Introduction

Many college students drink to excess, risking considerable negative repercussion in so doing (Perkins, 2002; Shuckit, Klein, Twichell, & Springer, 1994; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). It is estimated that 84% of college students drink alcohol and that greater than 40% commonly engage in heavy drinking (Presely & Meilman, 1992). Binge drinking or 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 (Wechsler, et al., 1994), vandalism (Engs & Hanson, 1988), and driving while under the influence (Engs & Hanson, 1988; Lloyd & Atkins, 1993; Perkins, 1992). Convergent findings also reveal inverse associations between heavy drinking and academic performance (e.g., Lloyd & Atkins, 1993). Overall, evidence suggests that many college students drink excessively and, thereby, experience considerable alcohol related problems (Wechsler, et al., 1994; 1999; Schuckit, et al., 1994).

The recurrent problem of alcohol misuse among students continues to attract scientific attention. Unfortunately, advances in interventions for alcohol abusing college students are limited. Most interventions have shown weak or no effects at all. Most interventions have been based on educational models (e.g., lectures and films regarding the dangers of alcohol). These interventions have been found almost universally ineffective (Conner & Gunther, 1996; Gorman, 1995; Miller, Wilbourne, & Hettema, 2003). Recently, a growing literature lends support to brief motivationally focused interventions (e.g., Williams., 2003). One approach that has been demonstrated to reduce the harmful consequences of heavy drinking among high-risk college drinkers consists of an initial assessment session followed by a motivationally focused feedback session (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Marlatt, Baer, Kivlahan, Dimeff, Larimer, Quigley, et al., 1998).

Based on the demonstrated effectiveness of motivational interventions, the goal of this research was to help elucidate how motivational constructs influence drinking behavior choices. This goal is accomplished by assessing how motivational variables relate to drinking among college students. Specifically, determining the role of an individual's life goals in drinking choices from a unified theoretical perspective. Added understanding about the motivational complexities of students' drinking decisions may be critical to the advancement of effective interventions. One well-supported theoretical model of motivations is social cognitive theory (SCT; Bandura, 1977; 1986; 1989; 1997). A review of the central constructs of social cognitive theory follows, applied to the problem of alcohol abuse.

Social Cognitive Theory

Social cognitive theory, focusing on self-efficacy and outcome expectancies, is a encompassing theoretical paradigm that has already received considerable attention in alcohol research. The present paper focuses on the constructs of self-efficacy, outcome expectations, goals and self-regulation.

Self-Efficacy

As the foundation of social cognitive theory, 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, observational learning, verbal persuasion, and physiological/emotional status. In the addiction literature, alcohol self-efficacy is most often operationalized as confidence in the ability to avoid heavy drinking (DiClemente & Hughes, 1990). Data from non-clinical samples indicate that self-efficacy to control drinking inversely relates to alcohol consumption (e.g., Williams, 1999). In clinical samples, self-efficacy for avoiding drinking inversely relates to future drinking as well (Sitharthan & Kavanaugh, 1990; Solomon & Annis, 1990). For example, a sample of current alcohol abusers, recently detoxified drinkers, and individuals who had maintained sobriety for at least a year, showed that those who had maintained sobriety for at least a year had higher self-efficacy than individuals in the two comparison groups (Strom & Barone, 1993). Miller, Ross, Emmerson, and Todt (1989) provided evidence that those who maintain abstinence have higher abstinence self-efficacy than individuals starting treatment. End-of–treatment cross-sectional and prospective analyses also indicate that self-efficacy inversely relates to drinking (e.g., Sitharthan & Kavanaugh, 1990). Despite generally consistent findings, a one-dimensional focus on the contributions of self-efficacy may make potentially important contributions of other motivational constructs unclear. One contribution to the literature may simply be studying more comprehensive models of substance abuse.

Outcome Expectations

Bandura (1997) has argued that models attempting to explain behavior using social cognitive theory should include a complete array of relevant variables; however, studies have too seldom employed comprehensive theory tests. Outcome expectations represent a second theoretically important construct to integrative views of social cognitive theory. Outcome expectancies generally fall within two domains, positive and negative. A positive outcome expectation reflects the perception that engaging in a behavior will produce a desirable effect. For example, one might hold the expectancy that drinking results in euphoria or greater sociability. Negative outcome expectations reflect the anticipation of an aversive consequence (e.g., "drinking makes me feel nauseous"). Expectancy theory holds that positive expectancies potentiate behavior and negative expectancies inhibit behavior (Rotter, 1954; 1966). Bandura (1986, 1997) asserts that there are three classes of outcome expectations: physical effects, such as reducing drinking to feel more healthful; social effects, such as reducing drinking to regain the respect of family members; or self-evaluative effects, such as reducing drinking to feel more positive about oneself. The sources of outcome expectancies are wide-ranging, and can be developed through direct experience, observational learning, or persuasive communication.

There are two types of outcome expectancies relevant to the research on addictive behaviors. The expectancies discussed thus far are mostly related to the acute effects of

drinking (Brown, 1985; Darkes & Goldman, 1993; Goldman, & Rather, 1993), and are commonly referred to as alcohol effect expectancies. A second type of alcohol expectancies reflect what people expect to happen when they stop or cut back on their alcohol use. For the purposes of the present research, this class of outcome expectancies will be referred to as alcohol change expectancies. This set of expectancies is particularly relevant to the understanding of change processes. Solomon and Annis (1990) provide evidence suggesting that heavy drinkers hold both positive (e.g., improved health and functioning) and negative (e.g., feeling more isolated from drinking friends) expectancies about reducing consumption. In intervention studies, such measures often are designed to help individuals build motivation for change. Thus, costs and benefits (i.e., alcohol change expectancies) are viewed as potentially causal determinants of change, empirically correlating with behavior change and substance use (Prochaska, DiClemente & Norcross, 1992). Despite relevance, change expectancies are seldom evaluated in concert with other SCT theory constructs in alcohol studies.

Goal Systems

Self-efficacy and outcome expectancies are situation and behavior specific constructs. Theoretically, SCT constructs are immediate cognitive precursors of behavior choice. Their predictive power in relation to behavior is well established. Even so, these behavior-specific cognitions and resulting behaviors are undoubtedly influenced by broader cognitive contexts that include personal goals. Personal goal system constructs such as personal strivings, personal projects, and current concerns reflect components of self-regulation sitting between concrete behavioral executions and personality traits. Consequently, personal goal systems represent a broader context in which motivations occur, including drinking-related motivations/decisions.

Goal Attributes

Goals have affective and behavioral attributes (Emmons, 1986). For example, one can feel good or bad about progress toward goals and can be more or less committed to and involved in achieving them. Research has consistently identified relationships between goal attributes and affective measures (e.g., Emmons & Kaiser, 1996). For example, Omodei and Wearing (1990) showed that the attributing greater value, difficulty, and commitment are related to subjective well-being. For example, Brunstien (1993) showed in a longitudinal study that individuals who were committed to, and attained their goals experienced increased subjective well-being. However, a high level of commitment and an absence of goal attainment resulted in lower ratings of subjective-well being. Such results have helped establish empirical links between goal perceptions and measures of well-being and mood.

Recently, research has begun to show that perceptions about goals are also possible determinants of substance use and substance-related problems. Lecci et al. (2002) demonstrated that the attributes of goal self-efficacy, meaningfulness and social support were inversely predictive of drinking problems. Williams (1999) conducted factor analysis on 10 person project attributes, which were modified for the present study. In

that study, data revealed three factors: Efficacy, Difficulty and Involvement. These factors were related to drinking cross-sectionally in univariate and multivariate analyses. The results demonstrated theoretically logical and consistent relationships. Difficulty positively correlated with drinking and inversely related to self-efficacy to avoid heavy alcohol use. Involvement inversely related to drinking, and higher levels of goal Involvement corresponded to higher levels of self-efficacy. These results indicate linkages between attributes of personal goal systems and specific behaviors, such as drinking.

Although wording choice varies, researchers assess a number of overlapping attributes in the study of personal goal systems. Analyzing goal attributes requires the conversion of idiographic goal statements into nomothetic attribute indices. Typically, study respondents self-generate and rate a number of goals on several of these attributes (Emmons & Kaiser, 1996; Little, 1983; 1988; 1998; Karoly, 1991), which are commonly factor analyzed to identify latent goal constructs. Research often identifies similar factors, reflecting perceptions of stress or difficulty, control and confidence, and personal investment or involvement in one's personal set of goals (Lecci, Karoly, Briggs, & Kuhn, 1994; Lecci, MacLean, & Croteau, 2002; Williams, 1999). The goal attributes evaluated in the present study were based on those described by Little (1983) and from a review on the goal literature. They were specifically chosen on potential relevance to social cognitive theory and alcohol use.

Goal Incongruence

Goals can be perceived to be congruent, neutral, or incongruent with other goals or specific behaviors. Incongruent goals are thought to work to the detriment of one another and disturb achievement processes (Elliot & Sheldon, 1998; Emmons & King, 1988; Little, 1983; McKeenan & Karoly, 1991). For example, incongruence among interpersonal goals has been related to poorer health and subjective well-being (Emmons, 1989). Emmons and colleagues (Emmons, King, & Sheldon, 1993; Emmons & King, 1988) also provide evidence that inability to resolve conflict between goals is associated with negative affect, adverse physical symptoms, and number of college health center visits.

