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Alcohol Expectancies Mediate the Relationship between Age of First Intoxication and Drinking Outcomes in College Binge Drinkers

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Abstract

Background—While prior research has shown that age of first intoxication (AI) is associated with negative alcohol outcomes, limited research has examined factors accounting for this relationship. Alcohol expectancies, or beliefs about the effects of alcohol, may explain such associations as both positive and negative expectancies have been shown to be key predictors of drinking outcomes.

Objective—The present study examined expectancies as mediators between early AI and alcohol-related outcomes.

Method—Data collection occurred in 2012 and 2013. Participants were college students (N = 562, 65.8% women) who completed an online survey including measures of alcohol use history, alcohol expectancies, typical alcohol consumption, and alcohol-related problems. Structural equation modeling was used to test the hypothesized model.

Results—Our findings support a model whereby AI is associated with drinking through its influence on both positive and negative expectancies. Specifically, an earlier AI was associated with stronger alcohol expectancies, which in turn, was associated with heavier alcohol use and alcohol-related problems.

Conclusions/Importance—These findings are consistent with expectancy theory and previous research suggesting that more experienced drinkers hold stronger drinking-related beliefs, be it positive or negative, and these expectancies ultimately explain variability in alcohol use and problems. Our findings further support that expectancies play an important role in the initiation of drinking behavior.

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Keywords

age of first intoxication; positive expectancies; negative expectancies; alcohol problems; alcohol use

One factor that has been linked to risky drinking patterns is the age of onset of alcohol use (AO) or the age of first intoxication (AI). Most research on this topic has focused on AO (e.g., Hingson & Zha, 2009; Rothman, Dejong, Palfai, & Saitz, 2008), and studies support that an early AO is related to heavy drinking and alcohol-related problems (e.g., Hingson, Heeren, Jamanka, & Howland, 2000; Hingson, Heerson, & Winter, 2006; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002). However, as compared with AO, AI has been found to be a stronger predictor of problem behaviors (i.e., substance use, being injured, getting into physical altercations, and having poorer academic performance) (Kuntsche, Rossow, Simons-Morton, Bogt, Kokkevi, & Godeau, 2013). As such, it could be more meaningful to examine AI rather than AO as early exposure to *heavy* alcohol use may be a strong contributor to long-term developmental consequences (see Maggs & Schulenberg, 2004 for review). Given the existing support that early drinking experiences are important predictors of alcohol-related risks, research seeking to understand possible mechanisms underlying such associations is needed to advance intervening efforts for harmful drinking.

Age of Intoxication and Alcohol Outcomes

While AI is shown to be more predictive than AO of problems (e.g., being injured and other substance use; Kuntsche et al., 2013), few studies have actually examined the relationship between AI and alcohol use outcomes. Of the limited research on the topic, there is general support of a negative association between AI and alcohol-related risks, such that those with an early AI experience more alcohol-related risks. Specifically, Henry and colleagues (2011) conducted a longitudinal study to examine AI and subsequent alcohol consumption in a sample of urban American Indian youth. Results indicated that adolescents who reported experiencing alcohol intoxication by age 14 were more likely to use alcohol heavily in later adolescence and to have an alcohol use disorder by young adulthood. Another study examined AI among 20 year-old Swiss males, and found those who retrospectively reported an AI before the age of 15 were three times more likely to engage in current risky alcohol use and other illicit substance use (Adam, Faouzi, Gaume, Gmel, Daepeen, & Bertholet, 2011). Other cross-sectional studies have found an earlier AI to be associated with a higher likelihood of engaging in unplanned and unprotected sex (Hingson, Heerson, Winter, & Wechsler, 2003) and increased risk for alcohol dependence (Ehlers, Slutske, Glider, Lau, & Wilhelmsen, 2006). More recently, Morean and colleagues (2012) found that an early AO and/or a quick progression from AO to AI was associated with a higher frequency of heavy alcohol use and more alcohol-related problems during their senior year of college. Contrary to these findings, one study found AI to be unrelated to binge drinking among their adolescent cross-sectional sample (Afitska, Plant, Weir, Miller, & Plant, 2008). One reason for these null findings may be due to the developmental stage of the sample as drinking often peaks during emerging adulthood (e.g., Thompson, Stockwell, Leadbeater, & Homel, 2014), rather than adolescence; consequently, such outcomes may not have been experienced

yet by the sample. Given the limited literature on AI and its influence on alcohol-related outcomes, additional research is needed to further elucidate these relationships.

