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## Journal of Ethnicity in Substance Abuse

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t792304000>

### Alcohol Expectancies as a Mediator of the Relation Between Impulsivity and Alcohol Consumption in Asian Americans

Susan C. Han <sup>a</sup>; Jerome L. Short <sup>a</sup>

<sup>a</sup> George Mason University, Fairfax, Virginia

Online Publication Date: 01 April 2009

**To cite this Article** Han, Susan C. and Short, Jerome L.(2009)'Alcohol Expectancies as a Mediator of the Relation Between Impulsivity and Alcohol Consumption in Asian Americans',*Journal of Ethnicity in Substance Abuse*,8:2,178 — 200

**To link to this Article:** DOI: 10.1080/15332640902897115

**URL:** <http://dx.doi.org/10.1080/15332640902897115>

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## **Alcohol Expectancies as a Mediator of the Relation Between Impulsivity and Alcohol Consumption in Asian Americans**

SUSAN C. HAN and JEROME L. SHORT

*George Mason University, Fairfax, Virginia*

*Past research on alcohol consumption in minority groups has focused on examining differences in the level of drinking. However, research has yet to fully examine racial differences in the factors that might mediate alcohol consumption. The current study sought to test whether alcohol expectancies mediated the relation of impulsivity on alcohol consumption for an Asian American sample. Participants included 57 Asian American and 70 Caucasian undergraduate students. Results showed that positive alcohol expectancies fully mediated the pathway between dimensions of impulsivity and alcohol use for Asian Americans. For Caucasian participants, only impulsivity predicted alcohol use. Future research on alcohol use and abuse by Asian Americans should consider the role of alcohol expectancies in different social contexts.*

**KEYWORDS** *alcohol consumption, alcohol expectancies, Asian Americans*

### INTRODUCTION

It is estimated that approximately 66% to 90% of adults in the United States have consumed alcohol at some point in their lives (American Psychiatric Association, 1994; Johnston, O'Malley, & Bachman, 1993) and 85% of college students drink regularly (Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee, 1998; Wechsler, Lee, Kuo, & Lee, 2000). Differential rates of alcohol consumption have been found within many subgroups, according to gender, family history of alcoholism, and peer socialization. Research has consistently shown that males drink more alcohol (Lex, 1995; Lo, 1996) and are at greater

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Address correspondence to Susan C. Han, MA, Department of Psychology 3FS, George Mason University, Fairfax, VA 22030-4444. E-mail: Shan8@gmu.edu

risk for developing alcohol-related problems than females (Perkins, 1992). It has also been found that individuals whose parents were alcoholics displayed higher rates of alcohol consumption and increased risk for problems with alcohol than individuals who did not have a family history of alcoholism (Mann, Chassin, & Sher, 1987; Sher, Walitzer, Wood, & Brent, 1991). In addition, age is related to alcohol consumption and college students represent a population that is at high risk for alcohol problems (Lundahl, David, Adesso, & Lukas, 1997). National survey statistics show that problematic use of alcohol is highest for people aged 18 to 24 years (National Institute on Alcohol Abuse and Alcoholism, 2002) and approximately 22% of college students meet DSM-IV criteria for current alcohol abuse or dependence (Substance Abuse and Mental Health Services Administration, 2003).

Gender, age, and family history of alcoholism all contribute to the short-term decision to drink alcohol, but also have long-term consequences because current drinking patterns can lead to future alcohol abuse or dependence. Because approximately 60% of males and 30% of females experience an adverse life event from alcohol consumption (American Psychiatric Association, 1994), it is important to study the variables that can determine current alcohol use patterns and may predict future problematic use.

Cultural processes involved in alcohol use and abuse have received limited attention in research. Past research that examined racial differences in consumption level has found that, in general, Caucasians drink more overall and report heavy drinking more often than non-Caucasians (Crowley, 1991; Deas, Grimes, Randall, & May, 2001; Keefe & Newcomb, 1996). Asian Americans tend to drink less than Caucasians, even when taking into account age (Akutsu, Sue, Zane, & Nakamura, 1989; Zane & Sasao, 1992). In addition, not only is overall quantity of alcohol consumption less for Asian Americans than for Caucasians, but prevalence rates for alcohol abuse and dependence are also the lowest in Asian countries (American Psychiatric Association, 1994) and there are relatively few alcohol problems overall in the Asian American community (Yu & Liu, 1986/1987).

When examining the factors that lead to drinking, Sue (1987) has found that Asian Americans tend to primarily consume alcohol to reduce stress and tension in their lives. In addition, O'Hare (1995) found that while Asians and Caucasians both tend to drink in similar environments (i.e., in small social groups), they differ in the level and amount of consumption in those social situations. Researchers have found that Caucasians tend to binge drink five times more often and experience twice as many alcohol-related problems compared to Asian Americans (Kitano & Chi, 1987; O'Hare, 1995). However, further research is needed to clarify the differences in quantity, frequency, and variability in alcohol consumption and racial differences in the factors that lead to drinking.

Therefore, the current study sought to investigate the comparative effects of two alcohol-related risk factors that contribute to alcohol consumption: impulsivity and alcohol expectancies. Undergraduate students were chosen as participants because this sample constitutes the age group most

vulnerable to current and future problems with alcohol (Lundahl et al., 1997). Asian Americans were compared with Caucasians on the level and predictors of alcohol consumption. Also, alcohol expectancies were examined as mediators of the relation of impulsivity to alcohol use. The model was applied to both Asian Americans and Caucasians to investigate cultural differences in the prediction of alcohol consumption.

