

Understanding Self-Efficacy for Alcohol Use:
The Roles of Self-Monitoring and Hypothesized Source Variables

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Abstract

Self-efficacy for avoiding alcohol use predicts alcohol use after treatment. However, self-efficacy predicts outcome differentially depending on whether ratings are made before or after treatment. In order to increase the predictive validity of self-efficacy judgments, the hypothesized sources of self-efficacy were examined in the current study utilizing a college student population. Self-efficacy ratings for avoiding heavy drinking before and after self-monitoring of drinking behavior were examined in order to understand whether careful examination of current behavior would result in more informed self-efficacy judgments. Participants ($N = 135$) completed questionnaires that assessed self-efficacy, drinking behaviors, alcohol expectancies, and perceived normative alcohol use. Participants were assigned to either the control or self-monitoring condition. Self-monitors recorded drinking behaviors during the four weeks after the baseline assessment. All participants returned for a follow-up assessment four weeks later. Consistent with predictions based on social cognitive theory, heavy drinking, positive alcohol expectancies, and perceived norms of use were inversely related to self-efficacy. Hierarchical multiple regression analyses indicated that self-monitoring did not lead to stronger relationships between source variables and self-efficacy. Individuals who appeared to be overconfident in their self-efficacy judgments at baseline did not make more accurate ratings as a result of self-monitoring. Results from this study highlight potential sources of information individuals use in making self-efficacy judgments.

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Introduction

Bandura's (1977; 1997) social cognitive theory has guided alcohol use and abuse research. Self-efficacy, a primary construct in social cognitive theory, has generally been defined as the conviction that one can successfully execute the behavior required to produce the outcomes (Bandura, 1977). According to Bandura (1999), efficacy beliefs determine the effort put toward a goal and the amount of perseverance demonstrated in the face of difficulties. In alcohol research there are various types of self-efficacy (i.e., control, abstinence, resistance), but self-efficacy is most often construed as the judgment of one's ability to avoid drinking heavily, also termed drinking refusal self-efficacy. Theoretically, evaluation of self-efficacy (SE) plays a key role in the ability to assess vulnerability to initiating alcohol abuse and in predicting ability to modify or abstain from abusing (DiClemente, Fairhurst, & Piotrowski, 1995). However, studies of self-efficacy have shown mixed results regarding the ability to predict alcohol use. The conditions and assessment techniques that lead to more valid self-efficacy judgments in this area are uncertain and may be informed by careful consideration of the theoretical determinants of self-efficacy. The present study explores factors related to the validity of efficacy judgments and potential means of increasing the validity of those judgments.

There are four hypothesized sources of self-efficacy: performance accomplishments, vicarious experiences, verbal persuasion, and emotional arousal. Performance accomplishments are the most influential source of efficacy information because they are based on experiences of personal mastery (e.g., Bandura, Adams, & Beyer, 1977). Cognitions are altered most readily by mastery experiences, which then strongly influence future behavior (Bandura, 1977). Past behavioral successes raise self-efficacy and repeated failures lower self-efficacy. Applied to the addictive behaviors, self-efficacy for successfully avoiding excessive alcohol use when confronted with a high-risk situation is also assumed to change systematically as a function of mastery experiences (Burling, Reilly, Moltzen, & Ziff, 1989). According to DiClemente, Fairhurst, and Piotrowski (1995), self-efficacy should mediate treatment gains and the successful modification of addictive behavior.

Differential Predictive Validity of Self-Efficacy

Studies of the predictive validity of self-efficacy judgments made both before and after treatment suggest the importance of the role of recent performance accomplishments. Regarding cigarette smokers, pre-treatment self-efficacy ratings typically have not predicted post-treatment

smoking outcomes (Baer, Holt, & Lichtenstein, 1986; Garcia, Schmitz, & Doerfler, 1990; Owen, Ewins, & Lee, 1989), although there is at least one exception (Gwaltney et al., 2001). On the other hand, future cigarette reduction or cessation has been predicted fairly consistently by end-of-treatment self-efficacy ratings (Baer et al., 1986; Condiotte & Lichtenstein, 1981; DiClemente, 1981). In a state-of-the-art study utilizing palm-top computers, daily self-efficacy judgments made after quitting predicted subsequent relapse risk, even after controlling for baseline self-efficacy and concurrent smoking (Shiffman et al., 2000). Overall, the majority of cigarette smoking research shows that self-efficacy demonstrates fairly consistent relationships to future smoking behavior, but end-of-treatment self-efficacy ratings have been more predictive of future behavior than pre-treatment self-efficacy ratings.

Alcohol studies have found mixed results regarding the predictive validity of both pre-treatment and end-of-treatment self-efficacy ratings. Solomon and Annis (1990) found that pre-treatment self-efficacy was strongly associated with average daily drinking at three-month follow-up. Over the course of treatment for alcohol problems, self-efficacy has been found to increase significantly (Burling et al., 1989; Rychtarik, Prue, Rapp, & King 1992, Vogel, Eriksen, & Bjoernelv, 1997), and efficacy by the end of treatment predicted abstinence at the six-month follow-up. End-of-treatment self-efficacy successfully predicted follow-up abstinence status for a condition receiving no aftercare treatment whereas it was not predictive of outcomes in the aftercare condition (McKay, Maisto, & O'Farrell, 1993). Other studies have also found that end-of-treatment self-efficacy was predictive of abstinence status at three-month follow-up (Goldbeck, Myatt, & Aitchison, 1997) and length of time to lapse over a 12-month follow-up period (Allsop, Saunders, & Phillips, 2000). Vogel et al. (1997) found that both pre- and post-treatment self-efficacy ratings significantly predicted status at follow-up; however, post-treatment self-efficacy correlated more highly with follow-up drinking status. Furthermore, lower self-efficacy at follow-up has specifically been associated with greater frequency and quantity of drinking (Solomon & Annis, 1990). Generally, pre- and post-treatment self-efficacy evaluations have been shown to predict drinking at follow-up, but post-treatment self-efficacy has demonstrated stronger relationships with drinking status. At present, explanations are lacking for the mixed findings regarding the ability of self-efficacy to predict future drinking.

The reasons why pre-treatment and post-treatment self-efficacy ratings show differential predictive validity have yet to be identified, but several possibilities exist. Bandura (1997) notes

that overconfidence, rather than underconfidence, is a common error in self-appraisals, and ceiling effects sometimes found in self-efficacy data corroborate his assertion (e.g., Rychtarik et al., 1992). For instance, substance abusers may be relatively unaware of the severity of their substance abuse problems and the difficulty in modifying their behavior; therefore, initial ratings of self-efficacy are high. During the course of treatment, individuals attempt to change their behaviors and, consequently, become more aware of the challenges involved in reducing substance use. For example, during alcohol cue exposure in treatment, alcoholics apparently became more aware of the difficulties in reducing their use, resulting in lower reported self-efficacy beliefs as compared to before cue exposure (Cooney, Gillespie, Baker, & Kaplan, 1987). Greater awareness of the difficulty in changing addictive behaviors and awareness of the previous rate of substance use due to having participated in treatment may lead to more accurate self-efficacy appraisals by the end of treatment. The resulting more accurate self-efficacy ratings may explain why end-of-treatment self-efficacy has generally been found to be more predictive of abstinence outcomes.

Stephens, Wertz, and Roffman (1995) examined the ability of hypothesized self-efficacy source variables to predict future behaviors of frequency and status of marijuana use in an attempt to better understand the inconsistent predictive validity of self-efficacy. They found that self-efficacy judgments demonstrated theoretically consistent relationships with the hypothesized sources of efficacy both before and after treatment, but end-of-treatment findings provided stronger support for efficacy theory than the pre-treatment data. In particular, the strength of the relationship between recent marijuana use and self-efficacy for avoiding use was substantially stronger after treatment. There were also indications that other sources of self-efficacy (e.g., contact with other users) were more strongly related to efficacy judgments after treatment. Thus, as efficacy judgments become better informed by recent experiences in treatment, their relation with source variables become stronger.

Other Sources of Efficacy Judgments

Although recent performance accomplishments may be the strongest source of efficacy judgments, Bandura proposes additional influences. Additional variables predictive of alcohol consumption that relate to the theoretical sources of self-efficacy may also help in understanding the type of information used to make self-efficacy judgments. Exposure to other drinkers who model restraint or the lack thereof may influence self-efficacy judgments. Exposure to heavy drinkers may be expected to lower self-efficacy ratings through two of Bandura's hypothesized

sources. Vicarious experiences provide information regarding others' capabilities and are another source of information regarding one's abilities (Bandura, 1997). Stephens et al. (1995) found that self-reported regular contact with marijuana smokers, a type of vicarious experience, was related to lower self-efficacy in marijuana-using participants. Fromme (1983) suggested that similarities found among peers' drinking habits may be explained by the modeling of drinking related behaviors by peers. Verbal persuasion is also likely to be encountered when in contact with other users. For instance, peers may actively encourage use, which will influence the user's self-efficacy beliefs.

Studies of alcohol-consuming college students have found several other predictors of alcohol consumption that also may affect self-efficacy judgments. Some of the more robust findings indicate that perceived alcohol use norms (Baer, Stacy, & Larimer, 1991; Baer, Tapert, & Marlatt, 1992; Mooney & Corcoran, 1991; Wood, Nagoshi, & Dennis, 1992) and alcohol expectancies (Baldwin, Oei, & Young, 1993; Brown, 1985; Burden & Maisto, 1998; Mooney, Fromme, Kivlahan, & Marlatt, 1987; Wood et al., 1992) are among several of the most predictive factors in college students' alcohol use. College students' perceptions of their friends' and others' alcohol use (i.e., perceived alcohol use norms) has been shown to be a significant predictor of self-reported alcohol use (Baer et al., 1992; Nagoshi, 1999; Sher, Bartholow, & Nanda, 2001; Wood et al., 1992), and accounted for variance of use beyond other variables, such as alcohol expectancies (Mooney & Corcoran, 1991; Reis & Riley, 2000). More specifically, perceived drinking patterns of close friends, but not people in general, were significantly related to one's own drinking rates (Baer et al., 1991; Larimer, Irvine, Kilmer, & Marlatt, 1997). Furthermore, perceptions of others' normative quantity of use, but not frequency, have been found to predict personal quantity of use (Baer et al., 1992; Wechsler & Kuo, 2000). Perceived alcohol use norms predict drinking rates even after controlling for prior drinking rates (Baer et al., 1992) and attitudes of personal alcohol use (Perkins & Wechsler, 1996).