Alcohol Expectancies

One potential factor accounting for the relationship between early drinking experiences and drinking outcomes may be one's alcohol expectancies or beliefs about the behavioral effects of alcohol use. According to alcohol expectancy theory, information learned from early alcohol-related experiences can influence decision-making on later drinking choices (Goldman, Brown, Christiansen, & Smith, 1991). These alcohol expectancies can be learned either by direct or indirect experiences (e.g., parental or peer alcohol use) (Christiansen, Smith, Roehling, & Goldman, 1989). Furthermore, expectancies have been shown to mediate the association between drinking antecedents and alcohol-related outcomes (e.g., Darkes, Greenbaum, & Goldman, 2004; Finn, Sharkansky, Brandt, & Turcotte, 2000; Henderson, Goldman, Coovert, & Carnevalla, 1994) and are important in the initiation and maintenance of alcohol use (e.g., see Jones, Corbin, & Fromme, 2001 for review; Maisto, Connors, & Sachs, 1981).

Alcohol expectancies may be positive or negative. Positive expectancies (e.g., tension reduction, increased sociability) have been linked to greater alcohol consumption among adolescents (e.g., Cable & Sacker, 2008; Patrick, Wray-Lake, Finlay, & Maggs, 2010) and college students (Bartholow, Sher, & Strathman, 2000; Del Boca, Darkes, Greenbaum, & Goldman, 2004; Fromme, Stroot, & Kaplan, 1993). Furthermore, heavier drinkers tend to report more positive expectancies as compared to lighter drinkers (e.g., see Jones et al., 2001; Lewis & O'Neill, 2000; Southwick, Steele, Marlatt, & Lindell, 1981). Regarding negative expectancies (e.g., impairment or aggression), research on its association with drinking has yielded inconsistent results (see Jones et al., 2001). However in general, prior studies have indicated negative expectancies are associated with less alcohol use (e.g., Baer, 2002; Leigh, 1989a; Wiers, Hoogeveen, Sergeant, & Gunning, 1997), and longitudinal research supports negative expectancies can predict less drinking one to two years later in adolescents (Grube & Agostinelli, 1999; Thush & Wiers, 2007). Thus, it appears that both types of expectancies may be important in determining drinking behavior.

Taken together, previous research on alcohol expectancies suggests that more experienced drinkers hold stronger beliefs about alcohol (see Jones et al., 2001). As such, it is possible that those who begin drinking heavily and become intoxicated at a younger age may hold stronger alcohol expectancies because they have had time to acquire more drinking experience. These expectancies could then explain their vulnerability to engaging in risky drinking patterns and experiencing associated harms. However to date, alcohol expectancies have not been studied in the context of AI, but have been with regard to drinking initiation. For instance, Dunn and Goldman (1998) found that children tend to have more negative beliefs about alcohol before their first drinking experience. They also found that expectancies become increasingly more positive throughout adolescence, which in turn, relate to their initiation of alcohol use. Supporting these findings, several studies found that beliefs regarding the sociable benefits of drinking predict AO (Aas, Leign, Anderssen, & Jakobsen, 1998; Christiansen et al., 1989; Killen et al., 1996) and initiation of problem

drinking behavior (Christiansen et al., 1989). Despite research indicating expectancies play a role in drinking behavior (e.g., Bartholow et al., 2000; Del Boca et al., 2004), no research has sought to understand how AI may be associated with expectancies. Focusing specifically on AI would elucidate the impact of early heavy drinking experiences on one's alcohol expectancies, and its association with alcohol use and problems.