## Background

Decades of research on alcohol consumption and alcohol disorders have focused on the biological and pharmacological changes that occur from drinking and measure blood alcohol level, gait, posture, balance, motor coordination, and decision making. The use of placebo experimental designs, in which participants drink water or tonic but believe they have consumed alcohol, have increased knowledge regarding the comprehensive effects of alcohol. These types of studies have shown that, although the pharmacological effects of ethanol can explain most of the cognitive and motor changes, they cannot fully account for the social changes in behavior (Williams & Clark, 1998). For example, it is difficult to predict why individuals similar in age, gender, and genetic history behave differently and report different subjective experiences after consuming similar amounts of alcohol. In addition, alcohol consumption does not fully account for the development of later alcohol use disorders (i.e., alcohol abuse or dependence). Therefore, researchers have turned toward studying the reinforcement properties of alcohol to explain drinking behavior. Taken from behavioral research, the principles of positive reinforcement predict that there may be an increase in the probability of a response (e.g., drinking). Negative reinforcement from the removal of an aversive stimulus may also decrease the target behavior (e.g., drinking). Thus, one method of studying alcohol use assesses the positive and negative reinforcement properties of alcohol consumption.

## Alcohol Expectancies

Alcohol expectancies can be defined as “the beliefs that individuals hold about the effects of alcohol on their behavior, moods and emotions” (Leigh & Stacy, 1991, p. 147). Many people drink and believe that they will subsequently experience certain effects; research on alcohol expectancies has sought to determine the factors that influence those anticipated effects. In this cognitive and behavioral model of alcohol use, differences in behavior after drinking are attributed to individual differences in the expected reinforcement properties of alcohol. Cognitions regarding both the positive and negative consequences of drinking have been shown to influence current drinking patterns and lead to future alcohol-related problems and alcohol dependence (Christiansen, Smith, Roehling, & Goldman, 1989; Dunn & Goldman, 1996).

As expected, ratings of expected positive consequences have been shown to be related to increased alcohol consumption (Reese, Chassin, & Molina, 1994; Sher, Wood, Wood, & Raskin, 1996), whereas negative expectations are associated with decreased levels of alcohol consumption (Fromm, Stroot, & Kaplan, 1993; Stacy, Widaman, & Marlatt, 1990; Sher et al., 1996).

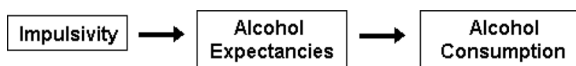
In addition, several studies have shown that the anticipated feelings of relaxation and tension reduction are significant predictors of later problematic drinking and the development of alcohol dependence (Dunn & Goldman, 1996; Goldman, Darkes, & Del Boca, 1999). Sue (1987) found that reduction of stress and tension is one of the main reasons Asians consume alcohol. Consequently, Asians and Asian Americans may be at great risk for developing alcohol problems in the future. As such, the current study seeks not only to replicate past research on relaxation and tension reduction expectancies, but also to investigate other alcohol expectancies that may contribute to alcohol consumption for Asian Americans.

### Impulsivity

Another important factor to consider in determining predictors of alcohol use is the effect of an individual's personality on his or her decision to drink. In particular, one aspect of personality—impulsivity—has been shown to be related to alcohol consumption. Impulsivity is a broad category of personality traits, which includes “acting without thinking or regard to consequences and engaging in risky behavior” (Whiteside & Lynam, 2003, p. 210). Characteristics of an impulsive personality have also been called “novelty seeking,” “behavioral under-control,” or “sensation seeking” in various research studies. Anthropological studies have documented the relationship between alcohol and impulsivity or disinhibition, but considered disinhibition a consequence of drinking behavior, such as becoming less sexually inhibited or more socially aggressive (e.g., Brain, 1986; Hanson, 1995; Heath, 1984). However, it is also important to understand the role of disinhibition as a risk factor leading to problematic alcohol consumption.

Impulsive behaviors have been shown to contribute to problematic alcohol use and binge drinking (Shedler & Block, 1990; Simons, 2003). This occurs because of a lack of premeditation or foresight and the need for high stimulation, which results from individuals' inability to inhibit their behaviors and their desire to work toward short-term goals (Colder & Chassin, 1997; Johnson & Cropsey, 2000). Impulsive individuals focus on immediate rewards, ignoring or not considering the negative consequences of alcohol consumption (Kahler, Read, Wood, & Palfai, 2003; Patterson & Newman, 1993).

In a study on the individual differences in drinking patterns over a 1-year period, Del Boca, Darkes, Greenbaum, and Goldman (2004) found that gender, alcohol expectancies, and personality were all significant predictors of variability in drinking. Importantly, impulsivity was mediated by alcohol



**FIGURE 1** Hypothesized model.

expectancies in determining alcohol consumption for a predominantly Caucasian sample. Therefore, although impulsivity is related to drinking, the mechanism by which it has its effect is through the mediator of alcohol expectancies (see also McCarthy, Brown, Carr, & Wall, 2001; McCarthy, Wall, Brown, & Carr, 2000; Schuckit, 1998). Since this mediated model had not yet been tested in Asian American populations, the current research seeks to do so.

### Current Study

The current study examined whether positive and negative alcohol expectancies and dimensions of impulsivity predicted alcohol consumption and then whether alcohol expectancies mediated the relation of impulsivity to alcohol consumption. Based on past research, it was expected that there would be racial differences between Asian Americans and Caucasians for each of these variables. There were three main hypotheses:

1. Asian Americans would experience less positive and less negative alcohol expectancies, lower levels on all dimensions of impulsivity, and lower alcohol consumption than Caucasians.
2. Positive and negative alcohol expectancies and the four dimensions of impulsivity would be related to alcohol consumption for both Asian Americans and Caucasians.
3. Positive and negative alcohol expectancies would mediate the relationship between the dimensions of impulsivity and alcohol consumption for both Asian Americans and Caucasians (see the hypothesized model in Figure 1).

