Using the Drinking Expectancy Questionnaire (revised scoring method) in clinical practice

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Abstract

The Drinking Expectancy Questionnaire (Young & Knight, 1989; Young & Oei, 1996) has been widely used in clinical and research settings over the past 20 years. A revised scoring method with a five-factor structure has been proposed but no normative data for this method is available (Lee, Oei, Greeley, & Baglioni, 2003). The aim of this study is to establish norms for the five expectancy subscales (Social Confidence; Sexual Interest; Cognitive Enhancement; Tension Reduction; and Negative Consequences) in a sample of adults entering hospital treatment for alcohol dependence (N=163) and a sample of university undergraduate students (N= 110). Clinical sample means on the expectancy subscales tended to be substantially higher than the means for the student sample, with the exception of Sexual Interest (which was higher in the students). Interestingly, the Negative Consequences subscale mean was more than two standard deviations higher in the clinical sample, and was strongly correlated with measures of depression, anxiety and stress. The Negative Consequences scores were strongly associated with drinking risk in the student sample but were not related to drinking measures in the clinical sample. A ROC analysis established a cut-off on the DEQ total of 107 that distinguished dependent drinkers from student drinkers with high sensitivity and specificity. The clinical utility of the DEQ in general will be discussed.

Keywords: Negative Alcohol Expectancies; Drinking Expectancy Questionnaire; Relapse Indicators; Clinical Norms

Abbreviations: Alcohol Expectancy Questionnaire (AEQ); Drinking Expectancy Questionnaire (DEQ); Receiver Operating Characteristic (ROC)
1. Introduction

Alcohol expectancies, or beliefs about the expected outcomes of drinking, feature prominently in most cognitive models of alcohol misuse and relapse (See Connors & Maisto, 1988; Leigh, 1989; Witkiewitz & Marlatt, 2004; Young & Oei, 1993). Expectancies are present in children (Dunn & Goldman, 2000), tend to become more positive as drinking experience increases (Christiansen, Smith, Roehling, & Goldman, 1989) and are hypothesized to be important mediators of drinking behaviour in adulthood. Research shows that the relationship between expectancies and drinking measures (such as quantity and frequency) differs between social drinkers and disordered drinkers. Due to this link between expectancies and drinking behavior, expectancies have been targeted in Cognitive Behavioral Treatment for alcohol misuse (Brown, Carrello, Vik, & Porter, 1998; Corbin, McNair, & Carter, 2001). Expectancies about the negative outcomes of alcohol consumption have also been a target for brief interventions in primary care settings (Center for Substance Abuse Treatment, 1999; Young & Oei, 1996).

1.1. Measures of Alcohol Expectancies

There are numerous explicit (self-report) measures of drinking expectancies that vary somewhat in content and scoring format. Both the Alcohol Expectancy Questionnaire (AEQ; Brown, Christiansen, & Goldman, 1987; Brown, Goldman, Inn, & Anderson, 1980) and the Drinking Expectancy Questionnaire (DEQ; Young & Knight, 1989; Young & Oei, 1996) have been used in research and clinical practice.

The AEQ asks respondents whether they endorse a list of positive alcohol expectancies on a dichotomous scale. Scores from the AEQ have been able to explain variance in drinking patterns across a wide variety of populations (e.g. Brown, Goldman, & Christiansen, 1985; Carey, 1995; Connor, Gudgeon, Young, & Saunders, 2007; Read, Wood, Kahler, Maddock, & Palfai, 2003; Stein, Goldman, & del Boca, 2000). Norms for clinical and
non-clinical adolescents and adults have been developed across the six positive alcohol expectancies (Brown, et al., 1987). According to a factor analysis, the three most salient positive expectancy types are expectations that alcohol will aid in tension reduction, increase social lubrication and facilitate the enjoyment of activities (Kushner, et al., 1994).

