



Factor structure of the alcohol expectancies questionnaire among adolescents in rural Ghana

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Abstract

Introduction: Children's early experiences with alcohol inform the development of alcohol-related beliefs which are known to predict alcohol consumption during the critical stage of adolescence. Yet, there has been considerably less research into these alcohol-related cognitions in low- and middle-income countries (LMIC) and existing measures of these beliefs are highly reflective of Western contexts, which may not be fully appropriate for use in LMICs. The aim is to ascertain the construct validity of the Alcohol Expectancies Questionnaire (AEQ) in a non-Western sample.

Methods: A cross-sectional diagnostic accuracy study involving 500 adolescents aged 10 to 18 years randomly selected from the database of the Navrongo Health and Demographic Surveillance System. Participants were administered the locally back translated version of the 34-item AEQ. Confirmatory factor analysis using the *lavaan* package in R was conducted to generate indices for the factor structure of the AEQ.

Results: Confirmatory factor analyses showed that while groupings of positive and negative expectancies were similar to those observed when expectancies have been assessed previously in Western studies, these formed a single 'alcohol expectancy' factor. Questions relating to positive tension reduction and negative physical expectancies showed inconsistent responses in this study.

Discussion and Conclusions: Commonly used tools for the assessment of alcohol expectancies may not be suitable for use in Ghana, possibly owing to their development and validation in Western contexts. These findings have implications for the assessment of alcohol-related beliefs in LMIC settings and begin to map out a research agenda to develop more contextually and culturally attune alcohol assessments.

KEYWORDS

adolescents, alcohol consumption, alcohol expectancies, factor structure, sub-Saharan Africa

1 | INTRODUCTION

Notwithstanding international efforts to raise awareness of alcohol harms [1] and a relative decline of alcohol consumption among younger populations in many Western

countries [2, 3], alcohol consumption continues to increase in many developing countries, including those on the African continent [4]. This growth is partly brought on by aggressive alcohol industry activities aiming to capture new markets in the face of tighter regulation in existing

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ones [5–7], and is facilitated by globalisation and economic liberalisation. Alcohol use is already a leading risk factor for death and disability among youth aged 15 to 24 years in sub-Saharan Africa [8–12] where around 40% of the population is aged 15 years and younger, compared to a global average of 26% in this age group [13]. Ghana's population, for example, is predominantly young (64% <24 years) [14] and previous research indicates that 12% of Ghanaian adolescents are often drunk [15], while a further 23% drink riskily [16]. Notwithstanding, compared to Western contexts alcohol research with a particular focus on sub-Saharan Africa, is scant. This includes a lack of valid and reliable alcohol measures to facilitate research and intervention efforts. Towards filling this gap, the current research reports the findings of a cross-sectional study of adolescents in Ghana with a focus on alcohol expectancies.

Defined as beliefs about what happens when individuals drink alcohol, alcohol expectancies emerge throughout childhood and adolescence [17–21] and are modifiable through primary intervention efforts [18, 22–24], especially when ideas about alcohol begin to transform into concrete behaviours [20, 25, 26] during critical developmental periods such as the transition from childhood to adulthood. To wit, alcohol consumption can be understood theoretically as a motivated pursuit whereby people's decisions to drink are based on the expectation that consumption will result in positive outcomes [27], and the Alcohol Expectancy Questionnaire [27] was designed to assess these beliefs. The measure is validated in both adults and adolescents previously, with broadly equivalent results in terms of apparent factor structure [28, 29].

Research in relatively economically advantaged nations documents that alcohol-related beliefs are powerful independent (of the influence of biological; [30]) predictors of problematic consumption [31, 32]. Such beliefs have been consistently identified in young children [33, 34], develop throughout adolescence as a consequence of experiences and exposure [29, 35–38], and are predictive of a variety of drinking behaviours, including consumption quantity, frequency and onset [38–42]. In short, existing studies indicate that children understand the prevailing practices surrounding adult consumption at an early age [29, 43, 44]. There is also ample evidence that children's alcohol cognitions are predictive of (risky) drinking levels even years later [29, 40, 44, 45]. The Alcohol Expectancies Questionnaire (AEQ) is designed to measure these alcohol beliefs and there is evidence from factor analysis that the question items on these beliefs have produced consistent responses among adolescents in Western settings [46]. Research is needed to examine how the increasing availability and use of alcohol in Ghana may manifest in

culturally shaped social cognitive expectations associated with the drug.

Indeed, when considering the importance of children's early alcohol experiences in forming relevant beliefs, it is striking that there has been considerably less research in Africa to examine whether alcohol-related cognitions parallel those in non-Western countries. As an exception to this lack of African research in this domain, we note a small-scale comparative study on drinking motives between Ugandan ($n = 26$) and German ($n = 49$) treatment seeking adult men, which suggests motives may be similar across these cultures [47]. With existing African research utilising alcohol expectancy measures primarily focussing on sexual expectancies [48–50] or beliefs among those with HIV [51] there have hitherto been no examinations of the full spectrum of alcohol expectancies in the African continent. Peruvian research in another low- and middle-income country (LMIC) found limited evidence that factor loadings established in the West were not fully applicable in the South American context [52, 53]. Building on this formative work, future efforts are required as it is also the case that existing measures of relevant constructs are highly reflective of the 'Western' settings in which they were developed [54] and may not be fully appropriate for use in LMICs. Such research is important because if standardised questionnaires do not perform consistently across diverse population groups, in terms of their factor loadings, they may require adjustments to better capture the nuanced beliefs associated with alcohol consumption. The present study aims to contribute towards filling these gaps by assessing whether the alcohol outcome expectancies scale and factor structure found by Leigh and Stacy [27] held for the current sample. We were guided by the following research questions: How does the alcohol expectancy questionnaire perform when delivered in a young Ghanaian sample? Does its factor structure mirror that observed in 'Western' samples?

