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The Moderating Role of PBS in the Relationship Between Positive  
Expectancies and Alcohol-Related Negative Consequences

by

Kray Scully

A Thesis

Submitted to the Graduate School,  
the College of Education and Psychology  
and the Department of Psychology  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Master of Arts

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May 2018

## ABSTRACT

Hazardous drinking college students have become an increasingly focused upon group within alcohol research, especially considering the extent of negative consequences they experience. Recently, increased positive expectancies has been identified as an influential contributor to increased hazardous drinking and alcohol-related negative consequences. However, more comprehensive evaluation of the domains of positive expectancies (e.g., sociability, tension reduction, sexual enhancement, liquid courage) is warranted to ascertain which types are more salient in predicting hazardous drinking and alcohol-related negative consequences. Further, research has yet to explore how protective behavioral strategies (PBS) affect the strength of the associations between specific positive expectancies and alcohol-related negative consequences. Therefore, the goal of the present study was to investigate the moderating role of PBS in the relationship between the domains of positive expectancies and alcohol-related negative consequences in a sample of hazardous drinking college students. Using moderated multiple regression, significant positive associations were observed for liquid courage and sexual enhancement positive expectancies whereas an inverse association for PBS-Serious Harm Reduction (SHR) emerged. But, no moderating effects for PBS were found in any of the analyses. These results suggest that liquid courage and sexual enhancement positive expectancies may be more salient in predicting alcohol-related negative consequences. Clinical and empirical implication, limitations, and future research directions are discussed.

## ACKNOWLEDGMENTS

I especially thank Dr. Michael Madson for his guidance, assistance, and mentorship throughout the conceptualization and completion of this project. I also appreciate Dr. Bonnie Nicholson and Dr. Richard Mohn for their valuable feedback throughout this process. Moreover, I would like to thank all the members of the Behavior and Alcohol Research Team for their support during the preparation, proposal, and defense of this project. Without the assistance from those above, completion of this project would not have been possible. For that, I am indeed very grateful.

TABLE OF CONTENTS

ABSTRACT ..... ii

ACKNOWLEDGMENTS ..... iii

LIST OF TABLES ..... vi

CHAPTER I - INTRODUCTION ..... 1

    Hazardous Drinking ..... 2

    Alcohol-related Negative Consequences ..... 2

    Alcohol-related Expectancies ..... 4

        Positive Expectancies..... 6

    Protective Behavioral Strategies ..... 8

    Positive Expectancies and PBS Use ..... 10

    Purpose of Study ..... 11

CHAPTER II – METHODOLOGY ..... 16

    Participants and Procedure..... 16

    Instruments..... 17

        Demographics Questionnaire..... 17

        Alcohol Use Disorders Identification Test- United States- (AUDIT [US]) ..... 17

        Comprehensive Effects of Alcohol Questionnaire (CEOA)..... 18

        Protective Behavioral Strategies Scale-Revised (PBSS-R) ..... 19

        Rutgers Alcohol Problem Index (RAPI)..... 19

Data Analysis .....	20
CHAPTER III - RESULTS.....	22
Multivariate PBS-CC and PBS-SHR Moderation Model.....	24
PBS-CC Independent Model.....	26
PBS-SHR Independent Model .....	28
CHAPTER IV – DISCUSSION.....	30
Research Implications .....	36
Clinical Implications.....	37
Limitations/Future Research.....	38
Conclusion .....	40
APPENDIX A – IRB Approval Letter.....	41
APPENDIX B Electronic Informed Consent.....	42
APPENDIX C Demographics Form .....	44
APPENDIX D The Alcohol Use Disorders Identification Test- United States (AUDIT [US]) .....	46
APPENDIX E Comprehensive Effects of Alcohol- Positive Expectancy Subscales .....	49
APPENDIX F Protective Behavioral Strategies Scale- Revised (PBSS-R) .....	50
APPENDIX G Rutgers Alcohol Problem Index (RAPI) .....	51
REFERENCES .....	52

## LIST OF TABLES

Table 1 Means, Standard Deviations, and Intercorrelations for Study Instruments. ....	23
Table 2 Multivariate Moderated Multiple Regression Analysis for Alcohol-Related Negative Consequences among College Students (N=253) .....	26
Table 3 Univariate Moderated Multiple Regression for PBS-CC in Relationships Between Positive Expectancies and Alcohol-related Negative Consequences in Hazardous Drinking College Students (N = 253) .....	27
Table 4 Univariate Moderated Multiple Regression for PBS-SHR in Relationships Between Positive Expectancies and Alcohol-related Negative Consequences in Hazardous Drinking College Students (N = 253) .....	29

## CHAPTER I - INTRODUCTION

Alcohol consumption among college students continues to pose serious public health problems across campuses and universities nationwide. Research suggests that the prevalence of hazardous drinking behaviors on college campuses is on the rise (Johnston, O'Malley, Bachman, Schulenburg, & Miech, 2017). Almost half of college students participate in hazardous drinking, such as heavy episodic drinking, at least once within a two-week period (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2015). Alcohol consumption at these levels is concerning given the range of alcohol-related negative consequences, such as hangovers, assaults, and sexual victimization that can occur as a result of college student drinking (White & Hingson, 2013). One approach to reducing alcohol-related harm among college drinkers has been to emphasize the use of protective behavioral strategies (PBS) by students when consuming alcohol, which are regulatory behaviors college students can use to protect themselves when drinking (Martens et al., 2007). A college student's experiences of and participation in these safe and hazardous drinking behaviors may be better understood through investigating the role of positive alcohol outcome expectancies, which are perceived benefits of drinking alcohol. Specifically, college student alcohol use literature may benefit from a more in-depth exploration of how positive beliefs surrounding alcohol use are associated with one's use of safe drinking behaviors and experiences of alcohol-related negative consequences. The current study sought to explore the relationship between PBS use, positive expectancies, and alcohol-related negative consequences among college students who participate in hazardous drinking.



## Hazardous Drinking

College students are considered an at-risk population for hazardous drinking, given their self-reported rates of this type of drinking behavior (NIAAA, 2015). The NIAAA (2015) defines hazardous drinking as consuming exorbitant amounts of alcohol (5 drinks or more in < 2 hours for males; 4 drinks or more in < 2 hours for females; 7 drinks or more in one day; 14 drinks or more in a week) within one sitting that subsequently increases one's risk of problematic alcohol and a higher susceptibility to experience alcohol-related negative consequences. College students are at an increased risk because the college environment facilitates hazardous drinking behaviors (Osberg et al., 2010; Paschall, Bersamin, & Flewelling, 2005). For example, 35% of all college students engaged in hazardous drinking within a 30-day period, compared to 31% of their non-college attending peers (Johnston et al., 2017). Trends in hazardous drinking rates among college students have been persistently high over the past few decades. Specifically, Hingson, Zha, and Weitzman (2009) found that the rates of binge drinking increased 3%, from 41.7% to 44.7%, between 1998 and 2005. Further, it has been estimated that one-quarter of college student drinkers meet the criteria for alcohol use disorder (Blanco et al., 2008). Hazardous drinking, while dangerous in and among itself, can lead to a variety of alcohol-related negative consequences that can detrimentally impact college students and subsequently diminish the quality of their lives and academic success (Borden et al., 2011).

### Alcohol-related Negative Consequences

Alcohol-related negative consequences are potentially adverse effects experienced by college students as a result of their alcohol consumption behaviors (Arterberry, Chen,

Verges, Bollen, & Martens, 2015). Research supports a positive relationship between alcohol consumption and the number of experienced alcohol-related negative consequences (Araas & Adams, 2009; Borden, Martens, McBride, Sheline, Bloch, & Dude, 2011; Hingson, 2010) and is consistent with research at the university where this study was conducted (see Landry, Moorer, Madson, & Zeigler-Hill, 2015; Madson, Moorer, Zeigler-Hill, Bonnell, & Villarosa, 2013; Noble, Madson, Mohn, & Mandracchia, 2013). In particular, White and Hingson (2013) estimated that there are 599,000 injuries, 646,000 physical assaults, 97,000 sexual assaults and 400,000 instances of unsafe sex as a result of college student alcohol consumption each year. Increased alcohol consumption is also related to negative academic outcomes, such as missing class or doing poorly on tests, in as many as a quarter of all college students who drink alcohol (Martin, Cremeens, Umstattd, Usdan, Talbott-Forbes, & Garner, 2012; Scholly, Katz, & Kehl, 2014). Further, alcohol remains the leading contributor in injury-related deaths of those in the 18 to 24 age group (Hingson et al., 2009). Specifically, there are approximately 1,800 alcohol-related deaths among college students each year (White & Hingson, 2013). Greater levels of drinking, such as participation in hazardous drinking, among college students are related to greater social interpersonal problems and riskier behaviors, such as sexual aggression (Foster, Caravelis, & Kopak, 2013; Lloyd, & McGarvey, 2009; Skidmore, Murphy, Martens, & Dennhardt, 2012; Randolph, Torres, Gore-Felton, Lloyd, & McGarvey, 2009). The extent, frequency, and ramifications of alcohol-related negative consequences, especially by those who engage in hazardous drinking, experienced by college students is a serious public health concern that warrants addressing. Therefore, it is important to conduct research that will inform and support

intervention and prevention methods among college students to reduce and ultimately prevent adverse effects as a result of alcohol use. Specifically, tailoring research towards factors that largely contribute to alcohol use behaviors, such as alcohol-related expectancies, may provide further insight into why college students engage in hazardous drinking.