The concept of goal incongruity is also applicable to the understanding of addictive behaviors. A study of three types of cigarette smokers (unaided successful quitters, relapsers, and current smokers) demonstrated that successful quitters had higher congruence between their goal of quitting and other goals than both relapsers and current smokers (McKeenan & Karoly, 1991). Williams (1999) demonstrated that perceived congruence between alcohol use and personal goal systems positively related to frequency of binge drinking after controlling for goal variables of involvement, difficulty and efficacy. Similarly, Weisz, Emmons and Tan (1994), in a longitudinal study, demonstrated that individuals who felt that alcohol facilitated their goals increased their drinking.

The perception of congruence or incongruence likely influences individual choices regarding substance use. In other words, perceptions of incongruence offers idiographic insight into the relationship between other personal goals and heavy drinking choices. Direct assessment of perceived incongruence may add to the predictive power of more general goal system attributes. For example, general attributions about one's goals expose the difficulty, importance, or controllability of a generalized goal system. However, information about the direct link between goals and alcohol use is not provided by those type of attribute ratings alone. Therefore, information regarding perceived goal incongruence is complimentary to more general goal attributions in the understanding of substance misuse.

Self-Regulation

Individuals motivated to meet goals incongruent with alcohol use may be more compelled to employ self-regulatory strategies. The ability to plan, evaluate and execute goal directed activities comprise the functions of self-regulation (Carver & Scheier, 1998). Cognitive, behavioral, and environmental self-regulation strategies produce behavior under the triadic view of reciprocal determinism (Bandura, 1997). For example, avoiding situations where others are drinkers is the execution of goal to abstain, using behavioral self-regulation. Despite its theoretical importance, few studies have examined the relationship between self-regulatory strategies and drinking behavior. To date, only one study has examined the role of self-regulatory strategies driven by Bandura's (1997) social cognitive model. Adams, Stephens and Williams (2000) demonstrated that higher use of self-regulatory strategies correlates with lower drinking quantity and frequency among college students. The present study seeks to evaluate the role of self-regulation within the context of other theoretically derived variables.

<center>Integrated Conceptual Model and Hypotheses</center>

The review above discusses the merit of evaluating several constructs that may conjointly affect drinking behavior. Such that, the integration of personal goal variables and social cognitive theory constructs may be instrumental in the prediction of drinking. The present study prospectively examines an integrative model of the relationships between personal goal systems and other social cognitive theory constructs (see figure 1).

Personal goal variables are hypothesized to impact positive and negative alcohol change expectancies, self-efficacy, and self-regulation. Cox and Klinger (1988) have suggested that learning about people's goal systems is integral to identifying idiographic incentives for change (i.e., costs and benefits for change). Given that, individuals who drink heavily yet see their goals as inconsistent with alcohol use, should perceive more benefits for change. The model also hypothesizes that goal variables directly influence alcohol self-efficacy. Effective self-regulation of behavior involves careful consideration of goals when making judgments regarding self-efficacy. For example, a person who is engaged in goals that are stressful and very demanding on their time will likely feel less confident in their ability to avoid heavy drinking, particularly if drinking is seen as a way to ease tension. In support of the hypothesis that goals affect alcohol self-efficacy, previous

research demonstrated that perceived goal difficulty inversely related to alcohol self-efficacy (Williams, et al., 1999). Lastly, in reference to goals, the model proposes that alcohol self-regulation is influenced by personal goals. As an example, highly important goals not involving alcohol use likely engender greater self-efficacy to employ drinking self-regulation strategies.

It is important to note that the model proposes several hypotheses regarding the interrelationships between social cognitive theory constructs. Self-efficacy is thought to be a critical determinant of self-regulation, as well as positive and negative alcohol change expectancies (Bandura, 1991; 1997). Increased self-efficacy is believed to result in greater application and use of self-regulatory strategies. The relationship between self-efficacy and alcohol change expectancies is complex. Past behavior influences self-efficacy, which in turn, partially determines alcohol change expectancies. Thus, the model posits that increased self-efficacy will result in increased positive alcohol change expectancies, increased use of self regulatory strategies, and decreased negative alcohol change expectancies.

Although the social cognitive theory constructs, including goal variables, have considerable overlap, full mediation is not indicated in the present model. Therefore, each of these constructs is believed to have unique explanatory power with respect to drinking. Self-efficacy, self-regulation, and positive alcohol change expectancies are inversely related to drinking, whereas negative alcohol change expectancies are believed to positively correlate with drinking.

Hypothesis

Several univariate hypotheses exist, relating personal goal system variables with heavy episodic drinking. Further, specific hypotheses are advanced describing the hypothetical relationships between personal goal system variables and proximal social cognitive theory determinants.

Because the current research employs a modified set of the goal attributes. The following hypotheses employ the factor names developed by Williams (1999).

Personal Goals Variables Hypothesized Relationships

• It was hypothesized that attributes of personal goal systems and more specific ratings of incongruence between goals and alcohol consumpstion are correlated with heavy episodic drinking (i.e., four or more drinks in a sitting for females and five or drinks in sitting for males). Based on theory and prior research:

    o It was hypothesized that perceived goal involvement and efficacy would be inversely related to heavy episodic drinking.
    o It was hypothesized that perceived personal goal system difficulty would be positively related to heavy episodic drinking.

o   It was hypothesized that perceived incongruence between goals and heavy alcohol use would be inversely related to heavy episodic drinking.

Personal Goals Variables Hypothesized Univariate Relationships with Proximal Social Cognitive Theory Determinants of Drinking

- The following hypotheses were made for the generalized attribute domains of Involvement and Efficacy.
    o   It was hypothesized that perceived Involvement and Efficacy positively related self-efficacy.
    o   It was hypothesized that perceived Involvement and Efficacy positively related to the number of positive outcome expectations for changing heavy episodic drinking.
    o   It was hypothesized that Involvement and Efficacy inversely related to the number of negative outcome expectations for changing alcohol use (i.e., heavy episodic drinking).
    o   It was hypothesized that perceived Involvement and Efficacy positively related to frequency of use of drinking self-regulation strategies.
- The following hypotheses were made for the generalized attribute domain of Difficulty.
    o   It was hypothesized that perceived Difficulty inversely related self-efficacy.
    o   It was hypothesized that perceived Difficulty inversely related to the number of positive outcome expectations for changing heavy episodic drinking.
    o   It was hypothesized that perceived Difficulty positively related to the number of negative outcome expectations for changing heavy episodic drinking.
    o   It was hypothesized that perceived Difficulty inversely related to frequency of use of drinking self-regulation strategies.
- The following hypotheses were made for perceived incongruence goal and heavy alcohol use.
    o   It was hypothesized that perceived incongruence inversely related self-efficacy.
    o   It was hypothesized that perceived incongruence positively related to the number of positive outcome expectations for changing heavy episodic drinking.
    o   It was hypothesized that perceived incongruence negatively related to the number of negative outcome expectations for changing heavy episodic drinking.
- It was hypothesized that perceived Difficulty inversely related to frequency of use of drinking self-regulation strategies.

Based on prior findings, the study explored the hypotheses that goal variables predicted variance in heavy episodic drinking beyond the full set of social cognitive theory determinants in the study (Williams, et al., 1999). The central aim this hypothesis was to determine whether the situational SCT determinants captured in sufficient detail drinking motivations. It is likely the case that SCT may fail to fully account for the complexities of motivational experiences as they relate to drinking. There may be non-specific effects

exerted by goals on behaviors that are not fully accounted for by individuals' estimates regarding expectancies and efficacy.

Method

Preliminary Work

A pilot study was conducted in the spring of 2001 to test and refine computer software and other study procedures. The pilot sample consisted of 73 females and 27 males with a mean age of 19.75 ($SD = 1.24$). The distribution of class standing was 30% freshman, 35% sophomore, 21% junior and 14% senior. Multiple aims were achieved during the pilot phase: 1) development and refinement of software security features; 2) testing of assessment procedures; and 3) refinement of consent and login procedures. In sum, the pilot study aided substantially in establishing the feasibility of the present study, and served to improve quality assurance procedures.

Participants

Present Study participants were 204 female and 101 male college students enrolled in psychology courses at Virginia Tech. The study excluded nondrinkers. Data was collected in the fall of 2001. The sample differed on drinking indices as a function of gender, but drinking did not differ as a function of class rank at baseline assessment (see table 1). Since baseline drinking varied consistently as a function of gender, subsequent analyses predicting drinking included gender.

Procedure

Participants were recruited through the psychology experiment participant pool and received two hours course credit for their participation. An advertisement was posted on a psychology study information board. The advertisement indicated the study was investigating the relationship between personality and drinking. In terms of study eligibility, participants had to be at least 18 years of age and a current drinker. All interested participants were then referred to the project's website to schedule an in-person consent session. Upon arrival at the consent session, potential participants were further informed about the nature of the study, including a discussion of potential risks (e.g., the admission of underage drinking). All participants read the informed consent as presented in-person and on the project's website (see appendix A). After signing the consent form, participants provided research staff with a personal identification code (PID) and their student identification number. Using the combination of their PID and student number, which were stored in secured databases separate from survey data, students were able to access and complete the website's questionnaire from a computer of their choosing on or off campus. The measures (appendix B) were administered on-line in a three-part sequence. First, participants completed the personal projects assessment packet. Second, participants completed a 30-day retrospective history of their drinking behavior via a computer enhanced timeline follow-back (Sobell & Sobell, 1996; 1986). Third, they

completed a series of self-report measures concerning characteristics of their drinking (see measures section).