2 | METHODS

2.1 | Setting

The study was conducted in Navrongo, Ghana, within the Navrongo Health and Demographic Surveillance Site area (under the Centre of the Ministry of Health of Ghana). The Navrongo Health and Demographic Surveillance Site is a community-based routine data collection system involving more than 157,000 people under continuous 4-monthly surveillance. The population is mainly rural (90% of the population live in rural communities), with a small suburban area around the capital.

2.2 | Participants

Based on an assumed effect size of 0.15 and power of 95%, we estimated a minimum sample size of 500. Primary and junior high school adolescents, and those currently not in school aged 10 to 18 years were randomly selected from the data base of the Navrongo Health and Demographic Surveillance Site and thereafter approached to participate. The selection ensured an equal gender ratio of 100 adolescents in five age cohorts (10, 12, 14, 16 and 18 years).

2.3 | Survey procedures

This cross-sectional research was undertaken as part of a Global Challenges Research Fund project to afford a detailed understanding of how alcohol use is viewed, shaped and experienced among adolescents in Navrongo-Ghana. Ethical approval for the project was granted by the Navrongo Health Research Centre's Institutional Review Board (NHRCIRB389).

2.3.1 | Training and recruitment

Experienced graduate research assistants (RAs) were recruited and trained in forward translation of the study measures into the local languages (Kasem and Nankam) by bilingual RAs. Agreement on the correct translation was by consensus. Listings (printed record of key participant demographics) of the randomly selected children and adolescents were generated in order that RAs could visit homes for assessment. Assent was obtained directly from younger adolescents aged 10, 12, 14 and 16 years, after obtaining informed consent from their parents/caregivers using the opt-out method [55, 56]. Older adolescents (18 years) were asked to provide informed consent.

2.3.2 | Administration of measures

Data were collected electronically using tablet computers between September and October 2020. Following informed consent/assent, the RA administered the measures to adolescents using either of the study's three languages starting with the socio-demographic questionnaire. The Alcohol Expectancy Questionnaire was administered along with other alcohol measures not used in the present analyses. All measures were completed on the same day, taking an average of 15 min in total.

2.3.3 | Measures for this study

1. The AEQ [27] is a 34-item measure where potential consequences of alcohol consumption are presented for participants to gauge how likely these consequences happen or can happen to them (on a six-point Likert: from 'no chance' to 'certain to happen'). These divide into positive and negative expectancies and eight lower order factors (four positive: social, fun, sexual and tension reduction; and four negative: social, emotional, physical, cognitive/performance). The positive expectancy factor was predicted by social facilitation, sex, fun and tension reduction/negative reinforcement, with negative expectancy predicted by negative emotions, negative social, physical and cognitive performance factors. It presents good reliability and predictive validity indices [57–59]. In its initial development it recorded Cronbach's reliability coefficients of 0.94 and 0.88 for positive and negative expectancies respectively, indicating good to excellent internal consistency [27].

Given the survey was interviewer administered, the short phrases of statements in the original version were converted to questions to make it easy for the respondent to understand the items. A similar approach was used in a previous validation study in Ghana which enhanced the psychometric properties of the validated measures [60]. Non-drinkers were asked to answer according to what they thought would have happened if they consumed drinks containing alcohol.

2. The AUDIT is a 10-item screening questionnaire originally developed by the World Health Organization for the early detection of hazardous and harmful alcohol consumption (alcohol abuse), including alcohol dependence in primary health care [61]. Each item is scored on a scale of 0 to 4 and generates a continuously distributed total score ranging from 0 to 40. Based on its initial validation, summed up scores of 8–15, 16–19, and 20 or more, represent probable diagnosis of hazardous use, harmful use, and alcohol dependence, respectively. In its initial development, it recorded sensitivities in the mid 0.90 and specificities averaging 0.80 for various degrees of problematic drinking at a cut-off of 8. The AUDIT was included to provide an estimate of the prevalence of the severity of drinking.

2.4 | Analysis

The data set was first checked for univariate outliers, and pairwise plots examined for any heteroscedasticity. Multivariate outliers were checked as per recommendations [62],

with no participants excluded. However, eight participants lacking alcohol outcome expectancy data were excluded, leaving a final analysis sample of 492.

To assess how the original alcohol expectancies model of Leigh and Stacy [27] applied to the current sample, all items were retained for inclusion in a confirmatory factor analysis using the lavaan package in R [63]. Modification indices and existing path coefficients were then examined for any warranted amendments to the Leigh and Stacy model (potentially removing a path coefficient if it was not significantly different from zero or adding a path coefficient that would significantly improve the model; if the modification index was >100 and made theoretical sense). To verify/cross test our models, the data set was then randomly split into two halves using the *splitSample* function on R (part of *SemTools*), with the revised model tested in one half. Following an iterative process to produce a statistically satisfactory and theoretically grounded model, the final model was then verified in the other (randomly split) half of the dataset. Model fit indices of comparative fit index (CFI), root mean square error of approximation (RMSEA) and standard root mean square residual (SRMR). Values of CFI above 0.9 indicate excellent fit [64], while RMSEA values of 0.01, 0.05 and 0.08 indicate excellent, good and mediocre fit, respectively [65]. SRMR values close to 0 indicate good fit [66]. Good fit indicates the model is reasonably consistent with the data. The measurement invariance of the final model was then tested across age and gender, where changes in CFI of less than -0.01 were regarded as evidence of invariance [67]. IBM SPSS Statistics for Windows (version 25) was used for initial data analyses. The lavaan package version 0.6-9 [63] for RStudio [68] was used for factor analysis of the data, as well as measurement invariance test.

3 | RESULTS

3.1 | Participant characteristics and prevalence of alcohol use disorder

All 500 target respondents (100%) participated in the study. There were slightly more males than females (male: 50.2%; female: 49.8%). The age cohorts were equally distributed in the sample. Prevalence of hazardous to harmful alcohol use disorder was 8.8% (95% confidence interval 6.6% to 11.6%). This translates to 5.2% (95% confidence interval 3.5% to 7.5%) Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition moderate to severe alcohol use disorder. Table 1 provides a summary of participant characteristics.

TABLE 1 Participant characteristics.