### Alcohol-related Expectancies

Alcohol expectancies are the perceived biological, psychological, and environmental outcomes related alcohol consumption (Fromme, Stroot, & Kaplan, 1993). Expectancy theory suggests that the anticipation of results subsequently affects behavior (Jones, Corbin, & Fromme, 2001). Essentially, hazardous drinking can be explained, in part, by alcohol expectancies (Jones et al., 2001) Fromme and colleagues (1993) propose that there are two dimensions of expectancies: positive and negative. As outlined by expectancy theory, positive expectancies are perceived beneficial effects of alcohol consumption (e.g. I would be more sociable; I would feel more relaxed), whereas negative expectancies are perceived detrimental effects of alcohol consumption (e.g. I would act aggressively; I would feel guilty). Through a confirmatory factor analysis, Fromme and colleagues (1993) also found that several factors encapsulate positive and negative alcohol-related expectancies. Tension reduction, increased sociability, liquid courage, and sexual enhancement are considered positive alcohol-related expectancies. Tension reduction expectancies refer to the belief that alcohol will alleviate anxiety and external stressors while sociability expectancies are associated with increasing interaction others (Fromme et al., 1993). Liquid courage expectancies are associated with lower inhibition and greater risk-taking behavior, and sexual enhancement expectancies are

associated with improvements to self-esteem and self-image (Fromme et al., 1993). Cognitive and behavioral impairment, risk and aggression, and self-perception are considered negative alcohol-related expectancies. Specifically, cognitive and behavioral impairment expectancies include expectations of adverse experiences like deficits in reasoning, awareness and coordination whereas risk and aggression expectancies are associated with confrontational and careless behaviors while drinking alcohol (Fromme et al., 1993). Further, self-perception expectancies refer to an increased inclination to self-evaluate negatively while under the influence of alcohol (Fromme et al., 1993). Taken altogether, alcohol expectancies have been suggested as salient predictors of alcohol use behaviors in college students (Cox & Klinger, 1990; Ham & Hope, 2003). Further, alcohol expectancies can be learned from peers and the environment (Durkin, Wolfe, & Clark, 2005) in that increased alcohol consumption and consequences are related to higher positive expectancies and lower negative expectancies (Burke & Stephens, 1999; Stamates, Lau-Barraco, & Linden-Carmichael, 2016).

Previous research has shown that alcohol-related expectancies tend to predict hazardous drinking and alcohol-related negative consequences among college students (see Dunne, Freedlander, Coleman, & Katz, 2013; Hatzenbuehler, Corbin, & Fromme, 2011; Madson, Moorer et al., 2013; McCarthy & Smith, 1996; Reid & Carey, 2015). Recently, Reid and Carey (2015), conducted a meta-analysis of college drinking interventions and found that alcohol-related expectancies significantly influenced alcohol consumption and alcohol-related negative consequences. These results suggest that changing these expectancies may be an important mechanism of action in reducing harmful alcohol use behaviors (Reid & Carey, 2015). Moreover, Dunne and colleagues

(2013), found that college students who reported more negative expectancies consumed less alcohol, whereas those who reported more positive expectancies engaged in more drinking and experienced more alcohol-related negative consequences. Given the relationship between alcohol expectancies and hazardous alcohol use behaviors, there is an increasing need to dismantle alcohol expectancies to better appreciate differential effects of the different expectancies.

In the past decade, some research has focused on parceling out the independent effects of positive and negative expectancies, with findings generally supporting a greater effect for positive expectancies (Monks, Tomaka, Palicio, & Thompson, 2010; Thompson et al., 2009). In line with expectancy theory, positive expectancies are more related to hazardous alcohol use behaviors, (Collins, Lapp, Emmons, & Isaac, 1990; Herschl, McChargue, MacKillop, Stoltenberg, & Highland, 2012). Specifically, more strongly held positive expectancies among college students have been linked with more participation in hazardous drinking behaviors (Lienemann & Lamb, 2013; McBride, Barrett, Moore, & Schonfeld, 2014) and adverse alcohol-related outcomes (Thompson et al., 2009) such as experiencing sexual victimization (Monks et al., 2010). These findings support examining only positive alcohol-related expectancies among a hazardous drinking sample.

### *Positive Expectancies*

The expectancy literature has emphasized the salience of positive expectancies and its association with hazardous drinking (Boekeloo, Novik, & Bush, 2011; Collins et al., 2014; Gaher & Simons, 2007; Ham, Zamboanga, Bridges, Casner, & Bacon, 2011; Lienemann & Lamb, 2013). Ham and colleagues (2011) found that higher positive

expectancies can put college students at more risk of participating in hazardous drinking within specific drinking contexts, while Boekeloo, Novik, and Bush (2011) found that the expectation of getting drunk may have more of an influence on hazardous drinking than consumption measures by themselves. Further, college students with higher positive expectancies who perceived negative consequences more favorably participated in more binge drinking behaviors than those with more negative perceptions of alcohol-related outcomes (Collins et al., 2014; Gaher & Simons, 2007; Lienemann & Lamb, 2013; O'Hara, Armeli, & Tennen, 2014). Additionally, Fearnow-Kenny, Wyrick, Hansen, Dyreg, and Beau (2001) found that, over time, increased positive expectancies predicted more relational and vocational alcohol-related negative consequences, such as poor job performance and poor familial relations. However, over the past decade, research has expanded to examining specific facets of positive expectancies and their associations with alcohol-related negative consequences and hazardous drinking.

Recently, there have been increased efforts to dismantle global positive expectancies by exploring the relationship of their individual dimensions with drinking behaviors (Linden, Lau-Barraco, & Millettich, 2014; Goldsmith, Thompson, Black, Tran, & Smith, 2012). In focusing their investigation on the predictive ability of one type of positive expectancy, Linden and colleagues (2014) found that higher endorsement of sociability expectancies was associated with increases in positive affect, drinking motives, alcohol consumption and alcohol-related negative consequences. Similarly, Goldsmith and colleagues (2012) also explored only one dimension of positive expectancies and found for those with generalized anxiety, higher endorsement of tension-reduction expectancies predicted more alcohol consumption and alcohol-related

negative consequences. However, this research is limited as most studies have not evaluated each dimension of positive expectancies within the contexts of hazardous drinking and consequences. Thus, there is a need to further examine the predictive effects of each positive expectancy in a model of college student drinking. Within this model, it is also important to not only consider alcohol use and consequences, but also account for the associations between positive expectancies and safe drinking behaviors, such as protective behavioral strategies, to better inform potential harm reduction and prevention approaches (PBS; Grazioli, Lewis, Garberson, Fossos-Wong, Lee, & Larimer, 2015). As such, to more comprehensively understand college student hazardous drinking and alcohol-related negative consequences, there is a need to examine the links between these expectancies and PBS.

#### Protective Behavioral Strategies

Protective behavioral strategies (PBS; e.g., “knowing where your drink is at all times,” “using a designated driver”) are safe drinking strategies that have been empirically associated with reduced alcohol use, hazardous drinking, and alcohol-related consequences among college students (Borden et al., 2011; LaBrie, Lac, Kenney, & Mizra, 2011; Linden, Kite, Braitman, & Henson, 2014; Martens et al., 2008; Pearson, 2013). PBS are generally categorized into two groups: indirect/Serious Harm Reduction (PBS-SHR) strategies related to fewer alcohol-related negative consequences and direct/Controlled Consumption (PBS-CC) associated with decreased alcohol consumption (Madson, Arnau, & Lambert, 2013; Villarosa, Messer, Madson, & Zeigler-Hill, 2017). Using a meta-analysis, Scott-Sheldon, Carey, Elliott, Garey, and Carey (2014) found that use of these PBS during the first year of college is related to reduced

alcohol consumption and alcohol-related negative consequences over the duration of their college career. Increased PBS use has also predicted significant reductions in hazardous drinking behaviors (Borden et al., 2011). Moreover, given the utility of PBS, researchers have endeavored to explore the differences in PBS use across a variety of predictors of college student alcohol use.

There is increasing support that factors such as mental health concerns (e.g., social anxiety), race, and sex are associated with varying degrees of PBS use among college students (see Araas & Adams, 2009; Borden et al., 2011; Howard, Griffin, Boekeloo, Lake, & Bellows, 2007; LaBrie, Kenney, & Lac, 2010; Madson & Zeigler-Hill, 2013; Martens et al., 2008; Noble et al., 2013; Villarosa, Kison, Madson, & Zeigler-Hill, 2016). Specifically, those who have poorer mental health use fewer PBS and are more likely to participate in hazardous drinking (LaBrie, Kenney, & Lac, 2010; Martens et al., 2008; Villarosa et al., 2017; Villarosa, Madson, Zeigler-Hill, Noble, & Mohn 2014). Further, research has consistently found that male college students tend to engage in less PBS use than female students (Araas & Adams, 2009; Borden et al., 2011; Howard et al., 2007; LaBrie et al., 2011; Madson, Moorer, et al., 2013), and African-American students tend to participate in more PBS use compared to White, non-Hispanic students (Lawrence, Abel, & Hall, 2010; Madson & Zeigler-Hill, 2013). Above and beyond demographic variables, there are social-cognitive and contextual factors that also influence the degree to which college students engage in PBS use (Pearson, 2013).

