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Social Situations and Alcohol: The Effect of Social Context on Alcohol Expectancies

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Expectancies

by

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Abstract

Alcohol is one of the most widely used recreational drugs in the United States today, despite being associated with a myriad of negative effects. Alcohol consumption occurs most frequently within social contexts, and seems to be strongly related to many social factors. It is known that an individual's expectations of the effects of alcohol influences his/her drinking behavior, and that social alcohol expectancies are some of the most frequently reported expectancies. In this study, we explored the relationship between alcohol expectancies and social influences by examining whether exposure to a social context would differentially activate alcohol expectancies. 115 young-adult male participants were exposed to either a social context or a control condition. Subsequently, participants' alcohol expectancies were assessed using both explicit and implicit measurements. Differences between conditions were found on the implicit expectancy measure (a free association task) but not on the explicit expectancy measures. Results from the free association task indicated that participants who were exposed to a social context were more likely to report positive and arousing words in response to the prompt "alcohol makes me _____". These differences suggest that exposure to a social context may not overtly change individuals' alcohol expectancies, but may increase the availability of positive and arousing alcohol expectancies. This increase in availability of

positive and arousing expectancies may explain one of the mechanisms involved in deciding to engage in social drinking.

Introduction

Alcohol is one of the most widely consumed psychoactive substances in the world today. In addition to being associated with injuries (e.g. Turner, Keller & Bauerle, 2010), violent behavior (Leonard, Collins & Quigley, 2003), and roadside fatalities (e.g. Mørland et al., 2011), alcohol is also a toxic substance. Alcohol consumption can cause both acute and chronic negative effects on the human body, including liver damage, increased risk of cancer and heart disease and damage to fetuses (Julien, Advokat & Comaty, 2010). Despite these effects, it is estimated that over half of Americans aged 12 and up consume alcohol, and that as many as seven percent of those who drink abuse or are dependent on alcohol (Substance Abuse and Mental Health Services Administration, 2010). The negative effects that alcohol has had on countless individual lives and on society as a whole has motivated numerous researchers across diverse fields of research to examine the nature of alcohol consumption behaviors. Alcohol consumption may be best understood in the greater context in which it occurs, with social influences being an important element of this greater context. A variety of social contexts seem inextricably tied to alcohol consumption. For example, most individuals are exposed to parental and societal drinking norms early on in their lives, so that middle-school children already have an established

idea of the effects of alcohol prior to their first drinking experience (Christiansen, Smith, Roehling & Goldman, 1989).

The relationship between alcohol consumption and social factors seems logical, given the centrality of social functioning to most human behaviors. Humans are a uniquely social species that greatly depend on social mechanisms for survival, as suggested by the existence of large-scale social structures such as societies, cultures, cities and nations. Human reliance on sociality for survival has also been demonstrated in research settings. For example, susceptibility to others' beliefs has been observed in both adults and infants less than a year old (Kovacs, Teglas & Endress, 2010), suggesting the existence of an intrinsic predisposition towards attending to information held by others. Human orientation towards sociality is further evidenced by the existence of cognitive mechanisms and neurobiological structures geared towards that function. The quintessential example of such a mechanism is the unmatched human cognitive ability to infer what other humans think (Adolphs, 2009).

The ability to infer what others think may be rooted in the functioning of mirror neurons, which encode the behaviors of others. Although mirror neurons have also been found in primates, these neurons have been implicated in uniquely human social abilities such as imitation learning (Rizzolatti & Craighero, 2004), empathy (Iacoboni, 2007) and possibly language (Fogassi & Ferrari, 2007). Humans therefore seem to possess neuron systems specialized for social functioning. Not only is the human brain specifically equipped for social functioning, it's development is influenced by external social factors as well. For

instance, it has been shown that exposure to culture can modify neural connectivity (Kitayama & Uskul, 2011) and that social information can alter gene expression in the brain (Robinson, Fernald & Clayton, 2008).

Because the human brain is geared towards attending to social information, performing social functions, and changing in response to social circumstances, it logically follows that human behavior should be greatly influenced by various social circumstances. An abundance of evidence suggests that alcohol consumption behaviors are particularly tied to social circumstances. Alcohol has been part of human culture for thousands of years, as evidenced by its presence in some of the most famous texts in existence. In the book of Genesis, Lot's daughters seduce him through the use of wine, and in Homer's Odyssey, Odysseus and his men subdue a Cyclops by first serving him wine and thereby inducing sleep. In current times, the influence of social factors on alcohol consumption can be clearly observed in the existence of norms regarding the appropriateness of (and sometimes requirement of) drinking in a variety of contexts such as shared meals, celebrations and religious ceremonies.

Research findings also provide evidence for the influence of social elements on drinking behavior. For instance, it is well established that an individual's drinking behavior is affected by such factors as their culture (e.g. Stickley, Jukkala & Norstrom, 2011; Tilki, 2006) and the drinking behaviors of their peers (e.g. Park, Sher, Wood & Krull, 2009; Phua, 2011). Indeed, even the drinking behavior of nearby strangers has been shown to influence individual drinking rates (Caudill & Marlatt, 1975). Taken together, the facts that social

functioning is central to human behavior and that alcohol consumption behaviors are influenced by many social factors suggest that alcohol consumption may serve a socially oriented function.

The question then becomes, what are the socially oriented functions that alcohol serves? We begin answering this question by focusing on the general mechanisms by which exposure to context leads to behavior. These mechanisms may be best described as anticipatory processes that utilize previously acquired relevant information in the planning and performing of behavior. That is to say, behavior is produced when one draws on past experience to assess a set of circumstances and subsequently identify the optimal response. This idea has been used to explain the many levels of organismic functioning, from neural development to conscious decision-making. In the field of alcohol studies, anticipatory processes have been conceptualized as the nexus where the multiple factors which influence drinking behavior converge (Goldman, Darkes, Reich & Brandon, 2006).

Genes, environment, individual biopharmacological differences, pre-natal environment, personality and co-morbid psychopathology all interact to create individual drinking behavior (Sher, Grekin & Williams, 2005). The aggregate of one's drinking behavior amounts to an individual's experience with alcohol, which in turn determines the individual's expected outcome from alcohol use. These expected outcomes, commonly referred to as alcohol expectancies, have been used to explain and predict drinking behaviors (e.g. Stacy, 1997). Furthermore,

alcohol expectancies have been shown to mediate the influence of many risk factors for alcohol use (Darkes, Greenbaum & Goldman, 2004).

Given the relationship between various social factors and drinking behaviors, it logically follows that social alcohol expectancies would be some of the most frequently reported alcohol expectancies, which they are indeed (e.g. Aas, Leigh, Anderssen & Jakobsen, 1998; Fromme & D'Amico, 2000). Social expectancies are expected effects of alcohol that relate to some aspect of social functioning. For example, a social expectancy item taken from the Alcohol Expectancy Questionnaire (*AEQ*; Brown, Christiansen, & Goldman 1987) states "After a few drinks, I don't worry as much about what other people think of me", while a simpler social expectancy item from the Alcohol Expectancy Multiaxial Assessment *(AEMax;* Goldman & Darkes, 2004) states "drinking makes one sociable". These and other social expectancies may explain how exposure to a social context can lead to drinking.

Social consumption of alcohol is a specific behavior, and like any behavior, it can be viewed as a decision. Decision-making is a process by which information (in the form of known probabilities, available evidence and subjective valuation of possible outcomes) is integrated to produce a choice (i.e. a behavior) (Gold & Shadlen, 2007). In regards to social drinking, the information utilized in the decision making process is essentially a collection of alcohol expectancies that indicate whether or not the act of social drinking will produce desirable effects. In other words, exposure to a social context (or any other drinking relevant context) is theorized to exert an effect on drinking behavior by first

activating relevant expectancies (i.e. the information used to make a decision) (Goldman, Reich & Darkes, 2005).

Social Drinking

Despite it's ubiquitous nature, relatively few studies in the field of alcohol research have attempted to examine the mechanisms of social drinking in the moment. Of the studies that did attempt to examine these mechanisms, many focused on external aspects of this phenomenon, such as peer influence on individuals' drinking (e.g. Borsari & Carey, 2001; Paton-Simpson, 2001; Lee, Geisner, Lewis, Larimer & Neighbors, 2007) rather than focus in the internal processes involved in social drinking.

Other studies have explored inter-personal factors, but focused on examining such topics as the predictive utility of beliefs regarding the anxiolytic and/or social enhancement effects of alcohol on drinking (e.g. Carrigan et al., 2008; Thomas, Randall & Carrigan, 2003; Knight & Godfrey, 1993). Though informative, such studies do not substantially differ from many alcohol expectancy studies, as they primarily explore the predictive qualities of perceived effects of alcohol on drinking and drinking related behavior. Fewer studies, however, have focused on the internal processes that an individual goes through in social drinking situations. The goal of this study is to examine the internal mechanisms that operate in response to an exposure to a social context (which are then theorized to influence social drinking). We aim to achieve this by

assessing individuals' alcohol expectancies when they are in the presence of a social situation.

Assessment of Expectancies within Context

Assessing expectancies at a specific moment or within a specific context assumes that expectancies are activated which are appropriate to the specific context for drinking. The conceptualization of expectancy as dynamic and fluctuating is inconsistent with their characterization as trait-like (e.g. Donovan, Molina & Kelly, 2009; Young, Knight & Oei, 1990). The idea that expectancies fare largely stable traits probably developed from a reliance on traditional alcohol expectancy measures for the assessment of alcohol expectancies. Alcohol expectancies were originally assessed using explicit questionnaires (e.g. the Alcohol Expectancy Questionnaire (*AEQ*); Brown, Christiansen, & Goldman, 1987). These types of questionnaires are made up of items intended to directly measure general beliefs concerning the effects of alcohol, largely independent of context.

Barring substantial changes in one's drinking style, it is unlikely that one's general set of beliefs about the effects of alcohol would change noticeably, especially over a relatively short span of time such as several months. Changes in generally stated explicit expectancies are unlikely to occur because these beliefs are part of individuals' declarative long-term memory, and as such they may be retained for a long period of time. Traditional expectancy questionnaires

can therefore be said to assess alcohol expectancies in an explicit way that highlights the relatively stable aspects of expectancies.

The goal of assessing expectancies within a specific context, however, is to capture subtle fluctuations in expectancies. For example, an individual's disposition towards alcohol consumption may vary greatly between Monday morning to Friday evening. This (theorized) change in disposition towards alcohol is in effect a change in expectancies. This proposed fluctuation in expectancies, however, would likely not be detected by a measure that assesses expectancies explicitly (and therefore focuses on the relatively stable aspects of expectancies). A measure that assesses expectancies implicitly may be far better suited for this example.

The explicitly assessed expectancies and the implicitly assessed expectancies discussed in the above paragraphs can be explained in terms of a dual processing model, such as the one proposed by Fazio and Olson (2003). This dual processing model suggests that behaviors can be influenced by both deliberative processes (in our case, the explicitly assessed expectancies) and spontaneous processes (implicitly assessed expectancies). In alcohol research, the spontaneous processes influencing behavior have been conceptualized as a form of alcohol expectancies, and these expectancies have been reliably assessed using implicit methodologies (Goldman, Reich & Darkes, 2005). What is more, implicit expectancy measures have been shown to account for unique variance in predicting drinking behaviors (Reich, Below & Goldman, 2010). Given

this evidence, it seems clear that measures of a more implicit nature are better suited for detecting subtle fluctuations in expectancies.

Implicit measures are designed to assess a target construct as it occurs automatically, without the individual's direct knowledge of the assessment process. In this manner, implicit assessment seeks to circumvent a participant's conscious deliberation of whatever response or action is being measured. Implicit assessment is performed either through disguising the process and/or object of measurement, or by making the process/object of measurement ambiguous and unclear. Disguising measurement involves conducting the measurement of a chosen dependant variable without the participants' knowledge (for example, measuring how much beer a participant consumed). Making the measurement process unclear or ambiguous involves clearly presenting the dependant variable, but doing so in a way that effectively hides the goal of the measurement (for example, testing participants' memory of word lists with the intent of observing how many alcohol expectancy words are recalled).

Over the last decade or so, a body of literature has emerged, composed of studies that set out to examine the functioning of expectancies across specific contexts, using primarily implicit expectancy measurement methodologies. When discussing expectancies within specific contexts, the word "context" is used as a broad descriptor of any circumstance or setting that is theorized to be relevant to alcohol expectancies. A context can therefore be anything from a specific mood, to a word-prime, to an individual's presence in a specific time and place.

Reich, Noll and Goldman (2005) showed that heavy drinkers were more likely to recall a greater number of alcohol expectancy words when primed with an alcohol cue. In their study, exposure to a simple context such as a word describing a type of alcohol, enhanced the ability to recall previously presented alcohol expectancy words, but only in heavier drinkers. These findings suggest that alcohol expectancies can be "activated" through priming. The idea that alcohol expectancies can be activated essentially means that expectancies can be made more salient and therefore more available. When expectancies become more readily available, it logically follows that they increase in their potential influence on an individual's drinking behavior. Reich, Noll and Goldman's work elucidates the process by which alcohol primes can induce or increase alcohol consumption.

Findings by Read, Lau-Barraco, Dunn and Borsari (2009) showed that expectancies can be activated at different levels. Read et al. instructed participants to report the effects that they would expect to experience under one of two imagined alcohol consumption scenarios: After having consumed either a low or a high dose of alcohol. Heavy and light drinkers reported markedly different expectancies in the imagined high dose condition, but did not exhibit differences in expectancies on in the imagined low dose condition. This finding suggests that specific alcohol expectancies (in this case, alcohol expectancies related to heavy episodic drinking) will only be activated with an appropriate prime.

Implicit measurement is not limited to paper and pencil assessments, and researchers have frequently exercised ingenuity in designing measurement methodologies. This ingenuity has led to the development of many versatile implicit assessment techniques. Although these techniques are all classified as "implicit", a large degree of variation exists in what these techniques measure, and how they measure it. For example, the Implicit Association Task (IAT) measures differences in milliseconds of response time to stimuli presented on a computer screen (e.g. Pedersen, Treloar, Burton & McCarthy, 2011). In contrast, Roehrich and Goldman (1995) measured how much beer participants consumed after being primed with both alcohol words and a video containing alcohol cues. Although both these studies utilized implicit measurement, they are clearly fundamentally different from one another. Because of the large variance in implicit measures, it is not clear that all implicit tasks measure the same object.

In designing this study, we selected the implicit measure that we believed was most suited for capturing the theorized effect. To this end, a free associates task was chosen. In an alcohol expectancy free associates task, participants generate their own free associates to a probe regarding the perceived effects of alcohol. Free association has been used as an effective method for exploring the alcohol expectancy memory network (e.g. Reich & Goldman, 2005).