Although the AEQ is a widely used measure in both research and clinical practice, historically there have been limitations of the measure (e.g. Fromme & D'Amico, 2000; Fromme, et al., 1993; Young & Oei, 1993). Items from the AEQ range from generalized statements about the effects of alcohol to more specific personal statements when research has shown more predictive power in specific statements (e.g. Critchlow, 1986; Oei, Hokin, & Young, 1990). The range of endorsement tendencies is restricted because responses on the AEQ are dichotomous. Further, the AEQ only captures positive expectancies of drinking alcohol; yet expectancies of negative outcomes from drinking have also been able to predict unique variance in drinking patterns of both alcohol dependent individuals and college students (Gadon, Bruce, McConnochie, & Jones, 2004; Lee, Greeley, & Oei, 1999; Leigh & Stacy, 1993; Thush et al., 2007).

1.2. The Drinking Expectancy Questionnaire

In addressing some of these weaknesses, the Drinking Expectancy Questionnaire (DEQ) provides an alternative means of measuring personal endorsement of alcohol expectancies. The original version of the DEQ (Young & Knight, 1989; Young & Oei, 1996) is a 43-item self-report measure of both positive and negative drinking expectancy items that load onto six subscales: Assertion, Affective Change, Dependence, Sexual Enhancement, Cognitive Change and Tension Reduction. Each item is assessed on a 5-point Likert scale (1 = Strongly Disagree, to 5 = Strongly Agree). The DEQ was developed using a three step process; (1) a database of self-statements about alcohol was generated from interviews of adult drinkers (students, professionals, psychiatric outpatients with alcohol problems, etc.)
and a literature review, (2) the 144 generated items that met inclusion criteria were administered to a community sample of 333 adults, (3) following factor analysis on the community sample, the items were given to a student sample. The DEQ has been psychometrically validated in New Zealand and Australia, and norms are available for university student, community and clinical samples. The DEQ was carefully constructed so that the items are phrased in the first person, present tense, using specific rather than global concepts, and written in simple language that could not be interpreted in more than one way. Among the statements are a number of reverse scored items. An investigation into the drinking patterns of university students found that the DEQ is able to explain an additional 19.1% variance over and above that of the AEQ (12.8%) for drinking frequency but not quantity (Young, Connor, Ricciardelli, & Saunders, 2006).

Confirmatory factor analysis of the DEQ was conducted on a community sample of 679 adults. This produced a psychometrically robust five-factor new scoring method using 37 of the original 43 items (Lee, et al., 2003). Using the new scoring method, items loaded strongly onto five subscales; Increased Social Confidence (12 items), Increased Sexual Interest (3 items), Cognitive Enhancement (3 items), Tension Reduction (3 items) and Negative consequences (16 items); see Table 1. The Negative Consequences subscale is expected to be clinically important, as it is likely that hazardous drinking is related to minimal endorsement of the negative consequences of drinking while strong endorsement of these items would be expected to protect against harmful drinking behaviour. However, to date no cut-off score on the DEQ has been established to differentiate between clinical and university student samples, and neither have norms on this five-factor version of the DEQ been published. It is also unknown how the five subscales relate to measures of drinking and mood, which would be relevant for clinicians using the measure in treatment services.
Further, it is unclear whether the total DEQ score or a subscale score can provide clinicians
with clinically meaningful indicators of relapse.

1.3. Clinical Importance of Alcohol Expectancies

Understanding alcohol expectancies and challenging problematic alcohol expectancies
can be useful in both secondary and tertiary forms of treatment (Goldman, 1994). Expectancy
challenge techniques can reduce levels of alcohol consumption in university students
(Darkes & Goldman, 1998). In heavy drinking male college students, expectancy challenge in
therapy can decrease levels of endorsed expectancies and lead to potential decreases in levels
of drinking (Corbin, et al., 2001) but in heavy drinking female students, there were increases
in levels of alcohol consumption after treatment (Corbin, et al., 2001). These gender
differences were not observed in another study of outpatient populations where changes in
levels of drinking were related to changes in positive expectancy endorsement (Connors,
Tarbox, & Faillace, 1993). Decreases in endorsement of positive expectancies were not
evident at the conclusion of treatment but were related to days of abstinence at 18 month
follow up. This finding supports research indicating that expectancies mediate drinking
behaviour – so changes in expectancies may precede changes in drinking over the medium to
long term (Cohen, McCarthy, Brown, & Myers, 2002).