Characteristics	Number (n)	Percentage (%)
Total (overall)	500	100.0
Sex		
Male	251	50.2
Female	249	49.8
Age, years		
10	102	20.40
12	98	19.6
14	99	19.80
16	98	19.6
18	103	20.6
Education level		
Primary school	259	51.9
Junior high school	171	34.3
Secondary school	69	13.8
Marital status		
Single	496	99.2
Married	1	0.2
Divorced	1	0.2
Cohabiting	2	0.4
Religious affiliations		
Christianity	414	82.8
Islam	42	8.4
Traditional	43	8.6
Others	1	0.2
Schooling status		
Currently in school	476	95.2
Ever been to school	23	4.6
Never been to school	1	0.2
Alcohol use		
No symptoms of AUD	462	92.4
Mild AUD	12	2.4
Moderate AUD	11	2.2
Severe AUD	15	3.0

Abbreviation: AUD, alcohol use disorder.

3.2 | Scale properties

3.2.1 | Internal consistency

The internal consistency of each lower order factor was checked prior to factor analysis (Table 2). While the reliabilities of Fun and Social Facilitation were good, those of Sex and Tension Reduction/Negative Reinforcement displayed poorer internal consistency. For the lower order negative

TABLE 2 Reliabilities (Cronbach's alpha) for lower order factors for the Ghana sample and the original alcohol expectancies questionnaire.

Factor		Ghana sample		Leigh and Stacy [26]	
		Individual	Overall	Individual	Overall
Positive	Social	0.67	0.56	0.90	0.94
	Fun	0.74		0.90	
	Sex	0.48		0.91	
	Tension reduction/negative reinforce	0.23		0.73	
Negative	Social	0.51	0.83	0.82	0.88
	Emotional	0.65		0.77	
	Physical	0.37		0.84	
	Cognitive/performance	0.75		0.82	

expectancy factors, internal consistency was reasonable for both Negative Emotions and Cognitive Performance. The values for both Negative Social and, in particular, Negative Physical were, however, relatively low. In general, consistencies were lower than those found by Leigh and Stacy [27]. The presence of differing age groups in the sample may have led to different interpretations of particular items, causing the lower internal consistency. Therefore, age-stratified testing of internal consistencies was conducted. These show that internal consistencies tended to be stable across age, suggesting any issues in interpretation were not specific to any one age group. Specifically, items that appeared to be impacting internal consistency values were the following:

Q16 (How likely are you to refuse unwanted sex?)—Sex.

Q31 (How likely do you feel less stressed?)—Tension reduction.

Q18 (How likely are you to get mean?)—Social (negative).

Q33 (How likely do you experience unpleasant physical effects?)—Physical.

The overall consistencies for the positive (0.56), and negative (0.83) expectancies were also lower than observed by Leigh and Stacy [26].

3.3 | Model results

3.3.1 | Model 0

Model 0 used the same factor structure as Leigh and Stacy [27], with two correlated factors of positive and negative alcohol expectancy that had four underlying factors each (Social Facilitation, Sex, Fun and Tension Reduction/Negative Reinforcement for positive; Negative Emotions, Negative Social, Physical and

Cognitive Performance factors for negative). This was run on the full sample.

Table 3 shows the model fit was not satisfactory. A series of iterative models were then analysed, whereby parameters that did not differ significantly from 0 were removed and those suggested by modification indices were added. Parameters for Model 0, 1, 2 and 3 (S2) are shown in Tables S2–S5, Supporting Information, respectively. Model fit parameters for all models are shown in Table S7.

3.3.2 | Model 3 (final model, S1)

The final model fit was reasonable (Table 3 for model fit; Table 4 for model parameters). This model was verified in the other randomly split half of the sample (S2). Table S5 shows the model fits for the S2 sample and the Model 3 (S2) parameter estimates are in Table S7.

Reliability analyses were run on the individual lower-level factors as per the final model structure. These showed the following items were causing low reliability: Q16 on Sex, Q31 on Tension Reduction, Q15 on Emotional, Q27 on Cognitive/Performance (see Table 5 for details). The model was rerun on the S1 sample with these items removed (Table S5), but this did not improve the overall model fit (Table S7). Further, while the reliabilities of the individual lower-level factors were improved, the reliability of the overall alcohol expectancy factor was reduced.

3.4 | Measurement invariance

To assess if the structure of Model 3 was the same across age groups and gender, and hence was applicable across the sample, measurement invariance testing was carried out. When testing for invariance, changes in CFI

TABLE 3 Model fit parameters.

	CFI	SRMR	RMSEA	RMSEA (10%)	RMSEA (90%)
Model 0	0.448	0.333	0.123	0.119	0.128
Model 3 (S1)	0.805	0.159	0.076	0.071	0.082

Abbreviations: CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardised root mean square residual.

of less than -0.01 between models were regarded as evidence of invariance [67]. To test whether the factor structure above held for the different age groups and sex in the overall sample, we carried out three stages of structural invariance testing: (i) invariance of regression coefficients; (ii) scalar invariance (i.e., equivalence of intercepts); and (iii) homogeneity of the residual variances. This was done by sex and then by age group. The results in Table S8, suggest invariance held at all levels, indicating that the alcohol expectancy structure found was equivalent across both age and sex. As recommended [69], testing for age and sex simultaneously was not possible due to the small group sizes.

4 | DISCUSSION

By drawing on a Ghanaian adolescent sample—a population on which there has been little alcohol research—the aim of this study was to assess whether the construct of alcohol expectancies as measured by the AEQ [27] is valid within this sample. Confirmatory factor analyses suggested that while the groupings of positive and negative expectancies were broadly similar to those in the original work [27] and other Western samples [70, 71], among a Ghanaian adolescent sample, responses formed a single ‘alcohol expectancy’ factor rather than related separate positive and negative factors. Furthermore, questions relating to alcohol’s positive effects on tension reduction (expecting to feel less stressed) and negative physical effects (experiencing unpleasant physical effects and expecting to feel sick) produced inconsistent responses among Ghanaian adolescents, contrary to previous factor analyses of Western data [46].