Free associates data are typically gathered with the goal of assessing the frequency or "strength" of specific associates in the general population (e.g. Nelson & McEvoy, 2000). The utility of free associates is not limited to characterizing memory in the general population, as free associates can also be

useful for exploring individual differences across experimental conditions. Previous work in our lab indicates that free associates are highly sensitive to context (Reich et al., 2007). Due to its high sensitivity, the free associates task seems ideal for capturing the subtle effects of a context manipulation.

The studies cited above have demonstrated that alcohol expectancies can be activated by unambiguous alcohol primes. These findings essentially mean that exposure to contexts related to alcohol will make one's memories of the effects of alcohol more salient. In this study, we theorized that because social contexts and alcohol consumption were so strongly related, certain social situations should be sufficient to prime alcohol expectancies, independently of any overt alcohol primes.

Drinking and Social Drinking Among Young Adults

The study of social drinking seems particularly relevant to the young adult male population. Data from the 2009 National Survey of Drug Use and Health (NUSDH; Substance Abuse and Mental Health Services Administration, 2009) indicates that rates of excessive drinking are substantially higher among young adults (aged 18-25) as compared to the rest of the United States population. In the United States, 41.7% of young adults engage in binge drinking (consuming 5 or more drinks at least once a month) and 13.7% engage in heavy drinking (meeting binge drinking criteria at least 5 times a month). The NSDUH survey also indicates that among young adults, males identify as drinkers more frequently than females (64.3% of males as compared to 58% of females), and

young adult males are known to increase drinking when in all male groups (Senchak, Leonard & Greene, 1998; Rosenbluth, Nathan & Lawson, 1978).

Part of the phenomena of elevated drinking in young adults may be explained by findings suggesting a tendency towards risky behaviors in members of that population. The tendency towards engaging in risky behaviors is related to alcohol consumption in that the two behaviors frequently overlap with one another. For example, in 2001 an estimated 31% of college students in the United States reported engaging in the risky behavior of driving under the influence of alcohol (Hingson, Heeren, Winter & Wechsler, 2005). Furthermore, the act of binge drinking itself, considering the effect it has on the body, can be viewed as a risky behavior independent of other behaviors that may co-occur with intoxication. Discoveries related to the prevalence and the underlying mechanisms of risky behaviors are therefore considered informative to the study of alcohol consumption.

Two personality traits, impulsivity and sensation seeking, have been strongly associated with risky behaviors, drinking and risky drinking (Fischer & Smith, 2008; Magid, MacLean & Colder, 2007). It seems that levels of impulsivity peak at around the age of 10 while levels of sensation seeking peak at around the age of 15. After reaching their peak levels, these qualities either stabilize or gradually decrease over time (Steinberg, Albert, Cauffman, Banich & Graham, 2008). Young adults' levels of sensation seeking and impulsivity are therefore relatively high because the decline of sensation seeking (and to a lesser extent impulsivity) is only in its early stages.

Some evidence from the field of neuroscience supports the notion that young adults are more prone, in comparison to older adults, to acting without caution: Several studies have found that the process of myelination in the prefrontal cortex continues well into an individual's twenties (Steinberg, 2008). Myelination quickens the pace of signals along neural nerve fibers, essentially increasing the efficiency of neural circuitry. The prefrontal cortex is associated with the ability to inhibit reactions (e.g. Yang and Raine, 2009) and plan ahead (e.g. Miller, Freedman & Wallis, 2003). These findings therefore imply that the neural mechanisms integral to the inhibition of risky behavior are not fully developed in young adults.

The neurological data cited suggests young adults gradually increase in their inhibitory abilities, while the behavioral/experimental data cited suggests young adults gradually decrease in their tendencies towards risky behaviors. The two sets of findings compliment each other, in that they both suggest that young adults are more likely than older adults to engage in risky behaviors, presumably as a function of sharing developmental similarities with adolescents.

Not only are young adults generally more prone to risky behaviors, but some evidence suggests they are also more likely to experience greater behavioral disinhibition in groups. Gardner and Steinberg (2005) examined risky behaviors in individuals who were in the presence of their peers. They examined risk-taking behaviors using a car simulator, ad compared the performance of adolescents, young adults, and older adults. Each of the "drivers" was accompanied by several same-aged peers, who were also present in the "car".

Gardner and Steinberg found that young adults were more prone to risky behavior as compared to older adults, but less prone to it as compared to adolescents. Taken together, the studies cited above show that as a population young adults are prone to excessive drinking and risk-taking, especially when in groups. The study of alcohol expectancy functioning within social contexts therefore seems especially pertinent to this population.

Rationale

In this study we aimed to activate and subsequently measure alcohol expectancies of young adult males, using a simulated social context as the prime for alcohol expectancies. Our goal was to examine the cognitive process which we theorized occurs when exposure to a social context leads an individual to consume alcohol. To this end, our experimental manipulation was intended to recreate a rudimentary aspect of a social situation, common to as wide a variety of social situations as possible. We therefore designed the manipulation with the objective of creating a feeling of group cohesion among participants. Because a sense of group cohesion is common to numerous social drinking situations, it was predicted to be an effective prime for social alcohol expectancies.

Young adult males were chosen as the target demographic due to their higher average drinking and general susceptibility towards disinhibition in groups. Because the target population of young adult males is relatively prone to excessive drinking (Chen, Dufour & Yi, 2004/2005) and excessive drinking in groups (Senchak et al.,1998). We anticipated that exposure to a social context

with same aged peers yet devoid of alcohol cues would activate memories related to drinking alcohol in groups (i.e. social drinking expectancies).

Simulation of a Social Situation

The purpose of the experimental manipulation was to simulate to some degree the type of social situation in which individuals from the population of interest would typically drink. The experimental manipulation, however, had to be designed in a way that would not undermine the overall aim of the study— to assess the influence of social contexts on alcohol expectancies independent of alcohol cues. The simulated social context was therefore developed with the goal of creating a social situation that was simultaneously similar in some aspect to the situations in which participants would drink socially, and yet devoid of overt alcohol cues. Because these design constraints were highly specific, we were unable to find examples in the literature that could be used as guidelines in creating our manipulation.

Social drinking situations (and social situations in general) are intricate contexts made up of a variety of different components. For the purposes of this study, it was decided to simulate a few basic components common to most social drinking situations, so as to create a context that would share similarities with the social drinking contexts of a diverse group of individuals. Although social drinking situations vary greatly, almost all such contexts involve a group (loosely defined) whose individual members are enjoying the context and feeling some degree of closeness/similarity to the people around them. The aim of our simulation was to

create an enjoyable context among a group of participants, and induce some degree of bonding between group members.

The manipulation was designed with the idea of first providing the essential conditions necessary for the creation of a social situation, and subsequently adding features that will increase the likelihood of developing a social situation. The first element of the manipulation design was a basic aspect of social contexts: Gathering multiple individuals in one location. Any social situation requires the presence of more than one individual, as well as the awareness of the presence of others. Indeed, the presence of others on its own has been shown to alter individuals' levels of arousal (Bond & Titus, 1983) and affect attentional processes (Guerin & Innes, 1984). It is our belief that simply being in the presence of others can be considered as a social situation, but not the type of social situation that is likely to share strong similarities with a variety social drinking contexts.

Interaction between group members was also considered to be a basic necessity for the simulation. Interaction among group members was deemed necessary for participants to begin feeling familiar with one another, and thereby experience group cohesion. Second, interacting with each other was meant to help shift participants' focus from the experiment itself to the simulated social situation.

The presence of others and the group interaction elements of the manipulation were simple to create. The subsequent requirements for a sense of group cohesion and an enjoyable were more difficult to operationalize and

create. Because social situations are influenced by both the characteristics of the individuals in the group and the nature of their interaction with one another, creating a manipulation that would invariably produce a cohesive group with general positive affect was not considered feasible. The manipulation was therefore intended to facilitate the formation of group cohesion and the creation of an enjoyable atmosphere, with the knowledge that the effects of the manipulation would inevitably vary as a function of individual group members and their interactions.

Intuitively, there seems to be some degree of conceptual overlap between experiencing a feeling of group cohesion in a social situation and between enjoying a given social situation. People tend to enjoy being around individuals they feel close to, and people also tend to feel close to individuals whose company they enjoy. Although these two facets of the social context manipulation were not independent of one another, they are described separately in the paragraphs below, for the sake of clarity.

We planned to passively facilitate group bonding by recruiting only young adult male participants, so that participants would share noticeable characteristics with each other. We anticipated that having participants interact with individuals who were similar to themselves would ease the bonding process. To actively (yet subtly) encourage the creation of group cohesion, we planned to lead participants to believe that their performance on a subsequent group challenge was going to be compared to that of other groups. For the purpose of facilitating the creation of a generally enjoyable atmosphere, we decided to show

the participants a video clip intended to induce positive affect and increase arousal (for a description of the video clip see the materials and procedure sub-section in the methods section).

The creation of group cohesion and the creation of an enjoyable context were conceptualized as the desired effect for the manipulation (i.e. an effect that is present in a wide variety of social drinking contexts). To best capture the desired social effect, we designated group size to 3-5 participants. This group size was intended to guarantee that on the one hand each group contained enough members for the participants to feel that they were in a group, but on the other hand guarantee that no group contained so many members that single individuals could go unnoticed.

Aims and Hypothesis

In this study, we hypothesized that exposure to a social context could differentially activate individuals' alcohol expectancies. We aimed to produce this effect in order to explore the mechanism by which exposure to context leads to social drinking. To test our hypothesis, we exposed groups of young adult males to our social context simulation and compared their alcohol expectancies to the expectancies of individuals in a single-person control condition. We predicted that exposure to an enjoyable social situation along with other young-adult males will lead to stronger activation of positive and arousing alcohol expectancies and of other expectancies related to social drinking scenarios.

Methods

Participants

  One hundred and fifteen males between the ages of 18-25 were recruited from undergraduate psychology classes at the University of South Florida. Participants were compensated for their time with extra credit points in their psychology classes. Participants were run either individually (in the control condition) or in groups of 3-5 (in the experimental condition).

Materials and Procedure

  Participants in the experimental group condition were run in groups of 3-5 while participants in the control single condition were run individually. Participants were given similar instructions in both conditions. In the experimental condition, participants were told that the study was looking into personal variables and how they affect group performance on a problem-solving task. In the control condition, participants were read a slightly modified script in which they were informed that the study was looking into personal variables and how they affect individual performance on a problem-solving task. Participants were then told that they would first watch a short clip as a "warm-up" activity, then fill out individual measures, and finally perform a group problem-solving challenge (or an individual problem-solving challenge in the single control condition). Participants

were also informed that their group score (or individual score in the single control condition) on the problem solving challenge will be compared to that of other groups (or individuals).

Informing participants that they will have to work on a challenge at the end of the study was meant to increase group cohesion in the experimental condition, by giving group members a shared identity and goal. The similar procedure in the control condition was intended to control for the potentially arousing effects of instilling a competitive mood in the participants.

Movie Scene Compilation and Movie Impression Questions

Participants were shown a short video clip compilation of moments taken from famous films. The intent of the compilation clip screening was to entertain and stimulate participants. The compilation featured excerpts from famous popular movie scenes in which the characters deliver inspirational speeches. The excerpts are edited together to form an inspirational narrative approximately 2:30 minutes in length. Many of the films featured in the compilation are widely known in pop culture, even among individuals who have not seen these films (e.g. *Braveheart*, *Lord Of The Rings*, *Rocky*).

The purpose of the compilation was to stimulate excitement and arousal among group members, thereby creating a positively charged social atmosphere for the next step in the manipulation, in which participants were required to interact and cooperate with each other. After viewing the film compilation, group condition participants were asked to discuss what they liked and disliked most

about the clip, and then write down their answers on a single sheet of paper. The purpose of these instructions was to encourage interaction among group members. In the single participant condition, participants were only instructed to write down their most liked and disliked parts of the clip.

Following the movie clip portion of the study, participants were told they would complete several measures and then go on to a problem-solving challenge at the end of the study. An implicit expectancy measure *(EOA*; Reich et al., 2007) was administered first to avoid any unwanted priming effects. As discussed in the introduction, implicit measures can be highly sensitive to contexts. It was therefore decided to administer the measure directly after the manipulation, so that between condition differences could only be attributed to the effects of the manipulation. An explicit expectancy measure *(AEMax;* Goldman & Darkes, 2004) was then administered, because such measures are known to be less sensitive to context effects. Following the assessment of expectancies, manipulation checks were administered. The manipulation checks were administered in this order so as to avoid any possibility that they would prime participants in any way and influence their responses on the expectancy questionnaires, which served as the dependent variables. The final measure administered during the experiment was a word completion task, presented as the problem-solving challenge at the end of the study. The word completion task was included primarily for the purpose of adhering to the pretext told to participants at the start of the study. The word-completion task was neither a dependent variable nor a manipulation check, and it was therefore considered

less important to protect the integrity of the measure from possible priming effects. The measures below were then administered in the order in which they are listed.

Effects Of Alcohol task

The *EOA* task *(*Reich et al., 2007) is a variation of the *free associates* task (*FA*; Reich & Goldman 2005; Nelson, McEvoy & Dennis, 2000). The EOA task instructs participants to generate five free associates describing the effects of alcohol and then rank the words they generated on two 1-7 Likert scales: Pleasantness and arousal.

The *EOA* task is comprised of both explicit and implicit elements. The free association element of the task is the implicit element, in that the process of free association is considered to be automatic (i.e. performed without conscious deliberation). The rating element of the task is more explicit, in that it requires participants to deliberate and reflect on the pleasantness and arousal of their reported words. The EOA task essentially utilizes implicit methodology to determine participants' most salient expectancies, and subsequently uses explicit measurement methodology to collect participants' subjective valuations of their own most salient expectancies. The expectancy words generated in response to this task are considered to be influenced by context. Because context is thought to affect which expectancy words are reported, we also expected it to affect average word rating to some degree (because word rating is at least partially

dependent on the specific word). The EOA task was therefore chosen as a measure likely to be sensitive to the subtle effects of a context manipulation.

Shortened Alcohol Expectancy Multiaxial Assessment (AEMax)

The shortened *AEMax* (Goldman & Darkes, 2004) is an explicit alcohol expectancy questionnaire that lists 24 alcohol outcomes frequently associated with alcohol consumption (e.g. Social) and asks participants how likely it is that each of those outcomes would occur to them as a result of consuming alcohol. For the purpose of this experiment the instructions for the shortened *AEMax* have been altered from their original wording so as to inquire about the participants' alcohol outcome expectancies regarding the present moment (i.e. what would happen if they consumed alcohol at the time of participating in the experiment), rather than in general. This change in the wording of the *AEMax* was intended to increase the measure's sensitivity to context to some degree.

