

DRINKING MOTIVES AND USE OF PROTECTIVE BEHAVIORAL STRATEGIES  
IN AN ETHNICALLY DIVERSE SAMPLE OF UNDERGRADUATE STUDENTS

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by

Lauren J. Ryan

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## **DEDICATION**

To my mother and father, whose unconditional love and encouragement made this possible. Thank you for your sacrifices.

To my boyfriend, whose support has meant the world and not gone unnoticed. Thank you for your strength.

To my friends, who have each kept me motivated in their own way. Thank you for keeping me connected.

## ABSTRACT

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College students often endorse greater alcohol consumption and increased likelihood of experiencing negative alcohol-related consequences, particularly ethnic minority youth. Protective Behavioral Strategies (PBS) can be used to offset these harmful effects and include stopping/limiting drinking, manner of drinking, and harm reduction. In addition to these strategies, four drinking motives may account for the amount and frequency of alcohol consumption: enhancement, social, coping, and conformity. Further, demographic variables, such as race and ethnicity or sex, may interact with motives and PBS to predict alcohol use among students. This study found motives and PBS varied by race, as did amount consumed, and racial differences were present within sex groups. Results included significant correlations between motives and PBS; positive motives (i.e., enhancement and social) and coping were associated with less PBS use, while the conformity motive was associated with increased PBS use. Further, regression analyses revealed main effects of coping and enhancement on alcohol use and main effects of coping and conformity on number of consequences. Other significant findings are presented which may potentially inform interventions designed to target at-risk and often neglected populations, particularly Hispanic/Latino and other minority youth, who may benefit from learning skills which may prove useful throughout the lifespan.

KEYWORDS STATEMENT: Alcohol use, Drinking motives, Protective behavioral strategies, Alcohol-related consequences

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## CHAPTER I

### Introduction

Alcohol consumption can have negative effects on a variety of outcomes including academic, social, health, and legal (Garcia et al., 2018). However, these negative consequences can be mitigated by protective behavioral strategies (PBS), which have been shown to minimize harmful effects associated with drinking (Martens et al., 2004). PBS are techniques used while drinking in order to decrease negative consequences associated with excessive alcohol use (e.g., hangovers, black outs, alcohol-related injuries). Examples of PBS include alternating between water and an alcoholic beverage, and having a friend let you know when you have had enough (Martens et al., 2005). Not only has research supported the incorporation of PBS to reduce alcohol use, support has also been found for PBS use to reduce harmful consequences associated with drinking among college students. The use of these strategies may even be more pronounced in decreasing the likelihood of experiencing negative consequences rather than altering consumption, as examples of consequences can extend to such dire events as physical and sexual assaults, injuries, and death (Madson et al., 2015; Martens et al., 2004; Sugarman & Carey, 2007). Less dire, but still meaningful from a public health perspective, alcohol-related consequences include a host of behaviors influenced by impaired control and increased risk-taking, as well as hangovers, nausea, and difficulty concentrating (Merrill, Wardell & Read, 2014; Robertson et al., 2012). PBS use has also been shown to moderate the effect of high anxiety on alcohol-related consequences, indicating these strategies may also extend to harm reduction for those with co-occurring mental health problems (Napper, LaBrie, & Hummer, 2012).

PBS are especially beneficial at decreasing the deleterious consequences of drinking, for those engaging in heavy drinking, which is salient among college students (Martens et al., 2007). Given the high rates of problematic drinking within this group, the existing literature on protective behavioral strategies primarily focuses on the collegiate population (Bravo, Prince, & Pearson, 2017). One study on university-based alcohol use interventions found incorporating behavioral strategies, such as setting limits, alternating alcoholic with nonalcoholic beverages, and choosing not to drink, mediated intervention efficacy (Larimer et al., 2007). Specifically, the intervention successfully reduced drinking in part because students in the experimental group who received information about PBS were then more likely to use those skills to reduce risks.

The effectiveness of PBS use is related to different types of PBS behavior, which are typically grouped into three distinct categories: Stopping/Limiting Drinking (SLD), Manner of Drinking (MOD), and Serious Harm Reduction (SHR; Martens et al., 2005). Stopping or limiting drinking includes behaviors designed to decrease use or stop overconsumption, such as setting a specific time to stop drinking. Manner of drinking encompasses how an individual drinks, such as avoiding drinking games, shots, or chugging. Serious harm reduction behaviors incorporate safeguards to offset some dangers of drinking such as obtaining a designated driver or never leaving a drink unattended. Regardless of method, all three factors are associated with lower levels of consumption and alcohol-related problems (Martens et al., 2005).

## **Drinking Motives**

In addition to PBS, presumably related factors that may influence alcohol consumption among college students are drinking motives (Cooper, 1994). Identifying the motivation behind a behavior can provide explanations for the frequency and continued use despite the presence of harmful consequences. Drinking motives encompass both positive and negative motivations, with the former designed to illicit feelings of pleasure and the latter to remove aversive feelings. Specific positive motives include enhancement (i.e., motives designed to increase personal feelings of well-being) and social (i.e., those designed to increase social feelings of well-being). Drinking to have fun or “feel good” falls under the category of enhancement, while drinking to increase sociability and celebrate are social motives. Conversely, two negative motives exist that are designed to improve or alleviate undesirable or unpleasant feelings, again both personally and interpersonally. These two are labeled drinking to cope and conformity motives. Drinking to cope is meant to help the individual forget about their problems, while the conformity motive refers to the attempt to fit in, or “doing it because everyone else is doing it.” Although the four motives seem similar, research has found that the different motives are more relevant to various populations (e.g., college students vs. the general population) and types of drinking behaviors (e.g., drinking alone or with others).

As with protective strategies, each specific motive may influence consumption and consequences differently. Enhancement and social motives have been found to be the most commonly endorsed motives among college students (Sheehan, Lau-Barraco, & Linden, 2013). These two motives were also found to be greater influences on the amount

of alcohol consumed, especially enhancement (Gardner, Robertson, Tatch & Walker, 2018; Sheehan et al., 2013). In regard to drinking to cope, while it may not be the most commonly endorsed motive, it has been associated with higher levels of negative consequences (Gardner, Robertson, Tatch & Walker, 2018; Merrill, Wardell, & Read, 2014). Drinking to cope may be associated with a broader pattern of maladaptive coping skills and potentially develop into a potential reliance on alcohol to tolerate distress, a situation in which college students may find themselves (Merrill et al., 2014).