Various factors measured at entry to treatment are related to relapse following
treatment, including: pre-treatment severity of alcohol use, beliefs about cravings and
personality factors (Meszaros et al., 1999; Miller, Westerberg, Harris, & Tonigan, 1996;
Turkcapar, Kose, Ince, & Myrick, 2005). High levels of global positive expectancies and
negative alcohol expectancy endorsement are predictive of treatment completion (Young &
Oei, 1996) and of relapse following alcohol treatment (Jones & McMahon, 1994)(Young &
However, it is unclear whether alcohol expectancy endorsement at discharge from treatment can also be used as an indicator of longer term drinking outcomes.

While changes in endorsements of positive expectancies are related to decreases in drinking levels, the relative clinical importance of targeting negative expectancies in prevention and treatment is less clear.

1.4. Study Aims

The current study will investigate the five factor structure of the DEQ with the preliminary aim of establishing norms on the subscales for a clinical and a university student sample. Next, relationships among the expectancy subscales and measures of drinking and mood in student drinkers and in adults entering hospital treatment for alcohol dependence will be examined. Finally, we will establish a clinically significant cut-off score on the DEQ-total, and investigate the validity of this cut-off score in predicting drinking outcomes at 3 months after hospital discharge.

2. Method

2.1. Participants

2.1.1. Student sample: This sample comprised 110 first-year university students (86% female) with an average age of 20.70 years ($SD = 5.19$). The majority of the participants were Caucasian (73%), 22% were Asian and 6% identified with other ethnicities.

On average, the participants scored 9.48 ($SD = 5.83$) on the Alcohol Use Disorders Identification Test (AUDIT), which is in the risky range of alcohol use (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). The AUDIT scores also revealed that the average drinking occasions approximately weekly or more frequent ($M = 2.04, SD = 1.07$) with just under five drinks per sitting ($M = 1.73, SD = 1.29$). More specifically, 55 (50%) of the
participants reported that they typically drank more than five drinks in one sitting. On average, these participants were in the normal range for depression, anxiety and stress according to the Depression-Anxiety-Stress scale (Lovibond & Lovibond, 1995) (see Table 2).

2.1.1. Clinical sample: The clinical sample comprised 163 adults (46.6% female) entering treatment at one of four private hospital alcohol treatment services in Southeast Queensland, Australia. Participants were over the age of 18-years and provided fully-informed consent, and were assessed as meeting criteria for an alcohol use disorder by a fully-qualified psychologist, or admitting psychiatrist. The age ranged from 19 to 68 years, with an average of 44.3 years ($SD = 10.9$). Over half were married or in de facto relationships (54.3%), 32.7% single, 15.0% divorced, 9.2% separated and 2.6% widowed. The majority of the sample identified their ethnicity as Caucasian (92.1%), 3.9% Aboriginal and 3.9% Other Ethnicity. Various levels of education were represented within the sample, with the majority of participants attaining their senior secondary education (28.3%), followed closely by those who attained a Certificate / Diploma qualification (22.4%), or a Bachelor’s degree (19.1%). Those with post-graduate qualifications represented only 5.3% of the population, and those who had attained any level of education lower than and including the junior secondary level made up 25%. The majority of participants reported being in full-time paid employment (29.9%), part-time workers represented 13.0% of the sample. Retired participants accounted for 8.4% of the sample, and 27.3% were receiving a Disability Support Pension.

Members of the clinical sample were drinking an average of 17.67 ($SD = 10.52$) standard drinks per drinking day (past 30 days), and a maximum number of standard drinks per drinking day (past 30 days) of 27.53 ($SD = 14.95$). The average number of days abstinent over the past 30 days was 5.43 ($SD = 7.39$) (see Table 2).

