A BEHAVIOR ANALYSIS OF ALCOHOL CONSUMPTION AND IMPAIRMENT AT UNIVERSITY PARTIES

by

Michael John Kalsher

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APPROVED:

E. Scott Geller, Chairman

R. T. Jones

M. W. Metzler

R. A. Winett

S. J. Zaccaro

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(ABSTRACT)

Four field experiments were conducted to examine situational determinants of alcohol consumption at university fraternity parties. Certain manipulated variables were relevant to the development of environmental strategies for predicting and decreasing excessive alcohol consumption and deterring alcohol-impaired driving. When entering university-sanctioned parties, students were asked a few questions and then they received a drink container and a stick-on badge, each with an ID number. During these parties, individual drinking rates of beer and mixed drinks or beer only were monitored under varying environmental conditions. When exiting the party, students' blood alcohol concentrations (BACs) were obtained with a breathalizer.

In Experiment 1, three types of beer (Budweiser, Bud Light, and LA) were available in kegs labeled "A", "B", and "C"). At a second party the kegs were labeled according to beer content (i.e., Budweiser, Bud Light, and LA). Results showed significant differences in drink choice across parties, with Budweiser most preferred by males and females when kegs did not indicate beer content and Bud Light most preferred by males and females when the kegs were labeled according to brand. The low alcohol (LA) choice was only selected substantially when the kegs did not reflect beer content.

In Experiment 2, students of legal-drinking age at each of two weekend fraternity parties chose one of two types of alcoholic beverages (beer or mixed drinks) to consume throughout the night. Unbeknownst to the partiers, at the first of these two parties the beer drinkers were served regular beer, whereas at the second party low alcohol beer was served. Drinking rates were similar for beer and mixed-drink consumption at both parties; at the party with LA beer, students' mean BAC when leaving the party was significantly lower for the beer drinkers (i.e., .026 for LA consumers vs. .063 for mixed-drink consumers).

For Experiment 3, students of legal drinking age at a weekend fraternity party chose one of two types of alcoholic beverages (beer or mixed drinks) to drink throughout the night. Unbeknownst to the partiers, drinkers were randomly assigned to either a regular alcohol content or low alcohol content version of their preferred beverage type. The drinking rates were greater for beer drinkers than for partiers consuming mixed drinks. Drinking rates were similar for both the low and regular alcohol alternatives. However, exit BAC was significantly greater for those in the regular-alcohol conditions.

In Experiment 4, the alcoholic beverages available to students of legal-drinking age at one party (i.e., mixed drinks and beer) were served either by bartenders or served by themselves. A test of the theory of reasoned action was conducted by attempting to predict number of drinks consumed and exit BAC from measures of general and specific intentions obtained two weeks before the party and at the start of the party. Specific drinking intentions obtained at the start of the party predicted a significant amount of variance in exit BAC ($R = .59$). The manipulation of situational variables also accounted for a portion of the variance in the number of drinks consumed

and exit BAC. One environmental determinant at this party was the nature of drink delivery (i.e., self-serve vs. bartender). Male and female beer drinkers assigned to the Self-Serve condition drank at a higher rate and consumed more of their preferred beverage type than did those drinkers served by a bartender, or by those consuming mixed drinks in the self-serve condition. This increase was highest for male partiers. Male and female mixed drink consumers assigned to the Self-Serve condition drank at the lowest rate and consumed the least amount of their preferred beverage type.

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The Problem and Attempts Toward Solution

Alcohol-related automobile tragedies represent the single greatest killer of young Americans aged 16 to 24 (Fell, 1984). Drivers in this category comprise only 20% of all licensed drivers, but these youth are involved in 42% of the vehicle accidents involving fatalities and alcohol. In addition, for all levels of crash severity, young drivers are considerably more likely to have been drinking than older drivers (Borkenstein et al., 1964; Farris, Malone, & Lilliefors, 1976; Filkins et al., 1970; Waller et al., 1970). In fact, for 18 and 19 year olds, the relative probability of a crash is four to nine times higher after any alcohol consumption than for other age groups. As reviewed by Douglass (1982) and Zylman (1973), the factors contributing to the over-involvement of youth in alcohol-related accidents are their relative inexperience with drinking, driving, and drinking-driving, as well as detrimental peer influence and negative reactions to parental guidance.

Traditional approaches to solving the problem of driving while under the infuence (DUI) have focused on either apprehending drunks while behind the wheel or obtaining legal convictions after an alcohol-related accident. Funds allocated to implement state police

alcohol checkpoints, jail and prison sentences, and court ordered participation in community service have greatly increased, yet fatalities and permanent disabilities related to drink driving continue unabated and await a more tenable solution (e.g., see reviews by Geller & Lehman, 1988, and Russ & Geller, 1985).

The opponents of traditional drink-driving countermeasures advocate primary prevention approaches focusing on environmental characteristics and other determinants that occur before the alcohol-impaired driver gets behind the wheel. The potential of some well designed research employing this approach has been attenuated to a great extent by the use of indirect assessment techniques that rely on self-report. Direct measurement of drinking behaviors and impairment conditions was the focus in the present series of four studies, conducted at six naturalistic parties.

Naturalistic Observations of Alcohol Consumption

Drinking at Bars

Sommer (1969) identified several factors likely to attract a patron to a bar and influence subsequent drinking behavior, including bar location, room decor, and drink prices. The availability of recreational and entertainment activities such as watching sports on a

large television screen, dancing, and live band music may also influence the risk of DUI in particular ways. Unfortunately, systematic observational studies of relationships between alcohol consumption, BAC, and various situational factors in naturalistic settings are few in number and urgently needed. Actually, the findings from field observations may not be so straightforward as some have presumed from intuition (e.g., Schaefer, 1983). For example, although bar entertainment prolongs the time spent in a bar and thus increases the amount of alcohol consumed (Clark, 1981; Schaefer, 1983), certain activities (e.g., dancing) may detract from excessive drinking and increase "sobering up" time.

Results from an investigation of 185 bars in Vancouver (Graham 1984) indicated that intoxication and aggression were related to larger seating capacity, rows of tables, no decor theme, and lower standards of furnishings and upkeep. Graham suggested that the decor and upkeep in a bar may convey a message to patrons about the kinds of behaviors expected. Other activities and general atmosphere characteristics that Graham identified as significant determinants of intoxication included the type of entertainment, availability of food, ventilation, noise, and crowding.

Happy hour. The "happy hour" typically refers to a period of time after the workday has ended and before the evening meal. This time of day is "off-peak" hours for most drinking establishments. To attract a greater volume of business, some entrepreneurs provide a happy hour as a context for socializing and an opportunity to consume alcohol at bargain prices. It is noteworthy that at the time of this writing, 16 states prohibit happy hours or other forms of sales promotion, and 22 additional states have such legislation pending (Waller, 1986).

The effect of reduced drink prices on individual drinking patterns was explored by monitoring the same persons as they drank in experimental and natural settings (Babor, Mendelson, Uhly, & Souza, 1980). In both settings, reduced prices (during happy hour) significantly increased the frequency of drinking episodes and the amount of alcohol consumed among casual and heavy drinkers. In a controlled setting (i.e., the clinical research ward at the Alcohol and Drug Abuse Research Center, Harvard Medical School), Babor, Mendelson, Greenberg, and Kuehnle (1978) found that during periods of reduced drink prices, male volunteers, categorized as casual or heavy drinkers, significantly increased (by eight times) their alcohol consumption compared to a

control group without a happy hour. Furthermore, the increased alcohol drinking during the happy hour was not a substitute for consumption at other times of the day. Babor et al. concluded that the patterns of drinking influenced by the happy hour (gulping drinks, massing of successive drinks, and consumption of straight drinks) are likely to be learned and repeated. The same function of lower beverage cost and increased consumption was found in the general population (Schmidt & Popham, 1978).

Size of drinking group. Sommer (1965) was among the first to recognize the importance of conducting systematic field research to investigate drinking patterns. He observed isolated male drinkers sitting alone in 32 Edmonton beer parlors, and contrasted their drinking behavior with that of drinkers in groups. He found that isolated drinkers ordered an average of 1.69 drinks, whereas individual drinkers in groups ordered 3.51 drinks. When the amount of time spent in the barroom was taken into account, however, the data suggested that the reason persons in groups drank more than isolated drinkers was not because they drank faster, but because they remained in the barroom longer. Sommer also found that isolated drinkers tended to be older (average age 42) than group drinkers (average age 36).

These seminal findings of Sommer were replicated 20 years later by the naturalistic observation of college-aged drinkers (Geller, Russ, & Altomari, 1986). Of the 243 college students (mean age about 19) observed drinking beer, only 19% drank alone whereas 48% drank in pairs, 16% drank in triads, and 17% drank in groups of four or more. Students drinking in groups drank significantly more beer per individual than those drinking alone (mean of 31 oz for students drinking with at least one other person compared to 19 oz for those drinking alone), but those drinking alone spent significantly less time in the bar (approximately 39 min for the 45 students drinking alone, 57 min for the 116 students in dyads, 55 min for the 40 students in triads, and 68 min for the 42 students observed drinking in groups of four or more). Thus, the rate of beer consumption was nearly identical for those drinking alone (.49 oz per min) and individuals drinking with others (.48 oz per min).

Rosenbluth, Nathan, and Lawson (1978) also observed that male and female college students drank more beer in groups than in dyads. An intriguing finding from these field observations that requires follow-up research, was that same-gender dyads showed less rapid beer consumption than mixed-gender dyads.

Foy and Simon (1978) employed a within-subject, laboratory study to demonstrate that the size of a drinking group did not influence the alcohol consumption of chronic alcoholics. It may be that drinkers with an extended history of excessive alcohol consumption have established drinking patterns that are relatively impervious to certain social factors. In other words, an interaction between personal and environmental factors is suggested such that the drinking behavior of alcoholics is less determined (or controlled) by situational factors than is the alcohol consumption of non-alcoholics.

Glasses versus pitchers. Geller et al. (1986) offered convincing evidence from naturalistic field observations that the sale of beer in pitchers may contribute to excessive alcohol consumption and subsequent risk for DUI. These investigators obtained systematic, reliable, and unobtrusive observations of drinking behavior at six bars that sold large quantities of beer to college students in 40 oz pitchers, 10 oz plastic cups, and 12 oz bottles. Of the 243 drinkers observed during their entire stay in a bar, 77% were male and 68% ordered their beer by the pitcher. By far, the most beer was consumed per person when it was ordered by the pitcher (i.e., mean per capita beer consumption was 10.0 oz from

cups, 15.1 oz from bottles, and 35.2 oz from pitchers). But rate of drinking did not vary significantly as a function of drink container, because those who ordered their beer by the pitcher stayed in the bar significantly longer (mean of 66 min) than those ordering beer by the bottle (mean of 34 min) or by the glass/cup (mean of 23 min).

The server. An especially critical aspect of the drinker's social environment is the server of alcoholic beverages. In response to "Dram Shop" laws which permit holding tavern owners liable if they serve alcohol to an intoxicated patron who later causes an accident while DUI, servers of alcoholic beverages are receiving special training aimed at preventing their customers from DUI (Mosher, 1979; 1983; Peters, 1986). Most intervention training programs teach servers to identify the specific warning signs that indicate when a customer may overindulge. Then servers learn to use a variety of tactics, including delaying alcoholic drink service, offering food, serving non-alcoholic beverages, and suggesting that the patron not drive. Some programs include the use of video vignettes and role-playing to help servers evaluate customers' behavior and to practice intervention skills.

There are a number of server intervention programs available, for example: 1) TIPS: Training for Intervention Procedures by Servers of Alcohol (6 hrs) developed by Morris Chafetz (1984), a member of the Presidential Commission on Drunk Driving, and used nationwide by major corporations such as Anheuser-Busch, Heublein, Miller Brewers, Mobil, Ogden Foods, and Ramada Inn; 2) TAM: Techniques in Alcohol Management (6-8 hrs) funded by the Michigan Licensed Beverage Association and sponsored by the Stroh Brewing Company (Christy, 1986); 3) LAST CALL: Learning Alcohol Service Techniques for Control Against Liquor Liability (6-8 hrs) which also offers advice regarding the modification of policy and environmental factors to reduce the probability of DUI (Christy, 1986); 4) HEART: Help End Alcohol-Related Tragedies, implemented by the South Carolina Commission on Alcohol and Drug Abuse for both alcohol servers (2 hrs) and bar managers (10 hrs); 5) a Management/Server Alcohol Awareness Program (3.5 hrs) sponsored by the National Restaurant Association for preparing managers to train their service personnel (Alcohol Health and Research World, 1986); 6) the Professional Beverage Server: Alcohol Server Awareness Curriculum (12 hrs) distributed out of the Wisconsin Office for Highway Safety; 7) a

California Office of Traffic Safety (OTS) program implemented in more than 80 licensed establishments (Bonney, 1986); and 8) a six-hr training program available from the National Highway Traffic Safety Administration (Vegega, 1986).

There have been only two systematic evaluations of the server intervention concept (Russ & Geller, 1987; Saltz, 1986; 1987). The Saltz evaluation compared DUI probability at two U.S. Navy enlisted clubs, one whose staff (i.e., waitresses, bartenders, food servers, security staff, and night managers) received an 18-hr, comprehensive server intervention program that included policy changes and situational modifications. Policy/environmental changes included, for example, having food available during all hours, assigning waitresses to specific stations, providing transportation for intoxicated patrons, and refusing or delaying the delivery of alcoholic beverages to customers at risk for DUI.

The Saltz evaluation concluded that server intervention was effective (Saltz, 1986), and made "a scientifically significant difference in alcohol-related problems stemming from alcohol sales and service" (Christy, 1986, p.16). It should be noted, however, that the dependent measures used in this evaluation did not

include a direct measure of server intervention nor of alcohol impairment. Specifically, the conclusions were based on interviews with customers who were asked their beverage consumption, height, weight, and gender from which BACs were estimated. Not only is it risky to rely on self-report data to assess behavior change, but the fact that many patrons were alcohol-impaired adds another reason for caution in drawing conclusions from this evaluation. Indeed, Russ, Harwood and Geller (1986) found substantial underestimation of beer consumption among partiers, especially among those with BACs greater than .05.

The server intervention evaluation by Russ and Geller (1987) obtained direct measures of servers' intervention behaviors and patrons' BAC levels both before and after 50% of the servers at two bars were trained in the TIPS program. Research assistants, who were unaware of which 17 servers had received the training, posed as regular patrons ("pseudopatrons") and set the occasion for server intervention to occur by drinking three alcoholic beverages per hr for two consecutive hrs. Using a hidden microphone, a partner taped all interactions between the server and pseudopatron, and at the end of the session measured the pseudopatron's BAC. Although the servers

were told during training about the use of pseudopatrons and agreed to the evaluation, servers were unable to distinguish the pseudopatrons from regular patrons when the visits actually occurred.

The comparison of data from pseudopatrons served by trained versus untrained bar personnel revealed substantial impact of the TIPS program, at least over the short term. Specifically, the trained servers initiated significantly more interventions to reduce the probability of DUI than did untrained personnel, and the pseudopatrons served by trained personnel exhibited fewer signs of intoxication and had significantly lower BAC levels than the pseudopatrons served by untrained servers.

The fact that the servers in this study were apparently able to identify correctly some intoxication cue(s) of the pseudopatrons is inconsistent with the results from Langenbucher & Nathan (1983). These investigators showed that bartenders, police officers, and social drinkers were able to identify target individuals' (with BACs of .00, .05, or .10%) level of intoxication only 25% of the time. In contrast, Teplin and Lutz (1985) showed that observers in a hospital emergency room could reliably apply an Alcohol Symptom Checklist to estimate levels of intoxication accurately. These contradictory

findings reveal the need for further research to determine which intoxication cue(s) servers can identify accurately in a bar setting. It may be that the cue used most often to prompt server intervention in the naturalistic setting was one that the "judges" in the Langenbucher and Nathan study did not have -- the frequency and timing of personally serving the alcoholic beverages.

Drinking at Parties

The party or social gathering of friends and acquaintances is an ideal setting in many respects for introducing techniques that reflect socially responsible drinking and contribute to reducing the risk of DUI. For example, such events could provide opportunities to serve low-alcohol or non-alcoholic beverages, or to administer field sobriety tests, or to make BAC feedback meters available. It is more likely that among friends, beneficial interactive discussions can evolve naturally to provide the rationale and support for appropriate server intervention, and thereby increase the probability that other partiers will practice DUI-prevention strategies. Indeed, such discussions among friends may result in practical refinements of techniques for controlling drinking and driving.

To date, most of the field observations of drinking behaviors has occurred in bars or tavern settings, although about as much alcohol consumption occurs at home and at parties or social gatherings (O'Donnell, 1985). In fact, the only systematic party observations related to the theme of this dissertation were taken by Geller and his students (Geller, Russ, & Altomari, 1986; Russ & Geller, 1988; Russ, Harwood, & Geller, 1986). For these studies, students entering fraternity parties answered a few demographic questions, signed a consent form, and then received an ID badge to wear throughout the evening. Observers at the bar recorded the ID number and time when each student obtained a beer from the available beer kegs. Before leaving the party, students answered a few questions, gave subjective evaluations of their perceived impairment, and took a breathalizer test of blood alcohol concentration (BAC).

Procedural difficulties made records of ongoing drinking rates unreliable, but intriguing findings were obtained. For example, the students were remarkably accurate when estimating their degree of alcohol impairment. When they erred, it was typically on the conservative side, believing they were more impaired than they really were (Russ, Harwood, & Geller, 1986).

Particularly noteworthy was the finding that intervals between party arrival and first drink, and between party departure and last drink varied inversely with a partier's BAC at the end of the party (Geller et al., 1986). In other words, those partiers (12 females and 8 males) who became legally drunk (i.e., BAC $\geq$ .10) were quickest to start drinking upon entering the party and gave the shortest "sobering up" times (i.e., had the shortest delays between drinking their last beer and departing from the party). This latter finding suggests that patterns of inter-drink intervals may be useful as warning cues for potential DUI risk. This notion requires follow-up investigation.

The field experiment by Russ and Geller (1988) studied students' preferences for three types of beer in a party setting. Upon entering a fraternity party, students were given a blind taste test whereby they successively tasted 2-oz samples of different beer types (i.e., Budweiser, Bud Light, and LA), and then were asked which sample they preferred to drink at the party. During the party, the three available beer kegs were labeled according to their contents (Budweiser, Bud Light, and LA), and students served themselves with standard 10 oz

cups on which the last four digits of their ID number was printed.

Although the taste test showed no significant taste preferences among the three types of beer, the students' keg selections reflected a strong bias. Budweiser was chosen slightly more often than Bud Light, but LA beer was hardly ever selected until the end of the party when the Budweiser and Bud Light kegs were emptied.

The primary aim of the experiments that follow was to improve the methodology of the few previous field studies of party drinking in order to study relationships between specific environmental manipulations and drinking behavior (i.e., beverage choice, rate of drinking, and BAC).

EXPERIMENT 1: THE STIMULUS CONTROL OF BEER LABELS

This field experiment was designed to correct for the procedural flaws in prior research conducted by Russ & Geller (1988). More specifically, Russ and Geller observed beverage selection at a single party with beer kegs labeled according to brand; and by tracking keg choice over time, they identified changes in keg selection as the beer supply ran out (i.e., first for Budweiser and then for Bud Light). Experiment 1 of this report varied the keg labels at two parties (i.e., no brand labels vs. brand labels) and tracked keg choice and drinking rates throughout the parties, with all three beer types (i.e., Budweiser, Bud Light, and LA) continually available. Gender effects were not studied by Russ and Geller, but were assessed in this experiment.

