Chapter 2

ALCOHOL OUTCOME EXPECTANCIES AND CONSEQUENCES: DO PEOPLE THINK THEMSELVES INTO AND OUT OF CONSEQUENCES?

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ABSTRACT

Alcohol consequences were originally assumed to be only a function of the amount of alcohol consumed. However, the balanced placebo design drinking studies of Marlatt and colleagues demonstrated placebo effects when no alcohol had been consumed. Beliefs about expected outcomes associated with consuming alcohol have been referred to as "alcohol outcome expectancies". Blume and colleagues later expanded upon the foundational work when they found that negative consequences were significantly and independently associated with outcome expectancies after controlling for alcohol consumption in a cross-sectional study, leading the authors to hypothesize that some negative consequences may be a function of alcohol outcome expectancies and independent of the amount of alcohol consumed. The current study replicated and extended those findings longitudinally, demonstrating that outcome expectancies significantly predicted alcohol related consequences three months later, after controlling for consumption ($\Delta R2 = .07$; Full Model $R2 = .48$) or number of binge drinking events ($\Delta R2 = .08$; Full Model $R2 = .44$), as well as age and gender. Interventions on positive expectancies may reduce the harmful consequences of drinking among university students who may be ambivalent about reducing the amount of alcohol they consume.

Keywords: addictive behaviors, university students, drinking consequences, expectancies, harm reduction.

1. INTRODUCTION

The association between alcohol misuse and alcohol-related consequences has been studied for a long time by addiction scientists (e.g., National Institute on Alcohol Abuse and Alcoholism, 1971, 2000). However, researchers have often been puzzled by the inconsistent or relatively modest relationships sometimes found between the amount of alcohol consumed and the number of consequences experienced (e.g., Kuendig et al., 2008; Rehm & Gmel, 1999). Because of the inconsistent findings and generally modest relationships between consumption and consequences, researchers became increasingly interested in how people's beliefs about drinking may be associated with subsequent drinking outcomes.

The famous balanced placebo design study by Marlatt and colleagues (1973) illustrated that beliefs are potent predictors of drinking behavior independent of actual amount of alcohol consumed. In this study, participants who were told they were consuming tonic water but who were in fact drinking significant amounts of alcohol acted sober, whereas participants who were told they had drank alcohol to intoxication, yet had not consumed anything stronger than tonic water, acted intoxicated. The study results opened the door for investigating how beliefs about drinking behavior predict subsequent outcomes, including drinking-related consequences.

2. BACKGROUND

2.1. Positive outcome expectancies

The next steps in this area of research were to examine how different kinds of beliefs may be associated with subsequent drinking behavior. Expectancies were a specific category of beliefs that was examined extensively. Alcohol outcome expectancies, for example, are beliefs drinkers have about what will happen as a result of drinking alcohol. The expected outcomes

can be either positive or negative. An extensive body of research has analyzed the relationships of alcohol expectancies with subsequent alcohol consumption and found that expectancies, especially positive expectancies, tend to be significant predictors of subsequent drinking (Blume, Schmaling, & Marlatt, 2003; Brown, Goldman, & Christiansen, 1985; Jones, Corbin, & Fromme, 2001).

Blume and colleagues investigated the relationship of positive expectancies with drinking related consequences among a sample of university students, and found that positive expectancies accounted for significant amounts of variance of alcohol-related consequences independent of those accounted for by consumption (Blume, Lostutter, Schmaling, & Marlatt, 2003). However, the study was limited by its cross-sectional design. The goal of the present study is to re-examine and extend the results of that particular study by use of a longitudinal design.

2.2. Concerns about undergraduate student drinking behavior

The drinking behavior of university students has been of great concern. University student drinking has been associated with significant negative consequences including academic problems, crime, aggression, sexual abuse, injury, and death and has been studied and documented in countless studies for many years, (Engs, Diebold, & Hanson, 1996; Hingson, Heeren, Winter, & Wechsler, 2005; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; Presley, Meilman, & Cashin, 1996; Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002). Most of the studies on university student drinking have utilized samples that mostly included White students. Very little is known, for example, about student drinking behavior among non-White American university students, even though the proportion of the population in the US is becoming increasingly non-White. As the demographics of the US change, more non-white university students will be seeking admission to the university. It will be important to understand the drinking behavior of these groups of students to effectively address drinking behavior on the campuses of the future.