Given the paucity of research examining both types of expectancies as they relate to early drinking experiences, this study sought to examine positive and negative expectancies and their associations with AI. Research into both types of expectancies may further our understanding as to why individuals with an early AI may be at higher risk for experiencing alcohol-related problems. To explain, as consistent with expectancy theory, individuals who become intoxicated at an earlier age may be reinforcing positive beliefs they have about what they will experience during a drinking occasion (e.g., alcohol will make me feel more sociable; Christiansen et al., 1989). Regarding negative expectancies, these beliefs also may be an important intervening variable. Perhaps an earlier AI is associated with negative expectancies because these individuals have more experience with negative consequences related to their alcohol use. Therefore, the relationship between AI and alcohol-related problems could be explained, at least partially, by both positive and negative expectancies.

Current Study

The goal of the present study was to examine the relationship between AI and alcohol use as well as the extent to which alcohol expectancies may explain these associations. Specifically, we aimed to examine (1) the relationship between AI and drinking outcomes (i.e., drinking quantity, frequency, binge drinking frequency, and alcohol-related problems) and (2) positive and negative expectancies as mediators of the relationship between AI and alcohol outcomes. Consistent with previous research, we hypothesized that an earlier, retrospectively reported AI would be associated with heavier alcohol use and more alcohol-related problems. Regarding our second aim, we expected an earlier AI would be related to stronger positive and negative expectancy endorsement. In addition, we predicted that the association between AI and drinking outcomes would be mediated by both positive and negative alcohol expectancies.

Method

Participants and Procedures

College student drinkers (N = 562; 65.8% women) were recruited through an undergraduate psychology research pool at a mid-size East Coast university. In order to be eligible, participants must have been between the ages of 18 and 25 years and have engaged in at least two heavy drinking episodes (i.e., consumed at least 4/5 standard drinks for women/men on one occasion) in the past month. Participant mean age was 19.96 (SD = 2.03) years. Participants were 50.9% Caucasian, 30.1% African-American, 5.5% Hispanic, 3.6% Asian/Pacific American, and 9.9% "Biracial/Other". Class standing was 37.5% freshmen, 27.6% sophomores, 18.5% juniors, 15.1% seniors, and 0.9% other.

Data collection was administered in small groups on campus. Following informed consent, participants completed a battery of self-report measures administered in one session that took approximately 1 hour to complete. Participants were compensated with extra credit in their classes for their participation. The current study was approved by the university's college committee on human subjects research and followed American Psychological Association guidelines (APA, 2002).

Measures

Age of intoxication—To assess age of first intoxication (AI), participants were asked, "At what age did you first get drunk on alcohol?" This method of assessing AI is consistent with prior research (Hingson et al., 2002; Morean et al., 2012).

Typical alcohol use—The Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) was used to assess typical alcohol consumption. Participants reported the number of drinks they consumed during a typical week over the past 3 months. Three indicators were created from the DDQ: total number of drinks consumed per week (quantity), number of drinking days per week (frequency), and the number of binge days during a typical week (binge frequency).

Alcohol-related problems—The Young Adult Alcohol Consequences Questionnaire (YAACQ; Read, Kahler, Strong, & Colder, 2006) was used to assess alcohol-related problems associated with drinking. The YAACQ is a 48-item questionnaire assessing experiences with negative drinking-related consequences (e.g., "I have passed out from drinking") within the past year. Items are rated dichotomously (no/yes). Higher score indicates a greater number of negative consequences within the past year. For the present study, internal consistency was $\alpha = .93$.

Alcohol expectancies—Alcohol expectancies were assessed with the Comprehensive Effects of Alcohol (CEOA; Fromme et al., 1993). The CEOA is a 38-item questionnaire which assesses positive and negative expectancies related to alcohol. Positive expectancy subscales include sociability (e.g., "I would be outgoing"), tension reduction (e.g., "My body would be relaxed"), liquid courage (e.g., "I would be courageous"), and sexuality (e.g., "I would enjoy sex more"). Negative expectancy subscales include cognitive and behavioral impairment (e.g., "My head would feel fuzzy"), risk and aggression (e.g., "I would act aggressively"), and self-perception (e.g., "I would feel guilty"). Responses are rated on a 4-point Likert scale ranging from *disagree* to *agree*. For the present study, internal consistency was $\alpha = .92$.