Researchers have emphasized the importance of considering PBS in the context of other social-cognitive and environmental variables, such as descriptive norms, injunctive norms, peer influence, and drinking motives (Arterberry, Smith, Martens, Cadigan, &



Murphy, 2014; DeMartini, Carey, Lao, & Luciano, 2011; Ebersole, Moorer, Noble, & Madson, 2015; LaBrie et al., 2011; Villarosa et al., 2016). Specifically, PBS weakens the association between drinking motives and alcohol use, in which higher PBS use resulted in less heavy alcohol consumption (LaBrie et al., 2011; Martens, Ferrier, & Cimini, 2007). Moreover, college students with higher acceptance for participating in hazardous drinking and weekly alcohol consumption engaged in less PBS use, consumed more alcohol, experienced more alcohol-related negative consequences (Arterberry et al., 2014; DeMartini et al., 2011). As evident, PBS research continues to be an important focal point in the college student alcohol literature in understanding the context surrounding the use of safe drinking behaviors. As such, more research is needed on PBS and its association with social-cognitive and contextual variables in a college student drinking model that includes hazardous drinking and alcohol-related negative consequences (Scully, Cottonham, Villarosa, Kison, & Madson, 2016). One such factor that may have a large influence on college students' participation in hazardous drinking, experience of alcohol-related negative consequences, and engagement in PBS use are their positive alcohol-related expectancies.

#### Positive Expectancies and PBS Use

The association between positive expectancies and safe drinking strategies has been briefly explored in the literature (Grazioli et al., 2015; Linden et al., 2014; Madson, Moorer et al., 2013; Yurasek et al., 2015). In a longitudinal analysis, Grazioli and colleagues (2015) discovered that PBS weakened the association between positive expectancies and adverse alcohol-related outcomes. Madson, Moorer and colleagues (2013) found that greater PBS use partially mediated the link between positive

expectancies and alcohol-related negative consequences. Conversely, Yurasek and colleagues (2015) examined the mediating role of positive expectancies in the relationship between brief motivational interventions and negative consequences in a mandated college student sample and found no significant effects. These contradictory findings further support the need to explore safe drinking strategies, positive expectancies, and alcohol-related negative consequences in hazardous drinking college student populations. However, all these studies examined global positive expectancies, which emphasizes the need to explore the four different facets of positive alcohol-related expectancies in these relationships. Moreover, questions remain as to whether the PBS subtypes differentially account for the strength of the associations between the four positive expectancies and alcohol-related negative consequences.

#### Purpose of Study

College students are engaging in hazardous drinking at an alarming rate (NIAAA, 2012), resulting in increased rates of alcohol-related negative consequences (White & Hingson, 2013; Borden et al., 2011). While PBS has been explored and supported as an effective means to reduce alcohol-related negative consequences, it is important to develop a more comprehensive understanding of what factors may influence college students' use of PBS. Positive alcohol-related expectancies may impact college students' engagement in hazardous drinking, experiences of alcohol-related negative consequences, and use of PBS. Furthermore, research on the effects of each individual positive expectancy and alcohol-related negative consequences in a hazardous drinking sample, or the associations between positive expectancies and the two factors of PBS (i.e., PBS-SHR and PBS-CC) is limited. Although previous studies (Madson, Moorer et al., 2013)

examined the mediating role of PBS on the relationship between alcohol-related expectancies and alcohol-related negative consequences and the moderating effects of PBS on positive expectancies as a whole (Grazioli et al., 2015), these studies examined global positive expectancies only. Moreover, Grazioli and colleagues' (2015) findings support the notion that the association between positive expectancies and alcohol-related negative consequences may be dependent upon PBS use. Therefore, the purpose of the proposed study was to assess the moderating role of PBS in the relationship between the four positive expectancies (i.e., sociability, tension reduction, liquid courage, and sexuality) and alcohol-related negative consequences in a hazardous drinking sample.

**Question 1:** To what degree do the dimensions of positive expectancies predict alcohol-related negative consequences in a sample of hazardous college drinkers?

**Hypothesis 1a:** It is expected that tension reduction positive expectancies will positively predict alcohol-related negative consequences.

**Hypothesis 1b:** It is expected that sociability positive expectancies will positively predict experienced alcohol-related negative consequences.

**Hypothesis 1c:** It is expected that liquid courage positive expectancies will positively predict experienced alcohol-related negative consequences.

**Hypothesis 1d:** It is expected that sexual enhancement positive expectancies will positively predict experienced alcohol-related negative consequences.

**Question 2:** To what degree do the two factors of PBS (i.e. PBS-SHR and PBS-CC) use predict alcohol-related negative consequences in a sample of hazardous college drinkers?

**Hypothesis 2a:** It is expected that PBS-SHR will negatively predict alcohol-related negative consequences.

**Hypothesis 2b:** It is expected that PBS-CC will negatively predict alcohol-related negative consequences.

**Question 3:** To what degree does PBS-SHR moderate the relationship between the dimensions of positive expectancies and alcohol-related negative consequences in a sample of hazardous college drinkers?

**Hypothesis 3a:** It is expected that PBS-SHR will moderate the relationship between tension reduction positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct relationship between tension reduction positive expectancies and alcohol-related negative consequences will be the strongest.

**Hypothesis 3b:** It is expected that PBS-SHR will moderate the relationship between sociability positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct relationship between sociability positive expectancies and alcohol-related negative consequences will be the strongest.

**Hypothesis 3c:** It is expected that PBS-SHR will moderate the relationship between liquid courage positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct relationship between liquid courage positive expectancies and alcohol-related negative consequences will be the strongest.

**Hypothesis 3d:** It is expected that PBS-SHR will moderate the relationship between sexual enhancement positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct relationship between sexual enhancement positive expectancies and alcohol-related negative consequences will be the strongest.

**Question 4:** To what degree does PBS-CC moderate the relationship between the dimensions of positive expectancies and alcohol-related negative consequences in a sample of hazardous college drinkers?

**Hypothesis 4a:** It is expected that PBS-CC will moderate the relationship between tension reduction positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct relationship between tension reduction positive expectancies and alcohol-related negative consequences will be the strongest.

**Hypothesis 4b:** It is expected that PBS-CC will moderate the relationship between sociability positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct relationship between sociability positive expectancies and alcohol-related negative consequences will be the strongest.

**Hypothesis 4c:** It is expected that PBS-CC will moderate the relationship between liquid courage positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct

relationship between liquid courage positive expectancies and alcohol-related negative consequences will be the strongest.

**Hypothesis 4d:** It is expected that PBS-SHR will moderate the relationship between sexual enhancement positive expectancies and alcohol-related negative consequences such that students who report fewer PBS, the direct relationship between sexual enhancement positive expectancies and alcohol-related negative consequences will be the strongest.

## CHAPTER II – METHODOLOGY

### Participants and Procedure

The initial sample consisted of 265 college students from a mid-sized, Southeastern university. At the time of study completion, participants must have been between the ages of 18-25 that reported consuming alcohol at least once within the last 30 days of participating in the study. Inclusion criteria also involved participants meeting a hazardous drinker threshold established by the literature (DeMartini & Carey, 2012), where only males who scored a 7 or higher and females who scored a 5 or higher on the Alcohol Use Disorders Identification Test- United States (AUDIT [US]) were considered. To maximize collected data integrity, two validity check items were placed throughout the survey to identify careless responding (e.g. “Please select ‘Strongly Agree’ for this item;” Meade & Craig, 2012). The twelve respondents who failed both validity checks were eliminated from consideration in the present study. Additionally, participants who spent less time completing the assessment battery compared to 95 percent of the study’s sample were further analyzed and excluded from data analyses if evidence of random responding was present (i.e. indicating the same response option for every item for an entire measure). However, following investigation of those cases, no further exclusion was necessary.

The remaining sample consisted of 253 college students ( $M = 20.13$ ,  $SD = 1.75$ ; 80% Female). The majority of the sample identified as “White, non-Hispanic (69%),” while the remainder of participants identified as “African-American (23%),” Latino/a (4%), and Other (4%). Many of the participants were freshman (38%) and seniors (25%) while 20% and 17% of the sample identified as juniors and sophomores, respectively.

SONA, an online participant management system, was used to recruit undergraduate psychology majors to participate in the study in exchange for partial fulfillment of class credit. Participants signed an Institutional Review Board informed consent (see *Appendix B*) and completed a battery of assessments that measured positive alcohol-related expectancies, alcohol consumption, hazardous drinking, alcohol-related negative consequences, and PBS use using Qualtrics, a secure online data collection system.