The high rates of beer consumption by college students (e.g., Geller, Altomari, Russ, & Harwood, 1985; Geller et al., 1986) suggests that many college students "drink to get drunk", and therefore we expected LA beer (with 3% alcohol by volume) to be the most unpopular beer when the kegs were labeled according to brand. To account for taste preference as a determinant of beer choice, a blind taste test of Budweiser, Bud Light, and LA Beer was conducted when students entered the party. With beer kegs

unlabeled according to brand, it was expected that keg choice should parallel the results of the pre-party taste test. At the party with brand-labeled kegs, however, partiers' keg selections may be more influenced by marketing strategies to promote particular brands. For example, given the marketing of Bud Light as a low caloric beverage for "weight watchers", co-eds may demonstrate the greatest preference for the Bud Light keg.

Method

Subjects and Setting

Data were obtained at two weekend fraternity parties at Virginia Tech, a large university (approximately 22,000 students) in southwest Virginia. The parties were separated by eight weeks during adjacent academic quarters, and were regularly scheduled functions of one particular fraternal organization. A total of 163 subjects (89 males and 74 females) attended the first party (Unlabeled Condition), and 375 subjects (152 males and 223 females) attended the second party (Labeled Condition). The fraternity house contained a large, smoke-free room that was used to conduct entrance/exit interviews and obtain measures of BAC (blood alcohol concentration) and an adjacent large "party room" containing a refrigerated cooling unit that housed kegs for the three beer types. Each keg had a separate "tap", serviced by a member of the fraternity social committee. This prevented uneven line-ups behind the kegs that could influence beer choice.

The "party room" was approximately 35 ft x 23 ft in size and was adjoined to an adjacent "two-tiered" outdoor wooden balcony (i.e., approximately 45 ft x 15 ft and 35 x 23 ft in size, respectively). The balcony area was lined

around its perimeter with a wooden bench for seating. Throughout the evening, partiers' danced in the "party room" to loud rock music played by a professional disk jockey who was hired by the fraternity. Given the presence of 163 and 375 partiers, respectively at each of the two parties, each partier had approximately 14.0 and 6.1 sq ft of "party space" at the two parties.

The fraternity house was located approximately four miles from campus and all subjects drove or received rides both to and from the party.

Procedure

Party entrance. Upon arrival at the party, subjects were asked to read and sign an informed consent form, which included an offer of free transportation home should the participant become "impaired" or "legally intoxicated" while at the party. Then research assistants asked the subjects their age, weight, and last four digits of their student ID number. The ID numbers were used solely for the purpose of tracking beverage choice and drinking rate, and not to identify individuals. Although no formal measure was taken of repeat partiers (i.e., those individuals who attended both parties), many of the fraternity members and their guests attended both parties. After this brief entrance interview, the

research assistants noted the time (to the nearest min) on the interview sheet and obtained each subject's BAC with an Alco-sensor III meter (Intoximeters Inc., St. Louis). Data obtained from subjects entering either party with a positive BAC reading were eliminated from subsequent analyses.

After BAC measurement, subjects were asked to participate in a blind taste test among the three types of beer available at the party (i.e., Budweiser, Bud Light, and low alcohol beer, termed LA). Two-ounce samples of each beer type, labeled as "X", "Y", or "Z", were given to each subject. The order of presentation of the samples was counterbalanced. Subjects were asked to rank order the three beer types according to taste preference, from most to least preferred, and then to indicate which they preferred to drink at the party. Following the taste test, subjects received a 9-oz plastic cup that had affixed to it a label containing the last four digits of their ID number and a corresponding label that they wore on their shirt or blouse throughout the party. The subjects were then allowed unlimited access to the three beer types for the remainder of the party.

Party process. The first party was an "Unlabeled" condition, whereby the keg taps for each beer were clearly

labeled as "A" (for Bud Light), "B" (for LA), or "C" (for Budweiser). The beer brands assigned to the kegs were randomly determined before the party and were known only by the author and one fraternity person responsible for changing the kegs. At the second party (referred to as a "Labeled" condition), the keg taps for each beer type were clearly marked by brand name: "Bud", "Bud Light", or "LA".

Throughout both parties, four research assistants stood behind the bar with clipboards and recorded for each subject: a) their four digit ID number, b) the beer type each subject requested from the bartenders, and c) the time (to the nearest min). Three of the four observers were primary observers for one of the three beer types while the fourth observer served as a reliability observer. In order to insure accuracy for the time category, a large luminescent digital clock was placed so that the four observers could clearly see it.

Party exit. Upon departure, each partier was asked to participate in a brief exit interview. During this interview, research assistants recorded the badge number of each subject and took measures of BAC. Those subjects whose BAC levels exceeded .05 (50 milligrams of alcohol per 100 ml of blood) were reminded that free

transportation was available. For those partiers who were legally drunk (i.e., BAC $\geq$ .10), the researchers demanded assurance that the individual would not drive a vehicle.

Results

Interobserver Reliability

The consecutive subject observations by the two independent observers were matched according to the drinkers' ID numbers. Matched ID numbers were found for 2,201 (97.6%) of the 2,256 cups of beer consumed at the two parties. The percentage of agreement for recording the beer keg and the time (within one min) for each pair of observations was calculated by totaling the agreements for a given data category (i.e., keg or time observation), dividing this sum by the number of agreements plus disagreements, and then multiplying this result by 100%. The agreement percentages were 99.7% for keg (or beer) choice and 98.5% for time of observation (within one min).

Pre-Party Taste Preference

A total of 156 subjects (96.9%) took part in the taste test at the Unlabeled party, and 164 subjects (44.0%) at the Labeled party took part in the taste test. At the second party (Labeled condition), the taste tests were discontinued after the number of students who took part in the taste tests approximated the number of taste tests obtained at the first party (Unlabeled condition). These data are summarized in Figure 1 on the following page.

As shown in Figure 1 on the following page, the taste preferences of subjects across parties were relatively consistent, with 42.3% (n=66) of subjects at the Unlabeled party and 41.0% (n=67) at the Labeled party picking Budweiser as the beer they most preferred. Bud Light was the second most preferred beer among subjects at both parties, with 35.1% (n=55) at the Unlabeled party and 35.6% (n=59) at the Labeled party selecting this beer as most preferred. Low-Alcohol (LA) beer was the least preferred beer at both parties, with 22.6% (n=35) of Unlabeled partiers preferring LA beer and 23.4% (n=38) of Labeled party subjects preferring LA beer. The Chi Square test of dependency between beer brand and preference was significant for both parties; for the Unlabeled party, $X^2(2)=14.2$, $p<.05$, and for the Labeled party, $X^2(2)=12.3$, $p<.05$. Six subjects at the Unlabeled party and four subjects at the Labeled party stated that they had no beer preference after tasting all three beers.

Beer Consumption

A total of 161 subjects (98.7% of the partiers) consumed beer at the Unlabeled party and 373 subjects (99.5% of the partiers) consumed beer at the Labeled party. Male subjects constituted 54.7% (n=88) of drinking partiers at the Unlabeled party; whereas at the Labeled

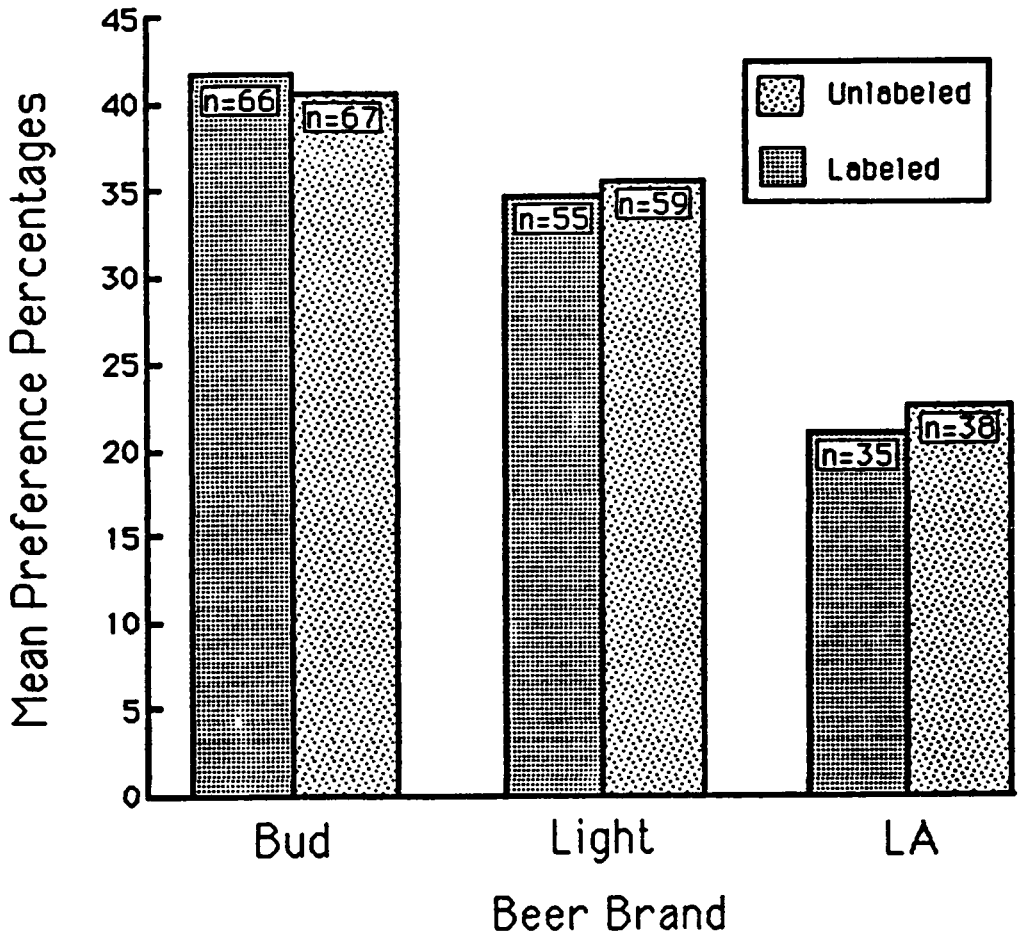

Figure 1. Percentage of subjects choosing Bud, Bud Light, and LA beer as most preferred in a blind taste test that preceded the fraternity parties with "Unlabeled" or "Labeled" beer kegs.

party, 40.8% (n=152) of the beer drinkers were males. The partiers consumed 878 cups of beer at the Unlabeled party and 1,378 cups of beer at the Labeled party.

Figures 2 and 3 on the following pages depict cumulative beer consumption per 15-min intervals for males and females at the Unlabeled and Labeled beer parties, respectively. Substantially more 9-oz cups of beer were consumed at the Labeled party (i.e., 1,360 cups) than at the Unlabeled party (i.e., 878 cups) primarily because a greater number of subjects were present at the Labeled party as compared to the Unlabeled party. In terms of per capita consumption, a 2 Party (Unlabeled vs. Labeled) x 2 Gender analysis of variance (ANOVA) indicated that beer consumption per individual was significantly higher at the smaller Unlabeled party, $F(1,530)=31.8$, $p<.0001$, with Unlabeled partiers consuming an average of 5.5 9-oz cups of beer each, as compared to 3.6 9-oz cups of beer for partiers at the Labeled party. Across both parties, males drank significantly more beer than females, $F(1,530)=38.4$, $p<.0001$, with males consuming an average of 5.5 cups versus 3.1 cups of beer for females. The interaction term was not significant ($p > .10$).

Figure 2 indicates that the pre-party taste preferences of subjects present at the Unlabeled party was

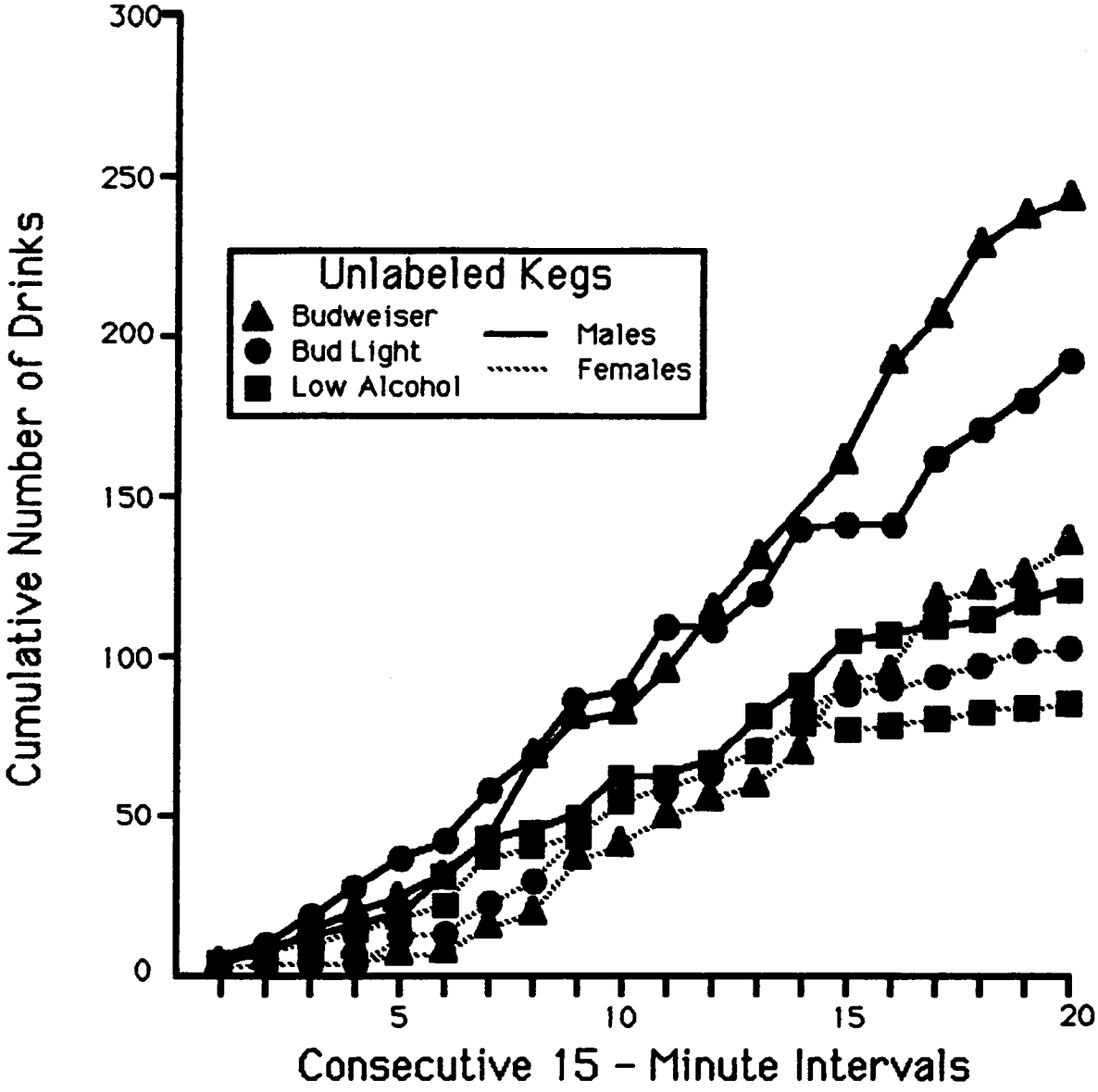

Figure 2. Cumulative number of cups of Budweiser, Bud Light, and LA beer consumed per 15 minute intervals by male and female students at the first fraternity party with the three beer kegs labeled as "A", "B", and "C".

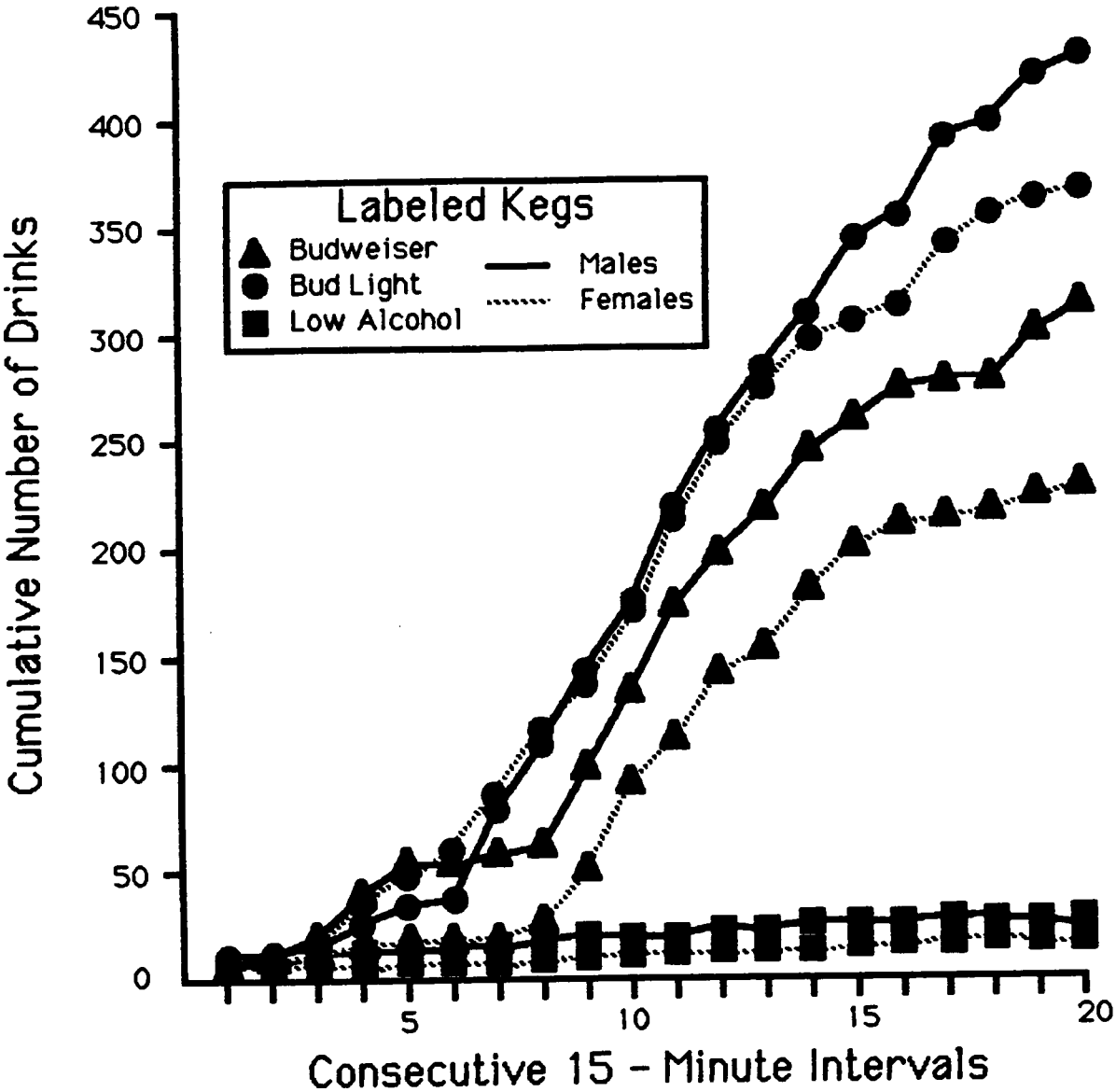

Figure 3. Cumulative number of cups of Budweiser, Bud Light, and LA beer consumed per 15 minute interval by male and female students at the second fraternity party with the three kegs labeled according to beer brand.

reflected in the observed drinking rates. Specifically, Budweiser was the beer of choice for both males and females, constituting 43.2% of all beer consumed by males and 40.5% of all beer consumed by co-eds. Bud Light was the second most frequently consumed beer at the Unlabeled party, constituting 34.5% of all beer selected by men and 32.1% of all beer selected by women. Low Alcohol (LA) beer was the least popular of beers served at the Unlabeled party constituting 22.3% of the beer consumed by males and 27.4% of the beer consumed by females.

