

PERSONAL PROJECTS AND ALCOHOL USE IN COLLEGE STUDENTS: AN
INTEGRATIVE SOCIAL COGNITIVE APPROACH

By

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Abstract

Despite the potential for unwanted consequences, college students continue to drink at high rates. Greater than 80% of college students drink alcohol and about 40% engage in occasions of heavy episodic drinking. Heavy episodic drinking among college students is associated with increased instances of verbal confrontations, physical fights, unprotected sex, vandalism, and driving while under the influence.

From a dynamic ecological perspective, goals represent a context in which drinking and all other endeavors occur, as well as a third social cognitive variable worthy of investigation in alcohol studies. As a technology for studying goal constructs, personal projects (Little, 1983; 1987; 1998) are embodiments of desired attainments an individual is trying to actualize. The present study examined the ability of goal constructs (i.e., personal project attributes) to explain drinking variance, both in combination and beyond known social cognitive determinants of alcohol use.

In a cross-sectional sample of 104 male and 96 female college students, results indicated that alcohol self-efficacy was the strongest predictor of alcohol consumption ($\beta = -.38$; $p < .01$), followed by goal involvement ($\beta = -.23$; $p < .01$) and negative drinking expectancies ($\beta = -.12$; $p < .05$). Positive drinking expectancies ($\beta = -.42$; $p < .01$) and goal efficacy ($\beta = .15$; $p < .05$) were significant determinants of alcohol efficacy. The complete model explained 34% of the variance in drinking, as measured by a 90-day timeline follow-back. The unique and indirect

contributions of goal involvement is a major finding of the study, indicating the viability of a dynamic ecological approach within the SCT framework.

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Personal Projects and Alcohol Use in College Students:

An Integrative Social Cognitive Approach

Despite potential for negative repercussions (Shuckit, Klein, Twichell, & Springer, 1994; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994), college students continue to drink at alarmingly high rates. It is estimated that 84% of college students drink alcohol and that greater than 40% commonly engage in heavy drinking (Presely & Meilman, 1992). Heavy episodic drinking (i.e., consuming more than five drinks in a single sitting) among college students is associated with increased instances of verbal confrontations (O'Hare, 1990), physical fights (Engs & Hanson, 1988), unprotected sex (Harvard School of Public Health, 1995; Pendergrast, 1994; Wechsler, et al., 1994), of vandalism (Engs & Hanson, 1988), and driving while under the influence (Engs & Hanson, 1988; Lloyd & Atkins, 1993; Perkins, 1992). Studies have converged to identify inverse associations between heavy drinking and academic performance (e.g., Goodwin, 1990; Lloyd & Atkins, 1993). Although recent data suggests that college drinking is slowly decreasing across the aggregate, most studies indicate a static effect in terms of the proportion of students who drink heavily (Gonzalez & Boughton, 1994; Magner, 1988; Tryon, 1992; Wechsler & Issac, 1992; Wechsler et al., 1994). Overall, evidence suggests that many college students drink excessively and, thereby, experience considerable alcohol related problems (Pendergrast, 1994; Schuckit, et al., 1994).

Diverse theoretical perspectives help explain dysfunctional drinking patterns. Biological reductionist explanations have focused on the neurological mechanisms that influence drinking (e.g., Blum et al., 1990). Behavioral theory asserts that individual differences in drinking reward salience and response to punishments help explain the etiology and course of alcohol disorders (Goldman & Rather, 1993). Problem behavior theory (Jessor & Jessor, 1977) places alcohol

abuse within the symptom cluster of an over arching problematic behavior syndrome, which includes precocious sexual behavior, delinquency, low achievement goals, poor academic performance, nonconformity, and a inclination toward seeking out new experiences (Kandel, 1980; Perry & Murray, 1985). Taken together, problem behavior clusters place the individual at greater risk for alcohol problems and a host of other negative health and social outcomes.

Genetic theories posit that elevated risk for alcohol disorders is largely attributable to a person's family drinking history (Searles, 1988). In sociocultural research, gender, socioeconomic status, and ethnic affiliation predict future drinking patterns (Goldman & Rather, 1993). Educational models are based on the premise that a lack of knowledge about alcohol engenders dysfunctional drinking trajectories and increasing an individuals' knowledge about drinking can alter trajectories and reduce alcohol abuse. Several intervention studies have shown increases in knowledge but have failed to show important and robust reductions in alcohol abuse among college student samples (e.g., Hansen & Graham, 1991). Recently social cognitive theory (Bandura, 1977; 1986; 1997), invoking the central constructs of self-efficacy and outcome expectancies, has garnered popularity in the alcohol literature. Based on demonstrated utility (e.g., Ellickson & Hays, 1991; Young, Oei, & Cook, 1991; Evan & Dunn, 1995; Brown, 1985a, Solomon & Annis, 1989), the present study maintains social cognitive theory as an integrating framework. Briefly explained, social cognitive theory puts forth that alcohol abuse is learned, serves a functional purpose, and emerges from dynamic interactions between environmental and person factors.

One social cognitive person factor, self-efficacy, is defined as one's perceived ability to engage in and carry out a specific behavior based on four sources of information: past performance success, observational learning, verbal persuasion, and physiological/emotional

status (Bandura, 1986; 1997). In the addictions literature, alcohol self-efficacy is most often operationalized as the individuals' confidence in their ability to avoid heavy drinking (e.g., DiClemente & Hughes, 1990). The type of behavior and the situation in which it is embedded modulates self-efficacy (Bandura, 1986; 1997). For instance, a person's efficacy to avoid heavy drinking may vary according to whether they are socializing in bar with friends or at home watching TV. In clinical samples of drinkers, self-efficacy to avoid heavy drinking explains subsequent drinking quantity and frequency (e.g., Sitharthan & Kavanaugh, 1990; McKay, Maisto, & O'Farrell, 1993). Unfortunately, the amount of variance accounted for by the efficacy construct in college populations is, mostly, modest (Young, Oei, & Crook, 1991; Bladwin, Oei, & Young, 1993). Although replete in the literature, self-efficacy, as a measure of an individual's confidence to avoid drinking heavily in a given situation, has not been as useful in explaining and altering college-drinking patterns as once presumed. For this reason, additional variables need to be considered in comprehensive models.

Outcome expectancies represent a second critical component of the social cognitive theory's explanation of drinking patterns (Rotter, 1954; Bandura, 1986; 1997). Alcohol outcome expectancies symbolize the beliefs that a drinker holds regarding their alcohol use (Goldman & Rather, 1993). More precisely, a specific action (e.g., drinking) carries with it a set of anticipated consequences or outcomes (Bandura, 1986; 1997). Consider the following representations, "if I drink, I expect to have a good time," or "if I drink, I expect to be more social." An exploration of the literature reveals that outcome expectancies are situationally bound and can be positive (expect good things to happen) or negative (expect bad things to happen). In probabilistic fashion, positive outcome expectancies potentiate a given behavior or thought (e.g., drinking) and, in reverse, negative outcome expectancies inhibit behavior (Rotter,

1954; 1966). Assessment and utilization of the alcohol expectancy construct has been an important feature of alcohol theory and intervention study for nearly two decades (e.g., Brown, Goldman, Inn, & Anderson, 1980; Christiansen & Goldman, 1983; Christiansen, Goldman, & Brown, 1985; Christiansen, Goldman, & Inn, 1982; Miller, Smith, & Goldman, 1990; Smith & Goldman, 1994). Lines of research examining expectancy construct have indicated that both drinkers and non-drinkers hold expectancies about alcohol use across age groups (Miller et al., 1990). Parent (Jessor & Jessor, 1975), peer (Webb, Baer, Francis, & Caid, 1993) and media (Austin & Mieli, 1994) sources have been found important sources for the development of individuals' alcohol expectancies. In varied samples, alcohol expectancies relate to family drinking history (Sher et al., 1991), predict treatment outcome (Brown, 1985a), and explain variability in quantity and frequency of alcohol consumption (Brown, 1985b; Darkes & Goldman, 1993). Despite considerable promise, outcome expectancies have exhibited consistent but moderate or weak predictive utility when studied as a potential determinant of college drinking (e.g., Baldwin et al., 1993).

The limited ability of outcome expectancies and self-efficacy to separately predict and alter drinking patterns invites a more integrative approach (e.g., Evans and Dunn, 1995; Cooper, Russell, & George, 1988). A motivational example may help to bring the notion of conjoint influence to light. Individuals may feel confident in their ability to carry out specific behaviors, but if the outcomes are not valued, they will be less likely to engage in that behavior; that is, they will be less motivated to do it. Despite the dynamic exchange between self-efficacy and outcome expectancies, studies seldom examine the explanatory power of outcome expectancies and self-efficacy in concert, which likely share influence on drinking through similar but partially unique mechanisms.

Under the social cognitive view, drinking is determined by multiple sources (Bandura, 1997). One potential source that has received little attention but warrants consideration is the experiences individuals have with their goals. Human behavior emerges from motivation toward desired outcomes or goals. Individuals engage in goals that range from the simplistic short-term variety to significant long-term aspirations (Pervin, 1996). Goals are represented through cognitive standards (Pervin, 1996). Mental and behavioral adjustments result from comparing behavior to the standard in a regulated feedback loop (Carver & Sheier, 1998). Because goals are embodied what we hope to happen, they have emotional or affective properties. They can be associated with positive feelings, such as pride and happiness, or they can be a source of shame and other negative emotions. People think of and embark on goals based on associations between the standard sought and positive feelings (Pervin, 1996). The associations formed between possible outcomes and positive affect occur via individuals' learning history, including stimulus response connections and observational learning (Pervin, 1996; Bandura, 1986). Once a goal is formed, continued effort is contingent on appropriate levels of reinforcement from self and/or others and confidence that it is achievable (goal efficacy). Combined with efficient reinforcement schedules and self-efficacy, goals that are proximal and moderately difficult foster continued engagement and hold the forces of abandonment at bay (Bandura, 1997).

Parsing goal systems to the level of planned steps means examining organizational structures that begin with broad overarching concepts such as being healthy, a superordinate goal, and incrementally reduce to basic behavioral components, the most concrete subordinate instructions (e.g., exercise today) (Pervin, 1996; Emmons, 1992; Powers, 1973). Each superordinate level provides instructions to the ones underlying the directive superordinate until you reach the most basic (subordinate) behavioral executions (Carver & Sheier, 1998; Pervin,

1996; Powers, 1973). Consider the following hierarchy: A student holds a superordinate goal of being knowledgeable with the subordinate components of doing well in classes and reading a wide array literature outside of class. Goal hierarchies are tiered planning process designed to consciously and unconsciously help individuals arrive at desired end points (Carver & Sheier, 1998).