The extent to which perceived norms of others' alcohol use can influence one's own behavior can be explained in terms of social learning theory. Perceptions of others' normative alcohol use are similar to the self-efficacy source of vicarious experiences. Individuals must judge their own capabilities in relation to others by making comparisons to a representative group (e.g., friends, other college students). Friends, as compared to people in general, are thought to be more influential because they are more similar on several comparative dimensions, such as age,

educational level, and socioeconomic status, and their behaviors are most often encountered. Memories of friends' behaviors may be faulty, however, due to recall processes that reconstruct information differently than how it was originally observed and encoded. This may be the process by which perceived norms of drinking are typically greater than actual normative data indicates. When it is believed that a close friend engages in a certain level of alcohol use, then one's own behaviors and self-efficacy for avoiding drinking may be modified based on the perceived normative information. Furthermore, friends are likely to discuss past drinking experiences, which may be a type of verbal persuasion. Therefore, examining perceptions of others' alcohol use norms may also add to our knowledge of the conditions promoting more valid self-efficacy judgments.

Another variable predictive of alcohol consumption is that of outcome expectancies. Bandura (1997) defines outcome expectancies as a judgment of the likely consequences a performance will produce. Alcohol expectancies (AE), outcome expectancies specific to alcohol use, reflect the beliefs a drinker holds regarding consequences of personal alcohol use. Common alcohol expectancies would include 'I expect to be more talkative' or 'I expect to have a hangover' after drinking alcohol. Outcome expectancies have repeatedly been shown to lend in the prediction of substance use. For individuals in treatment for alcohol problems, more positive expectancies are associated with negative treatment outcomes (Brown, 1985). In college student samples, alcohol expectancies have been found to increase the predictability of alcohol problems (Wood et al., 1992), drinking patterns (Brown, 1985; Katz, Fromme, & D'Amico, 2000; Stacy, 1997), and quantity and frequency of use (Baldwin et al., 1993; Mooney et al., 1987; Reis & Riley, 2000; Williams, 1999).

Self-efficacy has been found to inversely correlate with alcohol expectancies (e.g., greater SE was correlated with negative AE) (Burke & Stephens, 1997; Evans & Dunn, 1995), and expectancies have been proposed to be a determinant of self-efficacy (Williams, 1999). Alcohol expectancies may be expected to lower self-efficacy ratings through three of the hypothesized sources—vicarious experiences, verbal persuasion, and past performances. Alcohol expectancy beliefs generally begin to develop by observing others, such as parents, and influence the generation of expectancies due to the effects of modeling outcomes. Later, friends serve to influence alcohol expectancies by modeling possible effects of drinking. Witnessing a friend become sick after drinking too much, for example, helps to develop the expectancy of 'If I drink, I may become sick.' Verbal persuasion is likely to be encountered as well. Listening to a friend

discuss how much fun he had when he drank the past weekend, for instance, may result in generating the expectancy of 'Drinking helps people to have fun.' Alcohol expectancy beliefs also become more informed by one's own behaviors and the resultant outcomes that are encountered. Those outcomes encountered most often, either through past performances, vicarious experiences, or verbal persuasion, will become more salient expectancy beliefs. Examining alcohol expectancies may also further add to our knowledge of the conditions promoting more valid self-efficacy judgments.

Current Study

Fewer studies have examined self-efficacy in a non-treatment-seeking college student population. A study by Evans and Dunn (1995) demonstrated lower self-efficacy was significantly related to increased alcohol consumption in a representative sample of college students. Self-efficacy has been found to be one of the strongest predictors of alcohol consumption in college students in relation to goal system involvement and alcohol expectancies (Williams, 1999). In a study examining self-efficacy and self-regulatory strategies for controlling drinking, efficacy uniquely predicted the average number of drinks per drinking day, as did behavioral and environmental self-regulation strategies (Adams, 2000). Baldwin et al. (1993) found that opportunistic self-efficacy (i.e., when presented with an opportunity to drink such as passing a bar on the way home from work), was inversely related to frequency, but not quantity, of alcohol use in college students. Additionally, self-efficacy has been related to quantity of alcohol consumed and the frequency of drinking episodes (Burke & Stephens, 1997) and significantly adds to the prediction of quantity and frequency of alcohol use (Connor, Young, Williams, & Ricciardelli, 2000). One study assessed the ability of brief interventions to reduce college females' alcohol use over the course of two months and found that self-efficacy for engaging in specific behavioral skills to avoid heavy drinking was inversely related to future drinking (Curtin, Stephens, & Bronenberger, 2001). The sizes of the correlations were moderate, ranging between $-.34$ and $-.57$, indicating there is room for improving upon the predictive validity of self-efficacy judgments.

Studies comparing pre- and post-treatment self-efficacy or directly examining conditions that affect the validity of SE in college students are lacking. The same difficulties found with the ability of self-efficacy judgments to predict future behavior in an adult treatment-seeking sample may occur with a non-treatment seeking college sample. For instance, college students may overestimate their ability to refrain from heavy drinking in the face of peer pressure. Treatment is

the proposed mechanism by which self-efficacy judgments are improved in adult samples because treatment requires individuals to carefully examine successes and failures while attempting to change an addictive behavior. If closer attention to the relevant behaviors results in greater accuracy of self-efficacy judgments, then careful self-monitoring of drinking may produce the same results as participating in treatment.

Self-monitoring (SM; see Nelson, 1977 for review) involves monitoring and recording specified behaviors as they occur; therefore, a major advantage of SM is that it provides continuous performance feedback (Korotitsch & Nelson-Gray, 1999). Furthermore, self-monitoring of behavior closely relates to the hypothesized self-efficacy source of performance accomplishments. Past performance accomplishments are related to behavioral memories, which can be fallible due to the nature of how human memories are constructed. By recording behavior concurrently or very soon after it occurs, it is hypothesized that a more accurate self-efficacy judgment would be made because the past performance is more salient. Anecdotal responses reported by Sobell and Sobell (1973) indicated that one participant was surprised by what was learned after a period of self-monitoring. Specifically, monitoring made the participant "cognizant of what I was actually drinking—before it was a guess." Therefore, manipulating self-monitoring and examining its effect on the predictive validity of self-efficacy ratings may add to our knowledge of the conditions that promote valid efficacy judgments.

In the present paper, the relationships between various hypothesized sources and self-efficacy judgments, via both experimental and correlational method, were examined. It was hypothesized that (1) heavy drinking behavior, perceived norms regarding heavy drinking, and positive outcome expectancies for drinking would be inversely related to self-efficacy ratings at each assessment point whereas negative outcome expectancies would be positively related to efficacy judgments; (2) perceived norms and outcome expectancies would contribute to the explanation of self-efficacy ratings beyond heavy drinking; (3) the amount of variance in self-efficacy explained by the hypothesized source variables would be greater after self-monitoring; and (4) self-monitoring would cause greater changes in self-efficacy for those individuals who were initially overconfident in their ability to avoid heavy drinking.

Methods

Participants

Participants ($N = 136$; 55 males) were recruited over two semesters from the psychology research participant pool at Virginia Polytechnic Institute and State University. A copy of the informed consent and sign-up sheets were placed in a folder on the fifth floor of Derring Hall in which undergraduates signed up for the experiment during the first semester. Departmental changes necessitated the second semester of recruitment to be conducted on-line via Experimentrix© software. Psychology students logged onto the website, read a description of the study similar to that found in the folder during the first semester, and signed up on-line. Students 18 years of age and older who had (1) consumed alcohol on at least three separate occasions during the past thirty days and (2) had consumed a minimum of four to five drinks (four for women; five for men) on at least one of those occasions, were eligible to participate. The folder and website included a notation requesting those who signed up to bring planners or calendars that included the previous month to the first meeting. Extra credit points for participation were given dependent upon the condition to which participants were randomized and the completion of specific requirements of the study. Participants in the self-monitoring condition were awarded three points for extra involvement whereas participants in the control condition were awarded two points.

Ages of participants completing the baseline session ranged from 18 to 23 (mean = 19.49; ± 1.25 SD). The majority of participants were Caucasian (91.2%), with the remaining participants being Asian (3.7%), African-American (2.2%), Hispanic (0.7%) and Other (2.2%). Most participants were sophomores (40.4%), with the remaining participants being freshmen (28.7%), seniors (18.4%), juniors (11.8%), and one graduate student. The majority of the sample were not employed (69.1%), lived in an apartment (45.6%) or dormitory (42.6%), and did not belong to a fraternity or sorority (78.7%) at the time of the baseline assessment.

Procedure

Baseline Assessment

Assessment sessions were conducted in small groups, composed of a maximum of 10 participants, led by either the investigator or undergraduate research assistants. Participants were told that the purpose of the study was to examine factors related to college students' beliefs about alcohol, beliefs about friends' alcohol use, and personal alcohol use. Participants signed the consent form (Appendix A) and provided an email address and phone number in order that they could be

contacted in the future. It was explained that all identifying information would be kept confidential and that extra credit (two or three points) would be awarded based on the condition to which they were randomly assigned. During the baseline assessment participants were randomized to one of the two conditions based on pre-assigned identification numbers written on distributed packets. Participants were informed of their assignment to condition at the end of the session. All participants were asked to return for the follow-up assessment session one month from the first assessment. Participants were told the next assessment would be similar to the first and would last approximately 30 to 45 minutes. Participants were informed that they would receive an email or phone reminder two days in advance of the second meeting. Participants were able to sign up for the second assessment session by their preferred day and time after the packet of measures was completed.

After participants consented, a measure of self-efficacy was completed. Next, participants completed a Timeline Followback (TLFB) assessment of drinking for the past 30 days. Participants then completed a packet of measures, including demographic information, perceived drinking norms, alcohol expectancies, stage of change, and problems from alcohol use. The entire session lasted 45 to 60 minutes.

Self-Monitoring (SM) Group. Participants whose pre-assigned identification numbers indicated they were assigned to the experimental group were asked to stay for an additional five minutes. During that time, the SM group received SM cards, written and verbal directions regarding how to complete the self-monitoring cards, and directions for returning completed cards each week (see Appendices B & C for instructions to participants and SM card, respectively). Participants were also informed that they would receive credit (one point) upon completing and returning all four cards. After questions were answered, those participants were dismissed. The SM group then monitored their drinking behaviors for four consecutive weeks, beginning the day after the first session. The SM cards were turned into the experimenter's mailbox located in Derring Hall at the end of each week of monitoring. Korotitsch and Nelson-Gray (1999) recommend regular collection of self-monitored data in order to increase compliance. If a SM card was not returned by the designated date, the participant was contacted and reminded to turn in the card within two days.

Follow-Up Assessment

One month following the first session, participants returned in groups no greater than 10 participants in order to complete the second assessment. A packet of questionnaires similar to those

completed at baseline was administered, including the TLFB for the past 30 days. Included in the questionnaire packets of those participants in the SM group was a measure assessing the experience of monitoring and the accuracy of monitored data (see Appendix D). Following completion of the measures, participants were told they had completed the study, would receive their extra credit, and would be debriefed via email at the conclusion of the study. Debriefing was conducted in this way in order to avoid potential contamination of the pool of participants.

Measures

Demographic Information. A demographic questionnaire (Appendix E) was administered at baseline in order to gather information about participants' student status, age, sex, race, and membership in a fraternity or sorority.