Drinking at the Labeled party did not reflect pre-party taste preferences. As shown in Figure 3, Bud Light was the favorite among both male and female drinkers, constituting 58.6% of all beer consumed at the Labeled party. Male drinkers requested Bud Light 56.3% of the time, and female drinkers requested Bud Light for 61.5% of their selections.

Budweiser was selected 39.5% of the time at the Labeled party, 41.4% of the beer selections by males and 37.0% of the beer choices by females. The LA alternative was very unpopular at the Labeled party, constituting only 1.9% of all beer consumed. Males requested LA Beer only 2.2% of the time and females requested LA for only 1.5% of their drink selections.

Beer Brand Switching

Switching from one beer to another was more prevalent at the party where beer kegs were not labeled according to brand. Specifically, at the Unlabeled party, 33.3% of the 138 drinkers who drank more than one beer switched beers three or more times during the course of the party, whereas at the Labeled party only 21.7% of the 303 drinkers who drank more than one beer switched brands three or more times. At the Unlabeled party, 22.5% of the drinkers who drank more than one beer selected only one brand of beer; whereas at the Labeled party, 45.6% of those drinkers who drank more than one beer consumed the same brand of beer through the course of the party.

Of 97 drinkers who did not switch brands at the Labeled party, 73.2% drank Bud Light, 25.8% drank Bud, and only one drinker (1.0%) drank LA Beer throughout the party. Of the 31 drinkers who did not change beer brands at the Unlabeled party, LA beer was the most preferred beer, with 45.2% drinking only LA beer, 29.0% selecting only Budweiser, and 25.8% sticking with Bud Light. A Chi Square analysis indicated that drinkers at the Labeled party were significantly less likely to switch beer brands than drinkers at the Unlabeled party, $X^2(1, n=441)=5.89$, $p<.05$.

Blood Alcohol Concentration

A comparison of partiers' BAC readings obtained during the post-party interviews indicated comparable levels of intoxication among subjects at the two parties. Specifically, male drinkers at the Unlabeled party had average BACs of .063 (n=88), whereas the average BAC level of male drinkers at the Labeled party was .072 (n=152). The BACs of female drinkers averaged .075 (n=73) at the Unlabeled party, and .067 (n=221) at the Labeled party. A 2 Condition (Unlabeled vs. Labeled) x 2 Gender ANOVA revealed no significant effects.

Discussion

The results demonstrated dramatic stimulus control of beer-keg labels at university-sanctioned fraternity parties. Only when the beer kegs were unlabeled (according to brand) did the partiers' beer drinking match the results of a pre-party taste test. When the beer kegs were labeled according to the three types of beer available, drink selections did not parallel the pre-party preference for Budweiser (over Bud Light and LA), but suggested a strong influence of marketing strategies and perhaps a desire to get drunk. More specifically, at the party with brand-labeled kegs, LA beer was rarely selected (perhaps because of its low alcohol content), and Bud Light was selected more often than Budweiser by both males and females (presumably because of a strong advertising campaign for light beer -- it's even the choice for the macho male athlete).

Allison and Uhl (1964) also found a strong influence of brand label on subjects' beer preference. These researchers gave their subjects (experienced beer drinkers) a six-pack of various types of beer to take home, and asked them to rate each beer according to taste on a 10-point "excellent" to "very poor" scale. The bottles contained either the beer's brand label, or all

brand identification marks were removed and the bottles were labeled "A", "B", "C", etc. Only when the brand labels were used did the subjects rate "their" beer brand as tasting best.

The low popularity of LA beer at the "Labeled" party may suggest a social stigma attached to ordering a low alcohol drink or a desire to choose the brands that will get a person drunk faster. However, part of this drink selection bias was also due to taste preference, since both pre-party taste tests indicated lowest preference for LA beer, and at the "Unlabeled" party the LA beer keg was used least often. However, several individuals (i.e., about 23%) did select LA beer as most preferred during the beer-party taste tests, and LA beer was selected much more often at the "Unlabeled" than the "Labeled" party. This indicates a strong influence of factors other than taste in the frequent decision to avoid LA beer. Future research should attempt to identify more precisely the factors affecting low popularity of LA beer.

Further research is also needed to define the variables contributing to the preference of Bud Light over Budweiser at the party with kegs labeled according to brand. It would be interesting, for example, to determine whether lower calories were the prime reason for the

popularity of Bud Light among both men and women. Would such popularity remain if the beer kegs were labeled according to their alcohol content as well as brand name (i.e., 7% alcohol by volume for Budweiser, 5% alcohol by volume for Bud Light, and 3% alcohol by volume for LA beer)? Perhaps many partiers did not realize that Bud Light contained significantly less alcohol than Budweiser. This fact is certainly not mentioned in the "macho-based" advertisement of light beers. Perhaps this is a secret that should be well kept, at least among college students.

In the Spring of 1987, the author's advisor conducted a questionnaire survey in his introductory psychology classes that indicated a lack of awareness regarding the differential alcohol content in Budweiser versus Bud Light. Six separate multiple-choice questions included ten alternatives for indicating the number of calories and the percent of alcohol by volume for Budweiser, Bud Light, and LA beer. Most of the 425 respondents (86.8%) knew that Bud Light had fewer calories than Budweiser, whereas 84.3% chose the same amount of alcohol content for Budweiser and Bud Light.

In summary, this experiment suggests that substantial marketing will be necessary to make low alcohol beer a

popular drink alternative. This conclusion is supported by the relatively low sales figures for low-alcohol beers ("Sales are Disappointing", 1985). The results also show that appropriate marketing strategies can make a dramatic difference in beer choices, given that Bud Light (containing prominently less alcohol than Budweiser) was the most popular beer choice among both male and female partiers.

If advertising can prevent (or remove) a non-macho stigma associated with drinking a light beer, then it should be possible to do the same for LA beer. First, however, an analysis of drinking rates and BAC is necessary when either LA beer or Budweiser is provided without the partiers' knowledge. This would help to determine the potential of LA beer to prevent alcohol-impaired driving. It is possible that partiers will drink more LA beer than Budweiser in order to reach a desired state of alcohol impairment or drunkenness. Such a finding of "alcohol titration" would suggest that the potential of LA beer to prevent DUI may be limited, and that a marketing campaign to promote the use of LA beer may not be socially valid. On the other hand, it may be advantageous to serve LA beer without the partiers' knowledge. These queries were explored in Experiment 2.

EXPERIMENT 2: THE PARTY CONSUMPTION OF BEER VS. MIXED DRINKS

In a nationwide telephone survey of over 1000 licensed U.S. drivers, Berger and Snortum (1985) found that compared to individuals who usually choose mixed drinks over beer, those who preferred beer typically drank to higher levels of intoxication, were more likely to drive after drinking, and tended to consider DUI to be less serious. However, verbal report data collected in situations remote from the drinking setting may not accurately reflect actual alcohol consumption, impairment, and propensity to DUI. By observing the actual drinking rates and BAC of partiers drinking beer vs. partiers drinking mixed drinks, the proposed research was designed to test the veracity of Berger and Snortum's findings. In addition, unbeknownst to the partiers, at the first of these two parties (referred to here as Bud Party) the beer drinkers were served regular beer (Budweiser); whereas at the second party (termed LA Party), low alcohol (LA) beer was served. This comparison was added to determine the value of discreetly substituting a low alcohol alternative in party settings.

Method

Subjects and Setting

Data were obtained at two weekend fraternity parties at a different Virginia Tech organization than the fraternity described in Experiment 1. The first of two parties described in the present experiment was conducted approximately four weeks after the last party described in Experiment 1. The present two parties were separated by approximately eight weeks during the same academic quarter, and were regularly scheduled functions of the fraternity. This fraternity was selected since they normally served both mixed drinks and beer at their parties. The fraternity described in Experiment 1 served only beer at their parties. A total of 107 subjects (64 males and 43 females) attended the Bud party, and 118 subjects (70 males and 48 females) attended the LA party. The fraternity house contained a large, smoke-free room upstairs that was used to conduct entrance/exit interviews and obtain measures of BAC (blood alcohol concentration) and a large basement "party room" containing a refrigerated cooling unit that housed beer kegs and a completely stocked wet bar that was well suited for serving mixed drinks. Both parties were "costume parties" organized around particular themes (i.e., a "20,000

leagues under the sea theme, and a western "cowboy" theme). Partiers at both parties danced to loud rock music played by a disc jockey hired by the fraternity for the evening. The "party room" was 50 ft x 40 ft in size (i.e., approximately 2,000 sq ft). Given the presence of 107 and 118 partiers, respectively at each of the two parties, each partier had approximately 18.7 and 16.9 sq ft of "party space", respectively. The fraternity house was located approximately one mile from campus, and all subjects drove or received rides both to and from each party.

Procedure

Party Entrance. Upon arrival at the party, subjects were asked to read and sign an informed consent form, which included an offer of free transportation home should the partier become "impaired" or "legally intoxicated" while at the party. Then research assistants asked the subjects their age, weight, and last four digits of their student ID number. The ID numbers were used solely for the purpose of tracking beverage choice and drinking rate, and not to identify individuals. After this brief entrance interview, the research assistants noted the time (to the nearest min) on the interview sheet and obtained

each subject's BAC with an Alco-sensor III meter (Intoximeters Inc., St. Louis).

Subjects were asked to select beer or mixed drinks as their preferred beverage for the evening, and then received a 9-oz plastic cup that had affixed to it a label containing the last four digits of their ID number and a corresponding label that they wore on their shirt or blouse throughout the party. These ID numbers were printed on colored name tags; one color for beer drinkers and another color for those who chose mixed drinks. Throughout each party, the subjects were allowed unlimited access to their preferred beverage type (i.e., beer or mixed drinks).

Party process. During each party, research assistants (two near the beer keg and two near the area for mixing and serving mixed drinks) stood near or behind the bar and independently recorded for each subject, their four digit ID number and time per drink (to the nearest min). A large luminescent digital clock used in Experiment 1 was positioned so that all observers could see it clearly. The observers also verified that the bartenders served individuals the appropriate drink type according to the color of the badge affixed to their cup and shirt or blouse (i.e., green badges denoted beer

drinkers, whereas red badges denoted mixed-drink drinkers).

Party exit. Upon departure, each partier was asked to participate in a brief exit interview, whereby research assistants recorded the badge number and badge color for each subject, and took measures of BAC. Those subjects whose BAC levels exceeded .05 (50 milligrams of alcohol per 100 ml of blood) were reminded that free transportation was available. For those partiers who were legally drunk (i.e., BAC $\geq$ .10), the researchers demanded assurance that the individual would not drive a vehicle.

Results

Interobserver Reliability

The consecutive subject observations by the independent observers were matched according to the drinkers' ID numbers. Matched ID numbers were found for 80% of the 635 cups of alcoholic beverages consumed at the two parties. The percentage of agreement for recording the beverage type and the time (within one min) for each pair of observations was calculated by totaling the agreements for a given data category (i.e., beverage type or time observation), dividing this sum by the number of agreements plus disagreements, and then multiplying this result by 100%. The agreement percentages were 97.6% for beverage choice and 97.2% for time of observation (within one min).

Alcoholic Beverage Consumption

A total of 46% of the partiers selected beer as their preferred beverage at the Bud party, whereas 39% chose beer at the LA Party. Male subjects constituted 64% (n=32) of drinking partiers at the Bud party; whereas at the LA party, 61% (n=38) of the partiers were males. At the Bud party, the partiers consumed 159 and 152 cups of beer and mixed drinks, respectively, and at the LA party 127 and 197 cups of beer and mixed drinks were consumed respectively.

Figures 4 and 5 on pages 44 and 45 display cumulative cups per capita served to individuals drinking either beer or mixed drinks during consecutive 15-min intervals at the Budweiser and LA parties. The drinking patterns for mixed drink and beer drinkers were similar throughout both parties.

Figure 6 on page 46 depicts average number of cups consumed for beer and mixed-drink consumers at the Budweiser and LA parties. A greater number of 9 oz. cups were served to beer drinkers (6.9 and 5.3 cups per capita) than to drinkers of mixed drinks (5.6 and 5.2 cups capita) during the Budweiser and LA Parties, respectively. However, these differences were not statistically significant. A 2 Party (Budweiser vs. LA) x 2 Drink Types (Beer vs. Mixed Drinks) x 2 Gender ANOVA for total cups of alcoholic beverages consumed per capita indicated a significant main effect for only gender, $F(1,104)=4.17$, $p<.05$. Males consumed a significantly greater number of cups per capita across both parties (i.e., an average of 6.3 cups for males vs. 4.7 mean cups for females, $p<.05$). No significant differences between beer drinkers and mixed drink drinkers were found for the number of cups consumed.

Blood Alcohol Concentration

Figure 7 on page 47 depicts average BAC for beer and

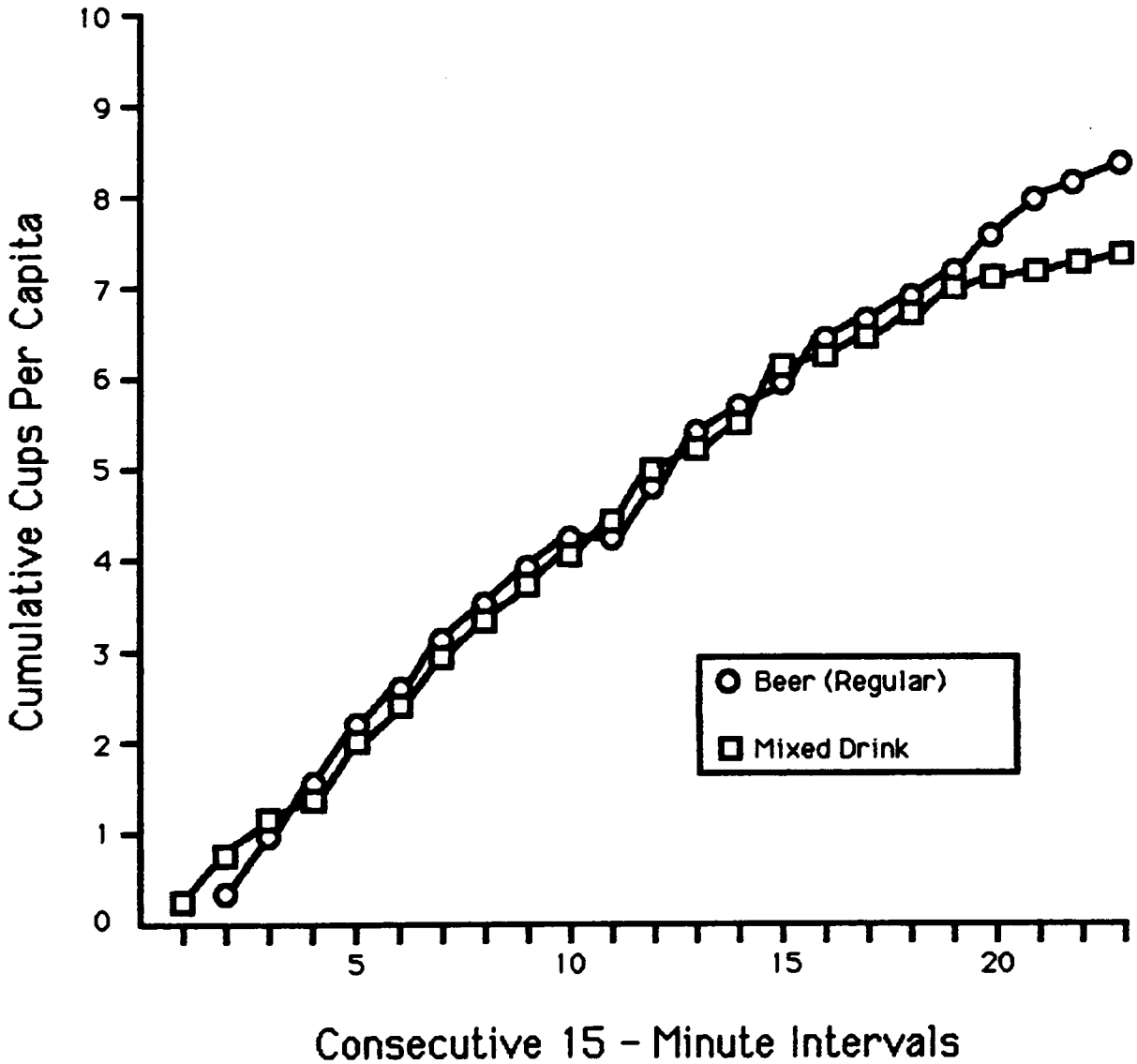

Figure 4. Cumulative cups per capita served to partiers consuming mixed drinks and regular alcohol content beer during consecutive 15 minute intervals.

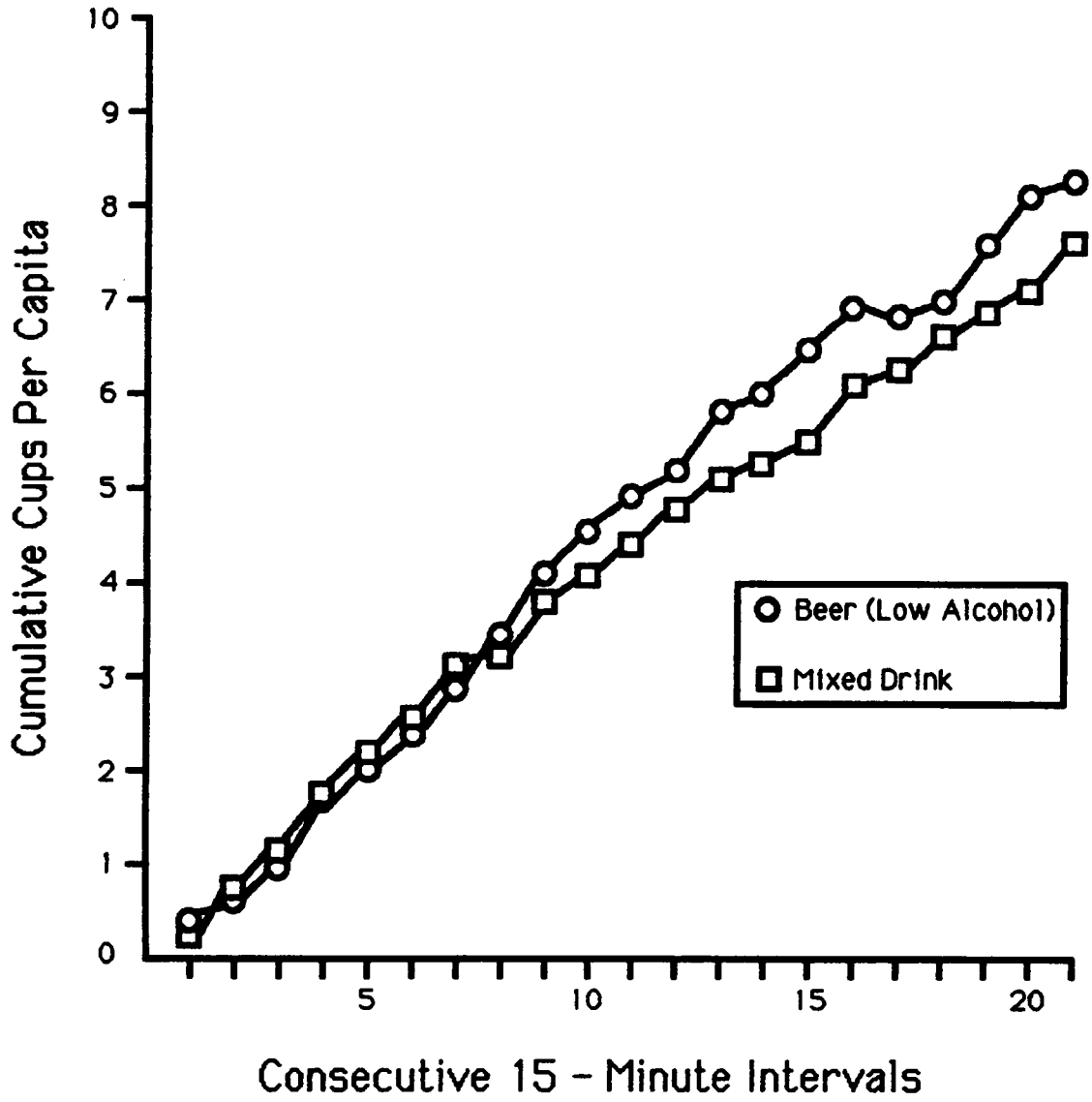

Figure 5. Cumulative cups per capita served to partiers consuming mixed drinks and low alcohol content beer during consecutive 15 minute intervals.

