Determinants of Alcohol Intoxication and Social Responsibility for DUI-Risk at University Parties

by

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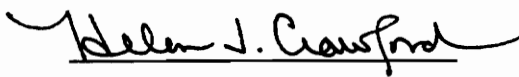
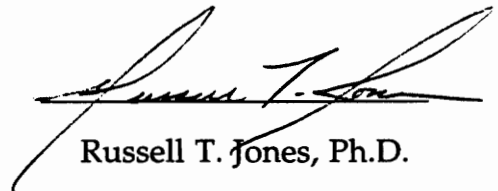DOCTOR OF PHILOSOPHY

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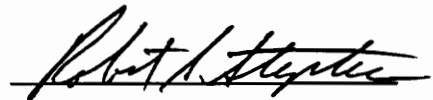
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Abstract

Alcohol abuse among youth and young adults and accompanying undesirable behaviors (e.g., physical aggressiveness, vandalism, date rape, DUI) is a significant public health problem. This field research examined various intervention techniques for reducing excessive alcohol consumption in party settings. Prior to four fraternity parties, students' drinking intentions, lifestyles, and person characteristics (i.e., self-esteem, optimism, personal control, group cohesion, sensation seeking) were measured. Before and after the fraternity parties, students' blood alcohol concentration (BAC) was objectively assessed with a breathalyzer. During the fraternity parties, students' participation in various intervention techniques was systematically observed. The impact of the intervention process for reducing the risk of DUI was assessed with both within-subject and between-subject comparisons. That is, two fraternities and two sororities participated in two successive parties, one with the intervention process and the other as a control (with a balanced AB vs. BA format). It was hypothesized that the intervention techniques would reduce excessive alcohol consumption and DUI risk from comparisons within the same fraternity/sorority and between two different fraternities/sororities. It was also hypothesized that students' behavioral

intentions to consume alcohol would predict their subsequent drinking behavior at a party. The intervention phase of the research was not successful in reducing overall intoxication rates at the fraternity parties studied. Students' intentions to consume alcohol, however, was a significant predictor of intoxication rates, accounting for 28 percent of the variance of exit BAC across all parties. Implications of this research for the design of future interventions aimed at curtailing the excessive use of alcohol among young adults are discussed.

Acknowledgments

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The Problem

Alcohol abuse among youth and young adults and accompanying undesirable behaviors (e.g., physical aggressiveness, vandalism, date rape, DUI) is a significant public health problem (Laurence, Snortum, & Zimring, 1988). Driving under the influence of alcohol (DUI), for example, is the number one killer of young people in America (NHTSA, 1993). Several factors contribute to the over-representation of youth in alcohol-related crashes. Teenagers have had relatively little experience with drinking alcohol, driving, and DUI (Williams, Lund, & Preusser, 1988). Teenagers are also susceptible to detrimental peer influence and may exhibit negative reactions to parental advice (Russ & Geller, 1985). The Insurance Institute for Highway Safety (1984) surveyed over 46,000 high school students from across the U.S., and found that by age 17 nearly half of the males and one-third of the females reported driving after drinking alcoholic beverages at least once in the past month.

In a national survey of students at 140 colleges in 1993, Wechsler and his colleagues (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994) found that 44% of the 17,592 students responding to the survey were binge drinkers (defined as having five or more drinks in a row for males and four or more drinks in a row for females during the two weeks prior to the survey). Further, 19% of the students were frequent binge drinkers (defined as binge drinking three or more times during the two weeks prior to the survey), and these students were more likely to experience serious health

problems and other negative consequences from their drinking behavior than were other students.

Archival data indicate that after 18- and 19-year-olds consume alcohol in any amount, their relative probability of a crash is four to nine times higher than for older drivers (Farris, Malone, & Lilliefors, 1976). This observation was supported by an analysis of 29,000 records in the Fatal Accident Reporting System (FARS). The analysis showed that 25 percent of teenage drinkers and drivers involved in fatal crashes had BACs greater than 0 but less than .10, compared to 15 percent of drivers aged 20-29, and 16 percent of those 30 and older (Voas & Fell, 1984).

Effective control of excessive alcohol consumption and its accompanying health and safety risks requires, in part, an analysis of drinking as a target behavior that can be changed within specific environmental contexts. More specifically, the modification of certain physical or social contexts for drinking can decrease alcohol abuse and concomitant risks (e.g., DUI, aggression, vandalism, unsafe sex). Cost-effective intervention techniques are needed, however, to establish environmental and social factors capable of decreasing excessive alcohol consumption in settings where such behavior is probable (Geller, Elder, Hovell, & Sleet, 1991; Geller & Lehman, 1988). Also needed are indigenous individuals (i.e., intervention agents) to implement the intervention techniques (Geller, 1992; Geller, Berry, Ludwig, Evans, Gilmore, & Clarke, 1990a; Geller, Ludwig, Gilmore, & Berry, 1990b).

Educational Approaches to Behavior Change

The relationship of DUI to "cognitive" aspects of drinking (e.g., attitudes, beliefs, intentions, and knowledge) has often been explored with questionnaires; and many DUI countermeasures are based on the assumption that changes in knowledge or attitudes result in behavior change (Zaks-Walker & Larkin, 1976). Vingilis (1984), however, suggested that changes in knowledge and attitudes about alcohol and DUI do not result necessarily in concomitant changes in drinking and driving behavior; and a number of studies in social psychology have supported a lack of correspondence between verbal statements of belief and actual behavior (Deutscher, 1966; Wicker, 1969). The National Highway Traffic Safety Administration's evaluation of the Alcohol Safety Action Program (ASAP), for example, indicated that ASAP increased knowledge about alcohol impairment and influenced beneficial changes in relevant attitudes, but it did not result in a significant decrease in DUI arrests or crash involvement among the program participants (US Department of Transportation, 1975).

Evaluations of other education and information programs designed for the general public have shown that modifications in knowledge and attitudes are not related consistently to changes in DUI (Wilde, 1976). As a result, Geller et al. (1991) suggested public health professionals place less emphasis on interventions that promote knowledge, and focus more attention on drinking behavior and the environments in which drinking and driving occur. However, it is possible that educational interventions by peers at the time and place that alcohol consumption is occurring will have beneficial impact. This is analogous to placing product promotion signs at the place of

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purchase (i.e., "point-of-purchase" advertising), which is the most cost-effective advertising technique (Geller, Winett, & Everett, 1982; Tillman & Kirkpatrick, 1972). This "point-of-purchase" educational approach is a component of the reported research.

Situational Manipulations for Intervention

The influence of environmental antecedents and consequences on behavior has long been documented in health behavior-change studies (cf. Elder, Geller, Hovell, & Mayer, 1994; Winett, King, & Altman, 1990). Clearly, the environmental context in which drinking occurs plays an important role in the precipitation of alcohol abuse and accompanying risk behaviors. In many respects, the "party" environment is an ideal setting for introducing intervention techniques to control alcohol consumption. For example, parties provide opportunities to: a) serve low-alcohol or non-alcoholic beverages, b) administer field sobriety tests, or c) make BAC breathalyzers available.

Among peers and friends at parties beneficial interactive discussions could be stimulated to provide the rationale and support for certain interventions designed to reduce excessive alcohol consumption and various undesirable consequences of alcohol impairment. In fact, such interaction among friends might result in practical refinements of intervention procedures to control alcohol abuse. Actually, about as much alcohol consumption occurs at parties or social gatherings as in bars or tavern settings (O'Donnell, 1985).

High school and college environments often provide a "captive audience" for increasing group awareness of alcohol abuse, and for

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influencing social norms and behaviors to control excessive alcohol consumption. Advocacy groups such as SADD (Students Against Drunk Driving), RID (Reduce Impaired Driving), MADD (Mothers Against Drunk Driving), and BACCHUS (Boost Alcohol Consciousness Concerning Health of University Students) have been among the most innovative and active in helping to curb drinking and driving (McCarthy & Harvey, 1988). Members of these and other organizations are intrinsically motivated to implement interventions for reducing alcohol consumption and preventing DUI (Sleet, Wagenaar, & Waller, 1989). As briefly reviewed below, some intervention techniques have been developed to motivate reduced alcohol consumption in settings where drinking occurs, but the research has been minimal and the findings preliminary and sometimes equivocal (Geller, 1990, 1992; Geller et al., 1991; Geller & Lehman, 1988). The reported research builds upon this literature, particularly with regard to the refinement of intervention procedures for use at university parties.

Field sobriety tests. Since alcohol affects performance adversely along several dimensions, including reaction time and standing steadiness (e.g., see Carpenter, 1962 for a review), Geller and Russ (1986) proposed that behavioral tests of impairment be used in a social context to determine a person's level of alcohol impairment. These investigators studied the validity of their thesis by asking students at college beer parties to participate in simple behavioral tasks that might reflect alcohol impairment (Geller & Russ, 1986; Russ & Geller, 1986). The tests were refined from those studied in the laboratory, and were designed for easy administration and scoring. For example, partiers were asked to catch a ruler as it dropped between their thumb and forefinger.

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The number of inches it fell was used to estimate reaction time. In addition, the same subjects were asked to participate in a 5-step, progressive body balance task. Participants were given points for maintaining their balance at each successively difficult level of the task.

Performance on both the ruler drop and body balance tasks contributed significantly to the prediction of actual BAC. Several partiers reported that poor performance on these tasks would dissuade them from driving. Unfortunately, such favorable reaction to the field sobriety tests decreased as a participant's BAC increased. Additional research has been accomplished in this intervention domain (Geller, Kalsher, & Clarke, 1991; Streff, Geller, & Russ, 1989), but much more is needed to investigate how simple performance tests can be used to encourage alcohol-impaired individuals not to drive. Actually, field sobriety tests might be more valid than BAC as an index of performance deficits related to driving (Johnson, 1983; Russ & Geller, 1986). Furthermore, simple field sobriety tests could be administered by party hosts, drink servers, or friends, in order to enhance a respondent's awareness of the debilitating effects of excessive alcohol consumption.

Self-administered BAC meters. Minimal user effort is required to obtain accurate BAC measurements from the relatively inexpensive, portable breath analyzer (Picton, 1979). Such devices can be purchased, borrowed, or made available in drinking establishments for providing immediate, individualized BAC feedback to guide individuals in their drinking/driving decisions. However, research assessing the utility of BAC meters has not been entirely favorable (e.g., see review by Russ, Geller, & Leland, 1989). For example, in a field study with DUI information provided to bar patrons, Oates

(1976) reported that subjects who received BAC feedback were no more likely to use public transportation services (e.g., bus or taxi) than were non-participants.

Even if the use of BAC feedback meters is shown to reduce DUI substantially, large-scale application of these devices depends on public acceptance. To assess public acceptance of BAC monitors, Vayda and Crespi (1981) conducted focus groups, administered questionnaires, and held meetings with special interest groups. The results of this study showed general skepticism and non-receptivity toward BAC monitors. Many judged the feedback concept as ineffective for people who DUI, because self-monitoring requires a high degree of rational decision making. Others felt that BAC feedback devices would be used primarily by those who are already responsible about their drinking and driving. It was generally believed that patrons who could benefit from the BAC feedback would not use the device or would choose not to heed its warning. However, if such feedback were accompanied by peer support from an "actively caring" intervention agent, the beneficial consequences of BAC feedback might increase dramatically. The present research studied this possibility by offering BAC feedback under public vs. private circumstances.

Distributing BAC nomograms. Normative values can be used to estimate one's BAC from body weight and the number of drinks consumed within two hours. A 120-pound individual who consumes four 12-oz beers in two hours, for example, could have a BAC of .10 percent (US Department of Transportation, 1979). Nomograms have been printed on key chains, bar napkins, and used as mail stuffers, and they have been distributed nationwide

as part of certain drunk-driving campaigns. Even though nomogram scales were derived from carefully controlled laboratory research, O'Neill, Williams, and Dubowski (1983) showed that the range of BACs for a given weight and within a certain period can vary greatly. As a result, nomograms may lead drinkers to under- or overestimate their BAC significantly (Waller, 1986). In the case of underestimation, nomograms may actually increase the chance of DUI. Therefore, it has been suggested that nomograms be removed from circulation and a better index of alcohol impairment be developed (Dubowski, 1984).

Glindemann and Geller (1994) tested the impact of nomograms in a party setting. In this research, 48 subjects used nomograms to aid them in predicting their BACs. Subjects significantly over-estimated their BACs at all intoxication levels when using the nomogram. In contrast, in an earlier study by Russ, Harwood, and Geller (1986), when subjects did *not* use a nomogram when estimating their BAC, they under-estimated their BACs at low and moderate levels of intoxication, and over-estimated their BAC *only* at high levels of intoxication. These comparisons suggest that nomograms could reduce the risk of DUI. Similar comparisons were studied in the reported research, in order to gain a better understanding of the utility and social validity of distributing nomograms in party settings.

Server intervention. In response to "Dram Shop" laws, which hold tavern owners liable if they serve alcohol to an intoxicated person who is later involved in a crash, many training programs have been developed to teach servers of alcoholic beverages ways to control consumption and reduce DUI (Mosher, 1979, 1983; Peters, 1986). Most intervention training programs

teach servers to identify the specific warning signs that indicate when a customer has overindulged. Servers learn to use a variety of impairment-reduction tactics, including offering food, delaying alcoholic drink service, 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 (*Alcohol, Health, & Research World*, 1986).

Although a number of server intervention training programs are available and have been widely distributed throughout the U.S. since 1984 (see reviews by Geller et al., 1991; Geller & Lehman, 1988), research designed to evaluate the impact of such programs has been minimal (Geller, Russ, & Delphos, 1987; McKnight, 1987; Russ & Geller, 1987; Saltz, 1986, 1987). Although the findings from this field research were equivocal, they were promising. Each investigator concluded that management policies, environmental contingencies, and interpersonal interventions are needed to increase the impact of server intervention training and assure long-term maintenance of the training principles (cf. Saltz, 1989).

The intervention techniques and guidelines developed from the reported research could provide practical information for improving this approach to reducing alcohol abuse. The theoretical/conceptual findings could provide insight into developing more effective server intervention training. For example, a valid "actively caring model" (see next page) could aid in defining the environmental and person factors contributing to an effective server intervention agent, and a "taxonomy of intervention techniques" could enable a systematic selection of the most influential

intervention procedure for a particular situation. These concepts are explained below.

Theoretical Perspectives

Multiple levels of intervention. Geller et al. (1990a, b) proposed a multiple intervention level (MIL) hierarchy to categorize behavior change approaches and evaluate their cost effectiveness. This model is characterized by multiple levels or tiers of intervention programs, ranging from the least intrusive techniques which target the maximum number of people for the least cost per person (e.g., public service announcements) to the most intrusive intervention techniques at the bottom of the hierarchy which requires one-on-one contact between intervention agent and target individual and is necessarily most costly. Individuals who are not influenced by interventions at a particular level of intrusiveness "fall through the cracks". They are not influenced by repeated exposure to intervention programs at this level, and require a more intrusive (and costly) intervention process. More intrusive (and more influential) intervention programs can be cost effective if individuals influenced at a less intrusive level of intervention can be enlisted as "actively caring" intervention agents.

Actively caring. Geller (1991, 1992) proposed the concept of "actively caring" as "going beyond the call of duty" to care for the health or safety of another person. Three person states or establishing conditions (Michael, 1993) were presumed to increase an individual's propensity to actively care: *self-esteem* ("I am valuable"), *personal control* and *optimism* ("I can make a difference"), and *belongingness* ("I belong to the group").

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Recently, Geller (1994 a, b) added Bandura's (1977) concept of self-efficacy to the actively caring model, and proposed that this construct, along with personal control and optimism, contributed to perceptions of empowerment. These interacting person states, presumed to be learned and influenced by ongoing social and situational variables, are depicted in Figure 1. There is some theoretical and empirical support for each of these transitory factors increasing one's propensity to help others (as in becoming an intervention agent), but only Geller and his students have combined these dimensions into one model.

Insert Figure 1 about here

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1. *"I am valuable"*. Michelini, Wilson, and Messe (1975) and Wilson (1976) found, for example, that subjects who scored higher on a sentence completion test designed to measure self-esteem as defined by Maslow (1970), were significantly more likely to intervene in a bystander intervention manipulation than subjects with lower self-esteem. Wilson (1976) concluded that individuals with lower self-esteem are more likely to be influenced by the social norms modeled by others (e.g., alcohol consumption at a fraternity party), whereas those with higher self-esteem look internally to their own evaluation of the situation and are less apt to model the socially irresponsible behaviors of others. The notion that self-esteem can be situational and transitory, and relate directly to helping behavior is consistent with the theorizing of Coopersmith (1967).

2. *"I can make a difference"*. Several person variables seem related to the "I can make a difference" factor proposed by Geller (1991, 1992), including self-efficacy (Bandura, 1977), locus of control (Rotter, 1966), learned optimism (Seligman, 1991), dispositional optimism (Scheier & Carver, 1985), and learned hopefulness (Zimmerman, 1990). Although conceptually it seems intuitive that optimistic individuals with expectancies of personal control (i.e., internals) will be likely to serve as intervention agents, this notion has not been tested directly. However, a research review by Carlson, Charlin, and Miller (1988) reported that the following positive experiences (conceivably increasing optimism) promoted helping behavior: finding a dime in the return slot of a public telephone, listening to soothing music, being on a winning football team, receiving a free packet of stationary, imagining a vacation in Hawaii, and being labeled a charitable person.

3. *"I belong to a group"*. With a group exercise, Rutkowski, Gruder, and Romer (1983) manipulated group cohesiveness in groups of two and four subjects. Then they observed the number of subjects who left the experimental room to assist a "victim" (confederate) who had ostensibly fallen off a ladder, and they timed the latency of rendering assistance. Results showed the expected effects of group cohesion, namely the more cohesive groups were significantly more responsive to the emergency situation.

This finding that manipulated group cohesion increased social responsibility (or active caring) was also found in a retrospective examination of the relationship between group cohesiveness and altruistic suicide in combat, an extreme form of helping/caring behavior (Blake, 1978). More specifically, an analysis of official information on Medal of Honor awards

given during World War II and the Vietnam conflict revealed that soldiers from smaller, more elite, specially trained combat units (presumed to be most cohesive) accounted for a significantly higher percentage of "grenade acts" (i.e., voluntarily using one's body to shield the other men from exploding devices) than soldiers from larger, less specialized units.

Thus, the empirical evidence available suggests that the "actively caring" model shown in Figure 1 could be used to predict individuals most likely to become an intervention agent. These person factors (or learned expectancies) might also be used to create environmental settings and social interactions capable of increasing the probability of "actively caring".

Geller (1991) reported the results of a corporate workshop during which employees listed work situations and events that increased and decreased self-esteem, optimism, and group cohesion. There was some overlap between events, contingencies, and opportunities contributing to self-esteem and personal control/optimism (e.g., conditions presumed to increase self-esteem were also included on lists to describe personal control/optimism). However, most items on the personal control/optimism and belonging/group cohesion lists were independent and different from those on the self-esteem lists.

Personality scales are available to measure the "actively caring" dimensions depicted in Figure 1, and these are discussed below. Each scale has impressive reliability and validity characteristics, but no research has combined these scales into one, as was performed for the research reported here. (See Appendix A for a copy of the Actively Caring Survey, and Appendix B for instructions on scoring the Actively Caring Survey.).

Personality measures of actively caring. The personality measures were all in the format of a 5-point Likert Scale. The 10-item Self-Esteem Scale (Rosenberg, 1965) is an established personality measure which has consistently shown reliable and valid results as a measure of *self-esteem*. The 12-item "Life Orientation Test" (LOT) developed and evaluated by Scheier & Carver (1985) was used to measure *optimism*. The authors reported an internal consistency coefficient of .76, a test-retest coefficient of .79, and acceptable convergent and divergent validity with a number of other personality measures.

Group cohesion and belongingness were assessed by the "Interpersonal Support Evaluation List" (ISEL) developed by Cohen (1983). If belongingness or group cohesion is defined as the resources provided by an individual's relationships, then, according to Cohen (1983), it can be measured with the ISEL (48-item scale, Cronbach's alpha = .77). The ISEL is considered a measure of perceived availability of social support and was designed with independent subscales measuring four separate functions. In a sample of college students (n = 63), perceived availability of social support moderated the relationship between negative life stress and depression. In fact, the data fit a "buffering" hypothesis pattern suggesting that social support protects one from the pathogenic effects of high levels of stress. Students' scores on the ISEL might predict significant variance in amount of alcohol consumption as well as degree of volunteerism as an intervention agent.

One of the most cited constructs in psychology has been Rotter's (1966) locus of control (LOC). People who have an internal LOC perceive that they are generally in control of response outcomes. In contrast, individuals with

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an external LOC feel that external events are often out of their personal control but instead are controlled by fate or chance. A review of 572 LOC studies (Strickland, 1989) concluded that individuals having internal scores on the LOC resist salient outside influence and control. The *personal control* factor of the "actively caring" model was assessed with the Nowicki-Strickland I-E scale (Nowicki & Duke, 1974; Nowicki & Strickland, 1973). This scale eliminates some of the problems with the traditional Rotter scale (Strickland, 1989), and it has well-established reliabilities and validity (test-retest r = .83; social desirability r = .10; 27-item scale; Nowicki & Duke, 1974; Nowicki & Strickland, 1973).

Self-efficacy theory proposes that behavior change operates through changing an individual's expectations of personal mastery and success (Bandura, 1977). Presumably those high in self-efficacy are more likely to attempt new behaviors, and therefore, be more responsive to interventions designed to increase actively caring. According to self-efficacy theory, expectations of self-efficacy are key to behavior change because they determine the initial decision to perform a behavior, the effort to expend, and the persistence to perform in the face of adversity. Sherer and Maddux (1982) found measures of self-efficacy related to locus of control, and concluded locus of control alone was not enough to predict an individual's belief in the ability to control the successes of outcomes in a given area. Individuals must also have some success experiences on which to base belief in a positive outcome.

Predicting risky behavior. Numerous researchers in the social and psychological sciences have studied a "risky behavior syndrome" by

correlating reports of risky behaviors with demographic and person characteristics (e.g., Beirness & Simpson, 1988; Jessor, 1987, 1989; Swisher, 1988; Wilson & Jonah, 1988). For example, Wilson and Jonah (1988) found that certain personality factors (particularly thrill-seeking and aggression) and an environmental variable (peer support or group cohesion) predicted a risky-driving index (defined by traffic violations on one's driving record). They also showed substantial correlations between this risk index and self-reports of other problem behaviors (including drug use, preferred speed, safety belt use, DUI, and charges for non-vehicular offenses). Additionally, certain social psychological and behavioral factors distinguished youth (ages 12 to 19) who became involved in vehicle accidents from those who didn't (Beirness & Simpson, 1988). These factors were significant predictors of DUI, driving while using marijuana, and willingness to ride with drinking drivers.

Donovan, Umlauf, and Salzburg (1988) assessed attitudes, personality, and hostility of high-risk drivers and identified two clusters of risky drivers -- those characterized by impulsivity, sensation seeking and aggressive acting-out behavior, and those showing high levels of dysphoria, emotional distress, resentment, and an external perception of control. The authors claimed practical significance of their findings with regard to matching intervention strategies with certain sub-populations. Similar market segmentation notions were addressed by Geller (1989).

Practically all of the research which defined a "risky behavior syndrome" used verbal report as both predictors and criteria. An exception was the Wilson and Jonah (1988) study (cited above) which used outcome

data as the criterion. None of the published studies attempted to predict actual behavior (e.g., alcohol consumption) with personality or lifestyle factors, as was done in the reported research.

Sensation seeking. The Zuckerman (1979) Sensation Seeking Scale (SSS); (inter-item alpha reliability = .84) was developed to measure individual differences in the need for stimulation and arousal. Scores on the SSS have been correlated with various traits, cognitive and perceptual styles, and different types of risk-related behaviors, such as experience with drugs, sex, alcohol, smoking, esoteric foods, and volunteering for unusual activities or experiments. The 40-item "Form V" of the SSS has four subscales with ten items each: (1) thrill and adventure seeking, (2) experience seeking, (3) disinhibition, and (4) boredom susceptibility.

Thrill and adventure seeking items express an individual's desire to engage in activities involving risk or danger, such as risky driving and mountain climbing. *Experience seeking* (ES) items describe nonconformist lifestyles, *disinhibition* (DIS) items indicate a desire for risky social behaviors, and *boredom susceptibility* items suggest restless behavior. Previous research supports the use of a slightly modified version of the SSS (Form V) (e.g., Andrucci, Archer, & Pancoast, 1989; Huba, Newcomb, & Bentler, 1981), which eliminates five questions (two from the ES subscale and three from the DIS subscale) which directly ask about the use of alcohol and narcotics and thus are possible confounds to the dependent measures under study (see Appendix C). Andrucci et al. (1989) performed a series of statistical analyses on their data with the five questions removed and reported no significant differences

in statistical patterning across the subscales. Huba et al. (1981) reported similar findings.

Recent studies have shown relationships between scores on the SSS and certain neurophysiological and biochemical variables that suggest a biological basis for sensation-seeking behaviors. Much of the research has been described in Zuckerman (1979), including conceptual foundations and current theory, a review of all related research published through the early part of 1979, the actual SSS questionnaires, and the norms and scoring keys for the different forms of the scales (see Appendix C for a copy of the scale).

Perceptions of invulnerability. One way to understand risky behavior is to consider people's unrealistic optimism about future life events. There is widespread evidence in the literature that normal people believe: a) their futures will be better than the average person's, b) good things are more likely to happen to them, and c) negative life events are more likely to happen to others (Taylor & Brown, 1988). In other words, people tend to think they are relatively invulnerable, and expect others will be the victims of misfortune more so than themselves. One possible implication of this perception of invulnerability is increased or unnecessary risk taking. By lulling people into a false sense of security, actual vulnerability may be increased if self-protective, precautionary, preventive behaviors are decreased. On the other hand, if people feel relatively invulnerable because they take lots of precautions (e.g., using safety belts, dieting, exercising, and not smoking), this belief may be related to *decreased* risk taking.

The notion that this illusion of unique invulnerability may have behavioral consequences has only recently been studied empirically, with

somewhat mixed results (Burger & Burns, 1988; Gerrad, Gibbons, & Warner, 1988; Lebovits & Strain, 1990; Whitley & Hern, 1991). Limitations of the existing research are that it has been based predominantly on self-report measures of behavior and relatively small sample sizes.

The research reported here compared subjects' illusions of invulnerability with their actual alcohol consumption as a measure of risky lifestyle. The research used a perceived invulnerability scale adapted from those developed by Weinstein (1980, 1984) and Perloff and Fetzer (1986), as well as a risky lifestyles scale developed by Geller and his students to estimate risk-taking propensity. Appendix D includes copies of these scales.

Predicting alcohol consumption with intentions. Significant relationships have been found between individuals' stated intentions and their *self-reports* of subsequent behaviors (Ajzen & Fishbein, 1977; Fishbein & Ajzen, 1975). Such a relationship has also been evidenced in research on alcohol consumption. For example, in a study of adolescent drinking habits, Schlegel, Crawford, and Sanborn (1977) found significant correlations between intentions to drink and subsequent verbal reports of drinking behavior. The author found no published studies, however, that compared behavioral intentions regarding alcohol consumption with actual behavior observed in field settings. The reported research assessed partiers' intentions to consume alcohol and reach certain BAC levels when entering parties, and then compared these explicit intentions with actual BACs when leaving the parties.

If individual intentions to drink are related to actual alcohol consumption, then such behavioral intentions may be a useful strategy for

selecting individuals for certain intervention strategies. For example, an important "first step" in the development of effective interventions to deter alcohol-related injuries from DUI is to select those individuals who are most at-risk for intoxication (Geller, 1989). To deter excessive drinking, these individuals may require more intensive (or intrusive) interventions than the normal population. Information from behavioral intention data may also be useful in customizing behavior change strategies to maximize the impact on a specific target group.

Preliminary Studies

Development of the Actively Caring Survey

Preliminary research began with the development of an "actively caring survey" for use with a college population, and validating the scales in the field for use with this population. After customizing the testing instrument for use with a college population, the survey was tested during a university orientation program. Research participants attended a student-run, three-day coed summer camp. These participants had recently been accepted into Virginia Tech and were attending the camp for orientation reasons, to have fun, meet people, and to have questions regarding "college-life" answered. All were incoming freshmen and approximately 17 or 18 years of age (90 men and 74 women). Subjects were recruited the first night of camp after an orientation speech given by the camp organizers. All students arriving to participate in the camp were given the opportunity to participate in the research.

Camp counselors and staff members also had the opportunity to participate in this research. Most of these counselors and staff members were

juniors and seniors (men and women) at Virginia Tech, and therefore approximately between the ages of 19 and 22. These camp counselors also had the opportunity to complete the actively caring survey before the campers arrived for their three-day stay. Additionally, anyone at the camp wishing to recognize an AC endeavor had the opportunity to fill out an actively caring recognition form (ACRF) and post it on the ACRF board at their leisure. This part of the study was observed (unobtrusively) by a research assistant. A total of 25 persons completed at least one ACRF to be posted on the ACRF board.

The actively caring survey (ACS) (see Appendix A) is a 60-item questionnaire containing items adapted from five different individual difference scales designed to assess an individual's self-esteem, self-efficacy, belongingness, optimism, and personal control. A sixth set of items asked respondents directly whether they were willing to emit certain actively caring (AC) behaviors. Self-esteem items were adapted from Coopersmith's Self-Esteem Inventory (1967) and Rosenberg's Guttman-type ten item scale for self-esteem (1965). Self-efficacy items were adapted from Sherer's Self-efficacy Scale (Sherer & Maddox, 1982); optimism items were adapted from Scheier & Carver's research (1985); personal control items were adapted from Nowicki's Locus of Control Scale for non-college as well as college adults (Nowicki & Duke, 1974). Belongingness items were adapted from Cohen's "Interpersonal Support Evaluation List" (1983).