Given that college students are often subjected to high levels of stress in multiple facets of their lives due to new responsibilities and exposure to novel experiences, it is unsurprising they may want to drink to combat negative emotions. Although some researchers hypothesize drinking to cope is most relevant to this population (e.g., Grant et al., 2007), college students seem to place more value on having fun and socializing than coping with their negative emotions, although this may depend on what emotion they are trying to manage (Vernig & Orsillo, 2015). Drinking to cope is more often found in middle or older adults, possibly due to the more limited social sphere for those age groups, as opposed to the college atmosphere in which most college student drinking is social in nature (Gilson, 2013; O'Hara, Armeli, & Tennen, 2014). Finally, research on the conformity motive has been mixed, with some recent studies choosing to omit it, describing it as the least applicable motive to students (Sheehan et al., 2013).

### **Protective Behavioral Strategies and Drinking Motives**

Given that protective behavioral strategies and drinking motives both affect drinking behaviors, it is unsurprising these two constructs are associated. For example, positive motives have been associated with less PBS utilization (Patrick, Lee, & Larimer,

2011). That is, individuals drinking for enhancement or social reasons are less likely to employ PBS and may worry these strategies might dull any positive effects from drinking. However, they may still engage in these strategies to protect themselves from consequences that may outweigh the benefits, such as hangovers. If individuals do employ PBS though, PBS have been shown to mediate the relationship between positive motives and use or consequences (LaBrie et al., 2011; Madson et al., 2015). Linden, Kite, Braitman, and Henson (2014) sought to examine which PBS individuals preferred based on their most prominent drinking motive and found participants drinking for positive motives were less likely to implement them while drinking. Further, individuals drinking to enhance interpersonal or personal feelings were less likely to use MOD strategies (e.g., avoiding drinking games and pacing drinks), similar to previous studies (Patrick, Lee, & Larimer, 2011). Less is known about specific strategies employed by those drinking for negative motives. Linden et al. (2014) found those wishing to use alcohol to cope or conform were more likely to use strategies that still enabled them to drink and fit in, but potentially reduced negative consequences. The lack of data on this topic may be more attributable to differences in types of strategies rather than lower rates of actual use, given that many strategies are social in nature (Martens, Ferrier, & Cimini, 2007). Little is also known about whether PBS mediates the relationship between negative motives and use or problems, although Martens et al. (2007) found no evidence to support mediation.

### **Strategies and Motives by Gender**

Prevalence of different motives and PBS may be tied to demographic differences. For example, gender has been associated with differing rates of protective behavioral

strategies usage. Studies have consistently shown women are more likely to use PBS than males (Clark et al., 2016; LaBrie, Lac, Kenney, & Mirza, 2011). Further, women who employ PBS are also more likely to use peer-directed strategies to reduce harm and avoid intoxication (Armstrong, Watling, & Buckley, 2014). Examples of strategies commonly used by women include those related to stopping/limiting drinking such as having a friend let you know when you have had enough to drink. Although gender differences regarding the use of strategies have yielded consistent results, results have been inconsistent regarding drinking motives. While some studies have found males endorse certain motives (i.e., enhancement, social, and conformity) more than females, other studies have found no gender differences for different motives (LaBrie, Lac, Kenney, & Mirza, 2011).

### **Strategies and Motives by Race and Ethnicity**

Another possible demographic variable influencing the use of specific PBS and endorsement of certain motives may be race or ethnicity. LaBrie et al. (2011) reported White students were more likely to endorse enhancement motives and serious harm reduction (SHR), while Asians were more likely to endorse coping and conformity motives and use of stopping/limiting drinking (SLD) strategies. Another study, Madson, Villarosa, and Moorer (2015), specifically examined Black/African-American college students and their alcohol. First, results indicated these students primarily drank for enhancement and were more motivated to drink to alter internal states (i.e., increase positive feelings) rather than increase sociability, unlike their White counterparts. Second, consistent with previous studies, Black/African-American students drinking for enhancement were likely to use more strategies while drinking, specifically, SLD and

manner of drinking (MOD) (Madson & Ziegler-Hill, 2013). Overall, previous studies have found that Black/African-American and Asian students were more likely to use strategies to limit or lower drinking, compared to their White peers (Clarke et al., 2016; LaBrie et al., 2011; Madson et al., 2013).

The majority of studies examining racial and ethnic differences primarily focus on differences between White and Black/African-American students. One recent study examining PBS use between students of these ethnic backgrounds found that PBS use did not influence Black/African American students' consumption. For White students, PBS influenced consumption, but this relation differed by strategy; harm reduction (e.g., using a designated driver) increased alcohol consumption, while limiting and manner of drinking decreased use (Gardner et al., 2018). Further, coping and social motives were associated with higher alcohol-related problems for both races; in addition, drinking for conformity influenced higher consequences among Black/African-American students alone. The authors posited that PBS may be a more effective tool for White students than Black/African American students and the significance of the conformity motive may be related to the setting (for instance, drinking norms at a predominantly white institution versus a historically black college or university). These results suggest certain drinking motives often endorsed among students of different ethnicities may increase vulnerability to alcohol-related harm, which may be due to differing cultural beliefs about drinking (Antin et al., 2014). For example, ethnic identity and religiosity may play a role in African American drinking beliefs (e.g., disapproval of others' drinking), while Asian cultural norms have been shown to emphasize drinking in moderation (Antin et al., 2014; LaBrie, 2011).

While researchers have started to examine race/ethnicity differences in drinking motives and use of strategies, little is known about other racial and ethnic groups, for example Hispanic college students. While previous literature has focused on consumption rates and alcohol-related problems, studies are scarce regarding ethnic differences between races other than White non-Hispanic and Black/African American students, particularly in regard to strategies and motives. Few studies, if any, have examined both motives and PBS simultaneously within an adequately large sample of Hispanic students, with most choosing only to study either motives or PBS, but not both. Regarding strategies, one study found no difference between using avoidance behaviors (i.e., stopping/limiting) or behaviors altering drinking (i.e., manner of drinking) as strategies (Lawrence, Abel, & Hall, 2010). Another study, focused solely on motives, found Hispanic college students who engaged in drinking were more likely to endorse stronger conformity drinking and more alcohol-related problems (Conn, Ejesei, & Foster, 2017).