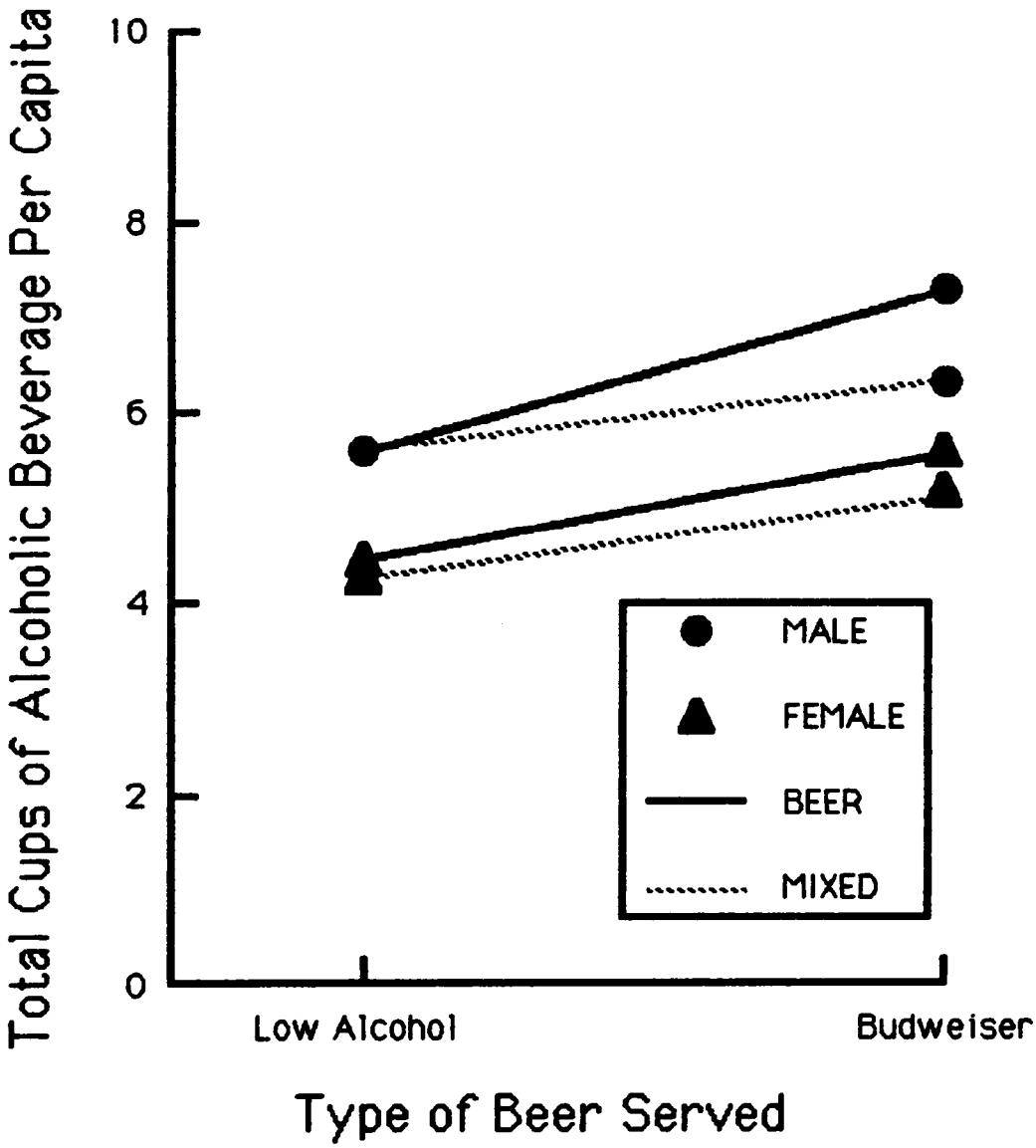

Figure 6. Total cups per capita served to male and female partiers consuming mixed drinks or Budweiser at Party 1 and mixed drinks or LA beer at Party 2.

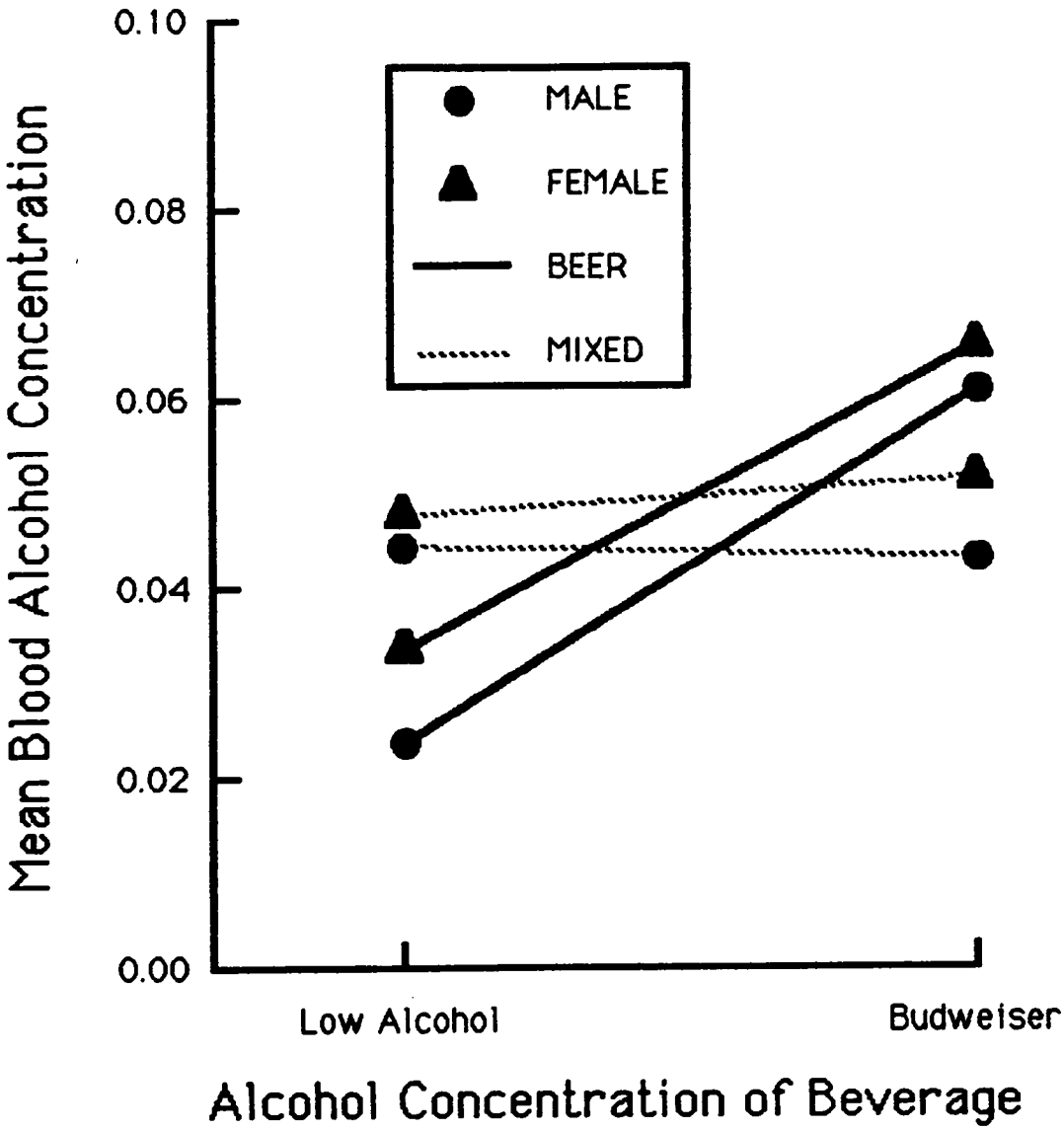

Figure 7. Mean blood alcohol concentration for male and female partiers consuming mixed drinks or Budweiser at Party 1 and mixed drinks or LA beer at Party 2.

mixed-drink consumers at the Budweiser and LA parties. The average exit BAC for beer drinkers was .063 (n=23) at the Bud party and .026 (n=24) at the LA party. The average BAC for those consuming mixed drinks was .046 (n=27) at the Bud party and .047 (n=38) at the LA party. The average BAC across both beverage types at the Bud party (.054, n=50) was greater than the average BAC at the LA party (.039, n=62). A 2 Party (Bud vs. LA) x 2 Drink Types (Beer vs. Mixed Drinks) x 2 Gender ANOVA on BAC, indicated a significant interaction between Party and Drink Type, $F(1,104)=3.99$, $p<.05$. No other effects were significant in the BAC analysis (all ps>.10).

Discussion

These results provide evidence refuting the claims of Berger and Snortum from interview data that beer drinkers become more intoxicated than drinkers of mixed drinks. The observational data of this field study showed no significant differences between these groups of drinkers at the Bud party in terms of their level of impairment, as assessed with BAC breathalizers. Not surprisingly, a significant difference in level of BAC was found between individuals consuming mixed drinks and those drinking LA beer at the LA party. Experiment 1 showed that individuals were more likely to drink LA beer when it was unlabeled. In the present experiment the subjects were not informed at either party as to the type of beer served. And, the data showed similar beer consumption patterns across the two parties. In other words, partiers did not titrate their beer consumption (i.e., drink more LA than Budweiser) in order to reach a desired level of impairment.

The finding of lower BACs among beer drinkers at the LA party has important implications for developing successful methods of promoting socially responsible drinking among a university population. For example, university sanctioned parties could require that only LA

beer be served, or that a switch to LA beer be made after a particular time (e.g., 12:00 midnight). It would be instructive to note whether partiers could determine if and when a switch to LA beer was made. Unfortunately, students' awareness of the beer type at the parties was not assessed in this experiment, but it is noteworthy that no one complained about the beer at the LA party.

Experiment 3 was designed to follow-up the possibility of serving lower-alcohol beverages at parties. At this fraternity party, conducted in the same setting as Experiment 2, both beer and mixed drinks were served as regular and low-alcohol alternatives (unbeknownst to the partiers). As in Experiment 2, the beer alternatives were Budweiser (7% alcohol by volume) and LA (3% alcohol by volume).

If many students at university parties drink alcoholic beverages to get drunk (as was suggested in Experiment 1), then it is possible that partiers in the low-alcohol conditions will consume more cups of beer or mixed drinks. In other words, if subjects titrate their consumption of alcoholic beverages in order to reach a desired level of impairment (or drunkeness for some partiers), then the benefit of providing low-alcohol alternatives may be limited (even if partiers are unaware

of the beverages' alcohol content). This possibility was supported somewhat by the observed per capita consumption rates of Bud drinkers vs. LA drinkers in Experiment 2 (see Figure 5). However, the BAC data of Experiment 2 did not support the titration hypothesis.

EXPERIMENT 3: DO COLLEGE PARTIERS DRINK TO GET DRUNK?: A TEST OF TITRATION

If subjects titrate their consumption of alcoholic beverages in order to reach a desired level of impairment (or drunkenness for some partiers), then the benefit of providing low-alcohol alternatives may be limited (even if partiers are unaware of the beverages' alcohol contents). This titration hypothesis was studied only for beer comsumption in Experiment 2, and significant titration was not demonstrated. Experiment 3 examined the validity of the titration hypothesis for the consumers of both beer and mixed drinks at a fraternity party.

Method

Subjects and Setting

Data were obtained at a weekend party that occurred at the same fraternity site described in Experiment 2, although the present party occurred approximately one academic quarter after the the parties described in Experiment 2. The party was a regularly scheduled function of the same fraternal organization. A primary reason for selecting this site was the availability of both beer and mixed drinks at the party. A total of 94 subjects (53 males and 41 females) attended the party.

The fraternity house contained large rooms upstairs that were used to conduct entrance/exit interviews and obtain measures of BAC. The students partied and danced in a large basement "party room" (i.e., approximately 2,000 sq ft as described in Experiment 2) containing a refrigerated cooling unit that housed beer kegs and a completely stocked "wet" bar for serving mixed drinks. Loud rock music was played throughout the evening by a professional disc jockey hired by the fraternity. Given the presence of 94 partiers, each partier had approximately 21.3 sq ft of "party space". The fraternity house was located approximately one mile from campus and subjects either drove or received rides both to and from the party.

Procedure

Party Entrance. Upon arrival at the party, subjects were asked to read and sign an informed consent form, which included an offer of free transportation home should the participant become "impaired" or "legally intoxicated" while at the party. Then research assistants asked the subjects their gender and weight. Subjects were asked to select beer or mixed drinks as their beverage choice for the evening, and then they were given a 9-oz plastic cup that had affixed to it a colored label (i.e., red badges

were given to individuals selecting mixed drinks, whereas green badges were given to individuals selecting beer). The labels contained a four-digit number and a corresponding label that they wore on their shirt or blouse throughout the party. Unbeknownst to the subjects, each four digit number began with a "1" or a "2", indicating whether subjects would receive a regular alcohol content (i.e., Reg) or a low alcohol content (i.e., Lo) variety of their preferred beverage type.

Subjects were randomly assigned to these conditions within their preferred beverage group and then allowed unlimited access to that beverage for the remainder of the party. Two bartenders at one end of a 10 ft bar served mixed drinks to those partiers with red badges, and the alcoholic content of the mixed drinks was determined by the first digit of the partiers' four-digit ID number (i.e., persons displaying a red badge number beginning with a "1" received 7/8 oz shots, whereas persons displaying red badge numbers beginning with a "2" received 1 1/4 oz shots). Standard shot amounts were administered by two bartenders using shot glasses that had been clearly marked at the respective correct levels (i.e., 7/8 oz and 1 1/4 oz) around the circumference of the shot glass. Two experienced research assistants stood behind the bar and

measured each shot before handing the shot glass to the bartender. Each measurement required agreement by both researchers before delivery to the bartender. [It was originally planned to use measurement devices that fit on top of the liquor bottles, but the liquor bottles varied in size and thus the devices did not fit all bottles.]

Two bartenders at the end of the bar opposite the mixed-drink bartenders served beer to those partiers with green badges, and the alcoholic content for each beer served was defined by the same procedure outlined above for mixed drinks (i.e., the first digit of the partiers' ID number). The two beer types (i.e., Budweiser and LA beer) were served from separate but adjacent unmarked beer taps.

Party process. Throughout the party, research assistants (two for the mixed drink setup and two for the beer kegs) stood near or behind the respective serving areas and independently recorded for each subject, their four-digit ID number and time per drink delivery (to the nearest min). A luminescent digital clock was positioned so that all observers could clearly see it. One of the observers for each observation team was designated as the primary observer for each of the beverage types (i.e., beer and mixed drinks). The observers also verified that

bartenders served partiers only the type of beverage prescribed by the color of the ID badge and the alcoholic content indicated by the first digit of their ID number (i.e., a "1" or a "2").

Party exit. Upon departure, each partier was asked to participate in a brief exit interview. During this interview, research assistants recorded for each student their badge number, the time, and a measure of BAC. Those subjects whose BAC levels exceeded .05 (50 milligrams of alcohol per 100 ml of blood) were reminded that free transportation was available. For those partiers who were legally drunk (i.e., BAC $\geq$ .10), the researchers demanded assurance that the individual would not drive a vehicle.

Results

Interobserver Reliability

The consecutive subject observations by the independent observers were matched according to the drinkers' ID numbers. Matched ID numbers were found for 93.0% of the 511 total cups of alcoholic beverages served at the party. The percentage of agreement for recording the beverage type, time (within one min), and shot type (7/8 oz or 1 1/4 oz) for each pair of observations was calculated by totaling the agreements for a given data category (i.e., beverage choice -- Beer or Mixed, alcohol content -- Reg or Lo, or time of observation), dividing this sum by the number of agreements plus disagreements, and then multiplying this result by 100%. The agreement percentages were 100% for beverage choice, 95.5% for shot size, and 99.5% for time of observation (within one min).

Alcoholic Beverage Consumption

Of the 94 partiers, 36% (20 males and 14 females) selected beer and 64% (33 males and 27 females) selected mixed drinks as their preferred beverage. Male subjects constituted 56% (n=53) of the drinking partiers who drank alcoholic beverages. The partiers consumed a total of 226 cups of beer and 285 cups of mixed drinks.

Figure 8 on the following page displays cumulative cups per capita served to individuals drinking either beer or mixed drinks across the Reg and Lo conditions during consecutive 15-min intervals. The drinking rates for beer drinkers were markedly greater than for those consuming mixed drinks. However, there were no differences in drinking rates for the Reg and Lo versions of both beer and mixed drinks.

Figure 9 shows the total cups per capita served to partiers was greater for beer drinkers than for those drinking mixed drinks across the Regular and Low Alcohol conditions. Specifically, beer drinkers consumed an average of 6.6 cups per individual (n=34), compared to an average of 4.8 cups per partier (n=60) among those drinking mixed drinks. A 2 Alcohol Content (Reg vs. Lo) x 2 Beverage (Beer vs. Mixed Drinks) x 2 Gender ANOVA indicated a significant main effect for beverage, $F(1,86)=8.11$, $p<.05$. No significant effects of alcoholic content (i.e., Reg and Lo) or gender were found for the number of cups consumed at the party, and no interaction terms were reliable (all $ps>.10$).