The present study offers two advantages over the Blume and colleagues (2003) study. Firstly, the study is longitudinal and allows for the investigation of hypothesized relationships over the course of a three months period. Secondly, the study includes a sample of Mexican American university students. Very little research has been conducted with this particular university student group, even though Mexican Americans are the fastest growing ethnic group in the US (Ennis, Ríos-Vargas, & Albert, 2011). In the present study, it is hypothesized that similar to the results of the Blume and colleagues (2003) study, positive alcohol expectancies will be positively associated with and account for significant amounts of observed variance of alcohol-related consequences independent of that accounted for by alcohol consumption.

3. METHODS

3.1. Participants

Study participants were recruited from the Introduction to Psychology course on the campus. Participants were included in the study if they expressed interest and reported drinking alcohol in the last week. Study participants at baseline (n = 96) had a mean age of 20.31 years and were predominately male (n = 57; 59%). Attrition of 12 participants was observed, yielding a study retention rate of 87.5% at three months follow-up. Analyses found no evidence of statistically significant differential attrition based upon age, gender, baseline consumption patterns, or positive alcohol expectancies scores. Study participants who completed three months follow-up (n = 84) had a mean age of 20.36 years and were predominately male (n = 48; 57.1%).

3.2. Measures

Demographic variables including age and gender were collected during the baseline assessment. Furthermore, the Alcohol Expectancy Questionnaire, a widely utilized assessment of positive alcohol expectancies, was administered to participants at baseline (AEQ; Brown et al., 1985). The Global Positive Changes (GPC) scale score collected at baseline assessment was

used in subsequent analyses ($\alpha = .88$). Alcohol consumption and pattern of use were determined by means of the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985), an assessment including questions and a retrospective drinking diary calendar chart to assess university student drinking behavior. The DDQ was completed at baseline and follow-up. For the purpose of this study, total numbers of binge drinking events and total consumption for the period between the baseline and follow-up assessments were determined from data collected via the DDQ at the three-month follow-up and used for subsequent analyses. Binge drinking was defined using the Wechsler criteria (Wechsler & Nelson, 2001) of five standard drinks per drinking event for men and four standard drinks per drinking event for women. The Rutgers Alcohol Problem Index (RAPI), a well-known 23-item measure to assess consequences of drinking among young adults including university students (White & Labouvie, 1989), was also administered at three-month follow-up. A total consequences score was used in subsequent analyses ($\alpha = .89$).

3.3. Procedure

Firstly, potential participants were recruited by means of advertisement through the Introduction to Psychology Subject Pool. Students who regarded themselves as "regular drinkers" were included in the study but excluded if they were graduating prior to the end of the follow-up period. Students who expressed interest in the study were invited to meet with research assistants of the study and completed the questionnaire packet in person. The participants provided demographic data first and then completed AEQ and DDQ (in that order). Ten weeks after baseline, research assistants contacted the participants again and scheduled a three-month follow-up. During the follow-up session, participants completed the DDQ and RAPI and were compensated with a $20 gift card of the university bookstore and thanked for participating in the study. The Institutional Review Board of the university approved this study.

3.4. Results

The aggregated study sample engaged in substantial alcohol use with a mean of 3.1 binge drinking events during the two weeks preceding follow-up and a mean of 413.4 standard drinks consumed over the 90-day period of the study. The mean total score of the RAPI was 20.33. A square root transformation was conducted prior to subsequent analyses to normalize the distribution of standard drinks consumed by the study sample.

Multiple regression analyses were used to test the study hypotheses concerning positive outcome expectancies, by firstly specifically examining the relationship of positive expectancies with consequences in the context of binge drinking events, and secondly examining the relationship of positive expectancies with consequences in the context of total standard drinks consumed. In the first regression analysis, age, gender, and total number of binge drinking events for the two weeks immediately preceding follow-up were entered, followed by baseline AEQ global positive expectancy scores, to predict total RAPI scores at three-month follow-up. The full regression model was found to be significant ($R^2 = .44$; $p < .001$; see Table 1), with all predictor variables found to be significantly associated with total RAPI scores. Specific to the aims of this study, as predicted the total global positive expectancy scores accounted for significant amounts of the observed variance of alcohol related consequences ($\Delta R^2 = .08$) at three-month follow-up.

