Examining the Relationships among General Coping, Alcohol-Specific Coping and Alcohol Use in a College Student Population

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(ABSTRACT)

The coping and alcohol literature indicates certain styles of coping are more protective against alcohol use than others. The purpose of the current study was to explore the associations among general coping styles, alcohol-specific coping skills, drinking to cope motives, and alcohol use in an effort to further examine their theoretical relationships. It was hypothesized that: (1) The relationship between problem-focused coping and alcohol use would be mediated by alcohol-specific coping, (2) Drinking to cope would mediate the relationship between avoidant emotion-focused coping and alcohol use, (3) The problem-focused coping facets of planning, active coping, suppression of competing activities, and restraint coping would contribute the most to the prediction of alcohol-specific coping skills, and (4) Intention to regulate drinking would moderate the relationship between problem-focused coping and alcohol-specific coping such that the relationship between the two would be stronger in individuals who have greater intentions of regulating their drinking.

College students (N = 327) completed several self-report measures that assessed their alcohol use, general coping styles, use of alcohol-specific coping strategies, and endorsement of drinking to cope motives for alcohol use. Analyses of fully latent variables were conducted using structural equation modeling techniques. Results suggested alcohol-specific coping skills partially mediated the association between problem-focused coping and alcohol use. An unexpected positive direct association between problem-focused coping and alcohol use

emerged; post-hoc analyses suggested specific facets of problem-focused coping more clearly explain that finding. The hypothesized relationships between avoidant focused coping and alcohol use were not supported but avoidant coping was significantly associated with drinking to cope, consistent with the literature. Finally, the positive association between problem-focused coping and alcohol-specific coping skills was not moderated by intentions to regulate drinking. Limitations and suggestions for future research are discussed.

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Introduction

In the 30 days prior to the American College Health Association's National College Health Assessment (ACHA-NCHA) survey of almost 20,000 randomly selected students, 18% of students drank 3-5 days, 16% drank 6-9 days (about twice weekly), and 13% drank 10-19 days (American College Health Association, 2005). Of those who reported drinking, 28% reported consuming 5-8 drinks the last time they drank and 15% had 9 or more drinks. The ACHA-NCHA survey also assessed negative consequences experienced during the past school year and found that 39% of students did something they later regretted, 31% forgot where they were or what they did, 19% physically injured themselves, and 16% had unprotected sex. Thus, data continue to reflect that a portion of college students drink heavily and experience negative consequences.

In order to alter student drinking, constructs that explain excessive drinking and which are responsive to intervention must be better understood. Coping skills are one such category of modifiable behaviors. The empirical evidence to date supports using cognitive-behavioral skills training approaches as treatment for alcohol dependent adults (Longabaugh & Morgenstern, 1999; Morgenstern & Longabaugh, 2000) and heavy drinking college students (Larimer & Cronce, 2002). One program, the Brief Alcohol Screening and Intervention for College Students (BASICS), includes cognitive-behavioral skills training and harm reduction approaches and has been effective in reducing alcohol use (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Murphy et al., 2001).

The rationale for studying coping's direct effects on drinking is primarily based on social cognitive theory models (e.g., Abrams & Niaura, 1987; Marlatt, 2005). Individuals with deficits in adaptive modes of coping may drink alcohol in order to cope (i.e., to reduce negative affect).

For example, if someone drinks to cope with anger, anger management skills are taught in order to replace drinking as an anger management tool. Individuals may also be taught alcohol-specific coping skills, such as drink refusal skills and how to pace drinking.

Theoretically, both general and alcohol-specific coping skills can be immediate determinants of heavy drinking but theory does not specify how these skills are associated with each other (i.e., does one precede the other) and alcohol use. Empirical investigations in which both types of skills are taught have not determined how they are theoretically associated with each other. The purpose of this study was to explore the associations among general coping styles, alcohol-specific coping skills, drinking to cope motives, and alcohol use in an initial effort to examine their theoretical relationships. Existing knowledge of these constructs will be reviewed first, followed by integrating the study of these different classes of coping.

General Coping Styles

Coping skills, the specific behaviors or cognitive activities people use in response to stressors or problems, are grouped into broad categories of coping styles based on the functions they serve (Lazarus & Folkman, 1984). The two most frequently cited styles in the literature are problem- and emotion-focused coping (Lazarus & Folkman, 1984). Problem-focused coping is generally associated with better health outcomes (e.g., Miller & Schnoll, 2000) and is action oriented (Lazarus, 1991) as it is directed at altering the problem or environment that causes the distress (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Examples include changing motivation or cognitions (e.g., develop new behavioral standards, learn new skills), altering environmental barriers, and finding new resources (Lazarus & Folkman, 1984).

Emotion-focused coping is predominantly a cognitive process as it aims to regulate emotional reactions to stressors (Lazarus, 1991). There are a wide range of emotion-focused

coping skills, and they generally fall under cognitive processes used to lessen emotional distress (e.g., venting to others) or eliciting support or help from others (Lazarus & Folkman, 1984). Of note, some refer to emotion-focused coping that involves obtaining help from others as support seeking coping (Laurent, Catanzaro, & Callan, 1997; Sica, Novara, Dorz, & Sanavio, 1997), which appears to be adaptive as it combines traits of problem- and emotion-focused coping (Carver, Scheier, & Weintraub, 1989; Lazarus & Folkman, 1984). Whether or not emotion-focused coping is beneficial depends on the sample population (Carver, Scheier, & Weintraub, 1989) and if it is conceptualized as primarily an approach or avoidant coping tactic (Miller & Schnoll, 2000).

Cox and Ferguson (1991) asserted that dichotomizing coping into problem-focused and emotion-focused coping is too simple. Factor analyses of coping measures indicate there are few variants of problem-focused coping but multiple types of emotion-focused coping (Aldwin & Revenson, 1987), lending to the difficulty of precisely delineating coping styles. Although the field does not agree on the exact number and types of coping, avoidance coping is widely studied (Cox & Ferguson, 1991). An avoidant coping style entails "removing" oneself from experiencing or thinking about a stressful situation and is generally associated with poor health outcomes but also depends on the ailment (Miller & Schnoll, 2000). Avoidant coping includes, for example, distraction techniques, denial, or the use of alcohol or drugs (Carver, Scheier, & Weintraub, 1989).

In general, problem-focused coping is associated with less drinking while more avoidant, emotion-focused coping is associated with greater drinking. These relationships have emerged not only in college students but are also consistently found in adolescent and adult samples (Bonin, McCreary, & Sadava, 2000; Boyd et al., 2002; Cooper, Frone, Russell, & Mudar, 1995;

Cooper, Russell, & George, 1988; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Eftekari, Turner, & Larimer, 2004; Heffernan, 1998; Windle & Windle, 1996). In college students, for example, problem-focused coping was correlated with less drinking (Willis, Wallston, & Johnson, 2001) and was the only daily-monitored coping style that predicted less daily drinking (Park, Armeli, & Tennen, 2004). Emotion-focused coping was correlated with greater frequency of drinking in college students (Ham & Hope, 2003; Willis, Wallston, & Johnson, 2001) but this relationship is inconsistent (Park & Levenson, 2002; Wilson, Pritchard, & Schaffer, 2004). For instance, a more emotion-approach or support seeking coping style appears to be unrelated to alcohol use (Laurent, Catanzaro, & Callan, 1997; Park, Armeli, & Tennen, 2004). Avoidance coping is consistently associated with greater alcohol use (Park, Armeli, & Tennen, 2004), even when the use of alcohol or drugs to cope is not included as part of the avoidant coping measure (Fromme & Rivet, 1994; Laurent, Catanzaro, & Callan, 1997; Park & Levenson, 2002).

Some researchers have examined the various facets of problem-focused, emotion-focused, and avoidant coping and have found they also have similar relationships with alcohol use. Across the few studies that have reported on the facets of coping, two of the problem-focused coping components, planning (Britton, 2004; Willis, Wallston, & Johnson, 2001) and suppression of competing activities (McKee, Hinson, Wall, & Spriel, 1998), were associated with less drinking. The avoidant coping facet of behavioral disengagement (Britton, 2004; McKee, Hinson, Wall, & Spriel, 1998; Willis, Wallston, & Johnson, 2001) was associated with increased drinking, as expected. Not surprisingly, use of substances (i.e., drink or use drugs to cope), also a component of avoidant coping, was most strongly related to alcohol use compared to the other coping facets (Britton, 2004; McKee, Hinson, Wall, & Spriel, 1998; Williams & Clark, 1998; Willis, Wallston, & Johnson, 2001). Only one aspect of emotion-focused coping,

venting of emotions (i.e., expressing feelings), was associated with alcohol use; however, it was associated with less drinking (Britton, 2004) and fewer alcohol-related problems (Britton, 2004; Willis, Wallston, & Johnson, 2001), suggesting that this facet of emotion-focused coping may be protective.

Overall, there is considerable consistency in the direction of the associations between coping and alcohol use. It appears as though dealing with problems in a direct way, as opposed to avoiding them or only addressing the emotional reactions, is most beneficial in terms of protecting against excessive drinking. The bivariate relationships between coping and alcohol use are significant but small, as absolute correlations average around 0.15, pointing to the need to integrate the study of coping with other alcohol-related constructs.

Alcohol-Specific Coping Skills

When applying the concept of coping to addictive behaviors, coping refers to what people do or think to handle the risk of relapse (Moser & Annis, 1996). In college students, these alcohol-specific coping skills are conceptualized to include limiting the quantity and/or frequency of drinking as well as possible consequences of drinking. The ACHA-NCHA survey (ACHA, 2005) documented that students varied in the number of protective strategies they used, and the more protective strategies used, the fewer negative consequences experienced (Martens et al., 2004). Benton and colleagues (2004) corroborated those results by finding that using strategies lessened the consequences of heavier drinking.

The above studies presented participants with a short list of strategies created by the researchers whereas a series of unique studies (Adams, 2000; Fearer, 2004) used a social cognitive theory-based measure created from strategies generated by college students that were then further refined empirically. Students who used more cognitive (i.e., think of negative past

and possible future consequences), behavioral (i.e., specific behaviors such as refusing drinks), and environmental (i.e., avoiding people, places, and activities associated with greater drinking; planning to drink in safer environments) strategies (see Table 2) drank less alcohol and reported fewer alcohol-related consequences (Adams, 2000; Fearer, 2004).

On average, the association between alcohol-specific coping skills and alcohol indices are twice the size (r = -.30) of the bivariate relationships between general coping styles and alcohol, suggesting that alcohol-specific coping skills may be more protective than general coping skills. Determining how general coping and alcohol-specific coping may be associated with one another and, in turn, with alcohol use, may help further inform theoretical models of alcohol use and misuse.

Drinking to Cope

Another alcohol-specific coping construct that may help relate general coping styles with alcohol use is the specific use of alcohol to cope with stressors. Drinking to cope represents the tendency to use alcohol to escape, avoid, reduce, or regulate unpleasant or negative emotions (Cooper, Frone, Russell, & Mudar, 1995; Cooper, Russell, & George, 1988; Kuntsche, Knibbe, Gmel, & Engels, 2005; Windle & Windle, 1996). Drinking to cope is a risk factor for drinking and is thought to be a proximal determinant of alcohol use, through which other influences on drinking are mediated (Kuntsche, Knibbe, Gmel, & Engels, 2005).

Drinking to cope (DTC) motives are clearly associated with alcohol use across multiple samples (Cooper, Russell, Skinner, Frone, & Mudar, 1992; Kassel, Jackson, & Unrod, 2000; Kuntsche, Knibbe, Gmel, & Engels, 2005; Laurent, Catanzaro, & Callan, 1997; Park, Armeli, & Tennen, 2004; Park & Levenson, 2002; Wilson, Pritchard, & Schaffer, 2004). Drinking to cope is also predictive of alcohol use in multiple age groups in cross-sectional (Cooper, 1994; Cooper,

Frone, Russell, & Mudar, 1995; Cooper, Russell, & George, 1988; Williams & Clark, 1998; Windle & Windle, 1996), longitudinal (Holahan, Moos, Holahan, Cronkite, & Randall, 2001), and experimental (for review, see Cooper, Russell, & George, 1988) studies.

It appears as though DTC is predominantly associated with less adaptive forms of coping, especially the more avoidant coping styles (Cooper, Frone, Russell, & Mudar, 1995; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Kassel, Jackson, & Unrod, 2000; Laurent, Catanzaro, & Callan, 1997; Park, Armeli, & Tennen, 2004; Park & Levenson, 2002; Windle & Windle, 1996). This relationship has emerged presumably because DTC represents drinking to cope with problems, which is a method of avoiding, rather than dealing, with them. However, the strength of this association varies depending on the conceptualization and measurement of avoidant coping as well as which other constructs are in the model. Additional research is needed to determine the extent to which general coping styles contribute to drinking to cope and alcohol use.

The Present Study

The current study evaluated the relationships among general coping styles, alcohol-specific coping, drinking to cope, and alcohol use by estimating hypothesized fully latent models. In particular, the study explored whether problem-focused coping's association with less alcohol use is mediated by alcohol-specific coping and, if supported, which facets of problem-focused coping drive this relationship. An additional aim was to determine if the association of avoidant emotion-focused coping with greater alcohol use is mediated via drinking to cope. In addition, the study explored if motivation to regulate drinking moderates the relationship between problem-focused coping and drinking self-regulatory skills.

Problem-Focused Coping and Alcohol-Specific Coping Skills. Alcohol-specific coping skills are problem-oriented in nature as they represent specific actions or cognitions individuals have engaged in to regulate their drinking. For this reason, they can be thought of as problem-focused coping applied specifically to drinking situations. The tendency to use problem-focused coping in general should be related to the application of alcohol-specific coping strategies (solid lines in top half of Figure 1). Therefore, it was proposed that the protective effect of problem-focused coping on alcohol use is not a direct effect, but is explained via the mediating effect of alcohol-specific coping skills. Emotion-focused and avoidant coping had no hypothesized associations with alcohol-specific coping skills since those general coping styles are not problem-solving oriented.

Facets of Problem-Focused Coping and Alcohol-Specific Coping Skills. It is likely that certain facets contribute more to the proposed positive relationship between problem-focused coping (PFC) and alcohol-specific coping skills. These facets were examined in order to better understand the relationship between problem-focused coping and alcohol-specific coping skills.

Planning and active coping are facets of problem-focused coping in which forethought is used to cope with stressors by creating plans and engaging in behaviors to cope, skills which are also necessary for controlling drinking. Thus, these general problem-focused coping facets are analogous to alcohol-specific coping skills in which particular plans are made and behaviors are engaged in to moderate alcohol use. The facets of suppression of competing activities and restraint coping represent coping with a stressor by avoiding other activities and by preventing oneself from acting hastily. Thus, these facets represent strategically *not* acting in order to deal with a stressor, similar to alcohol-specific coping skills that moderate drinking by not acting (e.g., avoiding heavy-drinking environments, not drinking rapidly). In sum, these behaviorally

oriented facets represent strategies for anticipating stressors and coping with them in advance or in the moment. It was proposed that these facets of problem-focused coping, collectively, will contribute the most to the prediction of alcohol-specific coping skills.