## METHODS

### Participants

One hundred twenty-seven students from a public Eastern university were included in the current study (57 Asian Americans and 70 Caucasians). Participants were a part of a larger study that included 30 additional students of non-Asian American and non-Caucasian descent. Students were recruited through an Experimentrix website, an online source for recruitment, and students received one research credit for their participation. An a priori power analysis was conducted to reduce the chances of a Type II error for the analyses. According to Cohen (1992), a minimum of 64 participants per

group is needed to ensure that a power level of .80 is obtained for medium effect sizes at an alpha level of .05 for an analysis of variance comparison between groups. This study had a slightly lower sample of Asian Americans than Cohen's recommendation for detecting a medium effect size, but more than enough for detecting a large effect size (for which the recommended sample size is 26 participants). This study also had a large enough sample of Caucasians to detect a medium effect size.

Overall, the sample was predominantly young (mean = 20.62 years; standard deviation [SD] = 5.02 years) and female (64.6% female; 35.4% male). In addition, most of the participants were in their first (42.5%) or second (26.8%) year of undergraduate study in college. Korean-American participants were the single largest Asian American group (47.4% Korean, 17.5% Vietnamese, 10.5% Chinese, 7.0% Filipino, 1.8% Taiwanese, and 1.8% Japanese). In the current study, only students who currently consumed alcohol were included because it has previously been shown when assessing alcohol expectancies that alcohol abstainers in the sample tend to confound results (Brown, Goldman, Inn, & Anderson, 1980).

## Materials/Instruments

### THE QUANTITY-FREQUENCY-VARIABILITY (QFV) INDEX

The QFV Index (Cahalan, Cisin, & Crossley, 1985) is a self-reported measure consisting of seven questions to assess an individual's alcohol consumption patterns. Items assess variability in type (beer, wine, or whiskey/liquor), quantity (1–2, 3–4, or  $\geq 5$ ), and frequency (e.g., once a year, once a month, 1 to 2 times a week, nearly every day, or three or more times a day) of alcohol consumed. Responses to this questionnaire were summed into a total QFV Index score that described an individual's alcohol consumption (Cahalan et al., 1985).

Although other research studies on alcohol consumption focus on quantity and frequency of drinking, the QFV Index differs from other measures in that it also assesses the type of alcohol consumed. Because of the differing alcoholic content of various drinks (e.g., hard liquor versus wine coolers or "spritizers"), the QFV Index provides valuable additional information in considering an individual's level of alcohol consumption. The QFV Index has been shown to be reliable and valid (Cahalan et al., 1985). In the current study, the total QFV Index score had a Chronbach's alpha value of .79.

### THE ALCOHOL EXPECTANCY QUESTIONNAIRE (AEQ)

Brown et al. (1980) designed a self-report measure, the AEQ, to assess positive and negative alcohol expectancies. It was empirically derived in a bottom-up format based on interviews from a national survey of individuals in clinical and non-clinical populations in response to the question "What effect does alcohol have on you?" Survey respondents varied in alcohol consumption levels,

ranging from abstainers to alcoholics. The AEQ is “one of the first and most widely used measures” of alcohol expectancies (Vik, Carrello, & Nathan, 1999, p. 294) and has both adult and adolescent versions to predict future alcohol consumption, frequency of drinking problems, and onset of alcohol use disorders.

Leigh and Stacy (1993) modified the AEQ to form a shorter version that consists of 34 items. Confirmatory factor analyses showed that the shorter version was a valid and reliable measure that tapped the same constructs as the original long version. The shorter version of the AEQ used in the current study consists of 34 questions based on a 6-point Likert scale (1 = “No Chance” to 6 = “Certain To Happen”). The items are summed into two dimensions of positive and negative dimensions measuring:

Positive:

- Social Expectancies (6 items) (e.g., “I am more accepted socially,” “It is easier for me to socialize”);
- Fun Expectancies (6 items) (e.g., “I have a good time,” “It is fun”);
- Sex Expectancies (4 items) (e.g., “I become more sexually active”); and,
- Negative Reinforcement/Tension Reduction Expectancies (3 items) (e.g., “It takes away my negative moods and feelings”).

Negative:

- Social Expectancies (3 items) (e.g., “I get into fights”);
- Emotional Expectancies (3 items) (e.g., “I feel ashamed of myself”);
- Physical Expectancies (4 items) (e.g., “I experience unpleasant physical effects”); and
- Cognitive/Performance Expectancies (5 items) (e.g., “I can’t concentrate,” “I become clumsy or uncoordinated”). (Leigh & Stacy, 1993)

Chronbach’s alpha values for the positive and negative dimensions have been shown to be high (.94 and .88, respectively) in past research (Leigh & Stacy, 1993). Content, criterion, and construct validity have also been shown with powerful predictive validity (Goldman, Greenbaum, & Darkes, 1997). In particular, several studies have shown that negative alcohol expectancies were a significant predictor of later problematic drinking and the development of alcohol dependence (Christiansen et al., 1989; Dunn, & Goldman, 1996). Research has demonstrated convergent and divergent validity with other alcohol questionnaires, such as the Drinking Expectancy Questionnaire (DEQ) and the Alcohol Effects Scale (AES) (Sher et al., 1996; Wall, Thrussell, & Lalonde, 2003; Williams & Clark, 1998). In the current study, the dimensions of the AEQ had Chronbach’s alpha values of .95 for positive expectancies and .88 for negative expectancies.