Further analysis conducted (not shown) suggest that current findings were not stratified by age or adolescent drinking experience. As such, while it has been suggested that the effects of alcohol change as drinking experience accumulates, and that age ought to be assessed within expectancy research [27], this does not appear to be borne out in the study context. Consequently, we suggest that some of the alcohol expectancy questionnaire [27] items are not understood, or at the very least are not responded to in a fashion consistent with replies observed within Western samples, regardless of their age or experiences.

A revision of items within LMIC countries with a different sociocultural positioning of alcohol may therefore be advisable.

The current findings are therefore an initial indication that alcohol expectancies measures may manifest in different ways in a Sub-Saharan African context. In this way, the current findings mirror similar data from Peru, where the outcome expectancy factor solutions based on Western research could not be replicated [52, 53]. Our findings therefore add to a growing evidence base that the tools for the assessment of alcohol expectations may require adaptation for use among populations in LMICs where alcohol behaviours may be different to those observed in better studied more affluent cultural contexts. Indeed, as outcome expectancies develop as a product of experiences of alcohol consumption [32, 72, 73], or the observation of/interaction with others [74], socio-contextual variability in the way individuals are socialised to alcohol may lead to divergent social expectations which are not well-captured by Western-validated scales.

Compared to Western populations where alcohol sales are controlled and relative alcohol-by-volume tends to be lower [75], in the Ghanaian context it is notable that the weak regulation of alcohol sales and advertising [76] means that alcoholic content of beverages consumed in Ghana may be more variable and possibly stronger. Ghana launched a national alcohol policy in 2017, but the legislative instrument required to operationalise the law is not yet in place. Given that heightened intoxication is associated with increasingly detrimental physiological impacts [77], it may also be speculated that expectations surrounding the physical consequences of alcohol consumption may be different in Sub-Saharan African contexts. In other words, divergent experiences of intoxication may manifest in different outcome expectancies between Western and Ghanaian populations, meaning that questionnaires validated primarily on Western samples may not be suitable for capturing beliefs in sub-Saharan Africa.

An alternative explanation of the current findings, particularly of the low reliabilities on specific items (refusal of unwanted sex [item 16]; drinking for tension reduction [item 31]; experience of unpleasant physical effects [item 33]; and experience of sadness [item 27]), may have been due to poor comprehensibility of the question items and cultural norms regarding drinking

TABLE 4 Parameter estimates for Model 3 (S1).

	Regression parameters		Variances	
	Unstandardised estimate (SE)	Standardised estimate	Estimate (SE)	Standardised estimate
Social facilitation				
Q20: How likely are you to be more outgoing?	0.959 (0.074)	0.778*	0.859 (0.095)	0.395*
Q23: How likely is it easier for you to socialise?	0.795 (0.066)	0.733*	0.782 (0.082)	0.463*
Q26: How likely are you to feel more sociable?	0.927 (0.069)	0.805*	0.669 (0.077)	0.353*
Q28: How likely are you able to talk more freely?	0.370 (0.064)	0.372*	0.939 (0.092)	0.661*
Q32: How likely do you become friendlier?	0.944 (0.076)	0.752*	0.978 (0.104)	0.434*
Q16: How likely are you to refuse unwanted sex?	0.933 (0.089)	0.681*	1.532 (0.154)	0.569*
Fun				
Q5: How likely are you to really become excited?	0.658 (0.063)	0.612*	1.447 (0.138)	0.626*
Q7: How likely are you to feel good?	0.806 (0.064)	0.710*	1.28 (0.127)	0.496*
Q14: How likely are you to feel happy?	0.640 (0.062)	0.606*	1.412 (0.134)	0.632*
Q10: How likely are you to have a good time?	0.905 (0.057)	0.820*	0.797 (0.088)	0.328*
Q1: How likely are you to be more accepted socially?	1.012 (0.066)	0.807*	0.956 (0.112)	0.437*
Q28: How likely are you able to talk more freely?	-0.518 (0.056)	-0.615*	0.939 (0.092)	0.661*
Q31: How likely do you feel less stressed?	0.58 (0.071)	0.588*	1.06 (0.099)	0.785*
Sex				
Q16: How likely are you to refuse unwanted sex?	0.282 (0.084)	0.197*	1.532 (0.154)	0.569*
Q22: How likely are you to have more desire for sex?	-0.969 (0.079)	-0.750*	0.756 (0.097)	0.372*
Q25: How likely are you to become more sexually responsive?	-0.986 (0.076)	-0.792*	0.873 (0.102)	0.433*
Q29: How likely do you become more sexually active?	-0.934 (0.076)	-0.753*	1.065 (0.118)	0.529*
Q21: How likely does it take away your negative moods and feelings?	0.311 (0.075)	0.251*	1.576 (0.161)	0.571*
Tension reduction				
Q21: How likely does it take away your negative moods and feelings?	0.733 (0.065)	0.731*	1.576 (0.161)	0.571*
Q31: How likely do you feel less stressed?	-0.221 (0.070)	-0.224*	1.06 (0.099)	0.785*
Q34: How likely are you able to take your mind off your problems?	0.770 (0.070)	0.655*	1.228 (0.123)	0.604*
Q24: How likely are you to feel pleasant physical effects?	0.381 (0.052)	0.463*	1.098 (0.119)	0.349*
Q17: How likely are you to have fun?	0.634 (0.061)	0.629*	1.433 (0.135)	0.736*
Social				
Q2: How likely are you to become aggressive?	0.671 (0.093)	0.572*	0.923 (0.118)	0.672*
Q8: How likely are you to get into fights?	0.801 (0.102)	0.646*	0.898 (0.143)	0.583*
Q18: How likely are you to get mean?	0.281 (0.085)	0.260*	1.088 (0.102)	0.932*
Emotional				
Q4: How likely are you to feel ashamed of yourself?	0.614 (0.08)	0.555*	1.700 (0.193)	0.692*
Q12: How likely are you to feel guilty?	0.827 (0.081)	0.794*	0.800 (0.201)	0.369*
Q27: How likely are you to feel sad or depressed?	0.311 (0.072)	0.296*	1.392 (0.137)	0.630*
Q15: How likely are you to get a headache?	-0.492 (0.093)	-0.561*	0.945 (0.091)	0.707*

