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Positive affective states and alcohol consumption: The moderating role of trait positive urgency

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Tables and Figures: 3 tables, 1 figure

Abstract

Trait positive urgency is characterised by risky and maladaptive actions in response to extreme positive affective states. Positive urgency has previously been shown to be a risk factor for alcohol consumption and alcohol-related problems, however, there has been limited experimental research examining how positive urgency may moderate relations between affective states and alcohol consumption. In the current study, a sample of 106 participants completed a trait measure of positive urgency and were then randomly assigned to one of three mood induction conditions: a high activation positive, a low-activation positive or a neutral mood condition. Subsequently, participants took part in a bogus beer taste test, where their alcohol consumption was subsequently measured. The results revealed that positive urgency significantly predicted increased beer consumption, but only for those participants in the high-activation positive mood induction group. The findings from this study provide support for positive urgency as a risk factor for alcohol use, and suggest that it may be of particular relevance in social situations where individuals experience highly activated positive affective states.

Keywords: impulsivity; UPPS; positive urgency; alcohol use; mood induction.

1. Introduction

Individuals engage in risky and maladaptive behaviours, such as substance abuse, gambling, excessive alcohol use, and risky sexual behaviours, in response to positive affect (Cheung and Mikels, 2011; Moore and Chatter, 2003; Zapolski et al., 2009). Although much research has examined the direct relationship between affective states and engagement in risky behaviours, the degree to which these relationships are moderated by stable individual differences has been less widely studied. More specifically, we might expect that individual differences in impulsivity-related traits will moderate relationships between affective states and risky behaviour. Trait impulsivity is now widely regarded as comprising several distinct, but related, facets. For example, Whiteside and Lynam (2001) factor analysed a number of self-report impulsivity inventories and found a robust four-dimensional structure, comprised of factors for sensation-seeking, (lack of) premeditation, (lack of) perseverance and urgency. Whiteside and Lynam (2001) developed a novel measure of these four facets of impulsivity, the UPPS. Urgency refers to the tendency to engage in risky and disinhibited behaviour when in a heightened emotional state. While the original UPPS focused more on negative emotionality in relation to urgency, a measure was later developed for assessing disinhibited behaviour in relation to positive emotional states (positive urgency; Cyders et al., 2007). The urgency traits have been shown to strongly predict a number of potentially risky behaviours (Cyders et al., 2009; Zapolski et al., 2009), and to also potentiate the relationship between affect and maladaptive actions (e.g. Cyders et al., 2010; Simons et al., 2010). Alcohol use has been one such potentially risky behaviour that has been examined in relation to the urgency traits.

Evidence suggests that positive urgency prospectively predicts increases in drinking quantity and negative outcomes from drinking in college students, even when controlling for the other UPPS traits (Cyders et al., 2009). Despite this, there have been relatively few

studies that have examined positive urgency as a moderator of the link between positive affective states and alcohol consumption, and more experimental studies are needed in this area (Cyders and Smith, 2008). A potentially useful approach in this context would be to directly manipulate mood state and then examine the effect of this manipulation on alcohol consumption, as a function of trait positive urgency. As far as we are aware, only one previous paper has done this. Across two studies, Cyders et al. (2010) examined the effects of a positive mood manipulation on alcohol consumption and risk taking as a function of positive urgency. In the second of these studies, they showed that positive urgency was the only UPPS facet to significantly predict increases in alcohol consumption, using a bogus beer taste test method, after a positive mood induction, controlling for the amount of beer consumed after a neutral mood induction.

While the mood induction procedure appeared generally successful in increasing positive emotional state, using a single positive mood induction condition leaves open the possibility that the target behaviour may vary by the level of arousal (Russel and Feldman-Barrett, 1999; Yik et al., 2011). While the mood induction used in Cyders et al. (2010) appeared to be designed to induce a high activation positive mood, it was notable in the second study that a measure of elation derived from the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) showed a non-significant decrease from pre to post induction. Given the centrality of aroused emotion to the urgency construct (Cyders and Smith, 2008), it may be of benefit to specifically manipulate level of arousal in a positive mood induction, as suggested by others (Treloar and McCarthy, 2012).

