Validity and Reliability of the CEOA:
Alcohol Outcome Expectancies and the Subjective Evaluation of those Effects

Bryan C Crook, Pi-Ying Chen, Tracey A. Garcia, B. A., and Lindsay S. Ham, Ph. D
Florida International University, Miami, FL
Janine V. Olthius and Byron L. Zamboanga Smith College, Northampton, MA

Introduction

- Increased positive alcohol expectancies (e.g., acting sociable, increased courage) have been shown to be related to increased rates of drinking and drinking problems in White European American (e.g., Brown, 1985) and Hispanic college students (Zamboanga, 2003).

- It has also been reported that expectancies labeled as negative by researchers (e.g., decreased inhibitions, acting aggressively) are predictive of alcohol use among college students (Fromme et al., 1994).

- Although the likelihood of a specific outcome from drinking is generally rated by participants, the determination of the "negative" or "positive" value of an outcome has been incorporated in an expectancy measures by researchers and theorists (e.g., Fromme et al., 1993).

  - However an individual may value, or desire, a negatively labeled expectancy.

  - Thus, depending on an individual's valuation of an expectancy, it is conceivable that a negatively labeled expectancy outcome would be associated with increased alcohol consumption even though these "negative" expectancies have been shown to be predictive of low drinking consumption levels or even abstention from alcohol use, especially in the case that a participant highly values this "negative" expectancy.

- The Comprehensive Effects of Alcohol scale (CEOA) was specifically developed to assess positive expectancies, negative expectancies, and valuations of these expectancies. However, the psychometric properties of the CEOA have been evaluated in primarily Anglo-American samples (Fromme et al., 1993; Ham et al., 2005; Valdivia & Stewart, 2005).

- The current study extends previous work (Fromme et al., 1993; Ham et al., 2005) by examining the psychometric properties of the CEOA in an ethnically diverse university sample (predominantly Hispanic).

Methods

- 333 predominantly Hispanic student volunteered to participate. For a summary of variables please see Table 1.
- In addition to demographic information, students completed instruments assessing alcohol expectancies, valuations, and hazardous alcohol use.

Comprehensive Effects of Alcohol (CEOA; Fromme et al., 1993)

- The CEOA is a 38-item self-report questionnaire that measures both alcohol outcome expectancies (on a 1 to 4 scale; Disagree to Agree, respectively) and the subjective evaluation of those effects (on a 1 to 5 scale; Bad to Good respectively).
- "Positive" (SOC= Sociability, LC= Liquid Courage, TR=Tension Reduction, Sex=Sexuality); "Negative" (CBI= Cognitive Behavioral Impairment, RA= Risk and Aggression, SP= Self-Perception)

Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 1992)

- The AUDIT is a 10-item measure that assesses hazardous drinking.

Table 1.
Summary of Sample Demographic and Study Variables (N = 333)

Gender	
Male	103 (31%)
Female	224 (69%)
Ethnicity	
White Hispanic/Latino	186 (56%)
Black Hispanic/Latino	14 (4%)
Caucasian	33 (10%)
African-American	32 (10%)
Asian/Pacific Islander	12 (4%)
Mixed	39 (12%)
Other	16 (5%)
Age	
18	118 (35%)
19	102 (30%)
20	38 (11%)
21	23 (7%)
22	15 (5%)
23-25	24 (7%)
26-30	8 (2%)
30+	7 (2%)

Table 4.
Principal Components Analyses of the Comprehensive Effects of Alcohol: Obliquely-Rotated Factor Loadings (Pattern Matrix) for Expectancies in the Student Sample (N=333)

	Factor Loading	Theoretical Scale
Factor 1: Risk & Aggression, Liquid Courage		
Eigenvalue = 9.51		
Variance Explained = 25.03%		
37. Powerful	.76	LC
19. Brave and daring	.68	LC
10. Dominant	.66	RA
25. Aggressive	.61	RA
22. Courageous	.58	LC
36. Take risks	.54	RA
35. Tough	.52	RA
20. Unafraid	.48	LC
9. Neglect obligations	(.35)	CBI
17. Loud, boisterous, noisy	(.34)	RA
Factor 2: Self-Perceptions, Cognitive Behavioral Impairment		
Eigenvalue = 4.58		
Variance Explained = 12.06%		
33. Self-critical	.76	SP
28. Guilty	.70	SP
4. Problems worse	.64	SP
30. Moody	.56	SP
23. Shaky, jittery next day	(.36)	CBI
Factor 3: Cognitive Behavioral Impairment		
Eigenvalue = 2.3		
Variance Explained =6.05%		
26. Responses slow	.79	CBI
8. Difficulty thinking	.79	CBI
6. Writing impaired	.75	CBI
2. Dulled senses	.63	CBI
15. Clumsy	.44	CBI
Factor 4: Tension Reduction, Liquid Courage		
Eigenvalue = 2.01		
Variance Explained =5.3%		
29. Calm	.76	TR
18. Peaceful	.75	TR
27. Relaxed	.65	TR
27. Creative	.45	LC
Factor 5: Sexuality		
Eigenvalue = 1.45		
Variance Explained =3.81%		
32. Better lover	.78	SEX
12. Enjoy sex more	.77	SEX
7. Sexy	.56	SEX
16. Act out fantasies	.45	SEX
Factor 6: Sociability		
Eigenvalue = 1.27		
Variance Explained =3.35%		
38. Sociable	.87	SOC
1. Outgoing	.84	SOC
24. Energetic	.75	SOC
34. Talkative	.69	SOC
14. Friendly	.68	SOC
3. Humorous	.64	SOC
5. Express Feelings	.45	SOC
31. Easier to talk to people	.43	SOC
Factor 7: Cognitive Behavioral Impairment		
Eigenvalue = 1.06		
Variance Explained =2.80%		
11. Head fuzzy	-.72	CBI
13. Dizzy	-.71	CBI