More generally, Hispanic college students have exhibited drinking behaviors different from those of African American, White non-Hispanic, and Asian peers, and most alcohol use studies featuring samples of Hispanic/Latino students focus on acculturation as a moderator (Zamboanga, Raffaelli, & Horton, 2006). While discussing acculturation may provide more insight into why outcomes may differ for Hispanic youths and other ethnic minorities, the scarcity of data makes it difficult to apply this concept to tangible results regarding both motives and PBS, especially in a college setting where higher levels of acculturation are likely to be reported among Hispanic students relative to their peers not attending college. Given that previous research revealed ethnic minorities are more likely to drink for conformity or coping motives, which could be

related to wanting to fit in with the “majority” White population or within their own Hispanic population, perhaps Latino college students may express higher levels of these motives (Conn, Ejese, & Foster, 2017; Mills & Caetano, 2012; Martens et al., 2008; Mulia, Ye, Greenfield, & Zeng, 2009). Further, students endorsing coping and conformity motives have reported higher use of stopping/limiting drinking strategies, which may be expected for this population as well (LaBrie et al., 2011).

While prior research has demonstrated various drinking motives exert differential influence on drinking behavior, perhaps considering motives and strategies together may better predict the likelihood of negative alcohol consequences. More information is needed about the interactions between these factors and race or ethnicity and sex in order to create research-based interventions. Exclusion of other prevalent groups from studies designed to minimize harm may have the opposite effect and adversely impact minority groups who are not provided with research-based interventions. Given the increasing diversity of college campuses and prevalence of high consumption, informing potential interventions from a culturally-informed perspective may lead to better effectiveness and longevity, as college drinking behaviors may continue into adulthood. Skills learned in prevention programs may be applied to other adverse life events, which has the potential to be especially beneficial for minorities.

### **The Current Study**

**Aim 1.** This study aimed to assess which drinking motives (e.g., enhancement, social, coping, conformity) are associated with different types of PBS (e.g., stopping or limiting drinking, method of drinking, serious harm reduction). Linden et al. (2014) found individuals drinking for positive motives (i.e., enhancement and social) were less

likely to use PBS overall, especially MOD (i.e., drink slowly, rather than gulp or chug). I hypothesize that social and enhancement motives will be positively associated with SLD strategies (i.e., drink water while drinking alcohol). Inversely, I hypothesized that drinking related to negative motives (i.e., coping and conformity) would be positively associated with SHR (i.e., only go out with people you know and trust) or MOD because these strategies will still allow them to decrease negative emotions through drinking.

**Aim 2.** The second aim was to assess whether the different motives and the use of strategies vary by race or ethnicity and sex. Based on the research of Madson and Zeigler-Hill (2013), I hypothesized that enhancement drinking motives would be associated with SLD strategies among African American participants. White individuals may drink for social motives and employ less PBS overall; however, White students may also use more SHR strategies compared to non-White students (Clarke et al., 2016; LaBrie et al., 2011). The research on Latino students is much more limited; therefore, I investigated the question of how motives and PBS are associated among these students but refrained from making a directional hypothesis.

**Aim 3.** The third aim focused on exploring interactions between motives, strategies, sex, and ethnicity in their associations with drinking behavior. First, I examined whether the interaction between drinking motives and PBS is associated with alcohol consumption. For example, previous research suggests individuals drinking for negative motives may consume lower amounts of alcohol; however, they may also endorse more alcohol-related problems. These negative motives may be associated with more alcohol consequences but mitigated among those who use serious harm reduction

strategies. Further, I explored the ways sex, ethnicity, motives, and strategies all interact in their associations with alcohol-related consequences and consumption.

## CHAPTER II

### Method

#### Participants

Students ( $N = 1711$ ) from diverse racial and ethnic backgrounds (primarily White Non-Hispanic, Hispanic, Black/African American, and Asian) were recruited from two universities located in Southeast Texas for a larger research study examining motives underlying the joint relation between exercise and alcohol use and the relation between physical activity and hangover incidence. These individuals comprised the sample for the current study. Participants came from research pools comprised of students in psychology courses at each university. The inclusion criteria for the parent study required that participants must: (1) be between 18 and 25 years of age, (2) engage in moderate physical activity for at least 30 minutes per week, and (3) have experienced a hangover in the past 3 months.

#### Procedure

Participants were directed from their university research system to Qualtrics, where they were presented with an electronic consent form. They were asked to complete a 40-minute online survey for which they would be compensated with one research credit. After reading the consent form, participants were then asked to select whether or not they agreed to participate. If they agreed, they were then presented with the survey questions. Upon completion, participants were required to email a code to the researcher, who then granted them credit. Survey responses were collected anonymously and not connected with student emails.

## CHAPTER III

### Measures

#### Demographics

Demographics collected included: gender, age, ethnic and racial background, current class standing, Greek affiliation, religious affiliation, and relationship status.

Means and percentages are presented in Table 1.

Table 1  
*Sample Characteristics*

Variable	(N = 1711)
Sex	
Female	1347 (79)
Male	364 (21)
Age	
18-25	20.4 (1.9)
Ethnicity	
African American/Black	352 (20.6)
Caucasian/White	748 (43.7)
Hispanic	547 (32.0)
Asian	112 (6.5)
Other	139 (9)
Class Standing	
Freshman	427 (25)
Sophomore	414 (24)
Junior	450 (26)
Senior	417 (24)
Greek Affiliation	
Greek	179 (11)
Not Affiliated	1530 (89)

#### Protective Behavioral Strategies

The 20-item Protective Behavioral Strategies Scale-20 (Treloar, Martens, & McCarthy, 2015) was used to capture endorsement of the PBS. An updated version of the original Protective Behavioral Strategies Scale (Martens et al., 2005), this measure increased the validity of the SHR subscale by adding items to cover a broader range of behaviors commonly endorsed by college students. Participants were asked to indicate

the degree to which they engage in behaviors when using alcohol or “partying” on a Likert scale from 1 (never) to 6 (always). Each statement corresponded to one of three strategies types: stopping/limiting drinking (e.g., “stop drinking at a predetermined time”), manner of drinking (e.g., “avoid mixing different types of alcohol”), and serious harm reduction (e.g., “know where your drink has been at all times”). Cronbach’s alpha for each subscale ranged between .81 and .88 in previous studies (e.g., Treloar et al., 2015). The current study produced lower alphas for each strategy: stopping/limiting drinking ( $\alpha = .75$ ), manner of drinking ( $\alpha = .70$ ), and serious harm reduction ( $\alpha = .60$ ).