Goals can be mutually symbiotic, neutral to each other, or they can exist in conflict and disturb achievement processes. According to Pervin's (1996) application of the equifinality concept, a cooperative goal may result in sub-goals and behavioral executions common to other goals. Cooperative goals appear to work well with others. In sharp contrast, some goals or their attendant behaviors work against others, fostering undesirable outcomes (e.g., conflict, emotional distress, etc.). For example, a study of three types of cigarette smokers (unaided successful quitters, relapsers, and current smokers) demonstrated that successful quitters had less intergoal conflict with their goal to quit than both relapsers and current smokers (McKeenan & Karoly, 1991). To further illustrate this point, consider a case in which a college student holds two competitive goals. John has a goal to lessen the emotional effects of a stressful week by drinking heavily and having fun at a party. He wants to blow off some steam. His goal to drink heavily and have fun probably competes with his "counter" goal to get an "A" on the next morning's midterm. The conflict between goals may have negative results. Something must give. Most likely, he cannot serve his desire to drink heavily and still get an "A" on the test. One possible outcome arising from this goal competition is that if he chooses to go out and drink heavily he may experience emotional upset over the probability of poor test performance during the party. To ward off the mounting negative affect, he may drink even more than he had originally intended, which could jeopardize his test performance. From this example and other

possible circumstances, we can think of numerous potentially dysfunctional goal patterns (e.g., self-defeating, conflicting, ill defined, etc.) that may be accompanied by equally problematic results (e.g., heavy drinking, psychological distress). Ergo, we can postulate that for some individuals mismanaged or conflicted goal systems may foster heavy drinking. This paper's central position proposes that increased knowledge about goal circumstances that engender heavy drinking may inform basic alcohol disorder knowledge and assist future intervention development. The question then becomes "how does the study of goals and drinking fit into the commonly studied social cognitive view of drinking behavior?" Before answering the question of integration, an assessment methodology will be offered to clarify the operationalization of goals and goal experiences, as applied in this study. The operationalization will be coupled with demonstrations of useful techniques for cataloguing goals and their subjective experiences, which will often be referred to as goal attributes and congruencies.

Personal projects are posited to be integrative embodiments of desired attainments an individual is trying to actualize, that is, they are integrative statements of personal goals (Little, 1983; 1989; 1998). Similar to Murray's (1951) concept of serial programs, personal projects are sequential actions or thoughts organized toward attainment of a goal, which are ecologically bound. The content of personal projects can range from immediate desires in the moment to protracted life-long yearnings (Little, 1983; 1987; 1998). As critically important actions of individuals lives, personal projects reflect cognitive, affective, and behavioral attributes of goal directed behavior (Little, 1983; 1987; 1998).

Little's (1983) analytical framework for studying the role of personal projects in psychological processes typically employs a multicomponential assessment battery. In the first part of Little's (1983) suggested battery, projects are elicited in open-ended (self-report) fashion.

Respondents simply write down the projects that they are engaged in or thinking about. A person might report a diverse array of projects, ranging from “clean my room” to “contribute to western philosophical thought.” After writing down their projects, respondents rate each of their projects on a number of attributes (e.g., importance, progress, enjoyment, etc.). The attributes are designed to capture the meaning, structure, stress, efficacy and value-congruence surrounding a person’s project system (Little, 1983; 1998; Pervin, 1996). An attribute (e.g., importance, control, progress) can be averaged across projects, creating a comparable index for each participant. This nomothetical index can then be tested for relationships with variables of interest (e.g., drinking). To elaborate on a few attributes included in the present study: “Importance” conveys the degree to which the goal is highly valued by the respondent; “Control” conveys how the respondent feels in control of the project; and “Progress” conveys how much the person feels that they have been successful in the project at the point of assessment.

In the final portion of the assessment battery, participants convey whether their projects impact or affect one another or some other activity in life. A relevant example for the present study is whether drinking heavily may adversely affect the goal to get an “A” in physics. By obtaining cross-goal impact ratings, the researcher examines how congruent individuals’ goals are with each other or how their goals may affect other behaviors (e.g., drinking alcohol).

Historically, personal project studies have indicated relationships with subjective well being (Omodei & Wearing, 1990) and measures of negative affect (Lecci, Karoly, Briggs & Kuhn, 1994). For instance, Plays and Little (1983) found that more enjoyable, moderately difficult, and important short-term projects were illustrative of individuals’ with greater life satisfaction. Using similar methodology, Karoly and colleagues (e.g., Lecci, Karoly, Ruehman,

& Lanyon, 1996; Karoly & Bay, 1990; McKeenan & Karoly; 1990) have related personal projects and analogues to varied health behaviors, such as smoking, pain control, and diabetic self-care. Other emerging self-regulatory perspectives have been studied as well. Emmons (1992) related personal strivings (i.e., representations of what a person is typically trying to accomplish) to a wider range of psychological states. Emmons (1986) found that negative affect relates to goal ambivalence, molar level (1992), conflict, and probability of attaining that goal (efficacy). In a similar stream of research, Cantor (1994) has formed a theoretical and analytical framework for studying purposeful behavior from a developmental stage perspective. To this end, she has invoked the construct of life tasks (i.e., specific tasks that individuals work on at different periods in their life; Fleeson & Cantor, 1995). In this research line, studies consistently showed that life task characteristics related to affective measures (for review see Cantor & Langston, 1989).

Returning to the task of integrating goals into social cognitive theory, the following theoretical network is offered to propel substantive evaluation of the interrelationships between alcohol self-efficacy, alcohol expectancies, personal project attributes and impact ratings, and alcohol consumption. In accord with self-regulation theory (Carver & Sheier, 1998), the content of outcome expectancies and self-efficacy flows to and from goals. In a dynamic feedback process, effort toward accomplishing the goal is maintained by one's belief that they will be successful (goal self-efficacy) and the value of the expected outcome (Carver & Sheier, 1998). Outside of particular goal a self-regulatory system operates to manage all goals inclusively. Given that different goal systems interrelate (Eden, 1988), individuals must self-regulate their goals in a manner that meets their overall hierarchy of goals and minimizes inter-goal conflict. Combining self-regulation theory and social cognitive theory, the present study hinged on the

assertion that goals exert direct influence on alcohol use and alcohol efficacy. The assertion is based on the presumption that individuals' confidence in their ability to avoid heavy drinking should be, in part, based on the type of goals that they have (e.g., academic and aspirations), as well as the attendant properties of those goals (commitment, emotional associations, etc.). Stated differently, individuals may be more confident in their ability to avoid heavy drinking if their goals system is inconsistent with heavy drinking and is effectively managed. Furthermore, goal properties or experiences directly affect how much respondents drink. Simply stated, people may regulate their drinking with partial influence from the type of goals they have and the experiences they have with those goals.

No direct influence is anticipated between goals or goal attributes (experiences) and alcohol-related expectancies due to the strict domain specificity of alcohol expectancies. That is, alcohol expectancies are directly relevant to discourse of drinking should have minimal effects on judgements about other goals. Consistent with previous research (e.g., Brown, 1985a; Evans & Dunn, 1995), alcohol expectancies should influence drinking. Counter to Bandura's suggestion that alcohol efficacy causally precedes alcohol expectancies (1997), the present model places expectancies as temporally preceding self-efficacy (e.g., Garland, 1985). The decision to do so is based on the finding that alcohol expectancies are often present prior to the onset of drinking (Miller et al., 1990) and drinking is not a performance quality endeavor (for review see Maddux, 1995). That is, the person seeking to drink heavily must only place the glass to their mouth and drink. Little performance competence is requisite for this action. Essentially, the position is that drinking involves means-end expectancies. However, in accord with Bandura's (1997) theoretical conceptualizations, the domain specific construct of alcohol self-

efficacy should emerge as the strongest predictor of drinking and expectancies should predict self-efficacy.

Many of the personal projects rating attributes have considerable overlap with social cognitive theory constructs (e.g., self-efficacy and outcome expectancies). For example, rating the likelihood of successfully accomplishing a personal project (control) overlaps the constructs of self-efficacy and outcome expectancies. Despite theoretical overlap, goals as motivational ecology measure should exert influence on alcohol efficacy because efficacy is thought to be correlated across domains (Maddux, 1995) and should affect behaviors across different domains. Goals represent an important motivational ecology construct and an important potential determinant of alcohol use. The present study is designed to bring a broader dynamic motivational context to view in alcohol research and expand existing theory.

Extending the purview of personal projects assessment methodology to alcohol-related behaviors may enhance our understanding of the reasons why people drink in the context of life's pursuits. In the proposed study, it was hypothesized that the type (i.e., goal cluster) and dimensional structure of personal project systems related to quantity and frequency of alcohol consumption in a college student sample. Stated differently, the study attempted to describe goal types and characteristics that, to a greater or lesser extent, contributed to drinking patterns. Several a priori hypotheses emerged from the aforementioned theory driven perspective:

1. It was hypothesized that degree of involvement with academic and career projects was inversely related to the amount of alcohol consumed. That is to say that an individual more involved in academic and career pursuits will likely turn greater self-focus to that domain and less to drinking endeavors. In such a case, drinking would offer less disturbance to

academic and career goal processes. Hence, the individual would drink less on the aggregate than individuals less involved in their academic and career goals.

2. It was hypothesized that the degree of difficulty experienced in relation to the pursuit of academic, career, and social goals would be positively related to the overall amount of alcohol consumed. If goals are set at too difficult a level, individuals would likely experience greater disturbance from the alcohol laden college milieu (e.g., respond to environmental cues), potentially resulting in distress and heavier drinking patterns for those who perceive their goals as overly difficult.
3. It was hypothesized that the degree of perceived congruence between goals and heavy alcohol consumption would predict a greater amount of alcohol consumption than attributes alone. Holding goal attribute ratings constant (e.g., involvement), individual's ratings of whether or not they see alcohol as detrimental to their goals would capture additional variance in drinking indices.
4. It was hypothesized that the interaction of project involvement and perceived congruence of alcohol use would explain additional variance in alcohol consumption beyond that accounted for by the main effects of academic project involvement and perceived congruence.
5. It was hypothesized that project attributes and congruence ratings would predict alcohol variance beyond previously tested social cognitive determinants of drinking (i.e., self-efficacy and outcome expectancies).
6. Lastly, it was hypothesized that the construct categories of goal attributes and alcohol expectancies would predict alcohol self-efficacy and all three construct categories would have direct influences on drinking behavior in an integrated path model.