Blood Alcohol Concentration

Figure 10 depicts differences in levels of BAC among subjects leaving the party by alcohol content group and by

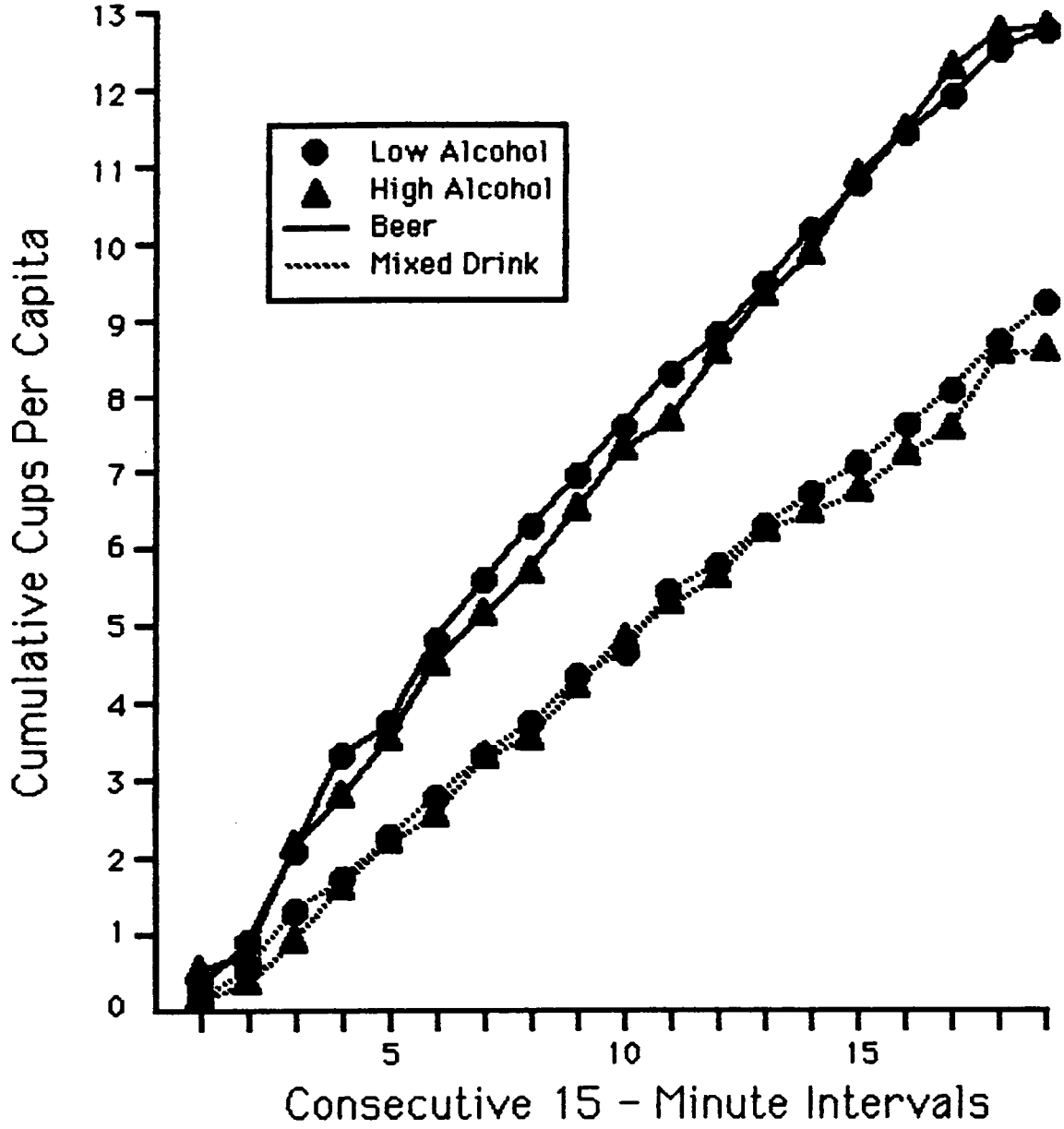

Figure 8. Cumulative cups per capita served to individuals drinking either beer or mixed drinks across high and low alcohol content conditions during consecutive 15 minute intervals.

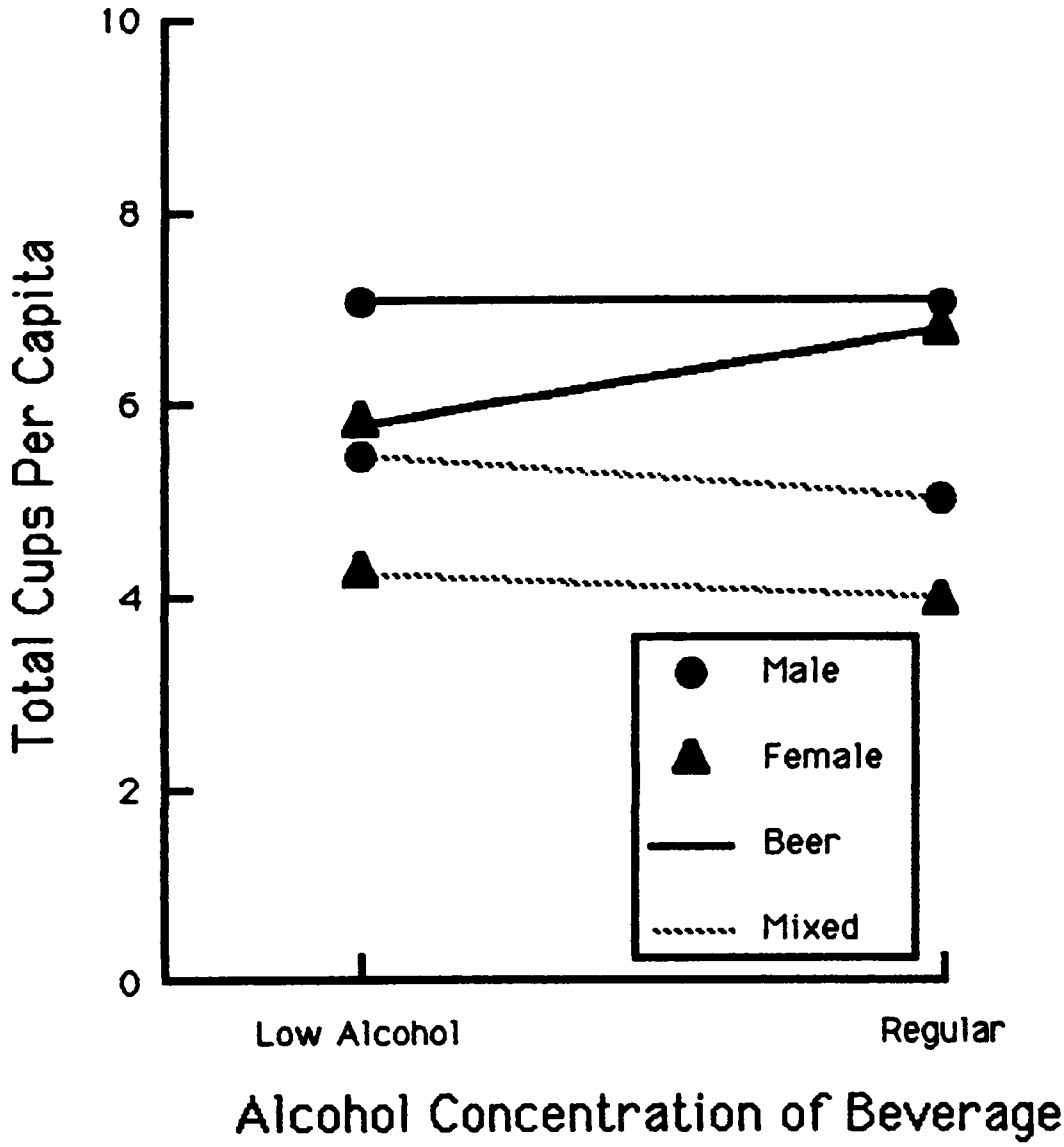

Figure 9. Total cups per capita served to partiers consuming high or low-alcohol content beer or mixed drinks.

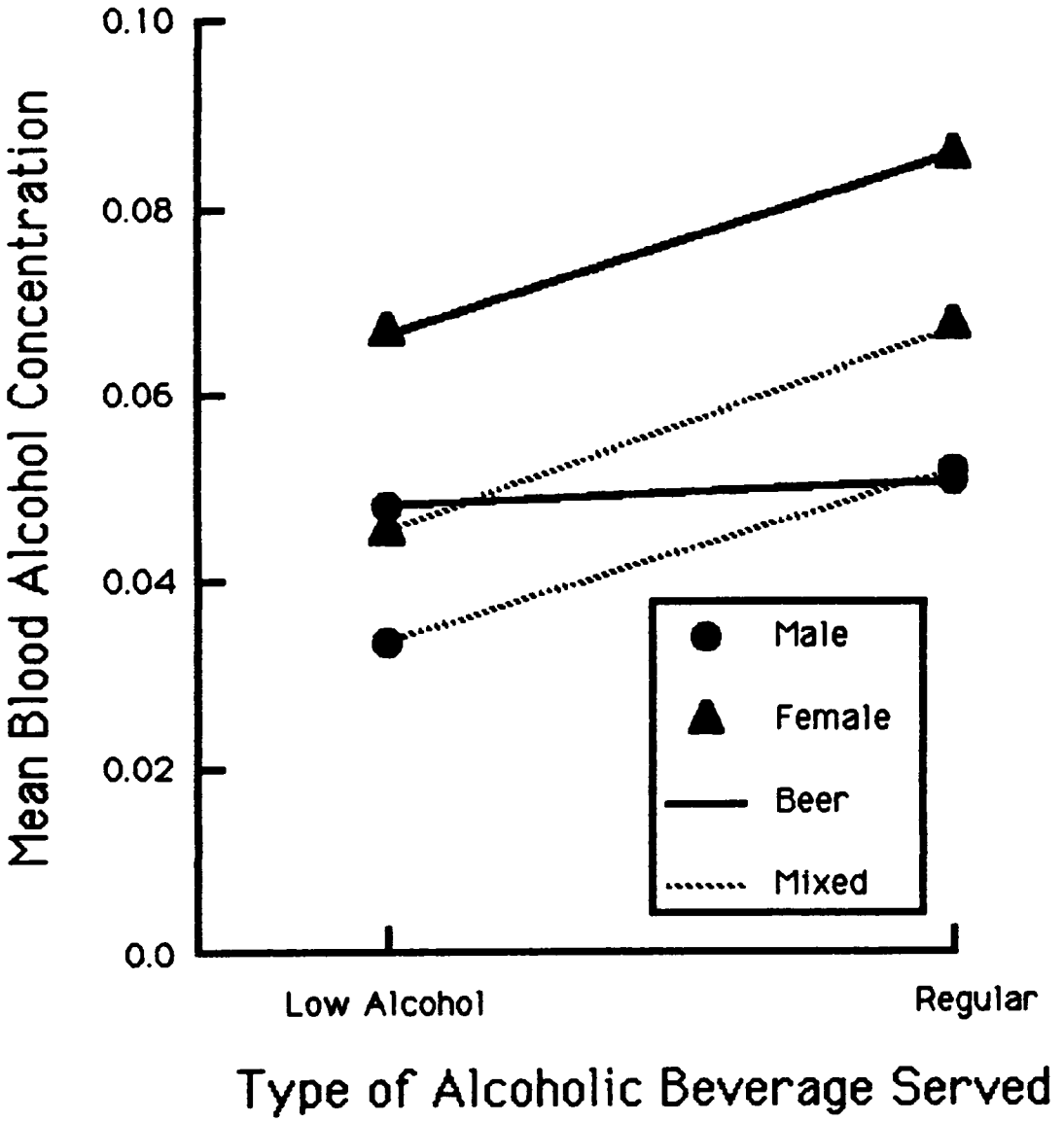

Figure 10. Mean blood alcohol concentration for male and female partiers consuming high or low-alcohol content beer or mixed drinks.

gender. Specifically, subjects in the Reg group had average exit BACs of .061 (n=44), whereas the average exit BAC level of subjects in the Lo alcohol content condition was .045 (n=49). Male drinkers had average exit BACs of .048 (n=52), whereas the average BAC level of female drinkers at the party was .058 (n=41). A 2 Group (Reg vs. Lo) x 2 Beverage (Beer vs. Mixed Drinks) x 2 Gender ANOVA indicated significant main effects for both alcohol content, $F(1,85)=4.85$, $p<.05$ and gender, $F(1,85)=3.86$, $p<.05$. There were no significant interactions.

Discussion

The results of Experiment 3 failed to support a titration hypothesis within drink types. Instead partiers got significantly less impaired when served beverages (beer or mixed drinks) with lower alcohol content. Although subjects' perceptions of differential alcohol content in their beer or mixed drinks was not systematically assessed, no beer drinker complained about beer taste, and only two consumers of mixed drinks indicated that they thought their drinks were weak. Several partiers did request an extra shot of alcohol in their mixed drink (i.e., a double), but this was not allowed. It is possible that providing for additional shots of liquor in mixed drinks would have increased the alcohol-impairment of those consuming mixed drinks, and this was studied in Experiment 4.

With the findings of this experiment and those of Experiment 2, it can be concluded that the availability of lower-alcohol beverages will produce lower alcohol impairment if the beverages are served without the partiers' knowledge, and if multiple shots of alcohol are not allowed in mixed drinks. Although the feasibility of such an intervention for preventing alcohol-impaired driving is probably limited to institution-sanctioned and

private parties, it has been estimated that about as much alcohol consumption occurs in such settings as in bars or taverns (O'Donnell, 1985).

Although more cups of beer than mixed drinks were consumed across both the regular and low alcohol conditions, the levels of blood alcohol concentration at the end of the party were not significantly different across the beer and mixed drink conditions. Thus, it took more 9-oz cups of beer than mixed drinks to reach similar levels of intoxication. Actually, this difference suggests that titration occurred between beverage types. In other words, the beer and mixed-drink consumers drank differential amounts of their selected beverages in order to reach similar levels of alcohol impairment. Since a 12-oz bottle of regular beer offers the same amount of alcohol available in a standard mixed drink, partiers may have figured that more 9-oz cups of beer than mixed drinks are needed to reach equivalent levels of alcohol impairment. Thus, prior drinking experiences may have influenced beer drinkers to adjust their drinking rate in order to reach a level of alcohol impairment commensurate with that usually attained in similar party situations. Because the partiers were not aware of the two levels of alcohol content within each drink type, they did not show

differential drink rates of high versus low alcohol beverages.

The differential alcohol impairment of males versus females in the present study attests to the need to assess both drink consumption and BAC. None of the prior studies of drinking in naturalistic settings included both of these indices (e.g., Cutler & Storm, 1975; Geller et al., 1986; Saltz, 1987, 1988; Sommer, 1965).

While the males at the four parties of Experiments 1 and 2 drank more alcoholic beverages than females, the exit BACs of male and female partiers were equivalent. In Experiment 3, however, the amount of alcohol consumption was not significantly higher for males than for females, and as a result females were significantly more alcohol-impaired than males when leaving the party for Experiment 3. Thus, when men and women drink equivalent amounts of alcohol (possibly because of modeling within pairs or couples), it can generally be expected that women will get more impaired than men (largely because of size differences and a greater proportion of adipose tissue among women).

Consequently, when it is observed that alcohol consumption is greater among males than females (e.g., Experiments 1 and 2; Cutler & Storm, 1975; Geller et al.,

1986; Reid, 1978; Sommer, 1965), it is not necessarily accurate to assume that men are at greater risk to DUI than women. In Experiments 1 and 2, men drank significantly more alcoholic beverages than women but were equally impaired at the end of the party; but because men and women drank equivalently in Experiment 3, at the end of this party women were more impaired and more at risk for DUI than men.

Heretofore, each of the parties included bartenders to serve the alcoholic beverages, whether beer or mixed drinks. The final field study of this project was designed to explore the potential impact of the drink-delivery format at a party setting, that is, bartender-service versus self-service. At this fraternity party, students were given their choice of beer or mixed drinks to consume consistently throughout the evening, but they were randomly assigned to obtain their beverages from a bar and bartender or from a self-service station. Given a desire to get drunk, partiers might prefer the self-service condition when it is most convenient (i.e., requiring beer to be poured from a pitcher).

On the other hand, the consumption of mixed drinks requires more effort (or inconvenience) at the self-service station than at the bar, and therefore students

who choose to consume mixed drinks might prefer bartender-service over self-service. Thus, it is reasonable to predict an interaction between type of drink (beer vs. mixed drink) and delivery service (self-service vs. bartender-service). More specifically, it was hypothesized that beer drinkers would consume more cups of beer and get more impaired with self-service than with bartender-service, but partiers consuming mixed drinks will consume more mixed drinks with bartender-service than with self-service.

Another objective of Experiment 4 was to study subjects' specific intentions to drink and get alcohol-impaired as predictors of actual alcohol consumption and impairment. Perceived locus of control (Rotter, 1966) is a potential moderator of the relationship between personal intentions and subsequent behaviors, and this possibility was also explored in Experiment 4.

EXPERIMENT 4: PARTY DRINKING AS A FUNCTION OF DELIVERY SERVICE: BARTENDER VS. SELF-SERVICE

The Theory of Reasoned Action and Socially Responsible Drinking

An approach toward predicting behavior that may hold substantial applied promise for the prediction and control of alcohol consumption in party settings derives from the work initiated by Fishbein and his colleagues (Ajzen & Madden, 1987; Ajzen & Fishbein, 1980; Ajzen & Fishbein, 1977; Fishbein & Ajzen, 1975). According to this theory, the immediate antecedent of any behavior is the intention to perform the behavior. Thus, the stronger a person's intention, the greater is the likelihood that the behavior will actually be performed. The theory, often referred to as the "Theory of Reasoned Action", proposes that behavior is a function of the intention to perform it, which in turn, is a function of the mathematically weighted sum of attitudes (e.g., a general positive or negative regard for an attitude person or object) and social norms (e.g., social pressures to perform or not perform a behavior) (Petty & Cacciopo, 1981). In the model, attitudes result from an individual's assessment of the specific consequences associated with performing or not performing a behavior. Social norms are a function of the belief

that a referent person wishes one to perform or not perform a behavior and the motivation to comply with that wish.

An important set of assumptions upon which the model is built focuses on four elements that are necessary for successful prediction of behavioral intentions: 1) an action; 2) the object toward which the action is directed; 3) the situation in which the action is performed; and 4) the time at which the action occurs. The basic notion underlying the specification of these elements derives from earlier research showing that attitudes are poor predictors of behavior (Ajzen & Fishbein, 1980; LaPiere, 1934; Wicker, 1969). Fishbein and Ajzen propose that attitudes and behavioral intentions are predictive of behavior when they are matched on the bases of specificity and time. Thus, specific attitudes predict specific behavior, whereas general attitudes are better predictors of general classes of behavior, particularly when all are assessed proximal in time. The Fishbein and Ajzen model has received empirical support from both laboratory and field research (Schlegel, Crawford, & Sanborn, 1977) and has been used to predict a variety of attitudes and behaviors, including, safety belt use (Wittenbraker & Gibbs, 1983), family planning (Vinokur-Kaplan, 1978;

Jaccard & Davidsen, 1972), fast food consumption (Brinberg & Durand, 1983), voting behavior (Bowman & Fishbein, 1978), and medical compliance (Wurtele, Roberts, & Leeper, 1982).

Schlegel et al., (1977) assessed the efficacy of the Fishbein and Ajzen model in predicting alcohol drinking among adolescents and found that a specific intention to drink is predicted from its corresponding attitude and normative beliefs. And, for the sample of students of legal drinking age, sigificant correlations were found between intentions and subsequent verbal reports of actual drinking behavior. While this study largely supports the major components of the Theory of Reasoned Action, as well as the stated need for correspondence of specificity among the elements, it also illustrates a common problem inherent in many studies which tested this theory -- a reliance on verbal report as the criterion against which the behavioral intentions are compared. Thus, one goal of Experiment 4 was to test the Fishbein and Ajzen model of behavioral intentions by comparing partiers' intentions toward drinking and impairment with their actual drinking behavior and level of impairment as measured by BAC at a university party. Based on previous studies (e.g., Schlegel et al., 1977; Wurtele, Roberts, & Leeper, 1982),

it was expected that specific intentions of drinking would be better predictors of actual drinking behavior than a more general measure, and that specific intentions assessed the night of the party would be better predictors of drinking behavior than specific intentions assessed two weeks prior to the party.

Another goal of the present experiment was to assess whether a personality variable (i.e., locus of control - LOC) would moderate the relationship between specific behavioral intentions toward drinking and impairment, and actual measures of drinking (i.e., number of 9-oz cups) and impairment (i.e., level of BAC). A potential benefit of this procedure would be to increase the percent of variance in drinking and impairment explained by specific intentions, thus allowing better prediction of drinking behavior and subsequent impairment among college drinkers at a party setting.

According to Rotter's (1954) social-learning theory, the probability that a particular behavior will occur in a given situation is a function of the reward value and the expectancy that the reward will follow the response. Rotter has suggested that individuals hold generalized expectancies concerning the LOC over rewarding events in their lives. Internals, persons who perceive an internal

LOC, believe that their own responses largely determine the amount and nature of the rewards they receive. On the other hand, individuals, who perceive an external LOC are termed Externals. They believe that the rewards they receive are largely determined by external forces (e.g., fate, luck, or chance).