(Continues)

TABLE 4 (Continued)

	Regression parameters		Variances	
	Unstandardised estimate (SE)	Standardised estimate	Estimate (SE)	Standardised estimate
Physical				
Q13: How likely are you to get a hangover?	0.079 (0.049)	0.096	-0.128 (0.386)	-0.083
Q15: How likely are you to get a headache?	1.056 (0.142)	1.204*	0.945 (0.091)	0.707*
Q30: How likely do you feel sick?	0.281 (0.057)	0.337*	1.23 (0.115)	0.886*
Cognitive/performance				
Q3: How likely Are you to be less alert?	0.244 (0.066)	0.249*	1.090 (0.099)	0.938*
Q6: How likely are you to become clumsy or uncoordinated?	0.951 (0.07)	0.785*	0.685 (0.081)	0.384*
Q9: How likely are you to lose concentration?	0.476 (0.061)	0.502*	0.819 (0.078)	0.748*
Q11: How likely are you to have problems riding?	0.787 (0.063)	0.734*	0.643 (0.070)	0.461*
Q19: How likely are you to have problems with memory and concentration?	0.560 (0.074)	0.483*	1.255 (0.118)	0.767*
Q27: How likely are you to feel sad or depressed?	-0.607 (0.087)	-0.450*	1.392 (0.137)	0.630*
Q15: How likely are you to get a headache?	0.414 (0.084)	0.368*	0.945 (0.091)	0.707*
Q13: How likely are you to get a hangover?	0.589 (0.068)	0.562*	-0.128 (0.386)	-0.083
Alcohol expectancy				
Social facilitation	0.657 (0.089)	0.549*	1	0.699
Fun	1	0.707*	1	0.500
Sex	-0.557 (0.087)	-0.487*	1	0.763
Tension reduction	1	0.707*	1	0.500
Emotional	1	0.707*	1	1
Physical	1	0.707*	1	0.500
Cognitive/performance	-0.464 (0.076)	-0.421*	1	0.500
Covariances				
Fun ↔ cognitive/performance	-0.868 (0.044)	-0.868*		
Fun ↔ sex	-0.689 (0.058)	-0.689*		
Sex ↔ cognitive/performance	0.597 (0.06)	0.597*		
Social ↔ cognitive/performance	0.388 (0.067)	0.388*		
Sex ↔ social	0.418 (0.075)	0.418*		
Social facilitation ↔ tension reduction	0.885 (0.056)	0.885*		
Tension reduction ↔ emotional	-0.505 (0.097)	-0.505*		

* $p < 0.001$.

among young Ghanaians. Comprehensibility and cultural relevance has been previously highlighted as an important consideration in assessing measures [73]. For example, it has been noted that in studies where instruments are translated for use in different health system contexts, cultural relevance of questions included must be ensured before data collection commences [78–81]. We forward translated all the key measures to ensure technical and semantic equivalence of the survey questions, but we did not specifically examine the cultural relevance of the

34 items on the AEQ before collecting data. This might explain the poor internal consistency scores of the physical effects and social aspects items. For example, ‘getting mean’ (item 24) as a possible consequence of consumption may not be culturally appropriate vernacular in Ghana.

Similarly, discourse around sex in Ghana is a taboo [82] and young people may not be comfortable discussing this with an unfamiliar researcher. Further, the question item framing of ‘sex’ as ‘wanted’ or ‘unwanted’ arguably has

TABLE 5 Reliabilities for lower order factors in final model and with low reliability items removed.

Factor		Model 3		Model 3 with Q16, Q31, Q15 and Q27 removed ^a	
Positive	Social	0.83	0.68	0.83	0.57
	Fun	0.71		0.71	
	Sex	0.38		0.50	
	Tension reduction/negative reinforce	0.55		0.71	
Negative	Social	0.51		0.51	
	Emotional	0.36		0.65	
	Physical	0.48		0.48	
	Cognitive/performance	0.55		0.76	

Note: Reliability estimates in bold are those modified by item removal.

^aQ16: How likely are you to refuse unwanted sex?—Sex; Q31: How likely do you feel less stressed?—Tension reduction; Q15: How likely are you to get a headache?—Physical; Q27: How likely are you to feel sad or depressed?—Emotional.

an implicit assumption that sex is allowed only if the young person wants it, with or without the effect of alcohol. In its original form, this item may not have been relevant for young people in Ghana, but this requires further investigation. For example, rewording the question to ‘I find it harder to say no to sexual advances’, as was done in a study in Uganda [51], may be more appropriate and translatable. Indeed, findings from the Ugandan work also support the usefulness of such modifications to the expectancy questionnaire. Here, the item on drinking to relieve stress was dropped because the word stress is challenging to translate in the Ugandan setting, a finding which appears to be mirrored by the low reliabilities in response to the stress reduction expectancy item in our Ghanaian sample. This finding may therefore suggest that, rather than being a learned form of drinking experiences, the concept of drinking to reduce stress may be more a westernised, normative concept—a form of cultural knowledge that informs behaviour [83]—that is simply not enacted (and thus recognised) in other socio-cultural contexts. Future (e.g., qualitative) research may therefore benefit from examining in more detail the cultural relevance of the items on these measures.

4.1 | Limitations

By nesting our study within a health and demographic surveillance site in Ghana, the current study was able to tap into a useful resource for studying mental health outcomes [84]. Nevertheless, several limitations should be borne in mind when considering findings: First, as discussed, the current study did not systematically establish the cultural relevance of the items on the AEQ at the outset of this work and this could affect the precision of

our estimates. Future studies should therefore include this important step. Second, while the sample size was very good for a factor analysis [85], we were unable to account for sample heterogeneity at all levels of the trait dimension [86]; almost all participants were currently in school or ever attended school. This could affect the external validity regarding the performance of the AEQ in young Ghanaians. This could be tackled if future studies improve the sampling procedure to ensure the sample is relatively heterogenous with a good spread of participants on key sociodemographic factors. Third, as this was an interviewer-administered assessment, the role of social desirability bias cannot be ruled out, particularly on a sensitive topic such as drinking. Future studies may put in measures to minimise the risk by providing reassurances of anonymity both during the informed consent process and the interview. Additionally, where the ability to read is not a constraint, the measure could be self-administered.