### Instruments

#### *Demographics Questionnaire*

Participants completed a brief questionnaire assessing demographic characteristics such as typical weekly consumption, age, sex, race, and year in school (see *Appendix C*).

#### *Alcohol Use Disorders Identification Test- United States- (AUDIT [US])*

The ten-item Alcohol Use Disorders Identification Test (AUDIT [US]; Center for Disease Control and Prevention [CDC], 2014) was used to measure hazardous drinking. This update of the original AUDIT proposed by Babor, Higgins-Biddle, Saunders, and Montiero (2001) included items such as: “How often do you have X (5 for men; 4 for women) or more drinks on one occasion?,” “How many standard drinks containing alcohol do you have on a typical day?” and “How often during the last year have you had a feeling of guilt or remorse after drinking?” (see *Appendix D*). The AUDIT (US) is intended to better encapsulate differences in hazardous drinking between men and women and better reflect United States drinking standards (CDC, 2014). Participants’ responses ranged from 0 (*never; no*) to 6 (*4 or more times a week; daily or almost daily*) on the first three items and from 0 (*never; no*) to 4 (*4 or more times a week; daily or*



*almost daily*). Total scores ranged from 0 to 46, with higher scores reflecting a participant's proclivity to engage in harmful drinking patterns and more drinking-related risk. Similar to the AUDIT, a cutoff score of 7 for males and 5 for females was used to distinguish hazardous drinkers from recreational drinkers on the AUDIT (US) (DeMartini & Carey, 2012). The previous version of the AUDIT has been shown to be valid in discriminating hazardous drinkers and detecting alcohol use disorder and dependence among college student samples (Reinert & Allen, 2007; Hays, Merz, & Nicholas, 1995). Internal consistency for the AUDIT-US was acceptable, wherein  $\alpha = .73$ .

#### *Comprehensive Effects of Alcohol Questionnaire (CEOA)*

The Comprehensive Effects of Alcohol Questionnaire (CEOA; Fromme, Stroot, & Kaplan, 1993) was used to assess expectations about the effects of alcohol consumption. The CEOA consists of seven subscales; however only the four subscales (i.e., Sociability, Tension Reduction, Liquid Courage, and Sexuality) that make up the positive expectancy factor were used in the current study. Sample items for each of the subscales include: "It would be easier to talk to people (Sociability)," "I would feel more relaxed (Tension Reduction)," "I would feel brave and daring (Liquid Courage)," and "I would be a better lover (Sexuality; see *Appendix E*)." Participants recorded responses ranging from 1 (*disagree*) to 4 (*agree*). Scores ranged from 8 to 32 for Sociability, 3 to 12 for Tension Reduction, 5 to 20 for Liquid Courage, and 4 to 16 for Sexuality. Higher scores on each of the subscales reflect increased endorsements of the positive effects of alcohol while drinking. Recent literature has supported acceptable reliability (Sociability:  $\alpha = .81$ ; Sexuality:  $\alpha = .68$ ; Tension Reduction:  $\alpha = .63$ ; and Liquid Courage:  $\alpha = .77$ ), validity and factor structure of the CEOA's positive factor subscales among college

student samples. (Ham, Stewart, Norton, & Hope, 2005; Valdivia & Stewart, 2005). In this sample, internal consistency statistics were acceptable for all subscales (Sociability:  $\alpha = .87$ ; Sexuality:  $\alpha = .78$ ; Tension Reduction:  $\alpha = .71$ ; and Liquid Courage:  $\alpha = .89$ ).

*Protective Behavioral Strategies Scale-Revised (PBSS-R)*

The Protective Behavioral Strategies Scale-Revised (PBSS-R; Madson et al., 2013) was utilized to measure participants' engagement in safe drinking strategies while consuming alcohol. The updated scale was used instead of the original PBSS developed by Martens, Ferrier, Sheehy, Corbett, Anderson, and Simmons (2005) due to the addition of three new items that improved the reliability of the Serious Harm Reduction (SHR) subscale, and found that the original Manner of Drinking and Stopping/Limiting Drinking subscales were better combined to capture controlled consumption PBS (Madson et al., 2013). The 18-item PBSS-R assessed PBS across two dimensions: Serious Harm Reduction (PBS-SHR) and Controlled Consumption (PBS-CC). SHR items included "knowing where your drink is at all times" and "using a designated driver" whereas CC items included "avoiding shots of liquor" and "determining not to exceed a set number of drinks" (see *Appendix F*). Participants rated their use of each PBS on a Likert-type scale ranging from 1 (*never*) to 6 (*always*). Total scores on the PBS-SHR subscale ranged from 6 to 36 while scores on the PBS-CC subscale range from 12 to 72, with higher scores on each reflecting increased use of PBS. During its inception, the PBSS-R demonstrated acceptable reliability (SHR:  $\alpha = .79$  and CC:  $\alpha = .90$ ) and convergent validity levels for college student samples (Madson et al., 2013). Internal consistencies for the PBS-SHR and PBS-CC subscales were acceptable, with alphas of .82 and .89, respectively.

*Rutgers Alcohol Problem Index (RAPI)*

The Rutgers Alcohol Problem Index (RAPI; Earleywine, LaBrie, & Pederson, 2008) was used to assess for alcohol-related negative consequences. This 23-item measure specifically examined the frequency of which participants have experienced negative outcomes as a result of their consumption behaviors. Items included consequences such as “went to work or school high or drunk,” “had a fight, argument or bad feeling with a friend,” or “neglected your responsibilities” (see *Appendix G*). Students rated how often they experienced an alcohol-related negative consequence over the past year using a Likert-type scale ranging from 0 (*never*) to 4 (*more than 10 times*), with total scores ranging from 0 to 92. Higher scores indicated more experienced negative consequences. Regarding college students, the RAPI has been shown to have acceptable reliability and validity in assessing alcohol-related negative consequences (Devos-Comby & Lange, 2008; Neal, Corbin, & Fromme, 2006).

#### Data Analysis

Participants who met the inclusion criteria (i.e., traditional age college students that have consumed alcohol within the past 30 days who meet the sex cutoffs on the AUDIT [US]) and those who completed at least 75 percent of the assessment battery were included in data analyses. Prior to calculating descriptive statistics, data collected for each construct were cleaned. Specifically, values outside of three standard deviations of the mean were examined, and extreme values were truncated in order to reduce the potential influential effects of outliers (Field, 2013). For those who meet the 75% completion threshold, random missing values were replaced by imputation using the “linear trend at point” function in SPSS. However, if the missing data was systematic in nature, missing values were replaced with a “-9” and still considered in assessing

descriptive and inferential statistics. Means and standard deviations of all variables considered were calculated after data cleaning. For all constructs and subscales, internal consistency statistics were calculated using Cronbach's alpha. To assess for the relationships among all variables in the model, bivariate correlations were conducted. To reduce the influence of outliers, extreme cases were isolated utilizing diagnostic statistics such as studentized residuals, leverage values, and standardized DfFits prior to running final regression analyses. Hierarchical multiple regression analyses were used to assess for the moderating role of PBS in the associations between the four types of positive expectancies and alcohol-related negative consequences.

### CHAPTER III - RESULTS

Means, standard deviations, and intercorrelations for study measures are found in Table 1. As expected, all positive expectancy subscales were positively related to negative consequences, whereas both PBS subscales were inversely correlated with alcohol-related negative consequences. Alcohol consumption statistics were also calculated for the sample. The mean drinks consumed per week among respondents was 10.94 (SD = 8.65), which is consistent with previous literature assessing alcohol use among hazardous drinkers (e.g., Blanco et al., 2008). Based on weekly alcohol use, moderate drinkers (4 to 11 drinks/week) comprised most of the sample ( $n = 133$ , 52.6%). Of those remaining, 32 (12.6%) participants were classified as light drinkers (0-3 drinks/week), and 88 (34.8%) participants were classified as heavy drinkers (12+ drinks/week; see Collins, Parks, & Marlatt, 1985).

All types of positive expectancies were significantly positively correlated with each other. Of the positive expectancies, liquid courage ( $r = .25$ ) and sexual enhancement ( $r = .30$ ), were significantly positively associated with alcohol-related negative consequences, whereas sociability ( $r = .06$ ) and tension reduction ( $r = .06$ ) were not. Moreover, PBS-SHR and PBS-CC were positive correlated with each other ( $r = .46$ ). Both PBS-SHR ( $r = -.37$ ) and PBS-CC ( $r = -.15$ ) were significantly inversely associated with alcohol-related negative consequences. Interestingly, tension reduction expectancies were not significantly correlated with any PBS ( $r = -.02$  with SHR and  $r = .00$  with CC) while sexual enhancement expectancies were significantly negatively associated with PBS-SHR ( $r = -.15$ ) and PBS-CC ( $r = -.24$ ). Additionally, while sociability expectancies

were negatively correlated with PBS-CC ( $r = -.17$ ), they were positively associated with PBS-SHR ( $r = .17$ ).