A more recent version of the the Theory of Reasoned Action termed the "Theory of Planned Behavior" (Ajzen & Madden, 1986) incorporated perceived control over behavioral achievement as a moderator of intentions. The Ajzen and Madden study showed that perceived behavioral control increased significantly the predictability of both behavioral intentions and actual behavior in an applied setting (i.e., a college classroom setting).

Given that internals presumably place more emphasis on intrinsic control of daily events than do externals, it is reasonable to believe that internals will state personal intentions with more consideration, confidence, and conviction than externals. Thus, it was hypothesized that the correspondence between intentions and behaviors will be greater for internals than externals.

Of interest will be the amount of variance in drinking rates and BAC predicted by specific versus general personal intentions given two weeks before a

fraternity party and on the night of the party itself. A high degree of predicted variance in alcohol consumption and impairment from personal pre-party intentions would imply less influence by ongoing environmental factors in the party setting. Hence, the results of a regression analysis for this portion of Experiment 4 may suggest an emphasis for further research of party drinking -- a focus on individual versus environmental determinants of excessive alcohol consumption.

Method

Subjects and Setting

Data were obtained at a weekend fraternity party at Virginia Tech. The party was a regularly scheduled function of a different fraternal organization than those described in Experiments 1 through 3. A total of 178 subjects (94 males and 84 females) attended the party. The fraternity house contained two rooms upstairs that were used to conduct entrance/exit interviews and sobriety tests and to obtain measures of BAC. The students partied in a 26 ft x 38 ft, basement "party room" containing a refrigerated cooling unit that housed beer kegs and a completely stocked wet bar for serving mixed drinks. A second bar setup was located across the room to accomodate those students assigned to the "self-serve" condition (i.e., students who served themselves beer or mixed drinks, rather than having drinks prepared and served by bartenders).

Throughout the evening, partiers' danced to loud rock music played on a stereo system that belonged to a fraternity member. The "party room" (approximately 988 sq ft in size) was substantially smaller than the party areas described in the previous experiments. Given the number of partiers (i.e., 178), each individual had approximately

5.6 sq ft of "party space"; compared to a range of 6.1 to 21.3 sq ft of space in the party areas of Experiments 1 to 3. The fraternity house was located approximately one block from campus and subjects either walked, drove or received rides both to and from the party.

Procedure

Pre-party questionnaires. Two weeks prior to the scheduled party, two questionnaires were distributed to fraternity members and their party guests for completion. The first questionnaire consisted of the original 29-item Rotter (1966) Internal-External (I/E) Locus of Control Scale and instructions for transferring the responses to the 29 questions onto standardized OPSCAN forms (note that the 6 buffer items were disregarded in the analysis). The second questionnaire (i.e., entitled "Party Questionnaire") consisted of questions concerning: a) the students' attitudes and intentions toward drinking and subsequent impairment in general; and b) the students' intentions toward drinking and becoming impaired on the night of the party. All subjects were asked to code the questionnaires by the last four digits of their student ID number.

Party entrance. Upon arrival at the party, subjects were asked to read and sign an informed consent form,

which included an offer of free transportation home should the participant become "impaired" or "legally intoxicated" while at the party. Then research assistants asked the subjects their age, weight, and last four digits of their student ID number. The ID numbers were used solely for the purpose of tracking beverage choice and drinking rate, and not to identify individuals. Subjects were asked to specify the number of 9-oz cups of beer, mixed drinks, and non-alcoholic alternative beverages they intended to drink while at the party and the level of impairment they intended to reach. Subjects were then asked to select beer or mixed drinks as their choice for the evening. After this brief entrance interview, the research assistants noted the time (to the nearest min) on the interview sheet and obtained BAC samples from only those subjects (39 males and 23 females) who reported some alcohol consumption prior to arriving at the party. BAC readings were obtained with Alco-sensor III meters (Intoximeters Inc., St. Louis).

Subjects then received a 9-oz plastic cup that had affixed to it a label containing the last four digits of their ID number and a corresponding stick-on label that they wore on their shirt or blouse throughout the party. This same number was also written on their wrist in

indelible ink to eliminate the potential of "badge switching" that was a possibility at the earlier parties. The ID numbers were printed on colored name tags; one color for subjects that would obtain their drinks (i.e., beer, mixed drinks, or non-alcoholic alternatives) from bartenders (i.e., red badges) and another color for subjects pouring or mixing their own drinks at a serve-yourself setup (i.e., green badges). Only four partiers (1 male and 3 females) selected non-alcoholic alternative beverages.

The partiers were randomly assigned to the "Self-Serve" and "Bartender" conditions, and then allowed unlimited access to their preferred beverage type (i.e., beer or mixed drinks) throughout the party. Couples entering the party were assigned to the same beverage delivery condition (i.e., self-serve or bartender). Partiers were specifically requested to stick with the same drink type (i.e., beer or mixed drinks) and the same delivery format (self-serve or bartender) throughout the party.

Party process. Throughout the party, research assistants (four behind the bar and four at the self-serve station) stood near or behind the respective serving areas and recorded for each subject: a) their five digit ID

number (i.e., the last four digits of their student ID number, preceded by a "B" or "M" indicating beer or mixed drinks as their beverage choice for the party), and b) time (to the nearest min) per drink delivery from a bartender or when completing self-service. A luminescent digital clock was positioned so that all observers could clearly see it. One data recorder per observation team was designated as the primary observer for each of the beverage types (i.e., beer and mixed drinks). The observers also served to verify that partiers obtained their drinks from the appropriate setup (i.e., self-serve vs. bartender) according to the color of the badge affixed to their cup and shirt or blouse (i.e., green and red badges). Given the possibility that partiers might occasionally attempt to obtain their drinks from the wrong bar setup, the data recorders were instructed to remind the partier of his/her error and to record this information onto the data sheet.

Party exit. Upon departing the party, participants were asked to cooperate in a brief exit interview. During this interview, research assistants recorded for each partier their badge number, gender, the time, and a measure of BAC. Those subjects whose BAC levels exceeded .05 (50 milligrams of alcohol per 100 ml of blood) were

reminded that free transportation was available. For those partiers who were legally drunk (i.e., BAC $\geq$ .10), the researchers demanded assurance that the individual would not drive a vehicle.

Results

Interobserver Reliability

The consecutive subject observations by the independent observers were matched according to the drinkers' ID numbers. Matched ID numbers were found for 78% of the 863 cups of alcoholic beverages served at the party. Although the amount of beer served in each 9 oz. cup of beer served throughout the party remained constant (i.e., one shot), the partiers could request multiple "shots" (i.e., "shot" number) of their preferred liquor (i.e., bourbon, gin, rum, or vodka) in their mixed drink cups. The percentage of agreement for recording the beverage type, time (within one min), and "shot" number for each pair of observations was calculated by totaling the agreements for a given data category, dividing this sum by the number of agreements plus disagreements, and then multiplying this result by 100%. The agreement percentages were 94% for beverage choice, 95% for time of observation (within one min), and 95% for shot number.

Alcoholic Beverage Consumption

Of the 67 partiers who provided both an entrance and exit interview, 61% (23 males and 18 females) selected beer and 39% (12 males and 14 females) selected mixed drinks as their preferred beverage. Males constituted 52%

(n=35) of the subjects. These partiers consumed 293 cups of beer and 155 cups of mixed drinks which was 52% of the total drinks (538 beer and 325 mixed drinks) served at the party.

Cumulative rate of drinking 9-oz cups. Figure 11 on the following page displays cumulative number of cups per capita served to individuals drinking either beer or mixed drinks across the Bartender and Self-Serve conditions during consecutive 15-min intervals. Beer drinkers in the Self-Serve condition drank at a greater rate than either beer drinkers served by a bartender, or by those drinking mixed drinks in the Self-Serve and Bartender conditions. Those partiers drinking mixed drinks in the Self-Serve condition drank at the lowest rate. For partiers in the Bartender condition, beer drinkers drank at a similar rate to those consuming mixed drinks,throughout the party.

Subject Selection. Of the 178 partiers entering the party (94 males and 84 females), a total of 67 partiers in the Bartender condition (35 males and 32 females) constituted the population for which subsequent dataanalyses were performed. This significant reduction in n size can be accounted for as follows: 1) Entrance or exit interview forms were missing for 80 subjects; 2) Partiers drinking from the wrong bar setups (i.e., 21

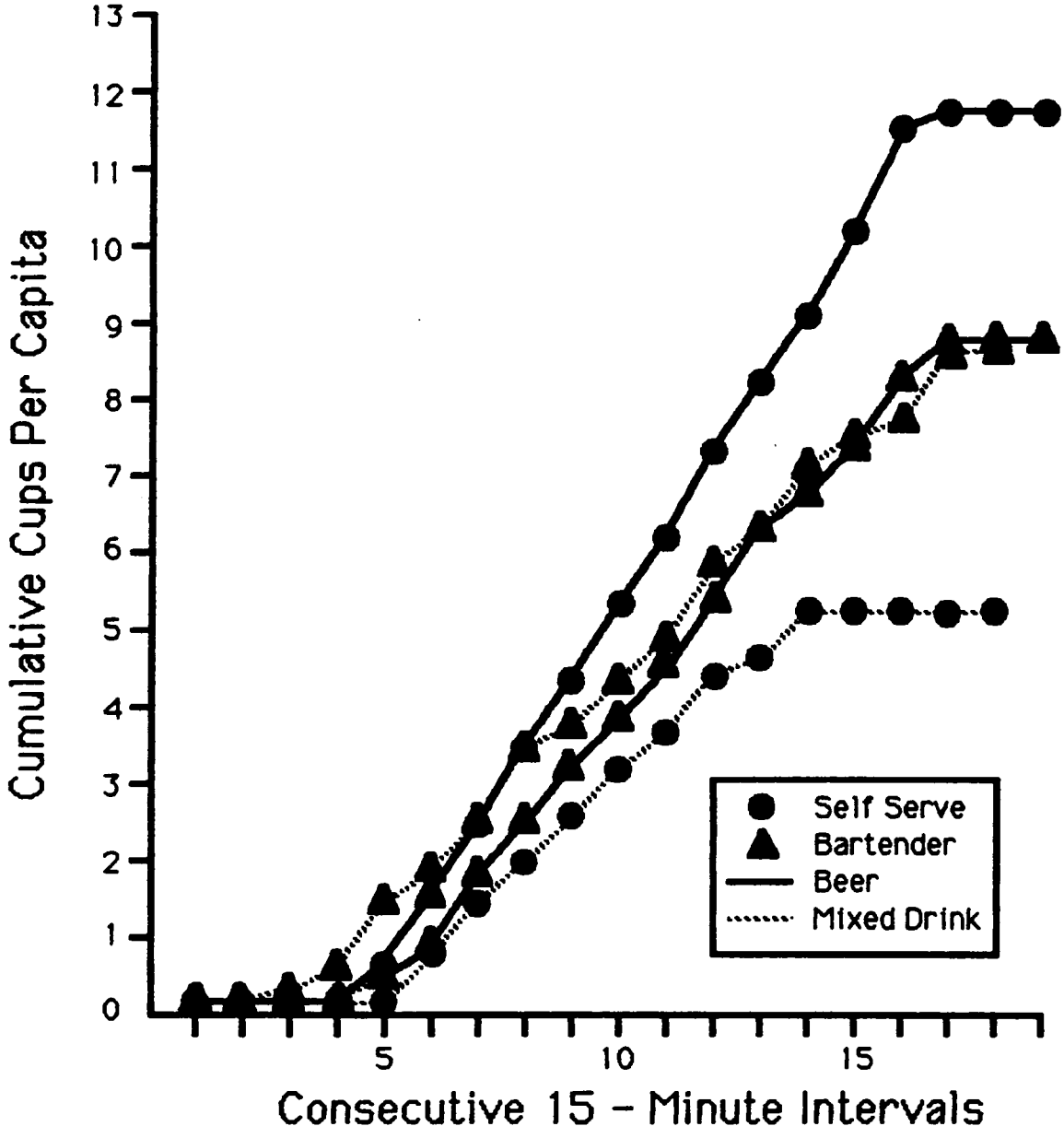

Figure 11. Cumulative number of cups served to partiers drinking either beer or mixed drinks across Self-Serve and Bartender conditions during consecutive 15 minute intervals.

subjects) were deemed "cheaters" and eliminated from the subject pool; 3) Subjects entering the party with BAC readings in excess of .05 (i.e., 7 subjects) were eliminated from the subject pool, and 4) Three subjects who consumed significantly more drinks than the other partiers (i.e., 21, 21, and 25 drinks, respectively) were deemed "outliers", and were eliminated from the subject pool.

Hourly rate of drinking 9-oz cups. An hourly drinking rate measure for each partier (i.e., cups of beverage per hour) was determined by dividing the total number of cups by the difference in arrival and departure times in min, multiplied by 60.

Regarding cups of beverage per hour, male partiers drank at an average of 3.0 cups per hour (n=33), compared to an average of 2.3 cups per hour (n=31) for female partiers. In the Bartender condition, beer drinkers drank at a slightly greater rate (2.7 cups per hour, n=21) than partiers drinking mixed drinks (2.4 cups per hour, n=19). In the Self-Serve condition, beer drinkers drank at a markedly higher rate (3.2 cups per hour, n=18) than those drinking mixed drinks (1.7 cups per hour, n=6). A 2 Drink Delivery Format (Self-Serve vs. Bartender) x 2 Beverage Type (Beer vs. Mixed Drinks) x 2 Gender ANOVA for cups per

hour indicated main effects of gender, $F(1,57)=5.70$, $p<.05$ and beverage type, $F(1,57)=9.11$, $p<.05$. Males drank at a significantly higher rate than females (3.0 vs. 2.3 cups per hour for males and females, respectively), and beer was consumed at a higher rate than mixed drinks (2.9 vs. 2.2 cups per hour for beer and mixed drinks, respectively). The analysis also revealed a significant Delivery Condition by Beverage interaction, $F(1,57)=4.01$, $p<.05$. As shown in Figure 12, this interaction was primarily due to greater drinking rates of beer than mixed drinks in the Self-Serve condition and more similar drinking rates for beer and mixed drinks in the Bartender condition. A post-hoc comparison of these differences using Scheffe's test revealed a significant difference ($p<.05$) between drinking rates for those partiers consuming beer and mixed drinks in the Self-Serve condition. This effect appears more prominent for males than females, although the Gender x Beverage x Delivery Condition interaction was not significant, $F(1,56)=2.39$, $.05<p<.13$.

Number of cups consumed. In terms of total number of cups of alcoholic beverages consumed by the partiers, male partiers consumed an average of 8.5 ($n=23$) total cups of beer and 7.3 ($n=12$) total cups of mixed drinks, whereas

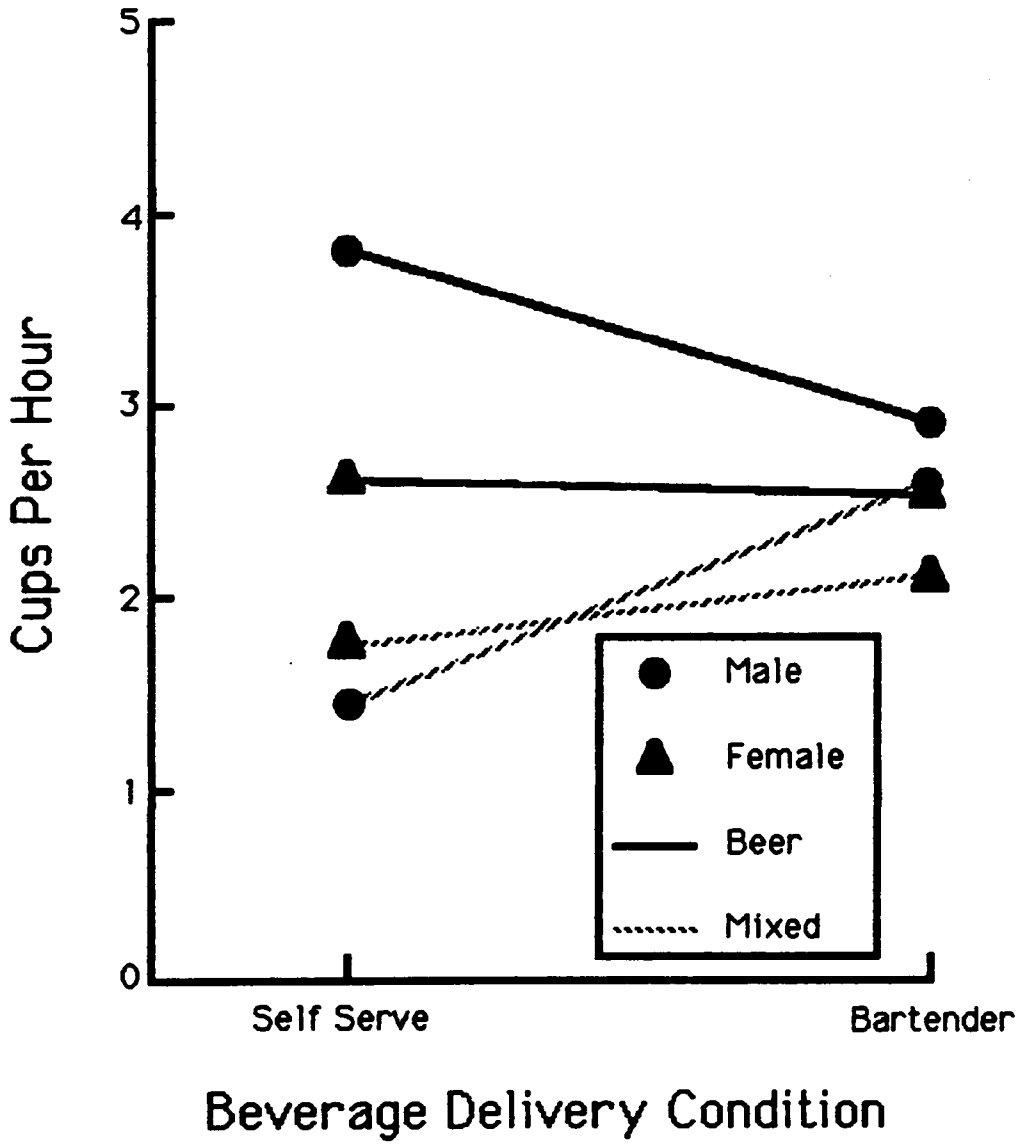

Figure 12. Cups per hour of beer and mixed drinks consumed by male and female partiers across Self-Serve and Bartender conditions during consecutive 15 minute intervals.

females consumed 5.4 (n=18) and 4.8 (n=14) cups of mixed drinks and beer, respectively. Beer drinkers in the Bartender condition consumed an average of 6.0 total cups (n=23), compared to an average of 8.6 cups (n=18) for those beer drinkers who served themselves. Partiers' drinking mixed drinks consumed an average of 6.4 cups (n=19) in the Bartender condition, compared to an average of 4.9 cups (n=7) for those who mixed their own alcoholic beverages. A 2 Delivery Condition (Bartender vs. Self-Serve) x 2 Beverage Type (Beer vs. Mixed Drinks) x 2 Gender ANOVA indicated a significant main effect for only gender, $F(1,60)=15.35$, $p<.05$, and a significant Delivery Condition by Beverage interaction, $F(1,60)=4.38$, $p<.05$.