Results

Prior to model testing, data were inspected for outliers and missing data. Regarding outliers, box plots revealed that four male participants reported extreme scores (i.e., outside the three interquartile range) on typical alcohol quantity and were Winsorized to match to the next highest score to reduce the impact on statistical estimates. Bivariate correlations were used to determine the interrelationships among study variables with SPSS version 21.0. SPSS revealed missing data ranged from .02% on AI to 14.5% on the YAACQ, and pairwise

deletion was used to account for missing data. Structural equation modeling (SEM) was used to test the hypothesized model in Mplus version 6.1 (Muthén & Muthén, 2008). In these analyses, the estimation method was maximum likelihood with robust standard errors. Standard with Mplus, we used full information maximum likelihood (FIML) to handle instances of missing data. Bootstrapping was used to address non-normality in the data. Statistical significance was tested with 95% bias-corrected (BC) confidence intervals generated from 10,000 bootstrap samples (Efron & Tibshirani, 1993). The parameter estimate is considered statistically significant if zero is not contained in the 95% BC confidence intervals. The chi-square goodness of fit statistic (χ^2), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) were used to assess model fit.

Regarding study aim 1, AI was negatively associated with alcohol use and alcohol-related problems. That is, individuals reporting an earlier AI also reported a greater number of drinks consumed throughout a typical week (i.e., alcohol use quantity) as well as a higher number of drinking days (i.e., frequency) and binge drinking days (i.e., binge frequency) during a typical week. An earlier AI also was associated with more experiences with alcohol-related consequences. Earlier AI was shown to associate more strongly with use quantity, binge frequency, and alcohol-related problems than one's frequency of drinking. Descriptive statistics and correlations among study variables are presented in Table 1.

Within the mediation model, three latent variables were created for (1) the four positive expectancies subscales on the CEOA (i.e., sociability, tension reduction, liquid courage, sexuality), (2) the three negative expectancies subscales on the CEOA (i.e., cognitive and behavioral impairment, risk and aggression, self-perception), and (3) alcohol consumption (i.e., quantity, frequency, binge frequency). All subscales were specified as indicator variables. Structural paths were added and the hypothesized model was tested (see Figure 1). This model indicated mostly adequate fit to the data, $\chi^2(46) = 231.578$, $p < .001$, CFI = .922, RMSEA = .085, and SRMR = .051 (Hu & Bentler, 1999).

Positive expectancies and the alcohol use latent variable were tested as intervening variables between AI and alcohol-related problems. Findings revealed that there was a significant indirect effect between AI, positive expectancies, alcohol consumption, and alcohol-related problems, $B = -0.04$ with 95% BC CI [−0.39, −0.04]. That is, an earlier AI was related to more positive beliefs about the effects of alcohol, which predicted more severe drinking behaviors and, consequently, more alcohol-related problems.

Regarding negative expectancies, an indirect effect also was tested whereby AI was related to alcohol-related problems through negative expectancies and alcohol use, $B = 0.02$ with 95% BC CI [0.00, 0.29]. Here, an earlier AI was associated with stronger negative expectancies, which related to more drinking involvement and, in turn, more alcohol-related harms experienced. Despite the nonsignificant individual pathway between negative expectancies and alcohol use, it can still be inferred that the link between AI and problems was indirectly associated through negative expectancies (Hayes, 2009). The overall model with both positive and negative expectancies accounted for 15.9% of the variance in drinking and 43.4% in alcohol-related problems.

Discussion

The present study sought to further understand the relationship between AI and alcohol use outcomes and to examine alcohol expectancies as an underlying mechanism. Consistent with our predictions, we found that AI was negatively related to alcohol use behaviors. Specifically, the earlier an individual reported that they experienced alcohol intoxication, the greater drinking quantity, drinking frequency, and binge drinking frequency they reported. These findings extend those of prior studies by demonstrating that earlier AI may be a risk factor for various types of risky drinking practices including consuming greater amounts of alcohol, more frequently. Furthermore, similar to previous studies (e.g., Ehlers et al., 2006; Hingson et al., 2003), we found those with an earlier AI tended to report more problems related to their alcohol use. Collectively, our findings suggest that an earlier age of first intoxication could contribute to an individual's risk for drinking and alcohol-related harms experienced during the college years.

