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Psychometric validation of measures of alcohol expectancies, retrospective subjective response, and positive drinking consequences for use with adolescents

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Abstract

The Anticipated Effects of Alcohol Scale (AEAS), the Subjective Effects of Alcohol Scale, and the Positive Drinking Consequences Questionnaire (PDCQ) are psychometrically sound measures of alcohol expectancies (expectancies), subjective response to alcohol, and positive drinking consequences, respectively, for use with adults. Prior research using these measures suggests that expectancies, subjective response, and positive drinking consequences are related yet distinct determinants of drinking. The current study presents psychometric evaluations of these measures for use with adolescents including confirmatory factor analyses (CFA) of the previously identified latent structures, internal consistency, and test-criterion relationships. Legally, alcohol cannot be administered to adolescents, so we assessed retrospective subjective response (during the first drinking episode ever [SEAS First] and the most recent drinking episode [SEAS Recent]). The sample comprised 248 Connecticut high school students (53.6% male; mean age 16.50 [1.19] years; 71.4% White) who completed an anonymous survey. CFA confirmed the latent factor structures for each measure. The AEAS, SEAS First, SEAS Recent and the PDCQ were internally consistent (mean α AEAS = .83; SEAS First = .88; SEAS Recent = .89, PDCQ = .87). AEAS subscales evidenced moderate overlap with corresponding SEAS First subscales (mean = .36) and SEAS Recent subscales (mean = .46) and modest overlap with the PDCQ (mean = .17). Expectancies, subjective response, and positive drinking consequences also accounted for significant variance in monthly drinking, lifetime maximum number of drinks consumed, and alcohol-related problems. In sum, the AEAS, the retrospective SEAS, and the PDCQ are psychometrically sound measures for use with adolescents.

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Keywords

alcohol expectancies; subjective response; positive drinking consequences; adolescent

1. Introduction

Efforts to prevent underage drinking in the United States have been ineffective; the majority of American youth initiate alcohol use prior to the legal drinking age of 21 years (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). As of 2014, 26.8% of 8th graders, 49.3% of 10th graders, and 66.0% of 12th graders have consumed alcohol at least once (Miech et al., 2015). While underage drinking is normative it is not consequence-free; youth drinking is associated with a range of negative outcomes including alcohol-induced brain damage; blackouts; missing school or work; neglecting family/friends or other responsibilities; engaging in risky sexual behavior; driving after drinking; automobile accidents and fatalities; physical/sexual aggression; homicide; suicide; and developing alcohol use disorder (e.g., SAMSHA, 2012). As such, understanding the range of biopsychosocial risk factors for underage drinking is crucial.

While a number of biopsychosocial risk factors for underage drinking have been identified, three constructs are the foci of the current study: alcohol expectancies (expectancies), subjective response to alcohol (subjective response), and positive drinking consequences. These constructs form a temporal ordering of the experience of alcohol effects, with expectancies occurring primarily before a drinking episode, subjective response to the acute alcohol effects occurring during a drinking episode, and positive drinking consequences occurring during/after a drinking episode.

According to expectancy theory, alcohol use is driven, in large part, by the belief that pleasurable outcomes will ensue, either via enhancement of positive emotions or relief from negative emotions (e.g., Maisto, Carey, & Bradizza, 1999). Of particular importance to understanding how expectancies function in youth, expectancies develop before alcohol use is initiated through exposure to others' drinking behavior (e.g., parents, peers, television/movie actors) and, subsequently, are influenced by personal experience once drinking begins (e.g., Maisto et al., 1999). While expectancies tend to be negative in younger children, adolescents commonly transition to holding more positive beliefs about drinking preceding alcohol initiation (e.g., Dunn & Goldman, 1998). Research has linked expectancies to an array of alcohol-related outcomes including heavy drinking, the experience of alcohol-related problems (i.e., negative drinking consequences), and the development of alcohol use disorder (e.g., Brown, Goldman, & Christiansen, 1985a; Connors, O'Farrell, & Pelcovits, 1988; Cooper, Russell, & George, 1988; Kilbey, Downey, & Breslau, 1998; Lundahl Davis, Adesso, & Lukas, 1997; Morean, Corbin, & Treat, 2012; Pastor & Evans, 2003; Rather & Goldman, 1994; Schuckit & Smith, 2001).

While expectancies are important cognitive drinking determinants, the experience of acute alcohol effects while drinking also predicts subsequent drinking behavior. Specifically, subjective response reflects a genetically heritable sensitivity to the pharmacological effects of alcohol (Schuckit, 2009) and can be assessed during a drinking episode (e.g., Morean et

al., 2013) or retrospectively (e.g., Schuckit et al., 1997; Schuckit et al., 2007). Similar to expectancies, individual differences in subjective response confer risk for heavy drinking, the experience of alcohol-related problems, and the development of alcohol use disorder (for a review see Morean & Corbin, 2010). Of particular relevance for studying subjective response in youth, individual differences in subjective response that are evident during early drinking episodes have been shown to confer risk for negative alcohol related outcomes experienced later in life (e.g., Schuckit et al., 1997; Schuckit et al., 2003; Schuckit et al., 2007).