The *AEMax* shows to what degree participants hold each of the 24 alcohol outcome expectancy words. Data from the *AEMax* can be used to compare participants' responses to single items (or responses to sets of items) across conditions. AEMax data can also be used to determine how a specific group's (e.g. an experimental sample) AEMax responses relate to one another. This latter type of analysis produces cluster diagrams that depict the "semantic proximity" of AEMax expectancy words to one another. We anticipated that altering the wording of the AEMax to reflect a subjective present-moment focus

could lead to observable differences between conditions using both analysis methods described above.

Perceived Group Reinforcement Scale (PGRS)

The PGRS is a 12 item measure of group cohesion developed to assess how individual members of experimental groups feel about their groups (Kirchner, Sayette, Cohn, Moreland & Levine, 2006). The measure asks participants to rate on a scale of 1-9 to what extent they agree or disagree with nine positive and three negative statements about the group. The PGRS was included in this study as a manipulation check, to examine the extent to which individual group members felt that they were part of their groups.

Additional Questions

The last of the individual measures was a compilation of additional questions about participants' drinking habits, their demographic information and their attitude towards the experiment. The questions are listed below:

1. What is your age?

2. What is your ethnicity?

3. What year in college are you?

4 Have you seen the clip compilation before today?

5. Have you met any of the other group members before today?

6. On a scale of 1 to 7, 1 being not at all and 7 being very much, how much would you say you enjoyed the film clip and group discussion part of this study?

7. On a scale of 1 to 7, 1 being not at all and 7 being very much, how much would you say you bonded with other group members until now?

8. How often do you drink alcohol?

9. When you drink alcohol, how much do you usually drink? (One alcoholic drink is a 8 oz cup of beer, a 6 oz glass of wine or a drink containing 1.5 oz of strong liquor like whiskey, gin, vodka or rum)

10. If you were offered a drink right now, would you accept it?

Questions 1-3 were intended to collect demographic information in order to detect possible effects of ethnicity, year in college and age on the alcohol expectancy measures. Questions 4-7 were collected as manipulation checks, to potentially aid in the explanation of any unexpected results (questions 5 and 7 were only asked of participants in the group condition). Questions 8 and 9 were intended to measure participants' frequency and quantity of alcohol consumption, in order to detect possible effects of drinker type on the alcohol expectancy measures. Question 10 was added as an additional manipulation check, to explore the possibility that participants who went through the group condition manipulation were more likely than single condition participants to report a desire to drink at the time of the study.

Word Completion Task

After participants completed all the measures described above, they were given a word fragment completion task as the problem solving challenge described to them at the beginning of the study. This measure was administered largely for the sake of remaining faithful to the story told to participants at the beginning of the study. Although the post-measurement phase of the study was secondary to the study's goal, an alcohol expectancy measure was chosen to serve as the problem-solving challenge. The task was a list of word fragments that participants were asked to complete to the best of their ability. Word fragments are words with several letters missing, such that the fragment can be completed to spell out multiple words.

The task contained 9 alcohol expectancy word fragments and 13 neutral word fragments. Alcohol expectancy word fragments are word fragments that could potentially be completed into alcohol expectancy words. For example, "_ _ O S E" could be completed to spell out "goose" or it can be completed to spell out "loose", a common alcohol expectancy word.

Because group condition participants and single condition participants were given slightly different descriptions of the word completion task, the task was subsequently administered differently in each condition. In the single condition participants completed the task by themselves, while in the group condition, participants collaborated together on the task.

Shortened Alcohol Expectancy Questionnaire

The *AEQ* (Goldman, Greenbaum & Darkes, 1987) was administered prior to participant enrollment in the study, to control for any potential preexisting differences in expectancies between participants. In the beginning of each academic term in which the study was conducted, psychology undergraduate students completed the *AEQ* as part of a multi-test assessment battery taken by all students who wish to participate in experiments during that term.

The *AEQ* is one of the original measures used to assess alcohol expectancies; the shortened *AEQ* used in this study contains 68 statements regarding alcohol expectancies and asks participants whether they agree or disagree with said statements. Each of the 68 items belongs to one of six AEQ subscales: Global Positive Changes, Sexual Enhancement, Social and Physical Pleasure, Social Assertiveness, Relaxation, and Arousal/Aggression.

Analysis

Group Condition PGRS Median Split

The experimental manipulation was intended to facilitate the formation of group cohesion. Because creating a manipulation that would reliably produce cohesive groups was not considered feasible, the PGRS was administered to account for variance in individual participants' perceived group cohesion. PGRS scores were used to assess the degree to which each of the participants in the experimental condition experienced cohesion with their group.

The PGRS was used to identify a subset of group condition participants for whom the manipulation clearly created the desired positive effect of a social context. Group participants were labeled as "high PGRS" participants if their total PGRS score was equal to or higher than the median (78). A PGRS score equal to or higher than this cut-off was taken as an indication that the manipulation successfully created the desired effect in a participant. 29 participants were identified as high PGRS participants. In addition to conducting comparisons between all participants in both conditions, comparisons were also made between single condition participants and the high PGRS group participants. These additional comparisons were made in order to contrast those group participants that definitely experienced the positive effect of a social context to

the single condition participants (who could not have experienced a social context).

Effects Of Alcohol Task

In accordance with protocol for analyzing free associate data outlined by Reich and Goldman (2005), free associates were edited so that words/terms that were essentially identical in meaning were collapsed into their root word. For instance, the responses "happy", "happier" and "more happy" were all entered as "happy". Thirty-eight unique first associates and 189 total unique associates were reported by all participants in the sample.

The frequency in which participants reported specific words (either as first associates or as any of the five free associates) was compared between conditions. Specific words were chosen for comparison between conditions if they were reported in the sample four or more times. The number four was decided on based on practical statistical considerations: If a word was reported four times in the group condition and no times in the single condition, a chi square analysis will show that the word was reported at significantly different rates, at a p level of .04 (for words reported four times in the single condition and no times in the group condition, p-level would be .044). The minimum frequency for comparison of a word across conditions was set at four, because it was not possible (in this sample) to establish significantly different rates of occurrence with a smaller word frequency.

Four occurrences across the entire sample is therefore the minimum frequency with which it is possible to establish significant differences in rates of occurrence.

To account for rates of reporting of synonyms, words similar to one another, and words that share a common meaning, word categories were created and compared between conditions. Word categories were created based on the list of unique associates provided by participants in the present study (independent of participant condition). The creation of word categories is not an established part of free associates analysis protocol, as such, there are no standard guidelines for the development of free associate categories. As an initial exploration of the utility of using word categories, these categories were created intuitively, rather than empirically: Unique associates were grouped together based on the experimenter's valuation of the words' semantic similarity.

As with the procedure for selection of specific words for analysis, a word category was retained (i.e. compared between conditions) if it had 4 or more observations. Twenty-eight word categories were created in this manner. Not all unique associates fit into categories. For the unique words that were included into categories, category affiliation was exclusive. That is, words were included in only one category. A detailed list of each category and the unique associates it describes can be found in Appendix I. Below is an alphabetically ordered list of the category titles, the numbers in parenthesis represent the number of times that words in that category were reported in this sample:

Agreeable (9), Angry (7), Behaving Badly (5), Brave (8), Buzzed (4), Calm (34), Carefree (5), Clumsy (9), Dehydrated (4), Disinhibitied (7), Emotional (5), Energized (14), Hungover (5), Impaired (25), Indifferent (4), Intoxicated (37), Lacking thought (6), Low mood (10), Physically Warm (7), Positive/aroused intoxicated activity (20), Positive/Jovial (78), Regrettable Actions (4), Sick (38), Social (37), Stupid (8), Tired (39) and Unattractive (5).

The process of category creation was subsequently repeated by combining the above listed categories (first order categories) thereby creating six second-order categories. Second-order categories were designed to contain words from a larger, yet still related, semantic range. For instance, the first order categories "energized" and "positive/aroused intoxicated activity" were combined into the second order category "positive urgency". Like the process for categorizing specific associates, inclusion of first order categories was exclusive. The six second-order categories are:

Undesirable Behavior (15), Positive Urgency (30), Absence of Caution (14), Negative Feelings (14), Pharmaceutical Effects (37), Decreased Ability (31)

Two third-order categories were created, with the intention of capturing a broad meaning shared by as many of the free associates as possible. These categories are: Wanted Consequences (100) and Unwanted Consequences (72).

In addition to comparison of specific words and word categories, ratings of free associate words were compared between conditions. Participants' ratings of all their associates were then averaged to create mean pleasantness/unpleasantness and arousal/sedation ratings, in order to capture and reflect the general trend of specific participants' ratings.

Shortened Alcohol Multi-Axial Assessment

Individual AEMax item scores as well as AEMax factor scores were compared between groups using independent samples t-tests, in order to search for possible significant differences across conditions. *AEMax* responses were also analyzed using cluster-analysis techniques. Cluster analysis is a method that weighs each item's average score in relation to all other available items' average scores. In this manner, cluster analysis calculates how closely related items are to one another. The analysis can then be used to produce a cluster diagram that depicts how the different items group together. Cluster diagrams derived from AEMax data are considered to be estimations of the semantic organization of alcohol expectancy words. By showing which words cluster together and which do not, the diagram is taken as a reflection of the semantic "distance" between the words.

Although cluster analysis uses calculations of the inter-relatedness of items to create cluster diagrams, the cluster diagrams themselves should be considered as qualitative data. Cluster analysis techniques do not estimate error and do not produce fit statistics or significance levels for the resulting cluster diagram. Because cluster diagrams are essentially produced with no estimation of the validity of the diagram, caution must be exercised when interpreting these figures.

The cluster diagrams created from participants' answers in the experimental and control conditions were compared to one another to determine if social and non-social contexts affected organization of alcohol related concepts.

Word Completion Task

Conducting between-condition comparisons using data gathered with the word fragment completion task raises a methodological issue. The task was completed individually by single condition participants but completed collectively by group condition participants. Comparing results across conditions is therefore problematic, because group condition and single condition participants essentially completed two different tasks.

Nevertheless, a basic analysis of the data was performed. The number of alcohol expectancy words reported by each participant was calculated and divided by the number of potential alcohol expectancy word fragments completed (i.e. word fragments that could be completed to form alcohol expectancy words). The resulting percentage reflected how many of the potential alcohol expectancy

word fragments were completed as alcohol expectancy words. This percentage was compared across conditions.

Results

Missing Data and Data Cleaning

      A small portion of the demographic data and expectancy measures data was missing at random. In some rare cases, participants' responses on a particular measure or set of questions were removed from the dataset. Data was removed from the sample in cases where participants' response or response patterns were clearly misguided, untruthful or random. For the AEMax, participants' responses were removed from the sample if the response pattern was clearly untruthful or random (e.g. a score of 0 on the first 12 items). For the EOA task, participants' responses were removed from the sample if the responses clearly did not follow the directions (e.g. responding to "alcohol makes me _____" with "Italy"). Together, missing and removed data accounted for less than 5% of the responses for any specific item.

Perceived Group Reinforcement Scale

      As discussed in the analysis section, participants' PGRS scores were used to select those participants who experienced the group manipulation effect most strongly. The PGRS scale has 12 items that were scored on a 1 to 9 Likert scale. The 12 PGRS items were added together (3 items were first reverse scored) to create the total PGRS score that was used as an indicator of the

participant's liking of their group. The minimum possible PGRS score was 12 and the maximum possible score was 108. Reporting a score of 5 (i.e. the middle point between "disagree" and "agree") for all 12 items would produce a total PGRS score of 60. The lowest score in the current study's sample was 47, while the highest score was 108. The mean total PGRS score for participants in the group condition was 79 (standard deviation 14.95) and the median was 78.

Participants with a PGRS score equal to or higher than the median were considered to be participants for whom the experimental manipulation had its desired effect. These participants were labeled as "high PGRS" participants and compared to single condition participants. In this manner, single condition participants were compared to those group condition participants for whom the manipulation most likely had the desired effect (in addition to being compared to all group condition participants. Whenever results in this study are said to have been compared across or between conditions, our intention is to convey that comparisons were conducted between group condition participants and single condition participants and also between high PGRS participants and single condition participants.

Sample Information

115 participants were randomly assigned to either the experimental group condition (N=57) or the control single condition (N=58). Group size ranged between 3-5 (6 groups of 3 members, N=18; 6 groups of 4 members, N=24; and 3 groups of 5 members, N=15).

Participants were males between the ages of 18-25 with a mean age of

19.9 (standard deviation 1.78) and a median age of 20 (see table 1). The ethnic

makeup of the sample was as follows: 57.4% (N=66) of the participants were

Caucasian, 12.2% (N=14) were African American, 13.9% (N=16) were

Hispanic/Latino, 4.3% (N=5) were Asian, 10.4% (N=12) described themselves as

"other" and 1.7% (N=2) did not report their ethnicity (see table 2).

Table 1: Sample Demographics and Clip Enjoyment

	Single Participant Mean (N=57*)	Group Participant Mean (N=56*)	High PGRS Participant Mean (N=29)	All Participant Mean (N=113*)
Age	19.9 (1.82)	19.95 (1.76)	19.83 (1.82)	19.92 (1.78)
Drinking Frequency	3.7 (1.46)	3.43 (1.46)	3.52 (1.5)	3.57 (1.46)
Drinking Quantity	3.97 (2.01)	4.11 (2.03)	4.5 (1.93)	4.04 (2.01)
Clip enjoyment	5.38 (1.32)	5.6 (1.19)	6.07 (0.8)	5.49 (1.25)

*Information is missing for one group condition participant and one single condition participant

Table 2: Distribution of Ethnicities in Sample

Ethnicity	Single Participants (N=56)	Group Participants (N=57)	High PGRS Participants (N=29)	All Participants (N=113)
Caucasian	30	36	19	66
Hispanic/Latino	7	9	4	16
African American	10	4	3	14
Asian	3	2	3	5
Other	7	5	0	12

*Information is missing for one group condition participant and one single condition participant

Participants in the sample drank an average of 4.04 drinks (standard

deviation 2.01) per drinking occasion, with a median and modal drinking

frequency of 2-3 drinking occasions per month (the frequency of drinking was

collected on an ordinal scale, therefore a mean score would be less informative)

(see table 1). This quantity of drinking is within normal range for young adult

males while the frequency of drinking is somewhat below normal frequency of

drinking for that age-group (Chen et al. 2004/2005). Prior to enrollment in the

study, participants completed an online version of the Alcohol Expectancy Questionnaire. Means for participants' AEQ scores (detailed in table 3) were within the normal range for the general adult population (Brown et al. 1987). The sample was considered to be within normal range for alcohol expectancies and drinking behaviors.