Another aim of this study was to explore factors that could help explain exactly how age of first intoxication is related to current drinking patterns. Specifically, we tested a model whereby alcohol expectancies were hypothesized to be underlying mechanisms of the pathway. Analyses demonstrated that both positive and negative expectancies were significant mediators. Thus, the longer one has been drinking to levels of intoxication, the more endorsement of positive and negative beliefs related to alcohol. These expectancies, in turn, were associated with more severe alcohol use patterns and more alcohol-related problems. Given that our model explained 15.9% of the variance in drinking and 43.4% in problems, alcohol expectancies are key to understanding the potential impact of early intoxication experiences on later drinking.

An interesting finding from the present study was the fact that an earlier AI was related to both stronger positive and negative expectancy endorsement. While our indirect pathway through positive expectancies was expected based on theory and research, the indirect pathway through negative expectancies was more surprising. To explain, as consistent with AO research (e.g., Christiansen et al., 1991), individuals who first experience alcohol intoxication at an earlier age report more positive beliefs regarding the effects of alcohol as adults. According to expectancy theory, these individuals likely had reinforced the positive beliefs they held about drinking during their early experiences with intoxication. Because of this reinforcement, these drinkers were motivated to continue consumption in such a way that delivers the outcome they expect (Jones et al., 2001).

On the other hand, negative expectancies are thought to restrain drinking (e.g., Jones & McMahon, 1994) and have generally been found to be negatively associated with alcohol use (e.g., Baer, 2002; Leigh, 1989a; Wiers et al., 1997). In examining the bivariate correlations between the negative expectancy subscales and drinking outcomes, we generally found that each negative expectancy subscale was more strongly related to alcohol problems than use. This is consistent with prior work (e.g., Pabst et al., 2014) and is not surprising given that individuals who have experienced more consequences hold more negative expectancies (e.g., Lee, Greely, & Oei, 1999). In our sample, negative expectancies may be less influential over one's drinking behaviors because young adult drinkers may perceive

negative consequences while drinking as normative (e.g., Lee, Geisner, Patrick, & Neighbors, 2010; McMahon, Jones, & O'Donnell, 1994) and relatively harmless (Lee et al., 2010). Additionally, it may be that while drinkers experience problems and develop negative beliefs, the perceived benefits of drinking may outweigh these potential negative outcomes (e.g., Patrick & Maggs, 2008), and subsequently are more influential over one's drinking.

With regards to our model, while the individual pathway from negative expectancy to alcohol use was nonsignificant, the overall indirect pathway from AI to problems through negative expectancies and alcohol use was significant. As purported by Hayes (2009), individual paths in a mediation model do not need to be significant in order for the indirect effect to be significant. Thus, these findings indicate that even though negative expectancies did not directly predict alcohol use in the individual pathway, negative expectancies partially explained the way in which AI related to alcohol-related harms. In other words, an earlier AI was associated with greater alcohol use and problems through greater endorsement of negative alcohol expectancies. One potential theoretical reason for this unexpected finding with negative expectancies could be explained by alcohol expectancy theory regarding the relative strength of each type of expectancy activated in associative memory networks (e.g., Goldman, Del Boca, & Darkes, 1999; Palfai & Wood, 2001; Reich & Goldman, 2005). It is theorized that repetitive alcohol use strengthens one's memory associations between drinking and its effects. In other words, as an individual gains more drinking experience, they also develop more beliefs about the effects of alcohol, which subsequently become more crystallized as one continues drinking (Christiansen, Goldman, & Brown, 1985). And, although a drinker may hold both positive and negative expectancies, certain expectancies may be more salient (or accessed in memory more quickly) than others (e.g., Palfai & Wood, 2001). Thus, while those with earlier AI hold stronger positive and negative expectancies, it may be that the positive expectancies ultimately exert more influence on drinking decisions as they are more readily activated in memory.