Participants were asked to complete a follow-up questionnaire 23 to 37 days following completion of the baseline. Participants were prompted via e-mail regarding their follow-up window. The follow-up assessment content was identical to baseline. All participants were asked whether they were under the influence of alcohol at the beginning of each assessment. Respondents under the influence were instructed to return to complete their assessment at a future date. The average length of time until follow-up completion was 27 days ($M = 27.40$; $SD = 3.65$). The decision of the 23-37 day follow-up was based on academic calendar constraints and provision of maximum opportunity to participate in the follow-up assessment. Of the 305 participants who completed the baseline, 174 completed the follow-up (57%) within the specified time period. Participants who completed the follow-up drank significantly less at baseline than those not completing the follow-up in terms total drinks consumed, but not on the average number of heavy drinking episodes per week or the number of drinks per drinking day (see table 2).

Measures

Personal Projects. 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, et al., 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).

Next, subjects rated their projects on 12 attributes (c.f., Little, 1989). The attributes assessed were as follows: 1) importance (how important each goal is to the respondent at the present time), 2) enjoyment (how much the respondent enjoys working on each goal), 3) difficulty (how difficult the respondent finds it to carry out the goal), 4) control (how much the respondent feel that they are in control of each goal, 5) stress (how stressful it is for the respondent to carry out the goal), 6) time adequacy (how much the respondent the amount of time they feel they spend working on the goal is adequate), 7) outcome (to what extent the respondent feels the goal will be successful), 8) challenge (to what extent

the respondent feels the goal is challenging and demanding), 9) progress (how success the respondent feels they have been successful in the goal so far), 10) absorption (to what extent the respondent feels the becomes engrossed in each goal), 11) intrinsic value (to what extent the respondent feels they pursue each goal because it is part of who they are, 12) avoidance, (to what extent the goal is pursued to avoid something negative). Respondents rated projects on each attribute scale from 0 to 10, with 10 representing the highest possible rating for each attribute. Participant ratings of each attribute were averaged to create nomothetic attribute average scores with higher scores indicating more of the scaled attribute.

Participants used a cross-impact questionnaire to convey the degree of perceived incongruence between their goals/projects and drinking heavily (Little, 1983; McKeenan & Karoly, 1991; Emmons 1986). 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. The incongruence 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. Scores were coded onto scale from 0 (*very positive*) to 4 (*very negative*). Occasions of heavy drinking were defined as drinking more than four or five in a single sitting for women and men, respectively. Average perceived goal incongruence ratings were used in all analyses with higher scores indicating greater incongruence between goals and heavy alcohol consumption (alpha = .77).

Timelime Follow-Back (TLFB). The timeline follow-back technique (TLFB: Sobell & Sobell, 1996) was used to assess drinking behavior. Respondents reported their drinking on a web-based calendar for each day over a retrospective 30-day period at both baseline and follow-up, which started the day prior to assessment. No overlapping calendar days between baseline and follow-up were used in the calculation of follow-up drinking variables. Total drinks consumed and drinks per drinking day were not analyzed for follow-up analyses, as the present study was primarily designed to add to the understanding of heavy episodic drinking. It is noteworthy that the full follow-up sample includes participants that did not have a heavy drinking episode at baseline ($n = 27$). However, no participant reported drinking zero total drinks at baseline. A supplementary set of analyses examined those having at least one heavy drinking episode at baseline. Three indices were derived by timeline follow-back technique at baseline: 1) average drinks per drinking day, 2) average number of heavy drinking episodes per week (four drinks in a single setting for females and five for males), and 3) total number of drinks consumed in the period. Average drinks per drinking day and total number of drinks consumed are presented from baseline data primarily for descriptive purposes. As noted above, analyses of follow-up drinking data focus on instances of heavy episodic drinking.

When completing the calendar, 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 reference and use their appointment books to aid recall of important dates. The TLFB has demonstrated good reliability and

validity (Sobell et al., 1986; Sobell & Sobell, 1996), and is common feature of assessment in alcohol studies. Research has shown computerized administration of the TLFB to be reliable when compared to an interview format (Sobell & Sobell, 1996).

Outcome Expectancy Scale. The anticipated consequences of changing one's alcohol use was measured by the Outcome Expectancy Scale, tapping both costs and benefits (Solomon & Annis, 1989) (Appendix B). The measure contains 38 items across two scales, positive (30 items, alpha = .94) and negative (18 items, alpha = .92). Respondents rated whether they agreed if situations would happen to them if you changed the way they drank, or stopped drinking over the next 45-days. Respondents rated items on a likert type scale reflecting their level of agreement with scores ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). The number costs and benefits rated as agree (3) or strongly agree (4) were used in all analyses. The poles of the scale were used in order to best reflect the salience of each item for participants.

Alcohol Self Efficacy. Self–efficacy was assessed in order to examine relationships with goal characteristics (e.g., incongruence with heavy episodic drinking), drinking behavior, and other social cognitive theory constructs. The alcohol self-efficacy measure assessed via 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 an adapted version 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) (Appendix B). The average of the 49-items was used as a measure self-efficacy for avoiding heavy alcohol consumption (alpha = .97).

Drinking Self-Regulation Questionnaire (DSRQ). The Drinking Self-Regulation Questionnaire (DSRQ) (Appendix B) is 50 item measure of self-regulatory strategies students use to control alcohol consumption (Adams, Stephens, & Williams, 2000). Respondents indicated on a scale from 0 (*Never*) to 4 (*Always*) how often they use particular strategies (e.g., counting the number drinks consumed). The DSRQ has three scales: cognitive strategies (15 items, alpha = .86), behavioral strategies (15 items, alpha = .87) and environmental strategies (20 items, alpha = .92). The DSRQ has been shown to relate inversely to both quantity and frequency of drinking. The average of all items comprised DSRQ scores used in analyses because there were no differential hypotheses for subscales. In the present sample, calculating the scale unifactorially, the DSRQ showed good reliability (alpha = .95; M = 1.93; SD = .60).

Data Analyses

All variables were examined for distributional qualities – mean, standard deviation and kurtosis. Analyses were conducted using the Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS). Responses to goal attribute items were subjected to exploratory factor analysis using squared multiple correlations as prior communality estimates. Maximum likelihood methodology was used in the initial

extraction process. An oblique Promax rotation was used because the dimensions in this study were thought to have conceptual overlap. The scree test and other criteria suggested by Hatcher (1994) were used to help guide decision-making process about which factors to retain: 1) variables underlying a factor should share some conceptual meaning. 2) items loading on the other factors appeared to be measuring different constructs, and 3) items loading on a particular factor had relatively high loadings on that factor and very small loadings on the other factors. To interpret the factor pattern, items with a loading of .40 or greater were retained for a given factor. Multiple regression was used to evaluate the path model and determine the unique contribution of variables in multivariate models.

Results

Exploratory factor analysis (EFA) was used to identify the latent factor structure of goal attributes in the study. The attribute factors were named (see table 3 for attribute operations and results): 1) Efficacy and Involvement – consisting of ratings on the outcome, control, importance attribute, and intrinsic value, progress, absorption, enjoyment and time adequacy; and 2) Difficulty – consisting of difficulty, stress, and challenge. Scale scores were computed for each factor by averaging items with a loading of .40 or greater. Notably, the avoidance attribute (i.e., to what extent is this project is pursued to avoid something negative) failed to load on either factor, and thus, was considered as a single manifest indicator in subsequent predictor analyses. The means, standard deviations, intercorrelations and alpha reliabilities of the Difficulty, Involvement and Efficacy, avoidance, incongruence variables are presented in table 4. The alpha reliability estimates suggested good internal consistency, with all variables exceeding .75. A review of the correlation matrix indicated that the difficulty factor was modestly correlated with the efficacy and involvement factor ($r = .15$).

Table 5 displays means, standard deviations, and intercorrelations among drinking indices at baseline for descriptive purpose. Because of distributional abnormalities in drinking variables, log transformations replaced original values for all analyses. On average, participants drank approximately 53 standard drinks, had approximately five drinks per drinking day and engaged in heavy episodic drinking 1.37 times per week. The table shows strong relationships among indices of heavy drinking at baseline. Table 6 depicts means and standard deviations of the heavy episodic drinking indices at follow-up. Change scores calculated were residualized change scores obtained by regressing follow-up drinking on baseline drinking. Positive change scores reflect reductions in drinking (i.e., follow-up drinking was subtracted from baseline). Examination of table revealed a slight increase in heavy episodic drinking from baseline to follow-up. The standard deviation suggests change that more significant change occurred among some individuals, ranging from an increase of 2.97 to a reduction of 1.87 in terms of average heavy drinking episodes per week. Among those who had at least one occurrence of heavy episodic drinking at baseline ($n = 147$), there was a mean decrease of .12 ($SD = .75$) heavy episodic occasions per week.

To examine the hypothesized relationships between drinking and baseline scores on goal attribute variables, zero-order correlations were calculated. These results are shown in

table 7. Goal incongruence and Involvement and Efficacy were significantly inversely related to total drinks consumed and number heavy episodes per week at baseline. Avoidance was positively related to drinking at baseline. Similarly, goal incongruence and Involvement and Efficacy were inversely related total drinks and heavy drinking episodes at follow-up. Avoidance was positively related to total drinks and heavy drinking episodes. Difficulty produced no significant relationships with alcohol use indices. None of the goal variables were predictive of change in heavy drinking episodes.

As shown in Table 7, zero order correlations were also examined between heavy drinking episodes and social cognitive theory indices. Baseline self-efficacy and self-regulation scores were inversely related to baseline and follow-up heavy drinking rate. Negative outcome expectancies were positively correlated positively correlated baseline and follow-up heavy episodic drinking. Positive outcome expectancies were not correlated with any index of heavy drinking rate. None of the SCT determinants were predictive of changes in heavy episodic drinking. Because change in heavy episodic drinking was not related in univariate analyses to goal or social cognitive theory constructs, subsequent analyses focused on predicting follow-up drinking from baseline scores on potential determinants.