As shown in Figure 13, the Beverage x Delivery interaction was due to prominently more cups of beer than mixed drinks consumed in the Self-Serve than in the Bartender Condition. A post-hoc comparison of these differences using Scheffe's test revealed a significant difference ($p<.05$) in number of cups consumed for partiers drinking beer versus mixed drinks in the Self-Serve condition. This effect of greater beer consumption by partiers who served themselves appears markedly greater for males than females, but as with the rate data, the

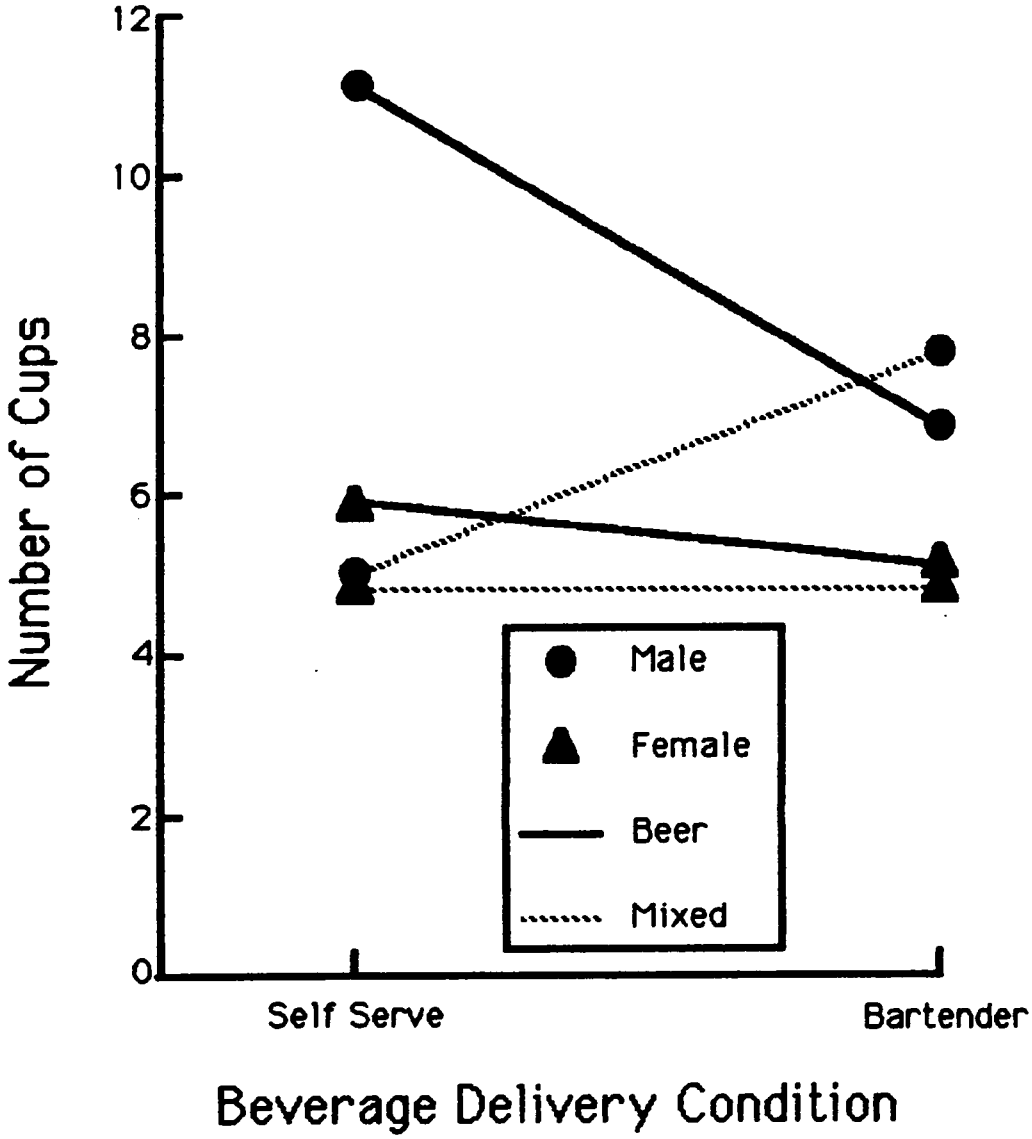

Figure 13. Cups of beer and mixed drinks served to males and females across Self-Serve and Bartender conditions.

third-order interaction term was not significant at the .05 level, $F(1,66)=3.65$, $.05<p<.061$.

Rate of shot consumption. Since consumers of mixed drinks at this party could receive more than one shot of alcohol (either from a bartender or the self-serve table), the cup data were adjusted to reflect extra shots per cups. 92% of the males (n=11) and 36% of the females (n=5) had at least one beverage cup with more than one shot of alcohol. As shown in Figure 14, the rate of obtaining extra shots per cup was equivalent for the Self-Serve and Bartender Conditions, and was higher for males than females. The 2 Delivery Condition (Bartender vs. Self Serve) x 2 Beverage Type (Beer vs. Mixed Drinks) x 2 Gender ANOVA for shots per hour indicated only a main effect of gender, $F(1,57)=12.90$, $p<.05$, with males consuming an average of 3.3 shots per hour and females consuming an average of 2.4 shots per hour. The Beverage x Delivery Condition interaction did not reach the .05 significance level, $F(1,57)=3.00$, $.05<p<.089$.

Number of shots consumed. The data for number of shots revealed the same basic relationships as number of cups. Again, the effects of converting cups to shots resulted in increasing the level of alcohol consumption equivalently for the Self-Serve and Bartender conditions,

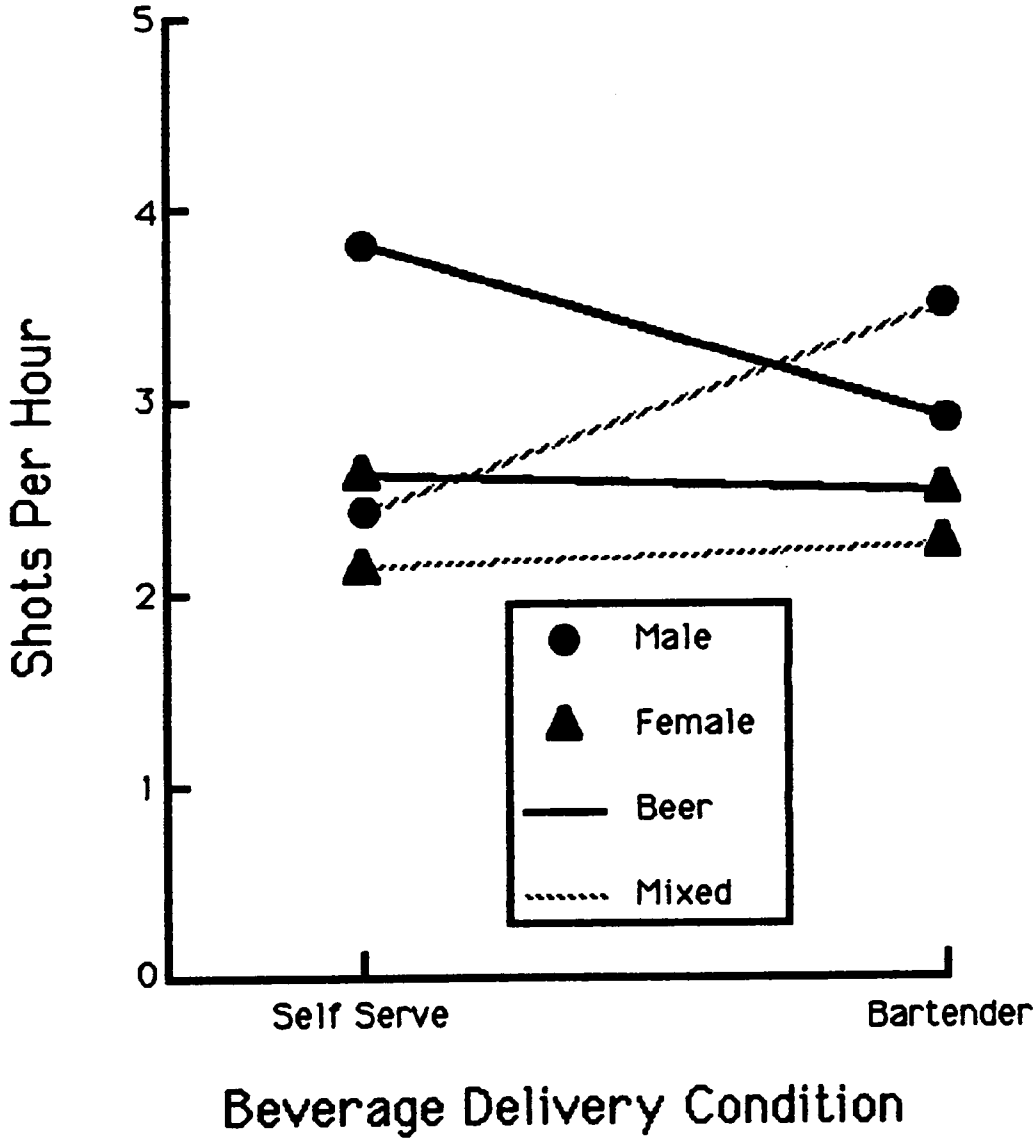

Figure 14. Shots per hour consumed by males and females consuming beer and mixed drinks across Self-Serve and Bartender conditions during 15 minute intervals.

and this increase was greater for males than females. The Beverage Delivery Condition (Self-Serve vs. Bartender) did not influence the addition of extra shots of alcohol to mixed drinks. The 2 Delivery Condition (Bartender vs. Self-Serve) x 2 Beverage Type (Beer vs. Mixed Drinks) x 2 Gender ANOVA indicated a significant main effect of gender $F(1,60)=26.87$, $p<.05$, and a nearly significant Beverage x Delivery Condition interaction, $F(1,60)=2.97$, $.05<p<.09$.

Blood Alcohol Concentration

A comparison of partiers' BAC readings obtained during the post-party interviews indicated consistent gender differences in levels of intoxication among subjects at the party. Males in both the Bartender and Self-Serve conditions had higher average exit BACs than did their female counterparts. Specifically, males in the Bartender and Self-Serve conditions had average exit BACs of .119 ($n=24$) and .105($n=11$), respectively. In contrast, females in the Bartender and Self-Serve conditions had average exit BACs of .067 ($n=18$) and .088 ($n=14$), respectively. A 2 Delivery Condition (Bartender vs. Self-Serve) x 2 Beverage (Beer vs. Mixed Drinks) x 2 Gender ANOVA indicated only a significant main effect for gender, $F(1,58)=5.80$, $p<.05$. There were no significant interactions.

Figure 15 depicts mean exit BAC as a function of gender and beverage delivery condition. The figure shows a greater gender difference in exit BAC for the Bartender than Self-Serve Condition, but this interaction was not reliable, $F(1,60)=2.74$, $.05<p<.103$.

Regression Analyses

Moderated procedure. It was expected that the relationship between partiers' specific intentions of drinking (obtained the night of the party) and the number of cups consumed, and between specific intentions of impairment (obtained the night of the party) and exit BAC would be moderated by LOC. Higher positive relations between specific intentions and behavior were expected for internals than for externals.

The simple correlations between specific intentions of drinking and number of cups consumed, and between specific intentions of impairment and exit BAC were .43 ($p<.0001$) and .67 ($p<.0001$), respectively. The simple correlations of LOC with measures of specific intentions (i.e., number of cups, and exit BAC) and LOC with the behavioral outcome measures (i.e., number of cups and exit BAC) were all nonsignificant (all $ps>.05$).

A moderated regression procedure was carried out using the following models:

Figure 15. Mean blood alcohol concentration for male and female partiers across Self-Serve and Bartender conditions.

Number of cups

Model 1

Cups = specific cups intention + LOC

Model 2

Cups = specific cups intention + LOC
+ specific cups intention x LOC

The test for contribution of the interaction term was not significant, $F(1,68)=.00$, $.05<p<.996$. The only significant contribution to the model was made by specific intentions ($p<.002$), with R^2 and adjusted R^2 values of .13 and .11, respectively.

Blood alcohol concentration

Model 1

exit BAC = specific impairment intention + LOC

Model 2

exit BAC = specific impairment intention + LOC
+ specific impairment intention x LOC

The test for the contribution of the interaction term was not significant $F(1,33)=.47$, $p<.50$. The only significant contribution to the model was made by specific intentions ($p<.0001$), with R^2 and adjusted R^2 values of .60 and .58, respectively.

Exploratory regression. A step-wise regression procedure was carried out to explore the potential for general intentions and specific intentions obtained at two points in time (i.e., two weeks prior to the party and on the night of the party) as predictors of alcoholic beverage consumption and BAC. It should be noted that the results of this procedure may be difficult to interpret because of a high degree of multicollinearity among these variables (i.e., simple correlations among the two measures of specific intentions and a general intention ranged from .60 to .74).

This exploratory procedure showed that specific intentions obtained the night of the party accounted for a significant portion of the variance in exit BAC (R^2 = .48). The other intention measures (i.e., general intentions and specific intentions obtained two weeks before the party) did not contribute significantly to the model. Specific intentions obtained the night of the

party also accounted for the greatest amount of variance in number of drinks consumed (R^2 = .15), when compared to the other intention measures.

Discussion

Party drinking was influenced by the procedure of delivering drinks. In fact, the hypothesis that mixed drinks would be consumed at a higher rate when delivered by bartenders, and beer would be consumed at a higher rate when self-served was supported when the dependent variable was cups of alcoholic beverages. Specifically, beer drinkers (especially males) consumed more cups of beers (and at a faster rate) when serving themselves than when served by a bartender, and consumers of mixed drinks (especially males) consumed more cups of mixed drinks when served by a bartender than when mixing their own alcoholic beverages.

The impact of the Beverage Delivery condition on beer versus mixed drink consumption was lessened substantially when taking into account the addition of extra shots of alcohol in mixed drinks. This increased the total alcohol consumption and rate of consumption for the mixed-drink partiers, and thus decreased the group differences. This finding does not detract, however, from a response cost interpretation of the Beverage x Delivery Condition interaction for beverage cups. In other words, the extra effort in mixing one's own mixed drink (rather than being served by a bartender) should have more impact on the

initial decision to obtain an alcoholic beverage, rather than the addition of extra alcohol. Once one starts to mix an alcoholic beverage or requests a bartender to prepare a mixed drink, minimal effort is required to add more alcohol or to ask the bartender for a "double" shot.

The BAC data indicated equivalent alcohol impairment for both beer drinkers and partiers who consumed mixed drinks, and for the Self-Serve and Bartender conditions. If extra shots had not been permitted, it is possible that beer drinkers would have shown the greatest level of alcohol impairment, especially males who served themselves (see Figure 12). Females drank significantly less cups of beer and mixed drinks than males, and were less apt to add shots of alcohol to their mixed drinks. As a result, females at this party reached significantly lower levels of BAC than males. This was the first party to show significantly lower BACs for females than males, however it should be noted that the degree of alcohol impairment for both males and females (e.g., mean exit BAC was .115 for males and .077 for females) was markedly higher at this party than any of the prior parties studied for this dissertation (e.g., overall mean BAC at the other parties was .065 for males and .062 for females).

It is instructive to consider a few environmental differences between this party and the prior parties, that may have contributed to the greater levels of alcohol impairment at the present party. First, this party was substantially more crowded, in terms of social density than the prior parties. More specifically, the amount of "party space" (i.e., area for dancing and drink acquisition) was about 5.6 sq ft per person at this party (mean BAC = .097), compared to 10.1 sq ft of party space per person at the parties in Experiment 1 (mean BAC = .069), 17.8 sq ft of party space per person at the Experiment 2 parties (mean BAC = .045), and 21.3 sq ft of party space per person at the party studied for Experiment 3 (mean BAC = .052). In fact, the acquisition of alcoholic beverages appeared more inconvenient at the latter, more crowded party.

At this party there was also minimal space to dance (on a 12 ft x 16 ft dance area) compared to the other parties with larger dance floors (20 x 20 ft for Experiment 1 and 20 x 30 ft for Experiment 2 and 3) and more party space per individual. In addition, dancing was promoted to a greater degree at the parties for Experiments 2 and 3 than for Experiment 4, since only these prior parties had hired a professional disc jockey

to play the tunes and announce "dance contests". The quality of the dance music was clearly the worst at the latter party with highest BACs.

Another environmental factor which may have contributed to differential alcohol consumption across parties was the attire of the partiers, which may have determined drinking intentions and behavior. That is, the attire at the last party was clearly most informal, with slacks (mostly levis) and shirts/blouses the norm. In fact, no male at this party wore a tie, and very few females wore a dress or skirt. In contrast, the partiers for Experiments 2 and 3 (the other parties that served mixed drinks) wore costumes according to a particular theme (i.e., "20,000 leagues under the sea" and "western cowboys"). The few partiers who did not wear a costume were most typically attired in semi-formal clothes (i.e., men wore slacks, sweater or tie and women wore dresses or blouses and skirts). Additional research is needed to determine more systematically whether these factors (e.g., spatial density, music quality, dancing frequency, and attire) contribute significantly to drinking rates and alcohol impairment in party settings.

It is instructive to consider the contribution of behavioral intentions for predicting alcohol consumption

and subsequent impairment at university parties. At the present party, specific behavioral intentions obtained the night of the party predicted a significant portion of the variance in number of cups consumed and exit BAC. These findings suggest that an assessment of partiers' specific intentions toward alcohol consumption and impairment just prior to the beginning of a party may be a practical tool for preventing DUI among partiers' in a university setting. The fact that partiers' impairment intentions were stronger predictors of behavior than were drinking intentions is noteworthy. Although college partiers' may be accurate in predicting the level of impairment they wish to reach at a party, they may not necessarily be accurate in predicting the amount of alcoholic beverage necessary to reach that level of impairment. Future research should address this issue.

General Discussion and Summary

This research introduced a methodology for assessing the impact of naturalistic environmental variables on the alcohol consumption and impairment of partiers. The methodology was applied at six fraternity parties and specific environment-behavior relationships were defined. Certain empirical questions, relevant to the understanding or prevention of excessive alcohol drinking and alcohol impaired driving, were addressed, and in some cases, answers were found. However, the research raised more questions than it answered, and as a result, provoked the need for follow-up study of drinking in party settings. The primary findings of this research are summarized by the following list:

1. Beer choice was affected by both taste and brand. Whereas students' drinking choices followed taste preferences when kegs were unlabeled, partiers' choice by brand was Bud Light and they rarely chose a keg with the LA (low alcohol) label. This implies prominent influence of marketing strategies for Bud Light and a need for rigorous and thoughtful marketing of LA beer.

2. When beer and mixed drinks were available, there were some higher consumption rates for beer; however, the blood alcohol concentration (BAC) of beer drinkers and

mixed-drink consumers were never signficantly different. Thus beer drinkers were not more at risk for DUI than those who consumed mixed drinks, as implied previously from survey research (Berger & Snortum, 1986).

3. The serving of lower-alcohol beverages (i.e., LA beer or 7/8 oz shots) without partiers' knowledge resulted in significantly lower BACs among those who consumed the low alcohol beverages. While there was a tendency in some cases for drinking rates to be somewhat higher for low-alcohol beverages compared to those with standard alcohol content, this slight evidence of titration was not enough to offset lower impairment from lower alcohol-content beverages. These findings suggest potential benefits from serving low alcohol beer and weaker mixed drinks unbeknownst to partiers. Further research is needed, however, to assess systematically whether partiers can discriminate the lower-alcohol beverages when only these are available. During a party there may be optimal times for substituting the low-alcohol alternatives. Although males usually consumed more alcoholic beverages than females, males were not more at risk than females for DUI when leaving a party. In fact, when measures of BAC indicated a gender effect, this was often due to higher BACs among females than males. This suggests a need to

educate coeds about their greater susceptibility to alcohol impairment when consuming alcohol at the same rate as males. Thus, it is risky for females to match alcohol consumption with male counterparts, and such drink pacing is probable among mixed-sex couples.