### **Drinking Motives**

The Drinking Motives Questionnaire (DMQ; Cooper et al., 1994) is a 20-item measure designed to assess the reasons individuals engage in alcohol use. The DMQ, which is considered a valid and reliable measure for adolescents and college students across cultures (Sun, Windle, Thompson, 2014), uses a four-factor model for these various motives: enhancement (five items; e.g., “it’s exciting”), social (five items; e.g., “it makes social gatherings more fun”), coping (five items; e.g., “to forget your worries”), and conformity (five items; e.g., “so that others won’t tease you about *not* drinking”). LaBrie et al. (2011) reported alpha levels of .88, .89, .89, and .90 for each motive, respectively, which is comparable to that found in other college student samples. The current study was consistent with previous studies for each subscale: enhancement ( $\alpha = .86$ ), social ( $\alpha = .90$ ), coping ( $\alpha = .85$ ), and conformity ( $\alpha = .87$ ). Participants are instructed to describe how often they drink for each reason using five choices: “never/almost never,” “some of the time,” “half of the time,” “most of the time,” or “almost always/always.”

### **Alcohol Use**

Participants were asked to report drinking over a one-month period to reveal any drinking patterns and average consumption amounts. The Daily Drinking Questionnaire (DDQ; Collins, Parks & Marlatt, 1985) asks participants to consider a typical week and write how many drinks and indicate how many hours (e.g., “0-1 hours”) they usually drink each day of the week. Additionally, this measure asks them how many times that month they have consumed alcohol (e.g., “never,” “two times a week,” “everyday”) and an estimate of the average amount consumed each occasion (e.g., “0 drinks,” “5 drinks,” “25 or more drinks”). Amount of alcohol consumed weekly was calculated using the sum of each participants’ responses from each day of the week.

### **Alcohol-Related Problems**

The parent study did not include a specific measure of alcohol-related consequences. However, items from the Hangover Symptoms Scale do assess consequences. The 28-item Hangover Symptoms Scale (HSS; Slutske et al., 2003) asked participants to select a number corresponding to how often within the past 12 months they felt a certain effect after drinking: 1 = Never (0% of the time), 2 = Occasionally (about 25% of the time), 3 = About half the time (50% of the time), 4 = Most of the time (75% of the time), or 5 = Every time I drank alcohol (100% of the time). Five items were used in the current study regarding the frequency of alcohol consequences: “feel very weak the next morning,” “have difficulty concentrating on things the next morning,” “have a lot of trouble sleeping,” “feel anxious the next morning,” and “feel depressed the next morning.” If an item was endorsed, participants were then asked how many times they experienced that symptom within the past 12 months: A = 2 times or less (once or

twice per year), B = 3-11 times (less than once per month), C = 12-51 times (more than once per month, but not every week), or D = 52 times or more (once per week or more frequently). In accordance with Slutske et al. (2003), each item was dichotomized to reflect past-year presence or absence. The total items were summed to yield a scale 0-5, representing none to all of the five consequences. Internal consistency of the HSS was acceptable in the current study ( $\alpha = .86$ ) and in previous studies ( $\alpha = .78$ ; Robertson et al., 2012).

### **Data Analytic Plan**

The coded data was entered into the Statistical Package for the Social Sciences (SPSS). Descriptive analyses were used to define sample characteristics and determine frequency and mean differences in endorsements of PBS, drinking motives, alcohol consumption (i.e., number of drinks) and alcohol-related problems. Further, these means and standard deviations were compared between race and ethnic groups.

Descriptive statistics, along with graphical methods were used to assess the assumption of normality for the distributions of the variables. Of note, alcohol use data has been shown to be typically positively skewed, with the majority of participants reporting low levels (Horton, Kim, & Saitz, 2007). Thus, I also aimed to explore other models appropriate for handling count data, such as a Poisson distribution or negative binomial regression, which are better suited to estimate count data.

To test Aim 1, correlational analyses were conducted to explore the association between motives and PBS. Aim 2 were tested using multivariate analyses of variance (MANOVA) to determine the extent different motives and PBS vary by race or ethnicity and sex, and if alcohol consumption and consequences vary in these to domains as well.

Finally, Aim 3 was tested using regression models, first examining main effects of motives, PBS, and race predicting alcohol consumption and consequences. For these models, race was recoded into dummy variables using White, Non-Hispanic ethnicity as the reference category. Interaction effects were then tested by creating product interaction terms representing interactions between race and motive and race and PBS in predicting alcohol consumption and consequences. The interactions were created using standard procedures outlined in Aiken and West (1991).

## CHAPTER IV

### Results

Overall, students reported drinking an average of eight drinks per week ( $M = 8.44$ ,  $SD = 8.82$ ) and an average of two alcohol-related problems ( $M = 2.29$ ,  $SD = 1.56$ ), most commonly feeling weak and difficulty concentrating. In this sample, students most frequently endorsed harm reduction strategies ( $M = 4.64$ ,  $SD = .65$ ), followed by limiting ( $M = 3.86$ ,  $SD = 1.22$ ), and manner of drinking ( $M = 3.34$ ,  $SD = 1.57$ ). Additionally, they most often reported social drinking motives ( $M = 3.21$ ,  $SD = 1.04$ ), followed by enhancement ( $M = 2.33$ ,  $SD = .99$ ), coping ( $M = 2.75$ ,  $SD = .99$ ), and conformity ( $M = 1.64$ ,  $SD = .81$ ).

When comparing these constructs between racial and ethnic groups, proportionally, Hispanic/Latino students reported higher rates of alcohol consumption ( $M = 9.56$ ,  $SD = 10.33$ ), with Asians reporting the least ( $M = 6.41$ ,  $SD = 6.57$ ). Unlike alcohol consumption, alcohol-related consequences, preferred PBS, and motives were on average the same across groups (Table 2). Regarding sex differences in alcohol use, men drank an average of two drinks more per week ( $M = 10.20$ ,  $SD = 9.54$ ) than women ( $M = 7.97$ ,  $SD = 8.55$ ) and an average of two hangover symptoms for both men ( $M = 2.16$ ,  $SD = 1.53$ ) and women ( $M = 2.32$ ,  $SD = 1.56$ ). Further, no sex differences emerged regarding endorsement of motives and PBS, with both reportedly drinking primarily for social motives and most commonly employing harm reduction strategies.