Alcohol Use. At each assessment, the Timeline Followback (TLFB; Sobell & Sobell, 1996) was used to retrospectively assess the quantity and frequency of participants' alcohol use over the past 30 days. This method of assessment utilizes memory prompts associated with certain dates within the time period being assessed in order to enhance recall (Appendix F). For each individual, average number of drinks per drinking day, frequency of drinking per month, and frequency of binge drinking per month were calculated for each administration of the TLFB. The TLFB has been shown to have high test-retest reliability ($r \geq .92$) in a college student sample (Sobell, Sobell, Klajner, Pavan, & Basian, 1986). Good validity has been demonstrated by comparing the TLFB to other assessments of alcohol use, such as reports of collaterals and biochemical tests (Sobell & Sobell, 1996). Binge drinking was defined for females as drinking four or more standard drinks on a single day and, for males, as drinking five or more standard drinks on a single day. Average number of drinks per drinking day and frequency of binge drinking were the primary variables of interest in relation to self-efficacy judgments, which assess perceptions regarding avoiding heavy alcohol use (see below).

Self-Efficacy. Self-efficacy was assessed at both time points by using a modified version of the Situational Confidence Questionnaire (SCQ; Annis & Davis, 1988). The modified version (Appendix G) includes 10 additional items relevant to college students. The SCQ is composed of 36 items in which respondents choose from a scale of 0% (not at all confident) to 100% (very confident) their confidence in their ability to avoid drinking heavily in situations listed in each of the items. Responses were converted to a 10-point scale for analyses. Higher scores indicate higher levels of self-efficacy for avoiding drinking heavily. This version of the SCQ has good reliability

(> .90) and validity (Greaves & Stephens, 1992) and yielded good internal consistency reliability with the present sample as well (.96). It yields two factors, self-efficacy for avoiding heavy drinking in positive and negative situations, and an overall self-efficacy score. The total self-efficacy score used for the current analyses was the average of all items.

Perceived Normative Drinking. A quantity-frequency index (Cahalan, Cisin, & Crossley, 1969) was used at both time points in order to assess participants' perceived norms of close friends' drinking behaviors. A modified version (Friends' Drinking Habits (FDH); Appendix H) was constructed, which requested participants to rate the drinking behaviors of their "close friends," defined as friends with which time is spent as opposed to friends with which participants rarely physically interacted. A modified version of this index has been successfully used in several studies (Baer et al., 1991; Baer et al., 1992; Mooney & Corcoran, 1991) whose aim was to assess perceived norms of others' alcohol use. Questions assess quantity ("When your friends drink, how often do they have as many as 5 or 6 drinks?") and frequency ("Over the past month, how often did your friends drink alcohol?") of alcohol use. Each item has four to nine responses from which to choose. Responses were scored to reflect the perceived norms of the average number of drinks consumed per drinking day.

Alcohol Expectancies. Leigh and Stacey's (1993) Alcohol Outcome Expectancies Scale (AOES; Appendix I) was administered at both time points. The AOES has been successfully used in numerous studies with college students. The AOES is composed of 34 items in which respondents choose from a scale of 1 (no chance) to 6 (certain to happen) the likelihood of experiencing drinking consequences listed in each of the items after drinking heavily. Both negative and positive outcomes of using alcohol are assessed. The positive scale yields four subscales (Positive Social Effects, Fun Effects, Tension Reduction Effects, and Sexual Effects), and the negative scale also yields four subscales (Negative Emotional Effects, Cognitive Impairment Effects, Physical Impairment Effects, and Negative Social Effects). Scores are summed within each scale, with higher scores indicating stronger expectancies. In order to reduce the number of potential predictors in the present study, only two scales were created that represented the average of all positive expectancy items and the average of all negative expectancy items, respectively. Reliability for the present sample was good for both the positive (.87) and the negative scale (.83). Test-retest reliability over a one-week interval was .87 (Leigh & Stacy, 1993).

Stage of Change. The Stage of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller & Tonnigan, 1996) was administered at each time point in order to assess for indications that participants desired to make changes in their alcohol use. The SOCRATES was designed for use and normed utilizing an alcohol abusing population and, therefore, may not be ideal for assessing motivation for change in a college student population. The short form of the SOCRATES is composed of 19 items (Appendix J) in which respondents choose a response from a scale of 1 (No! Strongly disagree) to 5 (Yes! Strongly agree) the degree to which they agree with statements that may or may not reflect how they feel about their drinking. The SOCRATES yields three subscales, with higher scores on each subscale (Ambivalence, Recognition, and Taking Steps) indicating higher levels of ambivalence toward making changes, recognition of problems and desire to make changes, and efforts being taken to make changes in alcohol use, respectively. Factor analyses on the current sample indicated a two-scale solution was better able to explain the data. Items from the Ambivalence and Recognition scales merged into one scale while Taking Steps remained separate. Reliability for the current sample was good (.90 - .93) across the two scales. Test-retest reliability for each of the scales ranges from .82 to .93 (Miller & Tonnigan, 1996). This measure was included for exploratory analyses based on motivation to change drinking.

Alcohol Problems. A 25-item version of the Rutgers Alcohol Problems Index (RAPI; White & Labouvie, 1989) was administered at both time points (Appendix K) in order to assess the frequency at which different problems may have been experienced either as a result of drinking or during drinking. Two additional items assessing problems with driving after drinking were added to further assess problems that college students may experience regularly. The RAPI was developed by utilizing an adolescent sample between the ages of 12 to 21 and is deemed appropriate to use in a college population. At baseline, problems experienced were assessed for the past 6 months while problems were assessed for the past 30 days at follow-up in order to avoid overlap in assessment. Respondents choose from a scale of 0 (never) to 4 (more than 10 times) the extent to which problems have been experienced as a result of drinking. Summing responses derives a total problem score with higher sums indicating more problems experienced. No criterion score is given to indicate level of problem drinking. Test-retest reliability yields a 95% retest rate (White & Labouvie, 1989) and internal consistency with the present sample was good (.91). This measure was included in order to conduct exploratory analyses examining problems from alcohol use.

Social Desirability. Social desirability in responding was measured by the Marlowe-Crowne Scale (MCS; Crowne & Marlowe, 1960). The MCS is composed of 33 true and false items (Appendix L) that describe either desirable but infrequent behaviors or undesirable but frequent behaviors. Items are scored to reflect level of socially desirable responding, with higher scores indicating higher levels of need for approval. Total means of samples approximate to the current sample range from 13.3 to 16.4 ($SD = 4.3$ to 6.8) (Paulhus, 1991). Reliability for the present sample is good (.79) and test-retest reliability over a one-month period is .89. This measure was included for exploratory analyses examining social desirability biases in responding.

Reactivity and Compliance of Self-Monitoring. A self-monitoring questionnaire (SMQ) was developed in order to assess the manipulation of self-monitoring, including any reactive effects and participants' compliance (Appendix D). At follow-up participants were asked several questions regarding the act of self-monitoring, assessing, for example, compliance to instructions and when participants recorded behaviors versus when they were asked to do so. Responses were provided in a Likert-scale or forced choice format, with "other" provided as an answer blank when appropriate in order that participants may write in reasons not accounted for by the provided answers.

Self-Monitoring. Four 3" x 5" cards (Appendix C) were distributed to the SM participants in an envelope upon initiation of self-monitoring instructions at the baseline assessment. Participants' ID number, when and where the card was to be turned in, and the specific dates of the four weeks of the self-monitoring period were written on each of the cards. The recording area of the card was in a table format, with one column for each day, and one row each for beer, wine, and liquor in order that participants would record quantities of each type of alcohol consumed. Having participants record alcohol consumption in such a detailed way, as opposed to combining across types of alcohol categories, was to aid participants in accurately recalling drinking information. On the reverse side of the card was a pictorial representation of drink equivalencies (e.g., 12 oz. of beer equals 5 oz. of wine equals 1 1/2 oz. of liquor) for participants to refer to when recording alcohol quantities. A shortened version of the verbal SM instructions was also provided on the reverse side of the SM cards. By having provided participants a written and pictorial description of standard drink equivalencies and written directions, more accurate data was expected to have been gathered.

Results

Randomization Check

In order to examine if random assignment was successful, chi-square analyses were conducted on categorical demographic variables and t tests with independent samples were conducted on the remaining demographic, dependent, and predictor variables. Participants assigned to the self-monitoring condition ($n = 67$, 25 males) versus the control condition ($n = 69$, 30 males) did not differ on any demographic, dependent, or predictor variables at baseline, except for class status, $X^2(4, N = 136) = 10.45, p < .05$. The self-monitoring group had more underclassmen while the control group had more upperclassmen at baseline. The lack of differences between conditions, however, on the primary drinking, self-efficacy, and source variables suggests that random assignment to condition generally was successful.

Attrition Analyses

Twenty-five participants failed to complete the follow-up assessment. In order to determine if participants who did not complete the study differed systematically by condition, chi-square analyses on categorical variables within each condition and 2 (Condition: Self-Monitoring vs. Control) \times 2 (Dropout Status: Yes vs. No) ANOVAs for the remaining variables were conducted. The ANOVAs did not reveal any significant main or interaction effects, indicating that dropouts did not differ systematically from completers on any of the primary variables of interest. Similarly, comparisons of participants assigned to the control condition who completed the study ($n = 58$) with those assigned to the control condition who did not complete the study ($n = 11$) on categorical variables indicated there were no differences on any variables. Participants assigned to the self-monitoring condition who completed the study ($n = 53$) compared to participants assigned to the self-monitoring condition who did not complete the study ($n = 14$) significantly differed on two demographic variables, employment, $X^2(1, N = 67) = 4.74, p < .05$ and housing, $X^2(3, N = 67) = 12.03, p < .01$. Self-monitors who did not complete the follow-up were more likely to be unemployed and living in an apartment. Although study completers and study drop-outs in the self-monitoring condition differed on two demographic variables, the lack of differences on the primary variables of interest suggests that participants who dropped out of the study were not meaningfully different from those who remained in the study. One self-monitoring participant's data was incomplete, resulting in a sample size of 52 used in analyses examining self-monitoring effects.

Self-Monitoring Compliance and Reactivity

Of those participants assigned to the self-monitoring condition who completed the study ($n = 53$), only 1 self-monitoring card out of a total of 212 cards (4 cards per participant) was not returned. Descriptive analysis of results from the Self-Monitoring Questionnaire indicated 49 participants (92.5%) found that completing the self-monitoring cards was either not difficult at all or a little difficult and all participants indicated having followed the directions. Fifty participants indicated they thought their self-monitoring data was either completely or mostly accurate. Ten (18.9%) of the 53 participants indicated that the act of self-monitoring affected their drinking. Eight thought self-monitoring led to decreases in drinking and two thought self-monitoring increased drinking. In sum, participants appear to have not been overburdened by the self-monitoring task and complied with directions provided.