Table 3: Sample Means on the Alcohol Expectancy Questionnaire Subscales

Scale	Scale Mean
Global Positive Feelings	7.42 (5.55)
Sexual Enhancement	2.08 (2.18)
Physical and Social Pleasure	5.99 (2.71)
Social Assertiveness	5.66 (3.48)
Relaxation	4.81 (2.88)
Arousal/Aggression	3.54 (2.37)
Total AEQ score	28.97 (16.63)

Demographic information and pre-study expectancy scores (i.e. AEQ scores) were compared between conditions. Independent samples t-tests were used to explore differences across conditions in total AEQ scores and AEQ subscale scores, drinking quantity and frequency, and age. No significant differences were found (see table 1). A chi-square analysis was performed on ethnicity and found no significant differences between conditions (see table 2). We therefore concluded that there were no pre-existing differences in age, drinking behavior and explicitly assessed alcohol expectancies between participants in the two conditions.

Manipulation Checks:

In addition to the PGRS, several questions were used as manipulation checks of different elements of the experiment. To determine whether viewing

the inspirational video clip was a) enjoyable and b) enjoyed more by participants in the group condition, participants were asked to rate the degree to which they enjoyed viewing the video clip (using a 1-7 Likert scale). Differences between conditions were not significant (see table 1). Although not significant, an independent samples t-test showed that the difference in average clip enjoyment between high PGRS participants (6.07) and single condition participants (5.6) trended towards significance $t(84)=-1.942$; $p=.056$. As previously noted, participants with high PGRS scores were identified as participants for who the experimental manipulation was most effective. The results for clip enjoyment suggest that high PGRS participants may have enjoyed the clip portion of the experiment more than single condition participants, which further implies that the manipulation successfully created the intended effect among high PGRS participants.

The experimental manipulation was intended to increase positive and arousing alcohol expectancies, and so it seemed possible that the manipulation could evoke in participants the desire to drink. For this reason, a question was added to potentially detect whether participants in the experimental condition were more likely to desire a drink. At the end of the study, participants were asked if they would accept an alcoholic beverage if it was offered to them at that time. Nine single condition participants, nine group condition participants, and four high PGRS participants indicated that they would accept a drink. These results were not significantly different across conditions, indicating that assignment to a particular condition did not influence participants' desire to drink.

To detect whether familiarity with the video clip affected the study's results, participants were asked if they had seen the clip before. Two single condition participants and four group condition participants reported seeing the clip before. The average rating for clip enjoyment for participants who had previously seen the clip (6.0) was not significantly different from the average for the rest of the sample (5.5), suggesting that previously viewing the clip did not noticeably influence the manipulation's effect.

To account for pre-existing social relationships, participants in the group condition were asked if they had previously met any of their fellow group members. 3 participants indicated previously meeting group members. The average rating for clip enjoyment for participants who had had previously met one of their group members (4.7) was not significantly different from the average for the rest of the sample (5.5), suggesting that previously meeting group members did not noticeably influence the manipulation's effect.

In total, 9 participants reported either previously seeing the clip or previously meeting other group participants. This small number of participants (less than 8% of the sample) hindered our ability to conclusively determine statistical difference or lack thereof. However, there were no indications that either being familiar with the clip or knowing other group members affected participants' responses during the experiment. If these factors did exert a subtle effect on participants' responses, the small number of these participants makes it unlikely that this subtle effect led to a statistically meaningful difference in the study's results.

Effects of Alcohol Task

When completing the EOA task, participants were asked to generate five associates to the prompt "alcohol makes me _____". The first associate produced by participants is thought to be the most reliable response. All five associates, however, have the potential of providing meaningful data. Chi square analysis revealed no significant differences between conditions in occurrence rates of first associates (see table 4). However, several significant differences were found when comparing rates of reporting specific words across all five free associates (see table 5) and rates of reporting words from specific categories (see table 6). Many of these differences were predicted by the hypothesis and are therefore considered to support it.

Table 4: First Associate Frequencies

First Associate	Single Participants (N=58)	Group Participants (N=57)	High PGRS Participants (N=29)	All Participants (N=115)
Drunk	12	7	2	19
Happy	9	10	3	19
Sick	7	2	0	9
Relaxed	3	5	3	8
Tired	3	3	1	6
Calm	1	4	3	5
Dizzy	1	4	2	5
Social	1	3	1	4

Table 5: All Associate Frequencies

All Associates	Single (N=58)	Group (N=57)	High PGRS (N=29)	All Participants (N=115)
Happy	21	21	9	43
Drunk	17	16	7	34
Sick	22	12	5	34
Tired	12	15	8	27
Relaxed	6	15**	8**	21
Funny	9	9	5	18
Dizzy	7	8	3	15
Fun	3	9	5	12
Social	4	8	3	12
Laugh	6	4	2	10
Loose	4	6	2	10
Outgoing	4	5	3	9
Sleepy	5	4	2	9
Talkative	2	7**	4	9
Feel Good	4	3	1	7
Hungry	6	1	0	7
Have Fun	6	0**	0	6
Calm	1	5	3	6
Angry	2	4	1	6
Confident	1	5	4**	6
Sociable	3	3	1	6
Stupid	0	5**	3**	5
Depressed	1	4	2	5
Loud	0	5**	5**	5
Silly	3	2	0	5
Uncoordinated	3	2	1	5
Crazy	1	3	3	4
Excited	2	2	2	4
Good	3	1	0	4
Warm	2	2	0	4
Clumsy	3	1	1	4
Throw up	1	3	2	4
Hungover	2	2	0	4

**: Number reported in "group participants" or "high PGRS participants" column is significantly different from the number in the "single participant" column.

Table 6: Free Associates Category Frequencies

Category	Single Participants (N=58)	Group Participants (N=57)	High PGRS Participants (N=29)	All Participants (N=115)
Positive-Jovial	40	38	19	78
Intoxicated	18	38	8	56
Sick	26	15**	7	41
Tired	18	21	10	39
Social	14	23	13**	37
Calm	13	21	11	34
Impaired	10	15	7	25
positive/aroused intoxicated activity	7	13	11**	20
Energized	7	7	6	14
Low mood	4	6	2	10
Agreeable	7	2	1	9
Clumsy	6	3	2	9
Brave	2	6	5**	8
Stupid	1	7	4	8
Angry	3	4	1	7
Physically Warm	3	4	0	7
Disinhibited	3	4	3	7
Lacking thought	4	2	0	6
Behaving badly	1	4	2	5
Carefree	2	3	3	5
Unattractive	5	0**	0	5
Emotional	2	3	1	5
Hungover	3	2	0	5
Buzzed	0	4**	3**	4
Regrettable actions	2	2	1	4
Indifferent	3	1	1	4
Dehydrated	2	2	1	4
Second Order Categories				
Pharmaceutical effects	18	19	8	37
Decreased functioning level	15	16	8	31
Positive urgency	13	17	14**	30
Undesirable behavior	6	9	3	15
Absence of caution	5	9	7**	14
Third Order Categories				
Wanted Consequences	35	41	24	76
Unwanted Consequences	41	31	13**	72

**: Number reported in "group participants" or "high PGRS participants" column is significantly different from the number in the "single participant" column.

Group condition participants were more likely to report words related to positive/arousing expectancies as well as social expectancies. "Talkative" (reported by seven group condition participants and two single condition participants; $\chi(1)=4.058$, p =.044), "Loud" (reported by five group condition participants and no single condition participants; $\chi(1)=5.39$, p =.021) and "buzzed" category words (reported by four group participants and no single participants; $\chi(1)=4.217$, p=.040). Similar to these results, high PGRS participants were more likely than single condition participants to report the word "Loud" (reported by five high PGRS participants and no single condition participants; $\chi(1)=10.61$, p =.001) and to report "buzzed" category words (reported by three high PGRS participants and no single condition participants; $\chi(1)=6.214$; p=.013). These results support the hypothesis that exposure to a social context could activate positive/arousing alcohol expectancies and social expectancies.

High PGRS participants also showed higher rates of reporting additional words related to positive/arousing expectancies and/or social expectancies. Compared to single condition participants, high PGRS participants reported the following words more frequently: "confident" (reported by four high PGRS participants and one single condition participant; $\chi(1)=5.199$, p =.044), "brave" category words (reported by six high PGRS participants and two single condition participants; $\chi(1)=4.971$, p=.026), "positive/aroused intoxicated activity" category words (reported by eleven high PGRS participants and seven single condition participants; $\chi(1)=7.88$, p=.005), "social" category words (reported by thirteen

high PGRS participants and fourteen single condition participants; $\chi(1)=3.867$, p=.049), "positive urgency"[1] second order category words (reported by fourteen high PGRS participants and thirteen single condition participants; $\chi(1)=6.042$, p=.014) and "absence of caution" second order category words (reported by seven high PGRS participants and five single condition participants; $\chi(1)=3.915$, p=.048). These findings further support our hypothesis.

Some of the differences in word frequencies between conditions were not predicted by our hypothesis, but did not directly contradict it either. "Relaxed" was reported more frequently by all group participants and high PGRS participants (reported by twelve group condition participants ($\chi(1)=4.810$, p =.028), eight high PGRS participants ($\chi(1)=6.96$, p =.008) and four single condition participants). The word "relaxed" connotes a positive and sedating meaning. Our hypothesis predicted greater frequency of reporting positive/arousing alcohol expectancies, and so this finding was not predicted by the hypothesis.

In several instances, single condition participants reported certain words more frequently than group and/or high PGRS participants. The hypothesis only predicted the type of words that group condition participants would report more frequently. The following findings were therefore not predicted by the hypothesis. Single condition participants reported "sick" category words (reported by twenty six single participants and fifteen group participants; $\chi(1)=4.294$, p=.038) and

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[1] The term "positive urgency" refers to a state of positive affect combined with arousal and impulsivity. This term has been used to characterize risky drinking behaviors (e.g. cite Smith)

"unattractive" category words (reported by five single participants and no group participants; $\chi(1)=5.137$, p=.023) more frequently than group condition participants. Single condition participants also reported "unwanted effects/consequences" third order category words more frequently than high PGRS participants (reported by 41 single condition participants and 13 high PGRS participants; $\chi(1)=5.492$, p=.019). These findings suggest that participants in the single condition were more likely to report negative expectancy words. Although these differences in rates of reporting negative alcohol expectancies were not predicted by the hypothesis, they do not contradict it either.

Lastly, two differences in rates of reporting words between conditions seemed contrary to our hypothesis. Single condition participants were more likely than group condition participants to report the term "Have fun" (reported by six single condition participants and no group condition participants; $\chi(1)=6.221$, p =.013). Because "have fun" is a positive expectancy, our hypothesis would predict the opposite of the results; that group condition participants would be the ones who reported "have fun" more frequently.

The term "have fun" was included in the category "positive/jovial" words, and no differences were found in rates of reporting "positive/jovial" words across conditions. However, the "positive/jovial" category contained a relatively large number of words and terms, which could have overshadowed a small difference between conditions. To account for this possibility, a variable was created to represent whether participants reported either the term "have fun" or a similar term: "fun". Either the term "have fun" or the word "fun" was reported by nine

single condition participants, nine group condition participants and five high PGRS participants. These results were not significantly different across conditions, and so the difference in rates of reporting "have fun" was not replicated with similar words.

The second finding contradicting our hypothesis was that "stupid" was reported more frequently by all group condition participants and by high PGRS participants, as compared to single condition participants (reported by five group condition participants ($\chi(1)$=5.39, p =.021), three high PGRS participants ($\chi(1)$=6.124, p =.013) and no single condition participants). This finding was unexpected as "stupid" appeared to be a negative word and it was not hypothesized that group condition participants would report such words at higher rates than single condition participants.

"Stupid" is a potentially ambiguous term. Although the official definition of the word is a derogatory description of a below average intelligence, "stupid" has also been used colloquially to describe a state of intoxication. If participants reported "stupid" with the latter colloquial meaning in mind, then the finding could be seen as supporting our hypothesis. Ratings of "stupid" were therefore examined, to determine what participants meant when they reported that word. Mean pleasantness and arousal ratings for "stupid" were 2.2 (standard deviation 1.1) and 2.6 (standard deviation 1.14), respectively, indicating that the participants who reported the word evaluated it as a negative word. These results confirm that the differences in rates of reporting the word "stupid" do in fact run contrary to our hypothesis.

In addition to comparisons of rates of reporting specific words, ratings of free associates were compared between conditions independent of the actual words reported (see table 7). Participants were asked to rate each of their self-generated associates on two 1-7 Likert scales: pleasantness/unpleasantness and arousal/sedation. Independent samples t-tests were used to compare participants' valence and arousal ratings of their self-generated associates across conditions. In addition, the average of each participants' valence and arousal ratings were compared across conditions. No significant differences were found in either set of comparisons, thus data from ratings of free associates did not support our hypothesis.

Table 7: EOA Rating Means

	Single Participants (N=58)	Group Participants (N=57)	High PGRS Participants (N=29)
FA1 Pleasantness	4.38 (2.16)	4.93 (1.99)	5.25 (1.6)
FA1 Arousal	4.24 (2.03)	4.07 (2.17)	4.45 (2.1)
FA2 Pleasantness	4.42 (2.18)	4.54 (2.1)	5.07 (1.65)
FA2 Arousal	4.42 (2.04)	4.26 (2.13)	4.79 (1.9)
FA3 Pleasantness	4.05 (2.11)	4.18 (2.13)	4.39 (1.81)
FA3 Arousal	3.85 (2.1)	4.18 (2.14)	4.28 (2.15)
FA4 Pleasantness	4 (2.26)	3.75 (2.22)	3.62 (2.18)
FA4 Arousal	3.91 (2.12)	3.77 (2.14)	4.18 (2.14)
FA5 Pleasantness	3.67 (2.2)	3.61 (2.11)	3.9 (2.11)
FA5 Arousal	3.73 (2.07)	3.55 (2.01)	4.11 (1.95)
Mean Pleasantness	4.12 (1.33)	4.18 (1.51)	4.39 (1.34)
Mean Arousal	4.03 (1.31)	3.98 (1.46)	4.38 (1.29)

Shortened Alcohol Expectancy Multi-Axial Assessment

The shortened AEMax is a measure composed of 24 words describing commonly held alcohol expectancies. Participants rated each word to denote how likely it was that they would experience the effects described by the word if they had an alcoholic drink at the time of answering the questionnaire. The 24 items on the AEMax loaded onto 8 factors, which were theorized to load onto three super-factors. The ratings of all items and the derived scores for the factors and super-factors were compared between conditions, with the guiding hypothesis that participants in the group condition were more likely to report positive/arousing expectancies. No significant differences were found between conditions (see table 8), and so our hypothesis was not supported by these results.