Also, similar to previous findings, males reported consuming more alcohol [ $t(251) = -4.92, p < 0.001$ ] and experiencing more alcohol-related negative consequences [ $t(251) = -3.02, p < 0.01$ ] than females. Moreover, consistent with prior research, females reported engaging in more PBS-CC [ $t(251) = 3.66, p < 0.001$ ] and PBS-SHR [ $t(251) = 4.76, p < 0.001$ ] than males. However, due to the lack of males in and power concerns with the sample, the current study did not explore the differential moderating effects of sex.

Table 1

*Means, Standard Deviations, and Intercorrelations for Study Instruments.*

	<i>M (SD)</i>	RAPI	SOC	TR	LC	SE	PBS-SHR	PBS-CC
RAPI	12.06 (13.31)	--						
SOC	25.87 (4.65)	.06	--					
TR	8.25 (2.11)	.06	.28*	--				
LC	13.74 (3.81)	.25*	.63*	.38*	--			
SE	10.04 (3.27)	.30*	.48*	.22*	.58*	--		
PBS-SHR	42.51 (12.70)	-.37*	.17*	-.02	-.04	-.15*	--	
PBS-CC	31.21 (5.52)	-.15*	-.17*	.00	-.16*	-.24*	.46*	--

*Note:* Rutgers Alcohol Problem Index (RAPI), Comprehensive Effects of Alcohol- Sociability (SOC), Comprehensive Effects of Alcohol- Tension Reduction (TR), Comprehensive Effects of Alcohol- Liquid Courage (LC), Comprehensive Effects of Alcohol- Sexual Enhancement (SE), Protective Behavioral Strategies – Serious Harm Reduction (PBS-SHR), and Protective Behavioral Strategies – Controlled Consumption (PBS-CC). \*  $p < 0.01$

### Multivariate PBS-CC and PBS-SHR Moderation Model

A moderated multiple regression was used to investigate the moderating effects of the PBS subtypes on the associations between the four positive expectancies and alcohol-related negative consequences. The first step of the analysis was consulted to analyze the direct effects of the four types of positive expectancies and the PBS subtypes with alcohol-related negative consequences. . A summary of direct associations among the four types of positive expectancies, two subscales of PBS, and alcohol-related negative consequences are presented in Table 2. Specifically, main effects were found for liquid courage ( $B = 12.76$ ,  $t(6,246) = 2.43$ ,  $p < .05$ ) and sexual enhancement ( $B = 12.84$ ,  $t(6,246) = 2.65$ ,  $p < .01$ ) positive expectancies such that increases in these expectancies predicted more alcohol-related negative consequences. However, there were no significant associations observed between sociability and tension reduction positive expectancies with alcohol-related negative consequences. When examining associations between alcohol-related negative consequences and the PBS subtypes, only one significant relationship was observed. College student hazardous drinkers who engaged in more PBS-SHR ( $B = 11.20$ ,  $t(6,246) = -5.21$ ,  $p < .001$ ) experienced less alcohol-related negative consequences.

Overall, three significant main effects were observed. Liquid courage and sexual enhancement positive expectancies were related to alcohol-related negative consequences whereas increased PBS-SHR use is associated with decreased negative outcomes. Additionally, three non-significant unexpected relationships emerged among sociability and tension reduction positive expectancies, PBS-CC use, and alcohol-related negative

consequences. Altogether, hypotheses 1c, 1d, and 2a were supported whereas hypotheses 1a, 1b, and 2b were null.

A summary of all tested moderated relationships among the two PBS subtypes, the four types of positive expectancies, and alcohol-related negative consequences is also presented in Table 2. Contrary to the author's hypotheses, a non-significant Step 2 was observed in the omnibus test. Specifically, the  $\Delta R^2$  was 0.02 ( $p = .49$ ), indicating that there were no significant moderations found in the analysis. Thus, the calculated moderating effects for sociability x PBS-CC ( $B = 11.98$ ,  $t(8,238) = -1.17$ ,  $p = .24$ ), tension reduction x PBS-CC ( $B = 12.00$ ,  $t(8,238) = .48$ ,  $p = .63$ ), liquid courage x PBS-CC ( $B = 11.96$ ,  $t(8,238) = -.92$ ,  $p = .36$ ), sexual enhancement x PBS-CC ( $B = 12.05$ ,  $t(8,238) = 2.52$ ,  $p = .01$ ), sociability x PBS-SHR ( $B = 12.00$ ,  $t(8,238) = .51$ ,  $p = .61$ ), tension reduction x PBS-SHR ( $B = 11.97$ ,  $t(8,238) = -.13$ ,  $p = .90$ ), liquid courage x PBS-SHR ( $B = 11.99$ ,  $t(8,238) = .80$ ,  $p = .94$ ), and sexual enhancement x PBS-SHR ( $B = 11.89$ ,  $t(8,238) = -1.16$ ,  $p = .25$ ) cannot be interpreted as applicable in this model. Because no moderating effects were observed, no simple slopes tests were conducted. PBS was not found to moderate any of the associations among the four types of positive expectancies and alcohol-related negative consequences. As such, to further assess for potential moderating effects, univariate models for PBS-CC and PBS-SHR were conducted.



Table 2

*Multivariate Moderated Multiple Regression Analysis for Alcohol-Related Negative Consequences among College Students (N=253)*

Predictor	RAPI			$R^2$
	$B$	$SE B$	$\beta$	
Step 1:				.223***
SOC	-.20	.23	-.07	
TR	-.30	.39	-.05	
LC	.70	.29	.20*	
SE	.78	.29	.19**	
PBS-CC	.09	.07	.09	
PBS-SHR	-.86	.17	-.36***	
Step 2:				.019
SOC x PBS-CC	-.02	.02	-.11	
TR x PBS-CC	.02	.04	.04	
LC x PBS-CC	-.03	.03	-.09	
SE x PBS-CC	.07	.03	.23	
SOC x PBS-SHR	.02	.04	.05	
TR x PBS-SHR	-.01	.09	-.01	
LC x PBS-SHR	.01	.07	.01	
SEX x PBS-SHR	-.09	.08	-.11	

*Note:* Rutgers Alcohol Problem Index (RAPI), Sociability (SOC), Tension Reduction (TR), Liquid Courage (LC), Sexual Enhancement (SE), Protective Behavioral Strategies – Serious Harm Reduction (PBS-SHR), Protective Behavioral Strategies – Controlled Consumption (PBS-CC) and Interaction Terms (x). \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

### PBS-CC Independent Model

To assess for univariate moderating effects, hierarchical multiple regression was used to examine each of the PBS subtypes as moderators separately. A summary for the results of exploring the moderating effect of PBS-CC in the relationships between specific positive expectancies and alcohol-related negative consequences is presented in Table 3. Main effects for sexual enhancement ( $B = 13.09$ ,  $t(5,247) = 3.36$ ,  $p = .001$ ) and liquid courage ( $B = 12.88$ ,  $t(5,247) = 2.73$ ,  $p = .007$ ), expectancies with alcohol-related negative consequences were found. No main effects were found for sociability ( $B =$

11.90,  $t(5,247) = -.862, p = .06$ ), tension reduction ( $B = 11.89, t(5,247) = -.428, p = .67$ ), or PBS-CC ( $B = 11.99, t(5,247) = -1.353, p = .18$ ). Similar to the multivariate model, a non-significant Step 2 was observed in the omnibus test. The  $\Delta R^2$  was 0.009 ( $p = .63$ ), indicating that there were no significant moderations found in the analysis. Therefore, the observed moderating effects for sociability x PBS-CC ( $B = 12.21, t(4,243) = .04, p = .97$ ), tension reduction x PBS-CC ( $B = 12.21, t(4,243) = .27, p = .79$ ), liquid courage x PBS-CC ( $B = 12.17, t(4,243) = -1.24, p = .22$ ), and sexual enhancement x PBS-CC ( $B = 12.24, t(4,243) = 1.46, p = .15$ ) cannot be interpreted as applicable in this model. Because no moderating effects were observed, no simple slopes tests were conducted.