Table 1. Binge drinking events and positive expectancies predicting RAPI scores at three-month follow-up (N = 81).

Predictor variable(s):	ΔR^2	Betas	t	95% C. I.
Age		.41	4.65**	1.186 to 2.964
Gender		-.24	-2.75*	-12.908 to -2.059
Binge drinking events		.21	2.40*	.322 to 3.432
AEQ Global Positive Scores	.08	.29	3.29**	.128 to .520

Notes: $R^2 = .44$; $F_{(4, 76)} = 14.89$; $p < .001$ for the full model. Betas, t values, and 95% confidence intervals listed are for the full model. * $p < .05$; ** $p < .01$

In the second regression analysis, age, gender, and square root transformed scores of total standard drinks of alcohol consumed for the 90-day period during the study were entered, followed by baseline AEQ global positive expectancy scores, to predict total RAPI scores at three-month follow-up. The full regression model was found to be significant ($R^2 = .48$; $p < .001$; see Table 2), with all predictor variables being significantly associated with total RAPI scores. Congruent with the first analysis, total global positive expectancy scores again accounted for significant amounts of the observed variance of alcohol related consequences ($\Delta R^2 = .07$) at three-month follow-up.

Table 2. Three months alcohol consumption and total AEQ predicting RAPI scores
at three-month follow-up (N = 84)

Predictor Variable(s):	ΔR^2	Betas	t	95% C. I.
Age		.42	5.01**	1.299 to 3.008
Gender		-.19	-2.13*	-11.581 to -0.387
Total drinks last three months		.24	2.70**	.140 to .927
AEQ Global Positive Scores	.07	.28	3.35**	.130 to .511

Notes: Square root transformation of total drinks score used in analysis. $R^2 = .48$; $F (4, 79) = 18.09$; $p < .001$ for the full model. Betas, t values, and 95% confidence intervals listed are for the full model.
* $p < .05$; ** $p < .01$

4. FUTURE RESEARCH DIRECTIONS

The logical next steps in this area of inquiry would be to conduct future studies at universities outside the US to generalize study findings. In addition, another logical next step is to use these findings for the development of harm reduction interventions designed to reduce consequences without necessarily expecting consumption reduction. Presumably such interventions would involve challenging alcohol expectancies without an emphasis on changes in reduction to examine if the intervention would be associated with significant reductions in alcohol related consequences over time among university students.

5. DISCUSSION AND CONCLUSIONS

The results supported our study hypotheses: positive alcohol expectancies as assessed by the global positive expectancies scale of the AEQ were found to be significantly associated with total number of consequences as assessed by RAPI after controlling for age, gender, and alcohol use among Mexican American university students. The hypothesized relationship was supported by results from two different regression models controlling for drinking in two different ways, the first controlling for total number of proximal binge drinking events and the second controlling for total number of standard drinks consumed during the study. In the model controlling for binge drinking events, baseline positive outcome expectancies accounted for 8% of the observed variance in alcohol related consequences at three month follow-up, and in the model controlling for proximal number of binge drinking events, positive outcome expectancies accounted for 7% of the observed variance in alcohol related consequences at three month follow-up.

The study findings are consistent with an earlier study that found that positive outcome expectancies was associated with consequences, independently of alcohol consumption (Blume et al., 2003). However, in the current study, with its longitudinal design, it emerged that positive outcome expectancies for alcohol at baseline were a significant predictor of subsequent number of alcohol related consequences experienced by participants independent of total consumption of alcohol or proximal number of binge drinking events during the study. As was originally suggested in the discussion of the well-known balanced placebo drinking study (Marlatt et al., 1973), alcohol use behavior seems to be a function of not only the level of alcohol use but also of the beliefs held by alcohol consumers, which can be independent of the level of alcohol being

consumed. In the present study and its predecessor (Blume et al., 2003), positive outcome expectancies concerning alcohol use seem to be accounting for consequences otherwise unaccounted for by the level of alcohol consumption.