Research participants' last four digits of their social security numbers were placed on their ACS. This ID marker was used to match each research participant's ACS with his/her ACRFs. All campers had the option of filling

out and posting an ACRF which read: "Recognize your fellow campers for actively caring!" This activity was a voluntary activity (like all camp activities) and all interested persons had the opportunity to participate. These forms contain "To:", "From:", and "For:" entry blanks. All posted forms were used to quantify frequency counts individually for each camp member. Camp counselors also had the opportunity to recognize their "subordinate" campers' instances of AC using the ACRFs.

Results of this survey were encouraging. An inter-item correlation analysis was performed, using standardized item alpha as a measure of internal consistency with the various subscales of the survey. Computed scores were as follows: belongingness, $\alpha = .83$; optimism, $\alpha = .82$; self-esteem, $\alpha = .82$; self-efficacy, $\alpha = .64$; personal control, $\alpha = .50$; and willingness to actively care, $\alpha = .75$. Additionally, a multiple regression analysis was performed, using willingness to actively care (i.e., the AC sub-scale) as the dependent variable. In this analysis, the variables belongingness, self-efficacy, and personal control (respectively) entered into the equation significantly, $F (47,5) = 7.77$, $p \leq .001$, accounting for a total of 45.3% of the variance in the AC sub-scale.

A series of Chi-Square tests were performed between the six subscales and subjects' ACRF participation, in an attempt to discern whether subjects who completed ACRFs scored higher on any of the six personality subscales of the ACS. A significant score was found for belongingness, Chi-Square (19) = 31.6, $p \leq .05$, with subjects who completed the ACRF scoring higher on the belongingness subscale than those who did not. Additionally, a trend toward significance was found for optimism, Chi-Square (21) = 31.3, $p = .07$, with

subjects who completed an ACRF scoring higher on the optimism subscale than those who did not.

Alcohol Research

Examining personality factors. Four preliminary alcohol research parties were conducted in preparation for the reported research. At the first study, subscales of the ACS were administered to party-goers, and results of the various personality measures were correlated with levels of blood alcohol concentration evidenced at the party. More specifically, the study investigated the relationship between sensation seeking, locus of control and alcohol consumption in an applied social setting, to determine whether the scales could be useful for the current research project. It was hypothesized that high sensation seekers and externals would consume more alcohol.

The subjects used in this pilot research were eleven fraternity brothers (of legal drinking age) at Virginia Polytechnic Institute and State University. Before a weekend social function, they were asked to participate voluntarily in a study assessing the relationship between personality and alcohol use. Data were collected at an off-campus fraternity house. Approximately 50 people attended the social function, consisting of brothers of the fraternity, their dates, and friends. As no alcohol was provided by the fraternity, fraternity members checked the identification (i.e., driver's license) of everyone who brought their own alcohol to insure they were of legal drinking age. Various alcoholic beverages were consumed at the social function, including beer, malt liquor, wine, and spirits (whiskey and vodka). The Blood Alcohol Concentration (BAC) of each subject was assessed before and after the social function with a DataMaster II breathalyzer.

The Pearson correlation coefficient between exit BAC and locus of control was $r= .63$, $p< .05$ (with externals reaching a higher mean BAC than internals), whereas the coefficient between Exit BAC and sensation seeking was $r= -.20$, $p> .10$. A stepwise multiple regression procedure was performed using exit BAC as the dependent variable. Locus of control entered significantly into the equation, $F(1,9)= 5.81$, $p< .05$, accounting for 39.2 percent of the variance. The variable sensation seeking failed to load significantly into the equation, $F(2,8)= 1.56$, $p> .10$. The Pearson correlation coefficients for exit BAC and the four subscales of the Sensation Seeking Scale failed to reach significance. Additional research was conducted (see below) to test the full ACS as a predictor of alcohol impairment as well as intervention participation.

Examining intentions to drink. At the second preliminary alcohol study, behavioral intentions were examined to investigate the extent to which intentions to drink predict actual drinking behaviors at university parties (Glindemann, Geller, & Ludwig, 1995). Impairment from alcohol consumption was measured with breathalyzers at a large, university-sanctioned fraternity party. Twenty-nine male and 14 female university students of legal drinking age participated in the research. The correlation between subjects' predictions of BAC made on the night of the party and actual BAC reached 0.53, $p < .001$. A stepwise multiple regression procedure, using BAC as the criterion, found subjects' predictions of BAC made on the night of the party to enter into the model significantly, accounting for 32.8 percent of the variance. During the present research, additional data were

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collected in an attempt to determine the extent to which various personality variables moderate this relationship.

   Refinement of sobriety tests to be used in social responsibility stations. The third preliminary study was conducted to refine various sobriety tests for inclusion at the social responsibility stations (SRSs) of the reported research and to develop specific field procedures for their application. Two sobriety tests were tested at this party: the "Nystagmus Gaze Test" (NGT) and the "Star Tracing Task" (STT). The NGT was conducted for two purposes: 1) to train our research assistants in its administration, and 2) to establish a procedure for its administration in party settings. The STT consists of a star within a larger star and requires a subject to draw a line between the two. We tested the STT with the consideration of using it during the intervention parties at the Performance Feedback social responsibility station (SRS). The task is easily administered, easily scored, and possesses a high level of "face validity," but it has (to the author's knowledge) never been systematically evaluated as a sobriety test. It was used at this party to determine its validity and reliability at estimating partiers' actual BAC.

   A total of 250 BAC breath samples (from different subjects) were collected with an overall mean of 0.059 (S.D. = 0.05), ranging from 0.0 to 0.20. Results obtained with the NGT revealed a correlation of $r = .40$, $p \leq .05$, between estimations of BAC made using the NGT and actual BAC. A stepwise multiple regression was performed, using exit BAC as the criterion. Estimations of BAC made using the NGT loaded significantly into the regression equation, $F (1, 37) = 7.13$, $p \leq .05$, accounting for 16.2% of the total variance.

Data analysis was also performed on the STT data. Results revealed a significant correlation, r = .393, $p \leq$ .05, between criterion BAC and the error rate of subjects on the task. The correlation between BAC and time to complete the task failed to reach significance, r = .088, $p >$ .10. A stepwise multiple regression was performed using exit BAC as the criterion. Only error rate loaded significantly into the equation, F (1, 58) = 10.59, $p \leq$ .05, accounting for 15.4% of the total variance.

Preliminary testing of SRSs. The fourth preliminary study was conducted as a test of the social responsibility station (SRS) approach to reducing alcohol abuse and DUI risk. Before the party, members of invited fraternities and sororities completed the ACS (n=130). During the party, four SRSs were in place, and partiers were free to participate at the stations if they desired. The four SRSs included 1) a BAC Feedback SRS, where students could have their BAC assessed with a breathalyzer, 2) a Performance Feedback SRS, where students could participate in various sobriety tests, 3) a Safe Driving SRS, where students could sign up to get a ride home from a designated driver, and 4) a Safe Sex SRS, where students could get information on safe(r) sex, date rape, and sexually transmitted diseases.

Partiers' BACs were collected upon arrival and exit from the party. The 46 male and 25 female subjects were tracked through all phases of the research. The mean actual BAC at this party reached .093, ranging from .005 to .238. A stepwise multiple regression procedure, using BAC as the criterion variable, was performed on participation scores at the four SRSs. Participation at the BAC feedback station (based on SRS participation points at that station) loaded significantly into the equation, F (1, 59) = 7.29, $p \leq$ .05,

accounting for 11% of the variance of actual BAC. Results indicated that as BAC rose, so also did participation at this SRS. Further analysis of the data is needed to explain this relationship. Additionally, for and during this party research assistants were trained in all aspects of data collection, and the experimental protocol for the SRS parties was field tested and subsequently refined.

Generally, the BAC feedback and performance feedback SRSs were the most popular, with a high level of participation at each station. Fifty-two subjects participated at the BAC feedback station, and 34 subjects participated at the performance feedback station. Additionally, 29 subjects participated at the safe sex station. Only three subjects participated at the safe driving SRS.

It was expected that participation would be higher at all four stations, but several explanations are available for the low participation rate. The most parsimonious explanation involves party size. The party started out as a "closed party" social hour for the two fraternities and two sororities participating in the study. However, at 9:00pm the party was opened to the general student population (the researchers had no control over this event, and the resultant turnout was expected by neither the researchers nor the fraternity hosting the party).

At the party, two local and very popular bands were playing, and after the doors were opened to the student population approximately 300 additional people entered the party, bringing the total attendance at the party to approximately 500 people. At this point, the party was literally shoulder-to-shoulder, and this made traveling from one room to another very difficult. As such, it seemed participation at the four SRSs was extremely curtailed, as

subjects simply could not reach them without extreme effort. Entrance and exit BAC measurements were not affected, however, as the BAC breathalyzers used for this purpose were located in a separate room just off of the main entrance to the fraternity house. (BACs were only collected on the original subjects, and not on the guests that arrived after 9:00pm.)

For the parties in the reported research, only "closed parties" (for the entire evening) were used for data collection purposes. This was accomplished by working with the leadership of the fraternities hosting the parties studied in the reported research.

Hypotheses

Individual Differences

It was hypothesized that students' behavioral intentions would predict their subsequent drinking behavior at a party (see Table 1 for a listing of all specific hypotheses). It was further predicted, however, that the relationship between intentions and behavior would be moderated by various demographic, personality, and lifestyle variables. For example, it was expected that students with greater experience with consuming alcohol at university parties would be more adept at assessing their intentions. It was also hypothesized that measures of the demographic (e.g., gender, ethnicity, class standing, and GPA), personality, and lifestyle variables included in the study would predict to various degrees which individuals become overly intoxicated and at risk for DUI, and which students would participate at an SRS to decrease adverse effects of alcohol impairment. Specifically, it was hypothesized that students scoring high on the "actively caring" dimensions of self-esteem, self-efficacy, optimism, personal control, and

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belongingness/social support would drink more responsibly and participate more at the SRSs. In addition, subjects' scores on the risky lifestyle questionnaire and the sensation seeking and perceptions of invulnerability scales were hypothesized to predict alcohol consumption and impairment.

Obviously, a prime goal of this research was to determine the relative impact of these various factors in predicting both undesirable behaviors (i.e., excessive alcohol consumption) and desirable behaviors (i.e., intervention participation) in an environmental setting with excessive alcohol consumption. The determination of differential predictability of the various factors operationally defined could be quite useful for the design of future interventions for the prevention of alcohol abuse and associated alcohol-related problems.

Insert Table 1 about here

Intervention Impact

The project also compared the alcohol consumption at parties with SRS interventions with parties without SRS interventions. The design (as discussed below) allows for these comparisons within the same fraternity and between different fraternities. It was expected that the degree of alcohol impairment per partier would be significantly less at the parties with SRS interventions. The degree of beneficial impact from SRS interventions was assumed to depend on the amount of participation at the various SRSs. From earlier research, it was expected that the BAC and performance feedback stations would be very popular, but whether participation at these SRSs

reduces alcohol impairment is an important empirical question. Some previous research (Harwood, 1984) and feedback research in bar settings (Russ, Geller, & Leland, 1989) suggest that participation at the feedback SRSs could actually increase intoxication when the feedback is given publicly (i.e., with other partiers giving social support for high BACs). However, this research also provided opportunities to receive BAC feedback privately, and under these circumstances it was expected that a beneficial impact of the feedback would occur.

Method

Overview

A series of four field experiments was conducted to study relationships between intentions, attitudes, lifestyles, personality variables, alcohol consumption/BAC, and participation as intervention agents in settings where excessive alcohol consumption is common. The research took place at four university-sanctioned fraternity parties. Students were questioned regarding their drinking intentions on the evening of the party, before entering the party. During pre-party assessment (i.e., at fraternity and sorority meetings), the subjects completed questionnaires to assess certain person factors, expectancies, demographics, and lifestyles. The person factors assessed included self-esteem, self-efficacy, optimism, locus of control, group cohesion, social support, sensation seeking, perceptions of invulnerability, and riskiness of lifestyles (see Appendices A, C, D, and E).

At each party there were several opportunities for students to demonstrate responsible drinking and caring for others regarding their excessive alcohol consumption and potential DUI risk. For example, at

independent "social responsibility stations" (SRSs) partiers were able to obtain BAC feedback and a BAC nomogram, sign up to be a designated driver or obtain a free ride home, take a field sobriety test, receive a free condom, or obtain information about the relationship between alcohol impairment, unsafe sex, and date rape (see below). Thus, a primary goal was to determine what personality, demographic, attitudinal, and lifestyle factors predict excessive alcohol consumption, alcohol impairment, and responsiveness to an intervention to reduce DUI risk for oneself or a peer.

A second primary goal was to determine the impact of the SRS interventions and evaluate whether large-scale dissemination of some SRS interventions is feasible and potentially cost effective. Also, by comparing results at these BYOB parties with findings of our previous research conducted at fourteen parties serving keg beer and/or mixed drinks for the same fraternity and sorority groups (e.g., Geller, Clarke, & Kalsher, 1991; Geller & Kalsher, 1990; Geller, Kalsher, & Clarke, 1991), it may be possible to assess whether the new university policy to allow only BYOB parties reduces levels of intoxication.

While universities expect a decrease in overall intoxication at BYOB parties (as compared to keg parties), no significant changes in overall consumption and intoxication levels were predicted. However, an increased range of intoxication at the BYOB parties was hypothesized, because individuals who bring a large supply of alcoholic beverages may feel compelled to "clean their plate" and consume all they bring to the party, as observed in earlier research at bars (Geller, Russ, & Altomari, 1986).

The employed methodology enabled a tracking of the SRS exposure per partier (approximately 150 subjects per party), and thus it was possible to study individual BAC as a function of particular SRS exposures, including choice of private or public BAC feedback, or both. An inverse relationship between amount and variety of SRS exposure and exit BAC was expected, although choosing the public BAC format might be an exception, and this possibility was assessed.

Experimental Design

The methodology for the reported research followed the same general procedures as those applied in previous field studies of alcohol consumption and impairment in party settings performed by the Center for Applied Behavior Systems (Geller & Kalsher, 1990; Geller, Kalsher, & Clarke, 1991; Glindemann, Geller, & Ludwig, 1995). The basic methodology is described below. It should be noted that the research did not encourage party drinking, but only added observation and intervention to ongoing university-sanctioned parties. Observations and exit interviews at previous party studies (Geller et al., 1986; Russ & Geller, 1988) revealed no obvious effects of these observation procedures on the general party milieu. For example, the partiers reported they did not pay any attention to the observers (also university students), and less than 5% of the subjects answered affirmatively to the question, "Did our presence at the party influence your drinking behavior?".

During the systematic testing of the SRS program, two fraternity and two sorority groups not yet tested before (selected non-systematically but not randomly) participated in the research. A fraternity and a sorority group together comprised each of two experimental groups. Each of these

experimental groups was tested twice. During these two testing sessions, each group (approximately 50 men and 50 women) received the experimental manipulation (i.e., the SRS interventions) at one party, while the other party (n = 100) served as a no-treatment control. Further, one experimental group received the control condition first and the experimental condition second (Group C/E), while the second experimental group experienced these two conditions in the reverse order Group E/C). This allowed for meaningful comparisons both within groups (each group serving as its own control), and between groups.

The research project worked with the student organizers of the parties to provide the following at SRS interventions: 1) a BAC Feedback SRS to provide BAC feedback and BAC nomograms in both a public and a private feedback format, 2) a Safe Driving SRS to sign up for free transportation or to be a designated driver, 3) a Performance Feedback SRS for field sobriety testing, and 4) a Safe Sex SRS with information on safe sex, date rape, and behavioral cues for detecting alcohol impairment. See below for a detailed description of each SRS and the type of data collected at each. Upon completion of the parties, the relationships between personality constructs, lifestyles, behavioral intentions, attitudes, participation at the various SRSs, and actual drinking behaviors were correlated. Stepwise regression analysis were used to determine significant predictors of BAC and participation at each SRS.

A possible concern was that the activities of the student leadership of the fraternities and sororities could have had an influence on the behaviors of party-goers, in either motivating party-goers to participate in the SRSs, or

in limiting drinking on the part of subjects. While working with these members of the student leadership, research assistants coached them to enable the subjects to act of their own accord, without any prompting from these student leaders (except, of course, in limiting the drinking of any students who became overly intoxicated and were at risk to themselves or others). In addition to coaching the student leaders, their behaviors at the parties were monitored, recorded, and measured.

Information about the Social Responsibility Stations (SRSs)

Upon entering a party, each party-goer was handed a flyer (see Appendix F) with a brief description of the following SRSs manned by undergraduate research assistants throughout the evening. Subjects were told they could visit any SRS as many times as they wanted, or not visit any. It was totally their choice.

Performance Feedback SRS

The procedures at this SRS were modeled after earlier studies of field sobriety tests as a potential deterrent of alcohol abuse and DUI (Geller et al., 1991; Russ & Geller, 1986; Streff, Geller, & Russ, 1989). When a partier approached this SRS, his/her ID number and gender were recorded, as well as a few relevant demographic factors (e.g., dominant hand). The subject was then administered the first feedback task, or if the subject had visited the SRS before, he/she was asked to choose which tasks to take. The following performance tasks ware used:

a) **One-leg stand.** During testing, a subject was asked to stand on one foot (they chose which foot) with their hands at their sides, raise their other foot six inches off the ground, and count to 45. The experimenter recorded

how many times the subject swayed, hopped on their foot, flailed their arms to keep their balance, or touched the ground with their raised foot. One point was assigned for each instance of these behaviors. A subject was considered to be intoxicated with a BAC of .08 or higher if they scored 4 or more points during the 45 seconds or if they could not complete the task.

b) **Ruler drop/reaction time.** As in Russ and Geller (1986), the subject was instructed to hold his/her hand perpendicular to an 18-inch ruler. The intervention agent (IA) adjusted the subject's thumb and forefinger so the inside distance between them was two inches. The IA then held the ruler at the 18-inch mark and positioned it just above the top of the subject's fingers. When the subject looked ready, the IA said "Ready" and dropped the ruler within three seconds. The subject's task was to close his/her thumb and forefinger as quickly as possible in order to catch the ruler as it fell. The distance the ruler traveled was recorded to the next whole number above the subject's thumb and forefinger. This task was repeated up to three times upon the subject's request. [Rulers were available for the subject to keep and use to measure the reaction time of other partiers.]

c) **Time estimation.** The subject was handed a stop watch and shown how to operate the start and stop functions. The subject was then asked to start the stop watch and stop it as close to 7 seconds as possible, without watching the face of the stop watch. The subject's score was the absolute difference between 7 and the number on the stop watch.

d) **Number pointing task.** The subject was handed a 2in x 4in laminated card with 12 numbers printed on it in random order. The subject was then asked to point to each number in sequential order (1 to 12) after the

IA said "Start". Subjects were not permitted to practice. The IA recorded the time it took for the subject to complete the sequence and noted any pointing errors. [The subject was asked if he/she would like to have a test card for use with others at the party. If the subject said "yes", the IA delivered a card for the subject to keep.]

e) Star tracing task. During this test the subject was given a sheet of paper containing two stars, one printed within the other (see Appendix F). The subject was then given a pen and asked to trace a star between the two printed stars, without lifting their pen or touching either of the printed stars. The subject was directed to proceed as quickly and accurately as possible. The IA recorded the time it took to complete the task, and the number of errors made (defined as tracing outside of the lines of the two printed stars).

f) Backwards counting. Subjects were asked to count backwards from 35 by 3's as quickly as possible. If the subject made an error, the IA said "no", gave the correct number, and asked the subject to continue counting from that number. The IA recorded the time it took the subject to complete the tasks in seconds, and the number of errors made.

After performing the one-leg stand sobriety test, the subjects were told they could take as many different performance tasks as they wished, stopping whenever they wanted. However, before leaving the SRS the subject's BAC was measured with an Alcosensor III breathalyzer and recorded with the subject's ID number and test results. The subjects were *not* told the results of the breathalyzer test, but were told that they could get BAC feedback at the BAC Feedback SRS. Each subject received a participation score at this SRS by counting the number of performance tasks completed *and* the number of

intervention materials taken (i.e., ruler and/or test card). Total possible points per visit = 8.

BAC Feedback SRS

At this SRS subjects could blow into a breathalyzer and receive written feedback (on a special feedback card with a BAC nomogram printed on the back). Before the breathalyzer test, the subjects gave a subjective estimate of their own BAC on a 10-point BAC scale with anchors of 0.00 for "no alcohol", 0.04-0.06 for "impaired" and 0.08 for "legally drunk". The IA reviewed the information on the nomogram and compared the estimated BAC for the subject (given his/her weight and drinks consumed) with the BAC obtained from the Alcosensor III. The subject was offered additional BAC nomograms, and the IA noted how many nomogram cards each subject took. The subject's score for this SRS was "3" points for each BAC measurement, and "1" point for each extra nomogram taken.

Two separate BAC Feedback SRSs were available during the experimental parties. One was a public feedback station, which was set up in the main SRS room with the other social responsibility stations. The second BAC Feedback SRS was a private feedback station. This station was set up in a small separate room close to the main experimental room.

Safe Driving SRS

At this SRS subjects could receive information (upon request) about penalties for being caught on campus and in town for DUI. Case studies were written on handouts of students stopped by campus or town police for DUI who received costly penalties. In addition, case studies of recent Virginia Tech students injured or killed in alcohol-related accidents were available on

handouts. At this SRS, students could sign up for a free ride home upon request (2 points) or sign up to be a designated driver (5 points per ride). This SRS served as the networking system for matching students who wanted a ride home with designated drivers. Before any rides occurred, the BAC of the driver and all passengers was assessed. In order to qualify as a designated driver, the subject's BAC had to be below 0.03%.

Safe Sex SRS

At this SRS, information (i.e., flyers) was available regarding date rape and unsafe sex consequences of alcohol abuse, as well as an "Intoxication Detection Aid" (IDA) which lists behavioral symptoms indicative of intoxication. This symptom cue card (termed an IDA in a master's thesis which explored this intervention technique, Glindemann, 1990) was modeled after the "Alcohol Symptoms Checklist" developed by Teplin and Lutz (1985) to facilitate successfully the estimation of intoxication levels in a hospital emergency room. Free condoms were also available at this SRS.

The SRS score for subjects interacting at this SRS was assigned as follows: 1 point for each of the three possible topics discussed (i.e., a different IA was available to discuss each topic -- safe sex, date rape, and the IDA), and 1 point for each information flyer taken from this SRS (i.e., a flyer will be available for each SRS topic -- safe sex, date rape, and the IDA); and 1 point per condom taken. The safe sex and date rape flyers used a case study approach to make the topic relevant to the partiers, and provided specific response information to prevent the target problem and react appropriately in an emergency situation related to the target problem.

Subjects and Settings

Party One. Party One served as the control condition for Group C/E. It took place on Wednesday, April 5, 1995. The party began at 9:00 pm and ended at 2:30 am.

Approximately 110 students attended Party One. Of those, 67 participated in the research (44 men, 23 women). An estimated 40 students did not participate in the research because they were under 21 years of age. The party took place at a large, two-story, off-campus house (the residence of the fraternity's social chairman). Party-goers congregated on the first and second floors, while the data collection stations (i.e., sign-in stations and BAC stations) were set up in the basement of the house. Alcoholic beverages consumed included beer (both kegged beer and canned beer), hard liquor, and "jello shooters" (i.e., jello made with 1/2 water and 1/2 vodka). Music at the party was supplied with a stereo. Approximately 30 people were given rides home by the "designated driver" crews.

Party Two. Party Two served as the experimental condition for Group C/E. It took place on Thursday, April 6, 1995. The party began at 9:00 pm and ended at 1:30 am.

Approximately 100 students attended Party Two. Of those, 72 participated in the research (53 men, 19 women). An estimated 30 students did not participate in the research because they were under 21 years of age. The party took place at a large, two-story, off-campus fraternity house. Party-goers congregated both outside and on the first and second floors, while the data collection stations were set up in the basement (i.e., sign-in stations and BAC stations) and on the first floor of the house (i.e., SRS stations). Alcoholic

beverages consumed included beer (both kegged and canned beer) and hard liquor. Music at the party was supplied with a stereo. Approximately 15 people were given rides home by the "designated driver" crews.

Party Three. Party Three served as the experimental condition for Group E/C. It took place on Friday, April 7, 1995. The party began at 8:30 pm and ended at 2:00 am.

Approximately 120 students attended Party Three. Of those, 94 participated in the research (52 men, 42 women). An estimated 25 students did not participate in the research because they were under 21 years of age. The party took place at a large, two-story, off-campus fraternity house. Party-goers congregated both outside and on the first and second floors, while all of the data collection stations were set up on the first floor of the house (i.e., sign-in stations, BAC stations, and SRS stations). Alcoholic beverages consumed included beer (canned beer) and hard liquor (BYOB). Music at the party was supplied with a stereo. Approximately 62 people were given rides home by the "designated driver" crews.

Party Four. Party Four served as the control condition for Group E/C. It took place on Friday, April 21, 1995. The party began at 6:00 pm and ended at 12:30 am.

Approximately 100 students attended Party Four. Of those, 68 participated in the research (40 men, 28 women). An estimated 30 students did not participate in the research because they were under 21 years of age. The party took place at a large, two-story, off-campus fraternity house (the same house used for Party Three). Party-goers congregated both outside and on the first and second floors, while all of the data collection stations were set

up on the first floor of the house (i.e., sign-in stations and BAC stations). Alcoholic beverages consumed included beer (canned beer) and hard liquor (BYOB). Music at the party was supplied with a stereo. Approximately 41 people were given rides home by the "designated driver" crews.

Data Collection Procedures

The basic procedure for collecting the field data was as follows:

1. Approximately two weeks before a scheduled party was to take place, the fraternity and sorority members anticipated to attend the party were administered the personality and lifestyle inventories during their weekly fraternity/sorority meeting by members of the research team.

2. Upon entering the weekend fraternity party, individuals were approached by research assistants who read a prepared statement indicating that the party sponsors (i.e., the hosting fraternity) had agreed to allow data collection at the party and any information gathered would be anonymous and confidential. [All participating subjects at these parties were of legal drinking age, as determined by "identification checks" or "carding" performed by fraternity members acting as doorman at the entrance of the fraternity house.] After this introductory statement, subjects were asked specific demographic information (e.g., age, gender, college status), whether they had consumed any alcohol before coming to the party, what mode of transportation they had used to get to the party, and whether they planned to drive home. Subjects were also asked to show the type and quantity of alcoholic and nonalcoholic beverages they brought to the party with them.

All information for each subject was coded according to the last four digits of their student ID number. In addition, subjects were asked whether

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they came to the party with a date (or were meeting a date at the party). If they answered affirmatively, their dates' ID numbers were recorded with their own, so we could analyze any effects of the presence of a date on drinking behavior and SRS participation. Thus, an additional category during data analysis was couples versus singles.

3. Subjects were informed that they would receive a BAC test at the end of the evening, and that free transportation was available to anyone wanting a safe ride home. Any student reaching a BAC of .08 or higher was not allowed to drive home. The students signed an informed consent form (see Appendix F) indicating they understood these contingencies and agreed to participate. For the purpose of tracking a subject's data throughout the party, each student wore a hospital wristband with the last four digits of their ID number (as done with no problems in the pilot research). If a party-goer chose not to participate in the research this information was recorded along with the party-goer's ID number.

4. In addition to signing the informed consent statement, partiers were asked to fill out a short survey with questions regarding their intentions to consume alcohol and reach certain levels of BAC (see Appendix F). At this time, subjects also received a BAC breathalyzer test, which served as a baseline measure of intoxication for the evening.

5. Subjects were handed a promotional flyer (see Appendix F) with a brief description of each SRS and a request to visit each SRS as many times as they wanted throughout the party.

6. If a subject visited one of the SRSs, their ID number was recorded, as well as certain information pertaining to their visit at that station. (These ID numbers were also recorded on the questionnaires administered earlier).

7. When subjects performed the sobriety tests at the "performance feedback" SRS, their BAC at the time was recorded through the use of a breathalyzer. In addition, outcomes of the field sobriety tests were recorded. During preliminary studies (see above), several sobriety tests were studied at fraternity parties, including the nystagmus gaze test, ruler-drop reaction time, number pointing (a critical tracking task), time estimation, handwriting, and backwards counting by three's.

As a result of this testing across two parties (approximately 200 subjects per test), the performance battery was refined for the proposed research. As a result of this refinement, the nystagmus gaze test and handwriting test were dropped from the battery (because of problems with inter-rater reliability between research assistants) and replaced with the one-leg stand sobriety test and the star tracing sobriety test.

8. Before subjects left the party, they were asked to complete an Exit Questionnaire (see Appendix F). Finally, each subject's exit BAC was assessed through use of a breathalyzer. If a subject's BAC was above .05, they were reminded that they should not operate a motor vehicle, and that free transportation home was available.

BAC Measurement

Two BAC DataMaster II (Analytical Systems, Inc., East Hartford, CT) breathalyzers were used to collect entrance and exit BACs from partiers as they arrived to and left from the party (accuracy = +/- .003 BAC; precision <

.003 SD). A portable Alco-Sensor III (Intoximeters, Inc., St. Louis, MO) breathalyzer was used to test BACs at the various SRSs (accuracy = +/- .005 BAC). The research team possesses eight of these devices and all were used to facilitate data collection. Before submitting a breath sample, each subject was asked to swish about 2 oz of water in his or her mouth. A standardized sampling procedure was used to ensure that alveolar (i.e., deep lung) air was collected.

Results

Subjects' Mean BAC at Parties

The mean BAC at Party One was .102 (s.d.=.06), with a range from .00 to .226. For males, the mean BAC was .107 (s.d.=.06), with a range from .00 to .226. For females, the mean BAC was .094 (s.d.=.06), with a range from .014 to .194 (see Table 2).