To examine the hypothesized relationships between goal attributes and SCT variables, zero-order correlations were calculated and are displayed in Table 9. These results showed that Involvement and Efficacy was positively correlated with self-efficacy, positive change expectancies, and drinking self-regulation. Difficulty was unrelated to the self-efficacy, outcome expectancies and self-regulation. Avoidance was inversely related to self-efficacy. Incongruence was found to be positively correlated with positive outcome expectancies and self-self-regulation.

A hierarchical multiple regression model assessed whether perceived incongruence between goals and follow-up heavy alcohol consumption (goal incongruence) predicted drinking variance beyond other goal attribute variables (see table 8). Given that incongruence was the only goal variable that directly connected drinking and goals, this test was designed to test the hypothesis that perceived incongruence ratings provided additional explanation of heavy drinking beyond the general to attribute factors. In the first block model was gender entered into the equation, gender accounted for 4% ($p < .05$) of the variance heavy drinking episodes per week at follow-up. In the second block of the model, the three goal variables derived from attribute ratings were entered. The goal attribute variables of Involvement and Efficacy, difficulty and avoidance were accounted for an additional 11% ($p < .05$) of the variance. Last, goal incongruence was placed in the model and accounted for an additional 5% ($p < .05$) of the variance. These results provide evidence for unique contribution of incongruence ratings beyond that describe Efficacy and Involvement, Difficulty and avoidance.

The results presented in table 9 addressed the hypotheses that personal goal attributes, particularly goals incongruence, independently predicted drinking in a model, including gender and the combination of goal variables. The table shows that Involvement and Efficacy was uniquely inversely related to heavy drinking frequency ($\beta = -.22$). Similarly,

goal in congruence demonstrated a unique inverse relationship (β = -.23). However, in reverse, Avoidance was positively related to drinking in the full model (β = .22). Total variance accounted for in the full model was 20%. In sum, the data offered support to the hypothesis that goal incongruence ratings explain heavy drinking variance beyond that of the attribute variables. Further, results demonstrate that Involvement and Efficacy and avoidance make unique contributions in the prediction of heavy episodic drinking after controlling for gender, goal incongruence and Difficulty.

Next, the hypothesis that goal attributes explain variance in drinking beyond the set of social cognitive theory variables was evaluated. The test of this hypothesis is shown is table 10. In a hierarchical model, goal variables captured an additional 7% of the variance in weekly heavy episodic drinking rate at follow-up after controlling for gender, alcohol efficacy, change expectancies and drinking self-regulation. Self-efficacy, expectancies and self-regulation accounted for 24% of variance in heavy episodic drinking after controlling for gender. The full model accounted for 35% of the variance heavy drinking episodes per week at follow-up. These results offer support to the hypothesis that goal variables are not subsumed by the situational determinants of social cognitively theory.

The final hypothesis proposed a specified network of relationships that would emerge when the variables under study were combined into a conceptual model (see figure 1). Path analysis (for discussion Pedhazur, 1982; Hatcher, 1994) tested the conceptual model outlined in the introduction. First, as a molar cognitive factor, it was hypothesized that goal attributes would function as determinants of expectancies, self-efficacy, and self-regulation. Secondly, it was hypothesized that self-efficacy would directly predict drinking, and its effects would also be mediated by both outcome expectancies and self-regulation. The model further advanced that expectancies and self-regulation would have independent predictive utilities on the heavy episodic drinking index. The results of the models tested are depicted figure 2. Non-significant paths were dropped from the figure to simplify presentation of results.

The model was tested among all participants completing the baseline and follow-up assessments. Path coefficients are standardized regression coefficients derived by regressing each endogenous variable in the model on all hypothesized predictors simultaneously. The results depicted in figure 3 offered partial support for the proposed model. Alcohol self-efficacy was the strongest predictor of alcohol consumption among the social cognitive variables hypothesized to have direct effects (β = .34). Self-efficacy was inversely related to negative outcome expectancies (β = -.25) and positively related to self-regulation (β = .17) as predicted. Alcohol self-regulation was inversely predictive of heavy episodic drinking (β = -.21) whereas negative expectancies about change were positively predictive of heavy drinking episodes (β = .19).

Goal variables were significantly related to two social cognitive theory determinants in the model. The attribute factor of Involvement and Efficacy was positively related to both alcohol self-efficacy (β = .21) and self-regulation (β = .14). Beliefs about of pursuing goals that involved the avoidance of something negative inversely correlated with self-efficacy (β = -.16). Last, the more one saw alcohol as inconsistent with their goals the

higher they rated themselves on use of self-regulation strategies. Counter to the hypothesized model goal variables did not predict either positive or negative change expectancies. Also counter to hypotheses but consistent with the univariate analyses, Difficulty with goal pursuits did not influence any of the SCT variables.

Discussion

Few studies have explored the relationships between personal goal systems and college drinking behavior. The current study attempted to describe several personal goal attributes thought to relate to heavy drinking rates and related social cognitive theory constructs. Rather than focusing explicitly on drinking-related goals, the goal attributes studied focused on students' perceptions of idiographically generated goal systems. As expected, students who were more involved in and who felt efficacious about their personal goals reported less heavy drinking, whereas those whose goals were characterized by avoidance strategies tended have higher rates of heavy drinking. Perceptions of the incongruence between personal goals and heavy drinking also predicted less drinking beyond the contribution of the other goal variable ratings. Only perceived Difficulty with personal goals failed to show the predicted positive relationship with episodes of heavy alcohol consumption. The goal system attributes showed systematic relationships to social cognitive theory constructs of self-efficacy, self-regulation, and outcome expectancies for reducing drinking. Notably, goal variable ratings added to the explanation of heavy episodic drinking beyond the social cognitive theory constructs and a proposed theoretical model of the interrelationships received qualified support. Although the correlational nature of these findings precludes concluding that goal system variables causally influence students' drinking patterns, it is suggestive of an impact that larger motivational contexts may have on the propensity to engage in excessive consumption of alcohol. Consequently, these results imply linkages between aspects of personal goal systems and specific behaviors, such as drinking.

An exploratory factor analysis identified two underlying constructs in the personal goal system ratings that were labeled Involvement and Efficacy, and Difficulty. It is important to note that central elements of study analyses included the additional personal goal variables of avoidance and incongruence. These analyses were based on *a priori* hypotheses. Involvement and Efficacy showed negative relationships to frequency of heavy drinking episodes. As hypothesized, college students who perceived themselves as highly involved in the pursuit of their personal goals and efficacious about accomplishing them reported less frequent heavy drinking. In similar research, Lecci, MacLean, and Croteau (2002) showed that the higher of goal self-efficacy and meaningfulness was indicative of fewer alcohol-related problems. Williams (1999) found that greater goal system involvement corresponded to less drinking and greater self-efficacy to avoid drinking. Thus, individuals who are immersed in, enjoy, and anticipate success with respect to their personal goals appear to be less susceptible to high rates of heavy drinking, perhaps because greater Involvement and Efficacy potentially buffers the desire to drink.

Counter to study hypotheses, the Difficulty factor did not evidence significant relationships with heavy drinking. It may be that the kind difficult and stressful goals reported had little bearing on drinking decision processes. These results are inconsistent with previous research showing relationship between difficulty-related attributes and drinking. Williams (1999) demonstrated that perceived goal Difficulty (comprised of same three attributes) correlated positively with drinking quantity and frequency (Williams, 1999). Also inconsistent with the null finding, Lecci and colleagues (Lecci, et al., 2002) demonstrated that Distress, comprised of difficulty, stress, and conflict (how the goal conflicts with other goals), was related to drinking as a coping mechanism. However, Distress was not directly related to drinking in that study either. In sum, the relationship between drinking and Difficulty/Distress has been inconsistent. Therefore, further research should be conducted to more clearly elucidate the relationship.

The avoidance attribute reflected the degree to which an individual employed positive feedback mechanisms. Such mechanisms involve goals designed to avoid negative outcomes (Ford, 1987). Consequently, individuals with avoidance driven goals were hypothesized to be prone to distracting and/or self-medicating activities, such as heavy drinking. As expected, avoidance was positively related to heavy episodic drinking. This suggests that maintaining goals that focus on the avoidance of negative events may engender alcohol misuse. Use of more avoidance-based goal strategies has been previously demonstrated to correlate with greater life dissatisfaction (e.g., Elliot, Shedon, & Chruch, 1997). One tentative explanation of the present results is that both drinking and use of avoidance strategies are independently influenced by a general sense of life dissatisfaction. The implication is that some people drink to excess and have goals that focus on avoiding negatives because they are dissatisfied with their lives. An alternative hypothesis is that behavioral choice is less well defined when all one knows is to avoid a certain thing (e.g., going to jail). Simply having a goal of moving away from a negative state allows for a greater number of opportunities to engage in non-instrumental behaviors such as drinking. On the other hand, having a well-articulated and defined goal implies a better focus and direction. Enhanced focus on specific positive goals likely modulates heavy drinking. If we assume that level of avoidance is potentially responsive to therapeutic manipulation, interventions attempting to decrease avoidance may simultaneously reduce drinking.