5 | CONCLUSION

Conceptualisations of expectancies around alcohol consumption have been formulated primarily using Western samples and may not translate to the Ghanaian context. This may also be the case for other culturally similar contexts on the African continent which, along with research in other LMIC settings, represents a fruitful avenue for future inquiry. Researchers and clinicians in non-Western settings should be encouraged to pursue cross-cultural adaptation of the expectancy questionnaire and to explore similar scales which may also have an inbuilt Western bias. This is necessary to obtain a more accurate view about these beliefs and to inform interventions that seek

to reduce alcohol-related harms by targeting consumption-predictive beliefs. Our research is a first step in this important endeavour.

AUTHOR CONTRIBUTIONS

Conceptualisation: DH, BW. Data acquisition: MA, BW, RLM. Data analysis: AWQ, BW. Data interpretation: DH, BW, MA, BW, RLM. Drafting: BW. Critical revision: DH, BW, MA, BW, RLM. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

No conflict declared.

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REFERENCES

- Babor T, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, et al. Alcohol: no ordinary commodity: research and public policy. *Rev Bras Psiquiatr.* 2010;26:280–3.
- Kraus L, Room R, Livingston M, Pennay A, Holmes J, Törrönen J. Long waves of consumption or a unique social generation? Exploring recent declines in youth drinking. *Addict Res Theory.* 2020;28:183–93.
- Vashishtha R, Livingston M, Pennay A, Dietze P, MacLean S, Holmes J, et al. Why is adolescent drinking declining? A systematic review and narrative synthesis. *Addict Res Theory.* 2020;28:275–88.
- Obot IS. Alcohol use and related problems in sub-saharan Africa. *Afr J Drug Alcohol Stud.* 2006;5:17–26.
- Babor TF, Robaina K, Jernigan D. The influence of industry actions on the availability of alcoholic beverages in the African region. *Addiction.* 2015;110:561–71.
- Morojele NK, Dumbili EW, Obot IS, Parry CDH. Alcohol consumption, harms and policy developments in sub-Saharan Africa: the case for stronger national and regional responses. *Drug Alcohol Rev.* 2021;40:402–19.
- Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet.* 2009;373:2223–33.
- Ferreira-Borges C, Esser MB, Dias S, Babor T, Parry CD. Alcohol control policies in 46 African countries: opportunities for improvement. *Alcohol Alcohol.* 2015;50:470–6.
- Ferreira-Borges C, Parry CD, Babor TF. Harmful use of alcohol: a shadow over sub-Saharan Africa in need of workable solutions. *Int J Environ Res Public Health.* 2017;14:346.
- Ferreira-Borges C, Rehm J, Dias S, Babor T, Parry CD. The impact of alcohol consumption on African people in 2012: an analysis of burden of disease. *Tropical Med Int Health.* 2016; 21:52–60.
- Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet.* 2012;380:2224–60.
- World Health Organization. *Global Status Report on Alcohol and Health.* 2014.
- Saleh M. Population of Africa 2020, by age group. 2021. Available from: <https://www.statista.com/statistics/1226211/population-of-africa-by-age-group/>
- Ghana Statistical Service. *Ghana 2021 population & housing census: general report, 3B. Age and sex profile.* Government of Ghana. 2021.
- Doku D, Koivusilta L, Rimpela A. Socioeconomic differences in alcohol and drug use among Ghanaian adolescents. *Addict Behav.* 2012;37:357–60.
- GSS_GHS_ICF. *Ghana Demographic and Health Survey.* 2008.
- Cruz IY, Dunn ME. Lowering risk for early alcohol use by challenging alcohol expectancies in elementary school children. *J Consult Clin Psychol.* 2003;71:493–503.
- Dunn ME, Lau HC, Cruz IY. Changes in activation of alcohol expectancies in memory in relation to changes in alcohol use after participation in an expectancy challenge program. *Exp Clin Psychopharmacol.* 2000;8:566–75.
- Kuntsche E, Kuendig H. Beyond self-reports: drinking motives predict grams of consumed alcohol in wine-tasting sessions. *Exp Clin Psychopharmacol.* 2012;20:318–24.
- Miller PM, Smith GT, Goldman MS. Emergence of alcohol expectancies in childhood: a possible critical period. *J Stud Alcohol.* 1990;51:343–9.
- Schulenberg JE, Maggs JL. A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *J Stud Alcohol Suppl.* 2002;14: 54–70.
- Jester JM, Wong MM, Cranford JA, Buu A, Fitzgerald HE, Zucker RA. Alcohol expectancies in childhood: change with the onset of drinking and ability to predict adolescent drunkenness and binge drinking. *Addiction.* 2015;110:71–9.
- Larimer ME, Cronce JM. Identification, prevention and treatment: a review of individual-focused strategies to reduce problematic alcohol consumption by college students. *J Stud Alcohol Suppl.* 2002;14:148–63.
- Windle M, Spear LP, Fuligni AJ, Angold A, Brown JD, Pine D, et al. Transitions into underage and problem drinking: developmental processes and mechanisms between 10 and 15 years of age. *Pediatrics.* 2008;121(Suppl 4):S273–89.
- Darkes J, Goldman MS. Expectancy challenge and drinking reduction: experimental evidence for a mediational process. *J Consult Clin Psychol.* 1993;61:344–53.