Finally, while research has focused on negative drinking consequences for decades, the role that positive drinking consequences play in drinking behavior has been examined only recently (e.g., Corbin et al., 2008; Morean & Cooney, 2015). Based on the theory of operant conditioning (Skinner, 1953), the disproportionate experience of positive drinking consequences should prompt continued/escalating alcohol use while the experience of negative consequences should temper use. However, the relationship between positive and negative drinking consequences appears to be more complex, as research on college-aged individuals (Corbin et al., 2008) and on veterans seeking treatment for alcohol use disorder (Morean & Cooney, 2015) indicates that experiencing more positive drinking consequences is associated with heavier drinking and experiencing more alcohol-related problems.

While expectancies and subjective response have been established as interrelated determinants of drinking, the most widely used measures of expectancies and subjective response have not undergone sufficient psychometric evaluation to be considered reliable and valid assessment tools for use with adolescents. Of note, no measure of positive drinking consequences has undergone psychometric evaluation for use with youth. Thus, the current study presents psychometric evaluations of three recently developed measures of expectancies (i.e., the Anticipated Effects of Alcohol Scale; Morean et al., 2012), subjective response (i.e., the Subjective Effects of Alcohol Scale; Morean et al., 2013), and positive drinking consequences (i.e., the Positive Drinking Consequences Questionnaire; Corbin et al., 2008) to determine whether these measures can be used to assess expectancies, subjective response, and positive drinking consequences in youth with a sufficient level of statistical confidence.

We chose to evaluate the psychometrics of the AEAS, SEAS, and PDCQ for several reasons. First, these measures have undergone the most stringent psychometric evaluation of any measures of expectancies, subjective response, and positive drinking consequences in samples of young adults. Second, the AEAS and the SEAS have a number of strengths that may improve our understanding of these constructs in adolescents. The AEAS assesses a comprehensive range of alcohol effects that vary in terms of valence (i.e., negative to positive) and arousal (i.e., sedative to stimulant), specifies the number of drinks that a participant should imagine drinking, and specifies the duration of the hypothetical drinking episode. The AEAS also assesses expectancies that correspond to rising and falling blood alcohol levels, respectively. Similar to the AEAS, the SEAS assesses a comprehensive range of alcohol effects and was developed concurrently with the AEAS to permit direct comparisons of expectancies and subjective response across the ascending and descending limbs of the blood alcohol curve. To date, the SEAS only has been validated for use with

adults participating in alcohol administration studies. Given that it is illegal and unethical to serve alcohol to underage individuals, validation of retrospective versions of the SEAS that could be used to assess adolescents' subjective response at drinking onset (i.e., the first ever drinking experience; SEAS First) and during a recent drinking episode (i.e., SEAS Recent) would make a meaningful contribution to the literature. The most commonly used extant retrospective measure of subjective response to alcohol (The Self-Rating of the Effects of Alcohol Form; Schuckit et al., 1997) assesses the experience of four alcohol-related outcomes (i.e., feeling intoxicated, slurring speech, stumbling, and unwanted falling asleep [i.e., passing out]), most of which occur only at relatively large doses of alcohol and are likely to be experienced as negative. Thus, validation of the SEAS for use with adolescents would permit a richer understanding of early subjective response and its relation to alcohol outcomes given that it uniquely assesses positive, negative, stimulant, and sedative effects.

In light of the demonstrated psychometrics of the AEAS, SEAS, and PDCQ for use with adults, we anticipated that these measures would be psychometrically sound for use with adolescents. Specifically, we anticipated that 1) the latent factor structure of each measure would be replicated in the adolescent sample, 2) each measure would be internally consistent, 3) the measures would be inter-correlated at magnitudes which suggest that the constructs are related, yet distinct, and 4) the measures would evidence test-criterion relationships with alcohol use outcomes (i.e., total drinks consumed in the past month, maximum drinks consumed on a single occasion, and alcohol-related problems).

2. Materials and Method

2.1 Participants

Connecticut high school students (N=248) completed a brief survey assessing alcohol use behavior (53.6% male; 16.50 [1.19] years; 17.5% 9th grade, 19.5% 10th grade, 38.2% 11th grade, 24.8% 12th grade; 71.4% Caucasian; maximum number of drinks consumed on one occasion 9.40 [6.62]; 78.2% lifetime binge drinkers).