Table 2  
*Descriptive Statistics of Motives and Strategies by Race or Ethnicity*

Measure	Asian	Black/African American	Hispanic	White/Non-Hispanic
PBS				
Harm Reduction	4.64 (.63)	4.66 (.62)	4.64 (.66)	4.61 (.70)
Stopping/Limiting	3.84 (1.2)	3.85 (1.2)	3.89 (1.2)	3.87 (1.2)
Manner of Drinking	3.32 (1.6)	3.25 (1.6)	3.39 (1.6)	3.41 (1.6)
Motive				
Social	3.20 (1.0)	3.24 (1.0)	3.21(1.0)	3.19 (3.2)
Coping	2.32 (.99)	2.35 (.97)	2.31 (.98)	2.29 (1.0)
Enhancement	2.74 (1.0)	2.77 (.99)	2.75 (.99)	2.72 (1.0)
Conformity	1.61 (.80)	1.67 (.82)	1.65 (8.3)	1.62 (.81)
Drinks per week	6.4 (2.4)	7.5 (2.0)	9.6 (2.3)	9.0 (2.5)
Alcohol-Related Consequences				
Feeling weak	.68 (.47)	.69 (.46)	.66 (.47)	.66 (.47)
Decreased concentration	.65 (.48)	.68 (.47)	.64 (.48)	.63 (.48)
Decreased sleep	.32 (.47)	.33 (.47)	.34 (.47)	.29 (.45)
Feelings of anxiety	.36 (.48)	.39 (.49)	.37 (.48)	.33 (.47)
Feelings of depression	.29 (.45)	.31 (.46)	.29 (.45)	.26 (.44)

*Note.* Standard deviations are in parentheses.

To assess the assumption of normality of the distributions, histograms and skewness values were examined and determined to be normal for all measures. Of note, the alcohol use variable was highly skewed. The established cutoff of 80 drinks per week was used to exclude outliers; four cases were excluded based on this criterion.

Correlations between motives and PBS are presented in Table 3. Overall, those endorsing either of the positive drinking motives or drinking to cope were less likely to utilize protective strategies. More specifically, those endorsing the enhancement motive were less likely to employ any of the three strategies, while individuals reporting social and coping motives were only significantly less likely to report limiting drinking or manner of drinking. Conversely, those reporting conformity motives were more likely to utilize strategies overall, particularly stopping/limiting drinking.

Table 3  
*Correlation Between Protective Behavioral Strategies and Motives*

Measure	1	2	3	4	5	6
1. PBS: Harm Reduction						
2. PBS: Stopping/Limiting	0.45**					
3. PBS: Manner of Drinking	0.29**	0.53**				
4. Motive: Social	-0.02	-0.18**	-0.28**			
5. Motive: Coping	-0.04	-0.09**	-0.11**	0.49**		
6. Motive: Enhancement	-0.06*	-0.21**	-0.26**	0.68**	0.51**	
7. Motive: Conformity	0.01	0.07**	0.04	0.28**	0.41**	0.24**

*Note.* \* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the .01 level (2-tailed).

Multivariate analyses of variance (MANOVA) were conducted to determine the extent to which both motives and strategies vary by race or ethnicity and sex. There was a significant multivariate main effect for Asian race on motives, Wilks'  $\lambda = .99$ ,  $F(4, 1658) = 4.63$ ,  $p = .001$ ,  $\eta^2_p = .95$ . Further, univariate main effects for Asians were observed for the conformity motive,  $F(1, 1661) = 15.27$ ,  $p < .001$ ,  $\eta^2_p = .97$ . Asians ( $M = 2.07$ ,  $SD = .95$ ) were more likely to endorse drinking to conform more than non-Asian individuals ( $M = 1.61$ ,  $SD = .80$ ). There were no observed multivariate main effects on protective strategies; however, univariate effects were again observed for Asians on limiting drinking,  $F(1, 1660) = 5.28$ ,  $p = .02$ ,  $\eta^2_p = .63$ , and Black/African-Americans on manner of drinking,  $F(1, 1660) = 10.19$ ,  $p = .04$ ,  $\eta^2_p = .54$ . That is, Asians ( $M = 4.18$ ,  $SD = 1.2$ ) endorsed SLD strategies significantly more than non-Asians ( $M = 3.84$ ,  $SD = 4.18$ ) and Black/African-Americans ( $M = 3.6$ ,  $SD = 1.6$ ) endorsed MOD strategies more than non-Blacks ( $M = 3.25$ ,  $SD = 1.5$ ). Alcohol consumption significantly differed between some racial groups, specifically Latino (as compared to non-Latino),  $F(1, 1687) = 9.758$ ,  $p = .002$ ,  $\eta^2_p = .006$ , and White (as compared to all ethnic minorities),  $F(1, 1682) = 5.03$ ,  $p = .03$ ,  $\eta^2_p = .003$ . Latino students ( $M = 9.56$ ,  $SD = 10.3$ ) reported drinking more than non-

Latino ( $M = 7.92$ ,  $SD = 8.0$ ); similarly, White students reported drinking more ( $M = 8.95$ ,  $SD = 9.0$ ) than their non-White peers ( $M = 8.05$ ,  $SD = 8.7$ ). Racial differences also emerged within sex groups. Amount consumed did not vary for males by race; however, within females, amount consumed varied by race, particularly for Hispanic women,  $F(1, 1325) = 7.38$ ,  $p = .01$ . On average, Hispanic women ( $M = 8.98$ ,  $SD = 9.7$ ) drank more than non-Hispanic women ( $M = 7.48$ ,  $SD = 7.9$ ). No significant effects were found by race or sex on alcohol-related consequences.