The mean BAC at Party Two was .098 (s.d.=.06), with a range from .00 to .255. For males, the mean BAC was .097 (s.d.=.06), with a range from .00 to .255. For females, the mean BAC was .101 (s.d.=.05), with a range from .029 to .185 (see Table 2).

The mean BAC at Party Three was .102 (s.d.=.06), with a range from .00 to .203. For males, the mean BAC was .119 (s.d.=.05), with a range from .00 to .203. For females, the mean BAC was .081 (s.d.=.06), with a range from .001 to .181 (see Table 2).

The mean BAC at Party Four was .085 (s.d.=.05), with a range from .002 to .212. For males, the mean BAC was .096 (s.d.=.05), with a range from .022 to .212. For females, the mean BAC was .070 (s.d.=.05), with a range from .002 to .167 (see Table 2).

Insert Table 2 about here

Hypothesis 1: Students' behavioral intentions to consume alcohol (not general attitudes toward alcohol and DUI) will predict their subsequent drinking behavior at a party.

Upon entering the parties, students were asked: 1) how many alcoholic beverages they intended to consume at the party, 2) how impaired they intended to get at the party [Subjects were provided with an anchored rating scale corresponding with BAC to aid them with this estimation.], and 3) how impaired they believed the average person *of their gender* was planning to get at the party (see Appendix F, Behavioral Intentions Questionnaire).

Additionally, when exiting the parties (but prior to having actual BAC assessed), students were asked to estimate: 1) how many alcoholic beverages they had actually consumed at the party, 2) their current level of intoxication, and 3) the average current level of intoxication of other people *of their gender* at the party (see Appendix F, Exit Questionnaire).

Intentions to Consume Alcohol

Data from the four parties were collapsed for analyses. This resulted in 250 subjects being included in the analyses. Across the four parties, the mean exit BAC was .102 (SD = .06), with a range from .00 to .255. The mean estimation of quantity to be consumed was 7.63 (SD = 3.84), with a range from 0 to 20. The mean score for self-intentions of BAC was .105 (SD = .05), with a range from .00 to .200. The mean score for other-intentions of BAC was .121 (SD = .04), with a range from .011 to .200.

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The correlation between exit BAC and estimations of quantity to be consumed was $r = .42$, $p \leq .001$. The correlation between exit BAC and self-intentions was $r = .54$, $p \leq .001$. The correlation between exit BAC and other-intentions was $r = .23$, $p \leq .001$. The correlation between estimations of quantity to be consumed and self-intentions was $r = .71$, $p \leq .001$. Finally, the correlation between self-intentions and other-intentions was $r = .54$, $p \leq .001$ (see Table 3).

Insert Table 3 about here

The data were also analyzed using a stepwise multiple regression procedure, with the criterion variable being exit BAC. In this model, self-intentions entered into the model significantly, $F (1,240) = 93.8$, $p \leq .001$, accounting for 27.8 percent of the variance. Subjects' intentions of quantity to be consumed and other-intentions failed to enter significantly into the model.

Insert Figure 2 about here

Finally, the data were analyzed to determine what percentage of students under- and over-estimated how intoxicated they would eventually become at a party. A subject was considered to have estimated their intentions correctly if their stated self-intention was within +/- .01 of their exit BAC. Results indicated 37.5% of the students (n=93) under-estimated their eventual BAC, 44% (n=109) over-estimated their eventual BAC, and

18.5% (n=46) correctly identified how intoxicated they would become when stating their self-intentions (see Figure 2).

Intentions to consume alcohol by gender. To further explore the relationship between intentions to consume alcohol and actual drinking behavior, the data was analyzed by gender. This was considered important because past literature has shown differences in drinking styles between men and women (e.g., Engs & Hanson, 1985, 1989).

For males across all parties (N = 156), the mean exit BAC was .112 (SD = .05), with a range from .00 to .255. The mean estimation of quantity to be consumed was 9.19 (SD = 3.62), with a range from 0 to 20. The mean score for self-intentions of BAC was .123 (SD = .05), with a range from .00 to .200. The mean score for other-intentions of BAC was .127 (SD = .03), with a range from .011 to .200 (see Figure 3).

Insert Figure 3 about here

The correlation between exit BAC and estimations of quantity to be consumed by males was r = .47, $p \leq$ .001. The correlation between exit BAC and self-intentions was r = .53, $p \leq$ .001. The correlation between exit BAC and other-intentions was r = .16, $p \leq$ .05. The correlation between estimations of quantity to be consumed and self-intentions was r = .70, $p \leq$ .001. Finally, the correlation between self-intentions and other-intentions was r = .47, $p \leq$ .001.

A stepwise multiple regression procedure was performed on the male data, using exit BAC as the dependent variable. In this model, self-intentions

entered into the model significantly on the first step, $F_{(1,150)} = 55.8$, $p \leq .001$, accounting for 26.6 percent of the variance. On the second step, males' intentions of quantity to be consumed entered significantly into the equation, $F_{(2,149)} = 31.5$, $p \leq .001$, raising the amount of variance accounted for to 28.7 percent. Other-intentions failed to enter significantly into the model.

For females across all parties (N = 94), the mean exit BAC was .095 (SD = .05), with a range from .001 to .194. The mean estimation of quantity to be consumed was 4.57 (SD = 2.63), with a range from 0 to 16. The mean score for self-intentions of BAC was .079 (SD = .04), with a range from .020 to .175. The mean score for other-intentions of BAC was .110 (SD = .04), with a range from .050 to .200 (see Figure 3).

The correlation between exit BAC and estimations of quantity to be consumed by females was $r = .17$, $p = .10$. The correlation between exit BAC and self-intentions was $r = .50$, $p \leq .001$. The correlation between exit BAC and other-intentions was $r = .27$, $p \leq .01$. The correlation between estimations of quantity to be consumed and self-intentions was $r = .43$, $p \leq .001$. Finally, the correlation between self-intentions and other-intentions was $r = .60$, $p \leq .001$.

A stepwise multiple regression procedure was also performed on the female data, again using exit BAC as the dependent variable. In this model, self-intentions entered into the model significantly, $F_{(1,88)} = 27.8$, $p \leq .001$, accounting for 23.2 percent of the variance. No other variables entered significantly into the model.

Intentions to consume alcohol by condition. The relationship between intentions to consume alcohol and actual drinking behavior was also further

explored by analyzing the data by experimental condition. This was done because drinking rates and subsequent levels of intoxication were hypothesized to be influenced by the inclusion of the SRSs. As such, it is a reasonable assumption that the relationship between intentions and actual BAC would also be influenced by the presence of the SRSs.

For subjects in the control condition (N = 122), the mean exit BAC was .102 (SD = .05), with a range from .00 to .226. The mean estimation of quantity to be consumed was 7.31 (SD = 3.90), with a range from 0 to 20. The mean score for self-intentions of BAC was .104 (SD = .05), with a range from .00 to .200. The mean score for other-intentions of BAC was .120 (SD = .04), with a range from .025 to .200.

The correlation between exit BAC and estimations of quantity to be consumed by control subjects was r = .54, p ≤ .001. The correlation between exit BAC and self-intentions was r = .57, p ≤ .001. The correlation between exit BAC and other-intentions was r = .29, p ≤ .001. The correlation between estimations of quantity to be consumed and self-intentions was r = .76, p ≤ .001. Finally, the correlation between self-intentions and other-intentions was r = .57, p ≤ .001.

A stepwise multiple regression procedure was performed on the control data, using exit BAC as the dependent variable. In this model, self-intentions entered into the model significantly on the first step, F (1,117) = 53.4, p ≤ .001, accounting for 30.7 percent of the variance. On the second step, control subjects' intentions of quantity to be consumed entered significantly into the equation, F (2,116) = 30.8, p ≤ .001, raising the amount of variance

accounted for to 33.6 percent. Other-intentions failed to enter significantly into the model.

For subjects in the experimental condition (N = 128), the mean exit BAC was .109 (SD = .06), with a range from .001 to .255. The mean estimation of quantity to be consumed was 7.95 (SD = 3.78), with a range from 1 to 20. The mean score for self-intentions of BAC was .110 (SD = .05), with a range from .00 to .200. The mean score for other-intentions of BAC was .120 (SD = .04), with a range from .011 to .200.

The correlation between exit BAC and estimations of quantity to be consumed by experimental subjects was $r = .28$, $p \leq .001$. The correlation between exit BAC and self-intentions was $r = .50$, $p \leq .001$. The correlation between exit BAC and other-intentions was $r = .19$, $p \leq .05$. The correlation between estimations of quantity to be consumed and self-intentions was $r = .65$, $p \leq .001$. Finally, the correlation between self-intentions and other-intentions was $r = .53$, $p \leq .001$.

A stepwise multiple regression procedure was also performed on the experimental data, again using exit BAC as the dependent variable. In this model, self-intentions entered into the model significantly, $F (1,121) = 39.0$, $p \leq .001$, accounting for 23.7 percent of the variance. No other variables entered significantly into the model.

Estimations of Intoxication

Estimation of intoxication data (collected as subjects were leaving a party) was collected at all four parties, but analyses were performed separately on data collected from the two control parties and two experimental parties,

as estimations made at the experimental parties were possibly contaminated by participation at the BAC Feedback and Performance Feedback SRSs.

A total of 120 subjects made estimations of their intoxication level at the end of the control parties. Across the two control parties, the mean exit BAC was .102 (SD = .05), with a range from .00 to .226. The mean estimation of quantity actually consumed was 7.25 (SD = 3.94), with a range from 0 to 20. The mean score for self-estimations of BAC was .100 (SD = .05), with a range from .010 to .200. The mean score for other-estimations of BAC was .104 (SD = .03), with a range from .040 to .200.

The correlation between exit BAC and estimations of quantity actually consumed was r = .54, $p \leq$ .001. The correlation between exit BAC and self-estimations was r = .73, $p \leq$ .001. The correlation between exit BAC and other-estimations was r = .21, $p \leq$ .05. The correlation between estimations of quantity actually consumed and self-estimations was r = .55, $p \leq$ .001. Finally, the correlation between self-estimations and other-estimations was r = .57, $p \leq$ .001 (see Table 4).

Insert Table 4 about here

These data were also analyzed using a stepwise multiple regression procedure, with the criterion variable being exit BAC. In this model, self-estimations entered into the model significantly on the first step, $F_{(1,107)}$ = 121.2, $p \leq$ .001, accounting for 52.7 percent of the variance. On the second step, other-estimations entered into the model significantly, $F_{(2,106)}$ = 77.5, $p \leq$

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.001, raising the adjusted R Square to .586. Subjects' estimations of quantity consumed failed to enter significantly into the model.

Finally, the data were analyzed to determine what percentage of students under- and over-estimated how intoxicated they thought they were at the end of a party. A subject was considered to have estimated their BAC correctly if their stated self-estimation was within +/- .01 of their exit BAC. Results indicated 45% of the students (n=49) under-estimated their exit BAC, 37.6% (n=41) over-estimated their exit BAC, and 17.4% (n=19) correctly identified how intoxicated they were before having their exit BAC assessed (see Figure 4).

Insert Figure 4 about here

Estimations of intoxication at the experimental parties. While estimations made at the experimental parties were possibly contaminated by participation at the BAC Feedback and Performance Feedback SRSs, the information can still be viewed as informative, as it gives an indication of the influence of the SRSs on students' knowledge of their levels of intoxication at the end of a party.

A total of 128 subjects made estimations of their intoxication level at the end of the experimental parties. Across the two control parties, the mean exit BAC was .109 (SD = .06), with a range from .00 to .255. The mean estimation of quantity actually consumed was 6.11 (SD = 3.43), with a range from 0 to 20. The mean score for self-estimations of BAC was .094 (SD = .05),

with a range from .004 to .200. The mean score for other-estimations of BAC was .120 (SD = .03), with a range from .040 to .200.

The correlation between exit BAC and estimations of quantity actually consumed was r = .48, $p \leq$ .001. The correlation between exit BAC and self-estimations was r = .78, $p \leq$ .001. The correlation between exit BAC and other-estimations was r = .25, $p \leq$ .01. The correlation between estimations of quantity actually consumed and self-estimations was r = .46, $p \leq$ .001. Finally, the correlation between self-estimations and other-estimations was r = .45, $p \leq$ .001 (see Table 4).

These data were also analyzed using a stepwise multiple regression procedure, with the criterion variable being exit BAC. In this model, self-estimations entered into the model significantly on the first step, F (1,126) = 200.8, $p \leq$ .001, accounting for 61.4 percent of the variance. On the second step, subjects' estimations of quantity consumed entered into the model significantly, F (2,125) = 106.5, $p \leq$ .001, raising the adjusted R Square to .630. On the third step, other-estimations entered into the model significantly, F (3,124) = 76.0, $p \leq$ .001, raising the adjusted R Square to .640. All variables entered significantly into the model.

Estimations of intoxication by gender. As with the analysis of intentions to consume alcohol, the analysis of estimations of intoxication was also further explored by examining the results by gender, in an attempt to determine whether gender differences exist within this relationship. Only data from the control parties are considered here.

For males (N = 74), the mean exit BAC was .102 (SD = .06), with a range from .00 to .226. The mean estimation of quantity actually consumed was 8.30

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(SD = 4.02), with a range from 1 to 24. The mean score for self-estimations of BAC was .107 (SD = .05), with a range from .010 to .200. The mean score for other-estimations of BAC was .119 (SD = .03), with a range from .040 to .200 (see Figure 5).

Insert Figure 5 about here

The correlation between exit BAC and estimations of quantity actually consumed by males was r = .53, $p \leq$ .001. The correlation between exit BAC and self-estimations was r = .73, $p \leq$ .001. The correlation between exit BAC and other-estimations was r = .11, p = .34. The correlation between estimations of quantity actually consumed and self-estimations was r = .53, $p \leq$ .001. Finally, the correlation between self-estimations and other-estimations was r = .44, $p \leq$ .001.

A stepwise multiple regression procedure was performed on the male data, using exit BAC as the dependent variable. In this model, self-estimations entered into the model significantly on the first step, F (1,69) = 76.5, $p \leq$ .001, accounting for 51.9 percent of the variance. On the second step, other-estimations entered significantly into the equation, F (2,68) = 46.6, $p \leq$ .001, raising the amount of variance accounted for to 56.6 percent. Males' estimations of quantity consumed failed to enter significantly into the equation.

For females (N = 46), the mean exit BAC was .086 (SD = .05), with a range from .002 to .194. The mean estimation of quantity actually consumed was 5.28 (SD = 2.93), with a range from 1 to 16. The mean score for self-

estimations of BAC was .086 (SD = .05), with a range from .010 to .200. The mean score for other-estimations of BAC was .112 (SD = .04), with a range from .050 to .200 (see Figure 5).

The correlation between exit BAC and estimations of quantity actually consumed by females was $r = .59$, $p \leq .001$. The correlation between exit BAC and self-estimations was $r = .73$, $p \leq .001$. The correlation between exit BAC and other-estimations was $r = .34$, $p \leq .05$. The correlation between estimations of quantity actually consumed and self-estimations was $r = .53$, $p \leq .001$. Finally, the correlation between self-estimations and other-estimations was $r = .75$, $p \leq .001$.

Finally, a stepwise multiple regression procedure was performed on the female data, again using exit BAC as the dependent variable. In this model, self-estimations entered into the model significantly on the first step, $F_{(1,36)} = 40.6$, $p \leq .001$, accounting for 51.7 percent of the variance. On the second step, other-estimations entered significantly into the equation, $F_{(2,35)} = 29.4$, $p \leq .001$, raising the amount of variance accounted for to 60.6 percent. On the third step, females' estimations of quantity consumed entered significantly into the equation, $F_{(3,34)} = 23.3$, $p \leq .001$, raising the total amount of variance accounted for to 64.4 percent.

Hypothesis 2: The relationship between intentions to consume alcohol and actual behavior will be moderated by certain demographic, personality, attitudinal, and lifestyle variables.

A series of moderated regressions was performed to assess whether any variables moderated the relationship between intentions to consume alcohol and exit BAC at the control and experimental parties. Variables tested

included demographic, personality, attitudinal, and lifestyle variables. The moderated regression procedures were performed by first forcing the main effects into an equation using exit BAC as the criterion variable, and then adding the interaction term to the equation to determine whether it accounted for a significant amount of unique variance. Results are reported below by type of variable.

Demographic Variables

Demographic variables tested included: 1) gender (n = 138 men, 90 women), 2) school classification (n = 20 freshmen, 27 sophomores, 41 juniors, 39 seniors, 1 graduate student), 3) ethnicity (n = 1 Native American, 3 Hispanics, 5 Asians, 0 African Americans, 219 Whites), 4) grade point average (n = 8 at 4.0-3.5, 39 at 3.4-3.0, 61 at 2.9-2.5, 17 at 2.4-2.0, 3 at 1.9-1.5, 0 at 1.4-1.0, 0 at less than 1.0), and 5) an experience with alcohol composite score (mean = 14.7, S.D. = 3.5, range = 1 - 21); (see Appendix E, Experience with Alcohol Questionnaire).

At the control parties, experience with alcohol and self-intentions for BAC loaded significantly into an equation using exit BAC as the criterion variable, F (2,76) = 13.68, $p \leq .001$, accounting for 24.5 percent of the variance. Addition of the experience with alcohol composite score X self-intentions for BAC interaction term also loaded significantly into the equation, F (3,75) = 11.58, $p \leq .001$, raising the percent of variance accounted for to 28.9. To determine the direction of this moderating effect, a median split was performed on the variable experience with alcohol, and the correlation between actual BAC and the interaction term was determined for each level of the variable. The median split for this variable was made at a score of 15.0.

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For subjects scoring high in experience with alcohol, the correlation between BAC and the interaction term was $r = .39$, $p \leq .02$. For subjects scoring low in experience with alcohol, the correlation between BAC and the interaction term was $r = .31$, $p = .054$.

At the experimental parties, experience with alcohol and self-intentions for BAC also loaded significantly into an equation using exit BAC as the criterion variable, $F(2,95) = 5.76$, $p \leq .01$, accounting for 8.9 percent of the variance. Addition of the experience with alcohol composite score X self-intentions for BAC interaction term, however, did not load significantly into the equation.

Further moderated regression tests indicated that the variables gender, school classification, ethnicity, and grade point average did not moderate the relationship between intentions to consume alcohol and exit BAC at the control and experimental parties.

Personality Variables

Personality was measured using the Actively Caring Survey (see Appendix A), which is comprised of six sub-scales: 1) belonging (mean = 4.19, S.D. = .47, range = 2.8 - 5), 2) optimism (mean = 3.68, S.D. = .54, range = 2.1 - 4.9), 3) personal control (mean = 3.79, S.D. = .39, range = 2.8 - 4.8), 4) self-efficacy (mean = 3.72, S.D. = .43, range = 2.6 - 4.6), 5) self-esteem (mean = 3.88, S.D. = .49, range = 2.3 - 5), and 6) actively caring (mean = 3.71, S.D. = .45, range = 2.6 - 4.8). Each sub-scale was scored separately, and in addition a composite score was developed. All sub-scale scores were weighted by summing the responses of each question and then dividing the sum by the total number of questions of each sub-scale. The composite score (i.e., Total Score) was

derived by summing the six weighted sub-scores (mean = 22.97, S.D. = 1.96, range = 17.2 - 27.1). In addition, personality was also measured using the Sensation Seeking Scale (mean = 55.6, S.D. = 5.1, range = 44 - 64); (see Appendix C).

At the control parties, score on the optimism sub-scale and self-intentions for BAC loaded significantly into an equation using exit BAC as the criterion variable, F (2,78) = 14.52, $p \leq$ .001, accounting for 25.3 percent of the variance. Addition of the optimism score X self-intentions for BAC interaction term also loaded significantly into the equation, F (3,77) = 11.52, $p \leq$ .001, raising the percent of variance accounted for to 28.3. To determine the direction of this moderating effect, a median split was performed on the variable optimism, and the correlation between actual BAC and the interaction term was determined for each level of the variable. The median split for this variable was made at a score of 3.78. For subjects scoring high in optimism, the correlation between BAC and the interaction term was r = .28, $p >$ .10. For subjects scoring low in optimism, the correlation between BAC and the interaction term was r = .58, $p \leq$ .01.

At the experimental parties, optimism score and self-intentions for BAC also loaded significantly into an equation using exit BAC as the criterion variable, F (2,94) = 6.48, $p \leq$ .01, accounting for 10.3 percent of the variance. Addition of the optimism score X self-intentions for BAC interaction term, however, did not load significantly into the equation.

Results indicated that at the control parties, scores on the self-efficacy sub-scale and self-intentions for BAC significantly predicted exit BAC, F (2,78) = 13.18, $p \leq$ .001, accounting for an adjusted R^2 of .233. Addition of the self-

efficacy score X self-intentions for BAC interaction term significantly increased the adjustedR^2 to .269, F (3,77) = 10.81, $p \leq .001$. To determine the direction of this moderating effect, a median split was performed on the variable self-efficacy, and the correlation between actual BAC and the interaction term was determined for each level of the variable. The median split for this variable was made at a score of 3.75. For subjects scoring high in self-efficacy, the correlation between BAC and the interaction term was $r = .29$, $p > .10$. For subjects scoring low in self-efficacy, the correlation between BAC and the interaction term was $r = .62$, $p \leq .01$.

For the experimental parties, self-efficacy score and self-intentions for BAC significantly predicted exit BAC, F (2,94) = 6.80, $p \leq .01$, accounting for an adjusted R^2 of .108. Addition of the self-efficacy score X self-intentions for BAC interaction term did not significantly enter into the equation.

At the control parties, scores on the self-esteem sub-scale and self-intentions for BAC loaded significantly into an equation using exit BAC as the criterion variable, F (2,78) = 15.40, $p \leq .001$, accounting for 26.5 percent of the variance. Addition of the self-esteem score X self-intentions for BAC interaction term also loaded significantly into the equation, F (3,77) = 12.61, $p \leq .001$, raising the percent of variance accounted for to 30.3. To determine the direction of this moderating effect, a median split was performed on the variable self-esteem, and the correlation between actual BAC and the interaction term was determined for each level of the variable. The median split for this variable was made at a score of 3.83. For subjects scoring high in self-esteem, the correlation between BAC and the interaction term was $r = .34$,

$\underline{p} \leq .02$. For subjects scoring low in self-esteem, the correlation between BAC and the interaction term was $\underline{r} = .57$, $\underline{p} \leq .01$.

At the experimental parties, self-esteem and self-intentions for BAC loaded significantly into an equation using exit BAC as the criterion variable, $\underline{F}$ (2,94) = 6.14, $\underline{p} \leq .01$, accounting for 9.7 percent of the variance. Addition of the self-esteem score X self-intentions for BAC interaction term, however, did not load significantly into the equation.

Further moderated regression tests indicated that the variables actively caring, belonging, and personal control (as derived from sub-scale scores) did not moderate the relationship between intentions to consume alcohol and exit BAC at the control and experimental parties. Also, Total Score on the Actively Caring Survey did not moderate this relationship at either type of party.

Results indicated that for both the control and experimental parties, the Sensation Seeking score X self-intentions for BAC interaction term did not predict significantly more variance in exit BAC than the sensation seeking score and self-intentions for BAC alone.

Attitudinal Variables

The Invulnerability Scale (see Appendix D) was used to assess subjects' attitudes regarding the probability of experiencing negative life events, both for the night of the party and throughout the respondent's entire life. Subjects were asked to rate both the probability that they would experience these negative life events, and the probability that the average fraternity or sorority member of their gender at Virginia Tech would experience these

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negative life events. Responses were summed to derive a total invulnerability score (mean = 27.7, S.D. = 9.0, range = 12 - 67).

At the control parties, total invulnerability score and self-intentions for BAC loaded significantly into an equation using exit BAC as the criterion variable, F (2,75) = 12.19, $p \leq .001$, accounting for 30.9 percent of the variance. Addition of the total invulnerability score X self-intentions for BAC interaction term also loaded significantly into the equation, F (3,74) = 14.65, $p \leq .001$, raising the percent of variance accounted for to 34.7. To determine the direction of this moderating effect, a median split was performed on the variable total invulnerability, and the correlation between actual BAC and the interaction term was determined for each level of the variable. The median split for this variable was made at a score of 26.0. For subjects scoring high in invulnerability, the correlation between BAC and the interaction term was $r = .38, p \leq .02$. For subjects scoring low in invulnerability, the correlation between BAC and the interaction term was $r = .36, p \leq .05$.

At the experimental parties, total invulnerability and self-intentions for BAC again loaded significantly into an equation using exit BAC as the criterion variable, F (2,94) = 7.15, $p \leq .01$, accounting for 11.4 percent of the variance. Addition of the total invulnerability X self-intentions for BAC interaction term, however, did not load significantly into the equation.

Lifestyle Variables

Measures of students' lifestyles were assessed using the Risky Lifestyles Questionnaire (mean = 67.2, S.D. = 8.4, range = 41 - 91); (see Appendix D). Results indicated that at the control parties, Risky Lifestyles score and self-intentions for BAC significantly predicted exit BAC, F (2,75) = 13.71, $p \leq .001$,

accounting for an adjusted R^2 of .25. Addition of the Risky Lifestyles score X self-intentions for BAC interaction term significantly increased the adjusted R^2 to .30, F (3,74) = 11.87, $p \leq$ .001. To determine the direction of this moderating effect, a median split was performed on the variable Risky Lifestyles score , and the correlation between actual BAC and the interaction term was determined for each level of the variable. The median split for this variable was made at a score of 67.0. For subjects scoring high on the Risky Lifestyles score, the correlation between BAC and the interaction term was $r =$ .38, $p \leq$ .05. For subjects scoring low on the Risky Lifestyles score, the correlation between BAC and the interaction term was $r =$ .73, $p =$ .01.

For the experimental parties, Risky Lifestyles score and self-intentions for BAC significantly predicted exit BAC, F (2,94) = 5.75, $p \leq$ .01, accounting for an adjusted R^2 of .09. Addition of the Risky Lifestyles score X self-intentions for BAC interaction term did not significantly enter into the equation.

Hypothesis 3: Measures of demographic, personality, attitudinal, and lifestyle variables will predict to various degrees which individuals become overly intoxicated and at risk for DUI, and which students participate at an SRS ("social responsibility station") to decrease adverse effects of alcohol impairment.

A total of 228 students completed the pre-party survey of demographic, attitudinal, personality, and lifestyle variables. Of the students attending the control parties, 82 (of 135) completed the pre-party survey. Of those attending the experimental parties, 102 (of 166) completed the pre-party survey. As such, these are the sample sizes for all statistical tests included in this section, with the exception of tests involving gender, as gender of subject was

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recorded independently by research assistants during administration of BAC tests.

Demographic Variables

Demographic variables tested included: 1) gender, 2) school classification, 3) ethnicity, 4) grade point average, and 5) an experience with alcohol composite score (see Appendix E).

Prediction of intoxication at control parties. The only demographic variable significantly correlated with BAC at the control parties was gender (n = 135), $r = .17$, $p \leq .05$. However, the correlation between BAC and the alcohol experience composite score did approach significance, $r = .20$, $p = .07$. A one-way ANOVA was performed on gender, using exit BAC as the dependent variable. This equation was significant, $F(1,133) = 4.15$, $p \leq .05$, with males evidencing a mean BAC of .101, and females reaching a mean BAC of .081. A stepwise multiple regression procedure was performed, using exit BAC as the dependent variable, and none of the demographic variables reached the criterion for entry into the model.

Prediction of intoxication at experimental parties. Gender was also significantly correlated with BAC at the experimental parties (n = 166), $r = .22$, $p \leq .01$. In addition, class standing was correlated significantly with exit BAC, $r = .22$, $p \leq .05$. A one-way ANOVA performed using gender as the independent variable and exit BAC as the dependent variable reached significance, $F(1,164) = 4.92$, $p \leq .05$, with males reaching a mean BAC of .108, and females evidencing a mean BAC of .087. A one-way ANOVA was also performed using class standing as the independent variable. However, this equation failed to reach significance, $F(4,97) = 2.09$, $p = .09$. A stepwise

multiple regression procedure was performed, loading the five demographic variables into the equation. Only gender entered significantly into the equation, F (1,100) = 5.95, $p \leq .05$, accounting for 4.7 percent of the variance of exit BAC.

Prediction of participation at social responsibility stations. The only demographic variable significantly correlated with participation at the SRSs was gender (n = 166), r = .22, $p \leq .05$. A one-way ANOVA was performed on gender, using SRS participation points as the dependent variable. This equation was significant, F (1,164) = 8.06, $p \leq .01$, with males evidencing a mean SRS participation score of 8.44, and females evidencing a mean SRS participation score of 5.13. A stepwise multiple regression procedure was performed, using SRS participation score as the criterion variable, and none of the demographic variables entered significantly into the model.

The four SRSs (i.e., BAC Feedback SRS, Performance Feedback SRS, Safe Sex SRS, and Safe Driving SRS) were also analyzed separately. The only significant correlation found between participation at an individual SRS and the demographic variables was between participation at the BAC Feedback SRS and gender, r = .33, $p \leq .001$, with males participating more than females. A multiple regression equation was performed, using BAC Feedback SRS participation as the dependent variable and gender as the independent variable. Gender loaded significantly into the equation, F (1,100) = 9.04, $p \leq$ .01, accounting for 7.3 percent of the variance of participation at the station.

Personality Variables

Personality was measured using the Actively Caring Survey (see Appendix A), which is comprised of six sub-scales: 1) belonging, 2) optimism,

3) personal control, 4) self-efficacy, 5) self-esteem, and 6) actively caring. Each sub-scale was scored separately, and in addition a composite score was developed. All sub-scale scores were weighted by summing the responses of each question and then dividing the sum by the total number of questions of each sub-scale. The composite score (i.e., Total Score) was derived by summing the six weighted sub-scores. In addition, personality measures were assessed using the Sensation Seeking Scale (see Appendix C).