2.2. Measures
2.2.1. The Drinking Expectancy Questionnaire (DEQ)

The DEQ (Young & Knight, 1989) has been described in the introduction. The current study used the more recent five factor scoring method developed from a confirmatory factor analytic study (Lee, et al., 2003) and comprising 37 items. Each item was assessed on a 5-point Likert scale (1, Strongly Disagree, to 5, Strongly Agree). The five factors or subscales are Increased Social Confidence (12 items), Increased Sexual Interest (3 items), Cognitive Enhancement (3 items), Tension Reduction (3 items) and Negative consequences (16 items).

2.2.2. The Alcohol Use Disorders Identification Test (AUDIT)

The AUDIT (Saunders, et al., 1993) is a 10-item screening instrument developed by a World Health Organization collaborative team in six countries. It contains 10 questions examining alcohol consumption (3 items), drinking behaviour (3 items), adverse reactions (2 items) and alcohol-related problems (2 items). Scores on the items are summed to a total score out of 40, with a cut-off of 8+ indicating harmful or hazardous drinking, and 13+ to indicate a likelihood of alcohol dependence (Dawe, Loxton, Hides, Kavanagh, & Mattick, 2002). The overall sensitivity and specificity of the AUDIT is 92% and 98%, respectively.

2.2.3. TimeLine FollowBack (TLFB) drinking diary

The TLFB method (Sobell & Sobell, 1995) was used to assess drinking consumption and frequency in the clinical sample since the AUDIT is a screening tool and therefore not appropriate for a sample with established alcohol use disorders. The TLFB is a drinking interview that uses a calendar with public holidays, events and autobiographical details as memory cues to drinking over a specified time period, in this case the 30 days prior to hospital admission. This produces a detailed description of drinking patterns that has high test-retest reliability and external convergent validity with biochemical measures of drinking, official records and other self-report measures of drinking (Dawe, et al., 2002). For the purposes of this study, clinicians summarized the information from the TLFB into three
statistics; the average number of standard drinks per day over the past 30-days, the maximum number of standard drinks per drinking day over the past 30-days and the number of days abstinent in the past 30-days.

2.2.4. The Depression Anxiety Stress Scale (DASS-21)

The DASS-21 (Lovibond & Lovibond, 1995) is a tool used to measure the severity of symptoms of Depression, Anxiety and Stress. The DASS-21 requires the participants to rate whether each of the 21 statements apply to them over the past week on a 4-point Likert scale ranging from 1 (Did not apply to me at all) to 4 (Applied to me most of the time). When the scores are multiplied by two, they can be used as a direct comparison to the clinical cut-offs developed by the DASS-42 (Lovibond & Lovibond, 1995).

2.2.5. Demographic survey

A brief demographic survey was completed by both clinical and non-clinical populations in the study. Clinical participants also completed an additional set of demographics surveys covering other risk factors for relapse which will not be the focus of the current study.

2.3. Procedure

Participants in the student sample were recruited as a part of a larger study which was approved by the University of Queensland ethics committee. After informed consent was obtained, participants were required to complete all measures using an online survey. Participants were fully debriefed after the study. Participants in the clinical sample were recruited as part of a study run by the Alcohol and Drugs Clinical Indicators and Training (ADCIT) consortium in Brisbane. Participants gave informed consent to provide data through various alcohol and drug treatment services in South East Queensland, Australia. Procedures of the study had been approved by the University of Queensland ethics committee. At intake, participants completed a selection of surveys online or on paper. Clinicians at each hospital service assessed participants for the presence of alcohol or other drug dependence, and also administered the TLFB. Staff members at these
treatment sites administered the assessment battery again at discharge. A subset of the participants (N=85) was followed up at 3 months post discharge in order to assess the predictive utility of the DEQ scores. These participants completed the Timeline Followback drinking measure either face-to-face or by telephone and completed the selected self-report measures.