In order to help inform whether or not self-monitoring produced changes in drinking behaviors, 2 (Condition: Self-Monitoring vs. Control) x 2 (Time: Baseline vs. Follow-Up) ANOVAs were conducted. Means and standard deviations are presented in Table 1. There were no significant main or interaction effects for frequency of drinking or frequency of binge drinking per month. There was a significant condition by time interaction for average drinks per drinking day, $F(1, 109) = 9.24, p < .01$. The control participants' average drinks per drinking day did not change significantly from baseline to follow-up, $t(1, 57) = 1.90, p > .05$, while the self-monitoring participants' average drinks increased, $t(1, 52) = -2.34, p < .05$. These unexpected results suggest that self-monitoring led either to an increase in actual drinking or to an increased reporting of drinking relative to the control condition.

Self-reported drinking behaviors assessed at follow-up completely overlapped the self-monitoring period and provided an opportunity to assess the consistency of data reporting. Zero-order correlations between drinking variables constructed from the Timeline Followback at follow-up and those constructed from self-monitored data were calculated in order to determine the extent to which the reported data were similar. Correlations between self-monitored and follow-up drinking were significant and large in magnitude (.90 - .95). Additionally, t tests indicated that neither average drinks per drinking day, $t(1, 52) = .71, p > .05$, nor frequency of binge drinking, $t(1, 52) = 1.49, p > .05$, as reported in the self-monitored data was significantly different from Timeline Followback data at follow-up. These correlations and analyses indicate that the two methods of assessment of drinking accrued similar results.

Zero-Order Correlations of Self-Efficacy with Source Variables

In order to examine the hypothesis that current drinking behavior, perceived norms, and alcohol expectancies would predict self-efficacy, zero-order correlations were calculated. Correlations are presented for concurrently measured variables in Table 2 for the entire sample of participants at baseline. Self-efficacy was significantly negatively related to greater rates of drinking, positive outcome expectancies, and perceived normative drinking, as predicted. It was expected that negative outcome expectancies would significantly and positively correlate with self-efficacy, but this relationship was not found.

Multivariate Prediction of Self-Efficacy at Baseline

In order to evaluate the second hypothesis that perceived norms and alcohol expectancies would significantly contribute to the prediction of self-efficacy in addition to recent drinking behaviors, hierarchical multiple regression was utilized. Self-efficacy at baseline was regressed on the concurrently measured source variables. Recent drinking was entered on the first step due to the theoretical importance of past performance accomplishments. Perceived norms and alcohol expectancies were entered on the next step. Two models were tested with different indices of recent “heavy” drinking entered on Step 1. In one model average drinks per occasion served as the index of heavy drinking and, in the second model, frequency of binge drinking served as the index of heavy drinking. See Table 3 for regression results. Multicollinearity analyses indicated the predictor variables were not redundant in either model.

In the first model, 24% of the variance in self-efficacy at baseline was explained by average drinks per drinking day, the perceived norm of average drinks per drinking day, and positive and negative alcohol outcome expectancies, $F(4, 130) = 9.70, p < .001$. The addition of the latter three sources variables did not significantly add to the prediction of self-efficacy, $F(3, 130) = 2.28, p > .05$; therefore, this model did not support the hypothesis. The second model indicated 29% of the variance in ratings of self-efficacy at baseline was accounted for by frequency of binge drinking, the perceived norm of average drinks per drinking day, and positive and negative alcohol outcome expectancies, $F(4, 130) = 13.36, p < .001$. The addition of the latter three source variables in this model significantly added to the prediction of self-efficacy, $F(3, 130) = 3.41, p < .05$, supporting the hypothesis. Notably, examination of the Betas in both models indicated that the drinking indices and positive outcome expectancies were the only significant unique contributors to the models.

Multivariate Prediction of Self-Efficacy After Self-Monitoring

In order to examine the hypothesis that the source variables will explain more of the variance in self-efficacy judgments after self-monitoring, hierarchical multiple regressions were conducted separately for baseline and follow-up variables. Only participants in the SM group were used in these analyses ($n = 53$). Zero-order correlations were calculated first and are presented in Table 4 for both assessment points. Examination of the univariate relationships of self-efficacy with each of the source variables after self-monitoring suggest largely the same pattern as before self-monitoring; however, there is some evidence that the magnitude of the relationships were reduced from baseline to follow-up.

Self-efficacy was regressed on each of the source variables at follow-up in the same order as stated for the second hypothesis. Again, two models were constructed with different concurrent drinking indices entered in the first step. Results are presented in Table 5. Betas and R^2 's from baseline and follow-up regressions were then compared in order to assess whether source variables contributed more to the explanation of variance in self-efficacy at follow-up as predicted. Average drinks per drinking day significantly explained 20% of the variance in self-efficacy ratings before self-monitoring, $F(1, 50) = 12.49, p < .001$, but failed to explain significant variance in efficacy after self-monitoring, $F(1, 50) = 1.45, p > .05$. Similarly, 22% of the variance in self-efficacy was explained by frequency of binge drinking before self-monitoring, $F(1, 50) = 13.80, p = .001$, but binge drinking accounted for only 10% of the variance after self-monitoring, $F(1, 50) = 5.69, p < .05$.

Addition of the perceived norms and outcome expectancies source variables did not significantly contribute to the explanation of variance in self-efficacy at baseline for the average drinks model, $F(3, 47) = 1.42, p > .05$ or the binge drinking model, $F(3, 47) = 1.84, p > .05$, but did significantly add to variance explained after self-monitoring in both the average drinks model, $F(3, 47) = 2.96, p < .05$ and binge drinking model, $F(3, 47) = 3.20, p < .05$. Although addition of the source variables after self-monitoring significantly contributed to the variance explained in both models, the total variance explained for the full model was less than the amount of variance explained before self-monitoring. Thus, the hypothesis that self-monitoring would lead to stronger relationships between self-efficacy and hypothesized source variables was not supported.

Differential Changes in Self-Efficacy Ratings

It was predicted that participants whose initial self-efficacy ratings reflected overconfidence in their ability to avoid drinking heavily would show a decrease in self-efficacy beliefs whereas no change was expected for those whose initial self-efficacy ratings were more accurate or for those who did not self-monitor. It was reasoned that overconfidence would be most likely in heavy drinkers with high ratings of self-efficacy for avoiding heavy drinking. Therefore, in order to identify the relatively “overconfident” and relatively “accurate” self-efficacy ratings, the upper 50% of heavy drinkers were first identified via a median split of baseline indices of heavy drinking. Next, this subgroup of heavy drinkers was divided into two groups based on a median split of self-efficacy ratings at baseline. Heavy drinkers who indicated high confidence in their ability to avoid drinking heavily were assigned to the ‘overconfident’ group. Heavy drinkers who indicated less confidence in their ability to avoid drinking heavily were assigned to the ‘accurate’ group. The derivation of overconfident and accurate groups was repeated for both of the indices of heavy drinking (i.e., average drinks per drinking day and frequency of binge drinking) and the hypothesis was tested twice.

In order to detect changes in self-efficacy as a function of initial overconfidence, a 2 (Confidence: Overconfident vs. Accurate) x 2 (Time: Baseline vs. Follow-Up) x 2 (Condition: SM vs. Control) ANOVA was performed on self-efficacy ratings. If self-monitoring led to more accurate, and presumably lower, self-efficacy judgments, then a three-way interaction would be expected. Overconfident self-monitors would be expected to reduce their self-efficacy ratings from baseline to follow-up, whereas no change would be expected for the other groups. There were no significant main or interaction effects when heavy drinkers were based on average drinks per drinking day. A significant interaction of Time and Confidence was found $F(1, 53) = 14.43$, $p < .001$ when the top 50% of heavy drinkers was based on frequency of binge drinking per month. The accurate group’s self-efficacy ratings at baseline ($M = 4.46$, $SD = 1.05$) increased significantly at follow-up ($M = 5.06$, $SD = 1.29$), $t(1, 37) = -3.28$, $p < .01$. The overconfident group’s ratings at baseline ($M = 7.26$, $SD = .87$) significantly decreased at follow-up ($M = 6.58$, $SD = 1.45$), $t(1, 18) = 2.85$, $p < .05$. Thus, overconfident participants reduced their efficacy ratings regardless of treatment condition. This finding may be attributed to regression to the mean in the subsample selected for initially high self-efficacy ratings, but does not support the hypothesized relationship between self-monitoring and increased accuracy of self-efficacy judgments.

Discussion

The present study examined self-efficacy ratings for avoiding heavy drinking before and after the self-monitoring of drinking behavior in order to understand the conditions and variables related to more accurate efficacy judgments. Zero-order relationships between self-efficacy ratings and hypothesized sources of self-efficacy information were generally consistent with predictions both at baseline and follow-up assessments. Multivariate models showed that positive outcome expectancies contributed to the prediction of efficacy ratings beyond the significant contribution of recent drinking behavior, but negative outcome expectancies and perceived norms did not appear to account for unique variation. The hypothesis that self-monitoring drinking behavior would lead to increased correspondence between efficacy ratings and actual behavior was not supported. Instead, self-monitoring appeared to reduce the relationship between self-reported drinking behavior and self-efficacy judgments. Examination of changes in efficacy ratings following self-monitoring also failed to support the hypothesis that more overconfident participants would reduce their efficacy ratings.

Self-efficacy demonstrated significant univariate relationships with the hypothesized sources of self-efficacy at baseline and follow-up, as predicted by social cognitive theory (Bandura, 1977; 1997). Self-efficacy was inversely related to drinking indices, indicating that heavier drinking was related to lower efficacy to avoid drinking heavily. Perceptions of close friends' drinking also negatively correlated with self-efficacy such that people who perceived their friends as drinking heavily were likely to believe they themselves were unable to avoid drinking heavily. Positive alcohol expectancies were inversely related to self-efficacy ratings as well. People who held expectancies that drinking would produce desirable effects were less likely to believe they could successfully avoid drinking heavily. Finally, negative alcohol expectancies were not significantly related to self-efficacy, indicating that undesirable effects of drinking were not highly related to college students' self-efficacy appraisals.

Consistent with univariate results, indices of heavy drinking behavior consistently predicted self-efficacy at baseline when entered first into regression equations and continued to contribute uniquely after controlling for other hypothesized sources. This finding is consistent with Bandura's (1997) assertion that past performance accomplishments are the strongest and most informative source of self-efficacy information. Frequency of binge drinking appeared to explain somewhat more of the variance in self-efficacy ratings at baseline compared to average drinks per drinking

day. Frequency of binge drinking may have been more related to self-efficacy for avoiding drinking heavily, and thus, explained more of the variance in self-efficacy because it directly measures the number of times the individual reaches a threshold for heavy drinking. On the other hand, average drinks per occasion averages across both heavier and lighter drinking occasions and may have been unduly influenced by a few occasions of very heavy drinking.

Addition of the other hypothesized sources of self-efficacy at baseline did not consistently and significantly add to the variance explained in self-efficacy, with differential results occurring depending on the drinking index utilized. Positive alcohol expectancies were the only consistent contributor to the explanation of additional variance in self-efficacy ratings beyond recent drinking. This finding may indicate that the most important information when making efficacy ratings was the reinforcing quality of drinking behavior, and that this information was not completely reflected in recent drinking behavior.