In the present study, perceived incongruence between goals and heavy drinking emerged as a consistent determinant. For example, one may view a goal to get good grades as inconsistent with excessive drinking the night before finals. The study conceptualized incongruence as fundamentally unique from the other goal variables for the reason that it directly assesses the perceived relationship between goals experiences and drinking. In contrast, Involvement and Efficacy, Difficulty, and avoidance reflect affective and generalized perceptions of goals. Therefore, components of the present analyses focused on examining the independent predictive utility of perceived goal incongruence. After controlling for participant gender and the remaining goal variables, perceived incongruence predicted heavy drinking. These results reaffirm the notion that the relationship between drinking and incongruence may be important to the understanding of alcohol misuse among college students. Furthermore, the contribution of incongruence

is partially independent of the other goal attributes studied. These results are important in that they highlight the value of directly assessing the relationship between ideographic goals and drinking. Interventions may be enhanced by helping students to adopt a greater proportion of goals inconsistent with drinking and/or better understand potential discrepancies between the goals they already have and heavy drinking.

The study also sought to determine whether personal goal variables were predictive of alcohol use independent of alcohol domain specific SCT constructs (outcome expectancies, self-efficacy, and self-regulation strategies). As expected, personal goal variables independently accounted for drinking variance, with Involvement and Efficacy, avoidance, and perceived incongruence each adding to the prediction. The results are consistent with the premise that personal goal variables impact drinking in manner that is not fully described by situational SCT determinants. To some extent these findings challenge Bandura's (1997) position that personal goal attributes are less important than more domain-specific SCT constructs. For Bandura, self-efficacy best captures variability in behavior, and goal attributes should not enhance prediction. By contrast, these data suggest that goals provide additional information about future behavior that is not fully captured by SCT determinants. Consequently, these data point to the value of understanding motivational influences that are both broad and situational with the implication that motivational influences are manifold and describable.

One way to refine the description of predictor variables is through the application of theoretical models. Proposed interrelationships between variables was evaluated via a theoretically driven path analysis (see figure 1-2). In the model, goal variables were expected to predict alcohol self-efficacy, as it was believed that individuals reference their goal systems when making estimates regarding self-efficacy. Effectively regulating behavior toward a goal requires the evaluation of whether specific behaviors, such as drinking, are instrumental. The present data suggest that people who feel more feel more efficacious and involved by the goals they choose tend to have greater confidence in their ability to avoid or limit drinking. Conversely, people who maintain goals that are based on the avoidance of negative outcomes report less drinking control self-efficacy.

Bandura (1997) has argued that efficacy judgments bridge across domains of functioning, and in this case, Efficacy and Involvement may reflect a global efficacy construct across drinking and goal domains. The Involvement and Efficacy factor is largely composed of attributes reflecting level of absorption, progress and intrinsic value (i.e., involvement). It follows that individuals who find their goals rewarding and personally valuable view heavy alcohol use as detrimental, and thus feel stronger in their ability to avoid drinking. These findings are consistent with those reported by Williams (1999), who found that involvement was positively related to drinking self-efficacy in a multivariate model.

Avoidance was inversely related to alcohol self-efficacy in the path model. Of potential relevance, research has demonstrated that avoidance is related to greater levels of psychopathology, including affective and well-being disturbances (Elliot & Church, 2002; Elliot & Sheldon, 1998; Elliot, Sheldon, & Church, 1997). Relapse in alcohol treatment programs has linked to mood disturbances (Marlatt & Gordon, 1985).

Emotional disturbances, in some cases, may be a function of overemphasizing negative, avoidance-based goals instead of positive life change goals. In a similar vein, having goals that involve avoidance of negative events may also reflect a generalized sense of poor environmental control, and as a consequence, feeling inefficacious about avoiding heaving drinking in certain situations. Therefore, maintaining goals that involve the avoidance of negative events may result in diminished self-efficacy.

Alcohol self-efficacy was expected to influence self-regulation and change expectancies, and results offered support for this hypothesis. Partial support was found for the hypothesis that self-efficacy predicts change expectancies. The data indicated that self-efficacy was significantly and inversely related to negative change expectancies, suggesting that higher self-efficacy corresponds to lower levels of negative expectations about changing alcohol use. Counter to the efficacy/expectancy hypothesis, there was not an observed relationship between self-efficacy and positive expectations for change. However, self efficacy was positively related to self-regulation. To summarize, higher self-efficacy resulted in more negative expectations for alcohol use and greater application of self-regulation strategies.

Finally, the model advanced that self-regulation, change expectancies and self-efficacy each uniquely predicted drinking. Self-regulation was found to inversely relate to drinking, while negative change expectancies positively related to drinking. However, positive change expectancies did not relate to drinking. Therefore, use of fewer self-regulation strategies and higher levels of perceived negative consequences for change independently correspond to higher levels of drinking, but perceived positive consequences for change are not related to drinking behavior. Self efficacy was also independently predictive of drinking. Taken together, these data provide evidence that although these constructs overlap, each provides unique and valuable information for predicting heavy alcohol use among college students.

According to social cognitive theory (Bandura, 1997), the relationship between goals and alcohol is mediated by change expectancies, self-efficacy, and self-regulation (see figure 1). Although change expectancies were not found to mediate the relationship between goal variables and alcohol use in the present data, both self-efficacy and self-regulation were shown to be partial mediators. In sum, study analyses revealed qualified support for the mediation hypotheses, and indicated that goal variables exhibit predictive ability, independent of alcohol specific social cognitive theory constructs. These data highlight the potential importance of environmental motivational constructs in social cognitive theory. Change expectancies and self-efficacy may be specific to drinking behavior, whereas goal variables encompass information regarding the thoughts and feelings people have about goals in general, which also appear to affect drinking choices.

Limitations

The results discussed above should be viewed in light of several considerations. Because the study design involved a short follow-up period, it is difficult to accurately conclude causal influences. The inability to describe change from the variables tested is

particularly problematic. One potential remedy would be to use multiple follow-ups over a longer period of time, which would allow for the measurement of naturalistic change. Specific sample characteristics that limit the interpretation of the present results include sample size and gender. Less than 60% of the baseline sample completed the follow-up. The inability to test the model among all participants limits the interpretability of the data. A larger follow-up sample size would allow for further development of measurement models, causal analyses, and greater generalizability. The large proportion of women is also a limiting factor. Two-thirds of the present sample were women, which is not likely representative of most college campuses, making generalization tentative. Future studies may benefit from systematically oversampling college men.

Implications

The purpose of the present study was to expand the literature on college drinking by using social cognitive theory (Bandura, 1997) as a guide, focusing on the additive value of understanding goal systems. The results provided substantial support to the idea that goal constructs have predictive utility among college student drinkers. The present results may broaden the scope and application of social cognitive theory (Bandura, 1997), as well as contribute to the literature on college drinking by further elucidating the role of motivational processes, specifically goals. Traditionally, studies have examined self-efficacy and outcome expectancies independently, and rarely in combination. To date, no other study has assessed the role of goals, self-efficacy, outcome expectancies, and self-regulatory strategies simultaneously. These results suggest that each of these constructs has independent utility for understanding heavy drinking among college students. Although further studies are needed, the results tentatively suggest that self-efficacy is not the solitary pathway to behavior change, as implied by Bandura (1997). Rather, behavior change may be best predicted when a full complement of social cognitive theory constructs (Bandura, 1997) are assessed.

These findings may be of particular value to college administrators and clinicians, seeking to address alcohol problems on campuses. For example, interventions may be enhanced by providing systematic feedback regarding the relationship between goals and drinking. To that end, Williams et al. (2003) recently tested an intervention for college student drinkers that integrated goal feedback within the context of motivational interviewing (Miller & Rollnick, 1991). Preliminary results are promising, and indicate that the intervention is effective in reducing drinking. Cox and Klinger (Cox & Klinger, 1988) have developed an intervention strategy, Systematic Motivation Counseling, for alcohol dependent individuals that involved a motivational assessment and goal counseling. The focus of this intervention is to help individuals formulate reasonable non-chemical goals and identify salient incentives for achieving those goals. The central aim is to increase self-directed activities that did no involve the use of substances, which hypothetically decreases the need and desire to use drugs and alcohol. This intervention has not been tested in randomized clinical trials. Consequently, the effectiveness of this intervention is uncertain.

In summary, there was considerable support for hypotheses that goal attributes and goal to alcohol congruence ratings operate as determinants of drinking among college students and enhance the understanding of social cognitive, as applied to the problem of college student drinking. Personal goal Involvement and Efficacy, avoidance, and incongruence were significant correlates of alcohol use in both bivariate and multivariate analyses. Taken together, these findings invite further research that may be used to compliment existing interventions. Future research may expand the results by assessing multiple goal constructs (e.g., Emmons, 1992) and comparing differential utility. Expanded studies may also benefit longer prospective designs, which would likely provide a stronger basis for inferring causality. Burgeoning research connecting goals to drinking and potentially to behavior change over time, invites additional investigation.

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Table 1.

Baseline Drinking Variables Analyzed by Gender and Student Status (N = 305)

Dependent: Total Drinks Consumed

Variable	n	M	SD
Student Status			
Freshman	132	52.03	51.86
Sophomore	87	49.48	52.18
Junior	50	58.28	60.96
Senior	36	54.61	50.39
Analysis of Variance		$F(3, 301) = 0.37$	
Gender			
Male	101	83.35	65.19
Female	204	37.42	37.96
Analysis of Variance		$F(1, 303) = 46.87**$	

Dependent: Drinks per Drinking Day

Student Status			
Freshman		5.28	3.00
Sophomore		4.95	2.41
Junior		5.44	3.35
Senior		4.53	2.29
Analysis of Variance		$F(3, 301) = 0.73$	
Gender			
Male		6.76	3.38
Female		4.31	2.09
Analysis of Variance		$F(1, 303) = 49.63**$	

Dependent: Number of Heavy Drinking Episodes per Week

Student Status			
Freshman		1.36	1.14
Sophomore		1.35	1.26
Junior		1.40	1.12
Senior		1.41	1.28
Analysis of Variance		$F(3, 301) = 0.09$	
Gender			
Male		1.81	1.29
Female		1.15	1.07
Analysis of Variance		$F(1, 303) = 20.07**$	

Note. Analyzed variables in models were log transformations of raw data due to distribution abnormality. Means and standard deviations depicted in the table reflect were obtained from untransformed data. $**p < .01$, two tailed.