2.2 Procedures

The Yale Human Investigation Committee (HIC) approved all study procedures. To ensure participant anonymity and to help ensure that students would feel comfortable reporting about their substance use behavior honestly, both parental consent and student written consent/assent were waived by the HIC. During students' lunch periods, study staff distributed fliers to each table advertising a health behaviors survey and approached each table to assess students' interest in completing a 10-item screening questionnaire to determine study eligibility. Completing the screener was considered assent for this portion of the study. 519 students completed the screener. Students who reported lifetime alcohol use on the screener were eligible to complete a 25-minute survey in the school library at the end of the school day. All eligible students (n = 261) were given a paper ticket that they had to present at the library prior to taking the survey. To ensure that only eligible students were taking the survey (e.g., that an eligible student did not give his or her ticket to an ineligible student), students completed the eligibility screener a second time once they arrived at the library. Of the eligible students, 95.0% attended the library session and eligibility was

confirmed for each of these 248 students. Prior to completing the survey, participants were informed that participation was voluntary and anonymous and that their data would be kept confidential. To maintain anonymity, participants provided verbal assent (“yes”) to indicate willingness to participate in the study. Participants were compensated \$5.

2.3 Measures

2.3.1 Screening Questionnaire—Potential participants completed a 10-item questionnaire to determine study eligibility and returned it to our staff. Students who reported lifetime alcohol use (i.e., “yes” to the question, “Have you ever had a drink of alcohol?”) were invited to complete the larger survey at the end of the day. The remaining 9 items on the screener were filler questions (e.g., Who do you live with? Have you ever smoked a cigarette?). Students were not compensated for completing the screening questionnaire.

2.3.2 Demographic Information—Participants reported on their biological sex, race/ethnicity, and age.

2.3.3. Alcohol Expectancies (Anticipated Effects of Alcohol Scale [AEAS]; Morean et al., 2012)—Participants first imagined engaging in a binge drinking episode (i.e., 4 drinks for females or 5 drinks for males in 2 hours). They subsequently used an 11-point rating scale (0 = not at all; 10 = extremely) to report the extent to which they expected to feel 22 alcohol effects at two time points: immediately after their final drink (i.e., AEAS Ascending, capturing anticipated effects on the ascending limb of the blood alcohol curve) and 90 minutes later (i.e., AEAS descending, capturing anticipated effects on the descending limb). For use with adults, the AEAS has strong psychometric properties and comprises 4 subscales: high arousal positive (e.g., funny), high arousal negative (e.g., rude), low arousal positive (e.g., calm), and low arousal negative (e.g., woozy). Subscale scores for the AEAS were obtained by calculating item means.

2.3.4 Subjective Response to Alcohol (Subjective Effects of Alcohol Scale [SEAS]; Morean et al., 2013)—The SEAS was developed to assess adults’ subjective response to acute alcohol effects and has demonstrated strong psychometric properties when used to assess subjective response in the context of an alcohol administration session. The SEAS uses the same rating scale as the AEAS and its four subscales mirror those of the AEAS. In this study, adolescents used the 11-point rating scale to retrospectively rate their experience of 14 alcohol effects at 2 time points: 1) during their first ever drinking experience (SEAS First), and 2) during their most recent drinking experience (SEAS recent). Subscale scores for the SEAS were obtained by calculating item means.

2.3.5 Positive Drinking Consequences (The Positive Drinking Consequences Questionnaire [PDCQ]; Corbin et al., 2008)—Participants rated how frequently they experienced 14 positive drinking consequences over the past 3 months (response options: 0 times, 1-2, 3-5, 6-10, and >10). The PDCQ was scored by obtaining the mean of all items. Prior research conducted with college students (Corbin et al., 2008) and

with veterans seeking treatment for alcohol use disorder (Morean & Cooney, in press) indicates that the PDCQ comprises one subscale and has strong psychometric properties.

2.3.6 Alcohol Use—Participants reported the typical number of drinks they consume during a drinking episode and the frequency with which they consumed alcohol over the past month. A composite variable reflecting the total number of drinks consumed in the past month was calculated (i.e., quantity x frequency). Participants also reported on the maximum number of drinks they had ever consumed on a single occasion (i.e., lifetime maximum drinks). We assessed lifetime maximum drinks based on previous research that has shown that lifetime maximum drinks is an endophenotype related to alcohol use disorder (Saccone et al., 2000).

2.3.7 Alcohol-Related Problems (The Rutgers Alcohol Problem Index [RAPI]; White & Labouvie, 1989; Neal, Corbin, & Fromme, 2006)—Using the scale prompts “never, 1-2 times, 3-5 times, 6-10 times, >10 times,” participants rated how frequently they experienced each of 23 negative social/health-related consequences of alcohol use over the past three months. Prior research has shown that an 18-item version of the RAPI, in which items are coded as 0 (consequence was not experienced) or 1 (consequence was experienced at least once), is psychometrically superior to the original 23-item version for use with high school and college students (Neal et al. 2006). As such, the 18 psychometrically sound items were recoded as 0 or 1, and a summary score was created to reflect the total number of problems experienced.