Avoidant Coping and Drinking to Cope. Over the course of several studies, Cooper and colleagues (Cooper, 1994; Cooper, Frone, Russell, & Mudar, 1995; Cooper, Russell, & George, 1988; Cooper, Russell, Skinner, Frone, & Mudar, 1992) developed their model of problematic drinking in which one of the pathways to drinking begins with an avoidant coping style and is mediated by specific drinking to cope motives. Drinking to cope is construed as a maladaptive coping response used when more adaptive means of coping are unavailable (Cooper, Frone, Russell, & Mudar, 1995). Despite gathering empirical support for this model, the relationship of avoidant coping to drinking to cope varies depending upon other constructs in the model. Statistically significant support was found for drinking to cope mediating the relationship between avoidant coping and alcohol use when positive alcohol expectancies were included as a precursor of drinking to cope (Cooper, Russell, & George, 1988). The relationship was not significant when negative emotion and tension reduction alcohol expectancies were included as precursors (Cooper, Frone, Russell, & Mudar, 1995), but this finding could have been due to the composite avoidant coping variable used in the analyses. Additional work is needed to determine under which conditions the relationship between avoidant coping and alcohol use is mediated by drinking to cope.

Consistent with Cooper and colleagues' findings, the association of alcohol use with avoidance based emotion-focused coping was hypothesized to be fully mediated via drinking to cope (see bottom half of Figure 1). The tendency to use avoidant coping in general was proposed

to lead to the endorsement of coping drinking motives as an alcohol-specific method of avoiding problems.

Intentions to Regulate Drinking and Coping. When viewed within a broad self-regulatory perspective (Carver & Scheier, 1999; Carver, Scheier, & Pozo, 1992), which is incorporated into social cognitive theory (Bandura, 1997, 1999), behavior is explained in the context of the goals people pursue. According to this model, coping is enacted when goals are "blocked" and helps in goal attainment because coping leads to creating new goals, dealing with the stress of thwarted goals, and revising efforts toward original goals. People may be motivated to regulate drinking as a goal in and of itself or in order to help meet other goals, such as studying for a test.

Motivation to regulate drinking refers to the desire to control or limit the quantity and/or frequency of drinking. Motivation to control drinking has rarely been studied, and it appears as though it has not been studied in conjunction with coping. Measures of drinking intentions, in which participants rate the degree to which it is likely they will increase or decrease (Neal & Carey, 2004) or limit (Murgraff, Walsh, & McDermott, 2000; Murgraff, White, & Phillips, 1996, 1999) their drinking, tap into motivation for regulating drinking. Indirect measures of motivation for regulating drinking include reasons for limiting drinking (Greenfield, Guydish, & Temple, 1989) and violations of self-imposed drinking limits (Muraven, Collins, Morsheimer, Shiffman, & Paty, 2005). Taken together, these studies suggest students vary in desire to limit their drinking, but the more people intend to limit their drinking, the less they drink. Furthermore, when students think heavy drinking may interfere with achieving their goals, they use significantly more drinking self-regulatory strategies in order to control or limit their drinking (Williams, 2003).

Given that alcohol-specific coping skills help control drinking, it is unlikely they will be used if there is no desire to regulate drinking. Thus, the possibility that intentions to regulate drinking moderates the relationship between problem-focused coping and alcohol-specific coping also was examined (dashed line in Figure 1). It was proposed that problem-focused coping results in the use of alcohol-specific coping when individuals intend to regulate their drinking. When intention is absent, problem-focused coping will not lead to the use of alcohol-specific coping skills.

Hypotheses

In order to empirically test the proposed relationships among general coping styles, alcohol-specific coping, drinking to cope, and alcohol use, the following hypotheses guided the present study:

1. The relationship between problem-focused coping and alcohol use will be mediated by alcohol-specific coping.
2. Drinking to cope will mediate the relationship between avoidant emotion-focused coping and alcohol use.
3. The problem-focused coping facets of planning, active coping, suppression of competing activities, and restraint coping would contribute the most to the prediction of alcohol-specific coping skills.
4. Intentions to regulate drinking will moderate the relationship between problem-focused coping and alcohol-specific coping such that the relationship between problem-focused coping and alcohol-specific coping will be stronger in individuals who have greater intentions of regulating their drinking.

Method

Participants

Students in psychology classes at a large southeastern university were recruited for the study via an online research study recruitment and screening program, Sona-Systems, Ltd. The study was described as examining how alcohol use and alcohol-related thoughts and behaviors are theoretically associated. Eligibility criteria of being at least 18 years of age and having drunk alcohol at least once in the last 30 days were posted for students to read and self-determine eligibility. Non-drinkers were excluded due to the inability to assess alcohol-specific coping in individuals who do not drink. Students were offered one extra credit point for completing the study.

A total of 351 (43% male) students participated. Several participants (n = 24) were excluded, two of which were ineligible due to non-drinking and the remaining were excluded during the data screening process. Specific reasons for exclusion are given in the results section. The final sample (N = 327) was primarily female (n = 186, 57%), Caucasian (85%), and unemployed (67%). On average, participants were 19.57 (1.84 *SD*) years old, with 79% of the sample between 18 and 20. The majority of the sample was freshmen and sophomores (30% each), followed by juniors (22%), and seniors (18%). One-fifth of participants were members of a fraternity or sorority.

In the month prior to the assessment, participants drank on average 2.01 (1.10 *SD*) days per week, with the majority (92%) drinking on 3 or fewer days per week. Participants reported having 5.72 (3.13 *SD*) drinks on an average drinking day. Participants reported binge drinking, defined as 4+ drinks for women and 5+ drinks for men (Wechsler & Kuo, 2000), on 5.24 (4.41

SD) days out of the past 30 days. Participants reported an average of 7.19 (6.74 *SD*) problems due to their alcohol use.

Procedures

After students signed up to participate via the Sona-Systems program, they were individually emailed a copy of the consent form, the survey's URL address and password, and brief directions for completing the study. Participants completed the assessment online at surveymonkey.com. Recommendations of the American Psychological Association's Board of Scientific Affairs Advisory Group on Conducting Research on the Internet (Kraut et al., 2004) were followed when the online informed consent and assessment portions were designed. To evaluate possible measurement order effects, participants were assigned to one of two orders after blocking on sex so that an approximately equal number of males and females were assigned to each order.

Upon logging onto the survey's website, students completed a short consent quiz to demonstrate they read the consent form. Students continued directly to the survey if they agreed to participate and completed a series of measures assessing their demographics, alcohol use, general and alcohol-specific coping skills, drinking motives, and intentions to limit their drinking. The last portion of the survey contained additional measures of alcohol problems, self-efficacy, and alcohol expectancies that were included to disguise the purpose of the study. The majority of participants took between 25 and 45 minutes to complete the study. Unique electronic identifiers were inserted into participants' data in order to award extra credit and were deleted after the data was downloaded from the server.

Measures

Demographic Information (Appendix A). A demographic questionnaire was administered

to assess age, sex, race, class status, employment, and Greek membership.

Alcohol Use (Appendix D). A quantity-frequency (QF) measure, based on those in the literature (e.g., Cherpitel, 1997; Dawson, 2003; Sobell et al., 2003; Wood, Read, Palfai, & Stevenson, 2001), was administered to assess alcohol use during the past 30 days. QF measures use summary questions but produce drinking estimates highly similar to more detailed retrospective daily assessment measures (LaBrie, Pedersen, & Earleywine, 2005; Sobell et al., 2003). Items assessed frequency ('how many days did you drink per week?'), quantity ('how many drinks did you have when you drank?'), peak quantity ('What is the greatest number of standard drinks you drank in one day?'), and number of binge days ('How many days did you drink 4 (if you're a woman) or 5 (if you're a man) or more standard drinks?'). The measure had very good internal consistency ($\alpha > .86$) and convergent validity in a previous study (Walker, 2005) as well as in the current study ($\alpha = .84$). Peak quantity was not used as an indicator due to high pairwise multicollinearity ($r = .86$) with average quantity. The alcohol indices of quantity, frequency, and binge days ($\alpha = .70$) served as indicators of the latent variable alcohol use.

General Coping (Appendix B). The 60-item COPE questionnaire (Carver, Scheier, & Weintraub, 1989) was administered to measure general coping abilities and is comprised of 15 subscales (see Table 1) with four items each. Subscale items are summed to yield a total subscale score. Participants indicated how often they used each strategy in general when stressed, on a scale from 1 (I usually don't do this at all) to 4 (I usually do this a lot). All but three of the COPE subscales served as an indicator of a latent coping factor. The religion and humor subscales were excluded because the literature lacks a strong theoretical and empirical basis for them. The substance use subscale was excluded as an indicator due to its overlap with the drinking to cope construct. The COPE has good evidence of convergent and discriminant validity as well as

moderate to good reliability for each of its subscales. In the current sample, reliability for 8 of the 12 subscales was adequate to excellent (α = .70 to .95). Three of the remaining subscales had low reliability (α = .64 to .68) and one had very low reliability (mental disengagement, α = .42), similar to findings from other studies (e.g., Carver, Scheier, & Weintraub, 1989; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Ingledew, Hardy, Cooper, & Jemal, 1996).

Alcohol-Specific Coping Skills (Appendix F). The Drinking Self-Regulation Questionnaire (DSRQ; Adams, 2000) was created to assess specific strategies college students use to control their alcohol consumption. The measure was developed and refined in two studies, with the final 50-item version composed of the following 3 scales: cognitive (15 items), behavioral (15 items), and environmental (20 items) strategies. Participants indicated how often in the past 30 days they used a particular strategy on a continuum from 0 (never) to 4 (often). The DSRQ has demonstrated good construct validity and internal consistency (Adams, 2000; Williams, 2003), with reliability coefficients in the very good range (α = .85 to .93) in the current study. A total score for each of the three scales was calculated and each served as an indicator of the latent construct Drinking Self-Regulation Skills (DSRS).

Drinking to Cope (Appendix G). The Drinking Motives Questionnaire (Cooper, 1994), a 20-item measure that assesses four motives for drinking alcohol, was administered. Participants indicated how often they drank alcohol for each listed reason, on a scale from 1 (almost never / never) to 5 (almost always / always). Five items make up the drinking to cope (DTC) subscale and each item served as an indicator of the latent construct Drinking to Cope. Reliability of the DTC subscale was good (α = .83).

Intentions to Regulate Drinking (Appendix C). A modified version of the Behavioral Intentions Measure (Neal & Carey, 2004) was administered to assess intentions to increase or

decrease alcohol use. Intentions originally were assessed "in the next week" but were modified to assess participants' intentions regarding their drinking in the past 4 weeks in order to correspond with the assessment of alcohol use and alcohol-specific coping skills. The 7 items (e.g., On the average day in the past 4 weeks, did you want to drink more alcohol than you were drinking before?; On your heaviest drinking day, did you want to drink less than you were drinking before?) were rated on a Likert scale from 1 (definitely did not want to) to 6 (definitely wanted to). Upon recommendation by the measure's author (D. J. Neal, personal communication, February 22, 2006), the seventh question about binge drinking was not included in the scoring. After reverse scoring the appropriate items, all items were summed to derive a total score (range: 7 – 36). Internal consistency for the modified six-item measure was good ($\alpha = .79$), and correlations with alcohol and drinking self-regulatory skills measures were in the expected negative and positive directions, respectively. A median split was used to form two groups, those who intended to regulate their drinking ($n = 169$; $M = 23.83$, $SD = 3.79$; range: 20 – 36) and those who did not intend to regulate their drinking ($n = 158$; $M = 15.95$, $SD = 2.78$; range: 7 – 19). This dichotomized variable was used to examine the moderator hypothesis.

Alcohol Problems (Appendix E). The Rutgers Alcohol Problems Index (White & Labouvie, 1989), a 25-item measure that assesses both general and college-specific alcohol-related problems, was administered. Participants indicated how often in the past 30 days they experienced the listed consequences on a continuum from 0 (never) to 4 (more than 10 times). A total score was derived by summing responses to all items. The RAPI had good internal consistency ($\alpha = .85$) in the current study. The problem score was reported for descriptive purposes only.

Additional Measures (Appendix H). In order to help disguise the purpose of the study,

two additional measures were added to the end of the survey. A measure of self-efficacy for avoiding drinking (Situational Confidence Questionnaire; Annis & Davis, 1988) and a measure of alcohol outcome expectancies (Alcohol Outcome Expectancies Scale; Leigh & Stacy, 1993) were administered but not analyzed.

Results

Data Screening and Preparation

Data screening and manipulations were performed using SPSS 12.0 for Windows. Initial data screening revealed two participants were ineligible due to no alcohol use. Eighteen additional cases were excluded for the following reasons: 15 participants completed the survey in less than 20 minutes (given that the survey consisted of 246 questions, and based on pilot work, it seemed unreasonable that participants could complete it under 20 minutes); 1 (one) had a response pattern in which the same response was given for each measure, resulting in contradictory responses; and 2 had a large portion of data missing on one measure. The remaining cases were examined for within-person consistency among the alcohol use variables (e.g., peak alcohol quantity could not be less than average quantity) to help ensure accuracy of the data. Inconsistent values were made "missing" in order to achieve internal consistency.

Data were checked for normality and univariate and multivariate outliers. As expected, relatively few variables were univariate normally distributed and the assumption of multivariate normality was not met (joint test of skewness and kurtosis, $\chi^2 = 134.46$; $p < .05$). Various transformations for each variable were attempted, but the original nontransformed variables were retained for analyses because all of the variables could not be corrected to approximate normality. Four cases were excluded from the sample after evaluating univariate outliers using *z* scores and multivariate outliers using Mahalanobis distance. Thus, a grand total of 22

participants were excluded and 2 were deleted from the file due to ineligibility, resulting in a final sample of 327 to be used in the analyses.

Multicollinearity was evaluated using bivariate correlations, tolerance, and variance inflation factors for each variable. Peak quantity was excluded as an alcohol use indicator due to high pairwise multicollinearity with average quantity. No other problems were revealed. Missing values were spread throughout and comprised less than 5% of the dataset, thus, mean group values were imputed (Tabachnick & Fidell, 2001).

Inclusion / Exclusion Analyses

Reasons for exclusion were detailed in the previous section. In order to determine if the remaining cases differed significantly from the excluded cases, chi-square analyses were used to examine the categorical variables and Analysis of Covariance (ANCOVA), covarying for sex, was used to examine the continuously distributed variables.

Relative to included participants, excluded participants differed significantly on three COPE subscales. Excluded participants scored lower on planning than included participants (9.26 vs. 11.44; $F(2, 341) = 7.17$, $p < .005$). Excluded participants scored higher than the included participants on behavioral disengagement (7.95 vs. 5.96; $F(2, 344) = 11.60$, $p < .001$) and denial (6.70 vs. 5.63; $F(2, 343) = 3.72$, $p < .05$). No other significant differences between included and excluded participants were found.