In summary, the proposed study integrated several social cognitive theory constructs through personal project methodology in order to add understanding about the underpinning mechanisms of college drinking behavior. An improved understanding of goal factors that influence alcohol use could lead to interventions which simultaneously adjust maladaptive goal systems and decrease alcohol use. For example, if alcohol was serving as disturbance factor in a person's academic goal pursuit process, an intervention could be designed to aid the individual in self-focusing on academic goals that were incongruent with drinking and simultaneously teach the individual self-regulatory skills (e.g., planning, correction, and self-monitoring) to limit their drinking.

Method

Participants

Participants were students enrolled in psychology courses at Virginia Tech, 104 males and 96 females. Participants were recruited via sign-up sheet from the psychology participant pool. All students received course credit for their participation. The distribution of class standing was 69 freshman, 62 sophomores, 35 juniors, and 34 seniors and heavy episodic drinking differed by class rank, $F(3, 197) = 7.44, p < .05$. Seniors engaged in heavy episodic drinking less frequently during an average week ($M = 1.87$) than juniors ($M = 1.99$), sophomores ($M = 1.99$), and freshman ($M = 2.02$). No differences were found in drinks per drinking day and total drinking volume as a function of class rank. Women and men differed in terms of total drinking volume ($M = 101.24$ vs. 163.04), $t(1, 198) = 8.93, p < .01$, and drinks consumed per drinking day ($M = 3.84$ vs. 5.20), $t(1, 198) = 11.04, p < .01$, but not frequency of heavy episodic drinking, $t(1, 198) = 1.09, p > .05$. On average respondents were 18.5-years old ($SD = 1.5$).

Table 1 presents these data.

Procedure

Participants were recruited via a sign-up folder located on the experiment sign-up in the psychology building. Approved by the Institutional Review Board for Research Involving Human Subjects, a sign-up folder stated the title of the experiment (i.e., The Relationship between Personality and Alcohol Consumption in College Students) and contained a copy of the informed consent form, plus several sign-up sheets.

Upon arriving for the experiment, participants were given an informed consent form. They were told that the purpose of the study is to examine the relationship between personality and alcohol consumption in college students. The experimenters collected the informed consent forms and then administered the assessment battery in a three-part sequence. First, participants were given the personal projects assessment packet. Second, they completed a series of self-report measures concerning characteristics of their drinking. Lastly, participants completed a 90-day retrospective history of their drinking behavior, the timeline follow-back (Sobell & Sobell, 1996). Prearranged seating was used to insure that a participant's responses are not visible to other participants. To control for participant interaction effects, participants were asked not to talk during the experiment. To insure that the directions of each measure were understood, experimenters read aloud and explained the instructions for each of the three major sections. After all participants completed the assessment battery, the experimenter collected the packets and debriefed participants via written feedback concerning the study. After reading the debriefing statement, the experimenter individually asked participants if they had any questions or concerns. Before leaving the experimental room, experimenters thanked participants for their participation in the study and requested participants not to reveal the details of the study to other

students who have may been prospective participants. Experimenters collected data with groups of three to 25 participants, depending on recruitment and room seating arrangements.

Measures

Personal projects, in this study, were operationalized as sets of activities, commitments or concerns accompanied by desires, intentions, or plans the respondent was pursuing or planning to embark on soon (i.e., within one year; Lecci, Briggs, and Kuhn, 1994). In open-ended fashion, 10 projects were elicited. The following instructions were used for the project elicitation portion of the study.

We are interested in studying the activities and concerns people have during college. We call these personal projects. All of us have a number of personal projects at any given time that we think about, plan for, carry out, and sometimes (though not always) complete.

We are also very interested in learning about how people feel about these personal projects, how enjoyable they are, how stressful they are, how they may conflict with one another, and so on. We would appreciate if you could begin by just writing down *ten* personal projects that you are engaged in or thinking about at the present time. Remember that these are not necessarily formal projects, or important ones—we would prefer you give us both every day and long term projects that you are active in or thinking about in several areas of your life (e.g., social, academic, health).

List at least 10 projects that you are engaged in or thinking about at the present time.

Next, subjects rated their 10 goals on the 10 scaled attributes described below (Little, 1989). Experimenters instructed participants to rate their projects relative to their own subjective standard. Instruction indicated that all projects were not to be considered equally important, rather each was to be assigned a subjective importance rating relative to the participant's perception of the project considered most important. Respondents rated projects on each attribute scale from 0 to 10, with 10 representing the highest possible rating for each attribute. Ratings on each attribute were averaged across all projects to create broad project attribute scale

scores. Attribute scale scores were calculated within goal categories to test more specific hypotheses regarding goal attributes and drinking.

For example, participants rated the importance of a project according to the following instructions: Importance: How important each project is to you at the present time (use 10 if the project is very important to you and 0 if it is not at all important to you), $\alpha = .59$, $\underline{M} = 6.88$, $\underline{SD} = 1.17$. The average score of each attribute was used for analyses. The remaining attributes rating instructions were as follows:

- Enjoyment: How you enjoy working on each project (use 10 if you enjoy it a great deal and 0 if you do not enjoy it at all), $\alpha = .61$, $\underline{M} = 5.42$, $\underline{SD} = 1.49$.
- Difficulty: How difficult you find it to carry out each project (use 10 for a project that you find very difficult to carry out and 0 for one that you do not find difficult at all), $\alpha = .44$, $\underline{M} = 5.66$, $\underline{SD} = 1.19$.
- Control: How much you feel you are in control of each project (use 10 for a project over which you feel in complete control and 0 for a project over which you feel you have no control at all), $\alpha = .70$, $\underline{M} = 7.09$, $\underline{SD} = 1.37$.
- Stress: How stressful it is for you to carry out each project (use 10 if a project is very stressful to carry out and 0 if a project is very relaxing to carry out), $\alpha = .48$, $\underline{M} = 5.25$, $\underline{SD} = 1.35$.
- Time adequacy: How much you feel that the amount of time you spend working on each project is adequate (use 10 if you feel that the amount of time spent on a project is perfectly adequate and 0 if you feel, for one reason or another, that the amount of time you spend working on a project is not at all adequate), $\alpha = .67$, $\underline{M} = 5.59$, $\underline{SD} = 1.47$.

- Outcome: What you anticipate the outcome of each project to be (use 10 if you think that a project will be extremely successful and 0 if you think that a project will turn out to be a total failure), $\alpha = .65$, $\underline{M} = 7.09$, $\underline{SD} = 1.20$.
- Progress: How successful you have been in a project so far (use 10 to indicate that you have been very successful and 0 to indicate that you have had no success at all), $\alpha = .64$, $\underline{M} = 4.84$, $\underline{SD} = 1.49$ computed at item level across all ten projects.
- Challenge: To what extent each project is demanding and challenging to you (use 10 if a project is most challenging and 0 if it is not challenging at all), $\alpha = .40$, $\underline{M} = 5.49$, $\underline{SD} = 1.11$.
- Absorption: To what extent you became engrossed or deeply involved in a project (use 10 if you generally get absorbed in an activity and 0 if you tend to be uninvolved when doing it), $\alpha = .60$, $\underline{M} = 5.25$, $\underline{SD} = 1.23$.

Projects were coded into eight a priori content domains: 1) exercise-related health, 2) non-exercise health and self-improvement; 3) career; 4) social; 5) leisure; 6) academic; 7) trivialities; 8) self-actualization, self-fulfillment, or protracted yearnings. Coding procedures involved content analyses by two separate raters. Coders completed their ratings based on detailed instructions, including examples to clarify domain content ($\kappa = .91$). The frequency of respondents reporting one or more project within a given category were as follows: exercise-related health ($\underline{n} = 125$), non-exercise health project ($\underline{n} = 137$), career ($\underline{n} = 137$), social ($\underline{n} = 141$), leisure ($\underline{n} = 106$), academic ($\underline{n} = 200$), trivialities (128), and self-actualization, self-fulfillment, or protracted yearnings ($\underline{n} = 22$). Average attribute and congruence ratings were calculated within content domains to test the domain specific hypotheses. For example, participants' importance score for the academic domain reflects the average importance rating given from all

academic projects reported by a respondent. The same procedure was applied to the calculation of congruence ratings.

Participants used a cross-impact questionnaire to convey the degree of conflict between their projects and drinking heavily (Little, 1983; McKeenan & Karoly, 1991). The impact questionnaire used a rating system of pluses and minuses; very negative (--), negative (-), neutral (=), positive (+), and very positive (++) (Little, 1983). Through the plus and minus system, participants conveyed how instances of heavy drinking affected each project they listed. Occasions of heavy drinking were defined as drinking more than four or five in a single sitting for women and men, respectively. Ratings were made to the stem "Occasions of heavy alcohol use would affect my goal to..." Respondents made all possible comparisons between alcohol consumption and projects. Congruence ratings were summed across all projects and separately within goal content domains to create general and domain specific congruence scores.

The timeline follow-back technique (Sobell & Sobell, 1996) assessed drinking behavior. Respondents reported their drinking on calendar for each day over a retrospective 90-day period, which started the day prior to assessment. Participants recorded important dates and events (e.g., parties, vacations, and birthdays) on the calendar to facilitate the recall of particular drinking occasions. Participants were encouraged to bring and use their appointment books to aid recall of important dates. Three indices derived by timeline follow-back technique served as main dependent measures: 1) average drinks per drinking day, 2) average number of heavy drinking episodes per week, and 3) total number of drinks consumed in the period. The TLFB has demonstrated good reliability and validity (Sobell et al., 1986; Sobell & Sobell, 1996).