This study aimed to extend Cyders et al. (2010) by examining whether the induction of high-activation and low-activation positive affective states influence post-induction alcohol consumption, as a function of trait positive urgency. It is necessary to empirically validate that positive urgency is most influential in more activated positive affective states. In

the current study, we induced mood state across three conditions, a high-activation and low-activation positive mood induction and a neutral mood induction, and examined the effects of these on alcohol consumption using a bogus taste test method. Following from Cyders et al. (2010), we hypothesised that trait positive urgency would moderate the relationship between mood induction group and alcohol consumption, such that those with high scores on positive urgency would consume the most alcohol, but only in the high-activation mood induction condition.

2. Method

2.1 Participants

The participants in this study were undergraduate students studying psychology at Goldsmiths, University of London, who participated in return for course credits. The study sample consisted of 106 participants, with 60 females ($M = 24.07$ years of age, $SD = 7.74$) and 46 males ($M = 23.76$ years of age, $SD = 5.72$). All participants were at least 18 years of age and provided informed consent prior to participation. They were told that they would be participating in a study examining beer taste preferences in university students, and that they would complete several questionnaires and thinking exercises before completing a beer taste preference test. Only individuals who typically consumed at least one unit of alcohol per week and enjoyed drinking beer were eligible for participation. Participants who were on any prescribed psychoactive medication, or who were receiving treatment for neurological, psychiatric or substance abuse related conditions, were excluded from participating in the study. Ethical approval for this study was granted by the Goldsmiths Psychology Ethics Committee. Participants were fully debriefed at the end of the study.

2.2 Measures

2.2.1 UPPS-P Impulsivity Scale

The UPPS-P is a 59 item scale which is designed to assess trait impulsivity (Lynam et al., 2006). The inventory measures five distinct facets of impulsive behaviour; these are negative urgency, lack of perseverance, lack of premeditation, sensation seeking and positive urgency. Each item on the UPPS-P is scored using a 4-point Likert scale from 'Strongly Agree' to 'Strongly Disagree'. Cronbach's alpha for the UPPS-P facets in the current study was .87 for negative urgency, .80 for lack of premeditation, .83 for lack of perseverance, .84 for sensation seeking and .93 for positive urgency facet.

2.2.2. Alcohol Use Questionnaire (AUQ)

Alcohol use was measured using the AUQ, based on the timeline follow-back method. In this method participants are asked to retrospectively estimate their daily alcohol consumption over a time period ranging from a week to 6 months. The AUQ consists of 12 items: the first 9 items required participants to indicate their typical consumption of alcoholic beverages on a weekly basis over the last six months. The last three items asked participants about the speed of their drinking, the number of times they have been drunk in the last six months and the percentage of times they get drunk each time they drink. Several scores can be derived from the AUQ. Firstly, the total number of alcohol units consumed in an average week over the last six months was calculated. The standard UK measures for units were used. According to that, 25 ml single shot of any spirit was calculated as 1 unit; 175 ml standard glass of wine (12%) as 2 units and a pint of beer (4%) as 2.3 units. Secondly, a general alcohol use score (AUQ) was obtained by adding and weighting the weekly amount of wine, beer and spirit consumption, speed of drinking on one occasion, the number of times a participant gets drunk and the percentage of time feeling drunk in the last 6 months. Lastly, a

binge drinking score was calculated for all participants (see Townshend and Duka, 2002, for more details on the scoring used for the AUQ).

2.2.3 Alcohol Use Disorder Identification Test (AUDIT)

The AUDIT is a screening tool that is used to identify people who are at risk of developing alcohol problems. The self-report measure was developed by the World Health Organisation in 1982 and it is used in identifying the preliminary signs of hazardous drinking and mild dependence within the last year. The self- report measure contains 10 multiple choice items examining three distinct domains: recent consumption, dependence and harmful use. The responses to the questionnaire are scored using a points-based system and the overall score is obtained by adding scores for responses on each domain. The AUDIT measure was used to identify risky and hazardous drinking behaviour. Cronbach's alpha for the AUDIT was .79.

2.2.4 The UWIST Mood Adjective Checklist (UMACL)

The UMACL (Matthews et al., 1990) is a mood adjective checklist that comprises 24 adjectives used to describe different mood states, rated on a 4-point Likert scale. Participants are required to circle the response that best matches their current mood, with 1 being 'definitely' and 4 being 'definitely not'. The UMACL consists of three subscales: Energetic Arousal (EA) measures feelings of subjective positive high activation mood states; high scores on this scale indicate high EA. Tense Arousal (TA) measures feelings of subjective tension; higher scores on this scale indicate higher TA. Hedonic Tone (HT) measures the overall pleasantness of mood; higher scores indicate a more pleasant emotional state. In the current study we only report on the EA and HT scales, as they were most germane to our mood induction procedure. Cronbach's alpha was .83 for pre-mood induction EA and .75 for post-mood induction EA, and .89 for pre-induction HT and .89 for post-induction HT.