Table 2.

Baseline Drinking Variables Analyzed by Follow-up Status

Dependent: Total Drinks Consumed			
Variable	*n*	*M*	*SD*
Follow-up			
No	174	57.18	54.20
Yes	131	49.21	52.31
		$t(1, 303) = 2.10$*	
Dependent: Drinks per Drinking Day			
Follow-up			
No		5.40	2.75
Yes		4.91	2.88
		$t(1, 303) = 1.91$	
Dependent: Number of Heavy Drinking Episodes per Week			
Follow-up			
No		1.49	1.15
Yes		1.28	1.21
		$t(1, 303) = 1.94$	

Note. Analyzed drinking variables were log transformations of raw data due to distribution abnormality. Means and standard deviations depicted in the table reflect were obtained from untransformed data. * $p < .05$.

Table 3.

Oblique Rotation Factor Solution for Project Dimension Ratings

Factor Loading	*M* (*SD*)	Construct	Item
		Factor: Efficacy and Involvement	
.707	5.78 (1.39)	Absorption	To what extent you became engrossed or deeply involved in a project
.627	5.17 (1.64)	Progress	How successful you have been in a project so far.
.600	6.99 (1.45)	Intrinsic	To what extent do feel that you pursue you project because it is part of who you are, and not something you feel compelled to do for others or money or fame
.589	6.03 (1.46)	Time adequacy	How much you feel that the amount of time you spend working on each project is adequate.
.572	7.34 (1.25)	Outcome	What you anticipate the outcome of each project to be.
.550	7.54 (1.31)	Importance	How important each project is to you at the present time
.496	5.54 (1.41)	Enjoyment	How you enjoy working on each project.
.463	6.21 (1.63)	Control	How much you feel you are in control of each project.
		Factor: Difficulty	
.871	5.80 (1.37)	Difficulty	How difficult you find it to carry out each project.
.797	6.21 (1.28)	Challenge	To what extent each project is demanding and challenging to you.
.600	5.07 (1.41)	Stress	How stressful it is for you to carry out each project.

Table 4.

Two Factor Means, Standard Deviations, Intercorrelations, Coefficient Alpha Reliability Estimates for Goal Variables (N = 305)

	Project/Goal Factor	*M*	*SD*	1	2	3	4
1.	Difficulty	5.69	1.16	(.82)			
2.	Involvement and Efficacy	6.46	.92	.15*	(.79)		
3.	Avoidance	4.80	2.65	.07	-.06	(.81)	
4.	Incongruence	2.65	.61	.04	.02	-.02	(.77)

Note. Reliability estimates appear on diagonal. *p < .05, two tailed.

Table 5.

Baseline Means, Standard Deviations and Intercorrelations for Alcohol Indices

	Drinking Index	*M*	*SD*	1	2
1.	Total Drinks Consumed	52.63	53.19		
2.	Drinks per Drinking Day	5.12	2.83	.81**	
3.	Number of Heavy Drinking Episodes per Week Range = 0-7	1.37	1.19	.89**	.69**

Note. N = 305. Means and standard deviations depicted in the table obtained from untransformed data. **p < .01, two tailed.

Table 6.

Follow-up Means, Standard Deviations and for Heavy Episodic Drinking Indices (N = 174)

	Drinking Index	*M*	*SD*
1.	Number of Heavy Drinking Episodes per Week Range = 0-7	1.20	1.16
2.	Heavy Drinking Change	-.07	.71

Note. Means and standard deviations depicted in the table reflect were obtained from untransformed data.

Table 7.

Correlations between Follow-up Heavy Episodic Drinking Indices and Goal and SCT Variables

<u>Goal Variables</u>

Drinking Index	Involvement & Efficacy	Difficulty	Avoidance	Goal Incongruence
Baseline ($N = 305$)				
Heavy Drinking Episodes	-.15**	.01	.16**	-.19**
Follow-up ($N = 174$)				
Heavy Drinking Episodes	-.26**	-.02	.26**	-.25**
Heavy Drinking Change	-.08	-.05	.00	.01

<u>SCT Variables</u>

Drinking Index	Self-Efficacy	Positive Outcome Expectancies	Negative Outcome Expectancies	Self-Regulation
Baseline ($N = 305$)				
Heavy Drinking Episodes	-.29**	.06	.23**	-.29**
Follow-up (<u>n</u> = 174)				
Heavy Drinking Episodes	-.31**	-.10	.28**	-.29**
Heavy Drinking Change	-.08	-.03	.13	.02

Note. Analyzed drinking variables were log transformations of raw data due to distribution abnormality. Heavy drinking change is a residualized change score. ** $p < .01$.

Table 8.

Correlations between Baseline Goal and SCT Variables (N = 305)

Drinking Index	Self-Efficacy	Positive Outcome Expectancies	Negative Outcome Expectancies	Self-Regulation
Involvement and Efficacy	.22**	.12*	-.10	.19**
Difficulty	.02	.07	.00	.07
Avoidance	-.18**	.01	.11	-.10
Incongruence	.08	.12*	.05	.16**

Note. Analyzed variables in models were log transformations of raw data due to distribution abnormality. *p < .05, two tailed. **p < .01, two tailed.

Table 9.

Results of Multiple Regression to Explain Follow-up Drinking Variance by Goal Variables

Dependent: Number of Heavy Drinking Episodes per Week

Block	Variable(s) in Model	β	ΔR^2
I.	Gender	-.16*	.04**
II.	Involvement and Efficacy	-.22**	
	Difficulty	.05	
	Avoidance	.22**	
Aggregate of Block II			.11**
II.	Incongruence	-.23**	.05**

Note. p-values of aggregate blocks reflect the significance of the R^2 change. Analyzed variables in models were log transformations of raw data due to distribution abnormality. *p < .05, two tailed. **p < .01, two tailed.

Table 10.
Results of Multiple Regression Examining Ability of Goal Variables to Explain Variance beyond Established Social Cognitive Determinants Follow-up (n = 174)

Block	Variable(s) in Model	β	ΔR^2
Dependent: Number of Heavy Drinking Episodes per Week			
I.	Gender	-.10	.04**
II.	Alcohol Self-Efficacy	-.26**	
	Positive Change Expectancies	-.05	
	Negative Change Expectancies	.19**	
	Drinking Self-Regulation	-.14	
Aggregate of Block II			.24**
III.	Involvement and Efficacy	-.15*	
	Difficulty	-.01	
	Avoidance	.15*	
	Incongruence	-.17**	
Aggregate of Block III			.07**