Randomization Check & Order Effect Analyses

The administration of the alcohol use, alcohol-specific coping skills, and intentions to limit drinking measures were counterbalanced to offset possible order effects. In particular, it seemed possible that completing the intentions to limit drinking measure might bias subsequent assessments of alcohol use and drinking self-regulation strategies. Therefore, participants were

assigned to one of two orders, blocked by sex, so that an approximately equal number of male and female participants were assigned to each order. The orders were as follows: (1) alcohol use, drinking self-regulation strategies, intentions to limit drinking, and drinking motives and (2) intentions to limit drinking, drinking self-regulation strategies, alcohol use, and drinking motives. In order to determine if randomization to order was successful, chi-square analyses were conducted on the categorical demographic variables. Participants assigned to order 1 (n = 161) versus order 2 (n = 166) did not differ on any demographic variables, suggesting random assignment was successful.

Separate Multivariate Analyses of Variance (MANOVAs) with order as the between subjects variable were performed on the sets of alcohol use, DSRQ, DTC, and intentions to regulate drinking measures in order to detect possible order effects. There were no significant differences by order of measure administration. Inspection of correlation matrices revealed no readily observable differences in bivariate relationships among the variables for order 1 and order 2. These results suggest there were no differences in the scores due to the order in which they were administered, and subsequent analyses utilized the pooled dataset.

Analytical Plan for Hypotheses

LISREL 8.8 was used to examine the hypotheses via structural equation modeling methods. Maximum likelihood (MLE) is the most used estimation method and is routinely reported (Hoyle & Panter, 1995), but its estimates are inflated if data is nonnormal (Kline, 2005). SCALED χ^2 (Satorra & Bentler, 1990), which corrects χ^2 (Chou & Bentler, 1995; Ullman, 2001; West, Finch, & Curran, 1995) by penalizing for the amount of kurtosis, was produced in LISREL by invoking robust maximum likelihood estimation and was used as the omnibus fit statistic.

In order to compare alternative non-hierarchical models, ECVI (expected cross-validation index; Browne & Cudeck, 1993) as recommended by MacCallum and Austin (2000) was used. Smaller ECVI values indicate a better fitting model and indicate potential for replication (Byrne, 1998). Nested structural models were compared using the SCALED χ^2 difference test[1] (Satorra & Bentler, 1994). A nonsignificant SCALED χ^2_{diff} indicates the nested, more parsimonious model fits the data better than the more complex model.

Since χ^2 is impacted by several factors (e.g., large sample increases χ^2, model complexity decreases χ^2), three additional fit indices were selected to evaluate the fit of the measurement and structural models (Dilalla, 2000; Kline, 2005; Lei & Lomax, 2005; Ullman, 2001; West, Finch, & Curran, 1995). The CFI (comparative fit index; Bentler, 1988) compares a specified model against the independence model, with values $\geq$ .90 indicating reasonably good fit and values $\geq$ .95 indicating good fit. RMSEA (root mean square error of approximation; Browne & Cudeck, 1993) estimates lack of fit in the specified model compared to a saturated model, with values $\leq$ .05 indicating good fit, $\leq$ .08 indicating reasonable fit and > .10 indicating poor fit. If RMSEA's 90% confidence interval has .05 and .10 in its range, RMSEA may be impacted by sampling error (Kline, 2005). The SRMR (standardized root mean square residual) represents the average difference between the sample and estimated covariance matrix (Byrne, 1998; Ullman, 2001) and is interpreted the same as RMSEA. Parameter estimates in good fitting models were deemed significant at $p < .05$ if the critical ratio was > $\pm$ 1.96, computed as a *z* statistic in LISREL.

[1] The equation for calculating the SCALED χ^2 difference test is as follows:
(MLE χ^2_{nested} – MLE $\chi^2_{comparison}$) divided by the solution of { [df_{nested} * (MLE χ^2_{nested} / SCALED χ^2_{nested})] minus [$df_{comparison}$ * (MLE $\chi^2_{comparison}$ / SCALED $\chi^2_{comparison}$)] } / (df_{nested} - $df_{comparison}$) where MLE is the maximum likelihood χ^2 and "comparison" refers to the least restricted model (Satorra & Bentler, 1994).

Evaluating the Measurement Model

Confirmatory factor analysis (CFA) was performed on each of the two alternative measurement models presented in Figure 2. The two measurement models differed only in the number of coping style latent variables assessed by the subscales of the COPE. In Figure 2, circles represent latent variables, rectangles represent measured variables, presence of a line indicates an estimated parameter, and absence of a line connecting variables implies there is no hypothesized effect. Solid lines indicate relationships that were constant across the two measurement models tested, whereas dashed and dotted lines are used to differentiate the models. For both models there were 276 available *df*. The covariance matrix was analyzed in each model. Correlations, means, and standard deviations are provided in Table 3.

Two factor model

A two factor model of general coping style, with Problem-Focused and Avoidant Emotion-Focused coping as its factors, represented by dashed lines in Figure 2, was tested first. This model is based on the "useful" (i.e., approach) and "less useful" (i.e., avoidant) subscale delineation put forth by Carver and colleagues. The COPE subscales of active coping, planning, suppression of competing activities, positive reinterpretation, restraint, acceptance, and instrumental social support served as the proposed indicators of the Problem-Focused Coping (PFC) factor. The COPE subscales of emotional social support, focus on and venting of emotions, denial, behavioral disengagement, and mental disengagement served as indicators of the Avoidant Emotion-Focused Coping (AVC) factor. A total of 56 parameters were estimated (23 factor loadings, 23 error variances, and 10 factor correlations) resulting in 220 *df* for the two factor measurement model. The cases to estimated parameter ratio for this and every other model remained above the suggested minimum 5:1 ratio (Bentler & Chou, 1987; Kline, 2005).

Three factor model

A three factor model of general coping style, with the factors of Problem-Focused, Avoidant coping and Support Seeking, represented by dotted lines in Figure 2, was also tested. This formulation of coping style was based on theoretical and empirical grounds suggesting that both instrumental and emotional social support, as well as venting one's emotions, represent a distinct latent coping style in which emotional support seeking is conceived as useful or beneficial (e.g., Carver, Scheier, & Weintraub, 1989; Ingledew, Hardy, Cooper, & Jemal, 1996; Laurent, Catanzaro, & Callan, 1997; Sica, Novara, Dorz, & Sanavio, 1997; Williams & Clark, 1998). The proposed indicators of the Problem-Focused Coping (PFC) factor were identical to those in the two factor model except for instrumental social support which, along with emotional social support and venting of emotions, were hypothesized indicators of the latent construct Support Seeking (SS). The latent construct of Avoidant Coping (AVC) had as its proposed indicators the COPE subscales of denial, behavioral disengagement, and mental disengagement. A total of 61 parameters were estimated resulting in 215 *df* for the three factor model.

Measurement Model Estimation

Each measurement model in its entirety was subjected to CFA in one run. The factors were scaled to 1.0 by default in LISREL, and all latent constructs were allowed to freely correlate. The hypothesized 2 factor COPE measurement model was a poor fit to the data, with SCALED χ^2 (220,N = 327) = 889.53, $p < .05$; MLE χ^2 = 914.21; ECVI = 3.07 (90% CI = 2.80 – 3.37); RMSEA = .097 (90% CI = .09 - .10); CFI = .85; and SRMR = .10. The hypothesized 3 factor COPE measurement model was a better fit, SCALED χ^2 (215,N = 327) = 563.46, $p < .05$; MLE χ^2 = 577.48; ECVI = 2.10 (CI = 1.90 – 2.33); RMSEA = .071 (CI = .063 - .078); CFI = .92; and SRMR = .070, as indicated by ECVI's smaller value and acceptable values of the

supplemental fit indices. These findings suggest that SS is a distinct latent construct in this sample, separate from the avoidant coping construct with which its indicators are sometimes associated.

Final Measurement Model

SS and its indicators were removed from the final measurement model because no hypotheses were set forth concerning SS as a separate coping style. This theoretical decision also was supported empirically in this sample because almost half of the standardized residuals and the second largest modification index were associated with indicators of Support Seeking, indicating SS negatively impacted overall model fit. Therefore, the final measurement model had 20 measured variables, resulting in 210 available degrees of freedom. A total of 50 parameters were estimated, resulting in 160 *df* for the final measurement model. The final model with the latent factors PFC, AVC, DSRS, DTC, and ALC resulted in SCALED χ^2 (160,N = 327) = 382.16, $p < .05$; MLE $\chi^2 = 389.83$; ECVI = 1.48 (CI = 1.32 – 1.67); RMSEA = .065 (CI = .057 - .074); CFI = .94; and SRMR = .062, indicating good fit to the data according to conventional criteria. Examination of standardized residuals and modification indices indicated post hoc modifications would improve the model; however, they were contrary to theory. Theoretical considerations and avoidance of creating an overfitted model that was not generalizable were of paramount importance; therefore, the final measurement model was retained with no modifications and was used to estimate the structural models.

Standardized factor loadings and error variances for the final measurement model were within the expected range and all were statistically significant (see Table 4). The squared multiple correlations indicated each latent factor explained a relatively large percentage of the variance in each of its respective indicators, except for DTC #15 (i.e., drink to feel more

confident and sure; DTC explained 16% of its variance), restraint (PFC explained 18%), acceptance (PFC 16%), and mental disengagement (AVC 18%) indicators. Reliability for each of the latent factors was .80 or above, with the exception of AVC (.65). Correlations among the latent factors were in the expected direction and provided evidence of good discriminant validity among the constructs (see Table 5).

Evaluating the Structural Model

In order to evaluate the hypothesized fully mediated structural relationships between general coping and alcohol use, an alternative models approach was taken whereby the fit of the hypothesized model was evaluated by comparing it to two alternative *a priori* models. All models are presented in Figure 3 where plus and minus signs indicate the direction of the hypothesized effects. For ease of presentation, indicators of the latent constructs are not shown. The models are nested within each other, with the hypothesized model being the most parsimonious, in order to sequentially test the paths that were hypothesized to be zero.

Factors were scaled by setting to 1.0 the path of one indicator per construct; indicators with the highest factor loading from the measurement model were selected as the reference indicators (Byrne, 1998). The covariance among the exogenous factors, PFC and AVC, was freely estimated because general coping styles typically are intercorrelated (e.g., Park, Armeli, & Tennen, 2004). The number of measured variables in each model was 20, resulting in 210 available *df*.

Hypothesized Structural Model

The solid lines in Figure 3 represent the structural hypotheses that the effects of coping style on alcohol use are fully mediated. The top half of the figure shows the relationship between Problem-Focused Coping and less Alcohol Use is fully mediated by greater use of Drinking Self-

Regulation Skills. The solid lines in the bottom portion of the figure illustrate that use of Avoidant Coping is hypothesized to result in increased Alcohol Use via more Drinking to Cope motives. Direct effects from Problem-Focused Coping to Alcohol Use and from Avoidant Coping to Alcohol Use are not hypothesized. The hypothesized model is nested within the alternative comparison models.

Alternative Comparison Models

The addition of the dotted and dashed lines to the hypothesized model in Figure 3 illustrates the first alternative model that was estimated. In addition to estimating the mediated effects in the hypothesized model, this alternative model assumed direct effects of both Problem-Focused Coping and Avoidant Coping on Alcohol Use. This model, referred to as Model 1 for convenience, was estimated first as it contained the most parameters.

The second alternative model (referred to as Model 2 and represented by the solid and dotted lines in Figure 3) assumed that the effects of Avoidant Coping on Alcohol Use were fully mediated (i.e., the path from Avoidant Coping to Alcohol Use was set to zero) but retained both direct and indirect effects of Problem Focused Coping. If Model 2 fit the data as well as Model 1, as determined by the SCALED χ^2 difference test, evidence would be provided that the path from Avoidant Coping to Alcohol Use was not significantly different from zero. Next, the direct path from Problem-Focused Coping to Alcohol Use in Model 2 was set to zero to estimate the fully mediated hypothesized model (referred to as Model 3). Support for the hypothesized model would be evident if there were no significant differences between Models 2 and 3.

Estimation of Alternative Model 1

To estimate the alternative Model 1, a total of 47 parameters were freely estimated, resulting in 163 model *df*. Path estimates from PFC to DSRS, DSRS to ALC, and AVC to DTC

were significant and in theoretically consistent directions. The path from DTC to ALC was in the expected direction but only approached significance ($p < .06$). The standardized direct path from AVC to ALC was nonsignificant while the path from PFC to ALC was significant but unexpectedly positive (standardized estimate = .18). Fit statistics for this model are provided in Table 6.

Estimation of Alternative Model 2

The AVC to ALC path from Model 1 was then constrained to zero to estimate Model 2. All of the freely estimated standardized path estimates in Model 2 were identical to those in Model 1 above. The SCALED χ^2_{diff} test comparing Models 1 and 2 was nonsignificant, indicating that constraining the AVC to ALC path to zero was statistically supported. Supplemental fit indices also supported this finding, as they indicated the more parsimonious Model 2 was a good fit to the data (see Table 6); therefore, alternative Model 2 was retained for comparing against the hypothesized model.

Estimation of the Hypothesized Model (Model 3)

The hypothesized model was then estimated by setting to zero the path from PFC to ALC from Model 2. All freely estimated paths in this Model 3 were in the expected direction and significant, except the path from DTC to ALC, which remained nonsignificant (standardized estimate = .09). The SCALED χ^2_{diff} test between Models 2 and 3 was significant and the fit indices changed slightly, indicating Model 3 had a worse fit to the data and that the path from PFC to ALC should remain freely estimated.

Best Fitting Model

The above series of estimated models indicated that Model 2 best fit the data (see Figure 4), in which the direct path from AVC to ALC was constrained to zero while the remaining paths

were freely estimated. The specific effects in the model will now be examined in order to determine if the mediation hypotheses are supported. Full mediation is indicated when the total and indirect effects of a predictor on a criterion are significant, coupled with a nonsignificant direct effect of the predictor on the criterion. Partial mediation is present when the total, indirect, and direct effects are significant (Holmbeck, 1997; Kline, 2005).

Direct Effects. As anticipated, the results indicated that PFC was a significant predictor of greater use of DSRS (standardized coefficient = .32). DSRS also significantly predicted reduced alcohol use (standardized coefficient = -.58) as expected. Contrary to hypotheses, PFC had a significant direct relationship with ALC such that PFC led to more alcohol use (standardized coefficient = .18). Results corresponding to the bottom portion of the model indicated that, as expected, AVC resulted in greater DTC (standardized coefficient = .38). The effect of DTC on ALC was in the predicted direction but only approached significance (standardized coefficient = .12, $p < .06$). As hypothesized, there was no direct effect of AVC on ALC.

Indirect Effects. Indirect effects are estimated with the product of the predictor-mediator and mediator-criterion path estimates. A significant indirect effect establishes the predictor, potential mediator, and criterion are linked but makes no assertion that the predictor and criterion are associated with each other (Preacher & Hayes, 2004). Thus, a significant indirect effect is necessary but not sufficient to establish mediation (Holmbeck, 1997; Kline, 2005). The indirect effect of PFC on ALC via DSRS was significant (standardized estimate = -.19). This estimate indicates that for every increase in one standard deviation of PFC, ALC is reduced by .19 standard deviations via PFC's effect on DSRS. The indirect effect of AVC on ALC was not significant (standardized estimate = .05, $p < .08$), indicating avoidant coping was not linked with

alcohol use via drinking to cope. This finding was not surprising given the direct effect of DTC on ALC only approached significance ($p < .06$).