2.4 Data Analytic Plan

We examined descriptive statistics associated for total drinks consumed in the past month, maximum drinks consumed in a single episode, and alcohol-related problems. Using Mplus 7.1, we conducted CFAs to determine if the four-factor structures of the AEAS and the SEAS and the one-factor structure of the PDCQ were replicable in adolescents. We then evaluated Cronbach's α values to determine if items within the four subscales of the AEAS and SEAS, respectively, and within the PDCQ were internally consistent. Next, we conducted bivariate correlations among the AEAS Ascending, AEAS Descending, SEAS First, SEAS Recent, and PDCQ to examine interrelationships among these constructs in adolescents. Finally, we conducted univariate general linear models to determine if the AEAS Ascending, AEAS Descending, SEAS First, SEAS Recent, and/or the PDCQ predicted the total number of drinks consumed in the past month, lifetime maximum drinks, and/or alcohol-related problems after accounting for participant sex, race and age. The total number of drinks consumed in the past month was included as a covariate in the models predicting alcohol-related problems.

3. Results

On average, participants reported drinking 23.13 (SD = 37.68) drinks in the past month, a maximum of 9.40 (SD = 6.62) drinks on a single occasion, and 7.05 (5.24) alcohol-related problems. Given skewness (3.10) and kurtosis (12.88) values for the total number of drinks

consumed in the past month, this variable was log transformed prior to using it as an outcome variable.

For the AEAS and SEAS, we fit the four-factor solutions that previously were identified by Morean and colleagues (2012; 2013). For the PDCQ, we fit the single factor structure that previously was identified by Corbin and colleagues (2008). Each of the specified models adequately fit the data based on the following criteria: Bentler's Comparative Fit (CFI) > .90 (Bentler, 1990), Root Mean Square Error of Approximation (RMSEA) < .08 (Browne and Cudek, 1993, MacCallum et al., 1996), and Standardized Root Mean Square Residual (SRMR) < .08 (Hu & Bentler, 1999). See Table 1 for model fit indices.

Cronbach's alpha values indicated that the PDCQ and the subscales of the AEAS Ascending, AEAS Descending, SEAS First, and SEAS Recent evidenced acceptable to excellent internal consistency (See Table 2).

Bivariate correlations indicated that the AEAS Ascending, AEAS Descending, SEAS First, SEAS Recent, and the PDCQ assess interrelated, yet distinct, constructs. Correlations between corresponding subscales of the AEAS Ascending, AEAS Descending, SEAS First, and SEAS Recent (e.g., high arousal positive expectancies with high arousal positive SR at first drinking episode) ranged from small to large (.21-.65). PDCQ scores were associated significantly with all subscales of the SEAS First and SEAS Recent (range .19-.45) and with all subscales of the AEAS, with the exception of low arousal negative (range .03-.39; see Table 3). Average shared variances between measures were as follows: the AEAS and the SEAS First (12.7%), the AEAS and SEAS Recent (21.5%), the SEAS First and the SEAS Recent (29.2%), the PDCQ and the SEAS First (7.7%), the PDCQ and the SEAS Recent (8.9%), the PDCQ and the AEAS (4.4%).

Univariate general linear models indicated that the AEAS Ascending, AEAS Descending, SEAS First, SEAS Recent, and the PDCQ, respectively, accounted for significant variance in total drinks consumed in the past month, lifetime maximum drinks, and alcohol-related problems above and beyond participant sex, race, and age (See Table 4 for AEAS and SEAS; See Table 5 for PDCQ). Regarding the AEAS and SEAS, the high arousal positive subscale of each measure (i.e., AEAS Ascending, AEAS Descending, SEAS First, SEAS Recent) was positively associated with total monthly drinks and maximum drinks consumed on a single occasion. In addition, the high arousal negative subscale of each measure was positively associated with alcohol-related problems. Further, experiencing stronger high arousal negative effects during the first drinking episode was associated with consuming more drinks in the past month; experiencing stronger high arousal negative effects during a recent drinking episode was associated with consuming a larger number of lifetime maximum drinks. Of note, where significant effects emerged, expectancies for both positive and negative sedative effects appeared to protect against heavy drinking. Specifically, expecting stronger low arousal negative effects (e.g., woozy) on the ascending limb and stronger low arousal positive effects (e.g., relaxed) on the descending limb was associated with consuming fewer drinks over the past month. Similarly, expecting stronger low arousal negative and positive effects on the ascending limb was associated with consuming a smaller number of maximum drinks. Regarding the PDCQ, experiencing more positive drinking

consequences was associated with the total number of drinks consumed in the past month (15%), the maximum number of drinks consumed on an occasion (14%), and alcohol-related problems (19%) above and beyond the demographic covariates.