Table 8: AEMax Factor Means

	Single Condition (N=58)	Group condition- all (N=57)	Group condition- bottom half removed (N=29
Horny Factor	10.26 (4.13)	9.77 (4.04)	11.66 (2.7)
Ego Factor	8.18 (4.05)	8.33 (3.97)	8.66 (3.98)
Sick Factor	8.02 (4.36)	6.63 (3.39)	7.24 (3.47)
Woozy Factor	9.11 (3.83)	8.95 (3.52)	9.48 (3.74)
Social Factor	13.28 (4.08)	12.89 (4.13)	13.93 (3.48)
Attractive Factor	7.23 (3.78)	6.82 (4.34)	7.62 (4.15)
Sleepy Factor	9.79 (3.94)	10.4 (3.54)	11 (3.48)
Dangerous Factor	5.63 (3.29)	5.54 (4.35)	5.72 (4.44)
Sedating Super-factor	8.97 (3.25)	8.66 (2.87)	9.24 (2.79)
Negative/Arousing Super-factor	6.9 (2.76)	6.94 (3.35)	7.19 (3.75)
Positive/Arousing Super-factor	10.26 (3.17)	9.83 (3.41)	11.07 (2.49)

The AEMax was designed in a way that enables analysis of the resulting data using clustering techniques. Cluster analysis was used to produce a cluster diagram for the AEMax responses of participants in both conditions (as well as high PGRS participants' AEMax responses). The cluster diagrams showed how the different AEMax items grouped together across conditions. Figures 1.1, 1.2 & 1.3 show the cluster diagrams for AEMax responses by single, group and high PGRS condition participants, respectively.

Because cluster diagrams present a model of the data that does not account for error in any way, these diagrams can be viewed as qualitative data. Differences and similarities between cluster diagrams were therefore evaluated visually. Because we hypothesized that participants in the group condition would experience a greater activation of positive and arousing expectancies, we anticipated observing a close clustering of positive/arousing words among group condition participants, as compared to single condition participants. The hypothesis was not supported by data from the cluster diagrams, as the anticipated differences were not observed between conditions.

For all conditions examined (i.e. single condition participants, group condition participants and high PGRS participants), the clusters in the cluster diagrams approximately reflected the eight AEMax factors. That is to say, the 24 AEMax items usually clustered in such a way as to reflect the measure's factor structure. The finding that the cluster diagrams reflected the AEMax's psychometric qualities supports the validity of those diagrams as representations of participants' organization of alcohol expectancies.

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Because cluster analysis methods do not account for error and essentially produce qualitative diagrams, the cluster diagrams were compared visually. Some differences between the three cluster diagrams were observed (see figures 1.1, 1.2 & 1.3). These differences, however, were not predicted by the hypothesis, nor did they appear to be substantial or meaningful. For these reasons, the differences between diagrams are not further described in this section.
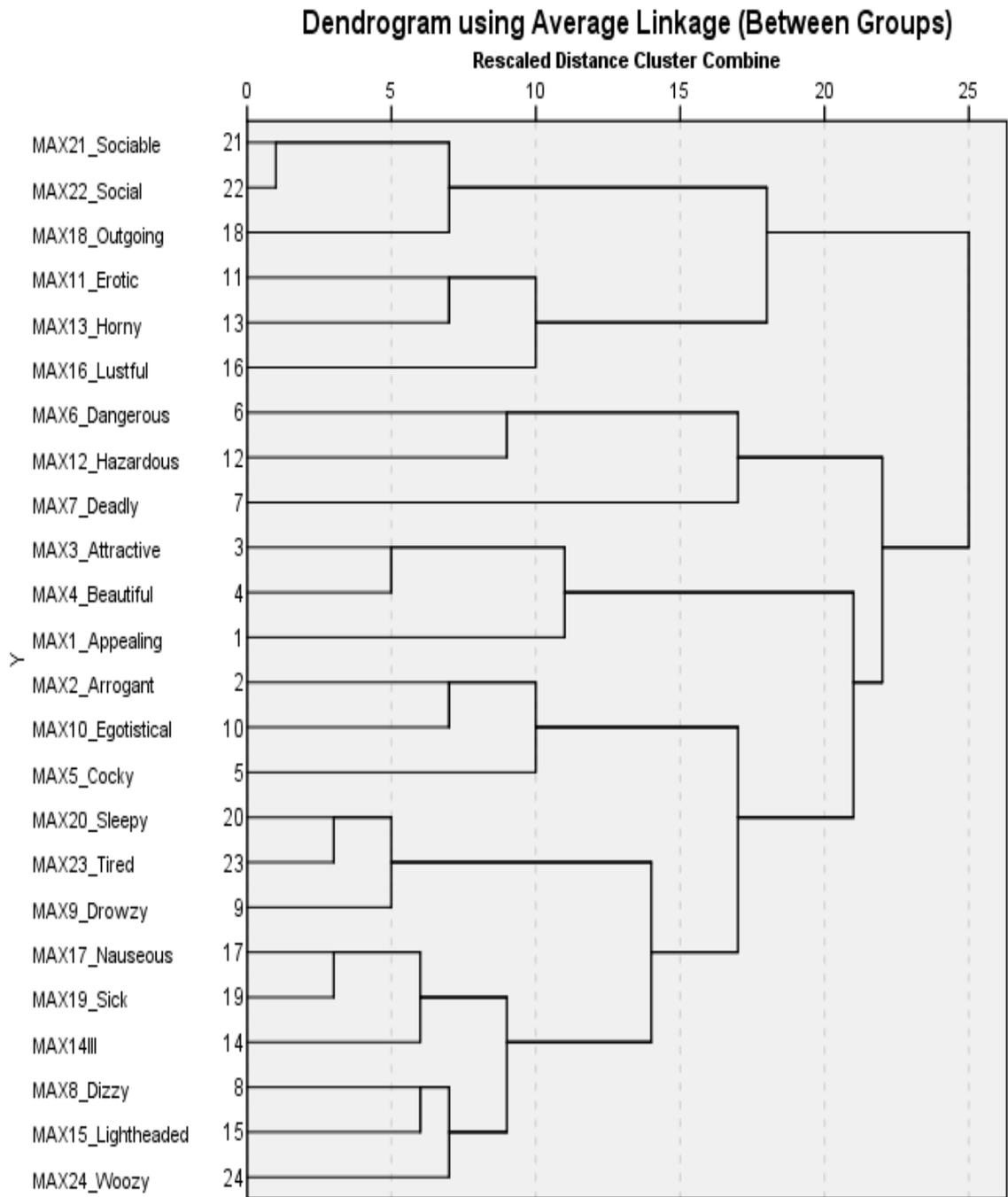
Figure 1: Cluster diagram for single condition participants' AEMax responses
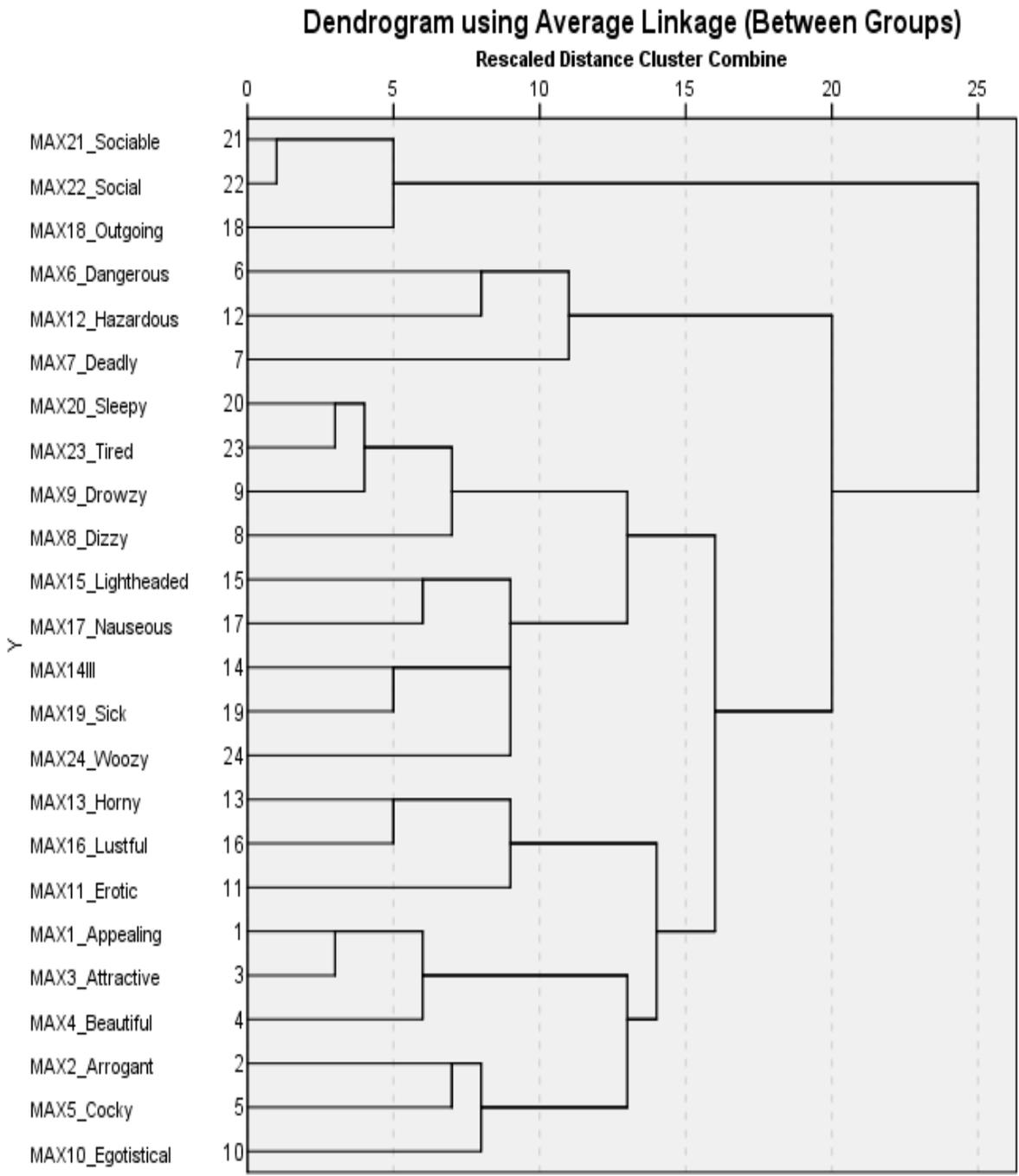
Figure 2: Cluster diagram for group condition participants' AEMax responses
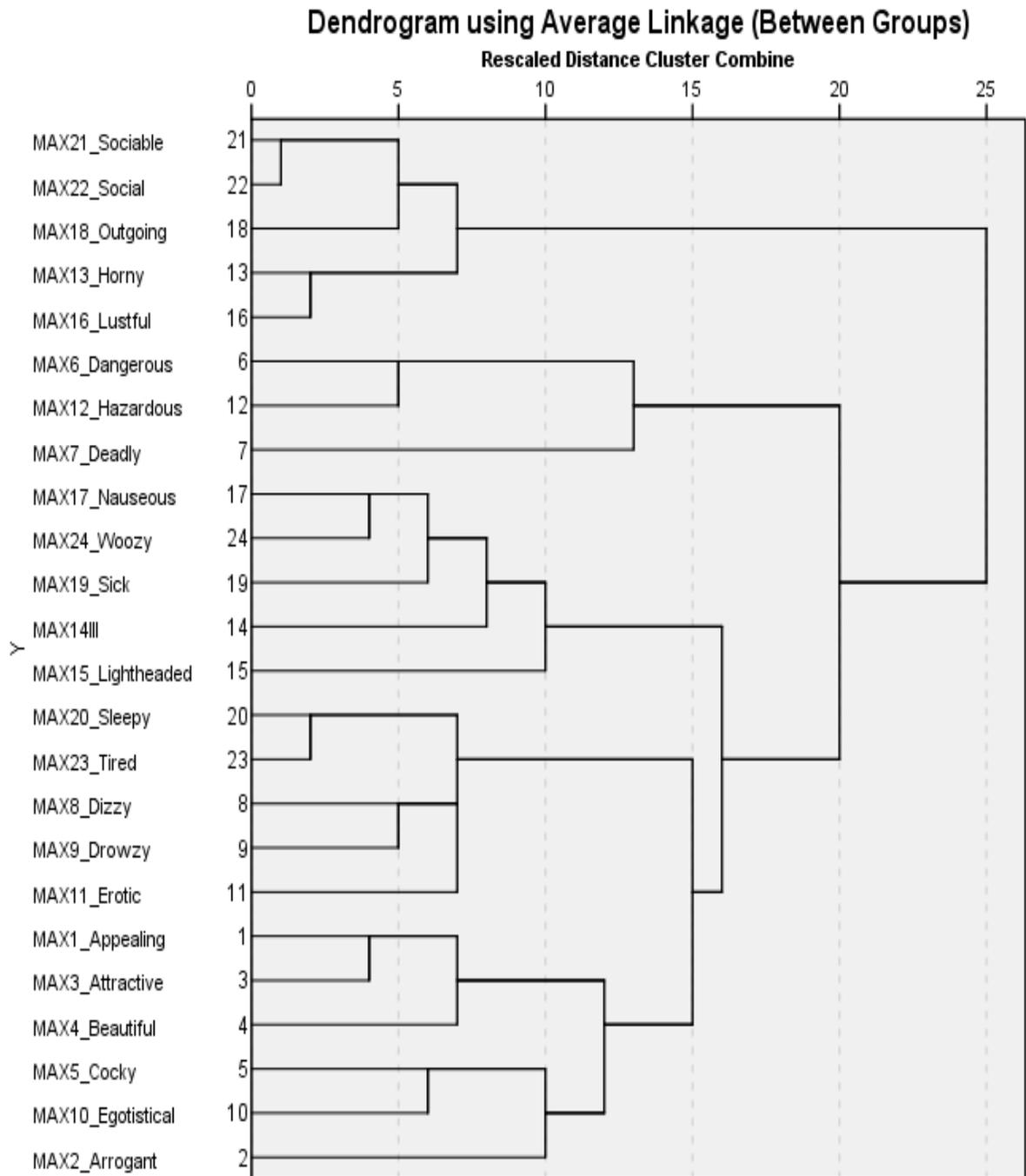
Figure 3: Cluster diagram for high PGRS participants' AEMax responses

Word Completion Task

In the word completion task, participants completed word fragments. All word fragments could be completed in to two or more possible words, and for some word fragments, one of the possible words was an alcohol expectancy word. The word completion task was included in this study primarily to adhere to the pretext told to participants at the start of the study (i.e. that the study will end with a problem solving challenge). Because the measure was added for practical, rather than theoretical, reasons, no hypothesis was made with respect to the results of the task. Nevertheless, independent samples T-tests were used to conduct between-condition comparisons of the percentage of alcohol expectancy words reported by participants. No significant between-condition differences were found in frequency of reporting alcohol expectancy words in response to word fragments.