Total Effects. In the Baron and Kenny (1986) tradition, a requisite step in testing for mediation is to establish that the initial variable predicts the criterion. The sum of the direct and indirect effects indicates the total effect of an exogenous variable on an endogenous variable and provides evidence of the predictor-criterion relationship. The total effect of PFC on ALC equals -.01 [direct effect (.18) + indirect effect (-.19)], suggesting there was no initial relationship between the predictor and the criterion.

Kenny (2006) and MacKinnon (2000) wrote that if the signs of the direct and indirect effects are in opposite directions, as was true in this study, establishing the initial predictor-criterion relationship may not be satisfied but mediation may still occur. In essence, the opposite signs mathematically cancel out the total effect, disguising it to look like the predictor and criterion are not associated with one another. More specifically, mediation may occur but it is suppressed by the opposite signs of the direct and indirect effects (Shrout & Bolger, 2002; Tzelgov & Henik, 1991). Suppression of effects is also indicated when the direct effect of a predictor on a criterion is greater in absolute value than the correlation between the same variables (Kline, 2005). Since each of these conditions for suppression were met, it seems reasonable to conclude that DSRS partially mediated PFC and ALC since their indirect and direct effects were significant. However, this finding does not support the hypothesis that PFC and ALC would be fully mediated by DSRS.

Turning now to the total effect of AVC on ALC, the total effect was not significant and equals .05 [direct effect (0) + indirect effect (.05)], indicating there was no statistically meaningful association between the predictor and criterion. Although the direct effect of AVC on

ALC was not estimated because it was not significant, the indirect and total effects also were not significant. Thus, the best fitting model lacked sufficient evidence to provide support for full mediation of avoidant coping and alcohol use by drinking to cope, contrary to the hypothesis.

Evaluating Specific Facets of Problem-Focused Coping

Hypothesized Facet Model

As the results above indicated there was a significant positive relationship between problem-focused coping and alcohol-specific coping skills, the hypothesis that this relationship was driven by specific facets of problem-focused coping was examined. Four indicators of PFC, planning, active, suppression of competing activities, and restraint coping, were hypothesized *a priori* to account for the relationship between PFC and DSRS. These four indicators represent behaviorally oriented strategies for dealing with stressors either in advance or in the moment. Conceptually, they are similar to alcohol-specific coping skills. The remaining PFC indicators, positive reinterpretation and acceptance coping, represent cognitive reinterpretations of events after they occur in order to limit stress and appear to have little relevance to promoting use of alcohol-specific coping skills or successfully limiting alcohol consumption.

Facet Model Estimation

The facet hypothesis was tested by estimating, with modifications, the best fitting structural model from the previous set of analyses (Model 2). The latent PFC construct was replaced by two constructs—PFC-behavioral (4 indicators; reliability = .79) and PFC-cognitive (2 indicators; reliability = .57). Of note, the path estimates from the PFC constructs to DSRS were of importance in this model. As in the structural models above, correlations among all exogenous factors were freely estimated and the endogenous factors of DSRS, DTC, and ALC were scaled by setting the same reference indicators to 1.0. The exogenous factors of AVC, PFC-

cognitive, and PFC-behavioral were scaled by allowing the factor variance default to 1.0. A total of 50 parameters were estimated, resulting in 160 model *df*.

The path from PFC-behavioral to DSRS was significant (standardized estimate = .40) while the PFC-cognitive path to DSRS was nonsignificant (standardized estimate = .09; see Figure 5). This finding lends support to the hypothesis that the relationship between PFC and DSRS is largely explained by the facets of problem-focused coping that are more active and aim to deal with stressors by anticipating them.

Although not hypothesized, the values of the nonsignificant path estimates from the PFC constructs to ALC revealed interesting relationships worth noting. The standardized path estimate from PFC-behavioral to ALC was in the negative direction predicted by theory and previous findings in the literature while the PFC-cognitive path to ALC was in the positive direction (.32; $p < .10$). Given that the path estimate from PFC (one construct) to ALC was unexpectedly positive in Model 2, these results indicate that finding may be explained by the PFC-cognitive facets of positive reinterpretation and acceptance.

Evaluating Moderation of PFC and DSRS

Hypothesized Moderator Model

The fourth hypothesis that intentions to regulate drinking would moderate the relationship between problem-focused coping and alcohol-specific coping was examined. It was hypothesized that individuals who tend to use problem-focused coping strategies and intend to regulate their drinking will use more drinking self-regulatory skills (Figure 1). This hypothesis was tested in the context of Model 2, the best fitting structural model depicted in Figure 4.

Moderator Model Estimation

A multiple groups approach to analyzing the moderator hypothesis was used. This approach involves simultaneously estimating the same model in subgroups that represent the levels of the moderator variable. Moderator groups were formed by median split on the intentions to control drinking composite variable, yielding sample sizes of 169 for the group who intended to control their drinking and 158 for the group who had fewer intentions of controlling their drinking. The moderator analyses were conducted using only the relationships between PFC, DSRS, and ALC constructs (i.e., the top half of the model in Figure 4) for two reasons. First, in order to have the minimum recommended 5:1 cases per estimated parameter given the reduced sample sizes for each level of the moderator, it was necessary to reduce the number of parameters estimated. Second, the hypothesis predicted that only the causal chain from PFC to DSRS to ALC would be moderated by intentions to control drinking. Therefore, the estimated model had 156 available *df* (12 observed variables results in 78 available *df* per group, times 2 groups). The measurement model estimated 54 parameters (9 factor loadings, 12 error variances, 3 factor disturbances, and 3 factor correlations per group), resulting in 102 model *df*.

The measurement model for each group was separately estimated. Factors were scaled by setting to 1.0 the same reference indicators as in the hypothesized structural model. The measurement model for each group fit the data moderately well (fewer intentions group: χ^2 = 116.01, SRMR = .074; greater intentions group: χ^2 = 98.42, SRMR = .072). No post hoc modifications were made because those suggested by the modification indices were inconsistent with theory. The measurement model for each group was then simultaneously estimated, yielding a pooled SCALED $\chi^2(114, N = 327) = 204.59$ against which the remaining models were compared using the SCALED χ^2 difference test.

Sets of parameters were then constrained to be equal across groups in the following order: factor variances, factor covariances, and factor loadings. As only truly invariant indicators should be used as the reference indicators (Vandenberg, 2002), they were also tested for invariance by freeing them and constraining alternative reference indicators. Errors of indicators were not tested for invariance, as "it is now widely accepted that to do so represents an overly restrictive test of the data" (Byrne, 1998). As each new set of parameters was constrained, the constrained model was compared against the previously estimated, less constrained model. Parameter constraints were cumulative such that when parameters were found to be noninvariant across groups, they remained constrained. All SCALED χ^2 difference tests were nonsignificant, indicating the groups' measurement models were fully invariant (test values not shown).

Structural paths were next tested for invariance. SCALED χ^2 difference tests indicated all structural paths were invariant across groups, including the path from PFC to DSRS. Thus, no support was found for the hypothesis that the relationship between problem-focused coping and alcohol-specific coping is stronger in individuals who have greater intentions of controlling their drinking.

Discussion

The current study examined the associations among general coping, alcohol-specific coping, drinking to cope, and alcohol use based on a social cognitive theory model of alcohol use. The hypothesis that the relationships between general coping styles and alcohol use were fully mediated by alcohol specific constructs was not supported. The association between problem-focused coping and alcohol use was only partially explained by the use of alcohol-specific coping skills, and post-hoc analyses suggested certain facets of problem-focused coping more clearly explained the indirect and direct effects on alcohol use. The hypothesized

relationships between avoidant focused coping and alcohol use were not supported. Finally, the positive association between problem-focused coping and alcohol-specific coping skills was not moderated by individuals' reported intentions to regulate their drinking, contrary to the hypothesis.

Results from the current study suggest the relationship between problem-focused coping and alcohol use is partially mediated by drinking self-regulatory skills. Individuals who report using a more problem-focused coping style in response to stress in general also tend to use more adaptive, alcohol-specific coping skills to control their alcohol use, resulting in less drinking. Thus, the ways in which people report generally coping with stress are related to the ways in which they deal with specific problems or possible problems, in this case, unwanted alcohol use. The results of the problem-focused coping facet analysis suggested these results were largely driven by the problem-focused coping facets of suppression of competing activities, restraint, planning, and active coping, collectively. These results were likely found because both sets of coping, general and alcohol-specific, involve coping with stressors either prior to or while they are occurring.

The relationship between problem-focused coping and alcohol use was not fully mediated by alcohol-specific coping, and the remaining direct effect was positive and contrary to previous findings and theoretical hypotheses. The problem-focused coping facet analysis indicated this unexpected finding may be due to the two cognitively oriented facets of positive reinterpretation and acceptance. These facets were associated with more alcohol use both directly and indirectly via an inverse association with drinking self-regulatory skills. The two cognitive facets involve reducing stress by reinterpreting experiences to accept them and to make them seem more like positive learning experiences. These cognitive activities appear beneficial on the surface but do

not readily lead to behavior change because the consequences of said behaviors are reinterpreted to seem less problematic. If the behavior at hand is drinking, the data suggests use of these cognitive problem-focused coping facets shall serve to perpetuate excessive drinking rather than curb it. Unfortunately, these results cannot be compared to those in the literature because no studies were found that reported analyzing alcohol use and the coping facets of positive reinterpretation and acceptance. In sum, it appears as though the cognitive facets of positive reinterpretation and acceptance help explain the unexpected direct positive association between alcohol use and the original problem-focused coping construct.

Regarding the findings associated with avoidant coping, the results did not support the hypothesis that drinking to cope fully mediates the relationship between avoidant coping and alcohol use because the path from drinking to cope to alcohol use only approached significance. This finding is inconsistent with those of Cooper and colleagues (Cooper, Frone, Russell, & Mudar, 1995; Cooper, Russell, & George, 1988) in which drinking to cope mediated alcohol use. However, those studies cannot be directly compared to the current one because they analyzed observed, not latent, variables; neither avoidant coping nor drinking to cope were operationalized similar to this study; and the samples were composed of adults and adolescents, not college students.

Although the nonsignificant association between drinking to cope and alcohol use found in this study approached significance, it is contrary to the significant associations reported in the literature. Unlike in the current study, the majority of studies that have found a significant relationship primarily used manifest variables and computed bivariate relationships between alcohol use and drinking to cope. Furthermore, although drinking to cope is expected to lead to alcohol use, it most likely results in heavier, problematic drinking. Studies that have examined

drinking to cope in conjunction with both alcohol use and alcohol-related consequences have borne this out (Cooper, 1994; Kassel, Jackson, & Unrod, 2000; Kuntsche, Knibbe, Gmel, & Engels, 2005; Windle & Windle, 1996). The latent measure of alcohol use in the current study included an indicator of heavy drinking, but it was combined with indicators of weekly frequency and quantity. Thus, it may be more fruitful for future studies to explore the association of drinking to cope with alcohol-related constructs by differentiating between drinking, heavy drinking, and drinking problems.

A notable limitation of the avoidant coping branch of the structural model involves the reliability of avoidant coping, which was .65. One implication is that the path coefficients "downstream" from avoidant coping could have been affected in unpredictable ways (Kline, 2005). There is no way to determine if the results would have provided more or less support for the hypotheses if avoidant coping's reliability was greater. As has been noted elsewhere (Lazarus & Folkman, 1984), low reliability may be an inherent property of coping measures because a respondent may endorse using only one strategy (i.e., one item) that makes up a subscale representing the latent factor, resulting in a lower reliability coefficient for that subscale. As the current study is only one of several that has found evidence of low reliability for avoidant coping (e.g. Carver, Scheier, & Weintraub, 1989; Cooper, Russell, Skinner, Frone, & Mudar, 1992; Ingledew, Hardy, Cooper, & Jemal, 1996), future studies should compensate for this likely occurrence by ensuring that a more than adequate number of indicators are available for each latent coping factor.

Furthermore, although the reliability of the DTC construct as a whole was .86, three of the five indicators had standardized factor loadings less than .75. This is comparable to the authors' findings (Cooper, 1994) but may have worked in concert with the low reliability of the

avoidant coping construct to impact the results. As Cooper's (1994) measure of drinking motives is most frequently administered (Kuntsche, Knibbe, Gmel, & Engels, 2005), future studies interested in the drinking to cope subscale should consider excluding #15 (i.e., drinking to increase self-confidence) as it had the lowest unstandardized factor loading in both the current study (.50) as well as the measure development study (.41; Cooper, 1994) in which confirmatory factor analysis was also used.

Aside from the measurement issues, the lack of a significant effect from drinking to cope to alcohol use may be partially attributable to drinking to cope being a less common drinking motive for college students (Kuntsche, Knibbe, Gmel, & Engels, 2005). Since drinking to cope may have less impact in groups who view heavy drinking as normative (Read, Kahler, Wood, Maddock, & Palfai, 2003), as college students often do, testing the hypothesized model in older populations who are more likely to endorse drinking to cope (Fromme & Rivet, 1994; Perkins, 1999) is advised.

Support was not found for intentions to control drinking moderating the effect of problem-focused coping on alcohol-specific coping. This result may have been due to several reasons, including the retrospective assessment of drinking intentions and the statistical decision to dichotomize the moderator variable. The study of intentions to control or regulate drinking deserves continued attention, especially given its relative lack of research. Ideally, future examinations of intentions would be conducted in the context of a prospective study predicting future rather than concurrent alcohol use.

The present study has several limitations, including the cross-sectional design and having just above the minimum number of cases per estimated parameter for some analyses. It was theorized that general coping precedes alcohol-specific coping, but longitudinal or experimental

studies are needed to help establish causality as well as to more clearly indicate if alcohol-specific coping mediates problem-focused coping and alcohol use. Additional studies are needed to determine if problem-focused coping is best conceptualized by limiting it to only proactive coping strategies that are used to help alleviate stress before and during stressful situations, as results from this study suggest. As discussed above, some of the analyses may have been negatively impacted by low reliability estimates of the latent avoidant coping construct. Continued work to delineate the various facets of avoidant coping and how they are best measured should improve this aspect of future coping-related research. Finally, although a model was found to fit the data reasonably well, that does not mean the model is correct or true, only plausible (MacCallum & Austin, 2000), and it should be evaluated against other plausible models.

The nuances of general coping styles' associations with alcohol use are brought to light when examined in the context of more complex models. In the current study, this was accomplished by studying general coping with alcohol-related constructs. Despite the lack of support for the hypotheses, all together the results indicated approach, action-oriented styles of coping are associated with behaviors protective against heavy drinking while avoidance-based coping styles are risk factors for drinking to cope. Not only is this consistent with the coping and alcohol literature, but it is also consistent with the larger coping and health literature in which more adaptive coping is associated with better outcomes (Penley, Tomaka, & Wiebe, 2002). One of the more promising findings from the current study is that problem-focused coping is associated with endorsement of greater use of theoretically consistent alcohol-specific coping skills, which had not been previously determined. Perhaps these initial findings will provide a

useful framework for studying various problem-specific coping skills, such as specific skills for coping with depression or cancer, in conjunction with general coping styles.