Perceived norms of quantity of use did not appear to aid in explaining additional variance in self-efficacy beyond other source variables. Participants' ratings of friends' quantity of drinking appeared to be largely redundant to personal use in the current study and added nothing to the model. This finding is not necessarily inconsistent with social cognitive theory. Bandura does not predict that the hypothesized sources will incrementally contribute to efficacy judgments. Perceptions of others' alcohol use have been predictive of personal alcohol use in individuals who misperceive the norm (Baer et al., 1992; Mooney & Corcoran, 1991). It may also hold true that perceived norms are only able to add to explaining self-efficacy ratings for individuals who misperceive the norm.

Negative alcohol expectancies did not significantly contribute to the explanation of variance in self-efficacy beyond the other source variables. This lack of contribution was consistent with the zero-order relationships that showed negative expectancies did not relate to drinking behavior or self-efficacy. College students did not appear to make use of this information, either in guiding their drinking behavior or their judgments about avoiding heavy drinking. This could partly be due to the types of negative effects the AOES assesses (e.g., aggressiveness, fights, shame, guilt, hangovers). The rate at which these types of negative consequences occur consistently, and thus, become incorporated into one's negative expectancies, may have been low in the population examined. Results from the RAPI indicated that problems experienced due to alcohol use was minimal in this population and helps to corroborate this assertion.

Inconsistent with predictions, self-monitoring did not lead to stronger relationships with hypothesized source variables. Drinking indices after self-monitoring explained less of the variance in self-efficacy than before self-monitoring. Self-reported drinking at follow-up appeared accurate as suggested by correlations between follow-up and self-monitored drinking indices; however, it appears that participants did not include this information in their follow-up self-efficacy judgments as indicated by increased drinking in this group without corresponding reductions in self-efficacy ratings. The current study was undertaken because of the apparent reporting bias with which self-efficacy judgments are made before individuals are fully aware of their behaviors. It is possible that relationships between drinking and self-efficacy were higher at baseline because both suffered from similar reporting biases. Whereas self-monitoring eliminated or reduced the bias in the report of heavy drinking, the bias in self-efficacy was unchanged. Thus, self-monitoring may lead to more accurate reporting of drinking but reduced correspondence with cognitions regarding avoiding drinking.

Although the other source variables significantly added to the model after self-monitoring, this finding may be an artifact of the reduced relationships between drinking indices and self-efficacy. Univariate relationships between the other source variables and self-efficacy appeared similar both before and after self-monitoring. Only positive expectancies made significant individual contributions after self-monitoring. Although the role of positive alcohol expectancies appears to become somewhat larger after self-monitoring, this also may be an artifact of the reduced relationship between self-efficacy and heavy drinking, which was not expected. Analyses did not indicate that positive expectancies changed as a function of self-monitoring.

Also inconsistent with predictions, a sub-group of self-monitors who appeared relatively overconfident in estimating self-efficacy at baseline did not demonstrate changes in self-efficacy as a function of self-monitoring. Overconfident individuals reduced their self-efficacy ratings regardless of the condition to which they were assigned. This finding suggests a possible regression to the mean effect.

Retrospectively reported drinking after self-monitoring was slightly less than drinking reported in self-monitored data. This raises the concern that self-monitoring may have had reactivity effects. Results from a study similar in design to the current one (Carney, Tennen, Affleck, Del Boca, & Kranzler, 1998) indicated that Timeline Followback data at follow-up showed slightly less drinking than the self-monitored data and concluded SM was not reactive.

They concluded that prospectively recorded drinking data is more accurate than retrospectively recorded data. Whitty and Jones (1992) corroborated those findings and found that prospective diaries detect greater proportions of heavy drinkers as compared to retrospective assessment methods. Other studies have statistically evaluated reactivity effects of self-monitoring and did not find evidence indicating self-monitoring was reactive for college students or for individuals who stated self-monitoring affected their drinking rates (Marlatt, 1985; Sobell et al., 1989). Lastly, Fremouw and Brown's (1980) review of the self-monitoring literature indicated that specific person characteristics increase the likelihood of self-monitoring being reactive, for instance, motivation to change increases reactivity. Participants in the current study did not indicate a desire to make changes nor did they indicate they had recently made changes. Analyses presented earlier indicated that self-reported drinking increased after self-monitoring. This increase could be due to either increased knowledge of drinking that resulted in more accurate reporting at follow-up or the increase could be due to reactivity effects of self-monitoring. Sobell et al. (1989) analyzed Timeline Followback drinking data before and after self-monitoring in order to assess for reactivity and did not find changes in drinking due to self-monitoring as was found in this study. The period of self-monitoring was briefer in the Sobell et al. study than in the current study. Had participants monitored their drinking for a longer period of time, significant indications of increased retrospective self-reporting of drinking may have been demonstrated. While increased reporting on the Timeline Followback in this study may appear to be a reactivity effect, relationships similar to the ones found in the current study between self-monitored data and self-report data at follow-up have also been found in studies in which the issue of reactivity was examined more closely. Those authors determined self-monitoring was not a contributing factor to the differences in drinking exhibited on the two methods of assessment. In sum, self-monitoring was proposed to assist individuals in becoming more aware of their drinking habits, and it appears as though this raised awareness is indicated by the increased reporting of drinking at follow-up.

Self-monitoring was also posited as a method to increase the accuracy of self-efficacy judgments because it would focus attention upon performance accomplishments. However, drinking indices explained less variance in self-efficacy after self-monitoring than before self-monitoring. Anecdotally, participants indicated they became more aware of their drinking habits; however, drinking habits in this population range from infrequent to very frequent binge drinkers. Raised awareness of patterns that fluctuate rather than remain consistent may help to explain why

drinking indices after self-monitoring explained less of the variance in self-efficacy ratings. Before self-monitoring, participants were likely to be confident in their ability to accurately report both their drinking habits and self-efficacy ratings; however, self-monitoring may have demonstrated that they had less of a consistent drinking pattern than they thought. Recognition of inconsistencies in drinking may have led participants to not incorporate drinking behaviors into ratings of self-efficacy at follow-up; therefore, they only incorporated long-standing and more consistent knowledge regarding positive alcohol expectancies. Perhaps a longer period of self-monitoring would have helped to establish a more consistent drinking pattern, which would have then affected cognitions utilized in self-efficacy judgments.

Results from this study inconsistently supported predictions based on social learning theory and indicate the need for further investigation due to several factors. Treatment was the proposed mechanism by which treatment-seekers' self-efficacy ratings are more predictive of alcohol use after treatment. When in treatment, individuals become more aware of previous use patterns and the relationship alcohol and drug use has with other areas of life (e.g., disturbed relationships, health problems, coping mechanisms). Self-monitoring was proposed to mimic the effects gained while in treatment. Self-monitoring, although successfully carried out in this study, appeared to raise awareness of consumption and positive alcohol expectancies, but did not impact self-efficacy ratings as anticipated. Alternative methods of self-monitoring may help to increase the comparability of self-monitoring to treatment. For instance, additional behaviors related to drinking could be monitored as they occur, such as money spent, alcohol's effect on life domains (i.e., relationships, school) or situations in which alcohol is consumed. Monitoring of negative consequences may also help college students become more aware of the influence of negative alcohol expectancies. Asking participants to pay attention to peripheral behaviors associated with drinking may be closer in approximation to information gained in treatment rather than solely monitoring drinking behaviors.

Participants' ratings of perceived normative use in this study may have been different from actual normative use in the population, but levels of perceived norms were similar to personal alcohol use, resulting in redundancy between norms and drinking indices. This redundancy may be why norms, although related to self-efficacy, did not add to the explanation of self-efficacy. Inclusion of additional participants who are more likely to misperceive the norm, such as members of fraternities or sororities and frequent binge drinkers (defined as having binged three or more

times in the past 2 weeks; Wechsler & Kuo, 2000), will help to evaluate this hypothesized efficacy source more effectively. Alternatively, assessing perceived norms for attitudes of drinking acceptance or common drinking situations may be additional, and perhaps better, contributors to self-efficacy judgments. Finally, the anticipated sample size was not recruited. Inclusion of additional individuals would have increased the power to detect effects, especially since some effects were in the expected direction but not significant. Despite limitations, the current study highlights the complexity of identifying and disentangling the factors and sources of information that individuals use to arrive at efficacy judgments.

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Table 1

Means and Standard Deviations of Predictor and Dependent Variables

Variables	<u>Control (n = 58)</u>				<u>Self-Monitor (n = 52)</u>			
	<u>Baseline</u>		<u>Follow-up</u>		<u>Baseline</u>		<u>Follow-up</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Self-efficacy	6.22	1.83	6.18	1.83	5.82	1.86	6.08	1.71
Average drinks per drinking day	5.46	2.39	5.14	2.40	5.52	1.93	6.22	3.41
Frequency of binge drinking / month	6.59	4.48	5.86	4.06	6.09	3.71	6.01	4.24
Frequency of drinking / month ^a	10.16	4.68	9.48	4.17	9.08	4.56	8.73	4.12
PN: Average drinks per drinking day	5.09	0.99	5.02	0.88	5.11	0.88	5.05	1.09
AOES-positive	4.26	0.62	4.23	0.56	4.45	0.58	4.40	0.48
AOES-negative	3.17	0.67	3.13	0.54	2.97	0.60	2.99	0.54
SOCRATES-Recognition ^b	1.74	0.58	1.63	0.54	1.64	0.56	1.64	0.60
SOCRATES-Taking Steps ^b	2.17	0.92	2.07	0.96	2.04	0.74	2.00	0.83
RAPI ^{b,c}	16.60	13.59	11.43	10.15	14.49	10.89	10.28	9.36
SMD: Average drinks per drinking day							6.29	3.02
SMD: Frequency of binge drinking / month							6.62	4.34
SMD: Frequency of drinking / month							9.65	4.76

^aNot used as a primary drinking index. ^bUsed for exploratory analyses only. ^cBaseline reflects problems in past 6 months, follow-up reflects past month. PN = Perceived norm. AOES = Alcohol Outcome Expectancy Scale. SOCRATES = Stage of Change Readiness and Treatment Eagerness Scale. RAPI = Rutgers Alcohol Problems Index. SMD = Self-monitored data.

Table 2

Intercorrelations of Concurrently Measured Self-Efficacy with Source Variables at Baseline for Full Sample

Variables	Baseline (n = 135)					
	1	2	3	4	5	6
1. Self-efficacy	1.00					
2. Avg drinks ^a	-.435**	1.00				
3. Freq of binge drinking ^b	-.485**	.634**	1.00			
4. PN: Avg drinks ^a	-.292**	.494**	.439**	1.00		
5. AOES-positive	-.292**	.313**	.198*	.169*	1.00	
6. AOES-negative	.062	-.039	.021	-.005	.163	1.00

^aAverage drinks per drinking day. ^bFrequency of binge drinking per month. PN = Perceived norm. AOES = Alcohol Outcome Expectancy Scale.