Although not specifically the focus of the study, it is also worth mentioning that the control variables of age, gender, and alcohol use behavior were all significant predictors of both regression models (Tables 1 and 2), with similar relationships found in both examinations: older age, male gender, and greater drinking (either proximal numbers of binge drinking events -Table 1- or total consumption -Table 2) were significantly associated with greater numbers of consequences. The findings concerning gender and levels of drinking are not particularly surprising. However, at first glance, the significant finding concerning age may be considered unusual since younger age is often considered a risk for greater consequences among sample of White university students, usually associated with maturing out behavior (e.g., Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001). However, the particular finding in the present sample that older age and being male were significantly associated with greater alcohol related consequences, independent of level of alcohol consumption, seems congruent with other research that has found that the maturing out process (students naturally reducing their consumption as they mature) commonly seen among many young adults may not occur with Mexican American young male adults (Caetano & Herd, 1988).

From a harm reduction perspective, the results are quite interesting since they provide additional evidence that consequences attributed to alcohol use may in some instances be the function of positive alcohol expectancies and independent of amount of alcohol consumed. Theoretically speaking, interventions on alcohol expectancies could potentially be used to target alcohol related consequences, even among those students who may be unwilling or unable to change consumption patterns, providing another possible method to reduce risks to students. Given that many students would have limited motivation to change as pre-contemplators or contemplators as defined by the Transtheoretical Stages of Change Model (e.g., Prochaska, DiClemente, & Norcross, 1992), and not yet considering reductions in drinking, it would be helpful to determine additional harm reduction approaches to help these students. Although speculative, the newly proposed hypothesis is worthy of further analysis given the results of this and other similar studies. In addition, the significant association of positive outcome expectancies with consequences accounted for relatively modest amounts of variance in consequences among the students, and therefore it is unknown if an intervention on expectancies would result in clinically significant reductions in consequences. However, it could be argued that any reduction could be potentially helpful for students, especially male students who may be at risk for not maturing out of the risky behavior.

The present study was novel in the sense that it examined the relationships over time and also included a Mexican American university student sample, a population whose drinking behavior has not been adequately examined. However, the study is not without its limits. Firstly, association with the study was voluntary and the sample size was relatively modest, therefore its design may prevent broad generalization of results to all university students. In addition, the recruitment of regular drinkers for the study means that the results likely only generalize to those university students who drink routinely. The results suggest that the study examined a rather heavy drinking sample of students, given descriptive findings concerning the constructs of interest, and although unintended, this particular bias may have been the result of the decision to exclude those students who did not consider themselves as regular drinkers. However, since regular drinkers in colleges and universities, especially those who engage in binge drinking, are those who may warrant the most concern for experiencing the harmful consequences of alcohol use, one could argue that the study results will likely generalize to those students considered at greatest risk.

There is a popular saying in American culture that "doing is believing", meaning that people often act consistently with how they believe. However, with regard to addictive behaviors, a more appropriate interpretation of what has been observed is that "believing is doing". The preponderance of research evidence concerning addictive behaviors suggests that what people believe about alcohol use may contribute to what they do, including the consequences they experience. Since beliefs are modifiable, this is generally good news for

clients and practitioners alike who have the ability to work together to change beliefs in order to reduce the risks of alcohol abuse.

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KEY TERMS & DEFINITIONS

Binge: peak-drinking events that are strongly linked to high risk for aversive consequences. The definition for binge events often varies by culture.

Harm reduction: intervention strategies with the goal to make substance use less risky for those who choose to drink or use. Although harm reduction does not exclude abstinence goals, it does not necessarily expect them either.

Outcome expectancies: beliefs that people hold about expected outcomes from engaging in a particular behavior, in this instance, substance use.

Transtheoretical stages of Change Model: developed by Professors James Prochaska and Carlo DiClemente, a model for understanding the typical process of behavior change and for assessing where a person may be in the change process. The model is often used to match interventions with client motivation to change.

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