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Table 1 *Subscales of the COPE*

Useful / Adaptive Subscales*

Active Coping
5. I concentrate my efforts on doing something about it.
25. I take additional action to try to get rid of the problem.
47. I take direct action to get around the problem.
58. I do what has to be done, one step at a time.

Planning
19. I make a plan of action.
32. I try to come up with a strategy about what to do.
39. I think about how I might best handle the problem.
56. I think hard about what steps to take.

Suppression of Competing Activities
15. I keep myself from getting distracted by other thoughts or activities.
33. I focus on dealing with this problem, and if necessary let other things slide a little.
42. I try hard to prevent other things from interfering with my efforts at dealing with this.
55. I put aside other activities in order to concentrate on this.

Positive Reinterpretation and Growth
1. I try to grow as a person as a result of the experience.
29. I try to see it in a different light, to make it seem more positive.
38. I look for something good in what is happening.
59. I learn something from the experience.

Restraint
10. I restrain myself from doing anything too quickly.
22. I hold off doing anything about it until the situation permits.
41. I make sure not to make matters worse by acting too soon.
49. I force myself to wait for the right time to do something.

Use of Instrumental Support
4. I try to get advice from someone about what to do.
14. I talk to someone to find out more about the situation.
30. I talk to someone who could do something concrete about the problem.
45. I ask people who have had similar experiences what they did.

Acceptance
13. I get used to the idea that it happened.
21. I accept that this has happened and that it can't be changed.
44. I accept the reality of the fact that it happened.
54. I learn to live with it.

Less Useful Subscales*

Focus On / Venting Emotions
3. I get upset and let my emotions out.
17. I get upset, and am really aware of it.
28. I let my feelings out.
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot.

Use of Emotional Support
11. I discuss my feelings with someone.
23. I try to get emotional support from friends or relatives.
34. I get sympathy and understanding from someone.
52. I talk to someone about how I feel.

Denial
6. I say to myself "this isn't real."
27. I refuse to believe that it has happened.
40. I pretend that it hasn't really happened.
57. I act as though it hasn't even happened.

Behavioral Disengagement
9. I admit to myself that I can't deal with it, and quit trying.
24. I just give up trying to reach my goal.
37. I give up the attempt to get what I want.
51. I reduce the amount of effort I'm putting into solving the problem.

Mental Disengagement
2. I turn to work or other substitute activities to take my mind off things.
16. I daydream about things other than this.
31. I sleep more than usual.
43. I go to movies or watch TV, to think about it less.

Substance Use
12. I use alcohol or drugs to make myself feel better.
26. I try to lose myself for a while by drinking alcohol or taking drugs.
35. I drink alcohol or take drugs, in order to think about it less.
53. I use alcohol or drugs to help me get through it.

Humor
8. I laugh about the situation.
20. I make jokes about it.
36. I kid around about it.
50. I make fun of the situation.

Religion
7. I put my trust in God.
18. I seek God's help.
48. I try to find comfort in my religion.
60. I pray more than usual.

*The authors' categorization of the subscales

Table 2

Scales of the Drinking Self-Regulation Questionnaire

Cognitive Strategies

1. Think about how I am acting
2. Think about the consequences of drinking too much
3. The next day, I think about what I did
4. Think about bad experiences in the past that were associated with alcohol
5. Think about how I'll feel the next day if I drink too much
6. Tell myself that I'll get sick if I drink too much
8. I tell myself that I don't want to look stupid
9. I tell myself that it is unhealthy
10. Think about how I will feel in an hour
11. Think about times when I drank too much and how bad I felt
12. Think about doing something I would regret
21. Engage in other activities while drinking, such as dancing, playing cards, etc.
23. Punish myself for drinking too much (e.g., not allowing myself to drink/ go out the next night; forcing myself to work through a hangover)
45. Ask my friends to regulate my drinking/ tell me when to stop
46. Tell my friends how much I'm planning on drinking

Behavioral Strategies

7. I tell myself when I've had enough
13. Drink slowly
14. Limit the number of drinks I consume
15. Throw my cup away after I've reached my limit
16. Pace myself/ drink only a certain amount per hour
17. Sip my drink
18. Avoid chugging or funneling
19. Count how many drinks I've had
20. Give drinks away
22. Refuse drinks
24. Don't drink before I go out
27. Stop drinking when I feel sick
28. Stop drinking when I get a buzz
32. Nurse my drink
49. Stop drinking when my speech is slurred or I'm not walking straight

Environmental Strategies

25. Don't drink when I'm in a mood that encourages drinking (e.g., depressed, anxious)
26. Only go out once a week
29. Stop drinking when I get really talkative
30. Go to places where there is no alcohol
31. Leave/ avoid places where people pressure me to drink
33. Don't drink with people I don't know
34. Avoid places where people will be taking shots
35. Avoid places where people will be drinking heavily
36. Avoid drinking with people who drink heavily
37. Drink only in small groups
38. Avoid drinking in places that I don't feel comfortable or am unfamiliar with
39. Avoid going to bars
40. Avoid fraternity/ sorority parties
41. Avoid standing near the keg or bar
42. Avoid places where I drink heavily
43. Avoid "free beer" parties
44. Only go out with responsible friends
47. Don't go bar or party "hopping" – stay in one place
48. Go to a room/ section of the bar where people are not drinking
50. Don't play drinking games

Table 3

Correlation Matrix, Means, and Standard Deviations among Measured Variables

Indicators	1	2	3	4	5	6	7
Alcohol Use (ALC)							
1. Frequency of drinking	1.000						
2. Quantity of drinking	.411**	1.000					
3. Binge drinking	.717**	.601**	1.000				
Drinking to Cope (DTC)							
4. DTC #1	.147**	.047	.146**	1.000			
5. DTC #4	.116*	.037	.126*	.588*	1.000		
6. DTC #6	.218**	.161**	.211**	.554**	.604**	1.000	
7. DTC #15	.153**	.124*	.182**	.263**	.412**	.298**	1.000
8. DTC #17	.179**	.113*	.184**	.779**	.663**	.675**	.353**
Drinking Self-Regulation Skills (DSRS)							
9. DSRQ - cognitive	-.227**	-.266**	-.204**	-.095	-.049	-.101	-.042
10. DSRQ - behavioral	-.346**	-.478**	-.398**	-.178**	-.192**	-.245**	-.163**
11. DSRQ - environmental	-.417**	-.477**	-.457**	-.154**	-.151**	-.237**	-.251**

Note. DTC #1, etc. are item numbers given by Cooper (1994). DSRQ = Drinking Self-Regulation Questionnaire

*$p < .05$, ** $p < .001$

Table 3 (cont'd)

Correlations, Means, and Standard Deviations among Measured Variables (cont'd)

Indicators	1	2	3	4	5	6	7
Problem-Focused Coping (PFC)							
12. active	-.047	-.031	-.056	-.174*	-.213**	-.129*	-.127*
13. planning	-.044	-.003	-.051	-.103	-.205**	-.170**	-.074
14. suppression of competing activities	-.034	.037	-.004	-.109*	-.136*	-.022	.043
15. positive reinterpretation	.000	.066	.049	-.081	-.201**	-.140*	-.089
16. restraint	-.021	.006	.036	-.076	-.059	-.030	-.014
17. acceptance	.005	.177**	.064	-.002	-.100	-.045	.076
Support Seeking Coping (SS)							
18. instrumental SS	-.023	-.110*	-.058	-.061	-.095	-.022	-.085
19. emotional SS	-.079	-.244**	-.115*	.012	.018	-.026	-.007
20. venting	-.073	-.214**	-.129*	.127*	.172**	.098	.105
Avoidant Coping (AVC)							
21. mental disengagement	.004	.071	.015	.204**	.169**	.164**	.111*
22. denial	.107	.073	.071	.126*	.181**	.177**	.127*
23. behavioral disengagement	.063	.041	.006	.223**	.295**	.225**	.232**
M	2.015	5.710	5.246	1.673	1.862	2.135	2.568
SD	1.091	3.106	4.336	0.890	1.064	1.122	1.262

*$p < .05$, ** $p < .001$

Table 3 (cont'd)

Correlations, Means, and Standard Deviations among Measured Variables (cont'd)

Indicators	8	9	10	11	12	13	14
Drinking Self-Regulation Skills (DSRS)							
9. DSRQ - cognitive	-.126*	1.000					
10. DSRQ - behavioral	-.273**	.592**	1.000				
11. DSRQ - environmental	-.221**	.484**	.658**	1.000			
Problem-Focused Coping (PFC)							
12. active	-.200**	.234**	.243**	.178**	1.000		
13. planning	-.201**	.281**	.231**	.121*	.717**	1.000	
14. suppression of competing activities	-.118*	.239**	.142**	.089	.527**	.525**	1.000
15. positive reinterpretation	-.122*	.255**	.145**	.169**	.517**	.529**	.391**
16. restraint	-.105	.185**	.156**	.152**	.339**	.318**	.292**
17. acceptance	-.036	.100	.007	.046	.323**	.285**	.277**
Support Seeking Coping (SS)							
18. instrumental SS	-.092	.278**	.213**	.186**	.368**	.357**	.307**
19. emotional SS	-.044	.251**	.243**	.256**	.177**	.192**	.124*
20. venting	.072	.220**	.165**	.151**	.075	.004	.098
Avoidant Coping (AVC)							
21. mental disengagement	.131*	-.017	-.104	-.017	-.093	-.116*	.006
22. denial	.184**	-.059	-.104	-.005	-.160**	-.160**	-.044
23. behavioral disengagement	.239**	-.077	-.123*	-.028	-.277**	-.232**	-.077
M	1.670	31.875	31.057	31.814	10.833	11.439	9.494
SD	0.962	9.886	11.168	14.929	2.089	2.543	2.025

*$p < .05$, ** $p < .001$

Table 3 (cont'd)

Correlations, Means, and Standard Deviations among Measured Variables (cont'd)

Indicators	15	16	17	18	19	20
Problem-Focused Coping (PFC)						
14. suppression of competing activities						
15. positive reinterpretation	1.000					
16. restraint	.349**	1.000				
17. acceptance	.368**	.345**	1.000			
Support Seeking Coping (SS)						
18. instrumental SS	.313**	.160**	.193**	1.000		
19. emotional SS	.193**	-.033	.012	.709**	1.000	
20. venting	-.054	-.126*	-.001	.432**	.652**	1.000
Avoidant Coping (AVC)						
21. mental disengagement	-.033	.157**	.099	.029	-.036	.050
22. denial	.036	.105	-.011	.034	.020	.100
23. behavioral disengagement	-.188**	.102	.070	.047	.035	.179**
M	11.294	9.234	10.543	10.793	10.577	9.610
SD	2.581	2.332	2.281	2.703	3.336	3.034

*$p < .05$, ** $p < .001$

Table 3 (cont'd)

Indicators	21	22	23
Drinking Self-Regulation Skills (DSRS)			
21. DSRQ - cognitive	1.000		
22. DSRQ - behavioral	.307**	1.000	
23. DSRQ - environmental	.305**	.503**	1.000
M	9.994	5.625	5.963
SD	2.270	1.949	1.808

*$p < .05$, ** $p < .001$

Table 4

Measurement Model Parameter Estimates

Indicators	Factor Loadings			Error Variances		
	Unst.	SE	St.	Unst.	SE	St.
Alcohol Use (ALC)						
Frequency of drinking	.83	.05	.76	.50	.09	.42
Quantity of drinking	2.00	.15	.65	5.63	.65	.58
Binge drinking[a]	4.02	.18	.93	2.62	.90	.14
Drinking to Cope (DTC)						
DTC #1	.73	.06	.82	.26	.04	.33
DTC #4	.79	.05	.74	.51	.08	.45
DTC #6	.82	.05	.73	.58	.07	.46
DTC #15	.50	.06	.40	1.34	.10	.84
DTC #17[a]	.89	.06	.93	.13	.03	.14
Drinking Self-Regulation Skills (DSRS)						
DSRQ - cognitive	6.46	.52	.65	56.01	5.65	.57
DSRQ - behavioral[a]	9.68	.54	.87	30.98	6.18	.25
DSRQ - environmental	11.49	.71	.77	90.86	11.64	.41
Problem-Focused Coping (PFC)						
active[a]	1.77	.10	.85	1.24	.17	.29
planning	2.12	.12	.83	1.99	.29	.31
suppression of competing activities	1.27	.11	.62	2.50	.24	.61
positive reinterpretation	1.66	.12	.64	3.92	.36	.59
restraint	1.00	.14	.43	4.44	.42	.82
acceptance	.92	.13	.40	4.36	.36	.84
Avoidant Coping (AVC)						
mental disengagement	.95	.15	.42	4.25	.38	.82
denial	1.25	.15	.64	2.23	.37	.59
behavioral disengagement[a]	1.41	.14	.78	1.28	.32	.39

Note. Unst. = unstandardized; St. = standardized; SE = standard error. All factor variances = 1.0.

[a] Reference indicators for structural models.

Table 5

Correlations of Latent Factors in Final Measurement Model

	1	2	3	4	5
1. ALC	1.00				
2. DTC	0.23*	1.00			
3. DSRS	-0.55*	-0.30*	1.00		
4. PFC	-0.03	-0.24*	0.32*	1.00	
5. AVC	0.06	0.36*	-0.14	-0.28*	1.00

Note. ALC = alcohol use, DTC = drinking to cope, DSRS = drinking self-regulation skills, PFC = problem-focused coping, AVC = avoidant coping

*$p < .05$

Table 6

Model χ^2 and Supplementary Fit Statistics for Estimated Structural Models

Model	Parameters set to zero	*df*	SCALED χ^2	MLE χ^2	ECVI (90% CI)	RMSEA (90% CI)	CFI	SRMR	SCALED χ^2_{diff}
1		163	399.39	408.42	1.51 (1.35 – 1.71)	.067 (.058 - .075)	.94	.080	
2	AVC → ALC	164	399.61	408.37	1.51 (1.34 – 1.70)	.066 (.058 - .075)	.94	.080	-0.055
3	AVC → ALC PFC → ALC	165	409.96	418.21	1.57 (1.40 – 1.77)	.067 (.059 - .076)	.94	.084	13.566*

Note. Model 1 = Alternative structural model depicted by all solid and dashed lines in Figure 3.