Discussion

In this study, we tested the hypothesis that social contexts could activate alcohol expectancies, by comparing the expectancies of participants primed with a social context to the expectancies of participants in a control condition. Two sets of comparisons were conducted with the data: comparisons between the single and group conditions, and comparisons between the single condition and the only those group condition participants whose PGRS scores were equal to or greater than the media (suggesting a high degree of group liking, which was taken as an indication of manipulation success, such that those participants with the highest degree of group liking were considered to be the participants for who the manipulation had the strongest effect). Three dependant variables were compared between conditions: Two explicit expectancy measures (the AEMax and the rating portion of the EOA task) and one implicit expectancy measure (the free associates portion of the EOA task). In both sets of comparisons, differences between conditions were found in participants' responses to the implicit portion of the EOA task, but not in the responses for either of the explicit expectancy measures.

The lack of between-condition differences in responses on the explicit expectancy measures was unexpected. Although explicit measures are recognized as less sensitive to context than implicit measures, differences

between conditions were anticipated. All explicit measures included in the study featured some degree of present moment focus, and this was thought to increase sensitivity to context. The wording of the Alcohol Expectancy Multi-Axial assessment task was changed to reflect an estimation of the likelihood that a specific effect of alcohol would be experienced if participants drank at that moment (in contrast to the original wording of the measure, which asked participants to evaluate the general likelihood that specific effects of drinking occur). We believed that exposing participants to a social situation combined with wording the AEMax to focus on their present moment expectancies would lead group condition participants to report more positive and arousing alcohol expectancies in comparison to single condition participants.

We used AEMax data in a cluster analysis, which computes the average of single items in relation to all other items, and thereby estimates conceptual proximity of those items. Cluster analysis produces cluster diagrams which are thought to represent the organization of alcohol expectancies for participants in each condition. We anticipated that even in the absence of statistically significant differences between the two conditions' means of AEMax likelihood ratings, the cluster diagrams could potentially show differences in organization of expectancies across conditions. Although some differences were found between conditions, these differences were not predicted by our hypothesis, nor did they seem to be meaningful differences. In addition, cluster analysis uses all available data without accounting for potential error. Consequently, there is no statistic method for confirming the validity of a cluster diagram as a representation of the

data. Therefore, the AEMax cluster diagrams were not considered to be informative of differences between conditions.

Between-condition differences were also anticipated in participants' valence and arousal ratings of their own free associates. The free associates themselves were considered as implicitly assessed data while the ratings of those associates were considered as explicitly assessed data. Because previous work from our lab suggested that the process of generating free associates is sensitive to contexts (Reich et al., 2007), we believe that the free associates generated by participants in this study were influenced by the context as well (i.e. social vs. control). Because we believed that the free associates themselves would differ between conditions, we anticipated that ratings of each condition's respective free associates would also reflect the anticipated differences. Specifically, group condition participants were expected to provide higher arousal and pleasantness ratings for their free associates.

Results Interpretation- Explicit Measures

There are several possible explanations as to why no manipulation effects were detected in explicit expectancy responses between conditions. First, it may be that the manipulation did not create the desired effect. Alternatively, the control condition manipulation and the experimental condition manipulation may have both had the same effect. Finally, it is possible that the manipulation had an effect that was not detected by these measures. Each of these possibilities has different implications.

If the manipulation did not have the desired effect, then that would mean that the social context created in this study was lacking in some aspect (e.g. perceived authenticity), and that this flaw led to the failure in generating the desired effect. Alternatively, it is possible that the manipulation did not create the desired effect because the theory on which the study was based was incorrect. This study was designed based on the theory that social contexts and drinking are so strongly related that certain social contexts should have the power to prime alcohol expectancies even without the aid of overt alcohol cues. It is possible that this theory is incorrect and that a social situation that is not overtly related to alcohol consumption cannot trigger alcohol expectancies in most individuals.

There are of course other possible explanations for the absence of differences in explicitly assessed expectancies between conditions. Viewing the inspirational video clip combined with conversing with peers in the experimental condition was intended to create a social situation that would illicit more positive and arousing expectancies in comparison to the control condition (in which single participants viewed the experimental clip). It could be that viewing the inspirational clip in the single control condition and viewing the clip and discussing it in the experimental group condition had similar effects on participants. The clip may have exerted an effect on both groups, and reached a ceiling effect for a non-alcohol prime, thereby drowning out any effects of the social aspect of the manipulation.

The manipulation may have also had an effect on explicitly assessed expectancies that went partially undetected. Relatively small differences may have occurred across responses on the explicit expectancy measures but gone undetected due to the limited power of the current sample size. Alternatively, differences may have occurred within subjects, rather than between. That is to say, the ratings and responses of participants in the experimental condition may have been significantly different from the ratings they would have provided, had they completed these measures as part of a pre-experiment battery. Finally, it may be that an effect occurred that was subtle and therefore not captured by explicit measurement.

The idea that the manipulation had an effect that was not detected by explicit expectancy measures may be the most likely explanation. From a theoretical standpoint, the study is based on evidence that has been strongly supported by research. The hypothesis that certain social contexts can activate alcohol expectancies is rooted in evidence that humans are fundamentally social organisms (e.g. Adolphs, 2009; Rizzolatti & Craighero, 2004) who not only drink socially but also hold strong beliefs regarding the socially oriented benefits of alcohol consumption (e.g. Aas et al., 1998; Fromme & D'Amico, 2000). Our hypothesis was also grounded in numerous findings regarding the context-sensitivity of alcohol expectancies (Reich et al. 2010). Because our hypothesis was constructed using robust findings from past studies, it does not seem likely that the manipulation was completely ineffectual.

Although no differences were found between groups on explicit expectancy measures were found, other findings in the data suggest that the experimental manipulation did have some degree of success. Results from the perceived group-reinforcement scale suggested that participants mostly liked and felt connected to their groups. As discussed in the results section, if a participant were to circle the middle score, 5, for all 12 PGRS items, that participant would have a total PGRS score of 60. The average PGRS score for group condition participants was 78, and over 90% of group condition participants reported a sum PGRS score that was above the neutral sum of 60. These results suggest that the manipulation successfully created an enjoyable social context. Moreover, several significant between conditions differences were detected in frequency of reporting specific words in the EOA task. These free associate differences, though qualitative, strongly suggest some degree of manipulation success.

Some trends in the data suggest the possibility that social context may have created sub-threshold differences between the condition's explicitly assessed expectancies. These findings, although not significant, warrant some discussion. As noted earlier, PGRS scores were used to identify the participants who experienced the social context effects most strongly (labeled as high PGRS participants). High PGRS participants' free associates ratings, when compared to the ratings of single condition participants, hinted at the possibility of between-condition differences in free associates valence and arousal ratings. Nine out of the ten mean ratings (five arousal and four pleasantness ratings) were higher for high PGRS participants (see table 7). These differences suggest that the

manipulation may have had a small effect on the explicitly assessed free associates ratings.

Results Interpretation- Free Associates

Data from explicit expectancy assessment measures did not support the hypothesis, however, data from the implicit portion of the EOA task (the free association task) revealed several noteworthy differences between conditions. The expected effect on EOA responses was an increase in frequency of reporting certain words by group condition participants. The social context was expected to prime participants such that they would be more likely to report expectancies related to social drinking experiences. Group condition participants were therefore expected to report higher rates of social expectancies, intoxication expectancies, and positive/arousing expectancies.

The majority of differences detected between conditions' rates of reporting specific free associates supported our hypothesis. The words that were reported at different rates across conditions seem to fit into several shared themes. High PGRS participants were more likely to report words that described positive/arousing expectancies with a theme of implied assertiveness or prowess: The word "confident" and "brave" category words.

Both high PGRS participants and all group condition participants were more likely to report words that described intoxication as well as words describing effects frequently associated with intoxication: The word "loud" and "buzzed" category words were reported more frequently by both high PGRS

participants and all group condition participants as compared to single condition participants. High PGRS participants were also more likely to report additional words pertaining to the theme of intoxication and related effects: "positive/aroused intoxicated activity" category words, "absence of caution" second-order category words and "positive urgency" second-order category words were reported more frequently by high PGRS participants than by single condition participants. It seems that high PGRS participants were more likely to report words related to thrill-seeking and impulsivity. Although a causal relationship cannot be determined based on the current data, these data do point towards a co-occurrence of group liking and the reporting of words related to impulsive and potentially risky behavior.

Finally, compared to single condition participants, group condition participants were more likely to report the word "talkative" and high PGRS participants were more likely to report "social" category words, supporting our hypothesis that exposure to a social context can increase the availability of social alcohol expectancies.

Other between condition differences discovered in rates of reporting specific associates were not anticipated on the one hand, but on the other hand did not contradict our hypothesis. Both high PGRS participants and all group condition participants reported "relaxed" more frequently than single condition participants, a result that was not expected due to the sedating connotations of the word. Nevertheless, it seems quite possible that some individuals associate

social drinking with relaxation and are therefore more likely to think of this word when primed with a social context.

Another set of unexpected findings were found in the responses of single condition participants, who reported "sick" category words and "unattractive" category words more frequently than all group condition participants, and reported "unwanted consequences" third-order category words more frequently than high PGRS participants. These differences were not anticipated because we only predicted the type of words that would be reported more frequently by group condition participants.

Though unexpected, the finding that single participants were more likely to report negative or undesirable expectancies are complimentary to the findings that were predicted by the hypothesis. The free associates data suggests that in a social situation, alcohol may be perceived as more rewarding (due, in theory, to the greater availability of positive expectancies), while in solitary situation, alcohol may be perceived as less rewarding (possibly due to the greater availability of negative expectancies).

Two of the free associate differences between conditions seemed contradictory to the hypothesis. "Have fun" was reported by single condition participants more frequently than by group condition participants, which contradicted the hypothesis that group condition participants would report higher rates of positive/arousing associates. When occurrence rates of "have fun" and "fun" were combined into one variable, however, the statistically significant

difference diminished entirely, suggesting that the original difference in rates of reporting "have fun" may have been a chance occurrence.

The other free associates finding that seemed to contradict our hypothesis was that the word "stupid" was reported by both group condition participants and high PGRS participants more frequently than by single condition participants. Subsequent examination of valence ratings concurred that "stupid" was valuated as a negative word. It is possible that as part of the effect of priming expectancies related to social drinking, a small number of group condition participants were primed with their past negative social drinking experiences in which they acted in a way that they retrospectively deem "stupid". It remains to be seen whether this effect (or an effect similar to it) will be replicated in future studies. A replication of this finding would call for a revision of the hypothesis that would accommodate the notion that exposure to a social context can prime some negative/sedating expectancies.

When comparing the frequency of occurrence of binary variables (i.e. the presence or absence of a particular word in participants' responses) between conditions in a relatively small sample, there is an increased risk for type I errors (as compared to the risk for type I errors if measures of associative strength were used). This can be observed in the current study, where a word reported as little as four times in one condition was considered to occur at a significantly higher rate if it was not reported at all in the other condition. Caution must therefore be exercised when interpreting significant differences in occurrence rates of any one specific word. The between-condition differences in rates of reporting words were

therefore interpreted holistically, rather than focusing on specific words (except for instances where specific words seemed to contradict the hypothesis). Between condition differences in free associates indicate that participants in the group condition, especially those participants who reported relatively high degrees of liking their groups, were more likely to report words related to social drinking scenarios or to positive/arousing effects of alcohol.

Although significant differences were found in the frequency of reporting specific words between conditions, it is important to note that no differences were found for rates of reporting first associates between conditions. First associates are often considered as more reliable because there is no risk of "chaining", which may occur when an associate is generated in response to prior associates rather than in response to the original prompt (Nelson, McEvoy & Dennis, 2000). Reich and Goldman (2005) used a similar task to the EOA task used in this study and determined that their second through fifth associates were genuine (i.e. associates to the original sentence stem and not to the first associate). Reich and Goldman sampled approximately 5,000 participants, and were therefore able to address this issue using several methods that necessitate a large number of observations. Although these analyses are impractical for use on a smaller sample of 115 participants, the findings reported by Reich and Goldman are taken to suggest that all five free associates reported by participants are meaningful. What is more, the reason for a lack of effect for first associates may only be a matter of statistical power. There were only 115 first associates in the entire sample, but there were approximately five times as many total associates,

making the detection of differences in frequency of occurrence across all words far more possible.

As a whole, the between condition differences detected in frequency of specific free associates strongly suggest that participants in the group condition were more likely to report positive/arousing expectancies, social expectancies and intoxication expectancies, as compared to participants in the single condition. These differences became more pronounced when comparing rates of reporting free associates between high PGRS participants and single condition participants. The high PGRS participants showed more significant differences in rates of reporting specific words, and the statistical strength of these differences was usually larger.

Future Directions

The most promising findings in the study came from the free associates measure. Refining the use of a free associates task as a context-dependant expectancy measure may be a promising avenue for exploration as part of future improvements to the current study's design. Grouping free associates words into categories proved especially useful in identifying differences between conditions, but the process used to create those categories can be greatly improved. The categories used in this study were created intuitively as an initial exploration of this technique's utility. Because these categories have proven useful in detecting the influence of context on expectancies, the logical next step is to create empirically derived word categories. Such categories would have greater

construct validity and should be more accurate in detecting the effect of context on expectancies.

The technique of concept mapping may be best suited for the task of creating free associates word categories. Concept mapping is a technique commonly used for grouping a set of statements/concepts/words into exhaustive and mutually exclusive categories. The process begins with the collection of statements about a specific topic of interest from a relevant population (the free associates collected in this current study can be used to that end). After the words are collected, a new set of participants (selected from the same population of interest) are given index cards with the previously collected words and asked to sort these cards as they see fit (no limitations on number of categories or number of words in each category are given).

The sorting information is subsequently analyzed using multi-dimensional scaling techniques (MDS). The MDS analysis is used to compute the frequency with which items were sorted with one another, then produces "distance" values that describe how conceptually "close" each word is to every other word. This analysis also produces a two dimensional map-like figure that depicts the words in relation to one another, with distances indicating degree of conceptual similarity. The distance values produced by the MDS analysis are subsequently examined using cluster analysis techniques. The cluster analysis takes the map of distances produced by the MDS analysis and uses those variables to assign all words to unique clusters. Those unique clusters can then serve as empirically derived word categories for use in future analyses of free associate data.

This study was designed with the goal of detecting differences between the expectancies of participants in a control condition, to those of participants in an experimental condition. The implicit portion of the EOA task proved most useful to that end, while the explicit expectancy measures used in the study were essentially ineffective. Therefore, implicit measures seem to be better suited for detecting the effects of social context manipulations on alcohol expectancies. Adding supplemental implicit measures to the study's design may increase the overall sensitivity for detecting social context effects. Because it is important that participants complete the measures while in the presence of the rest of the group (i.e. while in the simulated social context) paper and pencil measures seem most appropriate (computer based tasks, especially ones that measure response time, may be difficult to administer simultaneously to several participants in the same room).