### **Alcohol Consumption**

Main effects of motives, PBS, race, and sex as predictors of alcohol consumption were assessed using multiple regression analysis. Number of drinks per week was predicted by all three strategies: harm reduction,  $\beta = -.99$ ,  $t(1643) = -2.75$ ,  $p = .01$ , limiting drinking,  $\beta = -.42$ ,  $t(1643) = -2.02$ ,  $p = .04$ , and manner of drinking,  $\beta = -.39$ ,  $t(1643) = -2.46$ ,  $p = .01$ . Amount consumed was also predicted by coping,  $\beta = 1.31$ ,  $t(1643) = 5.06$ ,  $p < .001$ , and enhancement motives,  $\beta = 1.33$ ,  $t(1643) = 4.55$ ,  $p < .001$ .

Significant interactions were observed between White individuals and conformity,  $\beta = -2.19$ ,  $t(1615) = 3.67$ ,  $p = .01$ , such that weekly alcohol consumption was significant for low conformity ( $\beta = 1.66$ ,  $t(1677) = 2.72$ ,  $p = .01$ ) and not high conformity ( $\beta = -.15$ ,  $t(1677) = -.24$ ,  $p = .80$ ). Coping significantly interacted for three ethnicity groupings: Hispanic/Latino,  $\beta = 2.27$ ,  $t(1615) = 2.63$ ,  $p = .01$ ; White,  $\beta = 3.15$ ,  $t(1615) = 3.67$ ,  $p < .001$ ; and Black,  $\beta = 1.98$ ,  $t(1615) = 2.04$ ,  $p = .04$ . Simple slope analyses revealed that coping was positively related to alcohol use among Hispanic/Latino,  $\beta = 2.44$ ,  $t(1678) = 3.92$ ,  $p < .001$ , and White,  $\beta = 1.27$ ,  $t(1678) = 2.13$ ,  $p = .03$  participants, but the relation was the opposite among Black individuals,  $\beta = -1.68$ ,  $t(1678) = -2.28$ ,  $p = .02$ . Sex

significantly interacted with limiting strategies in predicting alcohol use ( $\beta = -1.19$ ,  $t(1666) = -2.26$ ,  $p = .02$ ). Simple slopes revealed that the relation was specific more males in that low limiting strategies was associated with more alcohol use,  $\beta = 2.73$ ,  $t(1677) = 3.97$ ,  $p < .001$ .

Given the number of statistical tests conducted in the above analyses, we applied a Bonferroni correction ( $p < .002$ ) to correct for alpha inflation with an initial  $p$  value of .05. When doing so, the main effects of coping and enhancement and the interaction between coping and White ethnicity remained significant. Simple slopes tests revealed the association between coping and alcohol use was positive for White, non-Hispanic individuals, such that higher endorsement,  $\beta = 1.27$ ,  $t(1678) = 2.13$ ,  $p = .03$ , of coping strategies predicted increased alcohol use and lower endorsement,  $\beta = .01$ ,  $t(1678) = .01$ ,  $p = .99$ , did not. Of note, the interactions between coping and other ethnicities did not remain significant.

### **Alcohol-Related Consequences**

Main effects were also examined to determine predictors of alcohol-related consequences, which included the coping,  $\beta = .43$ ,  $t(1652) = 9.73$ ,  $p < .001$ , and conformity motives,  $\beta = .46$ ,  $t(1652) = 9.70$ ,  $p < .001$ . Only one race-based interaction emerged with Hispanic/Latino participants utilizing harm reduction strategies, ( $\beta = -.47$ ,  $t(1624) = -2.73$ ,  $p = .01$ ). Of these, only the two main effects remained significant after applying a Bonferroni correction ( $p < .002$ ). There was no evidence of any interactions between motives or PBS and sex on alcohol-related consequences.

## CHAPTER V

### Discussion

The primary purposes of the current study were to examine the effects of race and sex on endorsement of drinking motives, protective behavior strategies, alcohol consumption and consequences, as well as any interactions in predicting alcohol use. Similar to Linden et al. (2014), students drinking for positive motives (i.e., social or enhancement) were overall less likely to use protective strategies, especially manner of drinking. I hypothesized these positive motives would be positively associated with stopping/limiting strategies; however, they were both significantly negatively associated with limiting and manner of drinking strategies, with the enhancement motive also negatively associated with harm reduction strategies. That is, those who drank for positive motives were less likely to use strategies, possibly to avoid hampering any positive effects.

The other hypothesis predicting a positive association between negative motives and harm reduction or manner of drinking were also not supported, with the coping motive negatively associated with both limiting and manner of drinking, which mirrors the results for the social motive. While those drinking for positive motives may not want to dull increased feelings of well-being, those drinking to cope may not want to dampen the negatively reinforcing effects of alcohol on negative emotions. Interestingly, conformity was the only motive to reveal a positive association overall with the strategies, and only revealed a significant association with stopping/limiting drinking. Consistent with previous literature, these strategies may allow individuals to still fit in (i.e., playing games), while preventing overuse of a substance they may not intrinsically

enjoy (Linden et al., 2014). Understanding which motives drive an individual's substance use can provide an integral component for case conceptualizations and inform treatment decisions designed to minimize use.

Number of drinks per week was predicted by less use of all three protective behavioral strategies and higher enhancement and coping motives, similar to previous findings (Gardner, Robertson, Tatch & Walker, 2018; Martens et al., 2005). Students reporting less use of any strategy were more likely to drink higher amounts per week, likely because they engage in more activities which may result in overconsumption due to less mindful drinking. The enhancement motive has consistently predicted higher amounts of use, especially for college populations, where partying and having fun are considered part of the quintessential "college experience." This may partially explain why binge-drinking is so prevalent within this group. Conversely, coping (i.e., a negative motive) may also be relevant for college students given the higher amounts of experienced stress and histories of maladaptive coping skills, otherwise previously regulated in part by parents.

Coping and conformity predicted higher experiences of alcohol-related consequences. These two negative motives may have resulted in more consequences due to the social nature of the protective behavior strategies and style of drinking (Gardner, Robertson, Tatch & Walker, 2018). Those drinking to conform may not wish to engage in strategies which may make them appear different from the group, while those drinking to cope may be drinking alone, which eliminates the possibility of employing certain strategies (i.e., having a friend cut you off or having a designated driver). Perhaps

working on interventions incorporating peer groups could provide support and social skills, which may be absent in those drinking for coping or conformity.