#### THE IMPULSIVE BEHAVIOR SCALE (IBS)

As stated previously, inconsistent operational definitions of impulsivity have led to conflicting results regarding the role of impulsivity in alcohol use in

past research studies. There are many different theories regarding impulsivity and personality as well as many different measures to assess these constructs. Therefore, Whiteside and Lynam (2001) conducted a factor analysis of many different impulsivity scales most often cited and used in research, including the Revised NEO-Personality Inventory (Costa & McCrae, 1985, 1992), Zuckerman's Sensation Seeking Scale (Zuckerman, 1994), and the EASI-III Impulsivity Scales (Buss & Plomin, 1975). Based on the results of the factor analysis, the IBS of personality was derived to measure four dimensions of impulsivity:

- Urgency: "the tendency to experience and act on strong impulses, frequently under conditions of negative affect (12 items, e.g., I have trouble resisting my cravings);"
- (lack of) Premeditation: "the inability to think and reflect on the consequences of an act before engaging in that act (11 items, e.g., I usually make up my mind through careful reasoning);"
- (lack of) Perseverance: "the inability to remain focused on a task that may be boring or difficult (10 items, e.g., I tend to give up easily);" and
- Sensation seeking: "the (1) tendency to enjoy and pursue activities that are exciting and (2) an openness to trying new experience that may or may not be dangerous (12 items, e.g., I'll try anything once)." (Whiteside & Lynam, 2003, p. 211)

The IBS consists of 45 questions and the four dimensions were shown to have alpha reliabilities of .87, .89, .85, and .83, respectively, in past research (Whiteside & Lynam, 2001). In the current study, the Chronbach's alpha values were .81, .87, .84, and .87 for the four dimensions, respectively.

## Procedure

On arrival at the laboratory, participants were provided with a written description of the study and informed consent was obtained. Then, participants completed paper copies of the AEQ, IBS, and QFV Index. Demographic information for the participant (e.g., age, gender, year in college, and religion) was also gathered. In the current study, no participant indicated that they were distressed by the procedures of the study and no participants indicated problems with alcohol.

## RESULTS

Table 1 displays the means, standard deviations, observed ranges, and possible ranges for the major predictor and outcome variables for Asian Americans. Table 2 displays the same information for Caucasians.

**TABLE 1** Correlation Matrix of Alcohol Expectancies, Dimensions of Impulsivity, and Alcohol Consumption for Asian Participants

Variables	1	2	3	4	5	6	7
1. AEQ Positive	—	.67**	.30*	-.29*	-.25	.52**	.58**
2. AEQ Negative	—	—	.33*	-.20	-.27	.24	.37**
3. IBS Urgency	—	—	—	.02	.07	.23	.25
4. IBS Premeditation	—	—	—	—	.56**	-.33*	-.27*
5. IBS Perseverance	—	—	—	—	—	-.43**	-.32*
6. IBS Sensation Seeking	—	—	—	—	—	—	.42**
7. QFV Index	—	—	—	—	—	—	—
Observed Ranges	19–113	15–65	14–39	13–40	11–37	14–45	0–27
Possible Ranges	0–114	0–90	12–48	12–44	12–40	12–48	0–48
Mean (SD)	73.96 (20.25)	41.00 (12.63)	26.86 (6.37)	24.19 (6.00)	21.18 (5.19)	31.19 (8.29)	15.84 (7.47)

\* $p < .05$ ; \*\* $p < .01$ .

AEQ = Alcohol Expectancy Questionnaire; IBS = Impulsive Behavior Scale; QFV Index = Quantity-Frequency-Variability Index; SD = standard deviation.

### Preliminary Analyses

In the preliminary analyses,  $t$  tests, analysis of variance, and correlations were used to test whether the demographic characteristics of sex, age, and year in college were related to the predictor, mediator, and outcome variables. There were no differences in sex, age, or year in college between the Asian American and Caucasian groups (all  $p$  values  $> .05$ ). When the

**TABLE 2** Correlation Matrix of Alcohol Expectancies, Dimensions of Impulsivity, and Alcohol Consumption for Caucasian Participants

Variables	1	2	3	4	5	6	7
1. AEQ Positive	—	.29*	.06	-.03	-.11	.09	.07
2. AEQ Negative	—	—	.18	-.14	.02	-.28*	-.21
3. IBS Urgency	—	—	—	.19	.27*	.16	.07
4. IBS Premeditation	—	—	—	—	.40**	.16	.12
5. IBS Perseverance	—	—	—	—	—	-.20	.04
6. IBS Sensation Seeking	—	—	—	—	—	—	.38**
7. QFV Index	—	—	—	—	—	—	—
Observed Ranges	52–113	24–72	14–49	13–44	10–35	12–48	0–35
Possible Ranges	0–114	0–90	12–48	12–44	12–40	12–48	0–48
Mean (SD)	81.21 (13.58)	44.96 (11.03)	27.46 (7.52)	24.31 (6.73)	19.56 (5.72)	33.17 (7.95)	18.80 (5.53)

\* $p < .05$ ; \*\* $p < .01$ .

AEQ = Alcohol Expectancy Questionnaire; IBS = Impulsive Behavior Scale; QFV Index = Quantity-Frequency-Variability Index; SD = standard deviation.

Quantity-Frequency-Variability scale of alcohol consumption was summed into a total composite score, there were no significant differences in drinking between sexes or across age or year in college.

