe a few
- 4 [ ] yes

### 3) Consequences of Drinking

In this section we would like to ask you about some possible consequences of drinking.

1. Do you ever think about the consequences of your drinking?

- 1 [ ] never
- 2 [ ] rarely
- 3 [ ] sometimes
- 4 [ ] most of the time
- 5 [ ] always

- 2) To the best of your recollection, please indicate the number of times that you have experienced the following drinking-related consequences (over the past 4 months). Also, in the space provided, please estimate for each consequence, the percentage of your drinking episodes that have resulted in that particular consequence (over the past 4 months).

	<u>Number of Time Consequence was Experienced</u>					
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5 or more</u>
I have had a hangover. (% estimate: _____.)	0	1	2	3	4	5
I have gotten nauseated and vomited from drinking. (% estimate: _____.)	0	1	2	3	4	5
Drinking has detracted from my sexual performance and enjoyment. . (% estimate: _____.)	0	1	2	3	4	5
Drinking has prevented me from having sex. (% estimate: _____.)	0	1	2	3	4	5
Drinking has resulted in my having sex when I really didn't want to. (% estimate: _____.)	0	1	2	3	4	5
My drinking has caused conflicts with close friends of the same sex. (% estimate: _____.)	0	1	2	3	4	5
My drinking has caused conflicts with close friends of the opposite sex. (% estimate: _____.)	0	1	2	3	4	5
I have gone without other things because of the cost of alcohol. (% estimate: _____.)	0	1	2	3	4	5
I have lost a girl/boyfriend due to drinking. (% estimate: _____.)	0	1	2	3	4	5



Number of Times Consequence was Experienced

	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5 or more</u>
I have not felt like doing anything productive the following day. (% estimate: ____.)	0	1	2	3	4	5
I have driven a car when I had too much to drink. (% estimate: ____.)	0	1	2	3	4	5
I have consumed alcohol while driving. (% estimate: ____.)	0	1	2	3	4	5
I have been arrested for drunk driving. (% estimate: ____.)	0	1	2	3	4	5
I have been arrested for public intoxication or drunk and disorderly. (% estimate: ____.)	0	1	2	3	4	5
I have engaged in petty theft. (% estimate: ____.)	0	1	2	3	4	5
I have received a lower grade because of drinking too much. (% estimate: ____.)	0	1	2	3	4	5
I have sworn to myself (or others) that alcohol will never pass my lips again. (% estimate: ____.)	0	1	2	3	4	5
I have gotten into a fight after drinking. (% estimate: ____.)	0	1	2	3	4	5
I have damaged property after drinking. (% estimate: ____.)	0	1	2	3	4	5
I have gotten into trouble with the law because of drinking. (% estimate: ____.)	0	1	2	3	4	5

Number of Times Consequence was Experienced

	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5 or more</u>
I was involved in some type of accident after drinking. (% estimate: _____.)	0	1	2	3	4	5
I did not remember what happened while I was drinking. (% estimate: _____.)	0	1	2	3	4	5
I have lost a job because of drinking. (% estimate: _____.)	0	1	2	3	4	5
I have been injured as a result of drinking. (% estimate: _____.)	0	1	2	3	4	5

3) Following approximately what percentage of your drinking episodes have you experienced regret or guilt?

- 1 [ ] Never
- 2 [ ] 1-19%
- 3 [ ] 20-39%
- 4 [ ] 40-59%
- 5 [ ] 60-79%
- 6 [ ] 80-100%

## APPENDIX XII

### Debriefing Sheet

This experiment is concerned with determining the influences of, 1) the expectation of receiving alcohol, 2) environmental variables, on subjects' drinking behaviour and subjective feelings. Half of the subjects are told they will receive alcohol while the remaining participants are told they will not receive alcohol. Half of each of these groups actually receives alcohol, and the remainder does not. Therefore, some subjects are told they will receive alcohol when they do not, and some subjects are told they will not receive alcohol when they actually do. This deception is critical to determining whether the mere expectation of receiving alcohol influences drinking behaviour or subjective feelings, and for determining the influence of the pharmacological properties of alcohol when there is no expectation for receiving alcohol.

In addition to the cognitive expectancy manipulation discussed above, half of the subjects participate in a laboratory setting, while the remainder participate in the Elbow Room. This is to determine whether merely being in a barroom setting significantly influences drinking behaviour and/or subjective feelings.

It is hypothesized that in the laboratory setting the expectation of receiving alcohol, regardless of whether alcohol is actually given, will result in an increased rate and amount of consumption. However in the barroom setting, it is expected that cognitive expectancy will play a less significant role in influencing drinking behaviour. If cognitive variables are less important in influencing drinking behaviour in a natural setting, treatment programs using extinction procedures will be suggested as being potentially more potent than a cognitive approach. The results of this study will also

- 2 -

bear on the question of the validity of laboratory analogue procedures, as similar research has previously been conducted exclusively in the laboratory in a non-social context. Finally, if it is demonstrated that desired changes in subjective feelings (e.g., increased sociability, increased self-confidence, decreased inhibitions) result from mere exposure to drinking related cues (i.e., the barroom setting), one could use this information in prevention and treatment programs to change peoples' attributions regarding the source of their favourably changed feelings.