Prediction of intoxication at control parties. Two of the sub-scales were significantly (negatively) correlated with exit BAC at the control parties; optimism and self-esteem. The correlation between exit BAC and optimism reached $r = -.24$, $p \leq .05$. The correlation between exit BAC and self-esteem reached $r = -.31$, $p \leq .01$. Additionally, the correlation between exit BAC and Total Score approached significance, $r = -.21$, $p = .06$. A stepwise multiple regression procedure was performed, loading the scores of the six subscales onto the dependent variable exit BAC. Self-esteem loaded into the equation significantly on the first step, $F (1,80) = 8.66$, $p \leq .01$, accounting for 8.6 percent of the variance. On the second step, belonging loaded significantly into the equation, $F (2,79) = 7.88$, $p \leq .001$, raising the total variance accounted for to 14.5 percent. No other variables loaded significantly into the equation. A multiple regression equation was also constructed between Total Score and exit BAC. This equation failed to reach significance, however, $F (1,80) = 3.64$, $p = .06$.

Score on the Sensation Seeking Scale was significantly correlated with exit BAC at the control parties, $r = .23$, $p \leq .05$. In addition, Sensation Seeking score loaded significantly into a multiple regression equation using exit BAC

as the dependent variable, F (1,78) = 4.29, $p \leq .05$, accounting for 4.0 percent of the variance of exit BAC.

Prediction of intoxication at experimental parties. Neither Total Score nor any of the scores for the six Actively Caring sub-scales were significantly correlated with exit BAC at the experimental parties. Further, none of the ACS scores loaded significantly into regression equations using exit BAC as the criterion variable. Likewise, Sensation Seeking score was not correlated significantly with exit BAC at the experimental parties, nor did the variable loaded significantly into a regression equation using exit BAC as the dependent variable.

Prediction of participation at social responsibility stations. Neither Total Score nor any of the scores for the six Actively Caring sub-scales were significantly correlated with overall SRS participation. Additionally, no scores loaded significantly into regression equations using overall SRS participation as the criterion variable.

Participation at each of the four SRSs was also separately examined. Participation at the Safe Driving SRS was significantly (negatively) correlated with belonging, $r = -.21$, $p \leq .05$. In addition, the correlation between participation at the Safe Driving SRS and self-efficacy approached significance, $r = -.19$, $p = .06$. No significant correlations were found between the six sub-scales and participation at the other three SRSs. However, the correlation between participation at the BAC feedback SRS and self-efficacy also approached significance, $r = .18$, $p = .07$. Finally, a series of stepwise multiple regression procedures were performed, loading the scores of the six sub-scales into separate equations using participation at the four SRSs as the criterion

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variable. The only significant loading occurred with the equation using participation at the Safe Driving SRS as the criterion variable. In this equation, belonging entered significantly into the equation, F (1,99) = 4.63, $p \le$ .05, accounting for 3.5 percent of the variance. No other variables loaded significantly into this equation. In addition, Sensation Seeking score was not significantly correlated with overall SRS participation or participation at any of the individual SRSs.

Attitudinal Variables

The Invulnerability Scale (see Appendix D) was used to assess subjects' attitudes regarding the probability of experiencing negative life events, both for the night of the party and throughout the respondent's entire life. Subjects were asked to rate both the probability that they would experience these negative life events, and the probability that the average fraternity or sorority member of their gender at Virginia Tech would experience these negative life events. Responses were categorized into four sub-scales: 1) self-ratings for the night of the party (SRNight), 2) self-ratings for the respondent's entire life (SRLife), 3) other-ratings for the night of the party (ORNight), and 4) other-ratings for experiencing negative events during the life of the average same-gender student (ORLife).

Prediction of intoxication at control parties. At the control parties, a significant correlation was found between exit BAC and SRLife, r = .51, $p \le$ .001, and between exit BAC and ORLife, r = .22, $p \le$ .05. In addition, the correlation between SRNight and exit BAC approached significance, r = .21, p = .07. A stepwise multiple regression procedure was performed, loading the four sub-scales onto the dependent variable exit BAC. Ratings of SRLife

loaded significantly into the equation, F (1,77) = 26.5, $p \leq .001$, accounting for 24.6 percent of the variance. No other variables loaded significantly into the equation.

Prediction of intoxication at experimental parties. At the experimental parties, the only significant correlation was evidenced between SRLife and exit BAC, r = .29, $p \leq .01$. In addition, the variable SRLife loaded significantly into a stepwise multiple regression equation using exit BAC as the criterion variable, F (1,99) = 9.32, $p \leq .01$, accounting for 7.7 percent of the variance. Ratings of SRNight, ORLife, and ORNight failed to load significantly into the equation.

Prediction of participation at social responsibility stations. A significant (negative) correlation was found between ratings of ORLife and overall SRS participation, r = -.19, $p \leq .05$. In addition, the correlation between ORNight and overall SRS participation approached significance, r = -.18, p = .07. The correlations between self-ratings and overall SRS participation failed to reach significance. Also, none of the four ratings loaded significantly into a regression equation using overall SRS participation as the criterion variable.

The four SRSs were also analyzed individually. A significant (negative) correlation was found between participation at the Safe Driving SRS and SRLife, r = -.19, $p \leq .05$. Additionally, a significant (negative) correlation was found between participation at the Performance Feedback SRS and ORLife, r = -.24, $p \leq .05$. No other correlations reached significance. Finally, a series of stepwise multiple regression procedures were performed, loading the four attitudinal sub-scales into equations using participation at the four SRSs as the dependent variables. The measure ORLife loaded

significantly into an equation using participation at the Performance Feedback SRS as the dependent variable, F (1,99) = 6.27, $p \leq .05$, accounting for 5.0 percent of the variance of participation at that station. No other factors loaded significantly into any equation.

Lifestyle Variables

Measures of students' lifestyles were assessed using the Risky Lifestyles Questionnaire (see Appendix D).

Prediction of intoxication at control parties. The correlation between score on the Risky Lifestyles Questionnaire and exit BAC did not reach significance. Further, the regression equation using Risky Lifestyles score failed to reach significance.

Prediction of intoxication at experimental parties. Risky Lifestyles score was not correlated significantly with exit BAC at the experimental parties. Likewise, the variable failed to load significantly into a regression equation using exit BAC as the dependent variable.

Prediction of participation at social responsibility stations. Risky Lifestyles score was not significantly correlated with overall SRS participation or participation at any of the individual SRSs. However, the correlation between Risky Lifestyles score and participation at the Safe Sex SRS did approach significance, r = -.24, p = .07.

Hypothesis 4: Students scoring high on self-esteem, personal control, optimism, and group cohesion will drink more responsibly and participate more at the SRSs.

To differentiate between students scoring high and low on each variable, a median-split was performed on the weighted scores of self-esteem,

personal control, optimism, and group cohesion (belonging). The mean score for self-esteem was 3.88 (SD = .49), with a range from 2.25 to 5.0. The median-split occurred at a score of 3.83. The mean score for personal control was 3.79 (SD = .39), with a range from 2.80 to 4.80. The median-split occurred at a score of 3.80. The mean score for optimism was 3.68 (SD = .54), with a range from 2.11 to 4.89. The median-split occurred at a score of 3.78. The mean score for belonging was 4.19 (SD = .47), with a range from 2.78 to 5.0. The median-split occurred at a score of 4.22.

To assess the veracity of hypothesis four, a series of one-way ANOVAs were performed using, in turn, the median-split independent variables self-esteem, personal control, optimism, and belonging. Dependent variables tested included exit BAC at control parties, exit BAC at experimental parties, overall SRS participation, and participation score at each of the four SRSs. Where significant results were obtained, 2 Personality Variable (High, Low) X 2 Gender (Male, Female) ANOVAs were performed to further explore the data. This was done to determine whether differences existed between males and females in the relationships of interest.

Self-esteem

A one-way ANOVA performed on the dependent variable exit BAC at control parties reached significance, F (1,80) = 12.03, $p \leq$ .001. The mean exit BAC at control parties for subjects scoring low on self-esteem was .120 (SD = .05), while the mean exit BAC for subjects scoring high on self-esteem was .076 (SD = .06).

In addition, a 2 Self-Esteem (High, Low) X 2 Gender (Male, Female) ANOVA revealed a significant main effect for self-esteem, F (1,78) = 13.60, $p \leq$

.001, but no interaction or main effect for gender, indicating that the significant relationship occurred for both males and females. The mean exit BAC for males scoring low on the self-esteem sub-scale was .124 (SD = .05), while for those scoring high in self-esteem the mean exit BAC was .086 (SD = .06). For females scoring low in self-esteem, the mean exit BAC was .115 (SD = .06), and for females scoring high on the self-esteem subscale the mean exit BAC was .056 (SD = .05) (see Figure 6).

Insert Figure 6 about here

The one-way ANOVA performed on the dependent variable exit BAC at experimental parties did not reach significance. The mean exit BAC at experimental parties for subjects scoring low on self-esteem was .099 (SD = .06), while the mean BAC for subjects scoring high on self-esteem was .098 (SD = .06). For males scoring low in self-esteem, the mean BAC was .112 (SD = .06), while those scoring high in self-esteem reached a mean exit BAC of .103 (SD = .06) at the experimental parties. Females scoring low on the self-esteem sub-scale reached a mean exit BAC of .074 (SD = .05), while those scoring high in self-esteem had a mean exit BAC of .087 (SD = .06) (see Figure 6).

The one-way ANOVAs performed on overall SRS participation and participation score at each of the four SRSs failed to reach significance (all p's > .05).

Personal control

None of the one-way ANOVAs performed for the independent variable personal control reached significance. However, the one-way

ANOVA performed on the dependent variable overall SRS participation did approach significance, F (1,99) = 3.19, p = .077. The average participation score for those scoring low on personal control was 7.02 (SD = 6.8), while the average participation score for those scoring high on personal control was 9.89 (SD = 9.3).

A 2 Personal Control (High, Low) X 2 Gender (Male, Female) ANOVA performed on the dependent variable overall SRS participation revealed a significant 2-way interaction, F (1,97) = 6.43, $p \leq$ .01, but no significant main effects. For males scoring low in personal control, the mean SRS participation score was 6.39 (SD = 5.4), while those scoring high in personal control evidenced a mean SRS participation score of 11.88 (SD = 9.7). Females scoring low on the personal control sub-scale had a mean SRS participation score of 8.28 (SD = 9.0), while those scoring high in personal control had a mean SRS participation score of 5.21 (SD = 6.5).

Optimism

None of the one-way ANOVAs performed for the independent variable optimism reached significance. However, the one-way ANOVA performed on the dependent variable BAC Feedback SRS score did approach significance, F (1,99) = 3.72, p = .057. The average participation score for those scoring low on optimism was 3.32 (SD = 2.8), while the average participation score for those scoring high on optimism was 4.82 (SD = 5.0).

A 2 Optimism (High, Low) X 2 Gender (Male, Female) ANOVA performed on the dependent variable BAC Feedback SRS score revealed a significant main effect for gender, F (1,97) = 6.59, $p \leq$ .01, but no significant interaction or main effect for optimism. For males, the mean participation

score was 4.59 (SD = 4.1), while females had a mean BAC Feedback SRS participation score of 2.34 (SD = 2.6).

Belonging

None of the one-way ANOVAs performed for the independent variable belonging reached significance.

Hypothesis 5: Participation rates will be higher at the BAC Feedback SRS and Performance Feedback SRS than at the Safe Driving SRS and the Safe Sex SRS.

Group C/E Experimental Party

Seventy-two students participated in the research at Party 2. Of those, 51 participated at the BAC Feedback station. The mean participation score was 4.14 (SD = 4.1), with a range from 0 to 21. A total of 13 subjects participated at the Performance Feedback station, which had a mean participation score of 1.24 (SD = 2.8) and a range from 0 to 12. Fourteen students participated at the Safe Driving SRS, which had a mean participation score of .39 (SD = .82) and a range of 0 to 3. A total of 22 subjects participated at the Safe Sex SRS. The mean participation score at the Safe Sex station was 1.04 (SD = 2.2), with a range of 0 to 12 (see Table 5).

Insert Table 5 about here

Group E/C Experimental Party

Ninety-four students participated in the research at Party 3. Of those, 52 participated at the BAC Feedback station. The mean participation score was 2.94 (SD = 3.4), with a range from 0 to 15. A total of 36 subjects participated at

the Performance Feedback station, which had a mean participation score of 2.95 (SD = 4.4) and a range from 0 to 17. Eleven students participated at the Safe Driving SRS, which had a mean participation score of .21 (SD = .62) and a range of 0 to 3. A total of 24 subjects participated at the Safe Sex SRS. The mean participation score at the Safe Sex station was 1.45 (SD = 3.5), with a range of 0 to 22 (see Table 6).

Insert Table 6 about here

Overall Participation

Combining the data collected at the two parties, a total of 166 subjects participated in the experimental condition. Between the two parties, 103 subjects participated at the BAC Feedback station. The mean participation score was 3.46 (SD = 3.8), with a range from 0 to 21. Interestingly, every subject at both parties who participated at the BAC Feedback SRS chose the public feedback option over the private feedback option. A total of 49 subjects participated at the Performance Feedback station, which had a mean participation score of 2.21 (SD = 3.9) and a range from 0 to 17. Twenty-five students participated at the Safe Driving SRS, which had a mean participation score of .29 (SD = .71) and a range of 0 to 3. A total of 47 subjects participated at the Safe Sex SRS. The mean participation score at the Safe Sex station was 1.27 (SD = 3.0), with a range of 0 to 22 (see Table 7).

Insert Table 7 about here

Correlations with exit BAC. The correlation between exit BAC and overall SRS participation was significant, $r = .25$, $p \leq .001$. In addition, significant correlations were evidenced between exit BAC and BAC Feedback SRS score, $r = .31$, $p \leq .001$, and between exit BAC and Performance Feedback SRS score, $r = .17$, $p \leq .05$. The correlations between exit BAC and scores at the Safe Driving and Safe Sex SRSs did not reach significance (see Table 8).

Insert Table 8 about here

Hypothesis 6: **The SRSs will reduce excessive alcohol consumption and DUI risk from comparisons within the same fraternity/sorority (a party with SRSs vs. a party with no SRSs) and between two different fraternities/sororities.**

Data was analyzed using both a between-subjects design and a within-subjects design. However, as some subjects attended only a control or experimental party, while other subjects attended both types of parties, the sample sizes are different for the two types of analyses. Relevant sample sizes are reported for each analysis.

Between-Subjects Analysis

For Group C/E, 67 students (44 male, 23 female) attending the control party and 72 students (53 male, 19 female) attending the experimental party were included in the analysis. For Group E/C, 68 students (40 male, 28 female) attending the control party and 94 students (52 male, 42 female) attending the experimental party were included in the analysis.

A 2 Group (Group C/E, Group E/C) X 2 Condition (Control, Experimental) X 2 Gender (Male, Female) ANOVA was performed on the dependent variable exit BAC. With this test, a significant main effect was found for gender, F (1,293) = 6.66, $p \leq$ .01. Also, a significant 2-way interaction was found between gender and group, F (1,293) = 3.80, $p \leq$ .05. No other significant main effects or interactions were found.

For Group C/E, males reached an average exit BAC of .107 (SD = .06) at the control party and .097 (SD = .07) at the experimental party. For females in Group C/E, the average exit BAC was .094 (SD = .06) at the control party and .101 (SD = .05) at the experimental party. For Group E/C, males reached an average exit BAC of .096 (SD = .05) at the control party and .119 (SD = .05) at the experimental party. For females in Group E/C, the average exit BAC was .070 (SD = .05) at the control party and .081 (SD = .06) at the experimental party (see Figure 7).

Insert Figure 7 about here

Within-Subjects Analysis

A total of 73 subjects (51 male, 22 female) attended both a control and experimental party. For Group C/E, 24 males and 7 females attended both types of parties. For Group E/C, 27 males and 15 females attended both a control and experimental party.

To test whether exit BACs were significantly higher at the control parties, a 2 Group (Group C/E, Group E/C) X 2 Gender (Male, Female) within-subjects ANOVA was performed, using the repeated measure of BAC across

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the control and experimental conditions. Neither the main effect for BAC across conditions nor the gender by BAC or group by BAC interactions reached significance (all p's > .05). However, the gender by group by condition interaction did reach significance, F (1,69) = 5.68, $p \leq .05$.

To further explore this significant interaction, a series of simple effects tests was performed, examining the data by gender within each group. For males in Group C/E, the mean exit BAC was .109 (SD = .06) at the control party and .106 (SD = .06) at the experimental party, a difference which failed to reach significance, t (23) = .31, $p > .10$. For females in Group C/E, the mean exit BAC at the control party was .063 (SD = .07), and the mean exit BAC reached .108 (SD = .04) at the experimental party. This difference also failed to reach significance, t (6) = -1.22, $p > .10$ (see Figure 8).

For males in Group E/C, the mean exit BAC was .105 (SD = .06) at the control party and .129 (SD = .05) at the experimental party. The difference between these scores was significant, t (27) = -2.47, $p \leq .05$, but in a direction counter to that hypothesized. For females in Group E/C, the mean exit BAC was .071 (SD = .05) at the control party and .066 (SD = .06) at the experimental party, t (15) = .31, $p > .10$, a non-significant difference (see Figure 8).

Insert Figure 8 about here

Discussion

The results of this field research were interesting and instructive. Hypotheses one and three were fully supported. In addition, hypotheses two,

four, and five were partially supported. Hypothesis six, however, was not supported (see Table 1).

Hypothesis One

The results indicated that many party-goers' self-intentions of BAC matched closely the level of intoxication they actually attained at a party, supporting Fishbein and Ajzen's (1975) "Theory of Reasoned Action". The research reported here, which measured actual drinking behaviors in a naturalistic environment, lends support to prior research which has found significant correlations between intentions to drink and subsequent verbal reports of drinking behavior (Schlegel, Crawford, & Sanborn, 1977).

In the current research, most subjects were able to estimate their subsequent level of BAC with a high degree of accuracy, as evidenced by the strong correlations between self-intentions of BAC and actual BAC at both the control and experimental parties (see Table 3). As hypothesized, students' behavioral intentions to consume alcohol predicted significantly their subsequent drinking behavior at a party, as evidenced by the stepwise multiple regression procedure performed. With that procedure, subjects' self-intentions of BAC entered into the model significantly, accounting for 27.8 percent of the total variance in the equation.

Interestingly, self-intentions of BAC made before the control parties were statistically more predictive of exit BAC than those made before the experimental parties. In a stepwise multiple regression procedure performed on the control party data only, self-intentions of BAC accounted for 33.6 percent of the variance of exit BAC. Using the same procedure on the experimental party data, self-intentions of BAC accounted for only 23.7

percent of the variance of exit BAC. This finding suggests that inclusion of the Social Responsibility Stations at a fraternity party may have altered subjects' drinking behavior from their original intentions.

The data regarding whether subjects over-estimated or under-estimated their eventual BAC when reporting self-intentions (see Figure 2) are useful for practical reasons. Partiers who under-estimate their eventual BAC may be more likely to operate a motor vehicle on the evening of a party, as they do not plan on becoming as intoxicated as they eventually do. Results indicated that 37.5% of the students in this research under-estimated their eventual BAC, thus indicating that this may be a substantial problem. Of interest was the finding that 18.5% of the subjects were able to correctly identify how intoxicated they would become within +/- .01 of their eventual BAC. This finding indicates that many partiers are quite aware of the level of intoxication there will eventually achieve on the evening of a party, and can relay this information to others if prompted.

Intentions to consume alcohol by gender. Both males and females evidenced a high degree of correspondence between their stated intentions to consume alcohol and their exit BAC (see Figure 3). The correlation between self-intentions of BAC and exit BAC reached r = .53 for males and r = .50 for females. Similarly, self-intentions of BAC accounted for 26.6 percent of the variance of exit BAC for males and 23.2 percent of the variance of exit BAC for females. However, males on average tended to become slightly less intoxicated than intended, while females tended to become slightly more intoxicated on average than intended (see Figure 3).

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Additionally, both males and females tended to over-estimate how intoxicated they thought other party-goers of their gender intended to become at a party. However, males tended to feel that they would become about as intoxicated as other males, on average, while females reported that other females, on average, intended to become much more intoxicated than themselves (see Figure 3). This was an interesting and unexpected finding, and bears future investigation.

Estimations of intoxication. Before leaving a control party, subjects were asked to estimate their own exit BAC (using the same anchored rating scale they used for self-intentions), as well as the average exit BAC of other partiers of their gender, before their actual BAC was assessed. [Data from the experimental parties for these questions was not analyzed, as participation at the BAC Feedback SRS may have confounded the results.] The data indicated that party-goers were quite adept at estimating their actual BAC. Indeed, the correlation between self-estimations of BAC and exit BAC reached $r = .73$, $p \le .001$ (see Table 4). Further, 17.4% of the students were able to correctly identify their exit BAC within +/- .01 (see Figure 4).

The data regarding whether subjects over-estimated or under-estimated their exit BAC (see Figure 4) is useful for practical reasons. As alluded to above, subjects who under-estimate their BAC are at increased risk for DUI, because they may operate a motor vehicle believing they are not legally intoxicated when in fact they are. In this case, providing partiers with BAC feedback could be a beneficial intervention. Conversely, providing BAC feedback to subjects who have over-estimated their BAC may be counter-productive, as the partiers may than decide that since they are not as

intoxicated as they supposed, it is all right to consume more alcohol. Future research is needed to resolve this apparent conflict.

Using a stepwise multiple regression procedure, subjects' self-estimation of BAC accounted for 52.7 percent of the variance of exit BAC. These findings are congruent with those reported by Geller and Kalsher (1990) and Glindemann (1990), which indicated that the best way to determine a partier's BAC, short of using a breathalyzer, is to simply ask them. The trouble with this approach, of course, is getting the partier to answer the question truthfully. If the partier feels that answering the question honestly may result in negative consequences for themselves, they may purposely under-estimate their BAC. Nevertheless, given the magnitude of subjects' abilities to accurately estimate their BAC, possible uses of this measurement technique should be examined more carefully. It is possible that, if used in a non-threatening manner, simply asking a partier to estimate their BAC could become a useful intervention component.

Estimations of intoxication by gender. Analyzing these data by gender, the results indicated that both females and males were equally adept at estimating their BAC (see Figure 5). The correlation between self-estimations of BAC and exit BAC reached r = .73 for both females and males. Similarly, self-estimations of BAC accounted for 51.7 percent of the variance of exit BAC for females and 51.9 percent for males. Both males and females, however, over-estimated how intoxicated they thought the average partier of their gender was when leaving the party (see Figure 5). This finding of partiers tending to view everyone else at a party as more intoxicated than themselves could prove useful when designing future interventions. If partiers were

made aware of the fact that everyone else at a party was not as intoxicated as they thought, then individuals may in turn consume less alcohol to retain the disparity between their own BAC and that of others. Future research is needed to examine this finding in greater depth.

Implications of hypothesis one. Both researchers and practitioners studying ways to reduce alcohol abuse and alcohol-impaired driving might consider these findings when developing prevention interventions. The popular media, for example, provide one form of intervention. Slogans such as "know when to say when" are targeting the whole population. However, individuals who indicate their intention to become intoxicated before attending a party may require a more intrusive intervention.

Geller et al. (1990a) proposed that a certain segment of the population will not change their behavior after a general (and unintrusive) intervention targeting an entire population. Instead, the intervention agent(s) should identify those individuals most likely to need more intrusive (and effective) interventions, and tailor their intervention process to meet the specific needs of this targeted sub-population. This strategy is termed "market segmentation" in the realm of social marketing, and is often the first step in a large-scale campaign to change behaviors or attitudes (cf. Geller, 1989).

This research suggests that behavioral intentions can be used to identify individuals who have fallen through the cracks (Geller et al., 1990b) of conventional mass media interventions. In addition, behavioral intentions may be used to customize an alcohol-related intervention package according to levels of expected alcohol use or abuse. One possible tactic, for example, would be to have party-goers give an estimation of their

intoxication before a particular drinking opportunity, and then to monitor those individuals who estimate they will become drunk during the evening. For example, these particular individuals should receive transportation information for impaired drivers, and be observed at the party for a potential intervention to prevent alcohol-impaired driving (e.g., see reviews by Geller, 1990 and Geller et al., 1991 for possible intervention strategies in party settings).

A person with intentions to reach a BAC beyond .05 could be asked to sign a promise card (Geller & Lehman, 1988), before beginning to drink, that they will use a designated driver or not drive. They might also be informed of sobriety tests available at the party to determine their depreciation in performance and/or judgment as a result of alcohol consumption (cf. Russ & Geller, 1986). Persons accompanying individuals with intentions to get drunk (e.g., dates, friends) should be advised to monitor the intoxication of their friend and be given a guide to aid such monitoring (Glindemann, 1990). In this way, persons most at risk for becoming legally intoxicated could be targeted for an intervention to reduce the risk of drinking and driving before they (and their friends) get immersed into the contingencies of the party setting that increase the probability of alcohol consumption and alcohol-impaired driving.

Further research is needed to assess drinking intentions at various time intervals before a party, in an attempt to determine the optimal time frame for having subjects make these types of estimations. In addition, future studies investigating the relationship between intentions to consume alcohol and actual BAC should further examine possible differences between males

and females, and should also include non-fraternity groups to determine whether this is a unique population with regard to these variables.

Hypothesis Two

The hypothesis that the relationship between intentions to consume alcohol and actual drinking behavior would be moderated by certain demographic, personality, attitudinal, and lifestyle variables was partially supported. Several variables moderated this relationship at the control parties. However, no variables were found to moderate the relationship between intentions to consume alcohol and actual drinking behavior at the experimental parties. As was suggested for Hypothesis One, a possible explanation for this finding is that inclusion of the Social Responsibility Stations at a fraternity party may have altered subjects' drinking behavior from their original intentions. If this in fact did occur, then the failure to find any moderating variables for the relationship between intentions to consume alcohol and actual drinking behavior at the experimental parties may indicate that the effect occurred across all levels of the variables found to moderate the relationship at the control parties.

For example, experience with alcohol was found to moderate the relationship between intentions to consume alcohol and actual drinking behavior at the control parties. This makes sense, as it indicated that subjects with more experience with consuming alcohol were better at making estimates of self-intentions. In other words, through past experience they knew how drunk they were going to become at the party. The failure of experience with alcohol to moderate the relationship between intentions to consume alcohol and actual drinking behavior at the experimental parties

may suggest that inclusion of the Social Responsibility Stations at the experimental parties apparently altered subjects' drinking behavior from their original intentions for both experienced and inexperienced drinkers.

Subjects' scores on the Risky Lifestyle scale were also found to moderate the relationship between intentions to consume alcohol and actual drinking behavior at the control parties. This indicated that those self-reporting a riskier lifestyle were more adept at estimating their self-intentions of BAC. It is probable that subjects with riskier lifestyles have also had more experience with alcohol and with attending parties, and thus were better at making these types of estimations based on their life experiences. As with the experience with alcohol variable, the failure to find a moderating effect of the Risky Lifestyle scores on the relationship between intentions and actual behavior at the experimental parties indicates that the presence of the SRSs altered subjects' drinking behavior from their original intentions across all levels of reported riskiness.

Future studies need to examine other possible circumstances under which the relationship between intentions to consume alcohol and actual drinking behavior are disrupted. It may be that it is under these circumstances when partiers consume more alcohol than they had originally intended, and thus become at greater risk for DUI. A partier planning to reach a low level of intoxication may plan on driving him/herself home. If they then consume more alcohol than they had originally intended, they are faced with the decision of whether they should still drive home. Explication of when this is more likely to occur could be used to direct future intervention efforts to high-risk circumstances. This is when it is likely the

relationship between intentions to consume alcohol and actual drinking behavior will be disrupted.

Hypothesis Three

The hypothesis that measures of demographic, personality, attitudinal, and lifestyle variables would predict to various degrees which individuals would become overly intoxicated and at risk for DUI was supported. At the control parties, gender, sensation seeking, self-esteem, belonging, and invulnerability were predictive of exit BAC. At the experimental parties, only gender and degree of perceived invulnerability were predictive of exit BAC.

In addition, the hypothesis that measures of demographic, personality, attitudinal, and lifestyle variables would predict to various degrees which individuals would participate at the Social Responsibility Stations was supported. The variables gender, belonging, and invulnerability were predictive to various degrees of which students would participate at the SRSs.

Prediction of intoxication. The only demographic variable found to be predictive of intoxication was gender. This variable, however, was predictive of intoxication at both the control and experimental parties. At both types of parties, males became significantly more intoxicated than females. A possible explanation for this finding is that all four parties were held at the fraternities' houses, rather than at the sororities' houses. As such, members of the sororities had to concern themselves with transportation plans for getting home, and thus may have "held back" somewhat in their rate of consumption of alcohol. Also, our previous research at fraternity parties has shown that males generally tend to drink to greater levels of intoxication

than females (Geller, Kalsher, & Clarke, 1991; Glindemann, 1990; Glindemann & Geller, 1994), and thus this finding is not surprising.

Perceived invulnerability also proved to be predictive of intoxication at both the control and experimental parties. At both types of parties higher scores on the SRLife scale were predictive of intoxication, indicating that students who believed they had a greater probability of experiencing negative events sometime during their life became more intoxicated on the night of the parties. Interestingly, the SRNight (Self-Rating, Night) component of the Invulnerability Scale was not predictive of exit BAC. This suggests that even though subjects that reached a high level of intoxication felt vulnerable to negative life events at some point in their life, they felt relatively invulnerable to negative events on that particular night.

Three personality variables were also predictive of exit BAC, but only at the control parties. These were sensation seeking, self-esteem, and belonging. For sensation seeking, subjects who scored higher on the scale became more intoxicated at the control parties. This finding is analogous to research by Zuckerman (1979) and Andrucci et al. (1989), who found scores on the SSS to be highly correlated with the self-reported use of alcohol.