The present study provides support for the utility of specifically assessing age of first intoxication as a risk factor for alcohol-related outcomes. The rationale for focusing on AI over AO, as noted earlier, was driven by prior research suggesting that early *heavy* alcohol exposure, rather than early exposure to low levels of alcohol use, contributes to various long-term consequences (e.g., Maggs & Schulenberg, 2004; Patrick & Schulenberg, 2014). It should be noted that in the present sample, 87.5% our participants reported their first intoxication to be 18 years old and under. It is well-known that adolescence marks an important growth period for brain development (e.g., Casey, Gield, & Thomas, 2000) and can be deleteriously impacted by heavy alcohol use (e.g., Brown, Tapert, Grandolm, & Delis, 2000; Crews, He, & Hodge, 2007). Because drinking to intoxication during adolescence may have lasting effects on specific cognitive processes (Wetherill, Squeglia, Yang, & Tapert, 2013) and decision making (Goudriaan, Grekin, & Sher, 2007), research focusing on drinking to intoxication is especially warranted.

The current study findings may inform prevention efforts targeting drinking-related risk factors in a couple of ways. First, prevention efforts have been largely aimed at delaying an individual's AO, and the present study supports focusing on delaying AI for individuals who have already started drinking. As such, efforts to delay such levels of consumption could be

beneficial in preventing potential developmental effects (e.g., drinking to cope during periods of transition) upon adult drinking practices (e.g., Schulenberg & Maggs, 2002). Another implication for prevention planning is our support for the role of alcohol expectancies in heavy drinking initiation. We found that alcohol expectancies were significant partial mediators in the pathway between AI and alcohol outcomes. Thus, a potential way to reduce risky alcohol behaviors may be modifying one's alcohol expectancies by utilizing expectancy challenge (EC) approaches (see Labbe & Maisto, 2011 for review). EC is an empirically supported method, based on principles of expectancy theory, and has been shown to be effective in reducing alcohol consumption in young adults (e.g., Darkes & Goldman, 1998; Lau-Barraco & Dunn, 2008) and modifying expectancies in children (Cruz & Dunn, 2003). Consistent with previous literature, EC approaches that focus on weakening one's positive expectancies may be most beneficial in reducing alcohol-related risks (e.g., see Labbe & Maisto, 2011).

The present findings should be interpreted with caution for several reasons. The generalizability of our results to the general population of adults is limited given that our sample consisted of college student binge drinkers who were primarily Caucasian and women. A different pattern of findings may be observed in samples comprising of lighter drinkers or those with differing demographic characteristics. Additionally, our data was retrospective, and thus, recall pertaining to their AI may be biased. However, because our sample consisted of individuals between the ages of 18 and 25 (where their current age was relatively close to their AI), the likelihood of retrospective recall inaccuracies may have been minimized (e.g., Crawley & Pring, 2000; Dobson, Smith, & Pachana, 2005). Another limitation relates to our cross-sectional design that limits our ability to infer causality regarding the relationships found. Although theory and data suggest alcohol expectancies to prospectively influence alcohol consumption (e.g., Cable & Sacker, 2008; Jones et al., 2001) and risk for alcohol-related problems (e.g., Goldman, 1994; Noar, Laforge, Maddock, & Wood, 2003), there also is research to suggest a reciprocal relationship, such that experiencing alcohol-related problems may modify one's expectancies (e.g., Aas et al., 1998; Sher, Wood, Wood, & Raskin, 1996). As such, future longitudinal work examining the complex relationships between AI, alcohol expectancies (including specific types of expectancies), and alcohol-related outcomes could provide evidence for the direction of influence of these variables. Finally, we examined positive and negative expectancies more broadly which limits conclusions regarding how specific types of alcohol expectancies relate to AI and alcohol-related outcomes. Thus, future studies may explore how these specific sub-types of positive and negative expectancies mediate these pathways.

Despite the limitations of this study, the current study contributed to the limited literature on AI and examined underlying mechanisms that may contribute to the association between AI and alcohol outcomes. To the best of our knowledge, this is the first study to test such relationships. Our results suggest that AI may be an important risk factor for problematic drinking. The current findings extended the larger alcohol literature by supporting alcohol expectancies, be it positive or negative, as serving an important role in the development of alcohol use patterns.