* p < .05. ** p < .01.

Table 3

Hierarchical Multiple Regression of Self-Efficacy at Baseline Regressed on Concurrently Measured Source Variables

Source Variables	β	ΔR^2
Step 1		
Average drinks per drinking day	-.324**	.19***
Step 2		
Norms: Average drinks per drinking day	-.100	.04
AOES-positive	-.187*	
AOES-negative	.079	
Full model		.23***
Step 1		
Frequency of binge drinking per month	-.412**	.24***
Step 2		
Norms: Average drinks per drinking day	-.074	.06*
AOES-positive	-.216**	
AOES-negative	.105	
Full Model		.29***

Note. $n = 135$. β 's are for the full model.

AOES = Alcohol Outcome Expectancy Scale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4

Intercorrelations of Concurrently Measured Self-Efficacy with Source Variables for Participants in Self-Monitoring Condition

Variables	<u>Baseline (n = 52)</u>					
	1	2	3	4	5	6
1. Self-efficacy	1.00					
2. Avg drinks ^a	-.447**	1.00				
3. Freq of binge drinking ^b	-.465**	.566**	1.00			
4. PN: Avg drinks ^a	-.326*	.602**	.456**	1.00		
5. AOES-positive	-.204	.155	.075	.143	1.00	
6. AOES-negative	.209	-.111	-.130	-.011	.252	1.00

Variables	<u>Follow-up (n = 52)</u>					
	1	2	3	4	5	6
1. Self-efficacy	1.00					
2. Avg drinks ^a	-.168	1.00				
3. Freq of binge drinking ^b	-.320*	.677**	1.00			
4. PN: Avg drinks ^a	-.273	.561**	.529**	1.00		
5. AOES-positive	-.288*	-.227	-.228	-.097	1.00	
6. AOES-negative	-.070	-.009	-.041	.013	.093	1.00

^aAverage drinks per drinking day. ^bFrequency of binge drinking per month. PN = Perceived norm. AOES = Alcohol Outcome Expectancy Scale.

* $p < .05$. ** $p < .01$.

Table 5

Hierarchical Multiple Regression of Self-Efficacy Regressed on Source Variables at Baseline and Follow-Up for Participants in Self-Monitoring Condition

Source Variables	β		ΔR^2	
	BL	FU	BL	FU
Step 1				
Average drinks per drinking day	-.337*	-.105	.20***	.03
Step 2				
Norms: Average drinks per drinking day	-.093	-.245	.07	.16*
AOES-positive	-.194	-.332*		
AOES-negative	.220	-.034		
Full Model			.27**	.18*
Step 1				
Frequency of binge drinking per month	-.363*	-.338*	.22***	.10*
Step 2				
Norms: Average drinks per occasion	-.127	-.129	.08	.15*
AOES-positive	-.213	-.373**		
AOES-negative	.214	-.047		
Full Model			.30**	.25**

Note. $n = 52$. β 's are for the full model.

BL = Baseline. FU = Follow-up. AOES = Alcohol Outcome Expectancy Scale.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Appendix A
Consent Form

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Informed Consent for Participants of Investigative Projects

Title of Project: Understanding Self-Efficacy for Alcohol Use:
The Roles of Self-Monitoring and Hypothesized Source Variables

Investigators: N. Robrina Walker, B.S.
Robert S. Stephens, Ph.D.

I. The Purpose of this Project

The purpose of this project is to examine factors contributing to individuals' beliefs about alcohol, beliefs about their friends' use of alcohol, and personal alcohol use.

II. Procedures

Everyone will be asked to complete several questionnaires that ask about their use of alcohol, their friends' alcohol use, and beliefs about the effects of alcohol. You will be asked to complete these questionnaires on two separate occasions over the course of one month. Subjects will be randomly divided into two groups. The first group will complete the questionnaires, as stated above. Subjects in the second group will complete the questionnaires and will also record and report their alcohol use over four weeks' time.

III. Risks

Few risks are involved with participation in this study. If there are any questions that make you feel uncomfortable, you may refuse to answer those questions or discontinue your participation in the study without penalty.

IV. Benefits of this Project

You may benefit from participating in this study by learning how psychological research is conducted.

V. Extent of Anonymity and Confidentiality

All responses will be kept strictly confidential. Your name will not be stored with any of the data we obtain from you. The consent form will be stored separately from your responses in a locked cabinet that is accessible only to members of the research team.

VI. Compensation

You will receive two to three extra credit points towards your psychology grade for participation in this study. All participants will earn 2 credit points for completing questionnaires on two separate occasions over one months' time. Those participants assigned to record their alcohol use over the course of four weeks will earn one additional credit point.

VII. Freedom to Withdraw

If at any time during the study you become uncomfortable, you are free to withdraw your participation without penalty. You will still receive credit for participating up to the point you withdrew. You may also choose not to answer specific questions without penalty.

VIII. Approval of Research

This research project has been approved (IRB #01-326), as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University and by the Human Subjects Committee of the Department of Psychology.

IX. Participant's Responsibilities

I voluntarily agree to participate in this study. I will be responsible for completing various questionnaires on two separate occasions about my alcohol use, my friends' alcohol use, and my beliefs about the effects of alcohol. I may also be responsible for recording my alcohol use over four weeks, depending upon the group to which I am randomly assigned.

X. Participant's Permission

I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project. If I participate, I may withdraw at any time without penalty. I agree to abide by the rules of this project.

Printed Name

Signature

Date

Should I have any questions about this research or its conduct, I may contact:

N. Robrina Walker, B.S.	231-7631	nawalke2@vt.edu
Robert S. Stephens, Ph.D.	231-6304	

IRB Representatives:

David Harrison, Ph.D.	231-4422	Dr. David Moore	231-4991
Chair, Psychology Human Subjects Committee		Chair, IRB CVM Phase II	moored@vt.edu

Appendix B

Self-Monitoring Instructions

Directions for Self-Monitoring Group

If you look in the envelope, you'll find four cards. I'll now read you directions on how to use the cards.

1. You will be recording how much alcohol you drink over the next month. We want to have detailed information on your pattern and amount of use. We are not asking you to make changes in the way you drink.
2. You will record the amount you drink over the next four weeks in the spaces provided on the graph on the front of the card. Starting tomorrow, where the arrow is on the card marked #1 in the upper left corner, write in how many standard drinks you consume, broken down by type of alcohol. On the back of the card are picture representations of standard drink equivalencies across beer, liquor, and wine, just like you saw when you completed the calendars. These pictures will help you determine if, for example, a beer you drink from a bar is equal to one standard drink or more. If you consume a mixed drink and it contains two shots of liquor, when you record the drink it will equal two drinks, not one.
3. We ask that you record your alcohol consumption for each day, at the end of the day. Doing it this way will be easier for you and more accurate rather than if you wait until the end of the week. Recording your consumption the morning after a night in which you drank is okay too, as long as you write it down as soon as possible. It is expected that recording your drinking each week will likely take approximately fifteen minutes.
4. For days in which no alcohol is consumed at all, please record zeros in the appropriate area of the graph.
5. You may be tempted to not correctly report all the alcohol you consume. For instance, if you consume a lot but don't want anyone to know, you may be tempted not to report the actual amount. Please accurately record the amount you consume. All of the information you provide will be kept confidential and your identifying information will be kept separately from your data.
6. You are to turn in each card the day after you have completed it. The cards are to be turned into the mailbox labeled "Robrina Walker," on the 5th floor of Derring, Room 5086-A. When and where you are to turn them in is also written on the bottom of the card. You are then to continue recording your alcohol use during the second week on the card labeled #2, and turn that card into the same mailbox on the day after you complete it. This process will continue until the fourth card is completed and turned in.

Appendix C

Self-Monitoring Card

Self-Monitoring Card

Front:

Please be as accurate as possible!

ID Number: _____

Date	S	M	T	W	T	F	S
Beer 12 oz.							
Wine 5 oz.							
Liquor 1 1/2 oz.							

Date Due: _____ Turn in at: 5th floor Derring, Rm 5086-A
"Robrina Walker" mailbox




Reverse:

Directions

1. Record your alcohol consumption as soon as possible after drinking—either at the end of the day or the morning after.
2. For days in which no alcohol is consumed, please write zeros in the table where appropriate.
3. Cards are due the day after completion. Continue recording alcohol consumption during the second week on the second card; turn that card in after completed. This same process will continue until fourth card is completed and turned in.

Drink Equivalencies

12 oz. beer = 5 oz. wine = 1 1/2 oz. liquor

Appendix D
Self-Monitoring Questionnaire

Self-Monitoring Questionnaire

Directions: The following questions ask about your experiences of recording your alcohol use over the last four weeks. Please answer as honestly as possible and indicate your answers by either filling in the blank or circling your answer.

1. Approximately how much time did it take to complete the self-monitoring card each week?

_____ minutes

2. How difficult was the task of recording how much you drank?

very difficult

somewhat difficult

a little difficult

not difficult at all

3. Did you follow the directions for self-monitoring that the experimenter provided? yes no

If no, what did you do instead? (please explain fully)

4. When did you typically record your alcohol consumption?

4a. morning night

4b. daily every other day every couple of days once a week

5. Do you think the act of recording how much you drank changed or influenced the amount you drank over the course of the past month?

yes no

If yes, did your alcohol use increase or decrease?

6. Sometimes the task of recording how much we drink is difficult. How accurate was the information you provided on the self-monitoring cards? (Circle one)

completely accurate

mostly accurate

half-way accurate

mostly inaccurate

not accurate at all

Appendix E
Demographic Questionnaire

Demographic Information

Please circle or fill in the blank with the appropriate response.

1. Sex: male female

2. Age: _____

3. Race: African-American Caucasian
 American Indian/Alaska Native Hispanic
 Asian Other

4. Employment: 30 hours or more per week
 20 – 29 hours per week
 10 – 19 hours per week
 less than 10 hours per week
 not employed

5. Class Status: Freshman
 Sophomore
 Junior
 Senior
 Graduate

6. Are you currently a member of a fraternity or sorority?
 yes no

7. What type of housing do you currently live in?
 Dormitory House
 Apartment Fraternity/Sorority house

8. If you live in fraternity/sorority house, please briefly describe the alcohol policy at the house.

Appendix F
Timeline Followback

Timeline Followback

We would like you to recall your drinking over the past **30 days**. This may sound hard to do, but it actually is not difficult, especially when you use a calendar for a reference. Calendars have been found to be very useful in helping people recall their drinking. Listed below are instructions and hints for using the calendar.

Instructions:

This and the following page contain directions that refer to writing on a calendar that is provided. The calendars are located directly after the two direction pages. While reading through the directions, please flip to the calendar sheets and write on them as necessary. You'll see that some days on the calendars have been crossed through. You only need to mark on the days that have not been crossed out.