4. Discussion

This study provides evidence for the psychometric properties of the AEAS, the retrospective versions of the SEAS, and the PDCQ for use with adolescents. For each measure, the original latent factor structure was replicated and there was sufficient evidence of internal consistency. As was observed within the adult samples, expectancies, subjective response, and positive drinking consequences as measured by the AEAS, SEAS, and PDCQ, respectively, represented related, yet distinct constructs. Furthermore, the measures evidenced concurrent, test-criterion relationships with drinking outcomes. In this sample, expecting or experiencing stronger high arousal positive effects was associated with heavier drinking but was unrelated to alcohol-related problems. However, one of the central strengths of the AEAS and the SEAS is that each measure assesses a comprehensive range of alcohol effects. The current findings indicate that the novel AEAS and SEAS high arousal negative and low arousal positive subscales appear to have utility for use with adolescents. Specifically, expecting or experiencing stronger high arousal negative effects was associated with the experience of alcohol-related problems across all models, experiencing more high arousal negative effects during the first drinking episode was associated with consuming more drinks in the past month, and experiencing more high arousal negative effects during a recent drinking episode was associated with consuming a larger number of lifetime maximum drinks. While anticipating or experiencing high arousal negative effects conferred alcohol-related risk, expecting to experience more low arousal effects appeared to serve a protective function against heavy drinking where significant findings emerged.

The study findings should be interpreted in light of several limitations. First, we relied on participant self-report, which is influenced by a participant's willingness and ability to answer honestly and accurately. Given that the survey was anonymous, participants may have been more willing to answer honestly. Furthermore, although alcohol-induced memory problems may cloud one's ability to report accurately about their experiences (especially early subjective response), these concerns are mitigated by the fact that participants in the current study began drinking, on average, in the past 2.5 years. Second, the data were cross-sectional, so future longitudinal research is needed to determine whether expectancies, subjective response (first episode and recent episode), and/or positive drinking consequences predict later drinking behavior or the experience of alcohol-related problems. A final limitation, we collected data from high school students in Connecticut, so it is unclear the extent to which the current findings would generalize to other geographic areas or to individuals of other ages. However, the fact that the psychometric properties of these measures now has been replicated in samples of adults and adolescents is encouraging.

5. Conclusion

The current study provides support for the psychometric properties of the AEAS, the SEAS First, the SEAS Recent, and PDCQ for use with adolescents. In addition to providing strong

evidence for construct validity (i.e., replicable latent factor structures), expectancies, subjective response, and positive drinking consequences were reliable (i.e., internally consistent) determinants of drinking and the experience of alcohol-related problems among underage youth. Given the strong psychometrics of the AEAS, SEAS, and PDCQ, researchers are encouraged to consider using these measures to assess expectancies, subjective response, and positive drinking consequences within samples of youth.

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References

- Bentler PM. Comparative fit indexes in structural models. *Psychological Bulletin*. 1990; 107:238–46. [PubMed: 2320703]
- Brown SA, Goldman MS, Christiansen BA. Do alcohol expectancies mediate drinking patterns of adults? *Journal of Consulting and Clinical Psychology*. 1985; 53:512–519. doi:10.1037/0022-006X.53.4.512. [PubMed: 4031207]
- Browne, MW.; Cudek, R. Alternative ways of assessing model fit.. In: Bollen, KA.; Long, JS., editors. *Testing Structural Equation Models*. Sage Publications; Newbury Park: 1993. p. 320
- Connors GJ, O'Farrell TJ, Pelcovits MA. Drinking outcome expectancies among male alcoholics during relapse situations. *British Journal of Addiction*. 1988; 83:561–566. doi:10.1111/j.1360-0443.1988.tb02575.x. [PubMed: 3382814]
- Cooper ML, Russell M, George WH. Coping, expectancies, and alcohol abuse: A test of social learning formulations. *Journal of Abnormal Psychology*. 1988; 97:218–230. doi: 10.1037/0021-843X.97.2.218. [PubMed: 3385075]
- Corbin WR, Meghan ME, Benedict D. The Positive Drinking Consequences Questionnaire (PDCQ): Validation of a new assessment tool. *Addictive Behaviors*. 2008; 33
- Dunn ME, Goldman MS. Age and drinking-related differences in the memory organization of alcohol expectancies in 3rd-, 6th-, 9th-, and 12th-grade children. *Journal of Consulting and Clinical Psychology*. 1998; 66:579–585. doi:10.1037/0022-006X.66.3.579. [PubMed: 9642899]
- Hu LT, Bentler PM. Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structural Equation Modeling-a Multidisciplinary Journal*. 1999; 6:1–55.
- Kilbey MM, Downey K, Breslau N. Predicting the emergence and persistence of alcohol dependence in young adults: The role of expectancy and other risk factors. *Experimental and Clinical Psychopharmacology*. 1998; 6:149–156. doi:10.1037/1064-1297.6.2.149. [PubMed: 9608346]
- Lundahl LH, Davis TM, Adesso VJ, Lukas SE. Alcohol expectancies: Effects of gender, age, and family history of alcoholism. *Addictive Behaviors*. 1997; 22:115–125. doi:10.1016/S0306-4603(96)00022-6. [PubMed: 9022877]
- MacCallum RC, Browne MW, Sugawara HM. Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*. 1996; 1:130–149.
- Maisto, SA.; Carey, KB.; Bradizza, CM. Social learning theory.. In: Blane, HT., editor. *Psychological theories of drinking and alcoholism*. Vol. 2. Guilford Press; New York, NY: 1999. p. 106-163.
- Miech, RA.; Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975–2014: Volume I, Secondary school students. Institute for Social Research, The University of Michigan; Ann Arbor: 2015. Available at <http://monitoringthefuture.org/pubs.html#monographs>
- Morean ME, Cooney JL. Positive drinking consequences predict pre-treatment alcohol use and Alcohol Use Disorder Identification Test scores in veterans seeking substance abuse treatment. *Substance Use and Misuse*. (in press).