The word fragment completion task used as the "problem solving challenge" in this study could serve as an additional implicit measure. In the present study, the word completion task was completed individually by single condition participants but completed collectively by group condition participants. Analysis of the results was therefore problematic because group participants' collaborative completion of the task is not comparable to single individuals' completion of the task. If group condition participants completed the task individually (in the same manner that they complete all other measures), or if a non-social control group condition was included in which participants would also

collaborate on this task, task performance could be compared across conditions without the issue of comparing qualitatively different sets of data.

Memory tests could also be employed as implicit expectancy measures, as they have been successfully used to measure expectancies in the past (e.g. Reich, Noll & Goldman, 2005). When participating in a study such as this one, participants are exposed to numerous alcohol expectancy words (in the explicit expectancy questionnaires). This by-product of assessment could be used as an additional assessment tool. At the end of a study, participants could be asked to recall as many of the alcohol expectancy words as they can. The number and type of alcohol expectancy words recalled could then be compared across conditions. Conducting such a comparison would enable the examination of whether an exposure to a social context led participants to remember more positive/arousing words.

Adding and improving the implicit measures used in this design would increase our ability to capture and characterize the effect of exposure to social context. Developing a more effective manipulation would compliment the changes to the measures by creating a more authentic social context and thereby adding to our ability to examine the functioning of expectancies within this context. Although free associates findings from the EOA task suggest the manipulation was successful to some degree, several changes can be made to potentially increase its effect. The intended effect of the manipulation was to simulate an aspect of a social situation that would share some similarities with the type of situation in which the participants would drink socially. The simplest

way to progress towards successfully creating such an effect would be to attempt and enhance participants' comfort with one another general enjoyment of the situation. To this end, a similarly enjoyable but longer manipulation may be useful.

The manipulation in this study spanned approximately 5 minutes. If a similarly enjoyable manipulation could be created so as to take up 20-30 minutes, the desired social effect may be stronger because participants would have spent a longer period of time experiencing the pleasant situation in the presence of one another. One possible method for creating a more prolonged yet still enjoyable situation could involve showing participants several excerpts from comedic films or television shows and asking them to discuss those clips among each other. Showing participants comedic clips will have the advantage of improving general mood and thereby facilitating group interactions.

Changes to the assessment and manipulation aspects of the study design would increase our ability to create and detect a change in participants' expectancies. It is equally important, however, to increase the degree of certainty with which between condition differences can be attributed to the manipulation. This study did not use a control group condition (i.e. a condition in which a group of participants was in a room together without experiencing the social-interactive aspect of the manipulation). We initially believed that participants in a control group would experience social facilitation would essentially be equal to a social context. This study was intended as a first attempt towards detecting the effect of a social context on individuals' alcohol expectancies. As such, it was initially

important to establish the existence of a difference between a social group condition and a single participant condition. The current study's results suggest that such a difference did occur. Because we theorized that the drinking relevant social situation will be created as a result of combining entertainment and interaction with others, it is now necessary to control for the entertainment element and the interaction with others element separately.

Besides more rigorous control conditions, additional manipulation checks could be added to establish more clearly whether the occurrence of a hypothesized effect was due to the proposed reason. Participants in the experimental condition were given the PGRS as a measure of their liking of their group, but no similar measure was given to participants in the single condition. It is possible that the high PGRS participants were simply group condition participants who experienced a positive affect and that if their responses were compared to the single condition participants who experienced a similar degree of positive affect, the observed expectancy differences would diminish in strength. Administering an affect measure (such as the Positive and Negative Affect Schedule (PANAS); Watson, Clark, & Tellegen, 1988) would help to determine what part, if any, affect played in the manipulation's effect. Another necessary manipulation check is an additional group cohesion scale, such as the Group Identification Scale (GIS; Cameron, 2004) for example. Adding another group cohesion scale would enable us to conduct a more rigorous examination of the effect of the social context manipulation.

Finally, this experiment was designed as between subjects study, but it can easily be turned into a both between and within subjects study. Participants completed the AEQ prior to enrolling in this study and completed the AEMAX in session. Administering the AEQ and the AEMAX prior to study enrollment as well as in session would allow us to examine both the within subjects effects and the between subjects effects. In this manner, some significant differences in explicit expectancy questionnaires may still be found.

Summary and Conclusion

Quantitative analysis of explicit alcohol expectancy data revealed no significant differences between conditions, although there was some indication that subtle, sub-threshold differences may have occurred. Analysis of the more implicit and qualitative free associates revealed significant differences between conditions in rates of reporting specific alcohol expectancy words. Group condition participants, and especially high PGRS group condition participants, reported more positive/arousing words and more words related to social drinking situations, as compared to single condition participants.

These differences suggest that a social context devoid of overt alcohol cues can activate individuals' alcohol expectancies by making the rewarding information about of alcohol use more salient. Caution must be exercised before reaching conclusions based on one study's findings and additional experimentation is required to support these findings. Replicating this study's findings would strengthen the claim that social cues can activate alcohol

expectancies without the presence of overt alcohol cues. In a sense, such findings would mean that in certain circumstances social cues function as alcohol cues. The idea that social cues can function as alcohol cues may serve as part of an explanation of how social drinking occurs— by virtue of simply being in the presence of one's social group (especially if one's social group is comprised of young adult males), an individual may be more likely to drink due to the greater availability of positive alcohol memories.

References

Aas, H., Leigh, B., Anderssen, N. & Jakobsen, R. (1998) Two-year longitudinal study of alcohol expectancies and drinking among Norwegian adolescents. *Addiction*, 93: 373-384

Adolphs, R. (2009). The social brain: Neural basis of social knowledge. *Annual Review of Psychology, 60*, 693-716.

Bond, C. & Titus, L. (1983) Social facilitation: A meta-analysis of 241 studies. *Psychological Bulletin,* 94: 265-292.

Borsari, B. & Carey, K. (2001) Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13: 391-424.

Brown, S., Christiansen, B. & Goldman, M. (1987) The alcohol expectancy questionnaire: An instrument for the assessment of adolescent and adult alcohol expectancies. *Journal of Studies on Alcohol,* 48: 483-491

Cameron, J. E. (2004). A three-factor model of social identity. *Self and Identity*, 3: 239–262.

Carrigan, M., Ham, L., Thomas, S. & Randall, C. (2008) Alcohol outcome expectancies and drinking to cope with social situations. Addictive Behaviors, 33: 1162-1166.

Caudill, B. D., & Marlatt, G. (1975). Modeling influences in social drinking: An experimental analogue. Journal of Consulting and Clinical Psychology, 43(3), 405-415

Chen, C., Dufour, M. & Yi, H. (2004/2005) Alcohol consumption among young adults ages 18-24 in the United States: Results from the 2001-2002 NESARC survey. *Epidemiological Bulletin,* 28: 269-280

Christiansen, B., Smith, G., Roehling, P. & Goldman, M. (1989) Using alcohol expectancies to predict adolescent drinking behavior after one year. *Journal of Consulting and Clinical Psychology*, 57: 93-99

Donovan, J., Molina, B. & Kelly, T. (2009) Alcohol outcome expectancies as socially shared and socialized beliefs. *Psychology of Addictive Behaviors,* 23: 248-259

Fazio, R. & Olson, M. (2003) Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, 54: 297-327

Fishcer, S. & Smith, G. (2008) Binge eating, problem drinking, and pathological gambling: Linking behavior to shared traits and social learning. *Personality and Individual Differences,* 44: 789-800

Fogassi, L., & Ferrari, P. (2007). Mirror Neurons and the Evolution of Embodied Language. *Current Directions in Psychological Science, 16*(3), 136-141.

Fromme, K. & D'Amico, E. (2000) Measuring adolescent alcohol outcome expectancies. *Psychology of Addictive Behaviors,* 14: 206-212.

Gardner, M. & Steinberg, L. (2005) Peer influence on risk-taking, risk preference and risky decision making in adolescence and adulthood: An experimental study. *Developmental Psychology,* 41: 625-635

Gold, J. & Shadlen, M. (2007). The neural basis of decision making. *Annual Review of Neuroscience, 30*, 535-74.

Goldman, M. & Darkes, J. (2004) Alcohol expectancy multi-axial assessment: A memory network-based approach. *Psychological Assessment* 2004, 16: 4-15

Goldman, M.S., Darkes, J., Reich, R.R., & Brandon, K.O. (2006). From DNA to conscious thought: The influence of anticipatory processes on human alcohol consumption, Munafo & Albery (Eds.) Cognition and Addiction, pp.149-186

Guerin, B. & Innes, J. (1984) Explanations of social facilitation: A review. *Psychological Research & Reviews,* 3: 32-52

Hingson, R., Heeren, T., Winter, M., & Wechsler, H. (2005). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18-24: Changes from 1998 to 2001. Annual Review of Public Health, 26259-279

Iacoboni, M. (2009). Imitation, empathy, and mirror neurons. *Annual Review of Psychology, 60*, 653-670.

Julien, R., Advokat, C., & Comaty, J. (2010) A primer of drug action. New York, NY: Worth Publishers

Kirchner, T., Sayette, M., Cohn, J., Moreland, R. & Levine, J. (2006) Effects of alcohol on group formation among male social drinkers. *Journal of Studies on Alcohol*, 67: 785-793.

Kitayama, S & Uskul, A.K. (2011). Culture, Mind, and the Brain: Current Evidence and Future Directions. *Annual Review of Psychology*. 62, 419-49.

Knight, R. & Godfrey, H. (1993) The role of alcohol-related expectancies in prediction of drinking behaviour in a simulated social interaction. *Addiction,* 88: 1111-1118.

Kovács, A., Téglás, E. & Endress, A. (2010). The Social Sense: Susceptibility to Others' Beliefs in Human Infants and Adults. *Science*. 330,(6012) 1830-1834.

Lee, C., Geisner, I., Lewis, M., Larimer, M. & Neighbors, C. (2007) Social motives and the interaction between descriptive and injunctive norms in college student drinking. *Journal of Studies on Alcohol and Drugs,* 68: 714-721.

Leonard, K. E., Collins, R., & Quigley, B. M. (2003). Alcohol consumption and the occurrence and severity of aggression: An event-based analysis of male to male barroom violence. Aggressive Behavior, 29(4)

Magid, V., MacLean, M. & Colder, C. (2007) Differentiating between sensation seeking and impulsivity through their mediated relations with alcohol use problems. *Addictive Behaviors,* 32: 2046-2061

Miller, E., Freedman, D., and Wallis, J. (2003) The prefrontal cortex: categories, concepts and cognition. In: A. Parker, A. Derrington & C. Blakemore (eds.), *The Physiology of Cognitive Processes,* (pp 252-273). USA: Oxford University Press

Mørland, J., Steentoft, A., Simonsen, K., Ojanperä, I., Vuori, E., Magnusdottir, K. et al. (2011). Drugs related to motor vehicle crashes in northern European countries: A study of fatally injured drivers. Accident Analysis and Prevention, 43(6), 1920-1926.

Nelson, D. & McEvoy, C. (2000). What is this thing called frequency? *Memory & Cognition*, 28, 509-522.

Nelson, D., McEvoy, C. & Dennis, S. (2000). What is free association and what does it measure? *Memory & Cognition*, 28, 887-889.

Park, A., Sher, K., Wood, P., & Krull, J. (2009). Dual mechanisms underlying accentuation of risky drinking via fraternity/sorority affiliation: The role of personality, peer norms, and alcohol availability. *Journal of Abnormal Psychology*, 118: 241-255.

Paton-Simpson, G. (2001) Socially obligatory drinking: A sociological analysis of norms governing minimum drinking levels. *Contemporary Drug Problems,* 28: 133-177.

Pedersen, S. L., Treloar, H. R., Burton, C. M., & McCarthy, D. M. (2011). Differences in implicit associations about alcohol between Blacks and Whites following alcohol administration. Journal of Studies on Alcohol and Drugs, 72(2), 270-278

Phua, J. (2011). The influence of peer norms and popularity on smoking and drinking behavior among college fraternity members: A social network analysis. *Social Influence*, 6: 153-168

Read, J., Lau-Barraco, C., Dunn, M. & Borsari, B. (2009) Projected alcohol expectancies in college drinkers. *Alcoholism: Clinical and Experimental Research,* 33: 1265-1277

Reich, R., Kwiatkowski, J., Lombardi, S., Nicklaus, H., Wooten, C., Below, M. & Goldman, M. (2007, June). *Context and Alcohol Expectancies: How Location Changes Free Associates*. Poster session presented at the 30th annual meeting of the Research Society on Alcoholism, Chicago, IL.

Reich, R. Below, M. & Goldman, M. (2010) Explicit and implicit measures of expectancy and related alcohol associations: A meta-analytic comparison. *Psychology of Addictive Behaviors,* 24: 13-25

Reich, R. & Goldman, M. (2005) Exploring the alcohol expectancy network: The utility of free associates. *Psychology of Addictive Behaviors,* 19: 317-325

Reich, R., Noll, J. & Goldman, M. (2005) Cue patterns and alcohol expectancies: How slight differences in stimuli can measurably change cognition. *Experimental and Clinical Psychopharmacology,* 13: 65-71

Robinson, G., Fernald, R., & Clayton, D.F. (2008). Genes and social behavior. *Science, 322(5903)*, 896-900.

Rizzolatti, G. & Craighero, L. (2004). The Mirror-Neuron System. *Annual Review of Neuroscience.* 27. 169-192.

Roehrich, L. & Goldman, M. (1995) Implicit priming of alcohol expectancy memory processes and subsequent drinking behavior. *Experimental and Clinical Psychopharmacology*, 3: 402-410

Rosenbluth, J., Nathan, P. E., & Lawson, D. M. (1978). Environmental influences on drinking by college students in a college pub: Behavioral observation in the natural environment. Addictive Behaviors, 3(2), 117-121

Senchak, M., Leonard, K. & Greene, B. (1998) Alcohol use among college students as a function of their typical social drinking context. *Psychology of Addictive Behaviors,* 12: 62-70

Sher, K., Grekin, E. & Williams, N. (2005) The development of alcohol use disorders. *Annual Review of Clinical Psychology,* 2005: 493-523

Stacy, A. (1997) Memory activation and expectancy as prospective predictors of alcohol and marijuana use. *Journal of Abnormal Psychology*, 106: 61-73

Steinberg, L. (2008) A social neuroscience perspective on adolescent risk-taking. *Developmental Review*, 28: 78-106.