Note. *p*-values of aggregate blocks reflect the significance of the R^2 change. Analyzed variables in models were log transformations of raw data due to distribution abnormality. *p < .05, two tailed. **p < .01, two tailed.
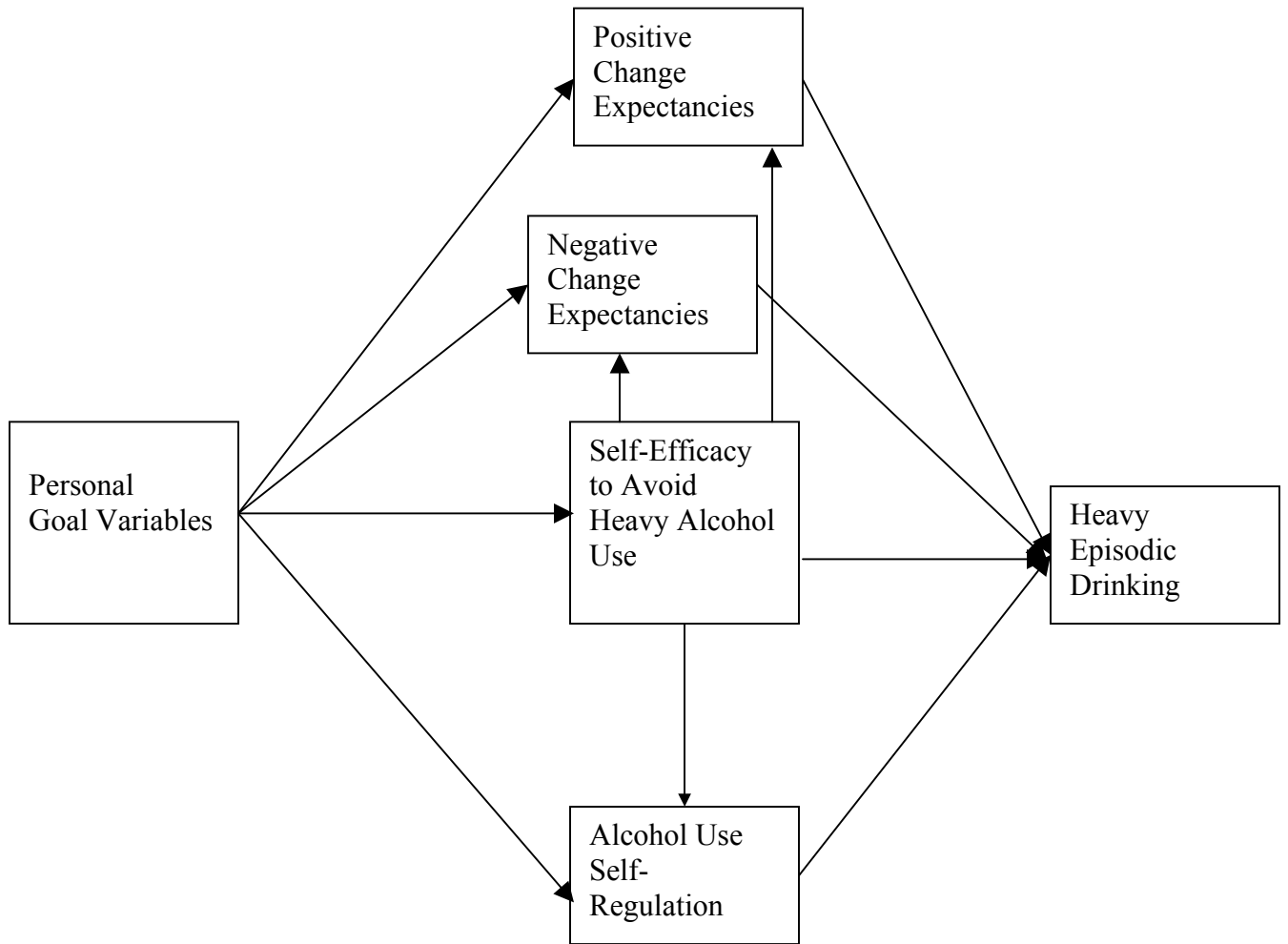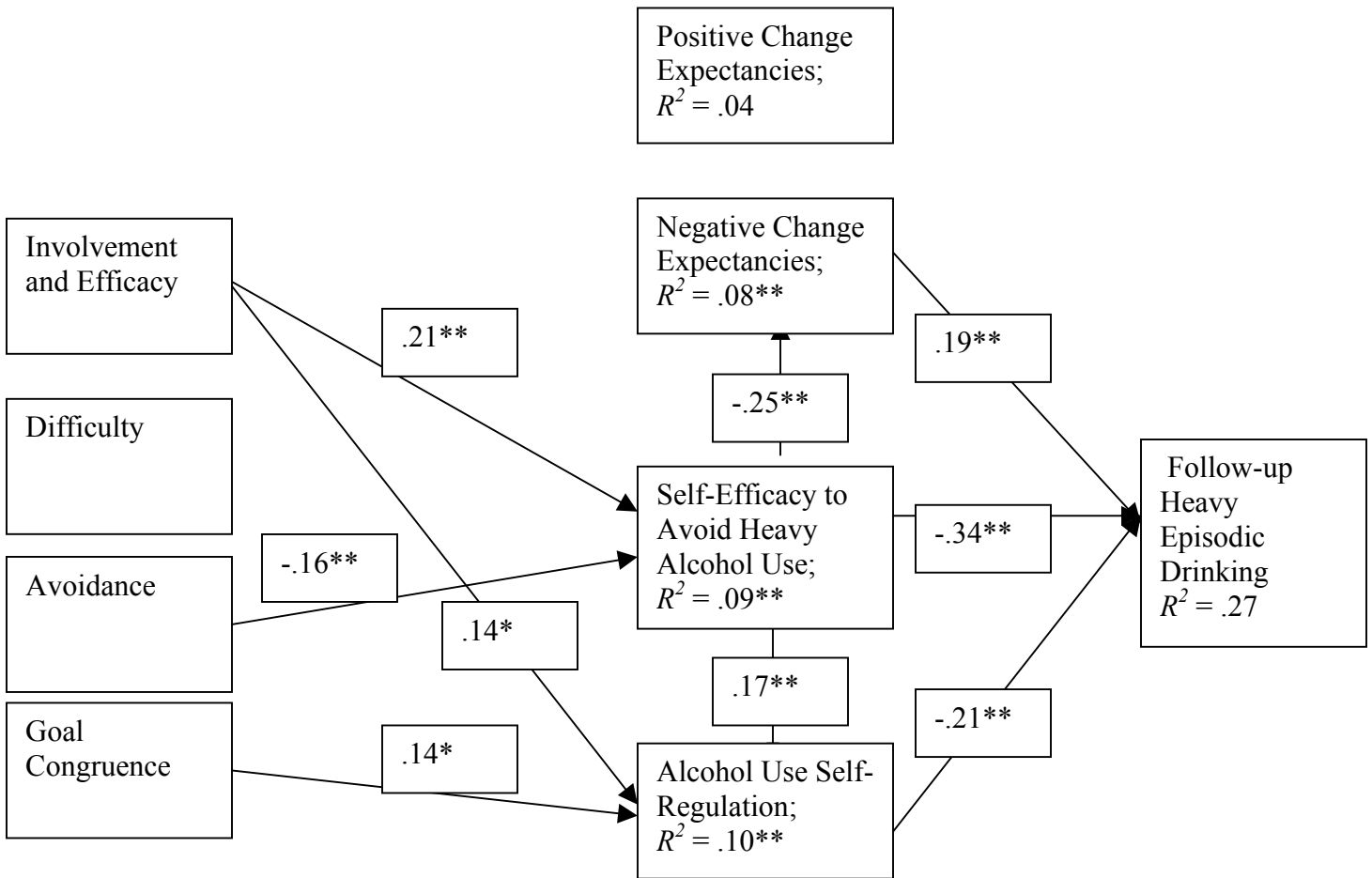
Figure 1. *Conceptual Model*

Figure 2. *Results Conceptual Model (n = 174)*

Note. Path coefficient represents standardized regression weights. *$p < .05$, two tailed. **$p < .01$, two tailed.

Curriculum Vitae

Carl D. Williams, Ph.D.

PERSONAL INFORMATION

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EDUCATIONAL BACKGROUND

Bachelor of Arts with honors, San Diego State University, San Diego, CA. (1996)

Master of Science, Clinical Health Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. (1999)

APA Internship in Clinical Psychology completed, University of California, San Diego, School of Medicine (2002)

Doctor Philosophy, Clinical Health Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. (2003)

Fellowship in Clinical Psychology, University of California, San Diego, School of Medicine; supervisor, Sandra Brown, Ph.D. (2002-)

CLINICAL EXPERIENCE

Graduate Clinician (Clinical Practicum, 1st, 2nd, and 4th 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, supervising individual and group therapy. Developed and implemented treatment protocol for adjudicated domestic violence offenders. Supervised manualized group treatment for conduct problemed high school students.
Fall, 1996-Spring, 1998; 1999-2000 academic year
Clinical Supervisors: Robert S. Stephens, Ph.D., Richard M. Eisler, Ph.D., ABPP, Angela Scarpa, Ph.D. and Russell T. Jones, Ph.D.

Year 1: Saw two clients with significant Psychopathology, one comorbid OCD and BPD, one pervasive developmentally delayed child with strong oppositional tendencies, conducted two adult and two child assessments

Year 2: Saw four long-term individual cases spanning the year, coprovided extensive marital therapy to one couple, in combination with another student developed manualized assessment and treatment procedures for smoking cessation, conducted two adult and two child assessments

Year 4: Developed and conducted two manualized treatment groups for anger and stress management for adjudicated domestic violence offenders. Supervised manualized group treatment for conduct problemed high school students

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 Cancer and Pain Clinic, conducting behaviorally based group smoking cessation interventions, conducting fitness and nutrition interventions, participating in addiction consultation for Spinal Cord Injury Unit, seeing individual medical psychology clients, 500 hour appointment.
Summer 1997.
Supervisors: Judith Chapman, Ph.D., Robert Hall, Ph.D., and Jeanette Hsu, Ph.D.

Therapist (Virginia Tech, Psychological Services Center)
Completed comprehensive diagnostic and social functioning assessments of court adjudicated dual diagnosis clients. Completed integrated reports of assessment data for Virginia Department of Corrections. Co-lead intergraded cognitive behavioral skills intervention targeting the co-occurrence on substance abuse and another definable Axis 1 pathology. Summer, 2001
Supervisor: Lee D. Cooper, Ph.D.

Psychology Intern (University of California, San Diego School of Medicine)
Major Sites/Rotations/Supervisors Assigned: VAMC La Jolla Alcohol and Drug Treatment Program (ADTP), Tamara Wall, Ph.D. , Ssupervisor; UCSD Outpatient Psychiatric Service, Patricia Judd, Ph.D. and Nancy Thomas, Ph.D., supervisors
Summer , 2000 - present

(Rotation #1, Alcohol and Drug Treatment Program VAMC, La Jolla)

- Conduct intake assessments and consultations including appropriate psychodiagnostic assessments with substance abusing populations.
- Provide cognitive behavioral, motivational, supportive, psychoeducational and other relevant adjunctive treatment modalities as a co-facilitator to outpatient substance abusing populations and their significant others through the ADTP out patient group (Orange), the Advanced Family and Friend's group, and the ADTP Children's group
- Co-facilitate a group delivered behavioral intervention for co-morbid smokers
- Conduct Interpersonal Communications Skills group with ADTP inpatients.
- Give lecture on the relationship between pain, pain management, and potential for relapse to ADTP inpatients.
- Co-facilitate a structured, time limited integrated cognitive behavioral treatment for veteran's dually diagnosed with substance abuse and depression disorders.