*$p < .05$ (indicates rejection of the model on the corresponding row)

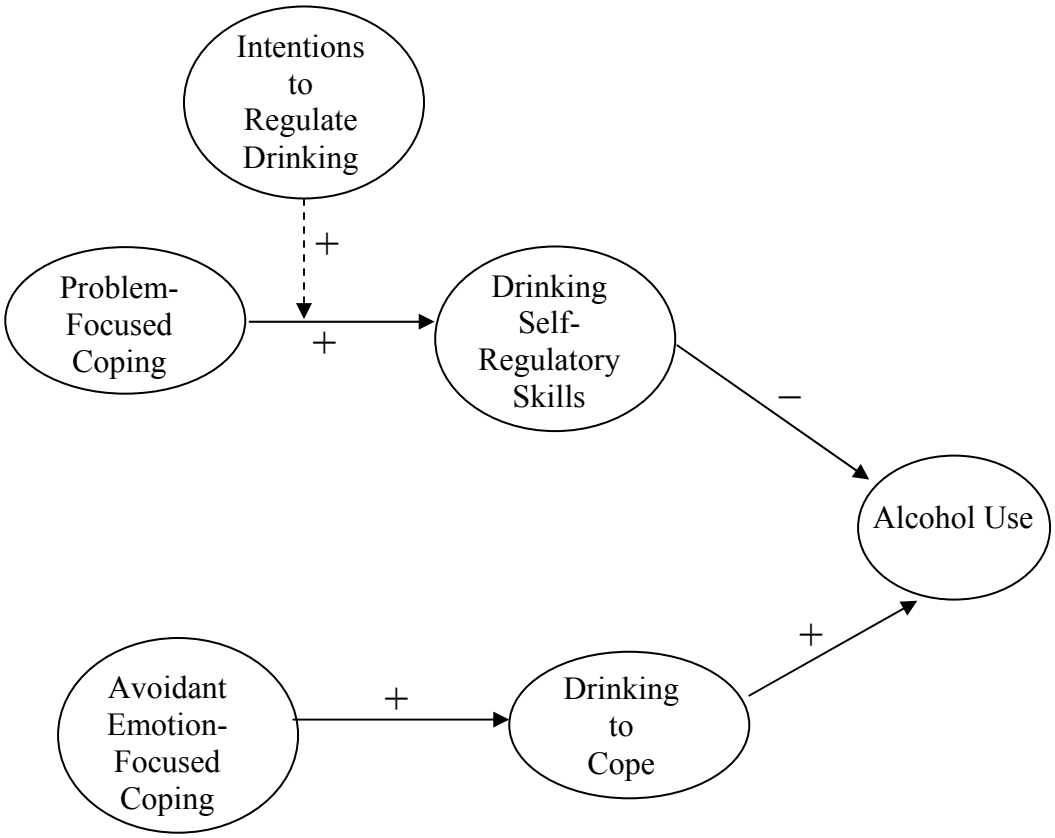
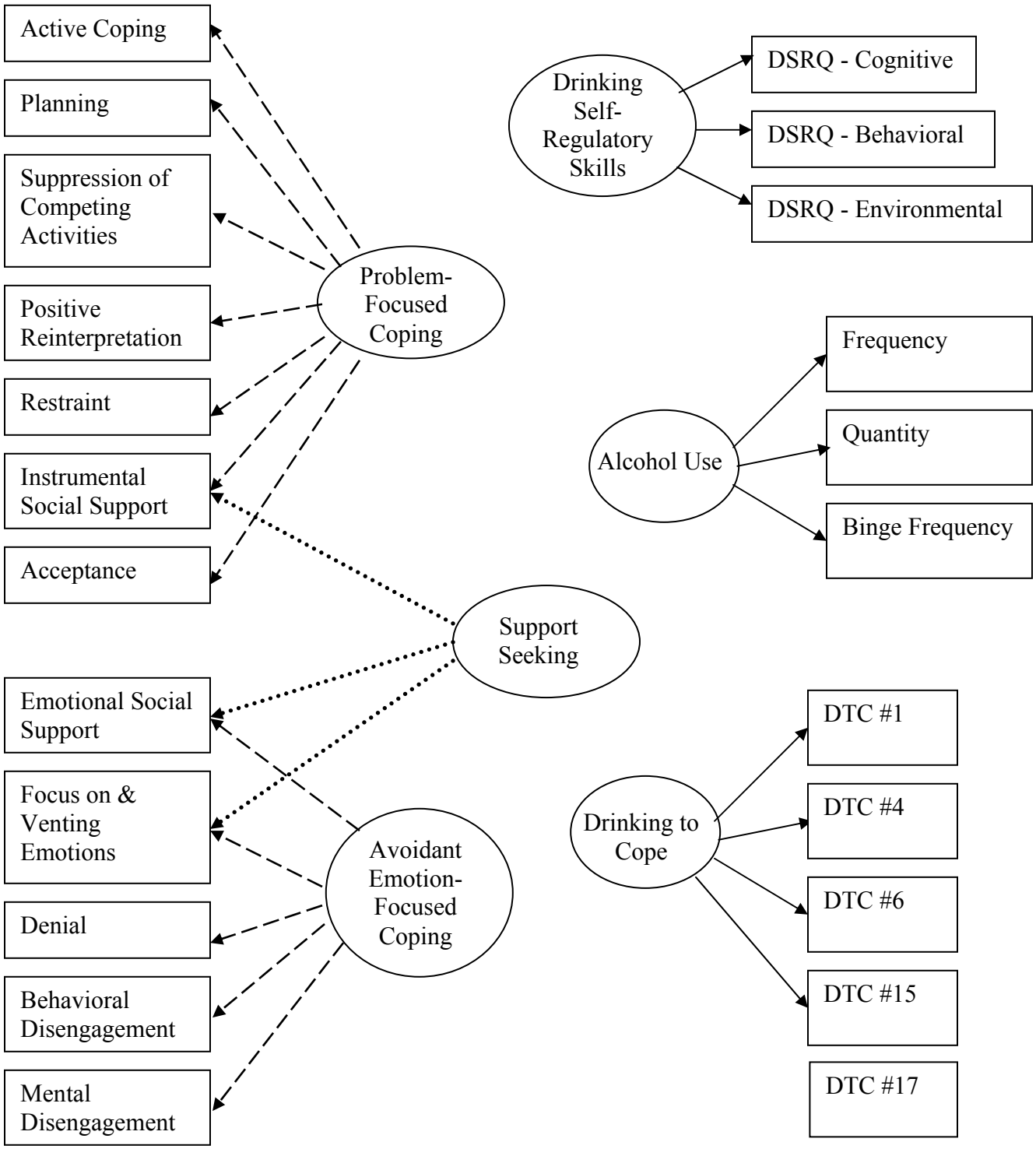


Figure 1

Conceptual Diagram of Hypothesized Relationships among Constructs

Figure 2

Conceptual Diagram of Hypothesized Measurement Model. The general coping factors are represented by Problem-Focused Coping, Support Seeking, and Avoidant Emotion-Focused Coping. The dashed lines from Problem-Focused Coping and Avoidant Emotion-Focused Coping to their indicators represent the 2-factor model of coping that was tested. In the 3-factor model of coping, the indicators of Support Seeking, denoted by the dotted lines, were no longer indicators of Problem-Focused and Avoidant Emotion-Focused Coping.



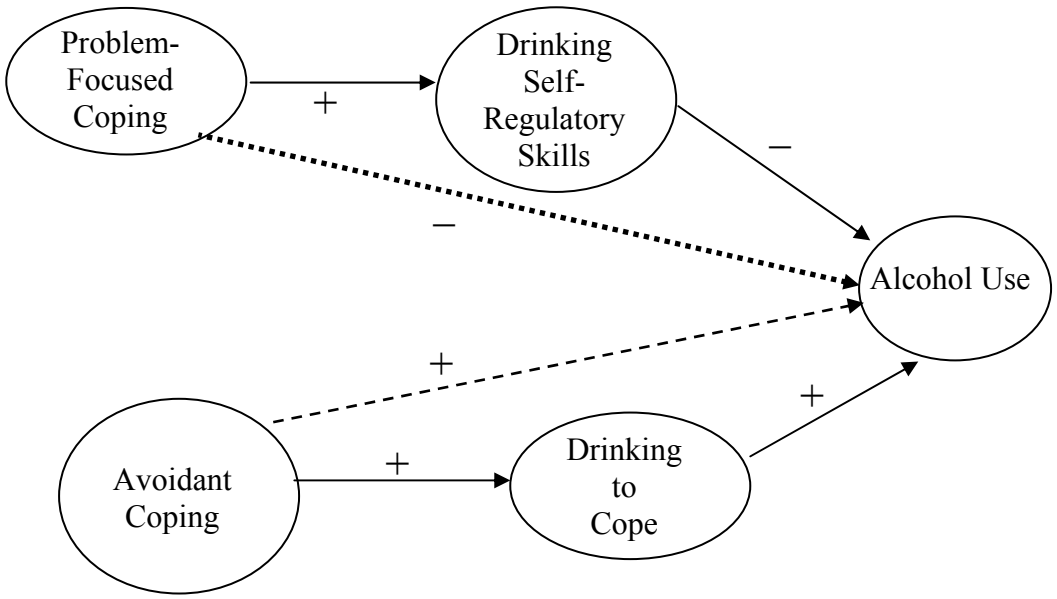


Figure 3

Conceptual Diagram of Hypothesized and Alternative Structural Models. All the paths as a whole represent the first estimated alternative model (Model 1). The next estimated alternative model is represented by the solid and dotted lines (Model 2). The fully mediated hypothesized model is represented by the solid lines only (Model 3).

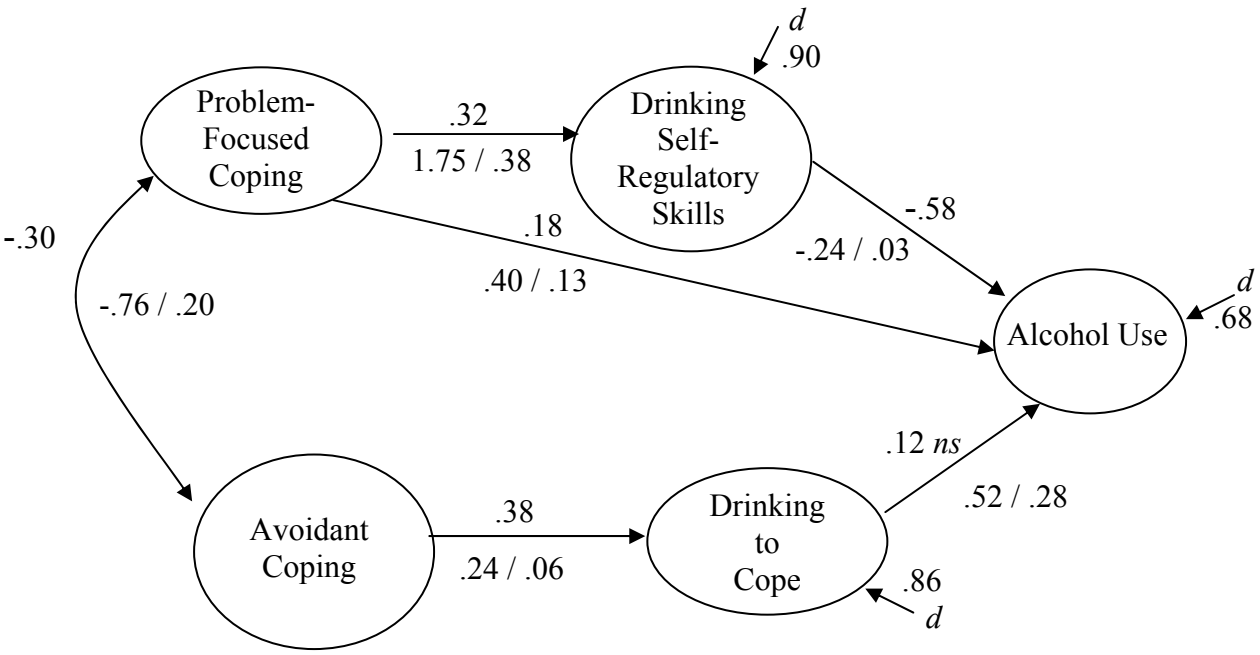


Figure 4

Final Structural Model (Model 2). Standardized path coefficients are presented above the arrows; unstandardized path coefficients / standard errors are presented below the arrows. All path coefficients are significant unless marked by *ns*.
d = standardized disturbances. Exogenous factors' residuals = 1.0.

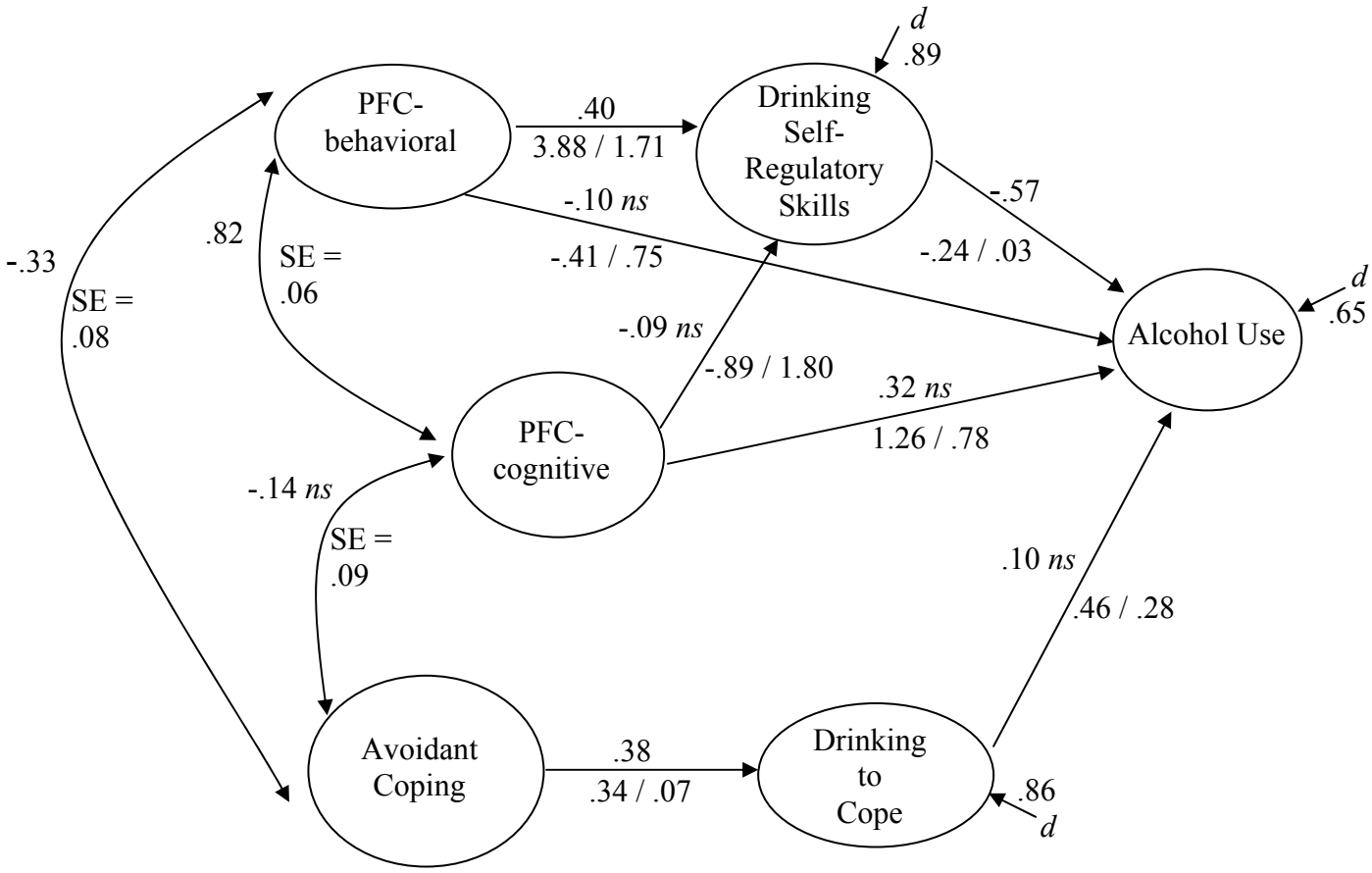


Figure 5

Problem-Focused Coping Facet Model. Standardized path coefficients are presented above the arrows; unstandardized path coefficients / standard errors (SE) are presented below the arrows. All path coefficients are significant unless marked by *ns*. There are no unstandardized estimates for the exogenous factors because the factors were scaled to 1.0.
d = standardized disturbances.