### Primary Analyses

The first hypothesis focused on racial differences in alcohol consumption, dimensions of impulsivity, and positive and negative alcohol expectancies; means between races were analyzed with *t* tests. The second hypothesis focused on the correlates of alcohol consumption and Pearson correlation coefficients were computed. The third hypothesis focused on alcohol expectancies as a mediator of the relation between impulsivity and alcohol consumption and was examined with a series of multiple regression analyses.

### Alcohol Consumption

There were significant differences between the races on drinking ( $t [100] = -2.49, p = .02$ ). Asian Americans had significantly lower scores on the QFV Index compared to Caucasians ( $M = 15.84$  vs.  $M = 18.80$ ), indicating that they exhibited less quantity, frequency, and strength of alcoholic beverage consumed.

Item analyses on the QFV Index also showed significant differences by race. Specifically, Asian Americans drank less frequently overall than Caucasians, with Asian Americans most often reporting that they consume alcohol "2 to 3 times a month" compared to Caucasians most often reporting "1 to 2 times a week" ( $M = 2.96$  vs.  $M = 3.77$ , respectively;  $t [125] = -3.25, p < .01$ ). In terms of type of alcohol consumed, there were no race differences in beer consumption ( $t [125] = -.58, p > .01$ ); however Asian Americans drank significantly less wine ( $t [125] = -1.91, p = .05$ ) and significantly less liquor ( $t [125] = -3.00, p < .01$ ) than Caucasians. In addition, on average, Asian Americans consumed 6.00 drinks a week and Caucasians consumed 8.73 drinks a week ( $t [125] = -1.93, p = .06$ ).

Binge drinking is typically defined as consuming five or more drinks in one occasion. Past research has shown that binge drinking is a risky phenomenon because binge drinkers also tend to use other illicit drugs (Johnston et al., 1993) and exhibit violent and truant behaviors (Tucker, Orlando, & Ellickson, 2003). One of the items on the QFV Index assesses binge drinking, asking participants to rate how often they "consume 5 or more drinks at one time." Again, there were racial differences on this item, with Asian Americans reporting they binge drink significantly less frequently than Caucasians ( $t [125] = -3.03, p < .01$ ). However, there were no significant differences in the number of occasions during which they consume 3 to 4 or 1 to 2 drinks ( $t [125] = -.71, p > .05$ ;  $t [125] = .50, p > .05$ , respectively).

## Impulsivity

Regarding impulsivity, there were no significant differences between races on the urgency, (lack of) premeditation, or sensation seeking subscales (all  $p$  values  $>.05$ ). However, Asian Americans rated themselves as significantly higher on the (lack of) perseverance subscale ( $t [91] = 2.56, p = .01$ ), indicating that they perceived themselves as less persevering and less hardworking on tasks and were overall more likely to give up easily compared to the Caucasians.

## Alcohol Expectancies

There were also racial differences in scores of positive and negative alcohol expectancies on the AEQ. Asian Americans had significantly lower ratings of positive expectancies ( $t [95] = -2.03, p < .05$ ) and also lower ratings of negative expectancies ( $t [123] = -1.87, p = .06$ ) from drinking than Caucasians did. This means that Asian Americans anticipated fewer positive and fewer negative effects from drinking compared to Caucasians.

## Correlational Analyses of Impulsivity, Alcohol Expectancies, and Alcohol Consumption

Overall, scores on the QFV Index, IBS, and AEQ were moderately related to one another. Specifically, the dimensions of impulsivity, including (lack of) premeditation ( $r = -.27, p < .05$ ), (lack of) perseverance ( $r = -.32, p < .05$ ), and sensation seeking ( $r = .42, p < .01$ ), were significantly correlated with alcohol consumption for Asian Americans. Also, the dimensions of impulsivity, including urgency ( $r = .30, p < .05$ ), (lack of) premeditation ( $r = -.29, p < .05$ ), and sensation seeking ( $r = .52, p < .01$ ), were significantly correlated with alcohol expectancies for Asian Americans. Finally, positive ( $r = .58, p < .01$ ) and negative ( $r = .37, p < .01$ ) alcohol expectancies were significantly correlated with alcohol consumption for Asian Americans. The full correlation matrix is in Table 1 for Asian American participants.

The same correlations were computed for Caucasian participants. Only the sensation seeking dimension of impulsivity was significantly correlated with alcohol consumption for Caucasians ( $r = .38, p < .01$ ). Positive and negative alcohol expectancies were not related to drinking for Caucasians ( $p$  values  $>.05$ ). The full correlation matrix is in Table 2 for Caucasian participants.

## Mediation Models Between Predictors and Alcohol Consumption

It was also hypothesized that the relationship between dimensions of impulsivity and alcohol consumption would be mediated by positive and negative

alcohol expectancies (Figure 1). Baron and Kenny's (1986) three-step method of testing mediation was used. A series of multiple regression analyses were conducted with dimensions of impulsivity as independent variables, positive and negative alcohol expectancies as mediators, and alcohol consumption as the dependent variable.