Leigh and Stacey's (1993) Alcohol Outcome Expectancies Scale (AOES) assessed the anticipated outcomes respondents held for drinking alcohol. The AOES is a 34-item

questionnaire that assesses both negative and positive outcome expectancies. Each item is prefaced with “When I drink alcohol.” Items are rated on a scale from 1 (“no chance”) to 6 (“certain to happen”). Participants responded to items such as, “I am more outgoing” and “I get a hangover.” Beyond the two primary scales, positive and negative expectancies, there are several subscales. The AOES subscales have good internal consistency, ranging from .88 to .94, and test-retest reliability, .87 (Leigh & Stacey, 1993). Using the average of the positive (18 items; $\alpha = .91$) and negative (16-items; $\alpha = .85$) scales in analyses, this instrument was included to determine the interplay between expectancies, self-efficacy, and goals.

Self-efficacy was assessed in order to examine relationships with goal characteristics (e.g., congruence with alcohol) and drinking behavior. The alcohol self-efficacy measure assessed the confidence that respondents had in their ability to avoid drinking heavily (i.e., five or more drinks in single sitting) in specific situations; for example, “if I was at a party and other people were drinking” (Solomon & Annis, 1990). Using a version specially adapted for college students, respondents rated 49-items on a 6-point scale labeled in percentage point increments of 20, with scores ranging from 0% (not at all confident) to 100% (very confident) (Greaves and Stephens, 1992). The average of the 49-items was used as a measure self-efficacy for avoiding heavy alcohol consumption ($\alpha = .97$).

Results

Analyses were conducted using the Statistical Package for the Social Sciences (SPSS) and the SAS System. For each participant, responses to attribute ratings (e.g., importance and absorption) were averaged across the 10 projects rated, yielding 10 average attribute scale scores. The 10 attribute score variables were subjected to exploratory factor analysis, using the maximum likelihood method to extract factors. Maximum likelihood extraction was used

primarily to avoid the untenable zero-error assumption of principal component(s) analysis. Prior communalities were based on multiple \underline{R}^2 estimates obtained by regressing each variable on all others. It is apropos to mention that the current analyses are consistent with commonly suggested requirements of common factor analysis (Hatcher, 1994). More specifically, the analyses were conducted on a sample with greater than 100 participants ($\underline{n} = 198$) and the number of participants were nearly 20 times the number of variables analyzed.

A scree test (Cattell, 1978) suggested that three latent factors best described the commonalities underlying the observed variables. Consequently, three factors were retained for both orthogonal (Varimax) and oblique (Direct Oblimin with Kaiser normalization; Delta = 0) explorations. For the purposes of substantively evaluating the rotated factor pattern, items were retained for a given factor if the factor loading was greater than .40 on that factor and less than .40 on the remaining factors. A three factor solution was indicated by both methods and were named: 1) Efficacy, consisting of ratings on the outcome, control and importance attribute scales ; 2) Difficulty, consisting of difficulty, challenge and stress ratings; and 3) Involvement, consisting of progress, enjoyment, absorption and time adequacy ratings. Based on the maximum likelihood extraction estimates, Chi-square analysis comparing the real matrix to the obtained matrix suggested a good fit to the data ($\underline{\chi}^2 = 25.03$; $df = 18$). The two real matrix was similar to the obtained. The three latent factors accounted for 64% of the common variance in the observed attribute scores. To supplement the scree test, several other criteria suggested by Hatcher (1994) were used in the decision making process about which factors would be retained. First, a minimum of three observed variables loaded on each common factor. Second, the variables underlying each factor shared some conceptual meaning. Third, the items loading on the other factors appeared to measure different latent goal attribute constructs. Fourth, the items

loading on a particular factor had high loadings on that factor and very small, near zero loadings on the other factors. In summary, a simple factor structure was observed. Table 2 offers the results obtained from the oblique rotation.

Factor score estimates used in subsequent analyses were calculated by averaging the items defining each factor. Mathematical and logical algorithms produced factor estimates across projects and separately within specific project content domains. Averaging the observed variables allows a less sample specific calculation of scores than linear model estimation algorithms (e.g., regression), making the current analyses more amenable to replication and expansion in future studies. Estimates obtained from the averaging method were found strikingly similar to the regression based estimates, as evidenced by the correlation between the two methods for each factor, respectively ($r = .94-.98$).

Reliability was assessed for each of the three project attribute scales by calculating coefficient alpha (Cronbach, 1951). Alpha reliability estimates suggested moderate internal consistency, with all scales exceeding .70, and were reported on the diagonal of table 3. A review of the correlation matrix between factors indicated that the difficulty factor was largely independent of the efficacy and involvement factors. However, as predicted from a self-regulatory framework (for review see Carver & Scheier, 1998), greater efficacy was indicative of greater involvement. Table 3 also revealed an elevated mean ($M = 7.02$; scale = 0-10) for the efficacy construct, a combination of outcome, control and importance.

Table 4 displays the means, standard deviations and correlation among alcohol use and problems indices. As indicated in table 4, when respondents drank, they tended to drink fairly heavily. Participants drank greater than four drinks per drinking occasion ($M = 4.55$) and averaged nearly two heavy drinking episodes per week ($M = 1.97$), according to the female (4

drinks) and male (5 drinks) specific criteria used in this study. The drinking indices correlated moderately with the number of problems associated with drinking reported ($r = .46-.57$), supporting the validity of the RAPI instrument.

To examine the relationship between drinking and the three project-attribute factors computed across project category domains, zero-order correlations were calculated. The observed relations varied by factor and drinking index. Project Involvement was inversely and significantly related to total drinking volume ($r = -.30$; $p < .01$), drinks per drinking day ($r = -.20$; $p < .01$), and weekly heavy episodic drinking rate ($r = -.29$; $p < .01$). Difficulty evidenced positive correlations with drinks per drinking day ($r = .23$; $p < .01$), number of heavy drinking episodes per week ($r = .20$; $p < .01$), and total drinks consumed ($r = .17$; $p < .05$). Counter to the anticipated results, efficacy was weakly and non-significantly related to drinking indices ($r = -.03$ to $-.13$).

To test the hypothesis that academic and career involvement would be related to drinking quantity and frequency, zero-order correlations were calculated (see table 5). All sample members recorded an academic project ($N = 200$). Fewer recorded a career project ($N = 137$). The observed correlations were consistent and in the expected direction. Correlations between academic involvement and drinking indices ranged from $-.17$ to $-.25$ and were statistically significant and in the expected direction. Although smaller in magnitude, a similar pattern of relations emerged for career involvement and drinking indices as well. Correlations between career involvement and drinking ranged from $-.13$ and $-.19$, but the only significant relationship evidenced was between career involvement and average drinking volume per drinking day.

Hypotheses asserting that academic, social, and career project difficulties were related to drinking were not supported (see table 6). Correlations between academic project difficulty and

alcohol use ranged from $-.03$ to $.02$. Relationships between career difficulty and drinking were also not evidenced ($r = -.06$ to $.04$). However, consistent with predictions, social difficulty was significantly, positively related to all drinking indices (see table 6).

Hierarchical multiple regression assessed whether perceived congruence between goals and heavy alcohol consumption predicted drinking variance beyond the three goal attribute factors (see table 7). In the first block of the model, the three goal attribute factors were entered. In the second block, the congruence variable was added. The data supported the hypothesis that project to alcohol congruence ratings would explained drinking variance beyond that of the attribute factors alone, explaining an additional 5% ($p < .01$) of the variance in each drinking index. Total variance accounted for ranged from 15 to 18%, as evidenced in the respective full models

In order to test the hypothesis that the project involvement by congruence interaction within academic goals would explain significant variance when involvement and congruence were controlled for involved data was subjected to hierarchical multiple regression procedures. The data did not offer support for the congruence by involvement hypothesis (see table 8). The interaction did not capture significant variation beyond the control block in any dependent variable tested. The total variance accounted for by the aggregate models ranged from six to nine percent, as depicted in table 8.

The fifth hypothesis, stating that goal variables would explain additional variance beyond known social cognitive determinants of drinking, gained support from the present data. The goal attribute ratings explained an additional 5% of the variance in weekly heavy episodic drinking rate, $F(4, 186) = 3.79, p < .01$, 5% in total drinks consumed, $F(4, 186) = 3.84, p < .01$, and 4% in drinks per drinking day, $F(4, 186) = 2.32, p > .05$ after controlling for alcohol

efficacy and outcome expectancies. In the models where number of heavy drinking episodes and total drinks were the dependent measures, goal involvement was the variable in block II demonstrating the strongest predictive utility (see table 9). In reference to drinks per drinking day as the dependent measure, difficulty was the only goal variable with a significant regression coefficient, $\beta = .13$, $p < .05$, and both the positive and negative expectancy scales captured significant variance, $\beta_s = .25$ and $-.18$, $p_s < .05$. In the social cognitive block of the model, block I, self-efficacy emerged as most consistent and strongest predictor of drinking, across indices (see table 9).

Hypothesis six advanced a specified network of relationships that would emerge when the potential determinants in this study were integrated into a single model. First, It was hypothesized that the three goal attributes and alcohol expectancies would predict alcohol self-efficacy. Secondly, all potential determinants (i.e., involvement, efficacy, alcohol efficacy, and alcohol expectancies) would have direct effects on the number of drinks respondents consumed over the retrospective 90-day period measured. Path analysis tested the theoretical model outlined in the introduction and shown in figure 1. Analyses were conducted using the statistical Package for the Social Sciences and the SAS System's CALIS procedure. Figure 1 depicts the results of the path analysis. The analyses used the maximum likelihood method to estimate parameters. Final analyses were conducted on the covariance matrix. Results indicated partial support for the proposed model. Alcohol self-efficacy was most consistent and strongest predictor of alcohol consumption, but personal project efficacy and positive outcome expectancies influenced efficacy in turn. Project involvement contributed independently to drinking as did negative expectancies (see figure 1).

Discussion

Few studies have examined the role of goals in drinking and there is dearth of data on the interplay between goal systems and college drinking behavior. Further, few if any studies have studied goal conflict between goals in relation to alcohol use and abuse. Goals, or in this case personal projects, can be considered a reflection of individuals' aspirations and an ecologically driven social cognitive theory construct. They also may represent a manageable mechanism for altering maladaptive drinking patterns. Following these assertions, the current study attempted to describe several personal project attributes that related to drinking patterns among the college students in our sample. Results indicated that project attributes in the general, academic, career, and social domains were related to drinking. Perceived congruence between projects and alcohol use added to the prediction of drinking beyond that of the project attribute factors (i.e., involvement, difficulty, and efficacy). Goal or project attributes explained additional variance in drinking behavior after controlling for drinking specific outcome expectancies and self-efficacy. The involvement goal attribute accounted for most of the independent prediction. A proposed causal model of the relationship between goal attributes and, alcohol efficacy and expectancies was shown to have some support. Overall, the results hold promise for broadening the scope of our understanding of the motivational context in which drinking occurs. A systematic review of study results follows.