(Rotation #2, Outpatient Psychiatry Service, UCSD School of Medicine)

- Provide psychodiagnostic assessment, treatment planning, and individual treatment to individuals with acute and chronic pathologies on an outpatient basis
- Participate in multidisciplinary team meetings including presenting clients on team and providing constructive feedback to other clinicians on team.
- Complete neuropsychological, personality, and intellectual assessments referred to the assessment team/seminar.
- Co-facilitate interpersonal, cognitive behavioral, and supportive group psychotherapy for patients diagnosed with anxiety and/or depression spectrum disorder(s) that occur concomitantly with physical disorders and/or significant Axis II features.
- Complete case conceptualization
- Conduct two psychoeducational workshops

Seminars Attended:

- UCSD Psychology Internship Seminar Series (weekly—year long)
- ADTP group supervision/training seminar (weekly—year long)
- ADTP staff meeting (weekly—year long)
- ADTP Research meeting
- Selected Grand Rounds and Case Conferences at VAMC-La Jolla
- UCSD Outpatient Services Assessment Seminar (weekly—year long)
- UCSD Outpatient Services Clinical Seminar (weekly—year long)

.
ACADEMIC/RESEARCH EXPERIENCE

Adjunct Lecturer, Instructor (University of San Diego)
Duties include preparing lecture, discussion, and assessment activities for a graduate level substance abuse class (syllabus and note archives available on request).
Spring 2003

Adjunct Lecturer, Instructor (San Diego State University)
Duties include preparing lecture, discussion, and assessment activities for an Introductory Psychology Class with 150 enrolled students (syllabus and note archives available). All lectures provided via PowerPoint.
Fall 2002

Graduate Teaching Assistant (Virginia Polytechnic Institute and State University)
Duties include preparing lecture, discussion, and assessment activities for a Personality Psychology Class with 65 enrolled students (syllabus and note archives are viewable at the following address:
http://filebox.vt.edu/users/cawilli6/cdw.htm); received excellent evaluations.
Fall 2000—
Supervisors: Robert S. Stephens, Ph.D. and Jack W. Finney, Ph.D.

Graduate Research Assistant (Virginia Polytechnic Institute and State University).

Duties to include protocol development, manualization of treatment procedures, measure selection and design, and quality assurance for NIDA RO1 competitive renewal to the Marijuana Check-up, a brief motivational intervention for chronic marijuana users.
Fall 2000-
Supervisors: Robert S. Stephens, Ph.D. and Roger Roffman, DSW (University of Washington, Seattle)

Graduate Research Assistant/NCI Exercise Study Interviewer (Virginia Polytechnic Institute and State University). Conducted interviews (seven-day physical activity, nutritional data, ad knowledge and attitudes about exercise and nutrition) for formative stages of a large NCI funded project targeting social cognitive theory determinants of exercise and nutrition via Internet technology.
Summer 2000-
Supervisors: Richard Winett, Ph.D. and Eileen Anderson, Ed.D.

Graduate Research Assistant (Virginia Polytechnic Institute and State University).
Duties to include data management/analysis, quality assurance of both clinical and assessment procedures, and general development and evaluation of a brief motivational intervention for chronic marijuana users (NIDA RO1): Motivating Marijuana Cessation. Made significant contributions to the submission of funded competitive renewal.
Spring 1999-
Supervisors: Robert S. Stephens, Ph.D. and Roger Roffman, DSW (University of Washington, Seattle)

Graduate Research Assistant (Virginia Polytechnic Institute and State University).
Duties include, leading laboratory activities, 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: Richard Winett, Ph.D. and Eileen Anderson, Ed.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 1996-97
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). A prospective study involving exercise science, behavior modification, and modification of social-cognitive theory determinants of physically active lifestyles, Spring, 1995-Spring, 1997
Supervisors: James F. Sallis, Ph.D. and Karen J. Calfas, Ph.D.

Research Assistant/Student Supervisor (San Diego State University Foundation).
Duties included, contributing to manuscripts for publication in professionally refereed journals, assisting with all components of data, including data entry staff training and supervision, statistical analysis, and consulting 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 1996
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, Data management assistant, doctoral dissertation, Christi A. Patten, Ph.D.
Fall 1994
Supervisor: John E. Martin, Ph.D.

HONORS/SCHOLARSHIPS

1996	Honored for outstanding service to the Class of 1996, San Diego State University
1995-96	National Science Foundation, McNair Scholar, San Diego State University

PROFESSIONAL/GROUP MEMBERSHIPS

1997-	American Psychological Association, Graduate Student Affiliate
1996-	Society of Behavioral Medicine
1995-96	Western Psychological Association
1997-	Association for the Advancement of Behavior Therapy

EXTERNAL SUPPORT

Assessing alcohol interventions for high risk college student drinkers (investigators: Williams, C.D. & Wall, T.), Academic Senate, University of California, San Diego ($9,000).

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

REVIEW ACTIVITIES

Guest Reviewer Journal of Child Clinical Psychology
Guest Reviewer Journal of Gender Culture and Health
Reviewer National Collegiate Athletic Association (NCAA) applications for secondary prevention of alcohol problems grants
Guest Reviewer Journal of Studies on Alcohol
Guest Reviewer Substance Abuse

PUBLICATIONS

Stephens, R.S., Roffman, R., Fearer, S., *Williams, C.D.*, Paciiano, J., & Burke, R.S. (under review). The Marijuana Check-Up: Reaching Users Who Are Ambivalent About Change.

Patten, Christi A; Vickers, Kristin S; Martin, John E; *Williams, C.D*. Exercise interventions for smokers with a history of alcoholism: Exercise adherence rates and effect of depression on adherence. Addictive Behaviors, 28(4) Jun 2003, 657-667

Williams, C. D. (1999). Personal Projects and Alcohol Use: An Integrated Social Cognitive Approach.
Unpublished master's thesis, Virginia Polytechnic Institute and State University, Blacksburg.

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.

Chen, A.H., Sallis, J.F., Castro, C.M., Hickman, S.A., Lee, R.E., *Williams*, C.D., & Martin, J.E. (1998). A home-based intervention to promote walking in sedentary ethnic minority women: Project WALK. Women's Health: Research on Gender, Behavior and Policy, (4), 19-39.

PRESENTATIONS

1. *Williams*, C. D.. Assessing alcohol interventions for high risk college student drinkers: The drinker's biography. In R.K. Hester (Chair). Taming demon rum: Helpful computer based solutions for problem drinkers. Symposium conducted at The Tenth International Conference on the Treatment of Addictive Behaviors, September 2003, Heidelberg, Germany.

2. Fearer, S.E., Walker, N.R., Stephens, R.S., Roffman, R.E., & *Williams, C.D.* Predicting Change in the Marijuana Check-up. (poster presented to the annual meeting of Association for the Advancement of Behavior Therapy, November, 2002, Reno, NV).

2. Stephens, R.S., Roffman, R.E., Fearer, S.E., Walker, N.R., & *Williams, C.D.* The Marijuana Check-up: Augmenting the impact of brief interventions for ambivalent marijuana users (poster presented to the annual meeting of Association for the Advancement of Behavior Therapy, November, 2002, Reno, NV).

3. Walker, N.R., Stephens, R.S., Roffman, R.E., Fearer, S.E., & *Williams, C.D.* Measuring Motivation for Marijuana Change. Stephens, R.S., Roffman, R.E., Fearer, S.E., Walker, N.R., & Williams, C.D.

4. *Williams*, C.D., Stephens, R.S., Roffman, R., & Adams, S.E. psychometric analyses of marijuana use and problems measures (poster presented to the annual meeting of Association for the Advancement of Behavior Therapy, November, 2000, New Orleans, LA).

5. Adams, S.E., Stephens, R.S., & *Williams*, C.D. Development of scale assessing drinking self-regulatory strategies among college student drinkers (poster accepted to the annual meeting of Association for the Advancement of Behavior Therapy, November, 2000, New Orleans, LA).

6. Stephens, R.S., Roffman, R. *Williams*, C.D., Adams, S.E., Burke, R.S., Balmer. A., & Piccano, J. The Marijuana Check-up: Outcomes and implications (poster presented to the annual meeting of Association for the Advancement of Behavior Therapy, November, 2000, New Orleans, LA).

7. Berghuis, J.P., Roffman, R.A., Stephens, R.S, Campbell, A., Swan, M., *Williams*, C.D., Adams, S.E., Smith, B, & Young, J., Motivating adolescent marijuana use Cessation: The teen marijuana Check-up (poster presented to the 7th Annual Joint Conference on Health: Washington State Public Health Association, September, 2000, Tacoma, WA).

8. Berghuis, J.P., Roffman, R.A., Stephens, R.S, Campbell, A., Swan, M., *Williams*, C.D., Adams, S.E., & Smith, B, Young, J., Motivating adolescent marijuana use cessation: Results of a pilot study (poster presented to the annual conference for the Society of Social Work Research, November, 2000, Atalanta, GA).

9. *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 presented at the annual meeting of Association for the Advancement of Behavior Therapy, November, 1999, Toronto, Canada).

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

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

12. *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).

13.   *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).

14.   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).

15.   Galper, D.I., Kearns, S.C., *Williams*, C.D., Altman, D.I., & Winett, R.S. Strenth 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).

16.   *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).

17.   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.).

18.   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.).

19.   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.).

20.   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)).

21.   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.. Personal projects and alcohol use in college students: An integrative social cognitive approach.

Stephens, R.S., Roffman, R.S., *Williams*, C.D., & Adams, S.E. (manuscript in preparation). The Marijuana Check-up: Outcomes and Implications.

Williams, C.D., Walker, N.R., Stephens, R.S., Roffman, & Adams, S.E. (manuscript in preparation). Measuring ambivalence for change in adult marijuana users.

REFERENCES

Robert S. Stephens, Ph.D., Associate Professor of Psychology and Director of Graduate Programs, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24060; Telephone: (540) 231-6304: E-mail stephens@vt.edu.

Richard Winett, Ph.D., Professor of Psychology and Director of Clinical Training, Virginia Polytechnic Institute and State University, Blacksburg, VA 24060; Telephone: (540) 231-8747: E-mail rswinett@vt.edu

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