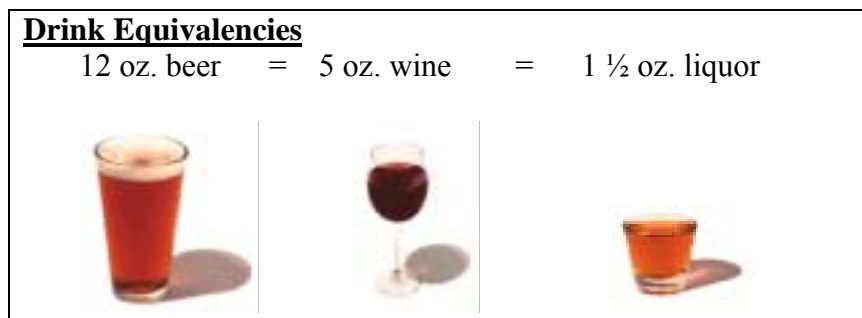
Filling in the Calendar

1. First mark events on the calendar provided. Marking events will help you remember what has been going on in your life which will then help you remember times that you might have drank alcohol. The following is a list of hints or suggestions for marking events on the calendar:
 - a. Mark days on the calendar that are specific to you, such as days you had tests, went to a party, birthdays, trips, doctor's appointments, when you were sick, etc.
 - b. Sometimes people have certain patterns to their life, such as always studying on certain nights or always going out with friends on certain nights. Marking these patterns may also help you recall your drinking.
 - c. If you have a planner or appointment book, you may use it to help you recall events that have occurred over the past month.

*Many people find it's easier to fill out the calendar starting with yesterday and then work their way backwards from there.

Recording Your Alcohol Use

2. Now that you have the events marked on the calendar, you can use them to recall if you drank on certain days. While a precise day-by-day account of your drinking would be great, all we expect you to do is estimate how much you've consumed daily. So if you're not sure how much you drank on a certain day, use your best estimate.
3. For each day on the calendar, please write in the number of drinks you consumed. Our definition of one drink is **one 12 ounce beer, one 5 ounce wine, or 1 ½ ounces of liquor** (straight or in a drink).



4. On any day in which you drank, write the total number of drinks you had, which means adding across different types of drinks. For example, if you had two 12-ounce beers and a drink with 1 ½ ounces of liquor, you would list that as 3 drinks.
5. On days you did not drink, please write in a "0".

Appendix G
Situational Confidence Questionnaire

SCQ

Directions: Listed below are a number of situations or events in which some people experience difficulty in avoiding heavy drinking. Imagine yourself in each of these situations and indicate how confident you are that you would be able to *resist the urge to drink heavily* (heavily means 5 or more drinks for men, 4 or more for women) according to the following scale:

not at all confident						very confident
0%	20%	40%	60%	80%		100%

I would be able to resist the urge to drink *heavily*:

1. if I felt uneasy in the presence of someone	0%	20%	40%	60%	80%	100%
2. if I unexpectedly found a bottle of my favorite booze	0%	20%	40%	60%	80%	100%
3. if I were at a party and other people were drinking	0%	20%	40%	60%	80%	100%
4. if I felt I had let myself down	0%	20%	40%	60%	80%	100%
5. if I broke up with my significant other	0%	20%	40%	60%	80%	100%
6. if I were talking to an attractive member of the opposite sex	0%	20%	40%	60%	80%	100%
7. if I suddenly had the urge to drink	0%	20%	40%	60%	80%	100%
8. if I angry at the way something had turned out	0%	20%	40%	60%	80%	100%
9. if other people didn't seem to like me	0%	20%	40%	60%	80%	100%
10. if I were at a friend's place and they were playing drinking games	0%	20%	40%	60%	80%	100%
11. if someone pressured me to be a "good sport" and have a drink	0%	20%	40%	60%	80%	100%
12. if I was at a fraternity party	0%	20%	40%	60%	80%	100%
13. if someone criticized me	0%	20%	40%	60%	80%	100%
14. if I were on a date and my date was drinking	0%	20%	40%	60%	80%	100%
15. if I had just finished a long day of classes or work	0%	20%	40%	60%	80%	100%
16. if it was a weekend	0%	20%	40%	60%	80%	100%

not at all confident						very confident
0%	20%	40%	60%	80%		100%

I would be able to resist the urge to drink *heavily*:

17. if I felt lonely	0%	20%	40%	60%	80%	100%
18. if I was at a casual get together	0%	20%	40%	60%	80%	100%
19. if I had some extra money	0%	20%	40%	60%	80%	100%
20. if a friend was buying me drinks	0%	20%	40%	60%	80%	100%
21. if I felt anxious and wanted to relax	0%	20%	40%	60%	80%	100%
22. if I had an argument with a friend or roommate	0%	20%	40%	60%	80%	100%
23. if I were in a restaurant and the people with me ordered pitchers of beer and mixed drinks	0%	20%	40%	60%	80%	100%
24. if I were at tailgate party for a football game	0%	20%	40%	60%	80%	100%
25. if someone I was attracted to was drinking	0%	20%	40%	60%	80%	100%
26. if there were problems at school or work	0%	20%	40%	60%	80%	100%
27. if other people made me tense	0%	20%	40%	60%	80%	100%
28. if I was with friends watching TV	0%	20%	40%	60%	80%	100%
29. if I were at happy hour with a group of friends	0%	20%	40%	60%	80%	100%
30. if I was bored	0%	20%	40%	60%	80%	100%
31. if I had just gotten a good grade on a test	0%	20%	40%	60%	80%	100%
32. if I were at a bar having a good time	0%	20%	40%	60%	80%	100%
33. if I was at a party where I didn't know many people	0%	20%	40%	60%	80%	100%
34. if I wanted to celebrate with a friend	0%	20%	40%	60%	80%	100%
35. if I was talking to someone I didn't know well	0%	20%	40%	60%	80%	100%
36. if I were enjoying myself at a party and wanted to feel even better	0%	20%	40%	60%	80%	100%

Appendix H
Friends Drinking Habits

FDH

Directions: Please answer the following questions about how much you think your closest friends drink. Think of your *closest friends*, which we define as those people with whom you spend much of your time.

1. We are interested in how frequently you believe your friends drink alcoholic beverages. In general, over the past month, how often did your friends have any drink containing alcohol, whether it was wine, beer, hard liquor, or any other alcoholic beverage? Please check the item that best describes their usual drinking frequency:

- two times a day
- once a day
- nearly every day
- three or four times a week
- once or twice a week
- two or three times a month
- about once a month
- less than once a month but at least once a year
- never

2. When you think about your friends drinking, how often do they have 7 drinks or more?

- nearly every time (if checked, skip to #6)
- more than half the time
- less than half the time
- once in a while
- never

3. When you think about your friends drinking, how often do they have 5 or 6 drinks?

- nearly every time (if checked, skip to #6)
- more than half the time
- less than half the time
- once in a while
- never

4. When you think about your friends drinking, how often do they have 3 or 4 drinks?

- nearly every time
- more than half the time
- less than half the time
- once in a while
- never

5. When you think about your friends drinking, how often do they have 1 or 2 drinks?

- nearly every time
- more than half the time
- less than half the time
- once in a while
- never

6. Think about the time when your friends drank the most this past month. How many drinks do you think they had on that occasion? (One drink equals 12 oz. of beer, 5 oz. of wine, or 1 ½ oz. of liquor.)

- 15 or more drinks
- 12 – 14 drinks
- 8 – 11 drinks
- 5 – 7 drinks
- 3 – 4 drinks
- 1 – 2 drinks
- 0 (I can't remember any of my friends drinking this month)

7. On how many occasions this past month do you think your friends drank:

- a. 15 or more drinks? # of occasions
- b. 12 – 14 drinks? # of occasions
- c. 8 – 11 drinks? # of occasions
- d. 5 – 7 drinks? # of occasions

8. How typical do you think your friends' drinking patterns this past month compare to their general drinking pattern over the past three months? (Check one)

- They drank more this month
- They drank somewhat more this past month
- They drank about the same this past month
- They drank somewhat less this past month
- They drank a lot less or not at all this past month
- They did not drink at all this month or during the past three months

Appendix I

Alcohol Outcome Expectancy Scale

AOES

Directions: The following is a list of some effects or consequences that some people experience after drinking alcohol. Indicate the likelihood that these various things would happen to you when you drink *heavily* (5 or more drinks for men, 4 or more for women)?

When I drink alcohol <i>heavily</i>...	No Chance	Very Unlikely	Unlikely	Likely	Very Likely	Certain to happen
1. I am more accepted socially	1	2	3	4	5	6
2. I become aggressive	1	2	3	4	5	6
3. I am less alert	1	2	3	4	5	6
4. I feel ashamed of myself	1	2	3	4	5	6
5. I enjoy the buzz	1	2	3	4	5	6
6. I become clumsy or uncoordinated	1	2	3	4	5	6
7. I feel good	1	2	3	4	5	6
8. I get into fights	1	2	3	4	5	6
9. I can't concentrate	1	2	3	4	5	6
10. I have a good time	1	2	3	4	5	6
11. I have problems driving	1	2	3	4	5	6
12. I feel guilty	1	2	3	4	5	6
13. I get a hangover	1	2	3	4	5	6
14. I feel happy	1	2	3	4	5	6
15. I get a headache	1	2	3	4	5	6
16. I am more sexually assertive	1	2	3	4	5	6
17. It is fun	1	2	3	4	5	6
18. I get mean	1	2	3	4	5	6
19. I have problems with memory and concentration	1	2	3	4	5	6

When I drink alcohol *heavily*...

	No chance	Very Unlikely	Unlikely	Likely	Very Likely	Certain to happen
21. It takes away my negative moods and feelings	1	2	3	4	5	6
22. I have more desire for sex	1	2	3	4	5	6
23. It is easier for me to socialize	1	2	3	4	5	6
24. I experience unpleasant physical effects	1	2	3	4	5	6
25. I am more sexually responsive	1	2	3	4	5	6
26. I feel more social	1	2	3	4	5	6
27. I feel sad or depressed	1	2	3	4	5	6
28. I am able to talk more freely	1	2	3	4	5	6
29. I become more sexually active	1	2	3	4	5	6
30. I feel sick	1	2	3	4	5	6
31. I feel less stressed	1	2	3	4	5	6
32. I am friendlier	1	2	3	4	5	6
33. I feel unpleasant physical effects	1	2	3	4	5	6
34. I am able to take my mind off my problems	1	2	3	4	5	6

Appendix J

Stages of Change Readiness and Treatment Eagerness Scale

SOCRATES

Directions: Please read the following statements carefully. Each one describes a way that you might (or might not) feel about *your* drinking. For each statement, circle one number from 1 to 5, to indicate how much you agree or disagree with it *right now*. Please circle one and only one number for every statement.