Finally, belonging was found to be predictive of exit BAC, with subjects scoring higher on the belonging sub-scale of the ACS becoming more intoxicated at the control parties. This finding indicates that partiers who felt more group cohesiveness were more likely to get caught up in the drinking activities of the group and subsequently become more intoxicated by the end of the evening. Also, those who reported greater belonging may have felt closer to their "brothers" and thus more protected by peers.

Prediction of participation at the social responsibility stations. Gender was found to predict participation at the BAC Feedback SRS, with males being significantly more likely to participate. A possible explanation for this finding is that, on average, males were more intoxicated than females. Support for this explanation lies in the finding that a significant correlation was evidenced between participation at this station and exit BAC (see Table 8). Another possible explanation is that the men were proud of their BACs, and urged each other on to find out just how intoxicated they had become, while females were not as interested in this information.

At the Safe Driving SRS, the personality variable belonging was found to be predictive of participation, with subjects scoring lower on the belonging sub-scale of the ACS being more likely to participate at the station. This finding suggests that those partiers who did not feel a high degree of group cohesion were more likely to seek a ride home through the research team rather than to ask for a ride home from another of the students at the party. Conversely, students who felt they were a part of the group may have felt more comfortable securing a ride home from a member of the group to which they felt they belonged. [See Hypothesis Five below for a more detailed discussion of participation at the Safe Driving SRS.] An additional explanation for males could be that those who felt greater group cohesion lived at the fraternity house, and thus didn't need a ride home.

Hypothesis Four

The hypothesis that students scoring high on self-esteem, personal control, optimism, and group cohesion would drink more responsibly at parties was only partially supported. Students scoring higher on self-esteem

did drink more responsibly at the control parties, but at the experimental parties no effect of this individual difference factor was seen on drinking rates. Further, no differences were evidenced in drinking rates between students scoring high and low on personal control, optimism, or group cohesion at either the control or experimental parties.

The hypothesis that students scoring high on self-esteem, personal control, optimism, and group cohesion would participate more at the SRSs was not supported. However, a trend towards significance was evidenced between level of personal control and overall SRS participation. Subjects scoring high in personal control had a mean overall SRS participation score of 9.89, while those scoring low in personal control had a mean overall SRS participation score of 7.02. The ANOVA performed on the dependent variable overall SRS participation score revealed a significant 2-way interaction, but no main effects. Interestingly, males who scored high in personal control participated significantly more at the SRSs than males who scored low in personal control (11.88 and 6.39 respectively), but the relationship was reversed for females. Women who scored high in personal control received a mean SRS participation score of 5.21, while those low in personal control received a mean participation score of 8.28. Further research is needed to explain this apparent difference in SRS participation between genders.

Self-esteem. The hypothesis that students scoring high in self-esteem would drink more responsibly at the parties was supported at the control parties, but not at the experimental parties. The ANOVA performed using control party exit BAC as the dependent variable revealed a significant main

effect for self-esteem, but no interaction or main effect for gender, indicating that the effect occurred for both males and females (see Figure 6). The finding that partiers with lower self-esteem became significantly more intoxicated at the control parties than did those with higher self-esteem is congruent with the literature on alcohol abuse. According to Seeman and Seeman (1992), low self-esteem is a motivator for alcohol use because alcohol provides feelings of self-worth. Therefore, alcohol is used by people with low self-esteem to control emotions, escape responsibility, and gain some degree of peer acceptance and social support. Future studies should examine the efficacy of teaching alternative coping skills to persons with low self-esteem as an alternative to consuming high levels of alcohol at parties.

It is interesting that the relationship between self-esteem and levels of intoxication did not hold true at the experimental parties. At these parties, subjects with higher self-esteem drank to greater levels of intoxication than at the control parties, and subjects with lower self-esteem drank to lesser levels of intoxication than at the control parties (see Figure 6). As was evidenced in the data concerning intentions for Hypothesis One, this finding suggests that inclusion of the Social Responsibility Stations at a fraternity party may have altered subjects' drinking behavior from their normal style of drinking. Unfortunately, the inclusion of the SRSs did not alter drinking rates uniformly downward. Instead, they appeared to have caused some types of people to become more intoxicated, while other types became less intoxicated. Additional research is needed to explicate these findings.

Hypothesis Five

The hypothesis that participation rates would be higher at the BAC Feedback SRS and Performance Feedback SRS than at the Safe Driving SRS and the Safe Sex SRS was partially supported. The BAC Feedback SRS was by far the most popular of the four stations, with a total of 103 subjects participating at the SRS over the two intervention parties. The Performance Feedback SRS and Safe Sex SRS, however, were about equal in popularity, with a total of 49 partiers participating at the Performance Feedback SRS across the two parties, and a total of 47 partiers participating at the Safe Sex SRS. The Safe Driving SRS attracted the lowest participation rate, with only 25 students participating at it across the two nights (see Table 7).

The overwhelming popularity of the BAC Feedback SRS was not surprising. Many subjects relayed to the research assistants manning this station that they had always wanted to try a breathalyzer, but had never had the opportunity. In some cases partiers reported they were interested in matching a "legal" criterion to their cognitive perceptions of impairment. In other words, they wanted to see how drunk they really were when they felt a certain way because of the consumption of alcohol. A possible concern, however, is that the availability of this feedback may have led to increased levels of impairment. Evidence of this is seen in the significant correlation between participation score at the BAC Feedback SRS and exit BAC (see Table 8). This relationship is understandable, though, because subjects who had had little to drink during the evening were probably not interested in receiving BAC feedback.

An interesting and quite unexpected finding concerned the private versus public feedback condition at the BAC Feedback SRS. Namely, *every* partier chose to participate in the public rather than private feedback condition. In fact, every partier shared their BAC information freely with the other partiers around the station. Two possible explanations are available for this finding. The first is that all subjects at a party were members of the same fraternity and sorority, and thus were quite comfortable sharing this type of information with their friends, with whom they are often in close contact with at parties. The second possible explanation is that subjects were seeking to compare their results with those of other subjects, in order to establish how intoxicated they were compared to the other partiers. It is likely that both of these explanations came into play to some extent.

Overall participation at the Performance Feedback SRS and the Safe Sex SRS were about equal (49 subjects and 47 subjects, respectively), but differences were seen between the two parties (see Tables 5 & 6). Participation was about equal at the Safe Sex SRS across the two fraternity/sorority groups, with 22 partiers from Group C/E visiting the station and 24 subjects from Group E/C visiting the station. However, the Performance Feedback SRS was much more popular with Group E/C (from which 36 students participated) than Group C/E (from which only 13 students participated). This finding is curious, in that the SRS was set up similarly at each party, and the personnel manning the station remained constant. A possible explanation is that greater participation early in the evening from Group E/C attracted other partiers to this SRS, who were curious to see the tasks that people were engaging in, and then wanted to try them for themselves. Participation at

this SRS for Group C/E did not begin until later in the evening, and thus there was not much activity at the station early in the evening.

The low participation rate at the Safe Driving SRS was probably due to the designated driver programs already in place by both fraternities participating in the research. Traditionally, each fraternity has two designated drivers on duty throughout the evening during every party they host, to either pick up or deliver home partiers. The parties studied in this research project were no exception. It may be that many of the party-goers were more comfortable asking for a ride home from members of their own group that have been designated for this task, rather than from researchers with whom they were not familiar. While this practice by the fraternities may have limited the participation at the Safe Driving SRS, we must nevertheless applaud the efforts of the fraternities for the institutionalization of the designated driver programs they have established.

Hypothesis Six

The hypothesis that the SRSs would reduce excessive alcohol consumption and DUI risk from comparisons within the same fraternity/sorority (a party with SRSs versus a party with no SRSs) and between two different fraternities/sororities was not supported.

Using a between-subjects approach, a main effect was found for gender, indicating that males became significantly more intoxicated than females, but the main effects for both group and condition failed to reach significance, as did all interaction terms. This indicated that the SRSs did not have a beneficial impact on intoxication rates across party conditions. Indeed,

intoxication rates remained relatively stable across party conditions for both genders of both groups (see Figure 7).

Using a within-subjects approach, the main effect of BAC across conditions failed to reach significance, indicating no overall difference between BACs at the control and experimental parties. However, a significant group by gender by BAC interaction was found. Simple effects tests indicated that for Group E/C, the difference in BACs between the two types of parties failed to reach significance for females, but did reach significance for males. This difference, however, was in the direction counter to that hypothesized, with the males becoming more intoxicated at the experimental party than the control party (see Figure 8).

The failure to find a beneficial impact of the SRSs on intoxication rates was unexpected and disappointing. It appears that, when attending these fraternity party, students (on the whole) were setting out to become intoxicated (as evidenced by their self-intention scores), and went on to do just that, despite the presence of SRSs. However, the SRSs may have had a beneficial impact on knowledge about possible dangers associated with the consumption of alcohol and on awareness of intoxication levels, thus decreasing the probability of DUI and other alcohol-related problems through education rather than through decreased levels of intoxication. As this information was not assessed during these field studies, future research is warranted to test this possibility. One possible approach would be to test partiers knowledge regarding alcohol use, misuse, and the dangers associated with alcohol use both before and after attendance at party which included the SRS intervention process.

Future studies should also determine whether it is possible to have SRSs manned by persons within a fraternity of sorority, so the intervention would not be entirely dependent on outside personnel. It is possible that a beneficial impact would occur when the stations are run by peers of the target group. Also, if such benefits did in fact occur, the program could maintain itself without outside intervention. Finally, it would be interesting to determine the impact of the SRS intervention process if the BAC Feedback SRS was not included, as presence of this station may have led to increased levels of alcohol consumption.

Keg Parties versus BYOB Parties

A secondary goal of this research was to assess whether the new university policy to allow only BYOB parties reduces subsequent levels of intoxication at fraternity parties. While universities expect a decrease in overall intoxication at BYOB parties (as compared to keg parties), no significant changes in overall consumption and intoxication levels were predicted. As it happened, a direct test of this hypothesis was possible, because Group C/E provided kegs of beer at both their control and experimental parties (a situation beyond the control of the research team), while Group E/C followed university policy and did not provide kegged beer at either of their parties.

The ANOVAs performed for Hypothesis Six revealed no significant main effects for group, indicating that the overall mean BACs were not significantly different between the parties that included kegged beer and those that did not. This finding suggests that the university policy of banning kegged beer parties may be ineffective at curtailing intoxication levels.

However, these findings should be replicated before any policy changes are recommended or considered. Also, there may be hidden benefits to the university policy, such as reduced availability of alcoholic beverages to partiers under the legal age for consumption of alcohol, and this research did not address those issues.

Conclusions

The most consistent findings of this research concerned the relationship between intentions to consume alcohol and actual drinking behavior, and the abilities of students to accurately estimate their BAC after consuming alcohol. The results indicated that many party-goers were quite adept at predicting how intoxicated they would become. Furthermore, after reaching that level of intoxication, students were able to accurately estimate just how intoxicated they had become. Future research should focus on possible interventions for getting subjects to lower their intentions for the consumption of alcohol. Also, party-goers indicating that they intend to become intoxicated could be targeted for specific interventions, as they represent a high-risk group for DUI.

The strongest relationship found between the personality variables studied and intoxication levels at the research parties was with self-esteem, supporting the findings of Seeman and Seeman (1992). Future studies should examine the efficacy of teaching alternative coping skills to persons with low self-esteem as an alternative to consuming high levels of alcohol at parties.

As for the SRS intervention phase of the research, the SRS technique did not prove successful in reducing overall intoxication rates at the fraternity parties studied. However, the SRSs may have had a beneficial impact on

knowledge about possible dangers associated with the consumption of alcohol and on awareness of intoxication levels, thus decreasing the probability of DUI and other alcohol-related problems through education rather than through decreased levels of intoxication. Future research is needed to assess this possibility.

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Table 1. Specific hypotheses.

Hypothesis 1: Students' behavioral intentions (not general attitudes toward alcohol and DUI) will predict their subsequent drinking behavior at a party.

Hypothesis 2: The relationship between intentions to consume alcohol and actual behavior will be moderated by demographic, personality, attitudinal, and lifestyle variables.

Hypothesis 3: Measures of demographic, personality, attitudinal, and lifestyle variables will predict to various degrees which individuals become overly intoxicated and at risk for DUI, and which students participate at an SRS ("social responsibility station") to decrease adverse effects of alcohol impairment.

Hypothesis 4: Students scoring high on self-esteem, personal control, optimism, and group cohesion will drink more responsibly and participate more at the SRSs.

Hypothesis 5: Participation rates will be higher at the BAC Feedback SRS and Performance Feedback SRS than at the Safe Driving SRS and the Safe Sex SRS.

Hypothesis 6: The SRSs will reduce excessive alcohol consumption and DUI risk from comparisons within the same fraternity/sorority (a party with SRSs vs. a party with no SRSs) and between two different fraternities/sororities.

Table 2. Mean BAC by gender across parties.

Party	Subjects	N	Mean BAC	SD	Minimum	Maximum
One	Total	67	.102	.06	0	.226
	Male	44	.107	.06	0	.226
	Female	23	.094	.06	.014	.194
Two	Total	72	.098	.06	0	.255
	Male	53	.097	.06	0	.255
	Female	19	.101	.05	.029	.185
Three	Total	94	.102	.06	0	.203
	Male	52	.119	.05	0	.203
	Female	42	.081	.06	.001	.181
Four	Total	68	.085	.05	.002	.212
	Male	40	.096	.05	.022	.212
	Female	28	.070	.05	.002	.167

Table 3. Correlation matrix of behavioral intentions variables (across four parties.

	Exit BAC	Quantity to be consumed	Self- intentions	Other- intentions
Exit BAC	—			
Quantity to be consumed	.42 $p \leq .001$	—		
Self- intentions	.54 $p \leq .001$	.71 $p \leq .001$	—	
Other- intentions	.23 $p \leq .001$	.37 $p \leq .001$	.54 $p \leq .001$	—

Table 4. Correlation matrix of estimation of intoxication variables (across two parties.

	Exit BAC	Quantity consumed	Self-estimations	Other-estimations
Exit BAC	—			
Quantity consumed	.54 p ≤ .001	—		
Self-estimations	.73 p ≤ .001	.55 p ≤ .001	—	
Other-estimations	.21 p ≤ .05	.17 p = .086	.57 p ≤ .001	—

Table 5. Participation at the Social Responsibility Stations by Group C/E.

Station	Number of Participants	Participation Mean Score	Participation Maximum Score
BAC Feedback SRS	51	4.14	21
Performance Feedback SRS	13	1.24	12
Safe Driving SRS	14	.39	3
Safe Sex SRS	23	1.04	12

Table 6. Participation at the Social Responsibility Stations by Group E/C.

Station	Number of Participants	Participation Mean Score	Participation Maximum Score
BAC Feedback SRS	52	2.94	15
Performance Feedback SRS	36	2.95	17
Safe Driving SRS	11	.21	3
Safe Sex SRS	24	1.45	22

Table 7. Participation at the Social Responsibility Stations across both experimental parties.

Station	Number of Participants	Participation Mean Score	Participation Maximum Score
BAC Feedback SRS	103	3.46	21
Performance Feedback SRS	49	2.21	17
Safe Driving SRS	25	.29	3
Safe Sex SRS	47	1.27	22

Table 8. Correlation matrix of SRS participation and exit BAC (across two parties).

	Exit BAC	BAC Feedback SRS	Performance Feedback SRS	Safe Driving SRS	Safe Sex SRS
Exit BAC	—				
BAC Feedback SRS	.31 $p \leq .001$	—			
Performance Feedback SRS	.16 $p \leq .05$	.21 $p \leq .01$	—		
Safe Driving SRS	-.06 $p = .46$	-.01 $p = .86$	.09 $p = .23$	—	
Safe Sex SRS	.03 $p = .71$	.05 $p = .51$	.33 $p \leq .001$	.04 $p = .59$	—

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Personal Control
"I am in control"

Self-Efficacy
"I can do it"

Optimism
"I expect the best"

EMPOWERMENT
"I can make a difference"

SELF-ESTEEM
"I am valuable"

BELONGINGNESS
"I belong to a team"

1. "I can make *valuable* differences."
2. "We can make a *difference*."
3. "I am a *valuable team member*."
4. "We can make *valuable differences*."
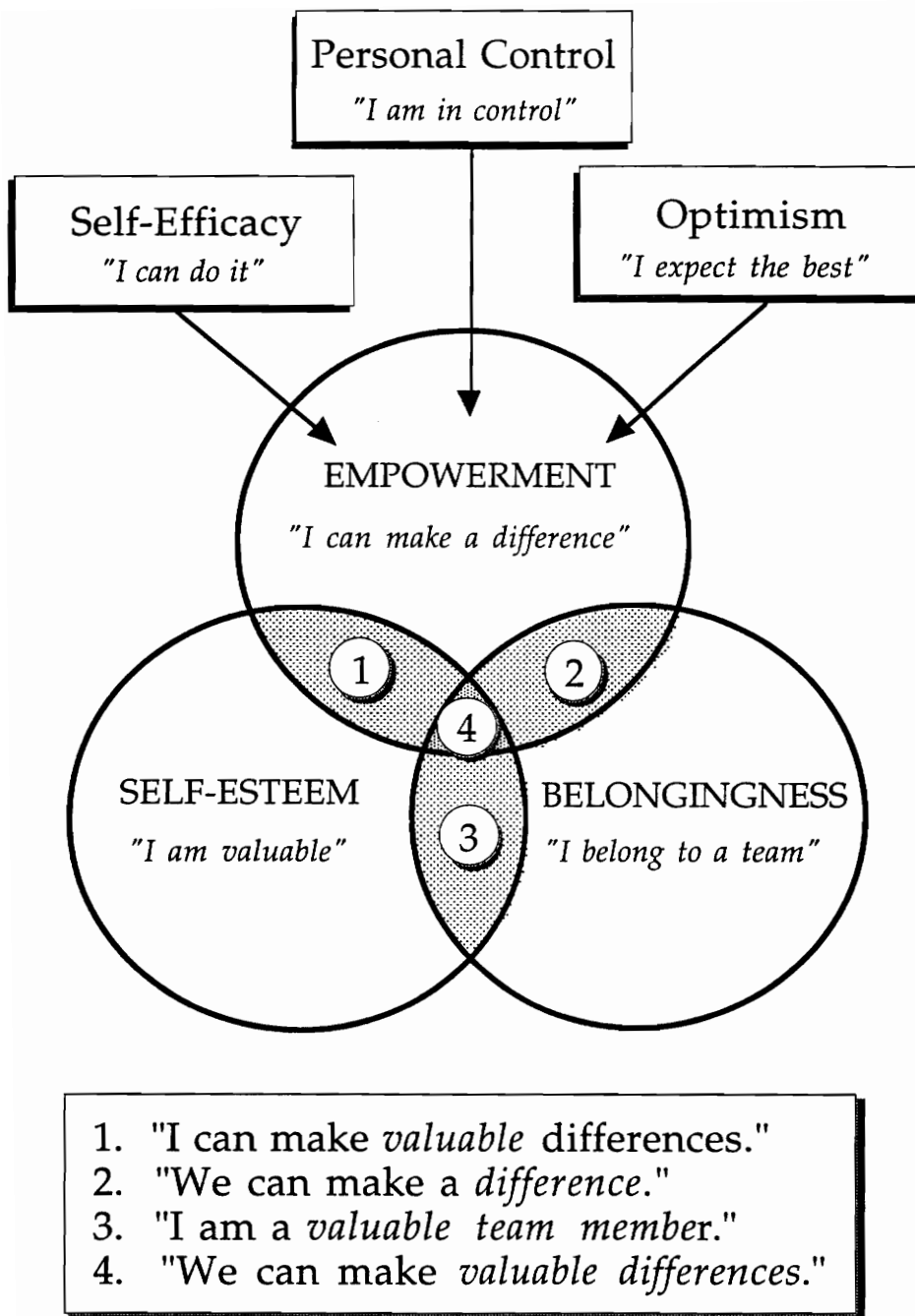
FIGURE 1. The Actively Caring Model.

Figure 2. Scatterplot of self-intentions of BAC by exit BAC.
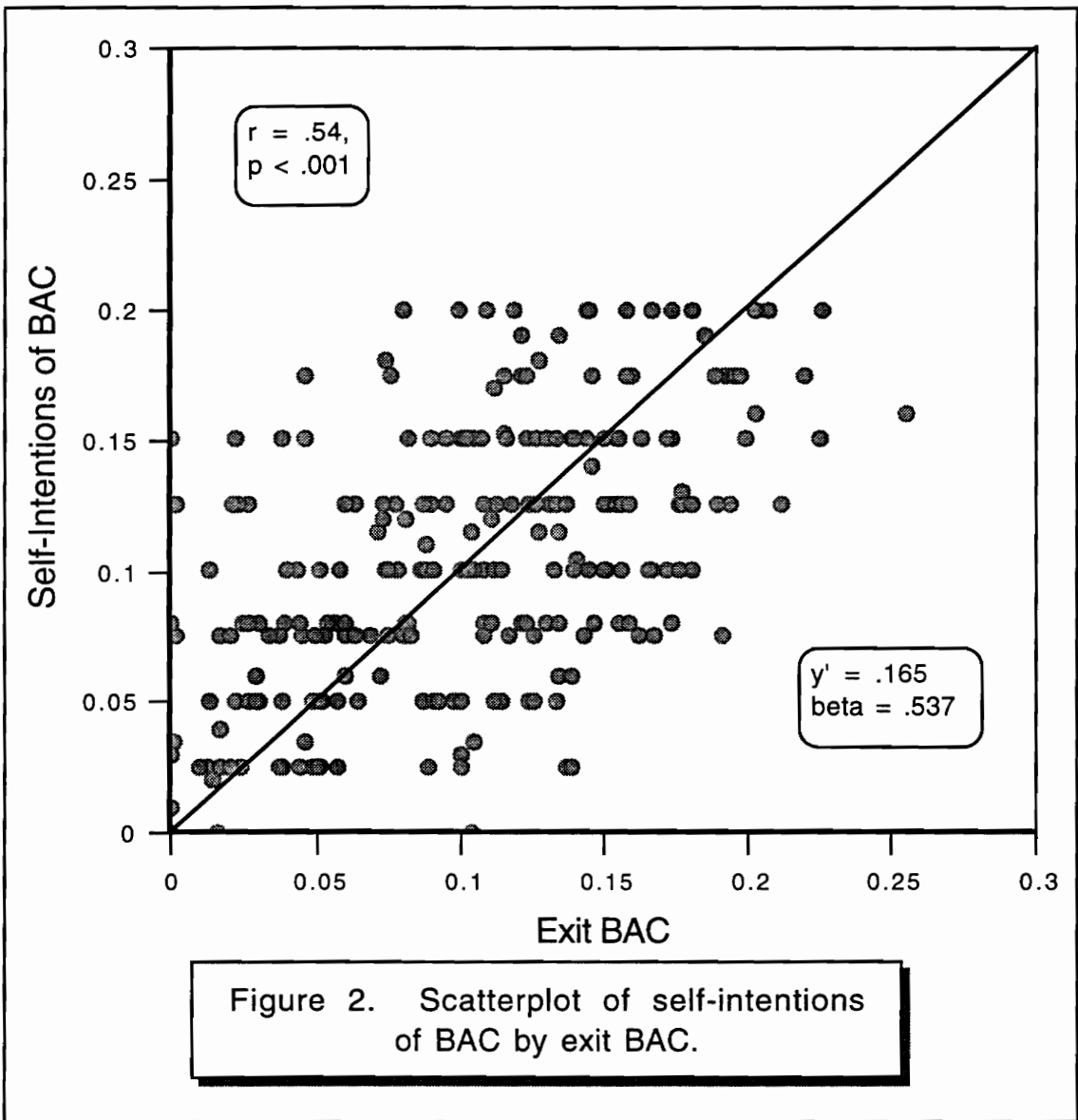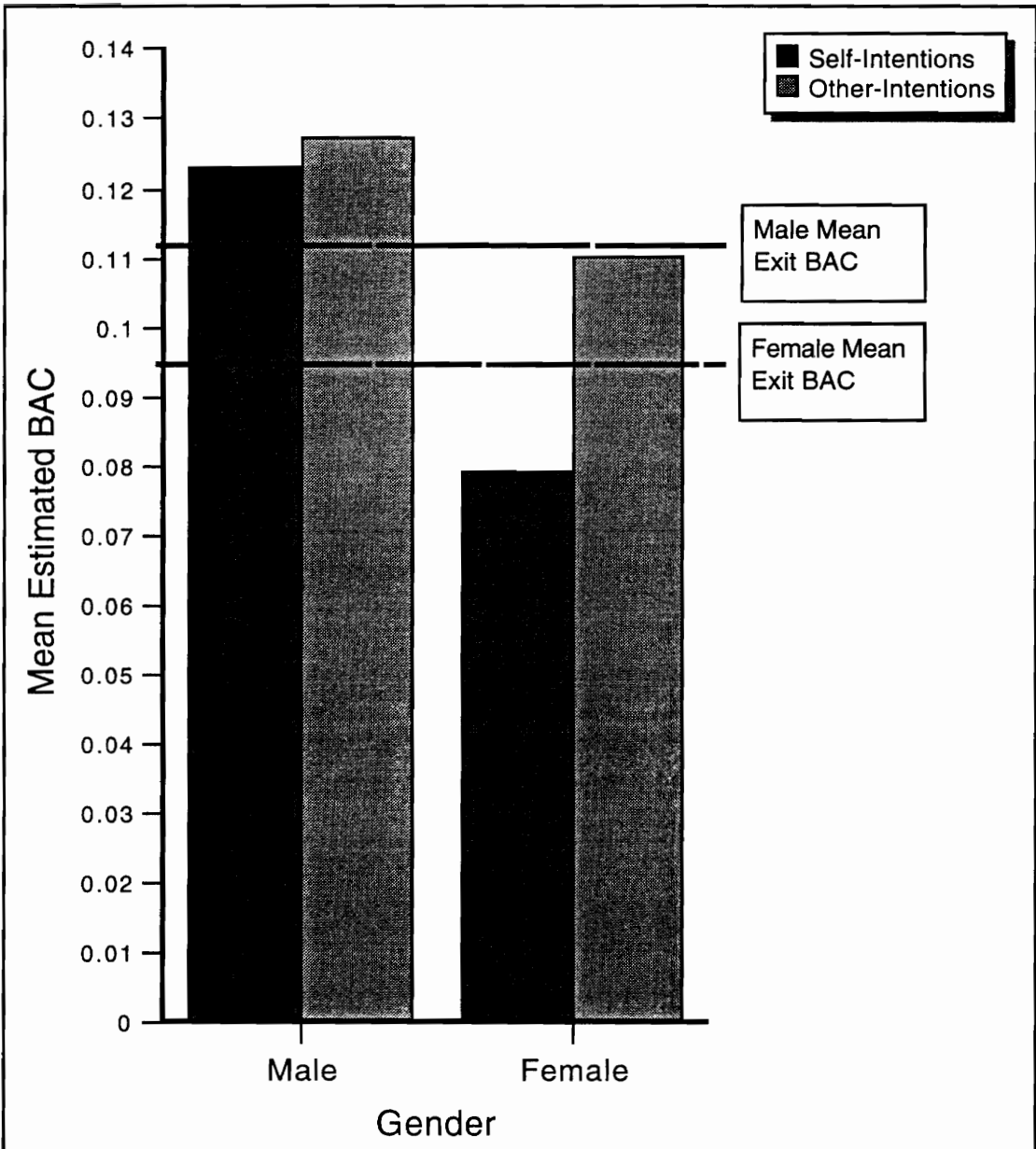
Figure 3. Mean score for self-intentions of BAC and other-intentions of BAC by gender.
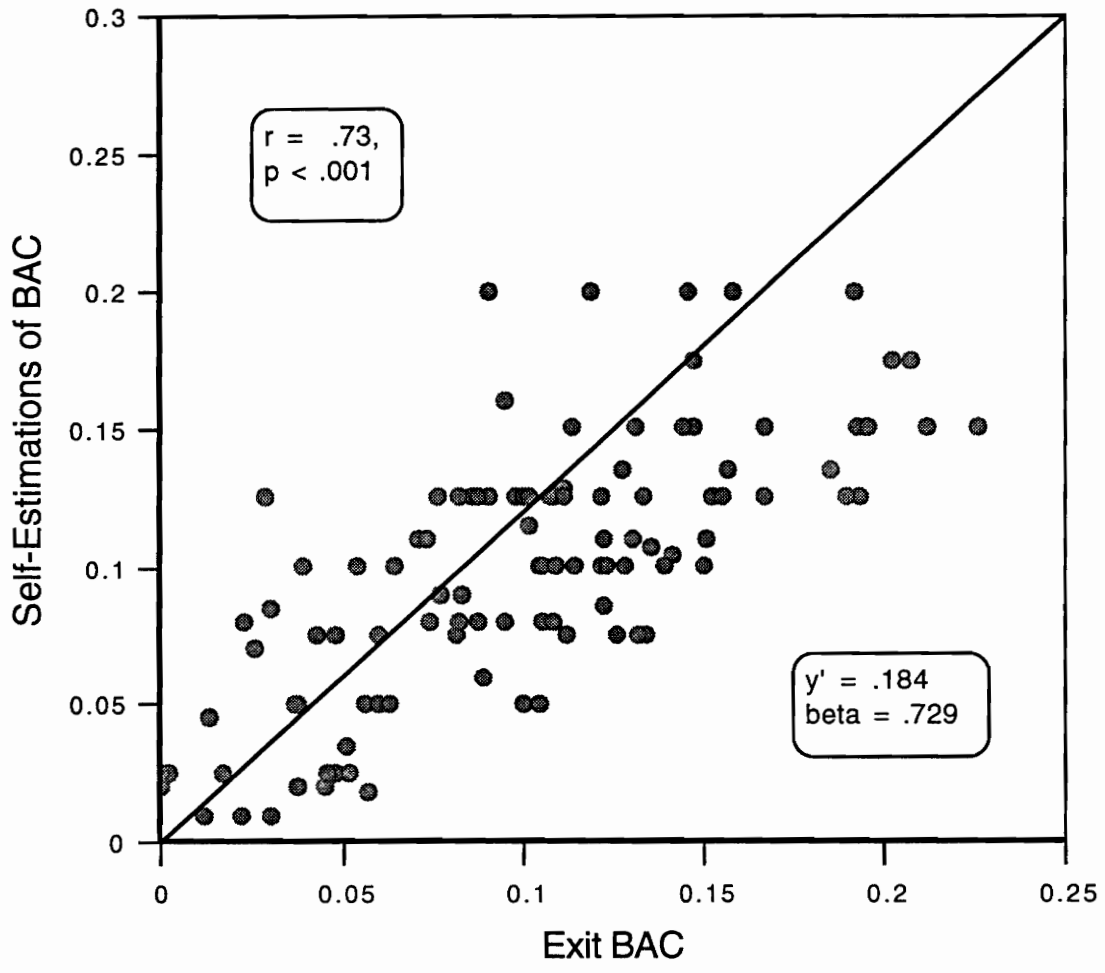
Figure 4. Scatterplot of self-estimations of BAC by exit BAC.