26. Tanner-Smith EE, Lipsey MW. Brief alcohol interventions for adolescents and young adults: a systematic review and meta-analysis. *J Subst Abus Treat*. 2015;51:1–18.
27. Leigh BC, Stacy AW. Alcohol outcome expectancies: scale construction and predictive utility in higher order confirmatory models. *Psychol Assess*. 1993;5:216–29.
28. Leigh BC, Stacy AW. Alcohol expectancies and drinking in different age groups. *Addiction*. 2004;99:215–27.
29. Smit K, Voogt C, Hiemstra M, Kleinjan M, Otten R, Kuntsche E. Development of alcohol expectancies and early alcohol use in children and adolescents: a systematic review. *Clin Psychol Rev*. 2018;60:136–46.
30. Gillmore MR, Wells EA, Simpson EE, Morrison DM, Hoppe MJ, Wilsdon A. Children's beliefs about drinking. *Am J Drug Alcohol Abuse*. 1998;24:131–51.
31. Neighbors C, Lee CM, Lewis MA, Fossos N, Larimer ME. Are social norms the best predictor of outcomes among heavy-drinking college students? *J Stud Alcohol Drugs*. 2007;68:556–65.
32. Wood MD, Nagoshi CT, Dennis DA. Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *Am J Drug Alcohol Abuse*. 1992;18:461–76.
33. Cook M, Kuntsche S, Labhart F, Kuntsche E. Do different drinks make you feel different emotions? Examination of young adolescents' beverage-specific alcohol expectancies using the alcohol expectancy task. *Addict Behav*. 2020;106:106375.
34. Voogt C, Otten R, Kleinjan M, Engels R, Kuntsche E. Alcohol-related knowledge and alcohol-related norms in 4- to 6-year-olds-evidence from the Dutch electronic appropriate beverage task. *Alcohol Clin Exp Res*. 2017;41:1637–47.
35. Kuntsche E. "Do grown-ups become happy when they drink?" Alcohol expectancies among preschoolers. *Exp Clin Psychopharmacol*. 2017;25:24–30.
36. Smit K, Voogt C, Otten R, Kleinjan M, Kuntsche E. Exposure to parental alcohol use rather than parental drinking shapes offspring's alcohol expectancies. *Alcohol Clin Exp Res*. 2019;43:1967–77.
37. Smit K, Voogt C, Otten R, Kleinjan M, Kuntsche E. Alcohol expectancies change in early to middle adolescence as a function of the exposure to parental alcohol use. *Drug Alcohol Depend*. 2020;211:107938.
38. Voogt C, Beusink M, Kleinjan M, Otten R, Engels R, Smit K, et al. Alcohol-related cognitions in children (aged 2-10) and how they are shaped by parental alcohol use: a systematic review. *Drug Alcohol Depend*. 2017;177:277–90.
39. Baldwin AR, Oei TP, Young R. To drink or not to drink: the differential role of alcohol expectancies and drinking refusal self-efficacy in quantity and frequency of alcohol consumption. *Cognit Ther Res*. 1993;17:511–30.
40. Kuntsche E, Muller S. Why do young people start drinking? Motives for first-time alcohol consumption and links to risky drinking in early adolescence. *Eur Addict Res*. 2012;18:34–9.
41. Ouellette JA, Gerrard M, Gibbons FX, Reis-Bergan M. Parents, peers, and prototypes: antecedents of adolescent alcohol expectancies, alcohol consumption, and alcohol-related life problems in rural youth. *Psychol Addict Behav*. 1999;13:183–97.
42. Wiers RW, Hoogveen KJ, Sergeant JA, Boudewijn GW. High- and low-dose alcohol-related expectancies and the differential associations with drinking in male and female adolescents and young adults. *Addiction*. 1997;92:871–88.
43. McAlaney J, Bewick B, Hughes C. The international development of the 'social norms' approach to drug education and prevention. *Drugs Educ Prev Policy*. 2011;18:81–9.
44. Zucker RA, Donovan JE, Masten AS, Mattson ME, Moss HB. Early developmental processes and the continuity of risk for underage drinking and problem drinking. *Pediatrics*. 2008;121(Suppl 4):S252–72.
45. Tanner-Smith EE, Steinka-Fry KT, Hennessy EA, Lipsey MW, Winters KC. Can brief alcohol interventions for youth also address concurrent illicit drug use? Results from a meta-analysis. *J Youth Adolesc*. 2015;44:1011–23.
46. Donovan JE, Molina BS, Kelly TM. Alcohol outcome expectancies as socially shared and socialized beliefs. *Psychol Addict Behav*. 2009;23:248–59.
47. Ertl V, Preusse M, Neuner F. Are drinking motives universal? Characteristics of motive types in alcohol-dependent men from two diverse populations. *Front Psych*. 2018;9:38.
48. Banks DE, Wingham RD, Wu W, Zapolski TCB. Examination of the indirect effect of alcohol expectancies on ethnic identity and adolescent drinking outcomes. *Am J Orthopsychiatry*. 2019;89:600–8.
49. Hurley EA, Brahmabhatt H, Kayembe PK, Busangu MF, Mabilia MU, Kerrigan D. The role of alcohol expectancies in sexual risk behaviors among adolescents and young adults in The Democratic Republic of the Congo. *J Adolesc Health*. 2017;60:79–86.
50. Kalichman SC, Simbani LC, Cain D, Jooste S. Alcohol expectancies and risky drinking among men and women at high-risk for HIV infection in Cape Town South Africa. *Addict Behav*. 2007;32:2304–10.
51. Woolf-King SE, Fatch R, Emenyonu N, Muyindike W, Carrico AW, Maisto SA, et al. Development and validation of the East Africa Alcohol Expectancy Scale (AFEXS). *J Stud Alcohol Drugs*. 2015;76:336–43.
52. Galvez-Buccollini JA, Paz-Soldan VA, Herrera PM, DeLea S, Gilman RH. Gender differences in sex-related alcohol expectancies in young adults from a peri-urban area in Lima, Peru. *Rev Panam Salud Publica*. 2009;25:499–505.
53. Perez-Aranibar CC, Van den Broucke S, Fontaine J. Validation of the alcohol expectancy questionnaire (AEQ-A) for Peruvian university students. *J Alcohol Drug Educ*. 2005;49:63–84.
54. Jahoda G, Cramond J. Children and alcohol. A developmental study in Glasgow. Vol I. London, UK: H.M. Stationery Office; 1972.
55. Pokorny SB, Jason LA, Schoeny ME, Townsend SM, Curie CJ. Do participation rates change when active consent procedures replace passive consent. *Eval Rev*. 2000;25:567–80.
56. White VM, Hill DJ, Effendi Y. How does active parental consent influence the findings of drug-use surveys in schools? *Eval Rev*. 2004;28:246–60.
57. Camacho L, Mezquita L, Ibanez MI, Moya J, Villa H, Viruela AM, et al. Spanish adaptation of the expectancy questionnaire (EQ) about alcohol effects in adolescents. *Psicothema*. 2013;25:529–35.
58. Mezquita L, Camacho L, Ibáñez MI, Villa H, Moya-Higueras J, Ortet G. Five-factor model and alcohol outcomes: mediating