	NO! Strongly Disagree	No Disagree	? Unsure	Yes Agree	YES! Strongly Agree
1. I really want to make changes in my drinking.	1	2	3	4	5
2. Sometimes I wonder if I'm an alcoholic.	1	2	3	4	5
3. If I don't change my drinking soon, my problems are going to get worse.	1	2	3	4	5
4. I have already started making some changes in my drinking.	1	2	3	4	5
5. I was drinking too much at one time, but I've managed to change my drinking.	1	2	3	4	5
6. Sometimes I wonder if my drinking is hurting other people.	1	2	3	4	5
7. I am a problem drinker.	1	2	3	4	5
8. I'm not just thinking about changing my drinking, I'm already doing something about it.	1	2	3	4	5
9. I have already changed my drinking, and I am looking for ways to keep from slipping back to my old pattern.	1	2	3	4	5
10. I have serious problems with drinking.	1	2	3	4	5
11. Sometimes I wonder if I am in control of my drinking.	1	2	3	4	5
12. My drinking is causing a lot of harm.	1	2	3	4	5
13. I am actively doing things now to cut down or stop drinking.	1	2	3	4	5
14. I want help to keep from going back to the drinking problems that I had before.	1	2	3	4	5

	NO! Strongly Disagree	No Disagree	? Unsure	Yes Agree	YES! Strongly Agree
15. I know that I have a drinking problem.	1	2	3	4	5
16. There are times when I wonder if I drink too much.	1	2	3	4	5
17. I am an alcoholic.	1	2	3	4	5
18. I am working hard to change my drinking.	1	2	3	4	5
19. I have made some changes in my drinking, and I want some help to keep from going back to the way I used to drink.	1	2	3	4	5

Appendix K

Rutgers Alcohol Problem Index

RAPI

Directions: Different things happen to people *when* they are drinking alcohol or as a *result of* their alcohol use. Some of these things are listed below. Please indicate how many times each has happened to you during the past six months while you were drinking alcohol or as a result of your alcohol use. Please circle the most accurate response using the rating system provided below.

How many times did the following things happen to you while you were drinking or because of your alcohol use during the past six months?					
0	Never				
	1	One to two times			
		2	Three to five times		
			3	Six to ten times	
				4	More than ten times
0	1	2	3	4	Not able to do your homework or study for a test?
0	1	2	3	4	Got into fights, acted bad, or did mean things?
0	1	2	3	4	Missed out on other things because you spent too much money on alcohol?
0	1	2	3	4	Went to work or school high or drunk?
0	1	2	3	4	Caused shame or embarrassment to someone?
0	1	2	3	4	Neglected your responsibilities?
0	1	2	3	4	Relative avoided you?
0	1	2	3	4	Felt that you needed more alcohol than you used to use in order to get the same effect?
0	1	2	3	4	Tried to control your drinking by trying to drink only at certain times of the day or certain places?
0	1	2	3	4	Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking?
0	1	2	3	4	Noticed a change in your personality?
0	1	2	3	4	Felt you had a problem with alcohol?
0	1	2	3	4	Missed a day (or part of a day) of school or work?
0	1	2	3	4	Tried to cut down or quit drinking?
0	1	2	3	4	Suddenly found yourself in a place that you could not remember getting to?
0	1	2	3	4	Passed out or fainted suddenly?
0	1	2	3	4	Had a fight, argument or bad feelings with a friend?
0	1	2	3	4	Had a fight, argument or bad feelings with a family member?
0	1	2	3	4	Kept drinking when you promised yourself not to?
0	1	2	3	4	Felt you were going crazy?
0	1	2	3	4	Had a bad time?
0	1	2	3	4	Felt physically or psychologically dependent on alcohol?
0	1	2	3	4	Was told by a friend or neighbor to stop or cut down drinking?
0	1	2	3	4	Drove shortly after having more than 2 drinks?
0	1	2	3	4	Drove shortly after having more than 4 drinks?

Appendix L
Marlowe-Crowne Scale

MCS

Directions: Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you.

- | | | |
|---|---|--|
| T | F | 1. Before voting I thoroughly investigate the qualifications of all the candidates. |
| T | F | 2. I never hesitate to go out of my way to help someone in trouble. |
| T | F | 3. It is sometimes hard for me to go on with my work if I am not encouraged. |
| T | F | 4. I have never intensely disliked anyone. |
| T | F | 5. On occasion I have had doubts about my ability to succeed in life. |
| T | F | 6. I sometimes feel resentful when I don't get my way. |
| T | F | 7. I am always careful about my manner of dress. |
| T | F | 8. My table manners at home are as good as when I eat out at a restaurant. |
| T | F | 9. If I could get into a movie without paying and be sure I was not seen, I would probably do it. |
| T | F | 10. On a few occasions, I have given up doing something because I thought too little of my ability. |
| T | F | 11. I like to gossip at times. |
| T | F | 12. There have been times when I felt like rebelling against people in authority even though I knew they were right. |
| T | F | 13. No matter who I'm talking to, I'm always a good listener. |
| T | F | 14. I can remember "playing sick" to get out of something. |
| T | F | 15. There have been occasions when I took advantage of someone. |
| T | F | 16. I'm always willing to admit it when I make a mistake. |
| T | F | 17. I always try to practice what I preach. |
| T | F | 18. I don't find it particularly difficult to get along with loudmouthed, obnoxious people. |
| T | F | 19. I sometimes try to get even, rather than forgive or forget. |
| T | F | 20. When I don't know something I don't at all mind admitting it. |

- T F 21. I am always courteous, even to people who are disagreeable.
- T F 22. At times I have really insisted on having things my own way.
- T F 23. There have been occasions when I felt like smashing things.
- T F 24. I would never think of letting someone else be punished for my wrongdoings.
- T F 25. I never resent being asked to return a favor.
- T F 26. I have never been irked when people expressed ideas very different from my own.
- T F 27. I never make a long trip without checking the safety of my car.
- T F 28. There have been times when I was quite jealous of the good fortune of others.
- T F 29. I have almost never felt the urges to tell someone off.
- T F 30. I am sometimes irritated by people who ask favors of me.
- T F 31. I have never felt that I was punished without cause.
- T F 32. I sometimes think when people have a misfortune they only got what they deserved.
- T F 33. I have never deliberately said something that hurt someone's feelings.

Vita

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EDUCATION

- 2002 - present** Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
Degree expected: Doctor of Philosophy
Program: Clinical Psychology
Specialization: Clinical-Adult Psychology
- 1999 – 2002** Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
Master of Science, Clinical Psychology.
- 1996 – 1999** Appalachian State University, Boone, North Carolina.
Bachelor of Science in Psychology, Minor in Sociology.
Graduated Magna Cum Laude.

CLINICAL POSITIONS

- 8/01 – 5/02** Salem Veteran’s Affairs Medical Center, Salem, VA. Externship: Substance Abuse Rehabilitation Treatment Program for inpatients. Duties: Conduct brief therapy, conduct various screening and intake assessments, attend weekly treatment team meetings, and attend supervision meetings.
- 8/99 – 5/01** Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Graduate Clinician. Duties: Conduct therapy, conduct psychoeducational assessments, co-facilitate Life Skills groups, and attend weekly supervision meetings with other clinicians.

RESEARCH POSITIONS

- 5/01 – 5/02** Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Research Assistant. Duties:
- Assisted in refinement and development of study design, development of protocols, and finalization of assessment battery; responsible for reviewing assessment tapes for quality assurance and training tape reviewers; and communicated with Seattle site regarding protocols and study implementation via weekly conference calls and e-mail for the PRN. The PRN is a NIDA-funded study designed to the effectiveness of nine sessions vs. treatment as needed (prn) in a marijuana-using sample, utilizing case

management, motivational enhancement therapy, and cognitive-behavioral skills training.

- Assisted in development of data entry screens, development and refinement of coding system for quality assurance, and tape coding for quality assurance purposes for the MCU2, described below. Communicated with Seattle site regarding protocols, study implementation, and quality assurance via weekly conference calls and e-mail.
- Assisted in refinement of study design and assessment battery, development of protocols; responsible for quality assurance of assessment sessions, training of assessors, and conducting assessments; participated in weekly conference calls for VA study (see Lash and Stephens grant, below).

5/00 – 5/01

Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Research Assistant. Duties:

- Assisted in the development of study protocol, manual, assessment battery, data entry screens, recruitment strategies, and quality assurance for assessment and therapy sessions for the MCU2, a NIDA- funded study comparing the effectiveness of a two- vs. a six-session motivational enhancement therapy. Participated in weekly conference calls related to the development and implementation of the study.
- Assisted in the preparation of three grant proposals:
 - 1) Stephens and Roffman - MCU2
 - 2) Stephens and Roffman - Teen MCU, an extension of a previous NIDA-funded pilot study examining the effectiveness of the motivational interviewing as a brief intervention for marijuana dependent adolescents
 - 3) Lash and Stephens - developed a measure assessing self-efficacy for adhering to treatment to be piloted in the Lash and Stephens grant (described below).

8/99 – 5/00

Department of Psychology, Virginia Polytechnic Institute and State University Blacksburg, VA. Graduate student. Duties:

- Assisted in preparation of grant proposal:
Lash and Stephens - A study designed to increase aftercare participation in substance users who complete a substance abuse treatment program at the Salem VA hospital.
- Familiarized self with relevant data sets from previous studies.

1999

Appalachian State University, Boone, NC. Undergraduate research assistant. Research area: Test Taking Skills in college students. Duties: Run study participants, administer Matching Familiar Figures Test, administer computer version of a test composed of GRE sample questions.

1998 – 1999

Appalachian State University, Boone, NC. Undergraduate Research Assistant. Research area: Community Behavioral Health. Duties: Attended and participated in weekly research meetings, participated in intervention design and delivery, collected and coded data, entered data, managed all data of study.

1998

Appalachian State University, Boone, NC. Undergraduate Research Assistant. Research area: Mock Aggression. Duties: Attended and participated in weekly

research meetings, coordinated data with another assistant in order to achieve inter-rater reliability, coded data, refined behavioral coding system.

TEACHING POSITIONS

8/99 – 5/99 Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Teaching assistant for Introductory Psychology. Duties: Presented material and facilitated class discussion in four recitation sections, proctored exams, developed and administered bi-weekly quizzes, graded assigned essays.

AWARDS & HONORS

2001 – 2002 Graduate Research Assistantship (full tuition waiver)
2000 – 2001 Graduate Research Assistantship (partial tuition waiver)
1999 – 2000 Graduate Teaching Assistantship (partial tuition waiver)
1999 Graduated Magna Cum Laude from Appalachian State University
1998 – 1999 Alpha Chi (national academic fraternity)
1997 – 1999 Gamma Beta Phi (national academic and service fraternity)
1996 – 1999 Chancellor's List (for GPA above 3.85)
 Dean's List (for GPA above 3.25)
1996 Appalachian State University Academic Scholarship (renewable per semester for GPA above 3.25)

GROUP AFFILIATIONS

1998 – 2001 Southeastern Psychological Association, student member

PRESENTATIONS

Walker, N. R., Stearns, D., Poole, A., & Ludwig, T. D. (1999). Peer agents, pledge cards, and accessibility to promote bike helmet use. Paper presented at meeting of the Southeastern Psychological Association, Savannah, GA.