Table 5.
Principal Components Analyses of the Comprehensive Effects of Alcohol: Obliquely-Rotated Factor Loadings (Pattern Matrix) for Valuations in the Student Sample (N=333)

	Factor Loading	Theoretical Scale
Factor 1: Risk & Aggression, Liquid Courage		
Eigenvalue = 11.58		
Variance Explained = 30.47%		
19. Brave and daring	.78	LC
37. Powerful	.77	LC
22. Courageous	.63	LC
36. Take risks	.56	RA
20. Unafraid	.49	LC
10. Dominant	(.38)	RA
Factor 2: Cognitive Behavioral Impairment, Risk & Aggression		
Eigenvalue = 5.96		
Variance Explained = 15.66%		
26. Responses slow	.83	CBI
13. Dizzy	.78	CBI
8. Difficulty thinking	.74	CBI
11. Head fuzzy	.66	CBI
6. Writing impaired	.64	CBI
15. Clumsy	.62	CBI
2. Dulled senses	.61	CBI
17. Loud, boisterous, noisy	.42	RA
Factor 3: Sociability, Tension Reduction, Liquid Courage		
Eigenvalue = 1.64		
Variance Explained = 4.32%		
38. Sociable	.88	SOC
1. Outgoing	.86	SOC
14. Friendly	.82	SOC
24. Energetic	.72	SOC
3. Humorous	.72	SOC
34. Talkative	.70	SOC
29. Calm	.63	TR
27. Creative	.53	LC
5. Express Feelings	.42	SOC
31. Easier to talk to people	.41	SOC
Factor 4: Self-Perception, Risk & Aggression, Cognitive Behavioral Impairment		
Eigenvalue = 1.48		
Variance Explained = 3.89%		
28. Guilty	.75	SP
25. Aggressive	.74	RA
33. Self-critical	.67	SP
4. Problems worse	.66	SP
23. Shaky, jittery next day	.55	CBI
9. Neglect obligations	.55	CBI
30. Moody	.52	SP
35. Tough	(.35)	RA
Factor 5: Sexuality, Tension Reduction		
Eigenvalue = 1.22		
Variance Explained = 3.22		
32. Better lover	.70	SEX
12. Enjoy sex more	.62	SEX
18. Peaceful	.60	TR
7. Sexy	.57	SEX
16. Act out fantasies	.55	SEX
27. Relaxed	.44	TR

Results

- Internal Consistency of the CEOA's 4 positive and 3 negative subscales was supported for both Expectancies and Valuations across all subscales as hypothesized.
  - As shown in Table 2, Chronbach's alpha values indicated adequate to good internal reliability.
- In general, expectancies and valuations were correlated with the hazardous drinking (assessed by the AUDIT) and this demonstrated concurrent validity, as shown in Table 3. However, the correlations for CBI expectancies and SP expectancies and valuations scales were not significant.

Table 2. Internal Consistency of the CEAO's sub-scales.

Cronbach's Alpha	Factor 1: Expectancies	Factor 2: Valuations
Scale		
1. Sociability	.87	.89
2. Tension Reduction	.72	.73
3. Liquid Courage	.81	.82
4. Sexuality	.77	.79
5. Cognitive and Behavioral Impairment	.83	.87
6. Risk and Aggression	.75	.77
7. Self-Perception	.70	.75

Table 3. Correlations of Expectancies and Valuations Sub-Scales of the CEOA Scores with the AUDIT.

	Sociability	Tension Reduction	Liquid Courage	Sexuality	Cognitive Behavioral Impairment	Risk and Aggression	Self-Perception
Expectancies	.29***	.26***	.36***	.28***	<.01	.26***	-.06
Valuations	.24***	.20***	.24***	.17*	.12*	.22***	.01

*Note. *p<.05. **p<.01. ***p<.001.*

- Factor Structure was examined separately for expectancies and valuations using exploratory principal components analyses (PCAs) with oblique rotation was used (i.e., Oblimin; cf., Fromme et al., 1993). The number of factors to retain was through consideration of: (a) examination of Eigenvalues and scree plot; (b) simple structure; and (c) factor interpretability. In interpreting factors, a cutoff of ≥ |.40| was used to determine salient loadings. Table 4 shows the rotated factor loadings for the items on scale, Eigenvalues, and variance accounted for the seven-factor expectancies solution. Table 5 presents this information for the five-factor Valuations solution.

Discussion

- The goal of the current study was to examine the CEOA's psychometric properties in a ethnically diverse population to meet the need for a more comprehensive measure of alcohol expectancies and valuations for use in diverse samples.

- Analyses related to internal consistency and concurrent validity provide support for the use of CEOA in an ethnically diverse college sample.

- Both negative and positive expectancies as well as valuations had important contributions to the prediction of hazardous drinking, supporting the notion that negative expectancies (Jones & McMahon, 1994) and valuations (Jones & McMahon, 1996) are important predictors as well as positive expectancies.

- In examining the factor structure of the expectancies, it was found that the factors loaded generally the same as originally reported (Fromme et al., 1993); though, the factors of RA and LC demonstrate the lack of distinct "positive" and "negative" expectancies. However, this is similar to findings of Ham et al., (2005), and may indicate that items on LC and RA scales may be tapping the same construct.

- Therefore, "positive" and "negative" expectancies were not always viewed as such by participants. It appeared that valuations of expectancies are important constructs independent from expectancies that need to be furthered studied for potential usefulness in assessment and treatment.

- Given the promising psychometric properties in this multicultural sample and high internal consistency the CEOA has potential usefulness in assessment and treatment.