- Morean ME, Corbin WR. Subjective response to alcohol: a critical review of the literature. *Alcoholism: Clinical and Experimental Research*. 2010; 34:385–95.
- Morean ME, Corbin WR, Treat TA. The Anticipated Effects of Alcohol Scale: Development and Psychometric Evaluation of a Novel Assessment Tool for Measuring Alcohol Expectancies. *Psychological Assessment*. 2012; 24:1008–23. [PubMed: 22708572]
- Morean ME, Corbin WR, Treat TA. The Subjective Effects of Alcohol Scale: Development and Psychometric Evaluation of a Novel Assessment Tool for Measuring Subjective Response to Alcohol. *Psychological Assessment*. 2013; 25:780–95. [PubMed: 23647036]
- Neal DJ, Corbin WR, Fromme K. Measurement of alcohol-related consequences among high school and college students: application of item response models to the Rutgers Alcohol Problem Index. *Psychological Assessment*. 2006; 18:402–414. [PubMed: 17154761]
- Pastor AD, Evans SM. Alcohol outcome expectancies and risk for alcohol use problems in women with and without a family history of alcoholism. *Drug and Alcohol Dependence*. 2003; 70:201–214. doi:10.1016/S0376-8716(03)00007-3. [PubMed: 12732414]
- Rather BC, Goldman MS. Drinking-related differences in the memory organization of alcohol expectancies. *Experimental and Clinical Psychopharmacology*. 1994; 2:167–183. doi:10.1037/1064-1297.2.2.167.
- Saccone NL, Kwon JM, Corbett J, Goate A, Rochberg N, Edenberg HJ, Foroud T, Li TK, Begleiter H, Reich T, Rice JP. A genome screen of maximum drinks as an alcoholism phenotype. *American Journal of Medical Genetics*. 2000; 96:632–7. [PubMed: 11054770]
- Schuckit MA. An overview of genetic influences in alcoholism. *Journal of Substance Abuse Treatment*. 2009; 36:S5–14. [PubMed: 19062348]
- Schuckit MA, Smith TL. A comparison of the correlates of DSM–IV alcohol abuse or dependence among more than 400 sons of alcoholics and controls. *Alcoholism: Clinical and Experimental Research*. 2001; 25:1–8. doi:10.1111/j.1530-0277.2001.tb02120.x.
- Schuckit MA, Smith TL, Danko GP, Isacescu V. Level of response to alcohol measured on the self-rating of the effects of alcohol questionnaire in a group of 40-year-old women. *Am J Drug Alcohol Abuse*. 2003; 29(1):191–201. [PubMed: 12731688]
- Schuckit MA, Smith TL, Danko GP, Pierson J, Hesselbrock B, Bucholz KK, Kramer J, Kuperman S, Dietiker C, Brandon R, Chan G. The ability of the Self-Rating of the Effects of Alcohol (SRE) Scale to predict alcohol-related outcomes five years later. *Journal of Studies on Alcohol and Drugs*. 2007; 68(3):371–8. [PubMed: 17446976]
- Schuckit MA, Smith TL, Danko GP, Trim R, Bucholz KK, Edenberg HJ, Hesselbrock V, Kramer JJ, Dick DM. An evaluation of the full level of response to alcohol model of heavy drinking and problems in COGA offspring. *Journal of Studies on Alcohol and Drugs*. 2009; 70:436–45. [PubMed: 19371495]
- Schuckit MA, Smith TL, Tipp JE. The Self-Rating of the Effects of alcohol (SRE) form as a retrospective measure of the risk for alcoholism. *Addiction*. 1997; 92(8):979–88. [PubMed: 9376780]
- Skinner, BF. *Science and human behavior*. Macmillan; New York: 1953.
- Substance Abuse and Mental Health Services Administration. [September 1, 2015] Report to Congress on the prevention and reduction of underage drinking. 2012. Available at: <http://store.samhsa.gov/product/PEP12-RTCUD>.
- Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2014.
- White HR, Labouvie EW. Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*. 1989; 50(1):30–37. [PubMed: 2927120]