Figure 5. Mean score for self-estimations of BAC and other-estimations of BAC by gender.

Figure 6. Mean exit BAC across parties by gender and level of self-esteem.
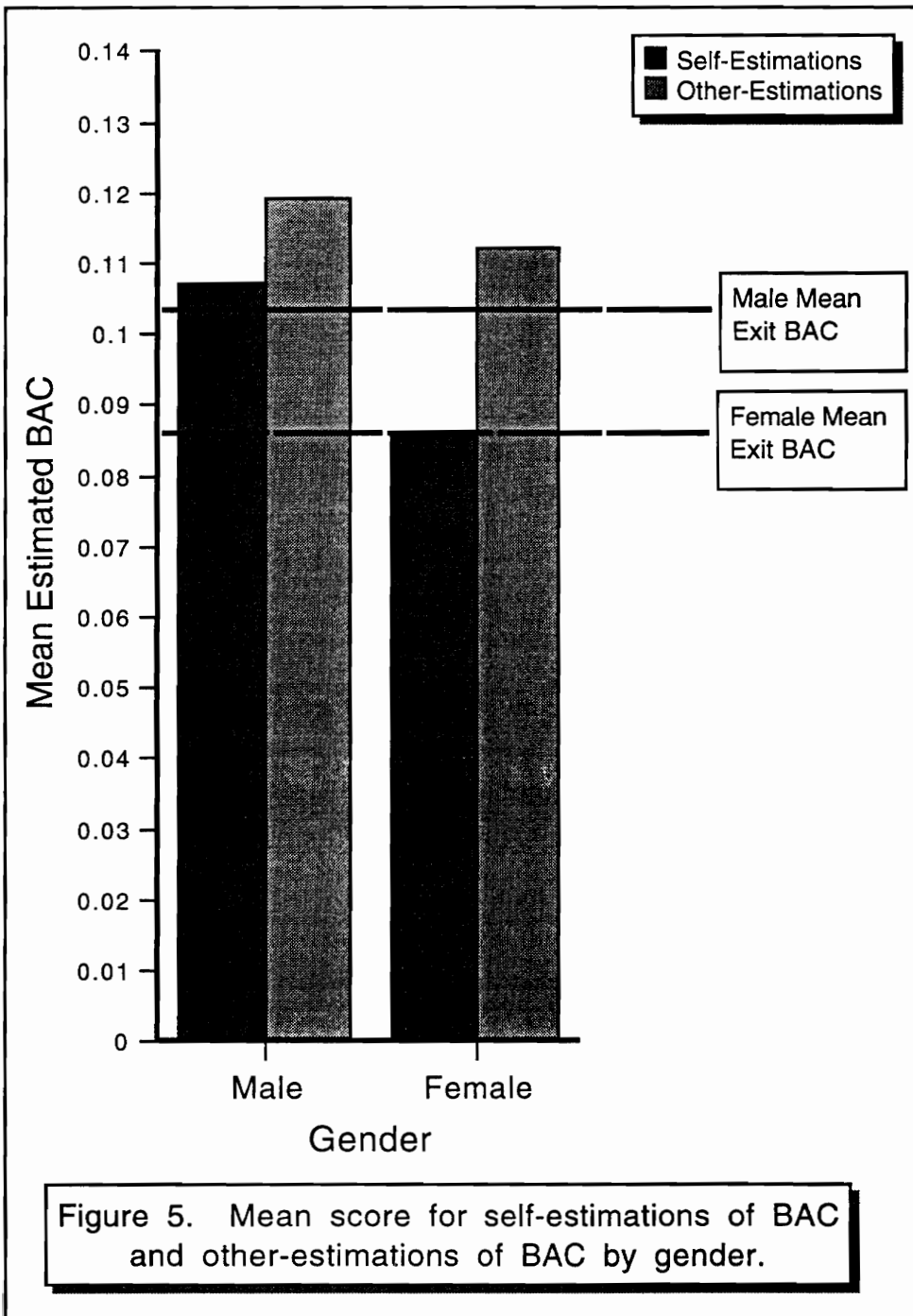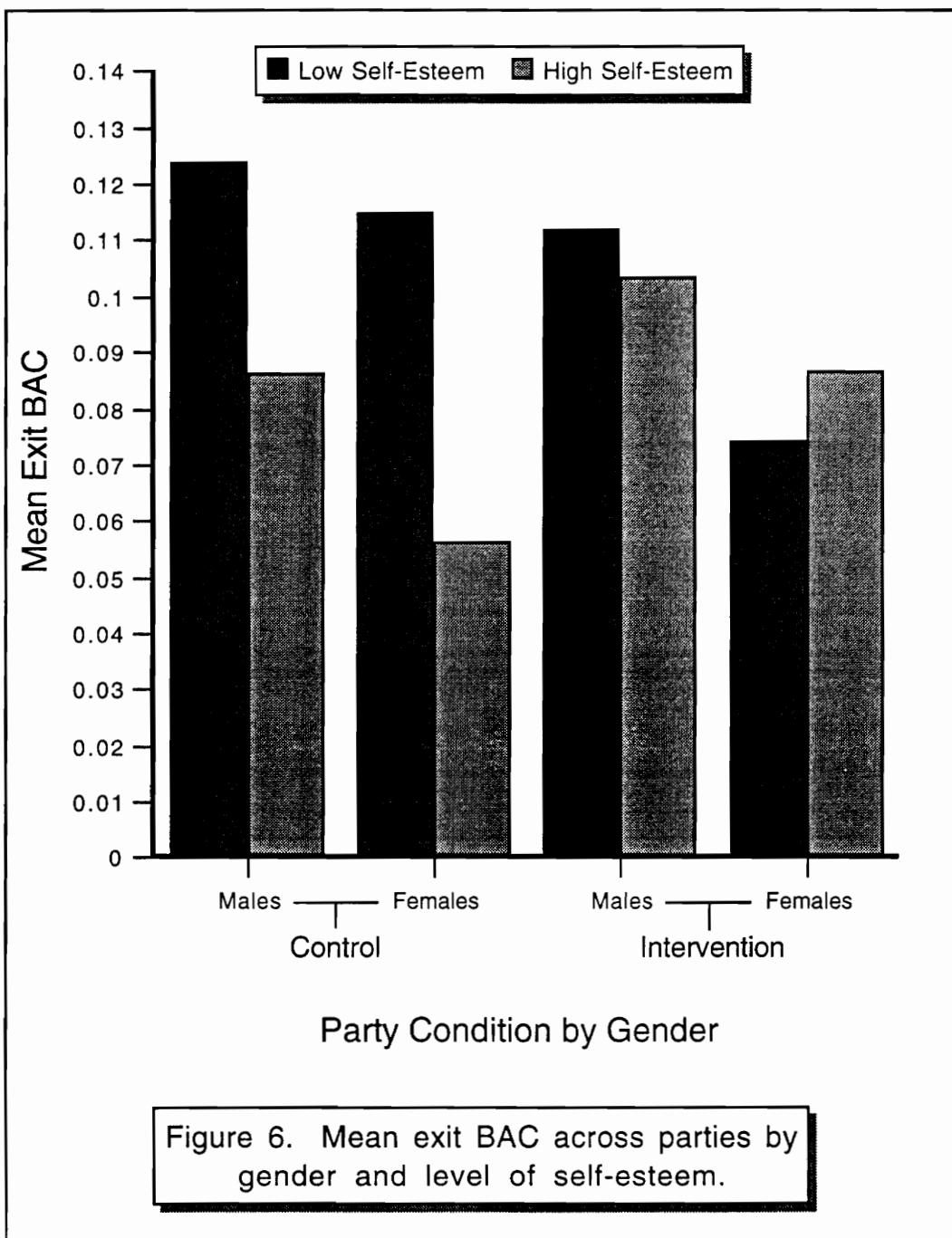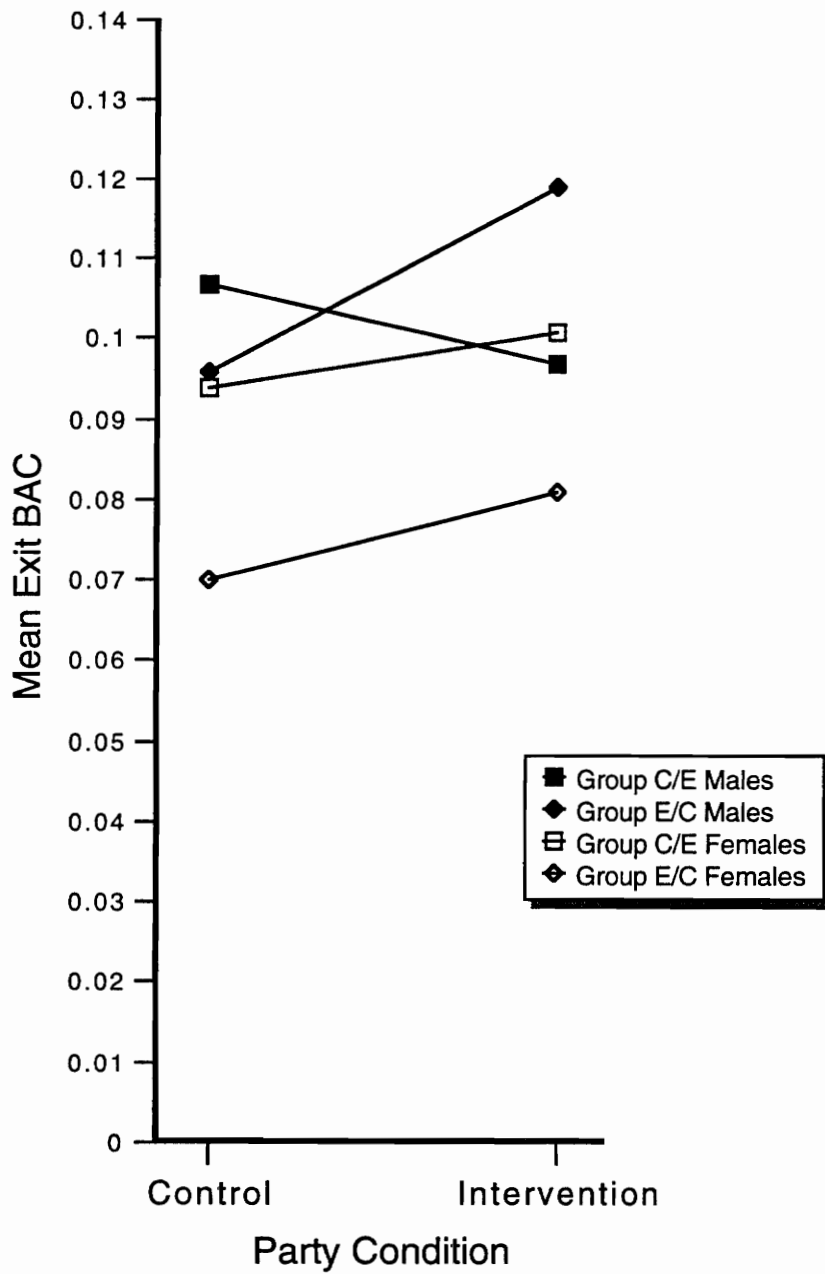
Figure 7. Mean exit BAC across party conditions by group and gender -- between-subjects analysis.
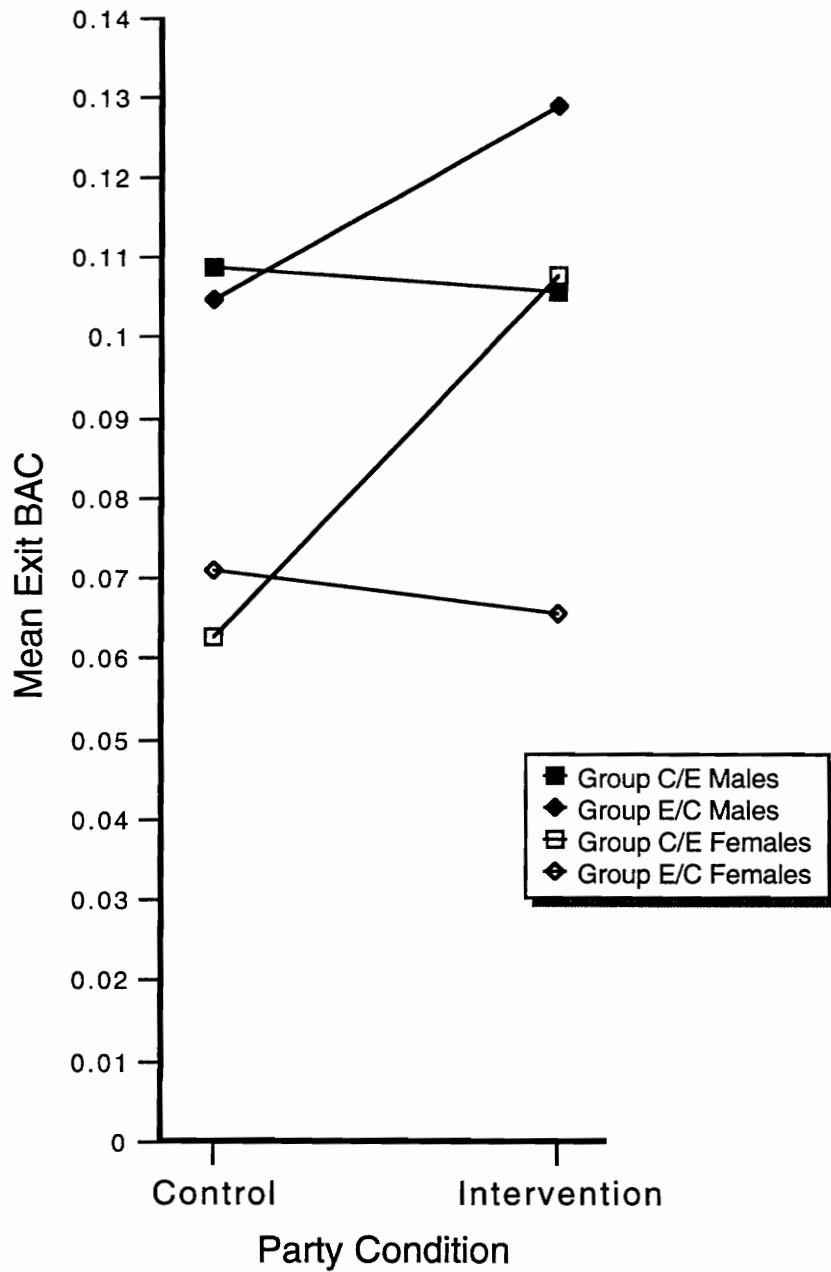
Figure 8. Mean exit BAC across party conditions by group and gender -- within-subjects analysis.

Appendix A: The Actively Caring Survey (ACS)

BELIEFS SURVEY

This is a questionnaire about your beliefs and feelings about various things. There are a number of statements with which you will tend to agree or disagree. After each statement, please circle the number that best describes your current feelings. The number you choose doesn't have to describe how you feel *all* of the time, just how you feel *most* of the time. You don't need to spend much time on any one item- mark your first choice, then move on to the next statement. Please be sure to fill in the number that indicates how you *actually* feel, not how you think you *should* feel. There are no "right" or "wrong" answers; this questionnaire only asks about your personal opinions. Remember that all your answers are completely anonymous.

**Circle 1 = completely disagree; 2 = disagree; 3 = sometimes
4 = agree; 5 = completely agree**

1) It is easy for me to make new friends.	1 2 3 4 5
2) I always look on the bright side of things.	1 2 3 4 5
3) There are lots of things about myself I'd change if I could.	1 2 3 4 5
4) I trust my "social group".	1 2 3 4 5
5) If somebody studies hard enough, he or she can pass any subject.	1 2 3 4 5
6) I really enjoy my "social group".	1 2 3 4 5
7) I have recently helped a person with a problem.	1 2 3 4 5
8) When trying to learn something new, I soon give up if I am not initially successful.	1 2 3 4 5
9) I'm a lot of fun to be with.	1 2 3 4 5
10) I usually count on good things to happen to me.	1 2 3 4 5
11) When good things happen, they happen because of hard work.	1 2 3 4 5
12) I dislike my "social group".	1 2 3 4 5
13) I should go out of my way to help people more often.	1 2 3 4 5
14) If something looks too complicated, I will not even bother to try it.	1 2 3 4 5
15) In uncertain or difficult times, I usually expect the best.	1 2 3 4 5
16) Most of the time it doesn't pay to try hard because things never turn out right anyway.	1 2 3 4 5
17) The members of my "social group" share much in common.	1 2 3 4 5
18) If a member of my "social group" comes to me with a personal problem, I'm willing to listen without being judgmental.	1 2 3 4 5
19) I should pick up trash I see left lying around.	1 2 3 4 5

Circle 1 = completely disagree; 2 = disagree; 3 = sometimes
4 = agree; 5 = completely agree

20) I have acquired my friends through my personal abilities
     at making friends.   1 2 3 4 5
21) I should donate blood as often as possible.   1 2 3 4 5
22) It's pretty tough to be me.   1 2 3 4 5
23) If anything can go wrong for me, it probably will.   1 2 3 4 5
24) When I get punished it usually seems it's because of some-
     thing I did wrong.   1 2 3 4 5
25) I try to leave everything a little better than I found it.   1 2 3 4 5
26) I feel like I really belong to my "social group".   1 2 3 4 5
27) When I see a person looking down or depressed I usually
     leave him/ her alone.   1 2 3 4 5
28) I give up on things before completing them.   1 2 3 4 5
29) I often wish I were someone else.   1 2 3 4 5
30) Things never work out the way I want them to.   1 2 3 4 5
31) Most of the time I feel that I can change what might happen
     tomorrow by what I do today.   1 2 3 4 5
32) I feel a need to be friends with the people in my
     "social group".   1 2 3 4 5
33) If a member of my "social group" needs help on a task,
     I am willing to help even if it causes me some
     inconvenience.   1 2 3 4 5
34) When I'm trying to become friends with someone who
     seems uninterested at first, I don't give up easily.   1 2 3 4 5
35) I have a high opinion of myself.   1 2 3 4 5
36) I rarely count on good things happening to me.   1 2 3 4 5
37) I feel that it's nearly impossible to change my parent's mind
     about anything.   1 2 3 4 5
38) The people in my "social group" are not afraid to share
     personal information with each other.   1 2 3 4 5
39) I don't usually recycle aluminum cans.   1 2 3 4 5
40) I'm a believer in the idea that "every cloud has a silver
     lining".   1 2 3 4 5
41) My "social group" is not very close at all.   1 2 3 4 5
42) Failure just makes me try harder.   1 2 3 4 5
43) When bad things are going to happen, they just are going
     to happen no matter what I try to do to stop them.   1 2 3 4 5
44) I wish I could have more respect for myself.   1 2 3 4 5
45) On the whole I'm satisfied with myself.   1 2 3 4 5
46) I hardly ever expect things to go my way.   1 2 3 4 5

**Circle 1 = completely disagree; 2 = disagree; 3 = sometimes
4 = agree; 5 = completely agree**

47) I avoid trying to learn new things when they look too
    difficult for me.   1 2 3 4 5
48) I am able to do things as well as most other people.   1 2 3 4 5
49) I'm often sorry for the things I do.   1 2 3 4 5
50) Most of the time I find it useless to try to get my own way
    at home.   1 2 3 4 5
51) I feel I have much to be proud of.   1 2 3 4 5
52) I am willing to help a "social group" member I don't know. 1 2 3 4 5
53) When I drive, I make sure all passengers wear their safety
    belts.   1 2 3 4 5
54) All in all, I am inclined to feel that I am a failure.   1 2 3 4 5
55) I take a positive attitude toward myself.   1 2 3 4 5
56) I'm always optimistic about my future.   1 2 3 4 5
57) One of the best ways to solve most problems is just not to
    think about them.   1 2 3 4 5
58) When someone doesn't like me, there's little I can do
    about it.   1 2 3 4 5
59) I feel close to the people in my "social group".   1 2 3 4 5
60) I try to recycle all paper, plastic and aluminum when
    possible.   1 2 3 4 5

Anonymous Subject Number

Please fill in the first letter of the city in which you were born _____.

Please fill in the first letter of your mother's maiden name _____.

Please fill in the number of the month in which you were born _____.

(This information will be used only for research purposes, and <u>will not</u> be used to identify you directly. This survey is useless to us without this information.)

THANK-YOU FOR YOUR TIME AND HONESTY

Appendix B: Scoring of the Actively Caring Survey (ACS)

Scoring Key for Actively Caring Survey (Alcohol Version)

- Items are grouped according to sub-categories.

- **R** designates that the items should be reverse scored.

Self Efficacy Subscale:

1) It is easy for me to make new friends.
8) When trying to learn something new, I soon give up if I am not initially successful. **R**
14) If something looks too complicated, I will not even bother to try it. **R**
20) I have acquired my friends through my personal abilities at making friends.
28) I give up on things before completing them. **R**
34) When I'm trying to become friends with someone who seems uninterested at first, I don't give up easily.
42) Failure just makes me try harder.
47) I avoid trying to learn new things when they look too difficult for me. **R**

Optimism Subscale:

2) I always look on the bright side of things.
10) I usually count on good things to happen to me.
15) In uncertain or difficult times, I usually expect the best.
23) If anything can go wrong for me, it probably will. **R**
30) Things never work out the way I want them to. **R**
36) I rarely count on good things happening to me. **R**
40) I'm a believer in the idea that "every cloud has a silver lining".
46) I hardly ever expect things to go my way. **R**
56) I'm always optimistic about my future.

Self Esteem Subscale:

3) There are lots of things about myself I'd change if I could. **R**
9) I'm a lot of fun to be with.
22) It's pretty tough to be me. **R**
29) I often wish I were someone else. **R**
35) I have a high opinion of myself.
44) I wish I could have more respect for myself. **R**
45) On the whole I'm satisfied with myself.
48) I am able to do things as well as most other people.
49) I'm often sorry for the things I do. **R**

51) I feel I have much to be proud of.
54) All in all, I am inclined to feel that I am a failure. R
55) I take a positive attitude toward myself.

Belongingness Subscale:

4) I trust my "social group".
6) I really enjoy my "social group".
12) I dislike my "social group". R
17) The members of my "social group" share much in common.
26) I feel like I really belong to my "social group".
32) I feel a need to be friends with the people in my "social group".
38) The people in my "social group" are not afraid to share personal
    information with each other.
41) My "social group" is not very close at all. R
59) I feel close to the people in my "social group".

Personal Control Subscale:

5) If somebody studies hard enough, he or she can pass any subject.
11) When good things happen, they happen because of hard work.
16) Most of the time it doesn't pay to try hard because things never turn out
    right anyway. R
24) When I get punished it usually seems it's because of something I did
    wrong.
31) Most of the time I feel that I can change what might happen tomorrow by
    what I do today.
37) I feel that it's nearly impossible to change my parent's mind about
    anything. R
43) When bad things are going to happen, they just are going to happen no
    matter what I try to do to stop them. R
50) Most of the time I find it useless to try to get my own way at home. R
57) One of the best ways to solve most problems is just not to think about
    them. R
58) When someone doesn't like me, there's little I can do about it. R

Actively Caring Subscale:

7) I have recently helped a person with a problem.
13) I should go out of my way to help people more often.
18) If a member of my "social group" comes to me with a personal problem,
    I'm willing to listen without being judgmental.
19) I should pick up trash I see left lying around.

21) I should donate blood as often as possible.

25) I try to leave everything a little better than I found it.

27) When I see a person looking down or depressed I usually leave him/ her alone. **R**

33) If a member of my "social group" needs help on a task, I am willing to help even if it causes me some inconvenience.

39) I don't usually recycle aluminum cans. **R**

52) I am willing to help a "social group" member I don't know.

53) When I drive, I make sure all passengers wear their safety belts.

60) I try to recycle all paper, plastic and aluminum when possible.

Appendix C: Sensation Seeking Scale

SENSATION SEEKING SCALE

INSTRUCTIONS

This is a questionnaire about your beliefs and feelings. Read each pair of statements, then circle the number of the statement that best describes your current feelings. The statement you choose doesn't have to describe how you feel *all* of the time, just how you feel *most* of the time. You don't need to spend much time on any one item—circle your first choice, then move on to the next pair of statements.

Please be sure to circle the number that indicates how you *actually feel*, not how you think you *should feel*. There are no "right" or "wrong" answers; this questionnaire only asks about your personal opinions. Remember your answers are completely anonymous and confidential.

---

1) 1. I like "wild", uninhibited parties.
    2. I prefer quiet parties with good conversation.

2) 1. There are some movies I enjoy seeing a second or even a third time.
    2. I can't stand watching a movie I've seen before.

3) 1. I often wish I could be a mountain climber.
    2. I can't understand people who risk their necks climbing mountains.

4) 1. I dislike all body odors.
    2. I like some of the earthy body smells.

5) 1. I get bored seeing the same old faces.
    2. I like the comfortable familiarity of everyday friends.

6) 1. I like to explore a strange city or section of town by myself, even if it means getting lost.
    2. I prefer a guide when I am in a place I don't know well.

7)   1. I dislike people who do or say things just to shock or upset others.
     2. When you can predict almost everything a person will do or say, that person is boring.

8)   1. I usually don't enjoy a movie or play where I can predict what will happen in advance.
     2. I don't mind watching a movie or play where I can predict what will happen in advance.

9)   1. A sensible person avoids activities that are dangerous.
     2. I sometimes like to do things that are a little frightening.

10)   1. I dislike "party animals".
     2. I enjoy the company of real "party animals".

11)   1. I like to try new foods that I have never tasted before.
     2. I order food with which I am familiar, to avoid disappointment and unpleasantness.

12)   1. I enjoy looking at home movies or travel slides.
     2. Looking at someone's home movies or travel slides bores me.

13)   1. I would like to take up the sport of water–skiing.
     2. I would not like to take up water–skiing.

14)   1. I would like to try surfing.
     2. I would not like to try surfing.

15)   1. I would like to take off on a trip with no pre-planned or definite routes, or timetable.
     2. When I go on a trip, I like to plan my route and timetable fairly carefully.

16)   1. I prefer the "down–to–earth" kinds of people as friends.
     2. I would like to make friends in some of the more "far–out" groups.

17) 1. I would not like to learn to fly an airplane.
     2. I would like to learn to fly an airplane.

18) 1. I prefer the surface of the water to the depths.
     2. I would like to learn to scuba dive.

19) 1. I would like to meet some persons who are gay (either men
        or women).
     2. I stay away from anyone I suspect of being gay

20) 1. I would like to try sky diving.
     2. I would never want to try sky diving from an airplane.

21) 1. I prefer friends who are excitingly unpredictable.
     2. I prefer friends who are reliable and predictable.

22) 1. I am not interested in experience for its own sake.
     2. I like to have new and exciting experiences and sensations
        even if they are a little frightening, unconventional, or
        illegal.

23) 1. The essence of good art is in its clarity, symmetry of form,
        and harmony of colors.
     2. I often find beauty in the "clashing" colors and irregular
        forms of modern paintings.

24) 1. I enjoy spending time in the familiar surroundings of
        home.
     2. I get very restless if I have to stay near home for any length
        of time.

25) 1. I like to dive off the high diving board.
     2. I don't like the feeling I get standing on the high board.

26) 1. I like to date members of the opposite sex who are
        physically exciting.

2. I like to date members of the opposite sex who share my values.

27) 1. The worst social sin is to be rude.
   2. The worst social sin is to be boring.

28) 1. A person should have considerable sexual experience before marriage.
   2. It's better if two married persons begin their sexual experience with each other.

29) 1. There is altogether too much portrayal of sex in movies.
   2. I enjoy watching many of the "sexy" scenes in movies.

30) 1. Even if I had the money I would not care to associate with flighty persons like those in the "jet set".
   2. I could conceive of myself seeking pleasures around the world with the "jet set".

31) 1. I like people who are sharp and witty even if they do sometimes insult others.
   2. I dislike people who have their fun at the expense of hurting the feelings of others.

32) 1. People should dress according to some standards of taste, neatness, and style.
   2. People should dress in individual ways even if the effects are sometimes strange.

33) 1. Sailing long distances in a small sailing crafts is foolish.
   2. I would like to sail a long distance in a small but seaworthy boat.

34) 1. I have no patience with dull or boring persons.
   2. I find something interesting in almost every person I talk with.

35) 1. Skiing fast down a high mountain slope is a good way to end up on crutches.
     2. I think I would enjoy the sensations of skiing very fast down a high mountain.

Appendix D: Perceived Invulnerability Scale and Risky Lifestyles

Questionnaire

The Perceived Invulnerability Scale adapted from those used by Weinstein (1980, 1984) and Perloff and Fetzer (1986).