You will be informed about which group you were assigned to, and please, to ensure the reliability and validity of the results do not tell your friends about the details of this experiment until after April 1986. Thank you.

Finally, if you have any alcohol-related concerns, Student Health Services or the Student Counselling Centre will be able to assist you.

APPENDIX XIII



The University of Western Ontario

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& International Education  
Stevenson-Lawson Building  
London, Canada  
N6A 5B8

TO: Stephen W. Wigmore,  
Ph.D. Student,  
Department of Psychology,  
SOCIAL SCIENCE CENTRE.

RE: 1985-86 HEALTH SCIENCES STANDING COMMITTEE ON HUMAN RESEARCH  
STATEMENT OF REVIEW NO. 1247

TO WHOM IT MAY CONCERN:

The Health Sciences Standing Committee on Human Research consisting of

- (1) D. Bocking, Vice-Provost Health Sciences (Chairman)
- (2) H. W. Baldwin, Assistant Vice-President (Research)
- (3) R. N. Green, Victoria Hospital Representative
- (4) G. Wisenberg, St. Joseph's Hospital Representative
- (5) C. N. Ghent, University Hospital Representative
- (6) B. Hoffmaster, Office of the President Representative
- (7) R. Solomon, Office of the President Representative
- (8) E. Good, Office of the President Representative
- (9) J. E. Brown, Faculty of Medicine Representative
- (10) J. Robertson, Faculty of Medicine Representative
- (11) J. T. Hamilton, Faculty of Dentistry Representative
- (12) S. Faux, Faculty of Nursing Representative
- (13) W. S. Yovetich, Faculty of Applied Health Sciences Representative

has examined the research project entitled "AN INVESTIGATION OF COGNITIVE  
AND ENVIRONMENTAL DETERMINANTS OF CRAVING FOR ALCOHOL, DRINKING  
BEHAVIOUR, AND SUBJECTIVE FEELINGS, AMONG SOCIAL DRINKERS"

as proposed by Stephen W. Wigmore

and considers it to be ethically acceptable under conditions of the University's policy on research involving human subjects.

2 DECEMBER 1985

Date Approved

c.c. R. Hinson

H. W. Baldwin,  
Assistant Vice-President  
(Research)

APPENDIX XIV

Present Feelings Questionnaire: Scale Items

<u>Scale 1 (SPD)</u>	<u>Scale 2 (PD)</u>	<u>Scale 3 (BI)</u>
<b>Stimulation /Perceived Dominance</b>	<b>Pleasurable Disinhibition</b>	<b>Behavioural Impairment</b>
<ul style="list-style-type: none"><li>- active/passive</li><li>- loud/quiet</li><li>- restless/peaceful</li><li>- daring/cautious</li><li>- wide awake/sleepy</li><li>- impatient/patient</li><li>- excited/calm</li><li>- dominant/submissive</li><li>- more humorous/ less humorous</li><li>- aggressive/unaggressive</li><li>- superior/inferior</li><li>- alert/dull</li><li>- strong/weak</li></ul>	<ul style="list-style-type: none"><li>- happy/sad</li><li>- relaxed/tense</li><li>- uninhibited/inhibited</li><li>- elated/depressed</li><li>- secure/insecure</li><li>- interested/bored</li><li>- self-accepting/ self critical</li><li>- satisfied/frustrated</li><li>- talkative/reticent</li><li>- un-self-conscious/ self-conscious</li><li>- outgoing/reserved</li><li>- unafraid/afraid</li><li>- more sexual/less sexual</li><li>- emotional/unemotional</li></ul>	<ul style="list-style-type: none"><li>- inefficient/efficient</li><li>- clumsy/coordinated</li><li>- poor concentration/ good concentration</li><li>- indiscreet/discreet</li><li>- rude/polite</li><li>- careless/careful</li><li>- slow responses/ quick responses</li><li>- defiant/obedient</li><li>- irresponsible/ responsible</li><li>- unconcerned about the outcome of a task/ concerned</li></ul>

APPENDIX XV

Drinking Topography: Coding Sheet

- 1) t to first sip: \_\_\_\_\_.
- 2) n sips beer #1: \_\_\_\_\_.
- 3) t to consume beer #1: \_\_\_\_\_.
- 4) t between beer #1 and beer #2: \_\_\_\_\_.
- 5) n sips beer #2: \_\_\_\_\_.
- 6) t to consume beer #2: \_\_\_\_\_.
- 7) Amount Remaining: \_\_\_\_\_.
- 8) Amount Consumed: \_\_\_\_\_.