Table 3

*Univariate Moderated Multiple Regression for PBS-CC in Relationships Between Positive Expectancies and Alcohol-related Negative Consequences in Hazardous Drinking College Students (N = 253)*

Predictor	RAPI			
	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$
Step 1:				.131***
SOC	-.160	.222	-.123	
TR	-.174	.407	-.028	
LC	.820	.300	.235***	
SE	1.026	.306	.252***	
PBS-CC	-.087	.064	-.083	
Step 2:				.009
SOC x PBS-CC	.001	.019	.003	
TR x PBS-CC	.009	.035	.019	
LC x PBS-CC	-.031	.025	-.115	
SE x PBS-CC	.039	.027	.124	

Note: Rutgers Alcohol Problem Index (RAPI), Sociability (SOC), Tension Reduction (TR), Liquid Courage (LC), Sexual Enhancement (SE), Protective Behavioral Strategies – Controlled Consumption (PBS-CC) and Interaction Terms (x). \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

### PBS-SHR Independent Model

A summary of the results of examining the moderating effect of PBS-SHR in the associations among the different types of positive expectancies and alcohol-related negative consequences is presented in Table 4. Main effects for sexual enhancement expectancies ( $B = 12.81$ ,  $t(5,247) = 2.57$ ,  $p = .011$ ), liquid courage expectancies, ( $B = 12.76$ ,  $t(5,247) = 2.49$ ,  $p = .015$ ), and PBS-SHR ( $B = 11.31$ ,  $t(5,247) = -5.24$ ,  $p < 0.001$ ) with alcohol-related negative consequences were found. However, no main effects were found for sociability ( $B = 11.81$ ,  $t(5,247) = -1.18$ ,  $p = .24$ ) and tension reduction expectancies ( $B = 11.81$ ,  $t(5,247) = -.66$ ,  $p = .51$ ). As observed with PBS-CC, a non-significant Step 2 was found in the omnibus test. The  $\Delta R^2$  was (0.001;  $p = .98$ ), indicating that there were no significant moderations found in the analysis. As such, the moderating effects for sociability x PBS-SHR ( $B = 11.94$ ,  $t(4,243) = .39$ ,  $p = .70$ ), tension reduction x PBS-SHR ( $B = 11.19$ ,  $t(4,243) = -.06$ ,  $p = .95$ ), liquid courage x PBS-SHR ( $B = 10.99$ ,  $t(4,243) = -.39$ ,  $p = .70$ ), and sexual enhancement x PBS-SHR ( $B = 11.07$ ,  $t(4,243) = -.22$ ,  $p = .82$ ) cannot be interpreted as applicable in this model. Given that no significant moderating effects were observed, no simple slopes tests were conducted. Altogether, univariately and multivariately, PBS does not moderate any of the associations among the four types of positive expectancies and alcohol-related negative consequences. Therefore, all hypotheses for questions 3 and 4 were not supported.

Table 4

*Univariate Moderated Multiple Regression for PBS-SHR in Relationships Between Positive Expectancies and Alcohol-related Negative Consequences in Hazardous Drinking College Students (N = 253)*

RAPI				
Predictor	<i>B</i>	<i>SE B</i>	$\beta$	$\Delta R^2$
Step 1:				.212***
SOC	-.259	.220	-.091	
TR	-.257	.387	-.041	
LC	.705	.287	.202*	
SE	.757	.294	.186*	
PBS-SHR	-.755	.144	-.313***	
Step 2:				.001
SOC x PBS-SHR	.016	.041	.037	
TR x PBS-SHR	-.005	.084	-.004	
LC x PBS-SHR	-.025	.066	-.035	
SE x PBS-SHR	-.017	.075	-.020	

*Note:* Rutgers Alcohol Problem Index (RAPI), Sociability (SOC), Tension Reduction (TR), Liquid Courage (LC), Sexual

Enhancement (SE), Protective Behavioral Strategies – Serious Harm Reduction (PBS-SHR), and Interaction Terms (x). \*  $p < 0.05$ , \*\*

$p < 0.01$ , \*\*\*  $p < 0.001$ .

## CHAPTER IV – DISCUSSION

The current study sought to investigate the direct associations between the types of alcohol positive expectancies and alcohol-related negative consequences and to explore the moderating role of PBS subtypes on those relationships in a sample of hazardous drinking college students. Results from this investigation indicated that certain types of positive expectancies may be more salient in predicting alcohol-related negative consequences in hazardous drinkers. Specifically, liquid courage and sexual enhancement positive expectancies predicted alcohol-related negative consequences, whereas no statistically significant relationships were found between sociability and tension-reduction expectancies with alcohol-related negative consequences. Additionally, PBS-SHR use was related to fewer alcohol-related negative consequences, while PBS-CC use demonstrated no significant association with alcohol-related negative consequences. No statistically significant moderations for PBS-CC or PBS-SHR use were found, suggesting that the relationships between all types of positive expectancies and alcohol-related negative consequences do not depend on the use of safe drinking strategies among this sample of hazardous drinking college students. However, considering the observed significant relationships among liquid courage and sexual enhancement positive expectancies and alcohol-related negative consequences, alcohol researchers and clinicians may benefit from addressing these beliefs through advocating for and designing interventions that may reduce alcohol-related harm for hazardous drinking college students.

Partially consistent with the study's hypotheses, two of the four investigated types of positive expectancies significantly predicted increased alcohol-related negative consequences in college students engaged in hazardous drinking. Liquid courage and sexual enhancement positive expectancies were positively associated with alcohol-related negative consequences. It may be that since these types of positive expectancies are riskier in nature, they are more likely to predict increased alcohol-related negative consequences (Patrick, Crouce, Fairlie, Atkins, & Lee, 2016). With engagement in hazardous drinking dangerous in and among itself, liquid courage and sexual enhancement positive expectancies are likely to compound the risk of alcohol-related harm, particularly among college students (Hatzenbuehler et al., 2011). Perhaps, when considering expectancy theory, college students engaged in hazardous drinking are more apt to believe that increased engagement in risk-taking and sexual behaviors is representative of enjoying themselves while consuming alcohol (Dunne et al., 2013). A potential explanation for the observed association between sexual enhancement positive expectancies and alcohol-related negative consequences may be the prevalence of females in the sample. Research suggests that sex-related alcohol expectancies contribute to increased alcohol-related negative consequences (see Moorer, 2016). With 80% of participants identifying as female, this association may appear more prominent than in a sample with more males. While liquid courage and sexual enhancement positive expectancies were found to be significantly associated with alcohol-related negative consequences, the current study is the first to exclusively examine each positive expectancy type with consequences. These findings provide additional insight into which specific positive expectancies may contribute to more alcohol-related harm.

Sociability and tension reduction positive expectancies were not statistically significant predictors of alcohol-related negative consequences, suggesting that sociability and tension reduction positive expectancies may not be as salient in contributing to alcohol-related harm experienced in this sample of college students. One potential explanation is that while temporarily relieving distress and being more outgoing may be more so benefits of recreational alcohol use rather than hazardous drinking, which subsequently contribute to fewer consequences. Rather, it is likely that those who engage in hazardous drinking behaviors and experience more consequences are in social contexts where participating in riskier alcohol use behaviors is more normative and acceptable (see Lewis, Neighbors, Geisner, Lee, Kilmer, & Atkins, 2010). Additionally, college student hazardous drinkers may be more inclined to engage in risky or sexually-motivated behaviors that account for alcohol-related harm above and beyond the perceived alleviating effects of alcohol. Perhaps, increased sociability and tension reduction positive expectancies have more of a direct influence on alcohol consumption rather than experienced alcohol-related negative consequences (see Goldsmith et al., 2012; Linden et al., 2014). It may be possible that positive expectancies only partially account for alcohol use and alcohol-related negative consequences. For example, sociability and tension reduction may be better predictors of alcohol use, while sexual enhancement and liquid courage may be better predictors of alcohol-related negative consequences. Further research is needed to determine the extent to which these findings generalize to other samples.

As expected, increased use of PBS-SHR was a statistically significant predictor of decreased alcohol-related negative consequences in hazardous drinking college students.

Consistent with previous literature (Bravo, Prince, & Pearson, 2017; LaBrie et al., 2013; Linden et al., 2014), this result suggests protective behaviors such as PBS-SHR might have practical utility for all college student drinkers. The direct inverse association between PBS-SHR and alcohol-related negative consequences has been long studied in college student alcohol use research, with similar findings consistently observed (see Borden et al., 2011 & Martens et al., 2008), lending further credence to the utility of safe drinking strategies reducing alcohol-related harm. Regardless of consumption differences, actions or behaviors taken to reduce alcohol-related negative consequences by those who are drinking can significantly decrease alcohol-related harm (Bravo et al., 2017; Villarosa et al., 2017). Moreover, college students who are knowledgeable of harm reduction strategies such as PBS-SHR experience fewer alcohol-related negative consequences (Scott-Sheldon et al., 2014). It appears that increased awareness of the effectiveness of PBS-SHR could be a major contributor to reduced alcohol-related harm for all college student drinkers (Pearson et al., 2013). Based on these findings and empirical support, it seems that PBS-SHR can serve as a first-line defense against alcohol-related negative consequences, even among college student hazardous drinkers.

Contrary to expectations, PBS-CC use was not significantly associated with alcohol-related negative consequences, suggesting that limiting alcohol consumption may have little effect on whether a college student drinker experiences alcohol-related harm. Thus, accounting for PBS-CC in the context of alcohol-related negative consequences may not be an appropriate conceptualization for adverse alcohol use outcomes, especially among hazardous drinking college students. There are several possible explanations for why the current study did not find PBS-CC as a significant predictor of alcohol-related



negative consequences First, perhaps a college student's alcohol use is so heavy that using safe drinking strategies designed to curb consumption and subsequently reduce alcohol-related harm may not work. Another explanation is that hazardous drinking college students are not concerned with or currently not experiencing significant alcohol-related negative consequences associated with alcohol use. Potentially, college students engaged in hazardous drinking likely opt to engage in PBS-SHR to reduce alcohol-related negative consequences rather than using PBS-CC because their consumption levels are already elevated. It is likely that students who engage in hazardous drinking behaviors are consuming alcohol to enjoy themselves, similar to the tenets of positive expectancy theory (Durkin, Clark, & Wolfe, 2005), or to potentially cope with negative circumstances in their lives (O'Malley & Johnston, 2002). Perhaps, the observed association between PBS-CC and alcohol-related negative consequences in this study may be better explained by another alcohol-related variable, such as social anxiety (see Villarosa et al., 2016), drinking context (see Braitman, Linden-Carmichael, & Henson, 2017) or drinking refusal self-efficacy (DRSE; see Ehret, Ghaidarov, & LaBrie, 2013). Nonetheless, results from this study suggest PBS-CC may have little influence over whether hazardous drinking college students experience alcohol-related negative consequences.