We are interested in the beliefs people have about themselves and others. You will be asked to estimate how likely it is that you will experience the events listed below and how likely it is that another person will experience these same events. Record all answers by circling one number on each scale following the events below.

<u>Self-rating</u>

How likely is it that you will experience each of the following events sometime during your life? (Please circle on number on each scale).

1. Having a heart attack
Not at all likely   1 2 3 4 5 6 7   Extremely likely

2. Developing a drug/alcohol addiction
Not at all likely   1 2 3 4 5 6 7   Extremely likely

3. Contracting a venereal disease
Not at all likely   1 2 3 4 5 6 7   Extremely likely

4. Getting a divorce
Not at all likely   1 2 3 4 5 6 7   Extremely likely

5. Attempting suicide
Not at all likely   1 2 3 4 5 6 7   Extremely likely

How likely is it that you will experience each of the following events on the night of the fraternity party later this week? (Please circle one number on each scale.)

6. Drink and drive
Not at all likely   1 2 3 4 5 6 7   Extremely likely

7. Get arrested for DWI
Not at all likely   1 2 3 4 5 6 7   Extremely likely

8. Get in an alcohol-related traffic accident
Not at all likely   1 2 3 4 5 6 7   Extremely likely

9. Travel with someone who is driving while intoxicated
Not at all likely   1 2 3 4 5 6 7   Extremely likely

10. Throw up from drinking too much
Not at all likely   1 2 3 4 5 6 7   Extremely likely

The Perceived Invulnerability Scale (con't).
Other rating

How likely is it that the average fraternity or sorority member of your gender at Virginia Tech will experience each of the following events sometime during your life? (Please circle on number on each scale.)

1. Having a heart attack
Not at all likely   1   2   3   4   5   6   7   Extremely likely

2. Developing a drug/alcohol addiction
Not at all likely   1   2   3   4   5   6   7   Extremely likely

3. Contracting a venereal disease
Not at all likely   1   2   3   4   5   6   7   Extremely likely

4. Getting a divorce
Not at all likely   1   2   3   4   5   6   7   Extremely likely

5. Attempting suicide
Not at all likely   1   2   3   4   5   6   7   Extremely likely

How likely is it that the average fraternity or sorority member of your gender at Virginia Tech will experience each of the following events on the night of the fraternity party later this week? (Please circle one number on each scale.)

6. Drink and drive
Not at all likely   1   2   3   4   5   6   7   Extremely likely

7. Get arrested for DWI
Not at all likely   1   2   3   4   5   6   7   Extremely likely

8. Get in an alcohol-related traffic accident
Not at all likely   1   2   3   4   5   6   7   Extremely likely

9. Travel with someone who is driving while intoxicated
Not at all likely   1   2   3   4   5   6   7   Extremely likely

10. Throw up from drinking too much
Not at all likely   1   2   3   4   5   6   7   Extremely likely

LIFESTYLES QUESTIONNAIRE

1) Over the last 3 months, how many times have you driven a vehicle after drinking two or more alcoholic beverages?

   1=0   2=1-3   3=4-10   4=more than 10

2) How many loaded firearms do you have in your house?

   1=0   2=1-3   3=4-10   4=more than 10

3) How many cigarettes do you smoke per day?

   1=0   2=1-3   3=4-10   4=more than 10

4) On your last 10 vehicle trips, how many times did you wear your safety belt?

   1=0   2=1-2   3=3-4   4=5-6   5=7-8   6=9-10

5) I tend to respect authority.

   1=Highly Disagree   2=Disagree   3=Not Sure   4=Agree   5=Highly Agree

6) Over the last month, how many times have you used an illegal drug?

   1=0   2=1-3   3=4-10   4=more than 10

Indicate below the speed you usually travel (with no vehicles in front of you) in the following speed zones:

7) When the speed limit is 35 mph, I usually drive

   1=6mph or more <u>below</u> the limit   2=1-5mph <u>below</u> the limit
   3=at the limit   4=1-5mph <u>above</u> the limit
   5=6-10mph <u>above</u> the limit   6=11mph or more <u>above</u> the limit

8) When the speed limit is 55 mph, I usually drive.

   1=6mph or more <u>below</u> the limit   2=1-5mph <u>below</u> the limit
   3=at the limit   4=1-5mph <u>above</u> the limit
   5=6-10mph <u>above</u> the limit   6=11mph or more <u>above</u> the limit

9) When the speed limit is 65 mph, I usually drive

   1=6mph or more <u>below</u> the limit   2=1-5mph <u>below</u> the limit
   3=at the limit   4=1-5mph <u>above</u> the limit
   5=6-10mph <u>above</u> the limit   6=11mph or more <u>above</u> the limit

10) What percentage of the time do you try to beat a yellow traffic light?

   1=Never   2=10-20%   3=30-40%   4=50-60%   5=70-80%   6=90-100%

11) What percentage of the time do you travel faster than the posted speed limit?

1=Never   2=10-20%   3=30-40%   4=50-60%   5=70-80%   6=90-100%

12) When in traffic, I am usually trying to set the pace (e.g., by being out in front)

1=Highly Disagree   2=Disagree   3=Not Sure   4=Agree   5=Highly Agree

13) If all speed limits were eliminated, and you were driving the sports car of your choice on an open highway with no other cars in sight, how fast would you travel (in mph)?

1= <20mph   2=21-30   3=31-40   4=41-50   5=51-60
6=61-70   7=71-80   8=81-90   9=91-100   10= >100mph

14) On your last 10 vehicle trips, how often was your car stereo so loud that occupants in adjacent vehicles could hear the sound?

1=0   2=1-2   3=3-4   4=5-6   5=7-8   6=9-10

15) At times, I "show off", even though I know that sometimes it's not safe?

1=Highly Disagree   2=Disagree   3=Not Sure   4=Agree   5=Highly Agree

16) Do you anger easily when behind the wheel?

1=Highly Disagree   2=Disagree   3=Not Sure   4=Agree   5=Highly Agree

17) Do you try to "get revenge" when you 're cut off on the highway?

1=Highly Disagree   2=Disagree   3=Not Sure   4=Agree   5=Highly Agree

18) Within the last 12 months, how many traffic tickets for moving violations have you received?

1=0   2=1   3=2   4=3   5=4 or more

19) Do you hunt for game (i.e., turkey, deer, etc.)?

1=Yes 2=No   (if No, skip to #22)

20) On your last 10 hunting trips, how often did you wear blaze orange?

1=0   2=1-2   3=3-4   4=5-6   5=7-8   6=9-10

21) Have you completed a hunting safety course?

1=Yes 2=No

22) If another vehicle cuts in too closely in front of me, I stay on their tail?

1=Highly Disagree   2=Disagree   3=Not Sure   4=Agree   5=Highly Agree

23) What kind of automobile do you own? (check all that apply, circle primary vehicle)

1= Truck/Utility   4= Stationwagon   7= Convertible (any type)
2= Minivan   5= Sportscar   8= Motorcycle
3= Sedan   6= Luxury car   9= Moped
10=Don't own a vehicle

24) When I try to repair something, I usually try and figure it out on my own, rather than consult the manual?

1=Highly Disagree   2=Disagree   3=Not Sure   4=Agree   5=Highly Agree

25) If you currently, or in the past have owned, a motorcycle, please list all the PPE (personal protective equipment) you normally used when you rode:

1=full face helmet   4=leather jacket   7=leather gloves
2=open face helmet   5=leather pants/chaps   8=leather boots
3=goggles/glasses   6=blaze orange vest   9=never rode a motorcycle
   (if helmet is open)

26) If you use a power lawn mower (gas or electric) when you mow the lawn, please list all the PPE you normally use as you cut:

1=shoes/boots   4=cotton gloves   7=long sleeved shirt
2=safety goggles   5=leather gloves   8=hearing protection
3=long pants   6=hat that shades face   9=don't own or use power
                                                          mower

27) If you use a chainsaw (gas or electric), please list all the PPE you normally use as you cut:

1=shoes/boots   5=work gloves   8=long sleeved shirt
2=safety goggles   6=hat that shades face   9=hearing protection
3=long pants   7=hard hat   10=don't own or use a
4=shin guards   chainsaw

28) How much time do you allow yourself to get ready for work in the morning?

1= less than 30min   2=31-45   3=46-60   4=61-90   5=more than 90min

29) About how many months ago did you have your last complete physical exam from a doctor?

1=<1   2=2-3   3=4-5   4=6-7   5=8-9   6=10-11   7=12 or more

30) I've been described as being "quick tempered" or as having a "hair trigger"?

31) In the last 10 times you were sun bathing, how many times did you use sunscreen lotion?

   1=0   2=1-2   3=3-4   4=5-6   5=7-8   6=9-10

32) On average, how many hours a day do you sit in the sunlight seeking a tan?

   1=0   2=1   3=2   4=3   5=4   6=5   7=more than 5 hours

33) Please circle the activities in which you participated during the past 12 months:
   (circle all that apply)

1= water skiing	5= jogging/running	8= scuba or snorkeling
2= snow skiing	6= aerobics	9= golfing
3= horseback riding	7= swimming	10= sky diving
4= football		

34) Please circle the activities in which you participated during the past 12 months:
   (circle all that apply)

1= weight lifting	5= caving	8= mountain climbing
2= softball/baseball	6= cycling	9= kayaking or canoeing
3= basketball	7= hiking/camping	10= dancing
4= tennis/racquetball		

Appendix E: Experience with Alcohol and Sexual History Questionnaires

Experience with Alcohol

Please circle the response that best describes you.

1) How often do you drink alcohol?

    1. More than 3 times a week
    2. 2 - 3 times a week
    3. Once a week
    4. 1 - 3 times a month
    5. A few times a year
    6. Almost never
    7. Never

2) On average, how many times per month do you attend parties where alcoholic beverages are served?

1. 10 or more	4. 3 to 4
2. 7 to 9	5. 1 or 2
3. 5 to 6	6. None

3) On average, when you do drink, how many 12 ounce glasses of beer, 6 ounce glasses of wine, standard mixed drinks, or 1 ounce shots of liquor do you consume?

1. 10 or more	4. 3 to 4
2. 7 to 9	5. 1 or 2
3. 5 to 6	6. None

4) Approximately how many times in the past two weeks have you consumed five or more drinks in an evening?

1. 12 or more	4. 3 to 5
2. 9 to 11	5. 1 or 2
3. 6 to 8	6. None

Sexual History Questionnaire

Please respond honestly and to the best of your knowledge to the following items. Circle the answer that best describes to you. Please keep in mind that all responses are kept confidential. If an item does not pertain to you at this time, please circle "Not Dating".

1) Marital status: 1 = single   2 = married   3 = divorced

2) Sexual orientation: 1 = heterosexual   2 = homosexual   3 = bisexual

3) Have you ever had intercourse?   1 = yes   2 = no

4) Total number of sexual partners over your lifetime:_____

5) Total number of sexual partners in the past 3 months:_____

6) Are you currently sexually active?   1 = yes   2 = no

7) If you are currently involved in a relationship, how would you categorize

that relationship? (Circle only one)
     1. just started dating   4. casual(more than 1 partner)
     2. casual(no sex)   5. monogamous(only 1 partner)
     3. casual(with sex)   6. not dating

8) If you use contraception, what types of contraception do you use? (Circle all that apply)
     1. condoms   4. foam/spermicide
     2. rhythm method   5. foam/spermicide & condom
     3. birth control pills   6. abstinence
     7. other (if other please indicate type) _____

9) During the past 3 months, how many times have you had sexual intercourse?
     1. 0   5. 10 - 15
     2. 1 - 3   6. 16 - 20
     3. 4 - 6   7. 21 - 25
     4. 7 - 9   8. 25 or more

Appendix F: Data Collection Sheets

Informed Consent

Determinants of Alcohol Impairment and Social Responsibility for DUI Risk at University Fraternity Parties

Participation in this study is completely voluntary. If you agree to participate in the study, you will be given a brief interview. Upon completion of this interview your actual Blood Alcohol Concentration (BAC) will be assessed using a breathalyzer, and this BAC score will be revealed to you upon completion of the assessment phase. Your BAC will again be assessed at the end of the party (as you are exiting). Upon completion of the study, the overall results will be presented to the fraternity group hosting the party.

If during the course of the evening your measured BAC level is over the legal blood/breath alcohol limit for driving (BAC > 0.05 = impaired; BAC > 0.08 = legally intoxicated) free transportation home will be provided for you if you so chose.

During the course of the interview you will be assigned a subject number. All data that is collected will be coded with this subject number so as to assure anonymity for all subjects. You are free to withdraw your consent and discontinue participation in this study at any time without prejudice or penalty.

This research project has been approved by the Human Subjects Research Committee and the Institutional Review Board. If you have any further questions please contact the Principle Investigators, Kent E. Glindemann, M.S. (231-8145) and E. Scott Geller, Ph.D. (231-6223), or Dr. R. Eisler, Head of the Human Subjects Committee of the Department of Psychology (231-7001), or Dr. Ernest Stout, Department Head, Research Administration (231-5281).

I hereby agree to voluntarily participate in the research project "Determinants of Alcohol Impairment and Social Responsibility for DUI Risk at University Fraternity Parties" described above and under the conditions described above. I am of legal age for the consumption of alcohol in this state. I am aware that free transportation home 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 > 0.08 = legally intoxicated) upon departure.

Signature _____ Student Number _____

Date _____ Witness _____

Form A

Informed Consent

Determinants of Alcohol Impairment and Social Responsibility
for DUI Risk at University Fraternity Parties

Participation in this study is completely voluntary. If you agree to participate in the study, you will be given a brief interview. Upon completion of this interview your actual Blood Alcohol Concentration (BAC) will be assessed using a breathalyzer, and this BAC score will be revealed to you upon completion of the assessment phase. Your BAC will again be assessed at the end of the party (as you are exiting). In addition, you are free to visit the various research stations as often as you like. Upon completion of the study, the overall results will be presented to the fraternity group hosting the party.

If during the course of the evening your measured BAC level is over the legal blood/breath alcohol limit for driving (BAC > 0.05 = impaired; BAC > 0.08 = legally intoxicated) free transportation home will be provided for you if you so chose.

During the course of the interview you will be assigned a subject number. All data that is collected will be coded with this subject number so as to assure anonymity for all subjects. You are free to withdraw your consent and discontinue participation in this study at any time without prejudice or penalty.

This research project has been approved by the Human Subjects Research Committee and the Institutional Review Board. If you have any further questions please contact the Principle Investigators, Kent E. Glindemann, M.S. (231-8145) and E. Scott Geller, Ph.D. (231-6223), or Dr. R.J. Harvey, Head of the Human Subjects Committee of the Department of Psychology (231-7001), or Dr. Ernest Stout, Department Head, Research Administration (231-5281).

I hereby agree to voluntarily participate in the research project "Determinants of Alcohol Impairment and Social Responsibility for DUI Risk at University Fraternity Parties" described above and under the conditions described above. I am of legal age for the consumption of alcohol in this state. I am aware that free transportation home 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 > 0.08 = legally intoxicated) upon departure.

Signature _____ Student Number _____

Date _____ Witness _____

Form B

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Entrance/Exit Protocol
Entrance
I.C. & Wristbands
When a person first enters the party, ask them if they would like to participate in the study and briefly explain the study to them (if necessary).

If they agree to participate, have them read and sign the informed consent sheet.

Ask them if they completed the pre-survey at their fraternity/sorority meeting. If they did not, ask them if the will at this time.

Attach a wristband to the subject. Record all data for the "Code # Data Sheets".

Entrance Interviews
Have subject complete the Behavioral Intentions Interview. (You must fill out the Subject # section. Use Band #).

Ask subject Q#1 of Entrance Intentions form (and complete Subject # section). Have subject complete second part of data form.

Entrance BAC
Complete BAC Data Sheet. Assess subject's BAC using DataMaster and record information. Inform subject of their BAC, and remind them to return at the end of the night to have their Exit BAC assessed.

(For Exp. Party) Give subject a flyer describing the various Social Responsibility Stations.

Exit
Exit Questionnaires
Have subject complete the Exit Questionnaire. (You must fill out the Subject # section. Use Band #).

Have subject complete the Intoxication Descriptor Checklist. (Again, you must fill out the Subject # section. Use Band #).

Exit BAC
Complete BAC Data Sheet. Assess subject's BAC using DataMaster and record information. Inform subject of their BAC, and remind them that we recommend not operating a motor vehicle if they have had anything to drink Ask them if they need use of a designated driver.

Data Collector: _____ Date: _____

Data Recorder: _____

Code Number Data Sheet

Time	Gender	Greek Org.	Code #	Band #	Date's Band #

Behavioral Intentions Questionnaire

Subject #: _____

Time: _____

For drink estimations, use the following formula:

    12 oz. beer = 4 oz. glass of wine = shot of 80 proof liquor = 9 oz. wine cooler

1. How many alcoholic beverages (in units) do you plan to drink at this party? ___

2. How impaired are you planning to get at this party? You may choose any number, even if it is not specifically marked on the scale.

    Enter an exact number: _____

```
   .000     .025    .050    .075    .100    .125    .150    .175    .200
    +--------+-------+-------++-------+-------+-------+-------+-------+------>
Completely        Legally      |                  Extremely     Completely
  Sober          Impaired     .080                   Drunk         Drunk
                             Legally
                              Drunk
```
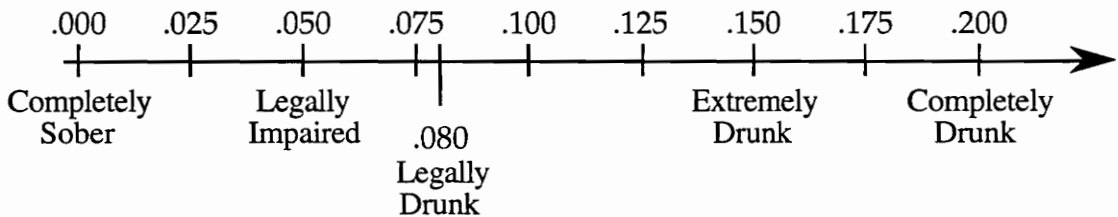
3. How impaired do you believe the AVERAGE person of your gender is planning to get at this party (other males if you are a male, other females if you are a female)? You may choose any number, even if it is not specifically marked on the scale.

    Average other, same gender, partiers BAC is: _____

4. Were you drinking before arriving at the party? Yes _____ No _____

5. If yes, how many units of alcohol do you estimate you had? _____

6. Are you going to continue drinking after the party ends? Yes ___ No _____

7. If yes, how many units of alcohol do you estimate you will have? _____

Data Collector: _____   Date: _____

Beverage Selection Survey

List quantity and type of each beverage brought (e.g., 24 12-oz Beer, 1 QT vodka, 6 12-oz soda, 4 wine coolers, etc.)

Band #	# Alcoholic Bevs Brought	# you plan to consume	# Non-Alcoholic Bevs Brought	# you plan to consume

Data Collector_____   Date_____

Entrance/Exit BAC Data Sheet

Ent/Exit	Time	Band #	Gender	How many drinks total?	Actual BAC

Exit Questionnaire

Subject #: _____

Time: _____

```
   .000    .025    .050    .075    .100    .125    .150    .175    .200
 ───┼───────┼───────┼───────┼┼──────┼───────┼───────┼───────┼───────┼──────▶
 Completely      Legally          │              Extremely    Completely
   Sober        Impaired         .080              Drunk         Drunk
                               Legally
                                Drunk
```

1. Using the scale above please estimate your current level of intoxication. You may choose any number, even if it is not specifically marked on the scale.

   My current BAC is: _____

2. Using the scale above please estimate the AVERAGE level of intoxication of other people of your gender (other males if you are a male, other females if you are a female) at this party.

   You may choose any number, even if it is not specifically marked on the scale.

   Average other, same gender, partiers BAC is: _____

3. How many alcoholic drinks have you consumed at this party.

   One drink = 12 oz. beer = 9 oz. wine cooler = shot of 80 proof liquor = 4 oz. wine.

   I had _____ drinks at this party.

Intoxication Descriptor Checklist

Subject #: _____

Time: _____

Please check as many of the following words and/or phrases which you feel describe how you feel right now.

_____   Vomiting drunk.

_____   Getting uncoordinated.

_____   Feel no effect yet.

_____   Completely sober.

_____   About to pass out.

_____   Happy buzz.

_____   Obliterated.

_____   Speech slurred.

_____   Drunk.

_____   Relaxed.

_____   Trashed.

Social Responsibility Stations

BAC Feedback Station:
Throughout the night, get your

Performance Feedback Station:
Test your motor

Safe Driving Station:
Sign up for a safe ride
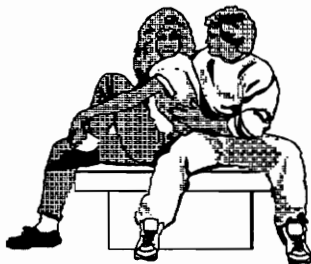
Safe Sex Information:
Learn information concerning safer sexual

Performance Feedback SRS Data Sheet (Page 1 of 2)

OBSERVER: _____ Time: _____

| Subject Information: | | | One-Leg Stand | | | | | | Stop Watch | | |
TIME	Sub. #	BAC	Sway	Arms	Hoppin'	Ground	FAIL	Total	Sec.	T-1.1	T-1.2

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Performance Feedback SRS Data Sheet (Page 2 of 2)

Date: _____

Back Counting			Number Tracking Task						Ruler Drop				AC
Start #	# Wrong	T-2.1	Card Ltr.	miss 1	T-3.1	miss 2	T-3.1	AC ?	Handed	D-1	D-2	AC ?	Total

Star Tracing Task

BEGIN HERE

Time : _____

Subject # : _____

Dominant Hand : _____

Elapsed Time : _____

Data Collector_____   **Date**_____

Data Recorder_____

STAR TRACING DATA SHEET

Band #	Time	Gender	Dom. Hand	Elapsed Time	Number Errors	Predicted BAC

Star Tracing Instructions

1. Record pertinent information.

2. Give subject test and pen.

3. Read:
    "Please start at the "plus" sign. Trace a line through the path formed by the two stars. Go to the right and keep the pen on the paper at all times. Do not turn the paper. Try to do it as quickly as possible and make as few errors as possible. Start when I say go."

4. Start the stopwatch when you say "go" and stop it when the subject completes the test and raises the pen from the paper.

5. Record the time.

6. Count the number of errors and record. Errors include:
    -Touching or crossing the lines of the star.
    -Breaks or discontinuities in the line formed by the subject.

7. Use "Estimated BAC." chart to estimate BAC.

BAC FEEDBACK SRS DATA SHEET

Data Collector: _____ Date: _____

Time	Band #	Est. BAC	Nomo. BAC	Actual BAC	Cards	Points	Public/ Private

How impaired are you right now? You may choose any number, even if it is not specifically marked on the scale.

```
     .000      .025     .050     .075     .100     .125     .150     .175     .200
  ───+─────────+────────+────────++───────+────────+────────+────────+────────+──────────▶
  Completely           Legally        │                  Extremely         Completely
    Sober              Impaired    .080                     Drunk             Drunk
                                  Legally
                                   Drunk
```
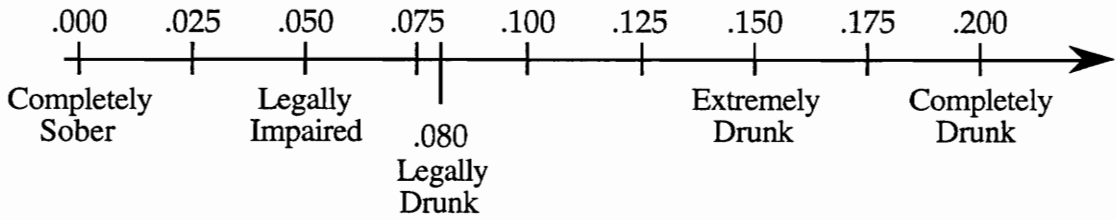
Protocol for Safe Driving SRS

1) Two sign-up sheets will be placed on a desk for participants to
   a) sign-up to receive a safe ride home or
   b) sign-up to provide a safe ride home (become a designated driver)

2) If a participant signs one of the sheets, immediately enter the time and their 4-digit wristband number on the SRS data sheet. If a subject chooses not to sign-up to be a designated driver or to receive a safe ride home but visits the SRS or takes pamphlets and/or stickers, mark the time and their 4 digit wristband number, and mark the points in the appropriate column of the data sheet. (If the subject does nothing more than visit the station, he/she will receive 0 points for their participation.)Thank them for their participation.

3) If a subject signs-up to be a designated driver, walk them over to the entrance/exit BAC station and measure their BAC on the DataMaster 2. Mark the BAC on the data sheet, but do not tell the subject his/her BAC. Inform them that they can get this information by visiting the BAC feedback SRS.

4) If a subject takes at least 1 sticker, or pamphlet which are placed on the table, record 1 point in the appropriate column of the data sheet.

5) Participants will receive 5 points for signing-up to become a designated driver, and 2 points for signing-up for a safe ride home. Record these points in the appropriate column of the data sheet.

6) Remind the subject to return to the station at the time they specified on the sign-up sheet that they would be leaving the party. Thank the subject for their participation.

7) Total the points the subject received for their participation and record this information in the appropriate column of the data sheet.

SAFE RIDE HOME SIGN-UP

SUBJECT NUMBER	BT ROUTE YOU LIVE ON	Time you want to leave the party

DESIGNATED DRIVER SIGN-UP

SUBJECT NUMBER	BAC	# OF PEOPLE YOU CAN FIT IN YOUR CAR	BT ROUTE You live on

Safe Driving SRS Data sheet

Data Collector: _____ Date: _____

Data Recorder: _____

Time	Band #	Sign up to get ride?	Sign up to give ride?	Actual BAC	Stickers/ Pamphlets	Total Points

DRUNK DRIVING FACTS

The number one killer of Virginia's youth is alcohol-related highway crashes.

- Young people represent only 14 % of the driving public, but represent 48% of the deaths on highways, 20% of the injuries, and 32% of all crashes.

- 16% of these crashes are alcohol related.

- two out of five Americans will be involved in an alcohol-related crash in their lifetime.

- 50% of 1988's traffic fatalities were alcohol related

- 39% of all fatal traffic crashes involved a drunk driver or pedestrian

- 38% of all drivers killed in 1988 were driving drunk

- In 1988 drinking was involved in:
    - 23,000 fatal crashes
    - 320,000 injury crashes
    - 1,600,000 property damage accidents
    - total cost for alcohol-related motor vehicle crashes was $12 billion

- Three-fourths of the cases on court dockets deal with DWI (driving while intoxicated)

- 31% of all arrests in a given year are for DWI

Protocol for the Safer Sex SRS

Note: This station is dealing with a sensitive topic. Try to answer people's questions to the best of your ability. Be honest and sincere and if you do not know a specific answer or are unsure, let the person know and direct their question to the numbers that are available to the services on campus (such as the health services or counseling center). Have fun & BE COOL!

1. Be familiar with all of the material at the station. Be sure to reread all of the material prior to the evening of the experimental condition.

2. Have the materials in an organized manner on the table.

3. When a participant approaches the table and begins to look at the material, note their gender and time on the data sheet.

4. Get the participants subject number located on their wrist band.

5. Mark the appropriate code for each pamphlet the participants takes. If the participant takes more than one of the same item, that counts as a separate item. Also, try to count how many condoms the participant takes. Remember, the participants are getting points for their participation.

6. If anything unusual occurs or something of particular interest, please mark this in the comment section.

Make sure the station stays stocked. If you need extra supplies we're going to keep them in a box underneath the table. Try not to let people take the condoms off our stations sign, they are glued onto the sign and they are attractive. Encourage people to take the condoms that are on the table.

If you have any problems, let Kent know and he'll give me the information and I'll try to help with the problem.

Good luck,
Kristy

Safe Sex Social Responsibility Station Data Sheet

Name: _____   **Date:** _____

Partner: _____

Band #	Time	Gender	Pamphlets taken	Condoms taken	IDA	Total Points

CODE FOR PAMPHLETS

1-ALCOHOL

2-RAPE

3-SEX
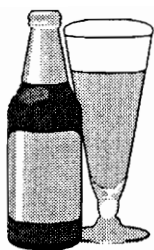
4-TOO MUCH

5-SEX & DRUGS

6-HOW TO USE

7-HOW TO HELP A FRIEND

8-PROTECTING SELF AGAINST AIDS

Intoxication Detection Aid (IDA)

SCORING: Items should be scored as "Yes" or "No" (Yes = 1, No = 0). A score of three on the IDA roughly correlates with a BAC of 0.05, and a score of five on the IDA roughly correlates with a BAC of 0.10 (Teplin & Lutz, 1985).

1) Smell of alcohol - The odor of alcohol is evident in face-to-face conversation.

2) Fine motor control - There is impairment of activities requiring fine motor coordination (e.g., fumbling with cigarettes, difficulty in retrieving ID cards from wallet or purse).

3) Gross motor control - The subject may stumble over or accidentally brush against objects, or have difficulty maintaining upright posture. The subject may have difficulty walking in a reasonably straight line.

4) Slurred speech - Any difficulty in enunciating words distinctly. This may be either a single error or several instances where words are indistinguishable or blurred so that speech is not articulated clearly and concisely.

5) Change in speech volume - Deviation from normal conversational volume appropriate to situation (i.e., subject's voice overly loud when there is no competing background noise, or he/she may whisper or talk very softly when there is no apparent reason for confidentiality). Subject's voice may go from low to high or from high to low volume when there is no external cue indicating that a shift in volume is required.

6) Decreased alertness - Increased response time to social or other environmental stimuli. Person may have difficulty paying attention to conversation or following simple commands.

7) Sweating - Excessive perspiration is observed which is not due to temperature, or where sweating is too profuse to be accounted for by nervousness or physical.

8) Respiration slow or shallow - Observer can detect a discernible deviation in respiration compared to his own breathing or that of other people involved in the interaction.