3. Results

DEQ total score and subscales means for both the clinical and student samples are presented in Table 2. The spread of scores on the DEQ subscales (standard deviations) are comparable between the student drinkers and the clinical sample. The mean values for the two samples were approximately equal on four of the five expectancy subscales (Sexual Interest, Cognitive Enhancement, Increased Confidence and Tension Reduction) but more than two standard deviations higher in the clinical sample for the Negative Consequences subscale. The clinical sample also had higher mean values on depression, anxiety and stress (DASS subscales) and an overall higher level of drinking at intake.

Correlations in Table 3 indicate that all of the expectancy subscales except for Cognitive Enhancement are correlated with drinking risk (AUDIT scores) in the student sample. Most relationships were positive, indicating that stronger endorsement of both positive and negative expectancies was related to more risky drinking. None of the expectancy subscales were correlated with depression symptoms in the student sample. Only Negative Consequences expectancies were related to anxiety and stress symptoms.

In the clinical sample (Table 4), the average number of drinks standard drinks and maximum standard drinks per drinking day were positively related to endorsements of Increased Confidence, Tension Reduction expectancies and Total DEQ scores. There were no significant relationships between days abstinent at intake and expectancy subscales. Endorsements of both Negative Consequences and Increased Confidence were related to
symptoms of depression, anxiety and stress. Tension reduction expectancies were also related to symptoms of anxiety and stress.

To establish cut-off scores, ROC analysis was used to determine the optimal cut-off for differentiating the student and clinical samples. DEQ sensitivity and specificity at every possible score were calculated to produce the ROC curve (See Figure 1; Streiner & Cairney, 2007; Trop, Stolberg, & Nahmias, 2003). Total DEQ scores demonstrated moderate accuracy; the area under the ROC curve was equal to .88; 95% confidence interval (CI) [.84, .92]. Using the results from the ROC analysis and visual inspection, a cut-off of 107 gave a sensitivity of 81% and specificity of 76%. Table 5 shows the levels of expectancy endorsement and levels of depression, anxiety and stress at discharge for the 107 participants who had completed self-report at discharge.

The preliminary predictive validity of the cut-off was then tested using 85 participants who were followed up three months after discharge (See Table 6). Using a cut-off of 107 derived from ROC analysis, those with higher risk DEQ scores at discharge also had worse alcohol outcomes at three months follow up (average standard drinks per day, maximum standard drinks per day and days to first relapse following discharge from hospital) but not days abstinence in the last 30 days. Those that were lost at follow up were more likely to drink more at baseline.

3. Discussion

The primary aim of the study was to establish greater clinical utility of the DEQ by examining mean scores in a clinical and student sample. At intake, beliefs that drinking increases social confidence enhances mental capacity and also leads to negative consequences were more strongly endorsed by alcohol dependent participants than by the students. Contrary to predictions, the adults entering hospital treatment for alcohol misuse endorsed the negative consequences of drinking at least two standard deviations higher than
the students which indicate that these participants were drinking at harmful levels despite a clear acknowledgement of the negative consequences of their drinking. This finding may suggest that the salience of negative consequences may have driven these participants to seek hospital treatment or that the focus on negative consequences of drinking (on health, relationships, finances, etc.) that is typically included in treatment may be misdirected (Center for Substance Abuse Treatment, 1999). Preliminary analyses looking at post-discharge relapse in this study showed that those whose total score on the DEQ at the end of treatment was above the cutoff of 107 were drinking at higher quantity at 3 months post treatment than the participants whose DEQ scores were below the cutoff. This suggests that addressing expectancies of negative consequences of drinking maybe important in the maintenance of treatment gains. Due to the small numbers in our follow up sample this finding does require replication with a larger sample.

The results of this study suggest that the relationships among individual expectancy subscales and drinking measures differ depending on the type of drinker and the reasons and context of drinking. In accordance with cognitive theories of depression (e.g. Miranda & Persons, 1988), expectancies of negative consequences of alcohol consumption were more available when respondents reported more negative mood states. In the clinical sample, drinking patterns were only related to endorsements of tension reduction expectancies and overall levels of expectancy endorsement. In the student sample, risky drinking patterns were related to endorsements of positive expectancies (Increased Confidence, Sexual Interest and Tension Reduction). Contrary to predictions, higher endorsement of the negative consequences of drinking was positively related to drinking risk, so acknowledgement of negative consequences is not acting as a protective factor in these nonclinical drinkers.