Appendix A

Demographic Information

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

1. Sex: male female

2. Age: _____

3. Race:
   - African-American
   - American Indian/Alaska Native
   - Asian
   - Caucasian
   - Hispanic
   - 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
   - Apartment
   - House
   - Fraternity/Sorority house

Appendix B

COPE

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Indicate what YOU usually do when YOU experience a stressful event.

In general, what do you usually do when you experience stress?	I usually **don't** do this at all	I usually do this a **little** bit	I usually do this a **medium** amount	I usually do this **a lot**
1. I try to grow as a person as a result of the experience.	1	2	3	4
2. I turn to work or other substitute activities to take my mind off things.	1	2	3	4
3. I get upset and let my emotions out.	1	2	3	4
4. I try to get advice from someone about what to do.	1	2	3	4
5. I concentrate my efforts on doing something about it.	1	2	3	4
6. I say to myself "this isn't real."	1	2	3	4
7. I put my trust in God.	1	2	3	4
8. I laugh about the situation.	1	2	3	4
9. I admit to myself that I can't deal with it, and quit trying.	1	2	3	4
10. I restrain myself from doing anything too quickly.	1	2	3	4
11. I discuss my feelings with someone.	1	2	3	4
12. I use alcohol or drugs to make myself feel better.	1	2	3	4
13. I get used to the idea that it happened.	1	2	3	4
14. I talk to someone to find out more about the situation.	1	2	3	4
15. I keep myself from getting distracted by other thoughts or activities.	1	2	3	4

In general, what do you usually do when you experience stress?	I usually **don't** do this at all	I usually do this a **little** bit	I usually do this a **medium** amount	I usually do this **a lot**
16. I daydream about things other than this.	1	2	3	4
17. I get upset, and am really aware of it.	1	2	3	4
18. I seek God's help.	1	2	3	4
19. I make a plan of action.	1	2	3	4
20. I make jokes about it.	1	2	3	4
21. I accept that this has happened and that it can't be changed.	1	2	3	4
22. I hold off doing anything about it until the situation permits.	1	2	3	4
23. I try to get emotional support from friends or relatives.	1	2	3	4
24. I just give up trying to reach my goal.	1	2	3	4
25. I take additional action to try to get rid of the problem.	1	2	3	4
26. I try to lose myself for a while by drinking alcohol or taking drugs.	1	2	3	4
27. I refuse to believe that it has happened.	1	2	3	4
28. I let my feelings out.	1	2	3	4
29. I try to see it in a different light, to make it seem more positive.	1	2	3	4
30. I talk to someone who could do something concrete about the problem.	1	2	3	4
31. I sleep more than usual.	1	2	3	4
32. I try to come up with a strategy about what to do.	1	2	3	4
33. I focus on dealing with this problem, and if necessary let other things slide a little.	1	2	3	4
34. I get sympathy and understanding from someone.	1	2	3	4
35. I drink alcohol or take drugs, in order to think about it less.	1	2	3	4
36. I kid around about it.	1	2	3	4

In general, what do you usually do when you experience stress?	I usually **don't** do this at all	I usually do this a **little** bit	I usually do this a **medium** amount	I usually do this **a lot**
37. I give up the attempt to get what I want.	1	2	3	4
38. I look for something good in what is happening.	1	2	3	4
39. I think about how I might best handle the problem.	1	2	3	4
40. I pretend that it hasn't really happened.	1	2	3	4
41. I make sure not to make matters worse by acting too soon.	1	2	3	4
42. I try hard to prevent other things from interfering with my efforts at dealing with this.	1	2	3	4
43. I go to movies or watch TV, to think about it less.	1	2	3	4
44. I accept the reality of the fact that it happened.	1	2	3	4
45. I ask people who have had similar experiences what they did.	1	2	3	4
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot.	1	2	3	4
47. I take direct action to get around the problem.	1	2	3	4
48. I try to find comfort in my religion.	1	2	3	4
49. I force myself to wait for the right time to do something.	1	2	3	4
50. I make fun of the situation.	1	2	3	4
51. I reduce the amount of effort I'm putting into solving the problem.	1	2	3	4
52. I talk to someone about how I feel.	1	2	3	4
53. I use alcohol or drugs to help me get through it.	1	2	3	4
54. I learn to live with it.	1	2	3	4
55. I put aside other activities in order to concentrate on this.	1	2	3	4

In general, what do you usually do when you experience stress?	I usually **don't** do this at all	I usually do this a **little** bit	I usually do this a **medium** amount	I usually do this **a lot**
56. I think hard about what steps to take.	1	2	3	4
57. I act as though it hasn't even happened.	1	2	3	4
58. I do what has to be done, one step at a time.	1	2	3	4
59. I learn something from the experience.	1	2	3	4
60. I pray more than usual.	1	2	3	4

Appendix C
Behavioral Intentions

The following questions ask how much you wanted to either increase or decrease your drinking over the past 4 weeks. Please respond with what you think you **WANTED** to do about your drinking, **NOT** what you **ACTUALLY DID** or what you think you **SHOULD HAVE DONE**.

	Definitely did **not** want to	Very much did not want to	Somewhat did not want to	Somewhat wanted to	Very much wanted to	Definitely **wanted** to
1. On **the average day** in the past 4 weeks, did you want to drink **more** alcohol than you were drinking before?	1	2	3	4	5	6
2. On **the average day** in the past 4 weeks, did you want to drink **less** alcohol than you were drinking before?	1	2	3	4	5	6
3. Think about **the day you had the most to drin**k in the past 4 weeks (your heaviest drinking day). On that day, did you want to drink **more** than you were drinking before?	1	2	3	4	5	6
4. Think about **the day you had the most to drin**k in the past 4 weeks (your heaviest drinking day). On that day, did you want to drink **less** than you were drinking before?	1	2	3	4	5	6
5. How much did you want to drink **more frequently** in the past 4 weeks, compared to your previous drinking?	1	2	3	4	5	6
6. How much did you want to drink **less frequently** in the past 4 weeks, compared to your previous drinking?	1	2	3	4	5	6

7. How much did you want to drink **5 or more drinks** (for men) or **4 or more drinks** (for women) on at least one occasion in the past 4 weeks?	1	2	3	4	5	6

8. Over the past 4 weeks, would you say you were more likely to want to (choose one):
    a. Increase your drinking?
    b. Decrease your drinking?
    c. Maintain (not change) your previous drinking levels?

Appendix D
Alcohol Use

Directions: Think about your drinking over the past 30 days when answering these questions. You can use your calendar or planner if that will help you. When asked how many drinks you drank, please write in the number of standard drinks you drank.

One standard drink equals: 12 oz. beer or
5 oz. of wine or
1 ½ oz of liquor (one small shot glass)

Example: If you had one 36 oz mug of beer, that would equal 3 standard drinks.

1. On average, how many days did you drink per **week**? _____

2. On average, how many drinks did you have when you drank? Please make sure to convert them to standard drinks.

_____

3. If you're a woman…how many **days in the past 30 days** did you drink 4 or more standard drinks? If you're a man…how many **days in the past 30 days** did you drink 5 or more standard drinks?

_____

4. How many days did you drink 10 or more standard drinks in the past **30 days**?

_____

5. What is the greatest number of standard drinks you have drank in one day, over the past **30 days**?

_____

6. How typical do you think your drinking patterns in the past 30 days compare to your general drinking pattern over the past 2 months? (Check one)

___ I drank more this month
___ I drank somewhat more this past month
___ I drank about the same this past month
___ I drank somewhat less this past month
___ I drank a lot less or not at all this past month

Appendix E
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 30 days 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 30 days?

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**	1. Not able to do your homework or study for a test?
0	**1**	**2**	**3**	**4**	2. Got into fights, acted bad, or did mean things?
0	**1**	**2**	**3**	**4**	3. Missed out on other things because you spent too much money on alcohol?
0	**1**	**2**	**3**	**4**	4. Went to work or school high or drunk?
0	**1**	**2**	**3**	**4**	5. Caused shame or embarrassment to someone?
0	**1**	**2**	**3**	**4**	6. Neglected your responsibilities?
0	**1**	**2**	**3**	**4**	7. Relative avoided you?
0	**1**	**2**	**3**	**4**	8. Felt that you needed more alcohol than you used to use in order to get the same effect?
0	**1**	**2**	**3**	**4**	9. Tried to control your drinking by trying to drink only at certain times of the day or certain places?
0	**1**	**2**	**3**	**4**	10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking?
0	**1**	**2**	**3**	**4**	11. Noticed a change in your personality?
0	**1**	**2**	**3**	**4**	12. Felt you had a problem with alcohol?
0	**1**	**2**	**3**	**4**	13. Missed a day (or part of a day) of school or work?
0	**1**	**2**	**3**	**4**	14. Tried to cut down or quit drinking?
0	**1**	**2**	**3**	**4**	15. Suddenly found yourself in a place that you could not remember getting to?
0	**1**	**2**	**3**	**4**	16. Passed out or fainted suddenly?
0	**1**	**2**	**3**	**4**	17. Had a fight, argument or bad feelings with a friend?
0	**1**	**2**	**3**	**4**	18. Had a fight, argument or bad feelings with a family member?
0	**1**	**2**	**3**	**4**	19. Kept drinking when you promised yourself not to?
0	**1**	**2**	**3**	**4**	20. Felt you were going crazy?
0	**1**	**2**	**3**	**4**	21. Had a bad time?
0	**1**	**2**	**3**	**4**	22. Felt physically or psychologically dependent on alcohol?
0	**1**	**2**	**3**	**4**	23. Was told by a friend or neighbor to stop or cut down drinking?
0	**1**	**2**	**3**	**4**	24. Drove shortly after having more than 2 drinks?
0	**1**	**2**	**3**	**4**	25. Drove shortly after having more than 4 drinks?

Appendix F
DSRQ

We are interested in the various strategies college students use to control their drinking. Using the scale below, please indicate how often you have used each of the following strategies in the past 30 days.

	Never	Rarely	Occasionally	Most of the time	Always
1. Think about how I am acting	0	1	2	3	4
2. Think about the consequences of drinking too much	0	1	2	3	4
3. The next day, I think about what I did	0	1	2	3	4
4. Think about bad experiences in the past that were associated with alcohol	0	1	2	3	4
5. Think about how I'll feel the next day if I drink too much	0	1	2	3	4
6. Tell myself that I'll get sick if I drink too much	0	1	2	3	4
7. I tell myself when I've had enough	0	1	2	3	4
8. I tell myself that I don't want to look stupid	0	1	2	3	4
9. I tell myself that it is unhealthy	0	1	2	3	4
10. Think about how I will feel in an hour	0	1	2	3	4
11. Think about times when I drank too much and how bad I felt	0	1	2	3	4
12. Think about doing something I would regret	0	1	2	3	4
13. Drink slowly	0	1	2	3	4
14. Limit the number of drinks I consume	0	1	2	3	4
15. Throw my cup away after I've reached my limit	0	1	2	3	4
16. Pace myself/ drink only a certain amount per hour	0	1	2	3	4
17. Sip my drink	0	1	2	3	4
18. Avoid chugging or funneling	0	1	2	3	4
19. Count how many drinks I've had	0	1	2	3	4
20. Give drinks away	0	1	2	3	4

	Never	Rarely	Occasionally	Most of the time	Always
21. Engage in other activities while drinking, such as dancing, playing cards, etc.	0	1	2	3	4
22. Refuse drinks	0	1	2	3	4
23. Punish myself for drinking too much (e.g., not allowing myself to drink/ go out the next night; forcing myself to work through a hangover)	0	1	2	3	4
24. Don't drink before I go out	0	1	2	3	4
25. Don't drink when I'm in a mood that encourages drinking (e.g., depressed, anxious)	0	1	2	3	4
26. Only go out once a week	0	1	2	3	4
27. Stop drinking when I feel sick	0	1	2	3	4
28. Stop drinking when I get a buzz	0	1	2	3	4
29. Stop drinking when I get really talkative	0	1	2	3	4
30. Go to places where there is no alcohol	0	1	2	3	4
31. Leave/ avoid places where people pressure me to drink	0	1	2	3	4
32. Nurse my drink	0	1	2	3	4
33. Don't drink with people I don't know	0	1	2	3	4
34. Avoid places where people will be taking shots	0	1	2	3	4
35. Avoid places where people will be drinking heavily	0	1	2	3	4
36. Avoid drinking with people who drink heavily	0	1	2	3	4
37. Drink only in small groups	0	1	2	3	4
38. Avoid drinking in places that I don't feel comfortable or am unfamiliar with	0	1	2	3	4
39. Avoid going to bars	0	1	2	3	4
40. Avoid fraternity/ sorority parties	0	1	2	3	4
41. Avoid standing near the keg or bar	0	1	2	3	4
42. Avoid places where I drink heavily	0	1	2	3	4
43. Avoid "free beer" parties	0	1	2	3	4

	Never	Rarely	Occasionally	Most of the time	Always
44. Only go out with responsible friends	0	1	2	3	4
45. Ask my friends to regulate my drinking/ tell me when to stop	0	1	2	3	4
46. Tell my friends how much I'm planning on drinking	0	1	2	3	4
47. Don't go bar or party "hopping" – stay in one place	0	1	2	3	4
48. Go to a room/ section of the bar where people are not drinking	0	1	2	3	4
49. Stop drinking when my speech is slurred or I'm not walking straight	0	1	2	3	4
50. Don't play drinking games	0	1	2	3	4

Appendix G
Drinking Motives

Directions: The following is a list of reasons people sometimes give for drinking alcohol. Thinking of all the times you drink, **how often** would you say that you drink for each of the following reasons?

	Almost Never / Never	Some of the time	Half of the time	Most of the time	Almost always / always
1. I drink to forget my worries	1	2	3	4	5
2. I drink because my friends pressure me to drink	1	2	3	4	5
3. I drink because it helps me enjoy a party	1	2	3	4	5
4. I drink because it helps me when I feel depressed or nervous	1	2	3	4	5
5. I drink to be sociable	1	2	3	4	5
6. I drink to cheer up when I am in a bad mood	1	2	3	4	5
7. I drink because I like the feeling	1	2	3	4	5
8. I drink so that others won't kid me about *not* drinking	1	2	3	4	5
9. I drink because it's exciting	1	2	3	4	5
10. I drink to get high or drunk	1	2	3	4	5
11. I drink because it makes social gatherings more fun	1	2	3	4	5
12. I drink to fit in with a group I like	1	2	3	4	5
13. I drink because it gives me a pleasant feeling	1	2	3	4	5
14. I drink because it improves parties and celebrations	1	2	3	4	5
15. I drink because I feel more confident and sure of myself	1	2	3	4	5
16. I drink to celebrate a special occasion with friends	1	2	3	4	5
17. I drink to forget my problems	1	2	3	4	5
18. I drink because it's fun	1	2	3	4	5
19. I drink to be liked	1	2	3	4	5
20. I drink so I won't feel left out	1	2	3	4	5

Appendix H
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 was 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%

AOES

Directions: Here is a list of some effects or consequences that some people experience after drinking alcohol. Please circle the number that best describes how drinking alcohol would affect you.