With contradictory findings related to the links among positive expectancies, PBS, and alcohol-related negative consequences recently demonstrated in the literature (see Grazioli et al., 2015 and Yurasek et al., 2015), the current research attempted to explore whether these differential results may be attributable to unique variance within positive expectancies and PBS use as a whole. However, there were no significant

moderating relationships found in the present study. These findings indicate that neither PBS-SHR or PBS-CC account for the strength of any of the associations between the four positive expectancies and alcohol-related negative consequences, suggesting that the two subtypes of PBS may have similar effects on all these relationships.

These results could be attributed to a number of explanations. For one, the study sought to better explain the variance among specific positive expectancies with PBS and alcohol-related negative consequences. The majority of existing literature examined positive expectancies as a global construct while exploring these associations, suggesting that studying positive expectancies collectively rather than parsed out more adequately accounts for this alcohol use variable. Moreover, of the studies that examined specific positive expectancies in isolation (see Goldsmith et al., 2012 and Linden et al., 2014), their research questions were tailored towards what each positive expectancy entailed. Considering the null findings and dearth of existing literature analyzing the four positive expectancies separately, when investigating positive expectancies in college student drinking, perhaps it may be best to globally examine this construct rather than exploring each expectancy exclusively. Moreover, with recent studies arguing for comprehensively examining PBS as a whole rather than separating the construct by subtypes (see Bravo et al., 2017), revisiting the study's model from a more global perspective may result in different findings. The absence of significant moderations may also be a product of an incorrect conceptualization of PBS' role in the relationship between positive expectancies and alcohol-related negative consequences. Instead of accounting for the strength of the associations between specific positive expectancies and adverse alcohol-related outcomes, the PBS subtypes may mediate the relationship among these variables.

Previous research has examined positive expectancies with PBS as a mediator and found that PBS fully mediated the relationship between positive expectancies and alcohol-related negative consequences (see Madson et al., 2013). Exploration of these associations considering how the PBS subtypes mediate the relationships between the specific types of positive expectancies and alcohol-related negative consequences has yet to be done. While no significant moderating relationships were found, future research might benefit from further investigation of the possible mediation associations among these variables.

### Research Implications

Despite the absence of significant moderations, the findings of the current study have meaningful research implications worth considering when exploring positive expectancies and PBS in the future. Given that this is one of the first studies to specifically establish that sexual enhancement and liquid courage positive expectancies predicted increased alcohol-related negative consequences in hazardous drinking college students, alcohol researchers may benefit from further investigating how increased endorsements of these two types of positive expectancies affect other alcohol-related variables, such as drinking refusal self-efficacy, social anxiety, alcohol motives, and drinking context. Moreover, considering the salience of sexual enhancement and liquid courage positive expectancies in hazardous drinkers, future research could further ascertain the salience of these positive expectancies among recreational drinkers and all college student drinkers. Conversely, because no significant associations were found between sociability and tension reduction positive expectancies and alcohol-related negative consequences, researchers may benefit from investigating these relationships in

all college student drinkers. Given that PBS-CC did not significantly predict decreased consequences, perhaps future research would benefit from a more deliberate focus on PBS-SHR in reducing alcohol-related harm. Furthermore, researchers continue to be encouraged to investigate how PBS subtypes vary across positive expectancies and samples of college student drinkers when accounting for how they predict alcohol-related negative consequences.

While findings from this study suggest that examining positive expectancies parsed apart might not be the most parsimonious consideration of this variable, researchers are encouraged to investigate specific positive expectancies within the context of research questions appropriately (i.e., sexual enhancement and sex-related consequences; see Goldsmith et al., 2012 and Linden et al., 2014). Furthermore, as the literature into specific positive expectancies develops, college student alcohol researchers may benefit from conducting analyses with both holistically considering positive expectancies and parsing it apart this variable. Indeed, any further explanation of unique variance in positive expectancies would be welcome in informing theory and potential interventions aimed at reducing alcohol-related harm.

#### Clinical Implications

Related to potential prevention and interventions, these findings also have many meaningful clinical implications worth considering in attempting to reduce alcohol-related harm in hazardous drinking college students. Specifically, clinicians may benefit from addressing sexual enhancement and liquid courage positive expectancies in hazardous drinkers when exploring reasons why they consume alcohol. Moreover, when discussing their positive expectancies, conceptualizing their experiences of alcohol-

related negative consequences through their perceived benefits of using alcohol may reduce consumption and ultimately decrease alcohol-related harm. Clinicians may also benefit from introducing or orienting hazardous drinking college students to PBS-SHR as an effective and supported safe drinking behavior to curb alcohol-related negative consequences. Discussing contexts or role-playing situations where different types of PBS-SHR can be used may be helpful in emphasizing the effectiveness of these safe drinking behaviors. Clinicians in programs tailored towards reducing alcohol-related negative consequences in college students (i.e., Brief Alcohol Screening and Interventions for College Students Program [BASICS];) may incorporate more detailed discussion related to PBS-SHR and liquid courage and sexual enhancement positive expectancies. Specifically, within BASICS, connecting how a college student's highest endorsed positive expectancies contribute to alcohol-related harm may provide insight into how these expectancies were developed, reinforced over time, and lead to alcohol-related negative consequences for clients (Dimeff, 1999). Regardless of clinical context, engaging in intentional discussions surrounding a client's alcohol-related positive expectancies can be beneficial in better understanding one's drinking and in formulating potential ways to reduce alcohol-related harm in the future.

#### Limitations/Future Research

While the findings provide further clarity regarding specific positive expectancies' predictability of alcohol-related negative consequences, there are some limitations worth considering. With an overwhelmingly female majority in the sample, the current findings may not adequately generalize to male college student hazardous drinkers. Future research may benefit from replicating the current study with a more

gender-stratified sample and extending the study by examining for gender differences across the specific positive expectancies, PBS subtype use, and alcohol-related negative consequences. Moreover, while the current study used well-established college student hazardous drinker cutoff scores (DeMartini & Carey, 2013), there are other empirically supported means of distinguishing hazardous drinkers, such as drinker categorization (see Collins, Parks, & Marlatt, 1985), different thresholds of measurement (see NIAAA, 2015), and varying cutoff scores using the AUDIT and AUDIT-Consumption (AUDIT-C; see Devos-Comby & Lange, 2008 & Madson et al., in review). Future research may benefit from collecting data based on these thresholds and cutoff scores and comparing how the associations among positive expectancies, PBS, and alcohol-related negative consequences differ among these hazardous drinker criteria.

Additionally, the present study only examined safe and harmful drinking variables among college student hazardous drinkers. It may be possible that certain types of positive expectancies or PBS use are more salient for recreational college drinkers. Better yet, these associations may be different among other samples of individuals, such as adolescents, non-college attending peers, or emerging adults. Future research may also benefit from investigating these associations in larger, more diverse samples to explore whether these relationships are similar across different racial and age groups. This investigation utilized a cross-sectional design, wherein data was collected at only one point in time. Future studies could benefit from a more longitudinal examination assessing how endorsement of positive expectancies, PBS use, and experienced alcohol-related negative consequences fluctuate across the course of an academic semester or career. The current study was also conducted at one, mid-sized Southeastern university,

which may limit the generalizability of the findings. Future research can address this limitation by collecting data on positive expectancies, PBS use, and alcohol-related negative consequences at multiple universities across the country to make results more applicable for broader, more diverse college student populations.

### Conclusion

The current study aimed to further explore the associations between specific types of positive expectancies and alcohol-related negative consequences while examining the moderating role of the PBS subtypes on these relationships. Higher endorsement of liquid courage and sexual enhancement positive expectancies predicted increased alcohol-related negative consequences. However, no significant associations between sociability and tension reduction positive expectancies with alcohol-related negative consequences were found. While increased PBS-SHR use predicted fewer negative consequences, no significant relationship between PBS-CC use and alcohol-related negative consequences was observed. Moreover, none of the PBS subtypes significantly moderated any of the associations among the four positive expectancies and alcohol-related negative consequences. Although there is an absence of significant moderations, the current study's findings further contribute to the college student alcohol use literature base and pinpoint potential areas of intervention and further research regarding sexual enhancement and liquid courage positive expectancies in hazardous drinking students. Implications and limitations are discussed, and potential future research directions are encouraged.

## APPENDIX A – IRB Approval Letter



### **INSTITUTIONAL REVIEW BOARD**

118 College Drive #5147 | Hattiesburg, MS 39406-0001

Phone: 601.266.5997 | Fax: 601.266.4377 | [www.usm.edu/research/institutional.review.board](http://www.usm.edu/research/institutional.review.board)

### **NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

The risks to subjects are minimized.