Highlights for Review

- Alcohol expectancies, subjective response to alcohol, and positive drinking consequences are well-established determinants of drinking, but few measures of these constructs have undergone sufficient psychometric validation for use with adolescents.
- We present psychometric analyses of the Anticipated Effects of Alcohol Scale, retrospective versions of the Subjective Effects of Alcohol Scale (i.e., first ever drinking episode and most recent drinking episode), and the Positive Drinking Consequences Questionnaire in a sample of 248 high school students.
- The original latent factor structure of each measure was replicated, there was sufficient evidence of internal consistency, the constructs were related, yet distinct, and each measure evidenced concurrent, test-criterion relationships with drinking outcomes (i.e., total drinks consumed in the past month, maximum number of drinks consumed on a single occasion, and alcohol-related problems).
- The Anticipated Effects of Alcohol Scale, the retrospective Subjective Effects of Alcohol Scale, and the Positive Drinking Consequences Questionnaire are psychometrically sound for use with adolescents.

Table 1

Model fit indices associated with a four-factor AEAS structure, a four-factor SEAS structure, and a 1-factor PDCQ structure

	<u>CFI</u>	<u>RMSEA</u>	<u>SRMR</u>
AEAS Ascending	.916	.056	.073
AEAS Descending	.918	.069	.079
SEAS First	.966	.053	.042
SEAS Recent	.940	.077	.056
PDCQ	.930	.059	.047

Note. Abbreviations are CFI (Bentler's Comparative Fit Index); RMSEA (Root Mean Square Error of Approximation); SRMR (Standardized Root Mean Square Residual); AEAS Ascending (expectancies on the ascending limb); AEAS Descending (expectancies on the descending limb); SEAS First (subjective response on the first drinking occasion); SEAS Recent (subjective response on the most recent drinking occasion); PDCQ (positive drinking consequences).

Table 2

Internal consistency of the AEAS subscales, the SEAS subscales, and the PDCQ

	AEAS Ascending	AEAS Descending	SEAS FIRST	SEAS RECENT	PDCQ
HIGH+	.91	.93	.91	.92	.87
HIGH–	.82	.86	.87	.92	
LOW+	.72	.76	.84	.83	
LOW–	.77	.85	.89	.90	

Note. Alpha values > .70 indicate acceptable internal consistency. Abbreviations are: AEAS Ascending (expectancies on the ascending limb); AEAS Descending (expectancies on the descending limb); SEAS First (subjective response on the first drinking occasion); SEAS Recent (subjective response on the most recent drinking occasion); HIGH+ (high arousal positive); HIGH– (high arousal negative); LOW+ (low arousal positive); LOW– (low arousal negative); PDCQ (positive drinking consequences).

Table 3

Bivariate correlations between AEAS subscales, SEAS subscales, and the PDCQ

	SEAS FIRST				SEAS RECENT				PDCQ
	HIGH+	HIGH-	LOW+	LOW-	HIGH+	HIGH-	LOW+	LOW-	
AEASA									
HIGH+	.44***	.15*	.27***	.22**	.59***	.20**	.37***	.23***	.39***
HIGH-	.05	.43***	.13*	.18**	.07	.52***	.06	.23***	.20**
LOW+	.26***	.16*	.35***	.22**	.28***	.15*	.39***	.19**	.24***
LOW-	.12	.12	.13	.21**	.13	.11	.07	.37***	.03
AEASD									
HIGH+	.34***	.19**	.27***	.15*	.58***	.23***	.45***	.13*	.32***
HIGH-	.05	.42***	.14*	.14*	.12	.49***	.12	.22***	.20**
LOW+	.31***	.15*	.35***	.16*	.43***	.08	.39***	.14*	.21**
LOW-	.11	.17**	.13*	.32***	.16*	.20**	.13*	.38***	.09
SEAS FIRST									
HIGH+					.56***	.18**	.38***	.26***	
HIGH-					.22***	.65***	.26***	.31***	
LOW+					.31***	.24***	.53***	.22***	
LOW-					.33***	.29***	.28***	.42***	
PDCQ	.34***	.38***	.19**	.20**	.45***	.44***	.30***	.30***	

Note.

bolded significant correlations indicate the relationship between corresponding subscales (e.g., high arousal positive expectancies with high arousal positive subjective response).

AEASA (expectancies on the ascending limb); AEASD (expectancies on the descending limb); SEAS First (subjective response on the first drinking occasion); SEAS Recent (subjective response on the most recent drinking occasion); HIGH+ (high arousal positive); HIGH- (high arousal negative); LOW+ (low arousal positive); LOW- (low arousal negative); PDCQ (positive drinking consequences); HIGH+ (high arousal positive); HIGH- (high arousal negative); LOW+ (low arousal positive); LOW- (low arousal negative).