When I drink alcohol ***heavily***…	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
20. I am more outgoing	1	2	3	4	5	6
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 pleasant 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

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EDUCATION

***Degree*:**	**Doctor of Philosophy in Clinical Psychology, APA-accredited, May 2007**
Location:	**Virginia Polytechnic Institute and State University, Blacksburg, VA**
Specialization:	Substance abuse
Advisor:	Robert S. Stephens, Ph.D.
Dissertation:	Examining the relationships among general coping, alcohol-specific coping and alcohol use in a college student population.

Internship:	**Predoctoral Internship in Clinical Psychology, APA-accredited, 2004 – 2005** **University of Mississippi Medical Center / G.V. (Sonny) Montgomery VAMC Consortium, Jackson, MS**

Degree:	**Master of Science in Clinical Psychology, May 2002**
Location:	**Virginia Polytechnic Institute and State University, Blacksburg, VA**
Advisor:	Robert S. Stephens, Ph.D.
Thesis:	Understanding self-efficacy for alcohol use: The roles of self-monitoring and hypothesized source variables.

Degree:	**Bachelor of Science in Psychology, Magna Cum Laude, June 1999**
Location:	**Appalachian State University, Boone, NC**
Minor:	Sociology

RESEARCH EXPERIENCE

Position:	**Grant Coordinator, 2001 - 2004**
Study:	NIDA-funded "Marijuana Dependence Treatment PRN," [Roger Roffman, DSW (PI)] evaluated the effectiveness of nine sessions vs. treatment as needed (prn) in a treatment-seeking, marijuana-using sample, utilizing case management, motivational enhancement therapy, and cognitive-behavioral skills training.
Location:	Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA
Supervisor:	Robert S. Stephens, Ph.D. (Co-PI)
Duties:	Assisted in finalization of study design; created and supervised creation of assessment protocols and manuals; assisted in training and supervising assessors; trained and supervised quality assurance staff that reviewed assessment videotapes; created data entry screens, managed data, supervised all data-related tasks; communicated with Seattle site regarding recruitment strategies and study implementation.

Position: **Grant Coordinator, 2001 - 2004**

Study: NIDA-funded "Motivating Marijuana Cessation," [Roger Roffman, DSW (PI)] evaluated the effectiveness of a two- vs. a six-session motivational enhancement therapy for non-treatment seeking marijuana dependent adults.

Location: Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA

Supervisor: Robert S. Stephens, Ph.D. (Co-PI)

Duties: Assisted in development and finalization of study design, recruitment strategies, assessment battery, treatment and assessment protocols and manuals; assisted in training assessors; assisted in developing and refining treatment fidelity coding system, coded intervention videotapes for treatment fidelity; coded assessment and intervention videotapes for quality assurance; assisted in supervision of assessors and interventionists; created and supervised creation of data entry screens, managed and analyzed data; communicated with Seattle site regarding implementation of the study.

Position: **Grant Coordinator, 2001 - 2004**

Study: Department of Veteran's Affairs Health Services Research and Development-funded "Improving Substance Abuse Treatment Aftercare Adherence and Outcome," [Steven J. Lash, Ph.D. (PI)] designed to increase aftercare participation of graduates of a 28-day inpatient substance abuse treatment program by using contracts, prompts, and reinforcers of attendance compared to treatment as usual.

Location: Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA and Salem VAMC, Salem, VA

Supervisors: Robert S. Stephens, Ph.D. (Co-PI), Steven J. Lash, Ph.D.

Duties: Assisted in development and finalization of study design and assessment battery; created assessment protocols and manuals; trained and supervised assessors; supervised quality assurance staff that reviewed assessment session audiotapes; supervised data entry screen creation, data entry, and data management.

Position: **Research Assistant, 1998 - 1999**

Study: Centers for Disease Control-funded community-based intervention to increase bicycle helmet use

Location: Department of Psychology, Appalachian State University, Boone, NC

Duties: Assisted in intervention design and delivery; collected, entered, and managed data.

Position: **Research Assistant, 1998**

Location: Department of Psychology, Appalachian State University, Boone, NC

Duties: Coded mock-aggressive behavioral data from videotapes.

GRANT ACTIVITIES

Grant-Writing Contributions

2004 NIDA-funded Stage 2 study, "Reaching and Motivating Change in Teen Marijuana Smokers"

2004 Department of Veteran's Affairs Health Services Research and Development-funded "Reinforcement of Abstinence and Attendance in Substance Abuse Treatment"

2001 NIDA-funded "Motivating Marijuana Cessation"

2001 NIDA-funded Stage 1b study "Reaching and Motivating Change in Teen Marijuana Smokers"

2000 Department of Veteran's Affairs Health Services Research and Development-funded "Improving Substance Abuse Treatment Aftercare Adherence and Outcome"

Grant Funding

2004 Virginia Tech Graduate Student Assembly Graduate Research Development Project Grant

2002 Virginia Tech Graduate Student Assembly Travel Fund

CLINICAL EXPERIENCE

Position: **Psychology Resident, 2004 - 2005**

Location: University of Mississippi Medical Center / G.V. (Sonny) Montgomery VAMC Consortium, Jackson, MS

Rotation: Chemical Dependence Treatment Program, 6 months (Supervisor: Jefferson D. Parker, Ph.D.): Co-facilitated dual-diagnosis process / psychoeducational group and CBT-based relapse prevention group; individual therapist for substance dependent inpatients with co-occurring Axis I, II and III disorders; conducted inpatient consultations for substance use treatment referral; conducted screenings for cognitive functioning, depression, social anxiety, and gambling problems; conducted personality assessments; was advised on responsibilities and assisted with tasks related to leading the Chemical Dependence Treatment Program; participated in weekly multidisciplinary treatment team meetings.

Rotation: Health Psychology, 3 months (Supervisor: Patricia M. Dubbert, Ph.D.): Conducted semi-structured evaluations to determine psychological suitability for bariatric (weight loss) surgery, conducted didactic portion of one of the monthly bariatric patient support group meetings, conducted semi-structured evaluations to determine suitability for surgical intervention for males with sexual dysfunction, consulted with cardiology outpatients on mental health and behavior modification issues, individual CBT for eating disorders and risk reduction in obesity, assisted with follow-up assessments for an exercise intervention with elderly veterans.

Rotation: Neuropsychology, 3 months: Conducted semi-structured neuropsychological evaluations to determine suitability for bariatric (weight loss) surgery, observed adult and child neuropsychological assessments, assisted with literature review of neurological toxins pertinent to a series of assessments.

Workshop: Motivational Interviewing: weekly didactic instruction of motivational interviewing principles and skills, modeling and in-vivo practice of skills, and implementation of skills with volunteer client followed by constructive feedback from certified MI trainers.

Position: **Clinical Psychology Extern, 2001 - 2002**

Location: Substance Abuse Residential Rehabilitation Treatment Program, Salem VAMC, Salem, VA

Supervisor: Steven J. Lash, Ph.D.

Duties: Conducted screenings for inpatient program admission, semi-structured intake interviews for general symptomatology, structured assessments for neuropsychological and cognitive symptomatology, and unstructured diagnostic assessments; facilitated an inpatient CBT-based relapse prevention group; individual treatment of inpatients with comorbid Axis I and II disorders; created model for delivering a two-session motivational enhancement intervention; attended weekly multidisciplinary treatment team meetings.

***Position*:** **Graduate Clinician, 2000 - 2003**

Location: Psychological Services Center, Blacksburg, VA

Supervisors: Richard M. Eisler, Ph.D. (2002 – 2003), Robert S. Stephens, Ph.D. (2000 – 2001), Thomas H. Ollendick, Ph.D. (2000)

Duties: Assessed and treated children and adults for learning disabilities, conduct disorders, mood and anxiety disorders, personality disorders, other psychopathology and life issues (e.g., marital discord); conducted brief motivational enhancement therapy for alcohol abuse; assisted in development of and co-facilitated an 11-week CBT-based group for dually-diagnosed members referred by the Virginia Department of Corrections, conducted pre- and post-treatment assessments for the CBT group.

SUPERVISORY & ADMINISTRATIVE EXPERIENCES

Research

Studies: NIDA-funded "Marijuana Dependence Treatment PRN," NIDA-funded "Motivating Marijuana Cessation," and Veteran's Affairs-funded "Improving Substance Abuse Treatment Aftercare Adherence and Outcome," 2001 - 2004

Duties: Trained and supervised assessors conducting baseline and follow-up assessments; supervised data entry screen creation, data entry, and data management; supervised undergraduate research assistants in various tasks, including data entry and conducting assessments.

Clinical

Location: University of Mississippi Medical Center / G.V. (Sonny) Montgomery VAMC Consortium, Jackson, MS, 2005

Duties: Supervised social work student in role of case manager while completing a rotation in the Chemical Dependence Treatment Program.

Location: Substance Abuse Residential Rehabilitation Treatment Program (SARRTP), Salem VAMC, Salem, VA, 2002

Duties: Conducted a review / training session on the interviewer-administered Addiction Severity Index.

Study: NIDA-funded "Motivating Marijuana Cessation," 2001 - 2002

Duties: Supervised therapists conducting motivational interviewing and cognitive behavioral intervention sessions.

Location: Psychological Services Center, Blacksburg, VA, 2003 - 2004
Duties: Supervised second-year doctoral psychology students.

Administrative

2004 – 2005 Chief Resident, University of Mississippi Medical Center / Jackson VAMC Consortium

TEACHING EXPERIENCE

Position: **Graduate Teaching Assistant, 1999 - 2000**
Location: Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA
Supervisor: Jack Finney, Ph.D., Chair, Department of Psychology
Class: Introductory Psychology, 4 sections
Duties: Created and presented lectures, created and graded writing assignments and quizzes.

JOURNAL REVIEWS

Archives of Clinical Neuropsychology
Journal of Clinical Psychology
Journal of Consulting and Clinical Psychology, ad-hoc reviewer
Journal of the American Geriatric Society
Medicine and Science in Sports and Exercise
Schizophrenia Research

AWARDS & HONORS

1998 Alpha Chi National Honor Society
1997 Gamma Beta Phi Society
1996 – 1999 Appalachian State University Academic Scholarship

PROFESSIONAL AFFILIATIONS

2003 – current American Psychological Association
2002 – current Association for Behavioral and Cognitive Therapies (named Association for Advancement of Behavior Therapy prior to 2005)
1998 – 2000 Southeastern Psychological Association

BIBLIOGRAPHY

Stephens, R. S., Roffman, R. A., **Walker, N. R**., DeMarce, J., Lozano, B. E., & Jones, M. E. (2006, January). *Marijuana dependence treatment for adults, PRN.* Paper presented at the annual International Conference on Treatment of Addictive Behaviors, Albuquerque, NM.

Walker, N. R., Hunt, Y. M., Grothe, K., Parker, J. D., Burke, R. S., Dubbert, P. M., for the PATHS Research Group. (2005, November) *Associations between tobacco use and alcohol moderation over time: Implications for clinical practice.* Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, Washington DC.

Walker, R. (2004, November). An Intern's Perspective. In A. M. Zeiss and R. J. Seime (Co-Chairs), *Internship Training Site Overview.* Panel discussion conducted at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, LA.

Jones, M. E., Lozano, B. E., & **Walker, N. R.** (2004, November). Therapeutic alliance and outpatient substance abuse aftercare: Mediation between intervention and treatment outcome? In S. J. Lash (Chair) and D. Kivlahan (Discussant), *Behavioral contracting, prompting and reinforcing substance abuse continuing care.* Symposium conducted at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, LA.

Stephens, R. S., Roffman, R., **Walker, N. R.**, & Fearer, S. A. (2004, November). *Motivational enhancement therapy with marijuana users low in motivation for change: Lack of differences in the effects of two versus six sessions.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, LA.

Lozano, B. E., Roffman, R., Tsuru, W., **Walker, N. R.**, & Stephens, R. S. (2004, November). *Marijuana dependent clients' outcome goals: Understanding shifts between abstinence and moderation.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, New Orleans, LA.

Walker, N. R. (2003, Summer). Understanding health implications of human-animal relationships using a functional support model. *Newsletter of the American Association of Human-Animal Bond Veterinarians, 9,* 11.

Walker, N. R. & Stephens, R. S. (2002, November). *Understanding self-efficacy for alcohol use: The roles of self-monitoring and hypothesized source variables.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Walker, N. R., Fearer, S. A., Stephens, R. S., Roffman, R., & Williams, C. D. (2002, November). *Measuring motivation for marijuana change.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Walker, N. R., DeMarce, J., Jones, M. E., Lozano, B. E., Stephens, R. S., Lash, S. J., & Burden, J. L. (2002, November). *Development of an aftercare self-efficacy questionnaire: Validity and ability to predict aftercare attendance.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Fearer, S. A., **Walker, N. R.**, Stephens, R. S., Roffman, R., & Williams, C. D. (2002, November). *Predicting change in the marijuana check-up.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Stephens, R. S., Roffman, R., Fearer, S. A., **Walker, N. R.**, & Williams, C. D. (2002, November). *The marijuana check-up: Augmenting the impact of a brief intervention for ambivalent marijuana users.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Donovan, K., Cooper, L., Fournier, A., & **Walker, N. R.** (2002, November). *Brief group treatment for dual diagnosis offenders on probation.* Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Lash, S. J., Stephens, R. S., Burden, J. L., Grambow, S. C., Horner, R. D., **Walker, N. R.**, DeMarce, J., Jones, M. E., & Lozano, B. E. (2002, November). *Contracting, prompting and reinforcing*

substance abuse aftercare attendance: Three month outcomes of a VA HSR&D clinical trial. Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Walker, N. R., Stearns, D., Poole, A., & Ludwig, T. D. (1999, March). Peer agents, pledge cards, and accessibility to promote bike helmet use. In T. D. Ludwig (Chair), *Reducing adolescent risk behavior: Alcohol, bike helmet use and driving safety.* Symposium conducted at the annual meeting of the Southeastern Psychological Association, Savannah, GA.

Manuscripts in Preparation

Fearer, S. A., Walker, N. R., Stephens, R. S., & Roffman, R. *Psychometric properties of the Readiness to Change measure in two samples of marijuana users.* Manuscript in preparation.

Hunt, Y. M., Walker, N. R., Parker, J. D., & Dubbert, P. M. *Patterns of tobacco use in heavy, nondependent drinkers: Descriptive characteristics and associations with alcohol moderation over time.* Manuscript in preparation.

Stephens, R. S., Roffman, R., & Walker, N. R. *The Marijuana Check-Up: A motivational enhancement intervention.* Manuscript in preparation.

Walker, N. R., Grothe, K., Hunt, Y. M., Parker, J. D., & Dubbert, P. M. *Subtypes of heavy, nondependent drinkers: Descriptive characteristics and outcomes of alcohol moderation counseling effects.* Manuscript in preparation.