The risks to subjects are reasonable in relation to the anticipated benefits.

The selection of subjects is equitable.

Informed consent is adequate and appropriately documented.

Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.

Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.

Appropriate additional safeguards have been included to protect vulnerable subjects.

Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".

If approved, the maximum period of approval is limited to twelve months.

Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: CH16080510

PROJECT TITLE: The Moderating Role of PBS in the Relationship Between Positive Expectancies and Alcohol-related Negative Consequences

PROJECT TYPE: Change to a Previously Approved Project

RESEARCHER(S): Kray Scully

COLLEGE/DIVISION: College of Education and Psychology

DEPARTMENT: Psychology

FUNDING AGENCY/SPONSOR: N/A

IRB COMMITTEE ACTION: Expedited Review Approval

PERIOD OF APPROVAL: 08/25/2016 to 08/24/2017

**Lawrence A. Hosman, Ph.D.**

**Institutional Review Board**



## APPENDIX B Electronic Informed Consent

**PURPOSE:** The present study is designed to examine the associations between positive alcohol-related expectancies, protective behavioral strategies, and alcohol-related negative consequences among heavy drinking college students.

**DESCRIPTION OF STUDY:** Participation will consist of completing several brief questionnaires via the Internet. The completion of these initial questionnaires should take approximately 60 minutes and participants will receive 1 credit. Questionnaires completed via the Internet will concern your feelings, attitudes, behaviors, and experiences. You will only receive credit for completing the survey and answering honestly.

**BENEFITS:** Participants are not expected to directly benefit from their participation. However, it is hoped that this study will contribute to our understanding of alcohol consumption and risky sexual behaviors.

**RISKS:** No foreseeable risks, beyond those present in routine daily life, are anticipated in this study. If participants find they are distressed by completing these questionnaires, they should notify the researcher immediately.

**CONFIDENTIALITY:** You will place your name on the informed consent form and the internet-based questionnaires. At the conclusion of data collection for this study, all identifying information will be deleted. Data gathered from the present study will be stored in a secure location for six years, at which time it will be destroyed. Findings will be presented in aggregate form with no identifying information to ensure confidentiality.

**PARTICIPANT ASSURANCE:** Whereas no assurance can be made concerning results that may be obtained (since results from investigational studies cannot be predicted) the researcher will take every precaution consistent with the best scientific practice. Participation in this project is completely voluntary, and participants may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Questions concerning the research should be directed to the primary researcher Kray Scully (kray.scully@usm.edu) or the research supervisor, Dr. Mike Madson at (601) 266-4546 (or e-mail at michael.madson@usm.edu). This project and this consent form have been reviewed by the Institutional Review Board, which ensures that research projects involving human participants follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406, (601) 266-6820.

If you experience distress as a result of your participation in this study, please notify the

primary researcher Kray Scully ([kray.scully@eagles.usm.edu](mailto:kray.scully@eagles.usm.edu)) or the research supervisor, Dr. Michael Madson ([michael.madson@usm.edu](mailto:michael.madson@usm.edu)). A list of available agencies that may be able to provide services for you are provided below:

University of Southern Mississippi Counseling Center (601) 266-4829  
Community Counseling and Assessment Clinic (601) 266-4601  
Pine Belt Mental Healthcare (601) 544-4641  
Pine Grove Recovery Center (800) 821-7399  
Forrest General Psychology Service Incorporated (601) 268-3159  
Lifeway Counseling Service Incorporated (601) 268-3159  
Behavioral Health Center (601) 268-5026  
Hope Center (601) 264-0890

**Consent is hereby given to participate in this study.**

APPENDIX C Demographics Form

Please circle or answer each question:

What is your age?

How do you identify yourself?

Male

Female

How do you identify yourself?

1. African American
2. Asian American
3. Eastern Indian American
4. International student
5. Latina/Latino
6. Middle Eastern American
7. Multiracial
8. Native American
9. White (non-Hispanic)
10. Other (specify):

Have you drunk alcohol in the past 30 days?            YES    NO

How many times have you drunk alcohol in the past 30 days?            \_\_\_\_\_

Have you ever received treatment for alcohol problems?

YES    NO

Are you a member of a sorority or fraternity?

YES    NO

Are you a member of a university athletic team?

YES    NO

Did you attend a junior college before coming to USM?

YES    NO

Please identify your academic status

Freshman

Sophomore

Junior

Senior

What is your enrollment status?

Full time

Part time

Where do you primarily live while going to school?

Dorm

Apartment – on campus

Apartment – off campus

Greek House

With parents

Do you use illicit drugs (marijuana, cocaine)?

YES NO

Do you take prescription medication?

YES NO

Do you take medication not prescribed for you?

YES NO

APPENDIX D The Alcohol Use Disorders Identification Test- United States (AUDIT

[US])

**Please circle the answer that is correct for you**

1. How often do you have a drink containing alcohol?

- Never
- Less than monthly
- Monthly
- Weekly
- Two to three times a week
- Four or six times a week
- Daily

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

- 1 drink
- 2 drinks
- 3 drinks
- 4 drinks
- 5 or 6 drinks
- 7 to 9 drinks
- 10 or more drinks

3. How often do you have X (5 for men; 4 for women) or more drinks on one occasion?

- Never
- Less than Monthly
- Monthly
- Weekly
- 2-3 times a week
- 4-6 times a week
- Daily

4. How often during the last year have you found that you were not able to stop drinking once you had started?

- Never
- Less than Monthly
- Monthly

- Weekly
- Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

- Never
- Less than Monthly
- Monthly
- Weekly
- Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

- Never
- Less than Monthly
- Monthly
- Weekly
- Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

- Never
- Less than Monthly
- Monthly
- Weekly
- Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

- Never
- Less than Monthly
- Monthly
- Weekly
- Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

- No
- Yes, but not in the last year

- Yes, during the last year

10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

- No
- Yes, but not in the last year
- Yes, during the last year

## APPENDIX E Comprehensive Effects of Alcohol- Positive Expectancy Subscales

DIRECTIONS: Mark a response from (1) for disagree to (4) for agree, depending upon whether or not you would expect the effect to happen to you if you were under the influence of alcohol.

### Sociability:

- I would act sociable
- It would be easier to talk to people
- I would be friendly
- I would be talkative
- I would be outgoing
- I would be humorous
- It would be easier to express feelings
- I would feel energetic

### Tension Reduction:

- I would feel calm
- I would feel peaceful
- My body would feel relaxed

### Liquid Courage:

- I would feel courageous
- I would feel brave and daring
- I would feel unafraid
- I would feel powerful
- I would feel creative

### Sexuality:

- I would be a better lover
- I would enjoy sex more
- I would feel sexy
- It would be easier to act out my fantasies



## APPENDIX F Protective Behavioral Strategies Scale- Revised (PBSS-R)

**Instructions:** Please indicate the degree to which you engage in the following behaviors when using alcohol or “partying (ranging from “1/Never” to “6/Always”).

### **Controlled Consumption:**

2. Determine not to exceed a set number of drinks
3. Alternate alcoholic and nonalcoholic drinks
4. Have a friend let you know when you have had enough to drink
5. Avoid drinking games
6. Leave the bar/party at a predetermined time
10. Stop drinking at a predetermined time
11. Drink water while drinking alcohol
12. Put extra ice in your drink
13. Avoid mixing different types of alcohol
14. Drink slowly rather than gulp or chug
15. Avoid trying to “keep up” or “out drink” others

### **Serious Harm Reduction:**

1. Use a designated driver
7. Make sure that you go home with a friend
8. Know where your drink has been at all times
16. Avoid getting in a car with someone who has been drinking
17. Always know what you are drinking
18. Avoid mixing alcohol with prescription drugs (whether prescribed for you or not)

## APPENDIX G Rutgers Alcohol Problem Index (RAPI)

Different things happen to people while 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 happen to you during the last three years while you were drinking alcohol or as the result of your alcohol use. When marking your answers, use the following code:

- 0= never
- 1= 1-2 times
- 2=3-5 times
- 3=6-10 times
- 4= more than 10 times

How many times did the following things happen to you while you were drinking alcohol or because of your alcohol use during the last 3 years?

- Not able to do your homework or study for a test
- Got into fights, acted bad, or did mean things
- Missed out on other things because you spent too much money on alcohol
- Went to work or school high or drunk
- Caused shame or embarrassment to someone
- Neglected your responsibilities
- Relatives avoided you
- Felt that you needed more alcohol than you used to use in order to get the same effect
- Tried to control your drinking by trying to drink only at certain times of the day or certain places
- Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking
- Noticed a changed in your personality
- Felt that you had a problem with alcohol
- Missed a day (or part of a day) of school or work
- Tried to cut down or quit drinking
- Suddenly found yourself in a place that you could not remember getting to
- Passed out or fainted suddenly
- Had a fight, argument or bad feeling with a friend
- Had a fight, argument or bad feeling with a family member
- Kept drinking when you promised yourself not to
- Felt you were going crazy
- Had a bad time
- Felt physically or psychological dependent on alcohol
- Was told by a friend or neighbor to stop or cut down drinking

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Advance online publication. <http://dx.doi.org/10.1037/adb0000092>