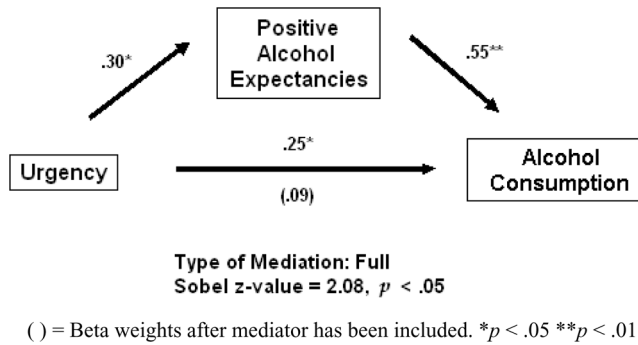
For a mediation model to be present, the independent variables must be correlated with the dependent variable, the independent variables must be correlated with the mediator, and the mediator must be correlated with the dependent variable, while controlling for the independent variables. Finally, for full mediation to occur, the effect of the independent variables on the dependent variable must be non-significant while controlling for the

**TABLE 3** Asian American Participants: Mediation Analyses of the Effects of Impulsivity on Alcohol Consumption as Mediated by Positive Alcohol Expectancies

Variables	R <sup>2</sup>	F	P	df	B	S.E.	t	p
Mediation Model 1								
Regression 1 (QFV Index = DV)	.06	3.70	.06	1,55				
IBS Urgency					.29	.15	1.92	.06
Regression 2 (AEQPOS = DV)	.09	5.23	.03	1,55				
IBS Urgency					.94	.41	2.29	.03
Regression 3 (QFV Index = DV)	.34	13.78	.00	2,54				
IBS Urgency					.11	.14	.77	.45
AEQPOS					.20	.04	4.74	.00
Mediation Model 2								
Regression 1 (QFV Index = DV)	.07	4.28	.04	1,55				
IBS Premeditation					-.34	.16	-2.07	.04
Regression 2 (AEQPOS = DV)	.09	5.21	.03	1,55				
IBS Premeditation					-.99	.44	-2.28	.03
Regression 3 (QFV Index = DV)	.34	14.00	.00	2,54				
IBS Premeditation					-.14	.14	-.94	.35
AEQPOS					.20	.04	4.70	.00
Mediation Model 3								
Regression 1 (QFV Index = DV)	.10	6.30	.02	1,55				
IBS Perseverance					-.46	.18	-2.51	.02
Regression 2 (AEQPOS = DV)	.06	3.61	.06	1,55				
IBS Perseverance					-.97	.51	-1.90	.06
Regression 3 (QFV Index = DV)	.36	15.47	.00	2,54				
IBS Perseverance					-.27	.16	-1.69	.10
AEQPOS					.20	.04	4.71	.00
Mediation Model 4								
Regression 1 (QFV Index = DV)	.17	11.57	.00	1,55				
IBS Sensation Seeking					.38	.11	3.40	.00
Regression 2 (AEQPOS = DV)	.27	20.76	.00	1,55				
IBS Sensation Seeking					1.28	.28	4.56	.00
Regression 3 (QFV Index = DV)	.35	14.48	.00	2,54				
IBS Sensation Seeking					.14	.12	1.24	.22
AEQPOS					.18	.05	3.81	.00

\* $p < .05$ ; \*\* $p < .01$ .

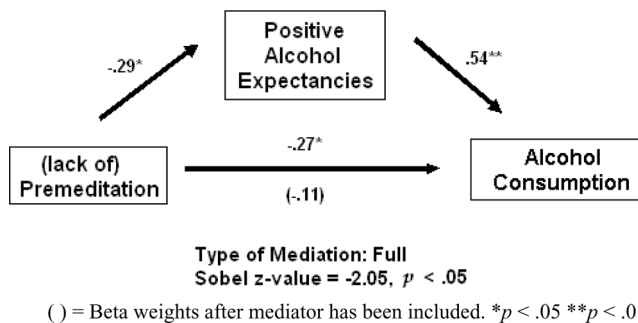
QFV Index = Quantity-Frequency-Variability Index; DV = dependent variable; IBS = Impulsive Behavior Scale; AEQPOS = Alcohol Expectancy Questionnaire: Positive Expectancies.



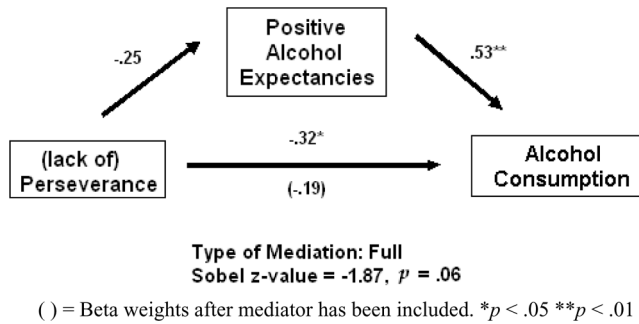
**FIGURE 2** Mediation model of urgency on alcohol consumption as mediated by positive alcohol expectancies.

mediator; if the effect in this last step remains significant, then partial mediation exists. Subsequently, Sobel's test can be used to determine the significance of the indirect effect between the independent variables, mediator, and dependent variable (Baron & Kenny, 1986; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004).

Results showed that for Asian Americans, positive alcohol expectancies fully mediated the relations between each of the urgency ( $z = 2.08, P < .05$ ), (lack of) premeditation ( $z = -2.05, p < .05$ ), (lack of) perseverance ( $z = -1.87, p = .06$ ), and sensation seeking ( $z = 2.83, p < .01$ ) dimensions of the IBS and the QFV Index. See Table 3 for these analyses and Figures 2 through 5 for the mediation models. In addition, for Asian American participants, negative alcohol expectancies were tested as mediators of the relationship between dimensions of impulsivity and alcohol consumption and results were found to be non-significant (all  $p$  values  $> .05$ ). Therefore, for Asian Americans, although high levels of reported impulsivity are strongly related to increased alcohol consumption, it is only through positive alcohol expectancies that the two constructs are related. Similar analyses were conducted