**APPENDIX X VI**



**Table A**  
**SET x INS Interaction on AC**

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
<b>Main Effects</b>					
BEV	1838.48	1	1838.48	0.091	0.764
SET	91686.93	1	91686.93	4.534	0.036
INS	40638.52	1	40638.52	2.010	0.160
<b>2-Way Interactions</b>					
BEV SET	45.06	1	45.06	0.002	0.962
BEV INS	1226.25	1	1226.25	0.061	0.806
SET INS	38370.70	1	38370.70	1.898	0.172
<b>3-Way Interactions</b>					
BEV SET INS	29785.470	1	29785.470	1.473	0.229
RESIDUAL	1536720.34	76	20220.00		
TOTAL	1744043.56	83	21012.57		

Table B

Main Effect of SET on T1

Averaged Multivariate Tests of Significance

Exact F      Hypoth. DF      Error DF      Significance of F

4.483            2.0            75.0            .014

Univariate F-tests with (1.76) D.F.

Variable      Hypoth. SS      Error SS      Hypoth MS      Error MS      F      Significance of F

T1            8.226            127.363            8.226            1.676            4.909            .030

NT            161.187            6523.359            161.187            85.834            1.878            .175

Table C

BEV x SET x TIME Interaction on Scale PDAveraged Multivariate Tests of Significance

<u>Exact F</u>	<u>Hypoth. DF</u>	<u>Error DF</u>	<u>Significance of F</u>
2.761	3.0	72.0	.048

Univariate F-tests with (1.61) D.F.

<u>Variable</u>	<u>Hypoth. SS</u>	<u>Error SS</u>	<u>Hypoth MS</u>	<u>Error MS</u>	<u>F</u>	<u>Significance of F</u>
SPD	2877.96	466497.59	2877.96	6304.02	.457	.501
PD	28341.18	250388.34	28341.18	3383.63	8.375	.005
BI	19.49	176128.68	19.49	2380.12	.008	.928

Table D  
 ANCOVA on Scale PD with Pretest Scores as Covariates

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
<b>Main Effects</b>					
BEV	72.98	1	72.98	0.016	0.901
SET	13703.97	1	13703.97	2.941	0.091
INS	6263.43	1	6263.43	1.344	0.250
<b>2-Way Interactions</b>					
BEV SET	17763.16	1	17763.16	3.812	0.055
BEV INS	3348.39	1	3348.39	0.718	0.399
SET INS	16923.46	1	16923.46	3.631	0.061
<b>3-Way Interactions</b>					
BEV SET INS	6911.94	1	6911.94	1.483	0.227
RESIDUAL	340205.271	73	4660.346		
TOTAL	681639.476	81	8415.302		

**Table E**  
**ANCOVA on Scale BI with Pretest Scores as Covariates**

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
<b>Main Effects</b>					
BEV	14276.88	1	14276.88	3.254	0.075
SET	6082.44	1	6082.44	1.386	0.243
INS	5148.53	1	5148.53	1.173	0.282
<b>2-Way Interactions</b>					
BEV SET	946.33	1	946.33	0.216	0.644
BEV INS	21300.31	1	21300.31	4.855	0.031
SET INS	9430.35	1	9430.35	2.149	0.147
<b>3-Way Interactions</b>					
BEV SET INS	130.85	1	130.85	0.030	0.863
RESIDUAL	320277.477	73	4387.363		
TOTAL	663558.390	81	8192.079		

**Table F**  
**ANCOVA on Craving with Pretest Scores as Covariates**

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
<b>Main Effects</b>					
BEV	164.13	1	164.13	0.579	0.449
SET	201.41	1	201.41	0.711	0.402
INS	793.67	1	793.67	2.801	0.098
<b>2-Way Interactions</b>					
BEV SET	919.51	1	919.51	3.246	0.076
BEV INS	2.06	1	2.06	0.007	0.932
SET INS	0.37	1	0.37	0.001	0.971
<b>3-Way Interactions</b>					
BEV SET INS	69.18	1	69.18	0.244	0.623
RESIDUAL	20679.86	73	283.24		
TOTAL	29910.99	81	369.28		

**Table C**  
**ANOVA on Subjective Drunkenness**

Source of Variation	Sum of Squares	df	Mean Square	F	Significance of F
<b>Main Effects</b>					
BEV	88.81	1	88.81	0.913	0.343
SET	601.68	1	601.68	6.182	0.015
INS	236.75	1	236.75	2.433	0.123
<b>2-Way Interactions</b>					
BEV SET	161.20	1	161.20	1.656	0.202
BEV INS	75.05	1	75.05	0.771	0.383
SET INS	131.30	1	131.30	1.349	0.249
<b>3-Way Interactions</b>					
BEV SET INS	3.90	1	3.90	0.040	0.842
RESIDUAL	7299.33	75	97.33		
TOTAL	8525.157	82	103.965		

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