Before discussing the results regarding goal attributes and drinking, some words on the factor analytic results are in order. The attributes included in the present study are consistent with Little's (1983) recommendations but are not an exhaustive attempt to assess all possible goal experiences. The study assessed specific attributes based on their perceived applicability to drinking among college students. Due to the large number of goal attributes assessed, ten,

common factor analysis was used to identify underlying dimensions and reduce the number of variables analyzed. An oblique rotation method indicated three quantitatively and conceptually distinct attribute factors. The attribute factors were named involvement, difficulty, and efficacy. Each demonstrated adequate reliability and met the rigorous analytical standards outlined in the results section. The attribute factors were derived by analyzing individual attribute ratings for all projects listed. The emergent factors were similar to those reported by other researchers (e.g., Lecci, Karoly, Briggs, & Kuhn, 1994).

Bivariate analyses correlating drinking and goal attributes across category domains revealed several significant relationships. Results varied according to the attribute factor and drinking index examined. Project involvement inversely related to total drinking volume, drinks per drinking day, and average number of heavy drinking episodes per week. Perceived goal difficulty demonstrated positive correlations with drinks per drinking day, average number of heavy drinking episodes per week, and total drinks consumed. In every case, goal difficulty and involvement correlated significantly with drinking and the observed relations were in the expected direction. Unexpectedly, the goal efficacy factor was unrelated to drinking. The null finding for the efficacy factor hints that judgements about anticipated success, perceived control, and importance operate independently of drinking choices. It is important to note that the efficacy factor did not have the behavioral and domain specificity advocated by Bandura (1997) for measuring self-efficacy (i.e., it was not a measure of alcohol self-efficacy). In stead, the efficacy factor represented a broad summary measure of perceived control and likely success across numerous and diverse projects or goals. Despite the counterintuitive efficacy results, the observed bivariate relations generally suggest an important link between goal experiences and college drinking.

Bivariate correlational analyses examined relationships between the specific domains of academic and career involvement with drinking indices. All sample members recorded an academic project and academic involvement correlated significantly with all three drinking indices. The strongest multiple correlation was with the heavy episodic drinking rate index. A similar pattern of relations emerged for career involvement and drinking indices. Approximately 70% of respondents indicated career projects. Career involvement inversely correlated with drinks per drinking day. Trends were evidenced with total drinks and heavy episodic drinking. In cases of both academic and career involvement, the observed correlations were consistent and in the expected direction. Overall, data point to a conclusion that the degree of involvement in commonly reported academic and career goals affects drinking. Individuals who are more engrossed and have a deeper sense of enjoyment with their aspirations are inclined to drink less.

Perceived difficulty of projects (comprised of the difficulty, stress, and challenge attributes) within the specific domains of academics and career were unrelated to drinking. These findings are counter to hypotheses and suggest that drinking does not serve the role of coping with academic and career stress. However, difficulty perceived in relation to social goals positively related to drinking. Respondents that felt their social goals were difficult and stressful were likely to drink more. Among this sample, individuals may use alcohol as a lubricant to reduce social anxiety or conflict. This hypothesis is consistent with reports demonstrating relationships between social anxiety and alcohol use among college students (e.g., Burke & Stephens, 1997; Leonard & Blane, 1988).

The first series of multivariate analyses involved examining the relationship between the goal attribute factors in combination and looked at the potentially unique contribution of goal to alcohol congruence ratings. Using hierarchical multiple regression, the first block included the

three attribute factors (involvement, difficulty, and efficacy) and the second block added the alcohol congruence variable. The first block indicated that goal involvement and difficulty contributed significantly at the multivariate level. The global goal efficacy factor did not emerge as a significant determinant of drinking. After controlling for the goal attribute factors, alcohol congruence made an independent contribution in each drinking index. Thus, the data offered support for the hypothesis that congruence ratings would explain drinking variance beyond that of the attribute factors alone, explaining approximately five additional percent of the variance in each drinking index. In sum, the combined goal variables captured between 15 and 18% of the variance in drinking and congruence ratings added an independent prediction. The data strongly suggest that the experiences individuals have with their goals affects their drinking behavior.

The second set of multivariate analyses tested the hypothesis that the interaction between involvement and congruence within academic projects would add predictive utility after involvement and congruence were considered. It was anticipated that individuals who held goals that were seen as highly involving and incongruent with heavy drinking would drink less. In reverse, individuals with highly involving goals that were congruent with heavy drinking would drink more. The data did not show enhanced prediction by the addition of the congruence by involvement interaction (see table 8). It may be the case the too few participants reported academic projects that were both involving and congruent with heavy drinking. In this case, no significant interactional enhancement should be evidenced because the interactional function can only operate at one level (i.e., high involvement and low congruence). The specificity of the interaction function would attenuate results for broader tests. In essence, it is unlikely that any academic pursuit would compel one to drink, excluding the presence of associated negative affect that may, in some cases, foster drinking. These data imply that involvement and

congruence judgements for academic projects are made somewhat independently and individually exert meaningful influence on drinking.

The third series of hierarchical regressions determined the ability of goal attributes and congruence ratings to account for variance beyond that of alcohol specific efficacy and outcome expectancies. Data revealed that the aggregate of the goal attributes and congruence ratings explained additional variance in heavy episodic drinking, total drinks consumed, and drinks per drinking day after controlling for alcohol efficacy and expectancies. Goal involvement was the goal factor exhibiting the strongest predictive utility. As anticipated, self-efficacy to avoid heavy drinking was the most consistent and strongest predictor of drinking across indices. These data do not necessarily indicate that the goal attribute factors of efficacy and difficulty do not indirectly affect drinking through presently unstudied mechanisms. The unique prediction of goal involvement represents a major finding of this study.

The final analyses involved testing proposed interrelationships of these social cognitive theory variables with drinking via path analysis (see figure 1). It was hypothesized that the efficacy, involvement, and difficulty factors would predict alcohol self-efficacy. If individuals monitor the potential affect heavy drinking could have on their goals, goal attributes should be referenced when making alcohol efficacy judgements. For example, highly enjoyable goals that do not involve alcohol should affect how willing a person is to restrict their drinking. Before making drinking decisions, good self-regulators consider their broader motivational landscape. They look to see if drinking is compatible with their broader goal system. Present data indicated a significant path for goal efficacy to alcohol efficacy. This finding may represent a generalization of self-efficacy across drinking and personal project domains, evidencing a self-global efficacy construct. Bandura (1997) asserts that efficacy judgements generalize across

domains of functioning. Although neither involvement nor difficulty showed statistically significant paths, path coefficients were in the expected direction.

Alcohol expectancies were hypothesized to affect alcohol efficacy based on research findings that indicate that alcohol expectancies are often present prior to the onset of drinking (Miller et al., 1990) and drinking is not a performance quality endeavor (for review see Kirsch, 1995; Maddux, 1995). Individuals' judgments about how willing or confident they are in their ability to control their drinking emanates from the value placed on the anticipated outcome. Positive expectancies about alcohol predicted self-efficacy to avoid heavy drinking, displaying a standardized path coefficient approaching .5. Negative expectancies were not significantly related to efficacy judgments. The null finding for negative expectancies indicates that estimations concerning confidence or willingness to limit drinking are largely unaffected by anticipating negative outcomes. These data suggest that positive expectancies may be more salient when making efficacy judgments about avoiding heavy drinking. Data further imply that individuals may be more willing to avoid heavy drinking if few positive outcomes are anticipated but are relatively unaffected by anticipation of negative events.

The second major aspect of the integrated model hypothesized that all potential determinants (i.e., goal attributes, alcohol efficacy, and alcohol expectancies) would have direct effects on the number of drinks respondents consumed over the retrospective 90-day period measured. Results indicated that alcohol self-efficacy was strongest predictor of alcohol consumption, followed by goal involvement and negative drinking expectancies.

In addition to integrating goals into the network of social cognitive theory constructs, portions of the above mentioned results have important implications for self-efficacy theory. Bandura (1986) has asserted that efficacy judgments are indicative of anticipated performance

quality. Consequently, outcome expectancies are predicted by efficacy judgements. That is, what you expect to happen depends on how well you think you can do the behavior. Therefore, outcome expectancies are not expected to add prediction beyond self-efficacy judgements. The direct path between negative expectancies and drinking combined with the demonstrated ability of positive expectancies to predict efficacy to avoid heavy drinking partially challenges these assertions. According to Kirsch (1995; 1982), expectancies can affect self-efficacy when level of ability or performance quality is not a central issue. Kirsch (1982) further contends that self-efficacy best reflects willfulness. In terms of the present study, positive expectancies may be inversely related to self-efficacy because individuals with a wealth of positive anticipations about drinking may be less willing, and therefore less confident in their ability, to avoid heavy drinking. Although plausible, it is unlikely that self-efficacy predicts positive expectancies. Although it is recognized that expectancies are malleable, alcohol expectancies begin to form early on and, in many cases, well before drinking has occurred (Miller et al., 1990). Thus, the present causal flow is predicated on a logical temporal relation. The relative lack of relationship between negative expectancies and efficacy is also noteworthy. These data suggest that individuals with more negative expectancies were not significantly more likely to have high drinking efficacy. Essentially, anticipating negative events from drinking did not necessarily mean higher efficacy. Again, the implication is that positive expectancies are more salient when people judge how willing they are to avoid heavy drinking. Lastly, the ability of negative expectancies to display an admittedly modest but unique prediction of drinking further supports the need for clearer differentiation of the efficacy and expectancy constructs.