**FIGURE 3** Mediation model of premeditation on alcohol consumption as mediated by positive alcohol expectancies.



**FIGURE 4** Mediation model of perseverance on alcohol consumption as mediated by positive alcohol expectancies.

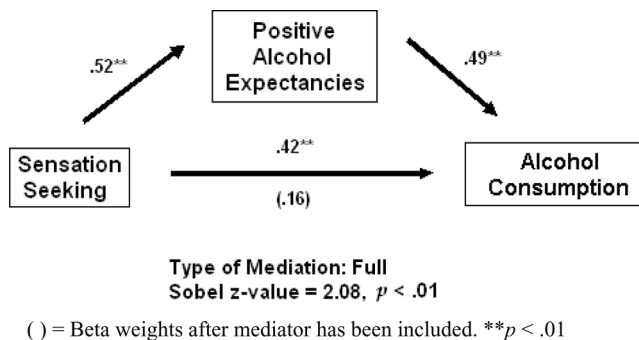
for Caucasians and there was no evidence of mediation for either positive or negative alcohol expectancies (all  $P$  values  $> .05$ ).

## DISCUSSION

The purpose of the current study was to test for racial differences in alcohol consumption, examine predictors of alcohol consumption, and identify the factors that might mediate alcohol consumption. Research has already begun to determine the variables that contribute to alcohol consumption and alcohol use disorders, but little research has focused on Asian Americans.

### Racial Differences in Alcohol Consumption, Impulsivity, and Alcohol Expectancies

Results confirmed findings from past research studies regarding racial differences in alcohol use between Asian Americans and Caucasians (e.g., Akutsu et al., 1989; Crowley, 1991; Keefe & Newcomb, 1996). First, compared to



**FIGURE 5** Mediation model of sensation seeking on alcohol consumption as mediated by positive alcohol expectancies.

Caucasians, Asian American participants drank less overall, drank less frequently, drank less wine and liquor, and had fewer occasions of binge drinking. Therefore, not only did Asian Americans exhibit less variability in quantity, frequency and type of drinking, but they also exhibited fewer episodes of binge drinking than Caucasians.

With impulsivity ratings, results showed that Asian Americans rated themselves as less persevering in their work than Caucasians were, but there were no significant racial differences in ratings of urgency, lack of premeditation, or sensation seeking. Thus, Asian Americans and Caucasians did not differ in ratings on most of the dimensions of impulsivity, except with regards to perseverance.

Regarding alcohol expectancies, Asian Americans had significantly lower ratings of positive and also lower negative expectancies than Caucasians did. Therefore, Asian Americans anticipated fewer positive and fewer negative effects from consuming alcohol than did Caucasians.

### Relationship Among Alcohol Consumption, Impulsivity, and Alcohol Expectancies

In the current study, ratings of impulsivity were correlated with alcohol consumption for Asian Americans. Those who rated themselves as more persevering, more premeditating, and more sensation seeking exhibited high variability in quantity, frequency, and type of drinking. Results regarding sensation-seeking confirmed past research findings, which documented a positive correlation with increased drinking. However, results that showed greater premeditation and perseverance were associated with decreased drinking were contrary to past research findings (e.g., Del Boca et al., 2004; Kahler et al., 2003). However, these studies used primarily Caucasian samples. The current study suggests that impulsivity may have different effects on alcohol consumption for Asian Americans when compared to other racial groups.

This finding may also be more intuitive when considering the effect of culture on schoolwork and alcohol consumption. Many Asian cultures prioritize academic achievement and dedication to school work (Chao, 1994). Thus, if the Asian American participants in the current study experienced stress and pressure toward school work, it may not be surprising that those who worked hard also drank to relieve that stress. Future studies should consider the relationship between impulsivity, specifically perseverance and premeditation, and drinking to cope with academic situations and domains.

The current study also found strong correlations between alcohol expectancies and alcohol consumption for Asian Americans. Past research has found that positive expectancies are associated with increased drinking and that negative expectancies are associated with decreased drinking

(e.g., Reese et al., 1994; Sher et al., 1996). However, for the Asian Americans in the current study, negative expectancies were unexpectedly related to increased consumption. Therefore, it is apparent that there are other factors that may explain why Asian Americans drink despite anticipating negative effects.

Social support may be one such factor that may provide clarification of this finding. Wills and Vaughan (1989) found that peer socialization factors can contribute to increased substance use in young teenagers and adolescents, such that youth who associate with peers engaging in drug-using behaviors are more likely to use drugs themselves (Oetting & Beauvais, 1986, 1987). It has also been shown that teenagers who reported less intimacy, communication, and understanding from their parents exhibited higher levels of alcohol and drug use than teenagers who subjectively experienced love and support from their families (Hundleby & Mercer, 1987). Thus, there may be an interactive effect between social support and negative alcohol expectancies, such that Asian Americans with less peer and parental social support may exhibit higher levels of alcohol consumption, despite their negative alcohol expectancies, when compared to those individuals with high levels of social support. Therefore, further research is necessary to replicate these results. It is also necessary to clarify the social factors that may moderate the relationship between negative alcohol expectancies and drinking for Asian Americans.

For Caucasians, greater ratings of sensation seeking were associated with greater alcohol consumption. This finding again confirms past research that has documented an association between increased impulsivity and more drinking (Simons, 2003). However, none of the other dimensions of impulsivity and neither positive nor negative alcohol expectancy was related to drinking for Caucasians in the current study. However, closer examination of the alcohol expectancies responses reveals that Caucasian participants scored highly on the AEQ. Specifically, for positive expectancies, the possible range was 0 to 119 on the AEQ; however, the observed range for Caucasian participants on positive expectancies was from 52 to 113 (Table 2). Thus, the high ratings of positive expectancies indicate that the Caucasian participants included in the current study are not representative of the population, rather they represent a sample that anticipates greater beneficial effects from consuming alcohol than the normal population. Consequently, this sample of Caucasians may also be different from samples in other studies on alcohol, which may explain why findings regarding positive and negative alcohol expectancies and dimensions of impulsivity (i.e., urgency, perseverance, and premeditation) were not replicated in the current study.