 $p < .001$

**
 $p < .01$

*
 $p < .05$

Table 4

AEAS and SEAS subscales predict total number of drinks consumed in the past month, maximum drinks consumed on a single occasion, and alcohol-related problems

	TOTAL NUMBER OF DRINKS CONSUMED IN THE PAST MONTH							
	AEASA		AEASD		SEAS FIRST		SEAS RECENT	
	<u>F (1, 226)</u>	<u>η_p^2</u>	<u>F (1, 226)</u>	<u>η_p^2</u>	<u>F (1, 224)</u>	<u>η_p^2</u>	<u>F (1, 227)</u>	<u>η_p^2</u>
MODEL	9.31	.22 ***	9.04	.22 ***	7.95	.20 ***	8.40	.21 ***
SEX	16.33	.07 ***	21.99	.09 ***	24.08	.10 ***	16.87	.07 ***
RACE	1.96	.01	1.05	.01	1.59	.01	1.56	.01
AGE	5.90	.03 *	2.29	.01	6.90	.03 **	5.19	.02 *
HIGH+	9.46	.04 **	20.73	.08 ***	8.53	.04 **	6.52	.03 *
HIGH-	3.23	.01	.00	.00	4.50	.02 *	3.63	.02
LOW+	2.68	.01	7.42	.03 **	2.03	.01	.10	.00
LOW-	11.81	.05 ***	.10	.00	.57	.00	.01	.00

	MAXIMUM DRINKS CONSUMED ON ONE OCCASION (LIFETIME)							
	<u>F (1, 226)</u>	<u>η_p^2</u>	<u>F (1, 226)</u>	<u>η_p^2</u>	<u>F (1, 225)</u>	<u>η_p^2</u>	<u>F (1, 227)</u>	<u>η_p^2</u>
MODEL	8.24	.20 ***	6.92	.18 ***	7.25	.18 ***	9.54	.23 ***
SEX	24.17	.10 ***	25.93	.10 ***	29.97	.12 ***	23.96	.10 ***
RACE	.17	.00	.26	.00	.02	.00	.02	.00
AGE	1.06	.01	.49	.00	.11	.00	.75	.00
HIGH+	8.77	.04 **	7.28	.03 **	8.23	.04 **	13.65	.06 ***
HIGH-	.07	.00	.02	.00	1.31	.01	3.92	.02 *
LOW+	4.94	.02 *	.17	.00	3.15	.01	.02	.00
LOW-	4.32	.02 *	2.36	.01	.48	.00	.24	.00

	ALCOHOL-RELATED PROBLEMS							
	<u>F (1, 224)</u>	<u>η_p^2</u>	<u>F (1, 224)</u>	<u>η_p^2</u>	<u>F (1, 222)</u>	<u>η_p^2</u>	<u>F (1, 227)</u>	<u>η_p^2</u>
MODEL	8.14	.23 ***	7.85	.22 ***	13.62	.33 ***	12.29	.30 ***
SEX	18.66	.08 ***	26.08	.10 ***	21.40	.09 ***	16.44	.07 ***
RACE	.00	.00	.05	.00	.36	.00	.03	.00
AGE	.26	.00	.44	.00	1.68	.01	.25	.00
# DRINKS	3.37	.02	4.35	.02 *	1.54	.01	1.20	.01
HIGH+	1.08	.01	.44	.00	.03	.00	1.49	.01
HIGH-	15.89	.07 ***	7.00	.03 **	39.18	.15 ***	27.01	.11 ***
LOW+	.09	.00	.00	.00	3.49	.02	.00	.00
LOW-	.03	.00	.85	.00	.05	.00	3.11	.01

Note.

bolded significant findings indicate a positive relationship; ***bolded, italicized*** significant findings indicate an inverse relationship. Abbreviations are: AEASA (expectancies on the ascending limb); AEASD (expectancies on the descending limb); SEAS First (subjective response on the first drinking occasion); SEAS Recent (subjective response on the most recent drinking occasion); # DRINKS (total # of drinks in the past month); HIGH+ (high arousal positive); HIGH- (high arousal negative); LOW+ (low arousal positive); LOW- (low arousal negative). Reference groups are females and non-Caucasian individuals.

 $p < .001$

**
 $p < .01$

*
 $p < .05$

Table 5

Positive drinking consequences predict total number of drinks consumed in the past month, maximum drinks consumed on a single occasion, and alcohol-related problems

	# DRINKS (PAST MONTH)		MAXIMUM DRINKS (LIFETIME)		ALCOHOL-RELATED PROBLEMS	
	F (1, 231)	η_p^2	F (1, 231)	η_p^2	F (1, 228)	η_p^2
MODEL	20.26	.26***	18.79	.25***	21.11	.32***
# DRINKS	--	--	--	--	.29	.00
SEX	13.27	.05***	18.19	.07***	24.77	.10***
RACE	1.29	.01	.01	.00	.18	.00
AGE	6.36	.03*	.63	.00	.44	.00
PDCQ	39.02	.15***	37.27	.14***	52.44	.19***

Note.

** $p < .01$

-- denotes a variable that was not included in the model.

Abbreviations are: # DRINKS (total # of drinks in the past month); PDCQ (positive drinking consequences). Reference groups are females and non-Caucasian individuals.

 $p < .001$

*
 $p < .05$