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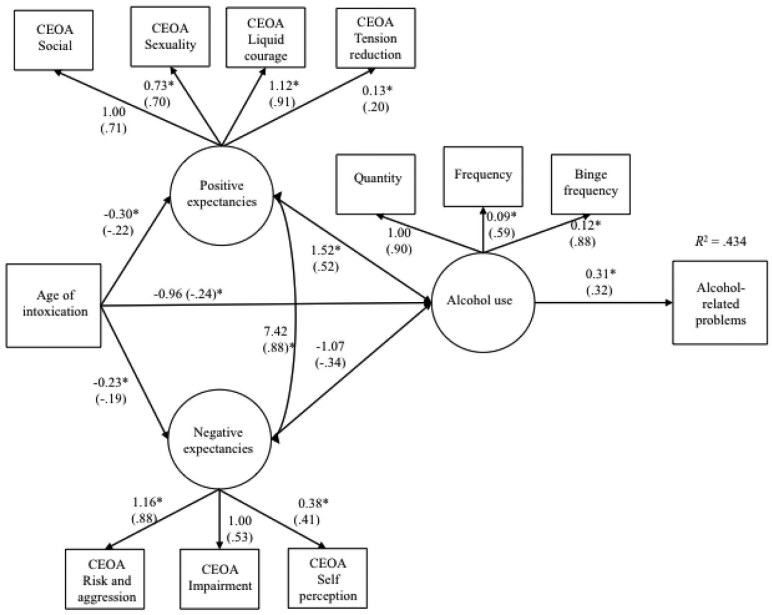

Figure 1.

Positive expectancies and negative expectancies latent factors as mediators of the relationship between age of intoxication and alcohol-related problems. Direct paths between alcohol-related problems and age of intoxication, positive expectancies, and negative expectancies were included in the analysis but omitted from the figure for clarity. Statistical significance levels pertain to unstandardized estimates based on 95% bias-corrected confidence intervals generated from 10,000 bootstrap samples. Standardized estimates are enclosed in parentheses. CEOA = Comprehensive Effects of Alcohol. *$p < .05$.

Table 1

Descriptive Statistics and Correlations among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. AI	-											
2. CEOA - Sociability	−.19**	-										
3. CEOA - Tension Reduction	.01	.21**	-									
4. CEOA - Liquid Courage	−.19**	.64**	.21**	-								
5. CEOA - Sexuality	−.20**	.58**	.23**	.63**	-							
6. CEOA - Cognitive Impairment	−.10*	.33**	.09*	.37**	.31**	-						
7. CEOA - Risk and Aggression	−.18**	.53**	.02	.75**	.51**	.44**	-					
8. CEOA - Self-Perception	−.03	.12**	.02	.22**	.38**	.44**	.38**	-				
9. DDQ - Quantity	−.28**	.24**	.01	.21**	.18**	−.02	.17**	−.07	-			
10. DDQ - Frequency	−.17**	.12**	.00	.11*	.16**	−.04	.09*	−.01	.54**	-		
11. DDQ - Binge Frequency	−.25**	.27**	.05	.24**	.22**	.01	.17**	−.04	.80**	.54**	-	
12. Alcohol-related problems	−.27**	.30**	.01	.37**	.30**	.36**	.43**	.30**	.34**	.22**	.33**	-
M	16.54	26.87	8.27	13.72	10.34	23.84	12.41	7.40	14.33	2.90	1.74	57.62
SD	2.28	4.41	2.06	3.84	3.24	5.43	3.80	2.64	10.05	1.45	1.30	8.67
Range	8-22	8-32	3-12	5-20	4-16	9-36	5-20	4-16	0-47	0-7	0-7	45-90
Skewness	−.43	−1.29	−.64	−.38	−.13	−.20	−.10	.70	1.12	1.09	.83	.96
Kurtosis	.93	2.22	.51	−.42	−.73	−.27	−.67	.34	.96	1.33	2.02	.95

Note. AI = Age of first intoxication; DDQ = Daily Drinking Questionnaire; CEOA = Comprehensive Effects of Alcohol. Positive expectancy subscales from the CEOA include Sociability, Tension Reduction, Liquid Courage, and Sexuality. Negative expectancy subscales include Cognitive and Behavioral Impairment, Risk and Aggression, and Self-Perception. Alcohol consumption items from the DDQ include typical alcohol use quantity, frequency, and binge frequency.

* $p < .05$.

** $p < .01$.