9) Sleepiness - Person is tired. This item is coded when external factors, such as time of day, would not account for this behavior. The subject may be dozing in a situation where a higher level of attention is the norm for most people (e.g., in a public social situation such as a bar, on the street, or during interaction with the police).

10) Pace of speech - Changes in rate of speaking (e.g., racing speech alternating with slow speech, or consistently slow or fast speech).

11) Red eyes - If eyes are bloodshot to any degree, this item should be coded positive.

Alcohol
When is it too much?

What questions can you ask yourself about your drinking?

Every once in a while those of us who are drink wonder if we are drinking too much. When are we in trouble? Here are some questions to ask yourself to evaluate where you are in relation to alcohol.

When is it too much?

When alcohol interferes with your life, health, grades, work, or causes problems with the law or your finances, then you have a problem.

Is a problem drinker an alcoholic?

It could be. A problem drinker could become an alcoholic. So prompt dealing with alcohol problems may prevent alcoholism. If you even wonder about it, seek help. Talk to someone who is experienced with alcohol problems at University Health Services or Counseling services. Call 231-7780 for a referral for help.

Check out your drinking behavior.

Take the following quiz and see where you stand. Be honest. Only you will see the results. **Answer yes or no to the following:**

At school have you ever--

1. - cut class to go to happy hour?

2. - had a drink while you study?

3. - missed class with a hangover?

Alcohol: When is it too much? (continued)

4. - done poorly on a test because of a hangover?

5. - hated studying because it interfered with drinking?

With friends and lovers have you ever:

1. - had sex while inebriated without using condoms?

2. - been injured while drunk?

3. - chosen friends or lovers because they drink as much as you do?

4. - regretted how you have treated people when you were drunk?

5. - been told by someone who cares about you that you drink too much?

In relation to health problems - mental or physical - have you ever:

1. - felt guilty about your drinking?

2. - been injured while drunk?

3. - blacked out while drinking?

4. - had a drink to combat loneliness?

5. - had a drink to forget your problems?

When dealing with money and problems with the law have you ever:

1. - been arrested or in trouble with school officials because of your drinking?

2. - been arrested for drinking and driving?

3. - borrowed money to drink?

4. - run out money because of partying?

5. - destroyed property while drunk?

Have you ever:

1. - had a drink to start the day?

2. - had a drink before going out to get started?

Alcohol: When is it too much? (continued)

3. - hidden how much you are drinking from friends, parents?

4. - just started to drink and kept on till all the booze was gone?

To score this test:

If you had more than 3 yes answers you should examine your drinking behavior. The test is divided into sections of your life in college. When there are several yes answers in one section you need to look at that part of your life and see how you can change.

Places to get help on campus are:

University Student Health Services

Phone #: 231-6444

Health Education Office at Student Health Services

Phone #: 231-3070

University Counseling Services

Phone #: 231-6557

This information was adapted from a brochure published at University of Arizona. Prepared by the Virginia Tech Student Health Services. 5/93

VITA

Kent E. Glindemann

DOB: 1/23/62

<u>Home Address</u>
3341 Big Run Road
Blacksburg, Virginia 24060
(703) 951-4138

<u>Office Address</u>
Department of Psychology
5100 Derring Hall
Virginia Tech
Blacksburg, Virginia 24061-0436
(703) 231-8145

Educational Background

Present

Ph.D. Candidate in Psychology
(Applied Experimental)
Ph.D. expected December 1995

1990

M.S. in Psychology
(Applied Experimental)
Virginia Polytechnic Institute
    and State University
Blacksburg, Virginia 24061-0436
Applied Experimental Program
Department of Psychology
    Areas of specialization:
    Community Behavioral
    Psychology & Applied
    Behavior Analysis

Master's Thesis: <u>Assessing Levels of Intoxication Through Behavioral Observation</u>.

1987

B.A. in Psychology (cum laude)
Salisbury State University
Salisbury, Maryland 21801
Major: Psychology
Minor: Sociology

Professional Affiliations

Center for Applied Behavior Systems

Virginia Academy of Science
Virginia Psychological Association
Association for Behavior Analysis
Southeastern Association for Behavior Analysis
Florida Association for Behavior Analysis

Professional Experience

10/93 to present - Project manager and coordinator on a two-year grant from the National Institute on Alcohol Abuse and Alcoholism (Grant # 5 R01 AA09604-02) investigating college-aged drinkers' propensity to engage in behaviors which minimize the risk of driving while intoxicated. Personality measures (of "Actively Caring") are collected and analyzed with respect to subjects' propensity to engage in various behaviors at actual university parties. Supervisor: E. Scott Geller, Ph.D.

9/88 to present - Project manager and coordinator of a series of research projects investigating the behavioral and environmental influences of alcohol consumption on college students. Project manager of the Center for Applied Behavior Systems. Supervisor: E. Scott Geller, Ph.D.

1/93 to 6/95 - Project manager and coordinator on a two-year grant from the Alcoholic Beverage Medical Research Foundation investigating intervention techniques for preventing DUI among college fraternity and sorority students after university-sanctioned parties. Supervisor: E. Scott Geller, Ph.D.

6/93 to 2/94 - Co-Principal Investigator on a grant from the Virginia Department of Motor Vehicles (# LE930459004) to conduct a series of seven summer workshops with the representatives of 500 Virginia-based corporations. The purpose of the workshops was to provide these corporate individuals with the educational "know-how" and resources to set up successful safety belt programs at their respective corporate sites. Co-Principal Investigators: E. Scott Geller, Ph.D. & Kent E. Glindemann, M.S.

8/92 to 12/92 - Graduate Research Assistant with the Department of Industrial and Systems Engineering. Developed and administered a survey instrument intended to measure the impact of an organizational reorganization undergone by a section of the Management Systems Laboratories. Supervisor: Shiela Winnet Ph.D.

5/89 to 9/90 - Graduate Research Assistant on a grant from the Center for Disease Control focusing on large scale behavioral strategies to influence

children to wear safety belts when traveling in motor vehicles. Principal Investigator: E. Scott Geller, Ph.D.

9/88 to 5/89 - Graduate Research Assistant on a project assessing perceptions of scenic beauty to areas surrounding a paper mill after the processing and release of effluents into waterways. This joint project includes the work of biologists performing toxicology studies. Principal Investigator: Albert M. Prestrude, Ph.D.

10/87 to 10/88 - Project manager on a grant from the Virginia Department of Motor Vehicles to co-ordinate and evaluate "Elmira-type" safety belt programs being conducted by nine separate police departments throughout the Commonwealth of Virginia. Co-Principal Investigators: E. Scott Geller, Ph.D. & Michael J. Kalsher, Ph.D.

10/87 to 9/88 - Project manager on a grant from the Virginia Department of Motor Vehicles to follow up and assess the impact of a previous grant in which a series of ten summer workshops were conducted with the representatives of 500 Virginia-based corporations. The purpose of the workshops was to provide these corporate individuals with the educational "know-how" and resources to set up successful safety belt programs at their respective corporate sites. Co-Principal Investigators: E. Scott Geller, Ph.D. & Michael J. Kalsher, Ph.D.

9/87 to 5/89 - Graduate Research Assistant for an Academy for Educational Development grant on child survival interventions in third world countries. Served as a consultant to devise and develop a system for analyzing and assessing child survival interventions in oral rehydration therapy (ORT) and expanded programs in immunization (EPI) being conducted in Nigeria, Africa. Supervisor: E. Scott Geller, Ph.D.

Teaching Experience

8/89 - present: Instructor for Field Study and Independent Study courses of students working with the Center for Applied Behavior Systems.

8/91 - 12/91 Graduate Teaching Assistant for Research Methods (graduate level class)

1/91 - 5/91 Graduate Teaching Assistant for Psychology of Motivation.

8/90 - 12/90 Graduate Teaching Assistant for Introductory Psychology.

8/89 - 12/89 Instructor for Advanced Learning Lab.

1/89 - 5/89 Graduate Teaching Assistant for Nervous Systems and Behavior.

8/88 - 12/88 Graduate Teaching Assistant for Introductory Psychology.

3/88 - 5/88 Graduate Teaching Assistant for Introductory Psychology.

12/87 - 2/88 Instructor for Cognitive Psychology Lab.

9/87 - 11/87 Graduate Teaching Assistant for Introductory Psychology.

Relevant Graduate Coursework

Behavior Management in Large Scale Systems; Community Psychology; Research Methods (two graduate level courses); Theoretical or Applied Statistics (three graduate level courses); Psychology of Learning (three graduate level courses); Social Psychology (two graduate level courses); Information Processing; Physiological Psychology (two graduate level courses); Health Psychology; Industrial Psychology (two graduate level courses); Organizational Psychology.

Other Skills

Extensive experience with the Macintosh computer system. Working knowledge of SPSS, StatView, Microsoft Excel, Microsoft Word, SuperPaint, Lotus 1-2-3, and other similar software.

Publications

Glindemann, K.E., Geller, E.S., & Ludwig, T.D. (Submitted for publication). Behavioral intentions and blood alcohol concentration: A relationship for prevention interventions. Journal of Alcohol and Drug Education.

Glindemann, K.E., & Geller, E.S. (Submitted for publication). Attacking alcohol abuse on the college campus: From theory to practical intervention. Journal of American College Health.

Glindemann, K.E., Evans, R.E., & Geller, E.S. (1989). Using a computerized critical tracking task to predict intoxication among college-aged populations. Proceedings of the 11th International Conference on

Alcohol, Drugs, and Traffic Safety (Vol. 2, pp. 116 - 130). Rockville, MD: National Clearinghouse for Alcohol and Drug Information.

Kalsher, M.J., Geller, E.S., & Glindemann, K.E. (1988). Environmental determinants of alcohol consumption at college parties. In K. Stewart, B. Sweedler, & C. Hughes (Eds.), 35th International Congress on Alcohol and Drug Dependence: Proceedings of the Section on Alcohol, Drugs, and Traffic Safety (Vol. 2, pp. 141 - 153). Rockville, MD: National Clearinghouse for Alcohol and Drug Information.

Training Manuals

Geller, E.S., Pettinger, Jr., C.B., Roberts, D.S., Glindemann, K.E., Jones, J.P., & Maddox, K.L. (December, 1993). Achieving a Total Safety Culture: From the Road to the Workplace (2nd Edition). Training manual developed for the Virginia Department of Motor Vehicles (for Grant # LE930459004). (141 pp.).

Geller, E.S., Roberts, D.S., Glindemann, K.E., Jones, J.P., & Maddox, K.L. (August, 1993). Achieving a Total Safety Culture: From the Road to the Workplace (1st Edition). Training manual developed for the Virginia Department of Motor Vehicles (for Grant # LE930459004). (123 pp.).

Technical Reports

Glindemann, K.E., & Geller, E.S. (1995). The Efficacy of Sobriety Tests at Various Levels of Intoxication Using a Signal Detection Approach. Technical report submitted to the Bosen Law Firm, Salem, Virginia.

Geller, K.E., & Glindemann, K.E. (1994). Intervening With Fraternities to Decrease Alcohol Abuse. First year report for Grant # 5 R01 AA09604-02 from the National Institute on Alcohol Abuse and Alcoholism.

Geller, E.S., Glindemann, K.E., Pettinger, JR., C.B., Roberts, D.S., Maddox, K.L., & Jones, III, J.P. (1994). Achieving a Total Safety Culture: From the Road to the Workplace. Final report for Grant # LE930459004 from the Virginia Department of Motor Vehicles (192 pages).

Roberts, D.S., & Glindemann, K.E. (1992). Fitness For Duty Testing For Occupational Safety: Evaluation of Current Techniques. Technical report submitted to Hoechst Celanese Corporation, Celco Plant, Narrows, Virginia.

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Geller, E.S., Kalsher, M.J., Clarke, S.W., Lehman, G.R., & Glindemann, K.E. (1989). <u>Naturalistic Analysis of Alcohol Consumption and Impairment in Party Settings</u>. Final report for Grant No. 230-11-110c-053-918036-1 from the Alcoholic Beverage Medical Research Foundation

Geller, E.S., Kalsher, M.J., Glindemann, K.E., Clarke, S.W., & Ludwig, T.D. (1989). <u>The Effects of Selective Enforcement of the Virginia Safety Belt Use Law</u>. Final report for Contract with the Commonwealth of Virginia Department of Motor Vehicles.

Published Abstracts

Glindemann, K.E., Rashleigh, C.M., Gee, A., & Mohla, A. (1994). Assessing the efficacy of the Star Tracing Task for predicting BAC at fraternity parties: A signal detection approach. Published in the <u>Proceedings of the 14th Annual Convention of the Florida Association for Behavior Analysis</u>, Orlando, Florida, p. 15.

Haskell, I.O., Glindemann, K.E., Clarke, S.W., & Spisak, J. (September, 1994). Is non-alcoholic beer an acceptable alternative?: Assessing ability to discriminate between types of beer. Published in the <u>Proceedings of the 14th Annual Convention of the Florida Association for Behavior Analysis</u>, Orlando, Florida, p. 20.

Glindemann, K.E., Mohla, A., LaMonica, J., Spiller, M.L., & Geller, E.S. (1994). The use of social responsibility stations at university alcohol parties: A test of individuals' propensity to "actively care". Published in the <u>Virginia Journal of Science</u>, 45(2), p. 112.

Rashleigh, C.M., Glindemann, K.E., Ammons, J., Heath, J. & Kang, S. (1994). The effects of instructional format on the completion of a psycho-motor sobriety test: Open strategy verses specified strategy. Published in the <u>Virginia Journal of Science</u>, 45(2), 119.

Pettinger, Jr., C.B., Kalsher, M.J., Roberts, D.S., & Glindemann, K.E. (1994). Alcohol testing through cognitive behavioral fitness tests. Published in the <u>Virginia Journal of Science</u>, 45(2), p. 122.

Glindemann, K.E., Maddox, K.L., & Jones, J.P. (1993). Behavioral intentions and subsequent levels of intoxication: An index for determining individuals at risk for DUI. <u>Proceedings of the 13th Annual Convention of the Florida Association for Behavior Analysis</u>, Ft. Lauderdale, Florida, p. 55.

Davis, J.C., Jaxtheimer, K.A., Roberts, D.S., & Glindemann, K.E. (1993). Alcoholic beverage selection and its relationship to subsequent intoxication at a university fraternity party. <u>Virginia Journal of Science</u>, <u>44</u>(2), p. 180.

Maddox, K.L., Glindemann, K.E., Zimmerman, J., Metzler, A.S., & Clarke, S.W. (1993). Use of a simple sobriety test to predict blood alcohol concentration: A field study. <u>Virginia Journal of Science</u>, <u>44</u>(2), p. 183.

Halsey, R.D., Little, S.E., Buchholz, C.T., & Glindemann, K.E. (1992). Determining individuals at risk for excessive alcohol consumption at university fraternity parties. <u>Student/Faculty Information Exchange for Enhancing Undergraduate Research</u>, <u>2</u>, 53.

Buchholz, C.T., Barn, L.A., Satz, J.M., Kaly, P.W., & Glindemann, K.E. (1992). Examining ways to alter registered levels of intoxication on an alcohol breathalyzer. <u>Student/Faculty Information Exchange for Enhancing Undergraduate Research</u>, <u>2</u>, 25.

Satz, J.M., Glindemann, K.E., Roberts, D.S., Freeman, C.M., & Barn, L.A. (1992). What do college students prefer to drink?: An examination of alcoholic beverage selection by type and quantity. <u>Student/Faculty Information Exchange for Enhancing Undergraduate Research</u>, <u>2</u>, 86.

Glindemann, K.E., Geller, E.S., & Coleman, C.M. (1991). DUI-Prevention research at parties: Some practical considerations and implications. <u>Virginia Journal of Science</u>, <u>42</u>(2), 253.

Little, S.E., Satz, J.M., & Glindemann, K.E. (1991). Assessing intoxication in the field: Use of signatures to estimate partiers' BACs. <u>Virginia Journal of Science</u>, <u>42</u>(2), 255.

Coleman, C.M., Glindemann, K.E., Halsey, R.D., & Little, S.E. (1991). Investigating "tricks" rumored to render intoxication detection devices inaccurate. <u>Student/Faculty Information Exchange for Enhancing Undergraduate Research</u>, <u>1</u>, 26.

Halsey, R.D., Glindemann, K.E., Coleman, C.M., & Little, S.E. (1991). Simple psychomotor tasks: Predictors of intoxication in university-age populations? <u>Student/Faculty Information Exchange for Enhancing Undergraduate Research</u>, <u>1</u>, 45.

Hall, S., Lee, J., & Glindemann, K.E. (1990). Is handwriting a reliable index of alcohol impairment? <u>Virginia Journal of Science,</u> <u>41</u>(2), 119.

Schumpert, C., Lugo, M., & Glindemann, K.E. (1990). New strategies for assessing intoxication in the field. <u>Virginia Journal of Science,</u> <u>41</u>(2), 119.

Levitt, D.S., Evans, R.E., Glindemann, K.E., & Geller, E.S. (1989). Development and evaluation of a computerized critical tracking task for predicting BAC. <u>Proceedings of the American Psychological Society,</u> <u>1,</u> .

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Glindemann, K.E., Geller, E.S., Pettinger, Jr., C.B., DePasquale, J.P., & Fortney, J.N. (March, 1996). <u>Intervening With Fraternities to Decrease the Risk of DUI.</u> Paper to be presented at the annual meeting of the South Eastern Psychological Society, Norfolk, Virginia.

Chevaillier, C.R., Glindemann, K.E., Fortney, J.N., Pettinger, Jr., C.B., & Gershenoff, A.B. (March, 1996). <u>BAC Feedback to University Students During Alcohol Awareness Week: A Longitudinal Study.</u> Paper to be presented at the annual meeting of the South Eastern Psychological Society, Norfolk, Virginia.

Walker, J.S., Clarke, S.W., Glindemann, K.E., & Geller, E.S. (March, 1996). <u>Effects of Attitudes and Normative Beliefs Concerning Alcohol Consumption on Impairment of College Students at University Parties.</u> Paper to be presented at the annual meeting of the South Eastern Psychological Society, Norfolk, Virginia.

Chevaillier, C.R., Glindemann, K.E., Fortney, J.N., Clarke, S.W., & Paul, S. (November, 1995). Providing Students With BAC Feedback: Do They Know How Drunk They Really Are? Poster to be presented at the 12th Annual Meeting of the Southeastern Association for Behavior Analysis, Charleston, South Carolina.

Walker, J.S., Porter, K., McGhee, Y., Glindemann, K.E., & Geller, E.S. (November, 1995). How Well Do Sobriety Tests Predict Intoxication?: A Series of Field Tests. Poster to be presented at the 12th Annual Meeting of the Southeastern Association for Behavior Analysis, Charleston, South Carolina.

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Ludwig, T.D., & Glindemann, K.E. (May, 1995). The Differential Effect of Assigned vs. Participatory Goal Setting on Response Generalization. Paper presented at the 10th annual conference of the Society for Industrial and Organizational Psychologists, Orlando, Florida.

DePasquale, J.P., Pettinger, Jr., C.B., Kalsher, M.J., & Glindemann, K.E. (January, 1995). Performance Based Testing: Acceptability and Effectiveness. Poster presented at the 5th semi-annual convention of the Florida Association for Behavior Analysis/Organizational Behavior Management Network, Clearwater Beach, FL.

Roberts, D.S., Glindemann, K.E., Jones III, J.P., Nuttycomb, K., & Geller, E.S. (May, 1994). Increasing Stair Safety Behaviors: Other-Focused versus Self-Focused Written Prompts. Paper presented at the 20th annual convention of the Association for Behavior Analysis, Atlanta, Georgia.

Glindemann, K.E., Buermeyer, C.M., Roberts, D.S., Mohla, A., & Ludwig, T.D. (May, 1994). Examining the Relationship Between Intentions to Consume Alcohol and Actual Drinking Behavior: A Series of Field Tests. Paper presented at the 20th annual convention of the Association for Behavior Analysis, Atlanta, Georgia.

Haskel, I., Wheeler, J.B., Ramsby, K.L., Maddox, K.L., & Glindemann, K.E. (May, 1994). Using Personality Inventories to Predict Intoxication at

University Parties: A Field Test. Poster presented at the 20th annual convention of the Association for Behavior Analysis, Atlanta, Georgia.

Rashleigh, C.M., Glindemann, K.E., Ammons, J., & Mohla, A. (April, 1994). Assessing the Validity and Reliability of the Star Tracing Task for Predicting Blood Alcohol Concentration at Parties. Paper presented at the Annual meeting of the Virginia Psychological Association, Charlottesville, Virginia.

Buermeyer, C.M., Glindemann, K.E., Previ, L.C., & Geller, E.S.. (October, 1993). Studying "Actively Caring" at a Student Camp: Personality vs. Behavioral Indices. Poster presented at the 10th Annual Meeting of the Southeastern Association for Behavior Analysis, Chapel Hill, North Carolina.

Maddox, K.L., Glindemann, K.E., Ramsby, K., Jantz, T., & Wheeler, J. (October, 1993). Using a Simple Sobriety Test to Predict Blood Alcohol Concentration: A Comparison of Field Tests. Poster presented at the 10th Annual Meeting of the Southeastern Association for Behavior Analysis, Chapel Hill, North Carolina.

Jones, J.P., & Glindemann, K.E. (September, 1993). Assessing the Relationship Between Personality Variables and Alcohol Intoxication at University Parties. Poster presented at the 13th Annual Convention of the Florida Association for Behavior Analysis, Ft. Lauderdale, Florida.

Glindemann, K.E., Clarke, S.W., Cleaveland, B.L., Buchholz, C.T., & Geller, E.S. (June, 1993). BAC Feedback and the use of Nomograms: A Community-Based Approach for Deterring DUI. Paper presented at the 7th annual meeting of the American Psychological Society, Chicago, Illinois.

Glindemann, K.E., Geller, E.S., Cleaveland, B.L., Buchholz, C.T., & Halsey, R.D. (May, 1993). Developing a Community-Based Process for Providing Individuals with Blood Alcohol Concentration Feedback. Symposium presented at the 19th annual meeting of the Association for Behavior Analysis, Chicago, Illinois.

Glindemann, K.E., Maddox, K.L., Davis, J.C., & Zimmerman, J.L. (April, 1993). Assessing the Social Validity of Using Non-Alcoholic Beer as an Alternative Beverage at Parties: A Field Study. Poster presented at the annual meeting of the Virginia Psychological Society, Virginia Beach, Virginia.

Holland, M.S., Roberts, D.S., Glindemann, K.E., & Metzler, A.S. (April, 1993). Developing a Methodology and Intervention Procedures for Increasing Bicycle Safety on a University Campus. Poster presented at the annual meeting of the Virginia Psychological Society, Virginia Beach, Virginia.

Buchholz, C.T., Glindemann, K.E., Molnar, A.E., Benedetto, J., & Haskel, I. (March, 1993). Nomograms and their Relationship to Intoxication: Are they Predictive in Community Settings? Poster presented at the annual meeting of the South Eastern Psychological Society, Atlanta, Georgia.

Glindemann, K.E., Clarke, S.W., Johnson, D., Buchholz, C.T., & Varner, S. (October, 1992). Is Non-Alcoholic Beer a Tasteful Alternative?: Assessing Individuals' Ability to Discriminate Between Types of Beer. Poster presented at the annual meeting of the Southeastern Association for Behavior Analysis, Ashville, North Carolina.

Glindemann, K.E., Clarke, S.W., Halsey, R.D., & Geller, E.S. (August, 1992). Enrolling College Students as Intervention Agents to Prevent Alcohol-Impaired Driving. Paper presented at the American Psychological Association Convention, Washington, D.C.

Geller E.S. (August, 1992). Invited panel discussion involving T.D. Berry, K.E. Glindemann, T.D. Ludwig, and D.S. Roberts. Industry and Community Applications of Behavioral Science: Making a Difference. Presented at the annual meeting of the American Psychological Association, Washington, D.C.

Molnar, A.E., Glindemann, K.E., Satz, J.M., & Stetler, D. (April, 1992). Assessing Attitudes on Vocational Education: A Survey of High School Students in Southwest Virginia. Poster presented at the annual convention of the Virginia Psychological Association, Roanoke, Virginia.

Barn, L.A., Glindemann, K.E., & Kaly, P.W. (April, 1992). Determining Drinkers' Levels of Intoxication Through an Analysis of Handwriting Samples: A Field Study. Poster presented at the annual convention of the Virginia Psychological Association, Roanoke, Virginia.

Glindemann, K.E., Halsey, R.D., Little, S.E., & Karageorge, K. (March, 1992). Behavioral Intentions and their Relationship to Subsequent Alcohol Intoxication at University Fraternity Parties. Invited symposium

presented for the Division 27 Regional Meeting at the Southeastern Psychological Association Convention, Knoxville, Tennessee.

Glindemann, K.E., Roberts, D.S., Clarke, S.W., & Geller, E.S. (October, 1991). Evaluating Ways to Fool an Alcohol Breathalyzer. Poster presented at the Southeastern Association for Behavior Analysis Convention, Charleston, South Carolina.

Kaly, P.W., Graham, N., & Glindemann, K.E. (October, 1991). Motivating Safe Driving Behavior: Assigned versus Participative Goal Setting. Poster presented at the Southeastern Association for Behavior Analysis Convention, Charleston, South Carolina.

Glindemann, K.E., Griffin, M., Porter, B.E., & Geller, E.S. (May, 1991). Graphology as an Index of Alcohol Impairment: Motivational Undermining. Symposium presented at the Association for Behavior Analysis Convention, Atlanta, Georgia.

Glindemann, K.E., Coleman, C.M., & Halsey, R.D. (March, 1991). An Assessment of College Students' Ability to Falsify an Alcohol Sobriety Test. Invited symposium presented for the Division 27 Regional Meeting at the Southeastern Psychological Association Convention, New Orleans, Louisiana.

Glindemann, K.E., Coleman, C.M., Wright, G.C.K., & Geller, E.S. (October, 1990). Using College Partiers' Signatures as an Index of Alcohol Impairment. Poster presented at the Southeastern Association for Behavior Analysis Convention, Wilmington, North Carolina.

Dewey, J.D., Porter, B.E., Glindemann, K.E., & Geller, E.S. (October, 1990). Assessing Codependent Behaviors Through Self-Report. Poster presented at the Southeastern Association for Behavior Analysis Convention, Wilmington, North Carolina.

Glindemann, K.E., Bonner, M.J., Clarke, S.W., & Brooks, A.L. (May, 1990). Developing a Behavioral Checklist for Estimating Partiers' Blood Alcohol Concentration. Symposium presented at the Association for Behavior Analysis Convention, Nashville, Tennessee.

Glindemann, K.E., Geller, E.S., Bonner, M.J., & Lugo, M.C. (April, 1990). Use of an Intoxication Detection Aid to Assess BAC Levels at University Fraternity Parties. Invited symposium presented for the Division 27

Regional Meeting at the Southeastern Psychological Association Convention, Atlanta, Georgia.

Glindemann, K.E., Evans, R.E., & Geller, E.S. (October, 1989). Using a Computerized Critical Tracking Task to Predict Intoxication Among College-Aged Populations. Paper presented at the 11th International Conference on Alcohol, Drugs, and Traffic Safety, Chicago, Illinois.

Clarke, S.W., Daleo, L., & Glindemann, K.E. (August, 1989). Winning is Everything: Spectators Responses to Negative Outcomes. Symposium presented at the American Psychological Association Convention, New Orleans, Louisiana.

Glindemann, K.E., & Lawless, W.F. (May, 1989). Development and Testing of a Computerized Critical Tracking Task for Predicting BAC. Invited symposium presented at the Association for Behavior Analysis Convention, Milwaukee, Wisconsin.

Glindemann, K.E., Levitt, D., & Eddins, R. (March, 1989). Situational Determinants of Alcohol Consumption at Fraternity Parties. Symposium presented at the Southeastern Psychological Association Convention, Washington, D.C.

Glindemann, K.E., Ludwig, T.D., & Kalsher, M.J. (March, 1989). Working with Local Police Departments to Increase Community-Wide Safety Belt Use. Symposium presented at the Southeastern Psychological Association Convention, Washington, D.C.

Gilmore, M.R., Evans, R.E., & Glindemann, K.E. (March, 1989). Increased Safety Belt Use at Public Swimming Pools: Direct versus Indirect Reward Strategies. Symposium presented at the Southeastern Psychological Association Convention, Washington, D.C.

Glindemann, K.E., Evans, R.E., & Geller, E.S. (October, 1988). Matching Teaching to Learning: Evaluating Health Talks in Nigeria. Poster presented at the Southeastern Association for Behavior Analysis Convention, Gatlinburg, Tennessee.

Kalsher, M.J., Glindemann, K.E., Clarke, S.W., & Geller, E.S. (August, 1988). Situational Determinants of Excessive Alcohol Consumption at Parties. Paper presented at the American Psychological Association Convention, Atlanta, Georgia.

Kalsher, M.J., Geller, E.S., & Glindemann, K.E. (August, 1988). Environmental Determinants of Alcohol Consumption at College Parties. Paper presented at the 35th International Congress on Alcohol and Drug Dependence, Oslo, Norway.

Evans, R.E., Glindemann, K.E., Kalsher, M.J., & Petkus, L. (May, 1988). The "Convincer": An Involving Demonstration to Motivate Safety Belt Use. Invited symposium presented at the Association for Behavior Analysis Convention, Philadelphia, Pennsylvania.

Kalsher, M.J., Glindemann, K.E., & Gilmore, M. (May, 1988). Applications of Behavioral Technology to Evaluate Education in Nigerian Health Clinics. Invited symposium presented at the Association for Behavior Analysis Convention, Philadelphia, Pennsylvania.

Kalsher, M.J., Geller, E.S., & Glindemann, K.E. (March, 1988). Promoting Safety Belt Use on Naval Bases: A Comparison of Incentive and Disincentive Strategies. Poster presented at the National Conference on Occupant Protection and Alcohol Countermeasures, Boston, Massachusetts.

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