- and moderating role of alcohol expectancies. *Pers Individ Differ*. 2015;74:29–34.
59. Monk RL, Heim D. Alcohol-related expectancies in adults and adolescents: similarities and disparities. *Adicciones*. 2016;28:35–40.
 60. Weobong B, Akpalu B, Doku V, Owusu-Agyei S, Hurt L, Kirkwood B, et al. The comparative validity of screening scales for postnatal common mental disorder in Kintampo, Ghana. *J Affect Disord*. 2009;113:109–17.
 61. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption-II. *Addiction*. 1993;88:791–804.
 62. Tabachnick BG, Fidell LS. Using multivariate statistics. 4th ed. MA: Allyn & Bacon; 2001.
 63. Rosseel Y. Lavaan: an R package for structural equation modeling. *J Stat Softw*. 2012;48:1–36.
 64. Kenny DA, McCoach DB. Effect of the number of variables on measures of fit in structural equation modeling. *Struct Equ Modeling*. 2003;10:333–51.
 65. MacCallum RC, Browne MW, Sugawara HM. Power analysis and determination of sample size for covariance structure modeling. *Psychol Methods*. 1996;1:130–49.
 66. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equ Modeling*. 1999;6:1–55.
 67. Putnick DL, Bornstein MH. Measurement invariance conventions and reporting: the state of the art and future directions for psychological research. *Dev Rev*. 2016;41:71–90.
 68. RStudioTeam. RStudio: integrated development for R. Boston: RStudio, PBC; 2020. <http://www.rstudio.com>
 69. Chen F, Curran PJ, Bollen KA, Kirby J, Paxton P. An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociol Methods Res*. 2008;36:462–94.
 70. Mezquita L, Camacho L, Suso-Ribera C, Ortet G, Ibanez MI. Development and validation of the alcohol expectancy questionnaire short form (EQ-SF) (Desarrollo y validacion de la version corta del cuestionario sobre expectativas de los efectos del alcohol (EQ-SF)). *Adicciones*. 2018;30:271–81.
 71. Stein LA, Katz B, Colby SM, Barnett NP, Golembeske C, Lebeau-Craven R, et al. Validity and reliability of the alcohol expectancy questionnaire-adolescent, brief. *J Child Adolesc Subst Abuse*. 2007;16:115–27.
 72. Wall AM, McKee SA, Hinson RE. Assessing variation in alcohol outcome expectancies across environmental context: an examination of the situational-specificity hypothesis. *Psychol Addict Behav*. 2000;14:367–75.
 73. Maneersriwongul W, Dixon JK. Instrument translation process: a methods review. *J Adv Nurs*. 2004;48:175–86.
 74. Martino SC, Collins RL, Ellickson PL, Schell TL, McCaffrey D. Socio-environmental influences on adolescents' alcohol outcome expectancies: a prospective analysis. *Addiction*. 2006;101:971–83.
 75. World Health Organization. Global status report on alcohol and health 2018. 2018.
 76. World Health Organization African Region. Alcohol marketing practices in Africa: findings from The Gambia, Ghana, Nigeria, and Uganda. 2011.
 77. Martinic M, Measham F. Swimming with crocodiles: the culture of extreme drinking. New York: Routledge; 2008.
 78. Erkut S. Developing multiple language versions of instruments for intercultural research. *Child Dev Perspect*. 2010;4:19–24.
 79. Mason TC. Cross-cultural instrument translation: assessment, translation, and statistical applications. *Am Ann Deaf*. 2005;150:67–72.
 80. Squires A, Aiken LH, van den Heede K, Sermeus W, Bruyneel L, Lindqvist R, et al. A systematic survey instrument translation process for multi-country, comparative health workforce studies. *Int J Nurs Stud*. 2013;50:264–73.
 81. Temple B. Nice and tidy: translation and representation. *Sociol Res Online*. 2005;10:45–54.
 82. Asampong E, Osafo J, Bingenheimer JB, Ahiadeke C. Adolescents and parents' perceptions of best time for sex and sexual communications from two communities in the Eastern and Volta Regions of Ghana: implications for HIV and AIDS education. *BMC Int Health Hum Rights*. 2013;13:40.
 83. Morris MW, Hong YY, Chiu CY, Liu Z. Normology: integrating insights about social norms to understand cultural dynamics. *Organ Behav Hum Decis Process*. 2015;129:1–13.
 84. Ae-Ngibise KA, Adiibokah E, Nettey OEA, Nyame S, Doku VCK, Asante KP, et al. "Making the mentally ill count", lessons from a health and demographic surveillance system for people with mental and neurological disorders in the Kintampo districts of Ghana. *Int J Ment Heal Syst*. 2017;11:22.
 85. Tinsley HEA, Tinsley DJ. Use of factor analysis in counseling psychology research. *J Couns Psychol*. 1987;34:414–24.
 86. Trninić V, Jelaska I, Štalec J. Appropriateness and limitations of factor analysis methods utilised in psychology and kinesiology-part 2. *Phys Culture*. 2013;67:5–17.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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