The study also aimed to assess variation in race/ethnicity and sex on motive and strategy endorsement. Although the hypotheses predict results for African American and White participants, the most significant findings relate to Asians in this sample. This may be a function of the smaller sample size for this group, though results are consistent with previous studies comparing White and Asian students. LaBrie et al. (2011) found Asians were more likely to endorse coping motives and use SLD strategies, as did this study. This may be a function of cultural differences in emotion regulation and social norms surrounding drinking (LaBrie et al., 2011). Another result revealed Black/African Americans significantly reported manner of drinking strategies compared to the other racial groups, which is another strategy designed to minimize overall amount consumed. Overall, these two findings are consistent with the literature suggesting these minority groups are more likely to use strategies to temper their drinking than their White peers (Clarke et al., 2016; Madson & Zeigler-Hill, 2013). Thus, minority groups may be more receptive to interventions encouraging strategy use and may find psychoeducation more advantageous than other individuals.

Regarding differential alcohol consumption and experiences of alcohol-related consequences, Hispanic/Latino and White students reported drinking higher weekly amounts than their peers. Further, Hispanic women in particular drank more than non-Hispanic female students, contrary to previous research that found Hispanic American women less likely to drink due to culturally-based attitudes about alcohol-use and strong family influence (Lawrence, Abel, & Hall, 2010). To better understand possible

mechanisms behind this, interactions were explored between motives, strategies, ethnicity, and sex in relation to drinking behaviors and consequences.

The most notable finding was the significant interaction between the coping motive and Hispanic/Latino, White, and Black/African-American groups on alcohol consumption. Particularly, higher coping for Hispanic/Latino and White students predicted increased alcohol use; however, for Black/African-American students, higher coping endorsement predicted less alcohol use. Perhaps Black/African-American students have additional cultural factors which may serve as protective factors against increased use. For example, they may have more awareness of cultural drinking beliefs influenced by religiosity and ethnic identity (e.g., disapproval of others' drinking), which they may not want to violate for fear of losing social support (Antin et al., 2014). Interestingly, only the interaction between White race and coping remained significant after correcting for alpha inflation. The coping motive may not be as relevant to minority groups due to stronger community ties, which may provide social support that White individuals may not as easily receive. This social support would serve as a protective factor for these groups and may partially explain these racial differences. Another interaction on alcohol consumption occurred inversely between groups, with low endorsement of limiting strategies associated with higher consumption for males and less alcohol use for females. Despite low use of limiting strategies, perhaps women already drinking less do not feel inclined to employ stopping strategies.

There were no significant interactions with race or sex and motives or strategies on alcohol consumption or consequences, which may be attributable to the measure used to examine these consequences and is a limitation of this study. Future research should

measure alcohol-related consequences with a more established measure, such as the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989). The use of five items from the Hangover Symptoms Scale (HSS) may have excluded other forms of alcohol consequences, which may have yielded more significant results. While, high alcohol consumption may be problematic alone, the negative consequences associated with drinking may have more long-lasting and detrimental effects.

Another limitation of this study was the less than desirable sample size of Hispanic/Latino students. A large aim of the study was to reveal more about Latino populations and their drinking patterns, and our smaller sample may not have produced detectable effect sizes. Should a larger sample be obtained in the future, studies should focus on the mechanisms behind drinking in the Latino population and their most accepted form of protective strategy, particularly among Hispanic women. Of note, though not significant after applying a Bonferroni correction, Hispanic/Latino students using less harm reduction strategies reported a greater amount of alcohol-related consequences. Increasing awareness of these types of strategies may decrease the experience of these harmful effects within this population.

Despite the extensive focus on college student samples and alcohol use, prior research has not thoroughly examined drinking behaviors between diverse groups, especially for Hispanic or Latino students. Differential alcohol use by race and ethnicity or sex may influence alcohol prevention and relapse prevention programs specifically targeting these minority groups whose specific needs are often overlooked in treatment programs. Though most students' drinking behaviors taper off after college, for some alcohol use may become chronic and less amenable to treatment. College-based

interventions have the potential to have long-lasting effects at this critical time point, during which engagement may be higher and social support may be stronger. Early interventions have the opportunity to provide these populations with protective strategies and skills that can be applied throughout the lifespan, through whatever challenges or adversity they face.

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## APPENDIX A

### PBSS-20

#### Treloar, Martens, & McCarthy, 2015

Indicate the degree to which you engage in the following behaviors when using alcohol or 'partying:'

1 (never) to 6 (always).

1. Use a designated driver
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've had enough to drink
5. Avoid drinking games
6. Leave the bar/party at a predetermined time
7. Make sure that you go home with a friend
8. Know where your drink has been at all times
9. Stop drinking at a predetermined time
10. Drink water while drinking alcohol
11. Put extra ice in your drink
12. Avoid mixing different types of alcohol
13. Drink slowly, rather than gulp or chug
14. Avoid trying to "keep up" or "out-drink" others
15. Refuse to ride in a car with someone who has been drinking
16. Only go out with people you know and trust
17. Avoid combining alcohol with marijuana
18. Avoid "pre-gaming" (i.e., drinking before going out)
19. Make sure you drink with people who can take care of you if you drink too much
20. Eat before or during drinking

Stopping/Limiting Drinking

2. 3. 4. 6. 9. 10. 11.

Manner of Drinking

5. 12. 13. 14. 18.

Serious Harm Reduction

1. 7. 8. 15. 16. 17. 19. 20.

## APPENDIX B

### DMQ Cooper, 1994

Below 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? Please indicate your responses according to the following scale:

1 (never/almost never), 2 (some of the time), 3 (half of the time), 4 (most of the time), 5 (almost always/always)

1. To forget your worries.
2. Because your friends pressure you to drink.
3. Because it helps you enjoy a party.
4. Because it helps you when you feel depressed or nervous.
5. To be sociable.
6. To cheer up when you are in a bad mood.
7. Because you like the feeling.
8. So that others won't kid you about not drinking
9. Because it's exciting.
10. To get high.
11. Because it makes social gatherings more fun.
12. To fit in with a group you like.
13. Because it gives you a pleasant feeling.
14. Because it improves parties and celebrations.
15. Because you feel more self-confident and sure of yourself.
16. To celebrate a special occasion with friends.
17. To forget about your problems.
18. Because it's fun.
19. To be liked.
20. So you won't feel left out.

#### Enhancement

7. 9. 10. 13. 18.

#### Social

3. 5. 11. 14. 16.