Steinberg, L., Albert, D., Cauffman, E., Banich, M. & Graham, S. (2008) Age differences in sensation-seeking and impulsivity as indexed by behavior and self-report: Evidence for a dual systems model. *Developmental Psychology*, 44: 1764-1778

Stickley, A., Jukkala, T., & Norström, T. (2011). Alcohol and suicide in Russia, 1870-1894 and 1956-2005: Evidence for the continuation of a harmful drinking culture across time?. Journal of Studies on Alcohol and Drugs, 72(2), 341-34

Substance Abuse and Mental Health Services Administration (2010) Results from the 2010 national survey on drug use and health: Summary of national findings. In *Office of Applied Statistics; Substance Abuse and Mental Health Statistics.* Retrieved October 29, 2011 from http://oas.samhsa.gov/NSDUH/2k10NSDUH/2k10Results.htm

Substance Abuse and Mental Health Services Administration (2009) Results from the 2009 national survey on drug use and health: Voume I. Summary of national findings. In *Office of Applied Statistics; Substance Abuse and Mental Health Statistics.* Retrieved October 29, 2011 from http://oas.samhsa.gov/nsduh/2k9nsduh/2k9resultsp.pdf

Thomas, S., Randall C. & Carrigan ,M. (2003) Drinking to cope in socially anxious individuals: A controlled study. *Alcoholism: Clinical and Experimental Research*, 27: 1937-1943

Tilki M. The social contexts of drinking among Irish men in London. Drugs: Education, Prevention & Policy. 13:247-261

Turner, J., Keller, A., & Bauerle, J. (2010). The longitudinal pattern of alcohol-related injury in a college population: Emergency department data compared to self-reported data. The American Journal of Drug and Alcohol Abuse, 36(4), 194-198.

Yang, Y. and Raine, A. (2009) Prefrontal Structural and Functional Brain Imaging findings in Antisocial, Violent, and Psychopathic Individuals: A Meta-Analysis. *Psychiatry Research*, 174: 81-88

Young, R., Knight, R., & Oei, T. (1990). The stability of alcohol-related expectancies in social drinking situations. *Australian Journal of Psychology*, 42: 321-330

Watson, D., Clark, L., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070

Appendix I-Categories

First Order Categories

<u>Agreeable</u>
Able to put up with certain things; accepting; approachable; easier to communicate with; more attached to the world; more involved; open

<u>Angry</u>
Angry; Mad

<u>Behaving Badly</u>
Bad; Callous; do wrong things; obnoxious; vulgar

<u>Brave</u>
Brave; Confident; Daring; Invincible

<u>Buzzed</u>
Buzzed; Tipsy

<u>Calm</u>
Calm; Relaxed; less nervous; loose

<u>Carefree</u>
Carefree; easy going; freer

<u>Clumsy</u>
Clumsy; Sloppy; Uncoordinated

<u>Dehydrated</u>
Dehydrated; Thirsty

<u>Disinhibited</u>
Careless; do things I wouldn't normally do; do things I wouldn't do sober; feel slightly uncontrol; impulsive; less careful; less inhibited; reckless; uninhibited

<u>Emotional</u>
Emotional; Vulnerable; Touchy; Upset

Energized
Able to stay up; alive; aroused; awake; awake feeling; energetic; energized at first; excited; hyper

Positive/aroused Intoxicated Activity
Crazy; Dance; go out; loud; party; rap; ridiculous; wild; outspoken; rowdy

Hungover
Hungover; sick the next morning

Impaired
Confused; Disoriented; Dizzy; Impaired; Incapable; Incoherent; Woozy; Slow; slow down

Indifferent
Care less; uncaring; numb; uninterested

Intoxicated
Drunk; Inebriated; Intoxicated; Smashed

Lacking Thought
Forget; forget me; forget things; not think; not think about problems; not worry about things

Low mood
Depressed; feel guilty; moody; sad; sad about mother

Physically Warm
Heated; Hot; Warm

Positive/Jovial
Feel good; feel great; fun; funny; giddy; giggly; good; goofy; happy; have a good time; have fun; jovial; laugh; playful; silly

Regrettable Actions
Do things you would regret; imprudent; lose control of a situation; make bad decisions; make poor decisions

Unattractive
Dirty; feel gross; sweat; smell not good; ugly

Tired
Drowsy; Sleep; Sleepy; Tired

<u>Sick</u>
Ill; Nauseous; Puke; Sick; throw up; vomit; have chills

<u>Social</u>
Friendly; less shy; nice; outgoing; smile; social; sociable; talk more; talkative

<u>Stupid</u>
Dumb; Idiotic; say dumb things; stupid

Second Order Categories

<u>Absence of Caution</u>
Combination of the categories: Brave; Disinhibited

<u>Decreased Functioning Level</u>
Combination of the categories: Clumsy; Impaired

<u>Pharmaceutical Effects</u>
Combination of the categories: Intoxicated; Buzzed

<u>Positive Urgency</u>
Combination of the categories: Intoxicated activity; Energized

<u>Undesirable Behavior</u>
Combination of the categories: Bad behavior; Angry; Regrettable actions

Third Order Categories

<u>Unwanted Consequences</u>
Combination of the categories: Bad behavior; Angry; Regrettable actions; Clumsy; Impaired; Low mood; Unappealing; Emotional; Ill; Hungover

<u>Wanted Consequences</u>
Combination of the categories: Carefree; Agreeable; Intoxicated activity; Energized; Social; Agreeable; Calm

Appendix II-Measures

Alcohol Expectancy Questionnaire (AEQ)

The following questions were administered online, prior to participation in this study. Participants were given the choice of answering "I Agree", "I Disagree" or "I choose not to answer this question"

1. Some alcohol has a pleasant, cleansing, tingly taste. (AEQ 1)
2. Drinking adds a certain warmth to social occasions. (AEQ 2)
3. When I'm drinking, it is easier to open up and express my feelings. (AEQ 3)
4. Time passes quickly when I'm drinking. (AEQ 4)
5. Drinking makes me feel flushed (AEQ 5)
6. I feel powerful when I drink, as if I can really influence others to do what I want. (AEQ 6)
7. Drinking gives me more confidence in myself. (AEQ 7)
8. Drinking makes me feel good. (AEQ 8)
9. I feel more creative after I've been drinking. (AEQ 9)
10. Having a few drinks is a nice way to celebrate special occasions. (AEQ 10)
11. When I'm drinking I feel freer to be myself and do whatever I want. (AEQ 11)
12. Drinking makes it easier to concentrate on the good feelings I have at the time. (AEQ 12)
13. Alcohol allows me to be more assertive. (AEQ 13)
14. When I feel "high" from drinking, everything seems to feel better. (AEQ 14)
15. I find that conversing with members of the opposite sex is easier for me after I've had a few drinks... (AEQ 15)
16. Drinking is pleasurable because it's enjoyable to join in with people who are enjoying themselves. (AEQ 16)
17. I like the taste of some alcoholic beverages. (AEQ 17)
18. If I'm feeling restricted in any way, a few drinks make me feel better. (AEQ 18)
19. Men are friendlier when they drink. (AEQ 19)
20. After a few drinks, it is easier to pick a fight. (AEQ 20)
21. If I have a couple of drinks, it is easier to express my feelings. (AEQ 21)
22. Alcohol makes me need less attention from others than I usually do. (AEQ 22)
23. After a few drinks, I feel more self-reliant than usual. (AEQ 23)
24. After a few drinks, I don't worry as much about what other people think of me. (AEQ 24)

25. When drinking, I do not consider myself totally accountable or responsible for my behavior. (AEQ 25)
26. Alcohol enables me to have a better time at parties. (AEQ 26)
27. Drinking makes the future seem brighter. (AEQ 27)
28. I often feel sexier after I've had a couple of drinks. (AEQ 28)
29. I drink when I'm feeling mad. (AEQ 29)
30. Drinking alone or with one other person makes me feel calm and serene. (AEQ 30)
31. After a few drinks, I feel brave and more capable of fighting. (AEQ 31)
32. Drinking can make me more satisfied with myself. (AEQ 32)
33. My feelings of isolation and alienation decrease when I drink. (AEQ 33)
34. Alcohol helps me sleep better. (AEQ 34)
35. I'm a better lover after a few drinks. (AEQ 35)
36. Alcohol decreases muscular tension. (AEQ 36)
37. Alcohol makes me worry less. (AEQ 37)
38. A few drinks makes it easier to talk to people. (AEQ 38)
39. After a few drinks I am usually in a better mood. (AEQ 39)
40. Alcohol seems like magic. (AEQ 40)
41. Women can have orgasms more easily if they've been drinking. (AEQ 41)
42. Drinking helps get me out of a depressed mood. (AEQ 42)
43. After I've had a couple of drinks, I feel I'm more of a caring, sharing person. (AEQ 43)
44. Alcohol decreases my feelings of guilt about not working. (AEQ 44)
45. I feel more coordinated after I drink. (AEQ 45)
46. Alcohol makes me more interesting. (AEQ 46)
47. A few drinks makes me feel less shy. (AEQ 47)
48. Alcohol enables me to fall asleep more easily. (AEQ 48)
49. If I'm feeling afraid, alcohol decreases my fears. (AEQ 49)
50. Alcohol can act as an anesthetic, that is, it can deaden pain. (AEQ 50)
51. I enjoy having sex more if I've had some alcohol. (AEQ 51)
52. I am more romantic when I drink. (AEQ 52)
53. I feel more masculine/feminine after a few drinks. (AEQ 53)
54. Alcohol makes me feel better physically. (AEQ 54)
55. Sometimes when I drink alone or with one other person it is easy to feel cozy and romantic. (AEQ 55)
56. I feel like more of a happy-go-lucky person when I drink. (AEQ 56)
57. Drinking makes get togethers more fun. (AEQ 57)
58. Alcohol makes it easier to forget bad feelings. (AEQ 58)
59. After a few drinks, I am more sexually responsive. (AEQ 59)
60. If I'm cold, having a few drinks will give me a sense of warmth. (AEQ 60)
61. It is easier to act on my feelings after I've had a few drinks. (AEQ 61)
62. I can discuss or argue a point more forcefully after I've had a drink or two. (AEQ 62)
63. A drink or two makes the humorous side of me come out. (AEQ 63)
64. Alcohol makes me more outspoken or opinionated. (AEQ 64)
65. Drinking increases female aggressiveness. (AEQ 65)

66. A couple of drinks makes me more aroused or physiologically excited. (AEQ 66)

67. At times, drinking is like permission to forget problems. (AEQ 67)

68. If I am tense or anxious, having a few drinks makes me feel better. (AEQ 68)

Effects of Alcohol Task (EOA)

In the blank items provided below, please write down the words or short phrases you would use to complete the phrase "Alcohol makes me _____." If you do not drink alcohol, please indicate what you think would happen if you did drink. Please write your responses in order, starting with the top blank and working down toward the bottom or last (fifth) blank. Please write whatever first comes to mind. Do not think too long. Respond as quickly as you can, but please write legibly.

    1. _____

    2. _____

    3. _____

    4. _____

    5. _____

Now that you have provided these responses, on a 1-7 scale please rate each response on how pleasant it is and how arousing it is below. For example, a response that you would consider extremely pleasant might be rated a 6 or a 7, while one that was extremely unpleasant might be a 2 or a 1. A high arousal response (alert, active, or wide awake) might be scored 6 or 7, while one that was low arousal (sleep, bored), might be scored 2 or 1. Each number below corresponds to the response you provided above.

	Pleasantness (1-7)	Arousal (1-7)
Response 1.	_____	_____
Response 1.	_____	_____
Response 1.	_____	_____
Response 1.	_____	_____
Response 1.	_____	_____

Shortened Alcohol Expectancy Multi-Axial Assessment Task

This page contains words describing possible effects of alcohol. For each word, imagine it completing the sentence: "**IF I DRANK ALCOHOL NOW IT WOULD MAKE ME _____.**"   Then, for each word **mark the number that indicates how likely you think it is that this effect would happen after drinking several drinks of alcohol**. "Drinking alcohol" refers to drinking any alcoholic beverage such as beer, wine, wine coolers, whiskey, scotch, vodka, gin, or mixed drinks.

There are no right or wrong answers. Answer each item quickly according to your first impression and according to your own personal beliefs about the effects of alcohol. Please mark your answers next to each word.

The available responses/numbers and their meaning are indicated below:

0	1	2	3	4	5	6
Never Always	Very Rarely	Rarely	Occasionally	Frequently	Very Frequently	

"IF I DRANK ALCOHOL NOW IT WOULD MAKE ME _____"

1. Appealing

2. Arrogant

3. Attractive

4. Beautiful

5. Cocky

6. Dangerous

7. Deadly

8. Dizzy

9. Drowsy

10. Egotistical

11. Erotic

12. Hazardous

13. Horny

14. Ill

15. Light-headed

16. Lustful

17. Nauseous

18. Outgoing

19. Sick

20. Sleepy

21. Sociable

22. Social

23. Tired

24. Woozy

Perceived Group Reinforcement Scale

Please indicate the extent to which you agree or disagree with the statements below using the following scale. A rating of "1" indicates that you strongly disagree and a rating of "9" indicates that you strongly agree. For all items, please refer to the group with which you participated in today's study.

Disagree	1	2	3	4	5	6	7	8	9	Agree

1. I liked this group.   1 2 3 4 5 6 7 8 9

2. The members of this group are interested in what I have to say.   1 2 3 4 5 6 7 8 9

3. The members of this group value my ability to contribute.   1 2 3 4 5 6 7 8 9

4. My presence makes a difference to this group.   1 2 3 4 5 6 7 8 9

5. I see myself as an important part of this group.   1 2 3 4 5 6 7 8 9

6. I am satisfied with this group.   1 2 3 4 5 6 7 8 9

7. The members of this group underestimate my ability to contribute.   1 2 3 4 5 6 7 8 9

8. I often disagree with the members of this group.   1 2 3 4 5 6 7 8 9

9. I feel included in this group.   1 2 3 4 5 6 7 8 9

10. In spite of individual differences, a feeling of unity exists in this group.   1 2 3 4 5 6 7 8 9

11. My presence is irrelevant to this group.   1 2 3 4 5 6 7 8 9

12. If an opportunity occurred outside this lab, I would look forward to being part of this group in the future.   1 2 3 4 5 6 7 8 9

Word Fragment Completion Task

Please complete the following set of incomplete words to the best of your ability

BR_ _E   ME_ _

_E_T   _AST

CRA_ _   _ _LLOW

_ _ICK   _ATE

_ _IEF   PI_ _

_ _N_Y   PRO_ _

B_ _ _D   R_D_

HA_ _ _   RA_ _

AMP   SE _

_OR_Y   _OUND

FA_ _   SI_ _

_OOSE   _OP

FI_ _ _   _ _OW

_OU_   WH_ _E

HA_ _   T_ _ED