It appears that in both samples, stronger belief that drinking helps reduce tension was related to more risky or heavy levels of drinking. Interestingly, scores on the Tension
Reduction and Social Confidence subscales were not related to symptoms of anxiety or stress, so it appears that for the non-clinical population, resolution of anxiety states was not connected to drinking. Focusing on the expectancies of Social Confidence and Tension Reduction may be more helpful in the treatment of alcohol use. Clinicians should take care not to attempt to refute the pharmacological evidence of the anxiety reducing properties of alcohol (Lingford-Hughes & Daglish, 2006) but instead to focus on the costs of relying on drinking as a strategy for reducing social or other forms of anxiety and the provision of alternative strategies for anxiety management.

This study also provided preliminary evidence that the DEQ can be used in clinical practice. Norms provided in the current study allow clinicians to identify risky levels of overall expectancy endorsement (i.e. total scores above the cut-off of 107) as well as subscale endorsement. Drinking expectancies have been targeted by two main techniques in therapy namely motivational interviewing and expectancy challenge (Wood, Capone, Laforge, Erickson, & Brand, 2007). These techniques are based on the premise that correcting unrealistically positive beliefs about drinking will lead to decreases in disordered drinking patterns (Darkes & Goldman, 1993; Lau-Barraco & Dunn, 2008). Some studies have shown that expectancy challenge can reduce drinking patterns in male university students (Darkes & Goldman, 1993; Lau-Barraco & Dunn, 2008; Wiers, van de Lutigaarden, van den Wildenberg, & Smulders, 2005). However, others studies have shown that reductions in drinking may be short-lived or only seen in males (Corbin, et al., 2001; Van de Lutigaarden, Wiers, Knibbe, & Candel, 2007).

Although the participants in this study were not given an expectancy-focused intervention, the findings showed that subdividing the clinical sample into those above and below the cut-off of 107 identified those who whose drinking outcomes were significantly
worse at 3 months post-discharge. On average, they were drinking in greater quantities at the follow-up than their counterparts who were below 107 on the DEQ-total.

There are several limitations to the current findings. Firstly the two samples are not matched for age and gender with both being potential confounds related to expectancy; it would also be beneficial to obtain norms for an age-matched general community sample. Despite this, studies have consistently shown university students drink at more hazardous levels than the general public (e.g. Stallman, 2010) and establishing norms on this sample will also be helpful for clinicians working in student counselling services and other services for young adults. Although great efforts were used to follow up clinical participants after discharge, only half of the participants could be reached. And those that could not be contacted for follow up were more likely to drink at higher levels at baseline so results need to be interpreted with this issue in mind. Further, past research in this area has indicated that changes in cognitions and expectancies may not have an impact till at least 18 month follow up (e.g. Connors, et al., 1993). Further attempts to validate the use of the DEQ as an indicator of relapse should follow a larger sample of clinical cases over a longer period of time.

Future research can also evaluate the concurrent validity of the DEQ by administering this measure alongside other measures of alcohol expectancies in both clinical and nonclinical samples.

3.1. Conclusions

The study has established norms on revised scoring version of the DEQ for clinical and student samples, and a cut-off of 107 for drinking risk. Although only half of the clinical sample was followed up, this current study illustrated that high levels of treatment resistant alcohol expectancies at discharge can be associated with adverse treatment outcomes at three months follow up. Also, the results of the current study suggest that negative alcohol expectancies have a weaker relationship with alcohol use indicators than tension reduction
expectancies in heavy drinkers. This implies that treatment strategies targeting the latter
cognitions maybe more effective. Clinicians can also make use of the norms presented in this
study as well as the proposed cut-off in order to identify high risk cases.
References


Figure Captions

Figure 1. Sensitivity and specificity of the DEQ Total Score. The area under the receiver operating characteristic curve = .88, SE = .02, asymptotic normal 95% confidence interval [.84, .92].