The goal attribute results partially counter Bandura's (1997) position that individuals' goals are secondary to and subsumed by domain-specific efficacy judgements. That is, the

unique prediction of goal involvement contests Bandura's assertions of goal subservience. Self-efficacy theory, as described by Bandura, maintains that goals cannot precede self-efficacy or add prediction. The argument is that you must first make an efficacy judgement before you engage in a goal. In addition, domain specific self-efficacy encapsulates behavioral prediction and attributes of other motivational pursuits do not enhance prediction. This paper's position is that to form a goal individuals scan the environment for desirable standards and estimations of willingness and confidence that follow are based on the value of the standard, past performance success, observation, persuasion, and emotional/physiological status. That is, the goal is first cognized and attributions about goal follow. In some cases, individuals pursue goals with high efficacy judgements and in other cases low efficacy is disregarded and pursuit persists. The general goals, assessed at a middle level of analysis in this study, bring a broader scope than the domain specific construct of self-efficacy. Individuals are influenced by more than their ability-confidence estimates when deciding what to do and how to go about doing it. They must turn their attention to how their behaviors and goals intertwine. From that analysis, they now have some requisite information for making willingness assessments. The more ecological perspective of self-regulation theory (e.g., Emmons, 1982; 1986; Carver & Scheier, 1998; Little, 1983; 1998) is consistent with the present findings. For instance, Carver & Scheier (1998) advance that certain activities and goals act as disturbance factors and limit the individual's ability to successfully meet referent standards (i.e., meet goals and sub-goals). That is, self-regulation theory holds that certain goal systems can work to the detriment or aid of others. The present findings suggesting that excessive drinking may interfere with goal processes or vice versa is consistent with this assertion. Disrupted goal systems have many consequences that may become aware to the individual and ideally, they use that information to make proper behavioral

adjustments (Carver & Scheier, 1998). Other times they may be ill equipped or unwilling to make the necessary changes for successful self-regulation. In terms of drinking, some individuals may be unaware or complacent about the incongruent or mismanaged relationship between their goals and heavy drinking, which allows the maladaptive drinking pattern to endure. Although these data inspire interesting theoretical conjecture, an acknowledgement of limitations should be made before expanding on the implications of the present study.

The cross-sectional design does not unequivocally establish the direction of influence. That is, causal influence cannot be firmly established from these data. However, as shown in the path analytic diagram the presumption was made that goal variables either indirectly influenced drinking through efficacy judgements or displayed direct effects on drinking. The development of the theoretical network before analysis provides the opportunity to suggest the direction of influence. It must be acknowledged that some personal projects reported might not be stable over time and, in most cases, personal projects have an eventual termination. Consequently, projects listed at the assessment time point may have not been active over the entire 90-day alcohol assessment period and thereby, could not have affected drinking behavior. Future studies should take steps to ensure that the goals reported are active over a reasonable period of time, avoiding ephemeral reports that may attenuate relationships.

Bearing the above noted limitations in mind, the consistent ability of the involvement factor, an analogue to Emmons (1986) degree of striving construct, to describe variance in drinking criteria across different multivariate models suggests that how involved individuals are in their general, academic and career goals factors into their drinking choices. In addition, the ability of goal involvement to explain drinking after accounting for the established social cognitive determinants of alcohol self-efficacy and outcome expectancies is notable. Path model

results indicated that goal involvement does not exert its influence on drinking through efficacy changes. That is, involvement is not mediated by self-efficacy. Rather, goal involvement appears to have largely direct effects on drinking, a previously undocumented relationship. This intriguing finding argues that drinking may be partially influenced by goal involvement mechanisms that operate outside the sphere of alcohol-specific efficacy judgements. Therefore, the data implies that a dynamic cognitive process exists where involvement with ongoing concerns and activities is referenced as individuals make choices of when and how to drink. Further, these cognitive processes are captured by efficacy judgements, the presumed common pathway for effects on behavior (Bandura, 1997). The idea that goals influence other decisions conforms to self-regulation theory's position that goal systems can compete, conflict or remain neutral (Carver Scheier, 1998). Such information can be brought to bear on intervention development and we can speculate that people who are more engrossed by their goal system spend more time working toward their aspirations and, consequently, drink less. Whereas individuals who are less captivated by their pursuits are likely to drink more. This may also suggest that individuals who drink heavily may be neglecting the activities and concerns in their lives that do not involve drinking.

Aspirations capture the essence of the college experience, and how involved or committed individuals are with their goals is critical. If drinking jeopardizes goal progress or takes time away from more important activities and concerns, interventions may be able to redirect the motivational focus of students to goals that strongly indicate moderation or abstinence. Thus, goal feedback and instruction about how to embark on and maintain an effective goal system may be a valuable augmentation to existing intervention protocols. One goal would be to assist the individual moving along the stage of change continuum (Prochaska

& DiClemente, 1992; 1983; 1988) and provide empirically validated change strategies. Studies (e.g., Bailey & Rachal, 1993) indicate that in contrast to heavy drinking in later adulthood, adolescent and college student drinking is more circumscribed and shorter in duration. Problems that result are less enduring rather than chronic. College drinking occurs in an environment where heavy drinking and drinking related problems are common place and unalarming. Thus, drinking heavily and experiencing a few minor problems may not have impact necessary to promote change. However, if the individual receives motivational enhancement therapy (Miller & Rollnick, 1991) centering on how drinking may interfere with their more important aspirations, their drinking behavior may come into doubt and an impetus for change may emerge.

Again, an improved understanding of goal factors that influence alcohol use could lead to interventions which simultaneously adjust maladaptive goal systems and decrease alcohol use. For example, if alcohol served to disturb a person's academic goal pursuit process, an intervention could be designed to aid the individual in self-focusing on academic goals that were incongruent with drinking and simultaneously teach the individual self-regulatory skills (e.g., planning, correction, and self-monitoring) to limit their drinking. Cox and colleagues (Cox & Klinger, 1988; 1989) reported a goal intervention strategy for alcohol misusers that involves a motivational assessment and goal counseling. For example, individuals receive counseling on how to formulate reasonable non-chemical goals and identify salient incentives for achieving those goals. To date, this motivational approach has not been assessed in randomized clinical trials and therefore, its effectiveness is not yet established. However, it may serve as useful reference for developing studies that incorporate personal projects assessment. As noted by Cox and Klinger (1988) learning about people's goal systems may help identify idiographic

incentives for change, as well as provide road maps to understanding client's drinking from a personal goals framework.

Because goals or standards, in social cognitive terms, interrelate with other constructs within the theories' system, research evaluating goal systems from an interactive and dynamic perspective may enhance understanding of college drinking patterns. Alcohol use may vary, in part, based on whether it is symbiotic with the goals an individual is working on and, thereby, goals constructs may demonstrate unique predictive utility. Testing the triad of goals, efficacy, and expectancies represents a more comprehensive assessment of social cognitive theory and synthesizes the current nomology. Of historical relevance, there do not appear to be any studies that have examined the role of personal projects in college drinking; moreover, there is dearth of data examining the and interplay between goals characteristics and other social cognitive theory constructs in relation to alcohol use. The present study sought to fill these gaps. Results were varied but encouraging.

In summary, there was substantial support for hypotheses that goal attributes and goal to alcohol congruence ratings function as determinants of drinking among college students and enhance the application of social cognitive to college alcohol research. Perceived goal involvement and difficulty were significant correlates of alcohol use at the both bivariate and multivariate levels. In addition, goal involvement was not mediated by alcohol efficacy and described significant unique variance in total drinking volume. As predicted, alcohol self-efficacy was the strongest predictor of drinking but the predictive utility of goal involvement surpassed the of alcohol expectancies. Taken together, these findings invite further research that may be used to enhance existing interventions. Future research should further expand this present methodology by assessing more stable goal construct (e.g., Emmons, 1992) or those

relevant to particular developmental stages (e.g., Cantor, 1994; Cantor & Langston, 1989).

Studies should also employ prospective designs to better affirm causality. And, should these types of studies bear fruit, interventions could be tested that integrate goal manipulation in reference to drinking in the hopes of unearthing pathways to moderation among heavy drinkers.

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Table 1.

Drinking Variables Analyzed by Sex and Student Status

Dependent: Total Drinks Consumed				
Variable		<u>n</u>	<u>M</u>	<u>SD</u>
Student Status				
	Freshman	69	143.29	166.90
	Sophomore	62	127.84	139.75
	Junior	35	130.14	140.31
	Senior	34	70.32	94.26
Analysis of Variance			F(3, 196) = 1.11	
Sex				
	Male	96	152.63	170.07
	Female	104	92.55	103.34
Analysis of Variance			F(1, 198) = 8.93*	
Dependent: Drinks per Drinking Day				
Student Status				
	Freshman		5.04	3.24
	Sophomore		4.54	2.54
	Junior		4.84	3.30
	Senior		3.29	2.44
Analysis of Variance			F(3, 196) = 2.89*	
Sex				
	Male		5.20	3.43
	Female		3.84	2.15
Analysis of Variance			F(1, 198) = 11.04*	
Dependent: Number of Heavy Drinking Episodes per Week				
Variable			<u>M</u>	<u>SD</u>
Student Status				
	Freshman		2.01	.16
	Sophomore		1.99	.15
	Junior		2.00	.16
	Senior		1.87	.14
Analysis of Variance			F(3, 196) = 7.44*	
Sex				
	Male		1.96	.17
	Female		2.00	.15
Analysis of Variance			F(1, 198) = 2.25	

* $p < .05$

Table 2.Oblique Rotation Factor Solution for Project Attribute Ratings

<u>Factor Loading</u>	<u>Item</u>	<u>Factor: Efficacy</u>
.849	OUTCOME:	What you anticipate the outcome of each project to be.
.635	CONTROL:	How much you feel you are in control of each project.
.525	IMPORTANCE:	How important each project is to you at the present time.
<u>Factor: Difficulty</u>		
.884	DIFFICULTY:	How difficult you find it to carry out each project.
.716	STRESS:	How stressful it is for you to carry out each project.
.692	CHALLENGE:	To what extent each project is demanding and challenging to you.
<u>Factor: Involvement</u>		
.856	PROGRESS:	How successful you have been in a project so far.
.610	ENJOYMENT:	How you enjoy working on each project.
.473	ABSORPTION:	To what extent you became engrossed or deeply involved in a project.
.438	TIME ADEQUACY:	How much you feel that the amount of time you spend working on each project is adequate.

Table 3.

Means, Standard Deviations, Intercorrelations, Coefficient Alpha Reliability Estimates for Project/Goal Attribute Factors

Project Attribute Factor		<u>M</u>	<u>SD</u>	1	2	3
1.	Difficulty	5.47	1.03	(.82)		
2.	Involvement	5.27	1.05	.06	(.72)	
3.	Efficacy	7.02	1.00	.10	.42**	(.81)

Note: N = 198. Reliability estimates appear on diagonal. **Correlation significant at .01 level (2-tailed)

Table 4.Means, Standard Deviations and Intercorrelations for Alcohol/Problem Indices

Drinking Index		<u>M</u>	<u>SD</u>	1	2
1.	Total Drinks consumed	123.80	144.83		
2.	Drinks per Drinking Day	4.55	2.96	.87**	
3.	Number of Heavy Drinking Episodes per Week Range = 0-7	1.97	.16	.78**	.71**

Note: Drinking indices based on 90-day retrospective self-report (TLFB). N = 199.