4. The procedures for serving alcoholic beverages (i.e., bartender-service vs. self-service) influenced the relative consumption of beer versus mixed drinks according to a convenience or response cost interpretation. Beer was consumed at a higher rate when partiers could serve themselves than when beer was served by a bartender. On the other hand, the rate of requesting mixed drinks was higher when bartenders mixed the drinks than when partiers had to mix their own alcoholic beverages. This interaction between drink type and drink delivery mode was more prominent for males than females, although not significantly so. Follow-up research is needed to study this potential gender effect further and to investigate the effect of including standard shot-measuring devices on the liquor bottles. The presence of these devices on the self-service liquor containers in the current research may have limited the amount of alcohol used when partiers prepared their own beverages. Given the extent to which extra "shots" of alcohol were added to mixed drinks, it is

possible that drinks would have been even more potent if the measuring devices did not limit each pour of the liquor bottle to 1 1/4 oz of alcohol.

5. A comparison of drinking rates across experiments suggested that certain environmental factors contribute to excessive alcohol consumption, including high spatial density, insufficient dance-floor space, and informal attire. It is important to consider, however, that this conclusion is essentially based on a comparison of the drinking during the first three experiments with that observed during the one party of Experiment 4. In fact, the excessive drinking at the final party may have been due to a variety of other factors that were specific to this party, including, for example, the particular fraternal organization (labeled as one of the more "rowdy" groups), the season or weather (a pleasant spring evening), and the particular night of the party (i.e., Friday night). All of the other parties (in Experiments 1 through 3) occurred on Saturday night. Thus, the present research represents an initial step toward cataloging party drinking according to specific situational variables, and the findings indicate that this is a worthwhile endeavor but is only a first approximation to identifying situational determinants of excessive

consumption of alcoholic beverages at university-student parties.

6. Specific intentions to drink certain alcoholic beverages and reach desired levels of alcohol impairment were reliable predictors of actual consumption and impairment (i.e., the amount of variance in exit BAC accounted for was more than 50%). This result supports the need for further investigation of behavioral intentions as predictors of alcoholic beverage consumption and impairment in party settings.

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Appendix A

Data sheets used to record observations for alcoholic consumption

Drinking Rate Data -- BEER

Page ___ of ___

Observer #1 ______________________________ Date ________________

Observer #2 ______________________________ Time ________________

Badge	Time	Badge	Time	Badge	Time

Drinking Rate Data -- MIXED DRINKS

Page ___ of ___

Observer #1 ______________________ Date ______________

Observer #2 ______________________ Time ______________

Badge	Time	Beverage	Badge	Time	Beverage

Appendix B

Informed consent and interview forms for Experiment 1

I will not hold KA, the University, or any representative thereof responsible for events that occur as a result of my alcohol consumption this evening. I am aware that free transportation is available and will be offered to me if I am over the legal blood/breath alcohol limit for driving (BAC > 0.05 = impaired; BAC > 0.10 = legally intoxicated) upon departure.

Name _____

Date _____

Witness _____

ENTRANCE INTERVIEW - UNLABELED

CONDITION XYZ

BADGE # _____ BAC _____ M F WEIGHT _____ TIME _____

Which do you prefer to drink tonight? _____

Why? _____

_____

Rank X Y Z in order of taste preference _____ _____ _____

CONDITION XYZ

BADGE # _____ BAC _____ M F WEIGHT _____ TIME _____

Which do you prefer to drink tonight? _____

Why? _____

_____

Rank X Y Z in order of taste preference _____ _____ _____

CONDITION XYZ

BADGE # _____ BAC _____ M F WEIGHT _____ TIME _____

Which do you prefer to drink tonight? _____

Why? _____

_____

Rank X Y Z in order of taste preference _____ _____ _____

EXIT INTERVIEW - UNLABELED

Badge # _____ Time _____ BAC _____

How many cups did you have of A? _____

How many cups did you have of B? _____

How many cups did you have of C? _____

Badge # _____ Time _____ BAC _____

How many cups did you have of A? _____

How many cups did you have of B? _____

How many cups did you have of C? _____

Badge # _____ Time _____ BAC _____

How many cups did you have of A? _____

How many cups did you have of B? _____

How many cups did you have of C? _____

Badge # _____ Time _____ BAC _____

How many cups did you have of A? _____

How many cups did you have of B? _____

How many cups did you have of C? _____

ENTRANCE INTERVIEW -- LABELED

I will not hold KA, the University, or any representative thereof responsible for events that occur as a result of my alcohol consumption this evening. I am aware that free transportation is available and will be offered to me if I am over the legal blood/breath alcohol limit for driving (BAC > 0.05 = impaired; BAC > 0.10 = legally intoxicated) upon departure.

Name _____

Date _____

Witness _____

BADGE # _____ BAC _____ M F WEIGHT _____ TIME _____

CONDITION ZXY

Which do you prefer to drink tonight? _____

Why? _____

_____

Rank X Y Z in order of taste preference _____ _____ _____

EXIT INTERVIEW - LABELED

Badge # _____ Time _____ BAC _____

How many cups did you have of Bud? _____

How many cups did you have of Bud Light? _____

How many cups did you have of LA? _____

Badge # _____ Time _____ BAC _____

How many cups did you have of Bud? _____

How many cups did you have of Bud Light? _____

How many cups did you have of LA? _____

Badge # _____ Time _____ BAC _____

How many cups did you have of Bud? _____

How many cups did you have of Bud Light? _____

How many cups did you have of LA? _____

Badge # _____ Time _____ BAC _____

How many cups did you have of Bud? _____

How many cups did you have of Bud Light? _____

How many cups did you have of LA? _____

Appendix C

Informed consent and interview forms for Experiment 2

Preference Study

CONSENT FORM

I will not hold the Corps of Cadets, the German Club, the University, or any representative thereof responsible for the events that occur as a result of my alcohol consumption this evening. I am aware that free transportation is available and will be offered to me if I am over the legal blood/breath alcohol limit for driving (BAC > 0.05 = impaired; BAC > 0.10 = legally intoxicated) upon departure.

Name _____

Date _____

'Witness _____

Badge * _____ M F Weight _____
(last 4 digits of Social Security #)

BAC _____ TIME _____

What alcoholic beverage(s) did you drink tonight?

Type _____ _____ _____

amount _____ _____ _____

What time did you start drinking tonight? _____

Which of the following beverages do you intend to drink tonight?

BEER MIXED DRINKS NON-ALCOHOLIC

Why? _____

How did you get here?

Drove: own car _____ borrowed car _____

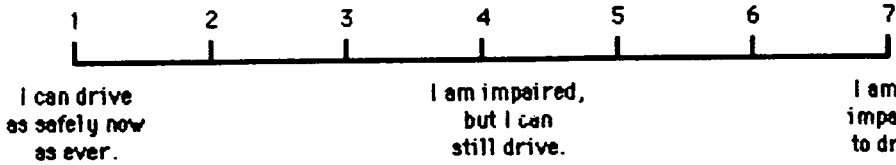
Rode with someone else _____

Bus _____

Walked _____

Other _____

Rate your current driving ability on this scale. Circle one number.



Badge # _____ Time _____ BAC _____ Badge Color: Red Green

Which beverage did you drink tonight? Beer Mixed Drinks Type _____

How many cups/drinks did you have? _____

How are you getting home? Drive own car | Drive another person's car | Got a ride | bus | other

Beverage Preference Study - German Club Spring
Consent Form

I will not hold the German Club, the University, or any representative thereof responsible for the events that occur as a result of my alcohol consumption this evening. I am aware that free transportation is available and will be offered to me if I am over the legal blood/breath alcohol limit for driving (BAC > 0.05 = impaired; BAC > 0.10 = legally intoxicated) upon departure.

Name _____

Date _____

Witness _____

Badge # _____ M F Weight _____ BAC _____ TIME _____

What alcoholic beverage(s) did you drink tonight?

Type _____ _____ _____

amount _____ _____ _____

What time did you start drinking tonight? _____

Which of the following beverages do you intend to drink tonight?

BEER MIXED DRINKS NON-ALCOHOLIC

Why? _____

How did you get here?

Drove: own car _____ borrowed car _____

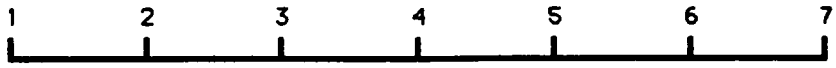
Rode with someone else _____

Bus _____

Walked _____

Other _____

Rate your current driving ability on this scale. Circle one number.



I can drive as safely now as ever. | I am impaired, but I can still drive. | I am too impaired to drive.

Question: Are you right- or left-handed? Right Left

Stopwatch Stopping Test

* Tell the subject that the object of this task is to stop the watch as close to 13 seconds as he/she can.
* Each Subject should stop the watch only once.
* If the subject is right handed have him/her use the left hand and vice versa.
* Start the watch for the subject and hand him/her the watch.
* After the subject has stopped the watch, record the time below.
* The seconds are in the box at the right. Fractions of seconds are just above the box.

The subject stopped the watch at _____._____seconds.

One Leg Stand

* Subject is to stand with both feet together, arms at his/her sides.
* Ask subject to - Raise your leg 6 inches from the ground.
  - Count one-thousand-one, one-thousand-two, etc.
* Start you stopwatch. Check the behaviors you observe the subject do.
* The test is complete if the subject puts his/her foot down three times, or 30 seconds elapse on your watch.

Put Foot Down _____
Swayed When Balancing _____
Used Arms for Balance _____
Hopping _____
Unable to do Task _____
(foot down 3+ times)

Badge #_____ Time _____ BAC_____ Badge Color: Red Green

Which beverage did you drink tonight? Beer Mixed Drinks Type

How many cups/drinks did you have? _____

Did you have any snacks at the party tonight? Yes No

Using the Scale below. How much snack food did you eat during the party?

I didn't eat very much. | I ate a moderate amount. | I ate a lot of snacks tonight.

Appendix D

Informed consent and interview forms for Experiment 3

Informed Consent/Entrance Interview Badge # _____

I will not hold the German Club, the University, or any representative thereof responsible for the events that occur as a result of my alcohol consumption this evening. I am aware that free transportation is available and will be offered to me if I am over the legal blood/breath alcohol limit for driving (BAC > 0.05 = impaired; BAC > 0.10 = legally intoxicated) upon departure.

Name: _____

Date: _____

Witness: _____

Please write the following phrase on the line below to indicate that you understand this consent form:

I have read and understand the above statement.

Circle the beverage you intend to drink tonight?

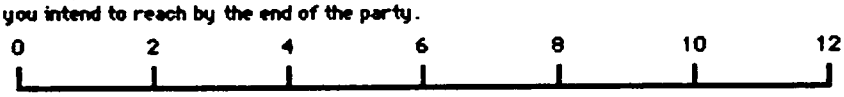
Beer Mixed Drinks Non-alcoholic

If you chose Mixed Drinks or non-alcoholic beverages, please indicate from the list of alcoholic and non-alcoholic beverages that were available tonight, the one(s) you drank tonight:

Alcohol Type	Mixers	Beverage(s consumed):
Bourbon	Coke	1) _____
Gin	Diet-Coke	2) _____
Rum	Orange Juice	3) _____
Vodka	Sprite	4) _____
	Tonic Water	

How many cups/drinks did you drink tonight? _____

Please put an "X" on the scale below to mark the level of alcohol impairment you intend to reach by the end of the party.



0 completely sober (BAC = .00)
2 slightly impaired (BAC = .02)
4 moderately impaired (BAC = .04)
6 impaired (BAC = .06)
8 moderately drunk (BAC = .08)
10 legally drunk (BAC = .10)
12 completely wasted (BAC ≥ .12)

How did you get here?

___ Drive my own car
___ Drive a borrowed car
___ Ride with someone else
___ Bus
___ Walk
___ Other_____

How do you intend to get home?

___ Drive my own car
___ Drive a borrowed car
___ Ride with someone else
___ Bus
___ Walk
___ Other_____

_____

Exit Interview Badge # _____

Now that the party has ended, I am aware that free transportation is available and will be offered to me if I am over the Legal breath alcohol limit for driving (BAC > 0.10 = Legally Intoxicated) upon departure.

Date: _____

Witness: _____

Please write the following phrase on the line below to indicate that you understand this consent form:

I have read and understand the above statement.

Time Badge Color: Green Red

Circle the beverage you drank tonight?

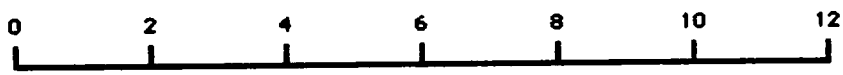
Beer Mixed Drinks Non-alcoholic

If you chose Mixed Drinks or non-alcoholic beverages, please indicate from the list of alcoholic and non-alcoholic beverages that were available tonight, the one(s) you drank tonight:

Alcohol Type	Mixers	Beverage(s consumed):
Bourbon	Coke	1) _____
Gin	Diet-Coke	2) _____
Rum	Orange Juice	3) _____
Vodka	Sprite	4) _____
	Tonic Water	

How many cups/drinks did you drink tonight? _____

Please indicate your current level of alcohol impairment on the scale below:

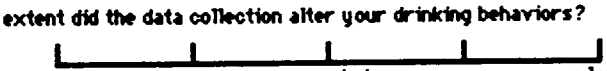


0 completely sober (BAC = .00)
2 slightly impaired (BAC = .02)
4 moderately impaired (BAC = .04)
6 impaired (BAC = .06)
8 moderately drunk (BAC = .08)
10 legally drunk (BAC = .10)
12 completely wasted (BAC ≥ .12)

How do you intend to get home?

___ Drive my own car ___ Bus
___ Drive a borrowed car ___ Walk
___ Ride with someone else ___ Other

To what extent did the data collection alter your drinking behaviors?



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Appendix E

Informed consent and interview forms for Experiment 4

Consent Form

I will not hold Sigma Nu, Viginia Tech, or any representative thereof responsible for the events that occur as aresult of my alcohol consumption this evening. I am aware that free transportation is available and will be offered to me if I am over the legal blood/breath alcohol limit for driving (BAC > 0.10 = legally intoxicated) upon departure.

Name: _____

Date: _____

Witness: _____

Badge # _____

_____

Please write the following phrase on the line below to indicate that you understand this consent form:

I have read and understand the above statement.

_____

_____
Signature

Entrance Questionnaire

Badge # (Last four digits of your student I.D. number) __ __ __ __

Weight ____ Age ____ Today's Date ____/____/____ Time _____ BAC ____

Gender ____

Given that both beer and mixed drinks will be served at Tonight's party, which of the beverage types listed below do you intend to drink?

beer mixed drinks both neither

If you intend to drink mixed drinks, which type of mixed drink?

_____

(i.e., given that bourbon, gin, rum, and vodka are available).

How many 9 ounce cups (1 shot of alcohol = 9 oz of mixed drink) do you intend to drink of each drink alternative?

beer _____ mixed drinks_____ non-alcoholic beverages _____

Circle the number below that reflects how impaired you intend to get at tonight's party.

1. completely sober
2. slightly impaired
3. moderately impaired
4. impaired
5. moderately drunk
6. legally drunk
7. completely "wasted"

Exit Questionnaire

Badge # (Last four digits of your student I.D. number) _ _ _ _

Weight ____ Age ____ Today's Date ____/____/____ Time _____ BAC ____
M D Y

Gender ____

Given that both beer and mixed drinks were served at tonight's party, which of the beverage types listed below did you drink?

beer mixed drinks both neither

If you drank mixed drinks, which type of mixed drink? _____
(i.e., given that bourbon, gin, rum, and vodka were available).

How many 9 ounce cups (1 shot of alcohol = 9 oz. of mixed drink) did you drink of each drink alternative?

beer ____ mixed drinks ____ or shots non-alcoholic beverages ____

Circle the number below that reflects how impaired you are now.

1 completely sober
2 slightly impaired
3 moderately impaired
4 impaired
5 moderately drunk
6 legally drunk
7 completely "wasted"

Transportation

I am aware that free transportation is available and will be offered to me if I am over the legal blood/breath alcohol limit for driving (BAC > 0.10 = legally intoxicated) upon departure.

Name: _____

Date: _____

Witness: _____

Badge # _____

Please write the following phrase on the line below to indicate that you understand this consent form:

I have read and understand the above statement.

_____

_____
Signature

Appendix F

Party questionnaire and personal belief questionnaire

Personal Belief Questionnaire

Confidential

This is a questionnaire to find out the way in which certain events in our society affect different people. Each item consists of a pair or alternates numbered 1 or 2. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief; obviously there are no right or wrong answers.

Your answers to the items on this inventory are to be recorded on the opscan form. Print your ID number on the opscan sheet and then blacken the appropriate numbers.

Please answer these items carefully, but do not spend too much time on any one item. Be sure to find an answer for every choice. Find the number of the item on the opscan sheet and indicate your choice by blackening "1" or "2" next to the appropriate item.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you're concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices. As soon as you have finished reading these instructions you may begin.

REMEMBER

Select that alternative which you personally believe to be more true.

For each item select the appropriate alternative for you and mark circle 1 or 2 on the opscan sheet.

I strongly believe that:

1. 1. Children get into trouble because their parents punish them too much.
   2. The trouble with most children nowadays is that their parents are too easy with them.

2. 1. Many of the unhappy things in people's lives are partly due to bad luck.
   2. People's misfortunes result from the mistakes they make.

3. 1. One of the major reasons why we have wars is because people don't take enough interest in politics.
   2. There will always be wars, no matter how hard people try to prevent them.

4. 1. In the long run, people get the respect they deserve in this world.
   2. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5. 1. The idea that teachers are unfair to students is nonsense.
   2. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. 1. Without the right breaks, one cannot be an effective leader.
   2. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. 1. No matter how hard you try, some people just don't like you.
   2. People who can't get others to like them don't understand how to get along with others.

8. 1. Heredity plays the major role in determining one's personality.
   2. It is one's experiences in life which determine what they're like.

9. 1. I have often found that what is going to happen will happen.
   2. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. 1. In the case of the well-prepared student, there is rarely if ever such a thing as an unfair test.
    2. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. 1. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
    2. Getting a good job depends mainly on being in the right place at the right time.

12. 1. The average citizen can have an influence in government decisions.
    2. This world is run by the few people in power, and there is not much the little guy can do about it.

13. 1. When I make plans, I am almost certain that I can make them work.
    2. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. 1. There are certain people who are just no good.
    2. There is some good in everybody.

15. 1. In my case, getting what I want has little or nothing to do with luck.
    2. Many times we might just as well decide what to do by flipping a coin.

16. 1. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    2. Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.

17. 1. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.
    2. By taking an active part in political and social affairs the people can control world events.

18. 1. Most people don't realize the extent to which their lives are controlled by accidental happenings.
    2. There really is no such thing as "luck".

19. 1. One should always be willing to admit his mistakes.
    2. It is usually best to cover up one's mistakes.

20. 1. It is hard to know whether or not a person really likes you.
    2. How many friends you have depends upon how nice a person you are.

21. 1. In the long run, the bad things that happen to us are balanced by the good things.
    2. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. 1. With enough effort we can wipe out political corruption.
    2. It is difficult for people to have much control over the things politicians do in office.

23. 1. Sometimes I can't understand how teachers arrive at the grades they give.
    2. There is a direct connection between how hard I study and the grade I get.

24. 1. A good leader expects people to decide for themselves what they should do.
    2. A good leader makes it clear to everybody what their jobs are.

25. 1. Many times I feel that I have little influence over the things that happen to me.
    2. It is impossible for me to believe that chance or luck plays an important role in my life.

Vita

Michael J. Kalsher

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