#### Coping

1. 4. 6. 15. 17.

#### Conformity

2. 8. 12. 19. 20.

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*Practicum Student – Substance Abuse Counselor and Evaluator* June 2018-August 2018  
 Walker County Adult Probation (Community Supervision and Corrections Department), Huntsville, TX  
 Supervisor: Wendy Elliot, Ph.D.

- Conducting substance abuse evaluations on adults on probation in the community for misdemeanor and felony charges
- Providing substance abuse counseling for brief and full-term sessions to provide probationers with relapse prevention skills

*Research Interviewer* July 2015-April 2016  
 Violence Intervention Program, Los Angeles, CA

- Conducting qualitative research and collaborating with a diverse team to discover ways to improve the conditions for youth involved in the Los Angeles County Probation system
- Touring all seventeen of the currently operating juvenile halls and camps and creating an audit report on the conditions of each facility based on our observations
- Training in interviewing techniques and basic crisis intervention

## RESEARCH EXPERIENCE

### *Graduate Research Assistant*

August 2016-Present

Sam Houston State University, Huntsville, TX

- Working with Craig Henderson, Ph.D., and his research team
- Assisting in the preparation of a \$15,000 ERG grant entitled Discrimination and Substance Use Among Ethnic Minority Emerging Adults
- Reviewing and coding tapes for a grant funded project involving the treatment of adolescent substance abuse using multidimensional family therapy
- Assisting in data collection and analyses for studies examining the relationships between exercise and alcohol consumption among college students

### *Undergraduate Research Assistant*

August 2014-May 2015

PSY 485, Undergraduate Research

Department of Psychological Sciences, Northern Arizona University

- Working with Sumner Sydeman, Ph.D., and his research team through the department's undergraduate research course
- Conducting literature reviews pertaining to novel substances and electronic nicotine delivery systems regarding various attitudes on usage and perceived health benefits
- Assisting in IRB submission, data collection, coding, and data input into SPSS
- Participating in journal club and presenting summaries of existing research and their implications for future research

## POSTER PRESENTATIONS

Damnjanovic, T., Miller, R. S., **Ryan, L.**, Lawrence, J. M., & Waymire, K. (2018, March). *Can death qualification reduce bias in sentencing decisions? Exploring factors impacting capital sentencing*. Paper presented at the American Psychology-Law Society Annual Conference, Memphis, TN.

**Ryan, L.**, Long, T., & Henderson, C. (2017, November). *Associations of daily positive and negative affect with daily alcohol use and exercise in an undergraduate sample*. Poster presented at the Texas Psychological Association Annual Convention, Houston, TX.

Sydeman, S., Wilkins, J., **Ryan, L.**, Padilla, C., Sisson, M., Valente, M., Gonzalez, J., & Phoenix, K. (2017, April). *Young adult abuse of prescription medications: Pain killers, stimulants, and sedatives/anxiolytics*. Poster presented at the Rocky Mountain Psychological Association Annual Convention, Salt Lake City, UT.

- Jessen, A., Valente, M. J., Russell, S. C., **Ryan, L. J.**, Sisson, M. L., Wilkins, J. W., & Sydeman, S. J. (2017, April). *Young adult knowledge, susceptibility and use of vaporized alcohol*. Poster presented at the Rocky Mountain Psychological Association Annual Convention, Salt Lake City, UT.
- Schiafo, M., Ball, E., Waymire, K., **Ryan, L.**, & Henderson, C. (2017, March). *Explaining the relation between aggression and delinquency: Individual and peer factors*. Poster presented at the American Psychology-Law Society Annual Conference, Seattle, WA.
- Sydeman, S., Russell, S., Hanlon, A., Wilkins, J., Sisson, M., Gonzalez, J., **Ryan, L.**, & Jessen, A. (2015, May). *Electronic cigarettes: Knowledge, attitudes, and smoking behaviors in young adults*. Poster presented at the Western Psychological Association Convention, Las Vegas, NV.
- Ryan, L.**, Hanlon, A., Jessen, A., & Sydeman, S. (2015, April). *A quantitative review of published research on electronic nicotine delivery systems (ENDS): An analysis of a rapidly expanding literature*. Poster presented at the Undergraduate Symposium at Northern Arizona University, Flagstaff, AZ.

## TEACHING EXPERIENCE

**Teaching Assistant** 2017-2018

Department of Psychology & Philosophy, San Houston State University

- Teaching a section of Introduction to Psychology
- Creating lesson plans and lecturing on an overview of the field of psychology
- Designing and grading exams testing practical application of concepts

**Tutor** 2013-2015

South Student Learning Center, Northern Arizona University

- Teaching students test taking, note taking, and study skills
- Reviewing concepts and clarifying key ideas for 18 different courses
- Leading exam reviews for introductory criminal justice, psychology & sociology classes
- Advanced Certified Tutor, Level II by the College Reading & Learning Association

**Peer Mentor** 2014

Department of Criminology & Criminal Justice, Northern Arizona University

- Mentoring twelve students from an introductory criminal justice class
- Facilitating group discussions and leading exam review sessions
- Creating group activities designed to teach about the justice system

## SUPERVISORY EXPERIENCE

**Peer Supervisor** Summer 2018

Supervisor: Mary Alice Conroy, Ph.D.

Department of Psychology & Philosophy, San Houston State University

- Facilitating supervision sessions of first-year doctoral students

- Providing feedback on foundational counseling skills, serving as a mock therapy client, and reviewing mock therapy sessions with supervisee

### **PROFESSIONAL MEMBERSHIPS**

American Psychology Association, Student Affiliate  
 American Psychology – Law Society, Student Affiliate  
 Asian American Psychological Association, Student Affiliate  
 Texas Psychological Association, Student Affiliate

### **HONORS, AWARDS, & MEMBERSHIPS**

Graduate Organization Leadership Scholarship	2017-2018
Graduate Student Psychology Organization, President (2017-2018)	2016-Present
Student Travel Award, Department of Psychological Sciences	2015
Student Travel Award, College of Social and Behavioral Sciences	2015
Student Travel Award, University College and the Office of the Provost, NAU	2015
Tutor of the Year, South Student Learning Center, NAU	2015
Psi Chi, Northern Arizona University	2014-2015
Outstanding Student, Department of Criminology and Criminal Justice	2014