**Correlation significant at .01 level (2-tailed)

Table 5.

Hypothesis One: Zero-Order Correlations between Alcohol Indices and Involvement for Academic and Career Projects

Drinking Index	<u>Academic Involvement</u>	<u>Career Involvement</u>
	(N = 200)	(N = 137)
Total Drinks	-.22**	-.17
Drinks per Drinking Day	-.17*	-.19*
Number of Heavy Drinking Episodes per Week	-.25**	-.13

*Correlation significant at .05 level (2-tailed), **Correlation significant at .01 level (2-tailed)

Table 6.

Hypothesis Two: Zero-Order Correlations between Alcohol Indices and Difficulty for Academic, Career and Social Projects

Drinking Index	<u>Academic</u> <u>Difficulty</u> (<u>N</u> = 200)	<u>Career</u> <u>Difficulty</u> (<u>N</u> = 137)	<u>Social</u> <u>Difficulty</u> (<u>N</u> = 141)
Total Drinks consumed	-.03	.01	.17*
Drinks per Drinking Day	.02	-.06	.20*
Number of Heavy Drinking Episodes per Week	-.04	.04	.17*

*Correlation significant at .05 level (2-tailed)

Table 7.

Hypothesis Three: Results of Multiple Regression to Explain Drinking Variance by Goal Variables.

Dependent: Total Drinks			
Block	Variable(s) in Model	β	R^2
I.	Involvement	-.32**	
	Difficulty	.19**	
	Efficacy	.03	
	Aggregate of Block I		.13**
II.	Alcohol Congruence	.24	.18**
Dependent: Number of Heavy Drinking Episodes per Week			
Block	Variable(s) in Model	β	R^2
I.	Involvement	-.23**	
	Difficulty	.24**	
	Efficacy	.03	
	Aggregate of Block I		.10**
II.	Alcohol Congruence	.21	.15**
Dependent: Drinks per Drinking Day			
Block	Variable(s) in Model	β	R^2
I.	Involvement	-.32**	
	Difficulty	.21**	
	Efficacy	.03	
	Aggregate of Block I		.13**
II.	Alcohol Congruence	.23	.18**

Note: p-values of aggregate blocks reflect the significance of the R^2 change.

**Correlation significant at .01 level (2-tailed)

Table 8.

Hypothesis Four: Results of Multiple Regression to Explain Drinking Variance from Academic Goal Involvement, Academic Goal to Alcohol Congruence, and the Involvement by Congruence Interaction.

Dependent: Total Drinks			
Block	Variable(s) in Model	β	R^2
I.	Involvement	-.22**	
	Congruence	.15*	
	Aggregate of Block I		.06**
II.	Interaction	-.13	.07
Dependent: Number of Heavy Drinking Episodes per Week			
Block	Variable(s) in Model	β	R^2
I.	Involvement	-.24**	
	Congruence	.15*	
	Aggregate of Block I		.08**
II.	Interaction	-.14	.09
Dependent: Drinks per Drinking Day			
Block	Variable(s) in Model	β	R^2
I.	Involvement	-.18*	
	Congruence	.17**	
	Aggregate of Block I		.06**
II.	Interaction	-.09	.06

Note: p-values of aggregate blocks reflect the significance of the R^2 change.

*Significant at .05 level (2-tailed), **Significant at .01 level (2-tailed)

Table 9.

Hypothesis Five: Results of Multiple Regression Examining the Ability of Goal Variables to Explain Variance beyond Established Social Cognitive Theory Determinants.

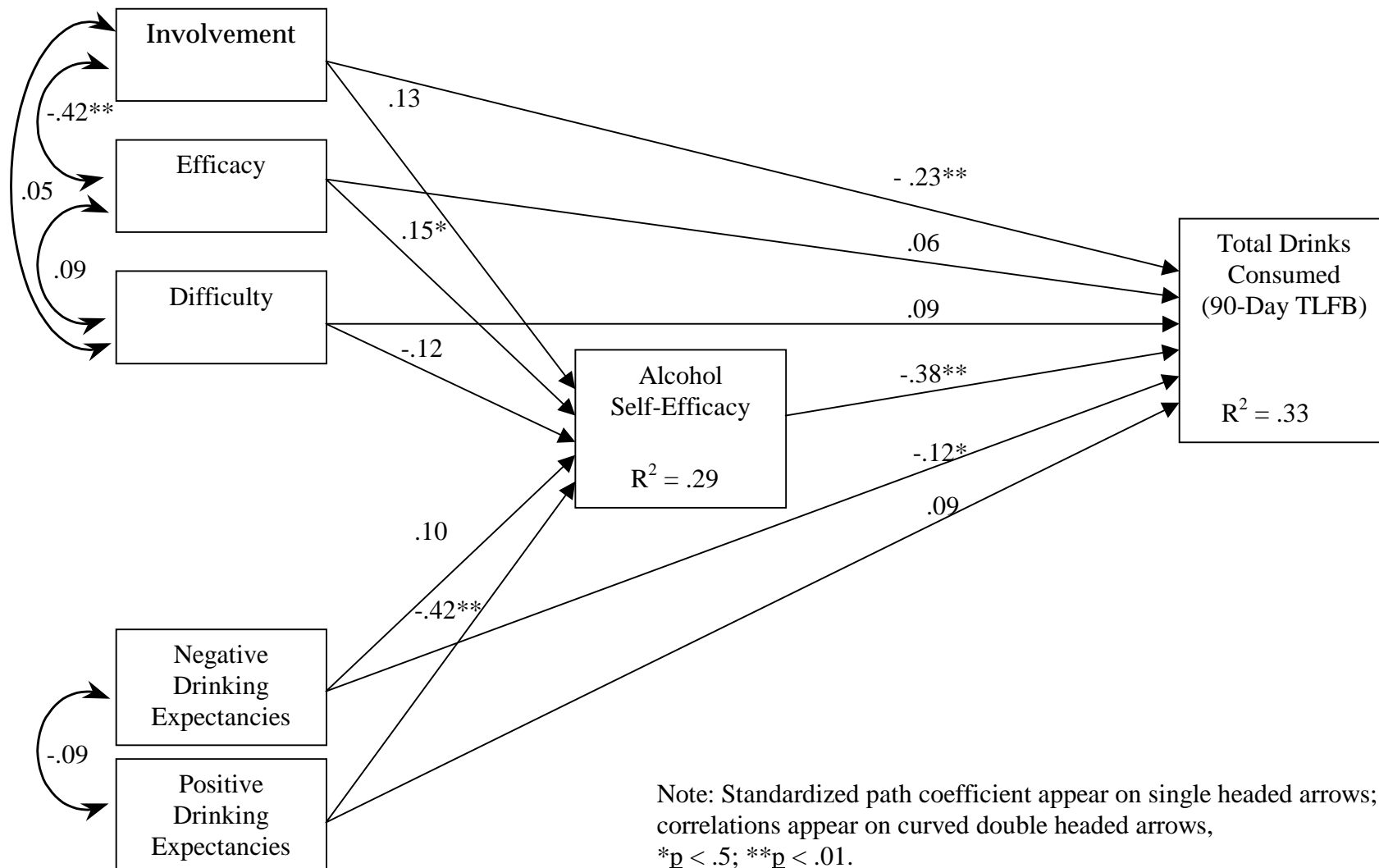
Dependent: Total Drinks			
Block	Variable(s) in Model	β	R^2
I.	Alcohol Self-Efficacy (SCQ)	-.43**	
	Positive Expectancies (AOES)	.13	
	Negative Expectancies (AOES)	-.12	
Aggregate of Block I			.28**
II.	Involvement	-.22**	
	Difficulty	.06	
	Efficacy	.08	
	Alcohol Congruence	.10	
Aggregate of Block II			.33**
Dependent: Number of Heavy Drinking Episodes per Week			
Block	Variable(s) in Model	β	R^2
I.	Alcohol Self-Efficacy (SCQ)	-.45**	
	Positive Expectancies (AOES)	.09	
	Negative Expectancies (AOES)	-.13*	
Aggregate of Block I			.29**
II.	Involvement	-.22**	
	Difficulty	.11	
	Efficacy	.07	
	Alcohol Congruence	.06	
Aggregate of Block II			.34**
Dependent: Drinks per Drinking Day			
Block	Variable(s) in Model	β	R^2
I.	Alcohol Self-Efficacy (SCQ)	-.32**	
	Positive Expectancies (AOES)	.25**	
	Negative Expectancies (AOES)	-.18**	
Aggregate of Block I			.29**
II.	Involvement	-.12	
	Difficulty	.05	
	Efficacy	.13*	
	Alcohol Congruence	-.08	
Aggregate of Block II			.33*

Note: p-values of aggregate blocks reflect the significance of the R^2 change.

*Significant at .05 level (2-tailed), **Significant at .01 level (2-tailed)

Figure 1. Integrated path model describing relationships between goal variable, alcohol efficacy, alcohol expectancies, and total drinking volume.

Goal Attribute Factors



Curriculum Vitae

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EDUCATIONAL BACKGROUND

- 1996 Bachelor of Arts with academic distinction, San Diego State University, San Diego, CA.
(GPA at SDSU: 3.96)
- 1999 Master of Science, Clinical Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- 1996- Doctoral Student, Clinical Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. (APA-Accredited)

ACADEMIC/PROFESSIONAL WORK EXPERIENCE

Graduate Research Assistant (Virginia Polytechnic Institute and State University).
Duties include, developing treatment and assessment protocols, instrument construction, quality assurance, manuscript development and contribution, data analysis for the Marijuana Check-Up (NIDA), a motivational enhancement intervention for heavy marijuana users.

Fall, 1997-present.

Supervisors: Robert S. Stephens, Ph.D. and Roger Roffman, DSW (University of Washington, Seattle)

Assessor/Workshop Leader (Virginia Polytechnic Institute and State University).
Duties include, assessment via computer and delivery of intervention protocol for large NIMH multi-site trial to prevent HIV infection in at risk youth.