The Caucasian participants in the current study also exhibited a significantly higher level of drinking and more episodes of binge drinking than did the Asian American participants. This is important because alcohol expectancies may differ according to current consumption level. Specifically, it has

been shown that alcohol abstainers may confound the results of studies on alcohol expectancies compared to light, moderate, and heavy drinkers (Brown, Christiansen, & Goldman, 1987). In addition, past research has documented the effects of heavy drinking on alcohol expectancies such that over time expectancies decrease with prolonged, heavy alcohol use (e.g., Sher et al., 1996; Smith, Goldman, Greenbaum, & Christiansen, 1995). Therefore, with the current heavy drinking and binge drinking Caucasian sample, it may not be surprising that alcohol expectancies were unrelated to consumption level.

### Mediation Models of Alcohol Consumption

Results from the current study found that positive alcohol expectancies fully mediated the relationship between dimensions of impulsivity and alcohol consumption for Asian Americans; negative alcohol expectancies were not determined to mediate this relation. As stated previously, there may be a complex relationship between negative alcohol expectancies and social support that may predict Asian Americans' drinking. However, with regards to positive alcohol expectancies, Asian Americans' decisions to drink rested solely on the cognitive anticipation of positive consequences from alcohol use, despite impulsive tendencies. This finding is in line with past research as well.

Studies on drinking norms within Asian American cultures have shown that Asian Americans drink in moderation and are disapproving of excessive drinking (Austin, Prendergast, & Lee, 1989; Sue, 1987). In addition, Asian American college students reported that they perceive their families and friends as less accepting of overall drinking and "getting drunk" than Caucasian college students did (Keefe & Newcomb, 1996; Sue, Zane, & Ito, 1979). As a direct consequence of these perceived social norms, Asian Americans tend to rate more costs and less benefits to drinking than Caucasians. Thus, for Asian Americans, perceived social norms and attitudes influence their cognitions about consequences from drinking. Conversely, impulsivity ratings remain an individual-level factor, one that is less influenced by societal norms. Therefore, Asian Americans may choose to drink or not to because of their cognitive expectancies rather than impulsive tendencies and the perceived social norms and attitudes that accompany those expectancies. Therefore, it is not surprising that impulsivity did not directly influence drinking; rather, in the current study, positive alcohol expectancies fully mediated the path between ratings of impulsivity and alcohol consumption for the Asian American participants.

Results from the current study also show that positive and negative alcohol expectancies did not mediate the relationship between dimensions of impulsivity and alcohol consumption for Caucasians. Therefore, alcohol expectancies were not a strong predictor of drinking for Caucasians; rather,

alcohol use was determined by impulsive behaviors. These findings support past research, which documented a relationship between impulsivity and alcohol consumption, (e.g., Kahler et al., 2003; Patterson & Newman, 1993) and a relationship between impulsive behaviors and binge drinking (e.g., Shedler, & Block, 1990; Simons, 2003). However, it is more interesting that alcohol expectancies did not predict drinking for these participants. As stated previously, the observed range in values on alcohol expectancies was restricted for the Caucasian participants, compared to the possible range of values that were documented in past research studies (e.g., Leigh & Stacy, 1991, 1993). In addition, due to the greater level of alcohol consumption and the frequent binge drinking episodes exhibited by the Caucasians, which can decrease alcohol expectancies, it is not surprising that expectancies were unrelated to consumption level.

### Limitations of the Current Study and Future Directions for Research

A major strength of the current study was the use of two variables—impulsivity and alcohol expectancies—studied independently and within a mediation model to predict alcohol consumption. In addition, the cultural comparison between Asian Americans and Caucasians allowed for increased knowledge about racial differences in alcohol use. There were, however, several limitations that should be taken into consideration. The current research used self-report as a method of obtaining data, which may be subject to biases in report (Arnold & Feldman, 1981). It has also been shown that self-reported level of drinking may not be as accurate as prospective monitoring of drinking (e.g., Mann et al., 1987; Sher et al., 1996). In particular, Searles, Helzer, Rose, and Badger (2002) found that retrospective reports of drinking were prone to significant error and bias when compared to daily tracking methods of recording alcohol consumption. Because the current research did not use a prospective or longitudinal design, it is not only subject to bias in report of drinking but also does not allow for clarification of definitive cause and effect relationships. Future research should employ longitudinal designs to determine whether alcohol expectancies mediate the prospective relationship between impulsivity and alcohol consumption.

Another limitation to the current study involves the use of “Asian American” as a label to describe people from many different countries. Participants in the current sample of Asian American participants varied in country of origin, with South Korea being most represented. However, it is also possible that there are as many differences between the many Asian American participants from different countries (e.g., Harachi, Catalano, Kim, & Choi, 2001; Zane & Sasao, 1992) as there are between the Asian American and Caucasian participants. Future research could consider equal representation of Asian American countries as well as equal sample sizes between Asian American and Caucasian groups.

## CONCLUSION

Despite the varying differences in consumption patterns and prevalence rates of alcohol problems, research on minority alcohol use is still sparse. Future studies should focus on cultural differences of drinking in terms of antecedents and consequences. The area of alcohol research is broad and it is difficult to incorporate the multiple variables into one design. However, the current study contributed to knowledge regarding cognitive and personality effects of alcohol expectancies and impulsivity on alcohol consumption in Caucasian and Asian American college students.

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