Fall, 1998-present.

Supervisors: Eileen Anderson, Ed.D. and Richard Winett, Ph.D.

Graduate Clinician (Clinical Practicum, 1st and 2nd Years) (Virginia Polytechnic Institute and State University) Duties included, seeing individual clients (conceptualization to treatment), conducting assessments, participating in clinical practicum team meetings, providing objective feedback to other team members. Fall, 1996-Spring, 1998

Clinical Supervisors: Robert S. Stephens, Ph.D., Angela Scarpa, Ph.D. and Russell T. Jones, Ph.D.

Clinical Trainee (Clinical Externship/Practicum) (Palo Alto Veterans Affairs Health Care System/Stanford University, Behavioral Medicine Clinic). Duties included, conducting addiction triage evaluations, brief therapy and evaluation for the Stanford/PAVA Cancer-Pain Clinic, conducting behaviorally based group smoking cessation interventions, conducting fitness and nutrition interventions, participated in addiction consultation for Spinal Cord Injury Unit, seeing individual clients (census = 9), 500 hour appointment. Summer 1997.

Supervisors: Judith Chapman, Ph.D., Robert Hall, Ph.D. and Jeanette Hsu, Ph.D.

Graduate Teaching Assistant (Virginia Polytechnic Institute and State University). Duties included, leading group discussions and presenting lectures in a recitation section of introductory psychology, grading papers, and proctoring exams. Fall - Spring 1996.

Supervisor: Jack Finney, Ph.D., Chair Department of Psychology

Research Assistant (San Diego State University Foundation). Duties included, developing and contributing to manuscripts for publication Project GRAD (Graduate Ready for Activity Daily; NHLBI). An on-going prospective cohort study involving exercise science, behavior modification, and the modification of social-cognitive theory determinants to promote active lifestyles, Spring, 1995-Spring, 1997. Supervisors: James F. Sallis, Ph.D. and Karen J. Calfas, Ph.D.

Research Assistant/Supervisor (San Diego State University Foundation). Duties included, contributing to manuscripts for publication in professionally refereed journals. Previous duties included assisting with all components of data, including data entry staff training and supervision, statistical analysis, and consultation on PC system software applications. Project SCRAP (Smoking Cessation in Recovering Alcoholic Persons), San Diego State University, Spring, 1995-1997. Supervisors: Christi A. Patten, Ph.D. and John E. Martin, Ph.D.

Teaching Assistant/Research Assistant (San Diego State University Foundation).

Teaching assistant, Health Dynamics, duties included proctoring exams, grading papers, overseeing student projects, and research assistance on Project GRAD, San Diego State University. Fall 1995. Supervisors: James F. Sallis, Ph.D., Karen J. Calfas, Ph.D. and Susan Caparosa, M.S.

Assistant Data Manager/Analyst (Navy Health Research Center, Clinical Epidemiology Division).

Duties included compiling, analyzing, and presenting data results. One study sought to develop and assess training models for the prevention of musculoskeletal injuries in Navy recruit and Special Forces populations. Another study, Operation Deep Freeze, examined the effects severe human isolation in the Antarctic. Overuse Injury Projects, Summer 1995 to Spring 1996.

Supervisors: Rahn Y. Minagawa, Ph.D., Rick Shaffer, Ph.D. and Stephanie K. Brodine, M.D.

Teaching Assistant (San Diego State University).

Duties included assisting in development of course guidelines, proctoring exams, grading papers, giving brief lectures on behavior modification, and supervising students' self-directed behavior modification projects, Psychology 211/Learning and Behavior. San Diego State University, Department of Psychology, Spring 1995.

Supervisor: Christi A. Patten, Ph.D.

Research Assistant (San Diego State University).

Duties included assisting in a programmatic effort aimed at ceasing tobacco use in recovering alcoholics, involving cognitive behavioral therapy, brand fading, exercise, and behavioral modification. Project SCRAP, a California State Tobacco Related Disease Project, San Diego State University, Fall 1994, Data management assistant, doctoral dissertation, Christi A. Patten, Ph.D.

Supervisor: John E. Martin, Ph.D.

HONORS/SCHOLARSHIPS

1996 Honored at graduation ceremony for outstanding contribution and service to the

Department of Psychology, San Diego State University

1995-1996 National Science Foundation, McNair Scholar, San Diego State University

1994-present Psi Chi Honor Society

1996- Golden Key Honor Society

PROFESSIONAL/GROUP MEMBERSHIPS

- American Psychological Association, Student Affiliate, 1997-present
- Society of Behavioral Medicine, Student Affiliate 1995-1996
- Association for the Advancement of Behavior Therapy, Student Affiliate, 1997-present
- President, Psychology Club, San Diego State University, 1995-1996
- Vice President, Psi Chi Honor Society, San Diego State University, 1995-1996
- Representative, College of Sciences Student Council, San Diego State University, 1995-1996
- Western Psychological Association, Student Affiliate, 1995-1996

External Support

Physical activity and television viewing among college seniors (Investigator: Williams, C.D.), McNair Scholar Foundation; National Science Foundation (\$2,400).

Supervisors: James F. Sallis, Ph.D. and Karen J. Calfas

Publications

Williams, C.D., Sallis, J.F., Calfas, K.J., & Burke, R.S. (1999). Demographic and psychosocial correlates of television viewing. American Journal of Health Promotion, 13(4), 207-214.

Patten, C.A., Martin, J.E., Hofstetter, R.C., Brown, S.A., Kim, N., & Williams, C.D. (1999). Smoking cessation following treatment in a smoke-free navy alcohol rehabilitation program. Journal of Substance Abuse Treatment, 16(1), 61-69.

Patten, Christi A.; Martin, John E.; Myers, Mark G.; Calfas, Karen J.; & Williams, Carl D. (1998). Effectiveness of cognitive-behavioral therapy for smokers with histories of alcohol dependence and depression. Journal of Studies on Alcohol, 59(3), 327-335.

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PRESENTATIONS

Williams, C.D., Stephens, R.S., Burke, R.S., Adams, S.E., & Buehrig, E. Personal projects and alcohol use in college students: An integrative Social Cognitive Approach (poster accepted for presentation at the Association for the Advancement of Behavior Therapy, November, 1999, Toronto, Canada).

Williams, C.D., Stephens, R.S., Roffman, & Burke, R.S. Measuring ambivalence for change in adult marijuana users. (poster accepted for presentation at the Association for the Advancement of Behavior Therapy, November, 1999, Toronto, Canada).

Adams, S.E., Williams, C.D., Stephens, R.S., Roffman, R.S., Burke, R., Campbell, A., & Swan, M. The Marijuana Check-up (poster accepted for presentation at the Association for the Advancement of Behavior Therapy, November, 1999, Toronto, Canada).

Williams, C.D., Adams, S., Stephens, R.S., Roffman, R., Campbell, A., & Swan, M. Characteristics of a non-treatment seeking sample of marijuana users (poster presented at the Society of Behavioral Medicine, November, 1999, San Diego, CA).

Williams, C.D., Sallis, J.F., & Calfas, K.J. Psychosocial correlates of television viewing (poster presented at the Society of Behavioral Medicine, 1998, New Orleans, LA).

Stephens, R.S., Roffman, R., Burke, R.S., Williams, C.D., Balmer, A., & Piccano, J. The Marijuana Check-up (poster presented at the Association for the Advancement of Behavior Therapy, 1998, Washington, DC).

Galper, D.I., Kearns, S.C., Williams, C.D., Altman, D.I., & Winett, R.S. Strength training for seniors: The effects of a five-week behavioral intervention on exercise behaviors, attitudes, and self-efficacy (poster presented at the 31st Annual Convention of the Association for the Advancement of Behavior Therapy, Miami, FL).

Williams, C.D., Linton, D.L., Bitensky, S., & Wharton, M. Evaluating professors: Identifying high correlates of effectiveness (presented at the Western Psychological Association Conference, 1996, San Jose, CA).

Patten, C.A., Martin, J.E., Myers, M.G., Calfas, K.J., Williams, C.D., & Gichon, E. Effectiveness of cognitive-behavioral depression therapy as an adjunct to smoking cessation treatment for recovering alcoholics (presented at the 4th International Congress of Behavioral Medicine, 1996, Washington, D.C.).

Patten, C.A., Martin, J.E., Brown, S.A., & Williams, C.D. Implementation of smoke-free policies in chemical dependency treatment facilities: a survey of current attitudes and practices (presented at the 4th International Congress of Behavioral Medicine, 1996, Washington, D.C.).

Patten, C.A., Martin, J.E., Williams, C.D., & Calfas, K.J., Use of physical exercise in the treatment of smoking cessation for recovering alcoholics (presented at The Society for Research on Nicotine and Tobacco, 1996, Washington, D.C.).

Patten, C.A., Martin, J.E., & Williams, C.D. The effects of a smoke-free policy in the navy alcohol rehabilitation center, San Diego ((presented at the 4th International Conference on Behavioral Medicine, as part of symposium, 1996, (Changing Smoking Behavior in the New Context of Tobacco Control: Results and Trends from the U. S., Australia, and South Africa)).

Martin, J.E., Calfas, K.J., Patten, C.A., Polarek, M., Noto, J., Beach, D., & Williams, C.D. The effects of 3 tailored smoking treatments for recovering alcoholics: One-year results of Project SCRAP (presented at the 4th International Congress of Behavioral Medicine, 1996, Washington, D.C.).

WORKS IN PROGRESS

Williams C.D., Stephens, R.S. (manuscript in preparation). Personal projects and alcohol use in college students: An integrative social cognitive approach.

Williams C.D., Stephens, R.S, Beuhrig, E. & Beyer, B. (manuscript in preparation). Goal molarity and drinking among college students.

Williams, C.D, Armstrong, C.A., Sallis, J.F., & Calfas, K.J. (manuscript in preparation). Associations between health indicators and television viewing.

COMPUTER SKILLS

Systems: VAX, PC, Macintosh, NT

Application Software and Hardware Skills: SPSS (including LISERAL, AMOS), SAS (including CALIS), Minitab, D-Base, Epi-Info, Excel, MS-Word (all versions), Word Perfect (all versions), Corel Presentations, Powerpoint, Internet Resources, troubleshoot Windows 95-98 and integrated software, Diagnose and replace all system hardware (PC)

REFERENCES

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