2.3 Procedure

The experimental sessions were held between 1pm and 7pm; all participants were tested individually. Baseline measurement of Breath Alcohol Content (BrAC) was taken from all participants on their arrival to ensure that they had not consumed any alcoholic drinks prior to testing. Participants were randomly allocated to one of the following mood induction conditions: high-activation positive mood ($n = 34$), low-activation positive mood ($n = 38$) and neutral ($n = 34$). All participants first completed the UPPS-P, the AUQ, the AUDIT and a baseline measure of the UMACL. Participants were then taken to an isolated cubicle for the mood induction procedure.

2.3.1 Mood induction procedure

The mood induction consisted of a combination of guided imagery vignettes and background music. The induction materials and procedure used in this study were based on those used in Study 4 from Smillie et al. (2012). In each condition participants were presented with four written scenarios and asked to imagine themselves in each scenario for several minutes before moving on to the next one, and to focus on how they would feel in each described situation. They were instructed to get into the feeling of each scene as much as possible, and were told that they would be asked to recall the scenarios afterwards (full instructions can be found in Smillie et al., 2012). Participants were not asked to recall parts of the scenarios at the end; this instruction was added to encourage them to undertake the task diligently. Participants in the high-activation positive mood condition viewed four vignettes describing appetitive, activating events, such as *'You buy a lottery ticket and you win £1000.00 instantly'*. Low-activation positive mood condition vignettes included pleasant, relaxing scenarios such as *'You are lying in the warmth of the sun on a tropical beach, with the sound of gentle waves in the background'*. Neutral vignettes included scenarios like *'You are driving down a long stretch of road as you make your way to work in the morning'*.

While completing the guided imagery task, participants listened to background music congruent with their allocated mood condition. The music for each condition was the same as that used in Smillie et al. (2012). The induction lasted for 8 minutes, and participants were administered the UMACL immediately after the induction.

2.3.2 Beer taste test

The beer taste test procedure was based on similar procedures used in Cyders et al. (2010) and Weafer and Fillmore (2008). Following the mood induction procedure, participants were moved to a different room in the laboratory and were asked to consume three different brands of beer and rate these on various aspects of taste. The brands of beer used in the study were Fosters, Becks and Becks Blue (non-alcoholic), with each cup holding 200ml of beer. The non-alcoholic beer was added as an option to minimize the level of potential intoxication. Each beer was served in a cold glass and was coded as A, B or C so the participant did not know which beer they were sampling. Participants were asked to drink from each cup as much or as little beer as they needed to rate each on a five-point Likert scale, with 1 being 'unpleasant' and 5 being 'pleasant'. They were asked to rate each beer on 4 dimensions: pleasant, strong tasting, sweet and fizzy. The scale was an adapted version of the beer taste test scale used in the study by Jones et al. (2011). Participants were asked to take as much or as little time as they needed to complete the rating scale. The amount consumed from each beer was measured in millilitres after the participants had left.

3. Results

3.1 UPPS-P and Alcohol Use Measures

Table 1 shows the descriptive statistics for the UPPS-P scales and the alcohol use measures, and the correlations between these measures. The correlations between the UPPS-P

and previous alcohol use measures show significant positive correlations between positive urgency and the alcohol use and problems measures. Positive urgency was significantly correlated with the AUQ total score, binge drinking score, typical weekly total alcohol consumption, and the AUDIT, while negative urgency was only significantly correlated with the AUDIT. The other three UPPS-P facets also significantly and positively correlated with alcohol use and problems.

Table 1
Bivariate Correlations and Descriptive Statistics for the Self-report Measures and Beer Consumption

Variable	1	2	3	4	5	6	7	8	9	10
1. Negative urgency	-									
2. Lack of premeditation	.46**	-								
3. Lack of perseverance	.40**	48**	-							
4. Sensation seeking	.21*	.35**	.10	-						
5. Positive urgency	.65**	.52**	.31**	.43**	-					
6. Alcohol use questionnaire	.12	.36**	.25*	.38**	.27**	-				
7. Binge drinking	.15	.32**	.24*	.32**	.26**	.96**	-			
8. Total units per week	.04	.36**	.20*	.37**	.20*	.79**	62**	-		
9. AUDIT	.28**	.42**	.35*	.41**	.35**	.68**	.61**	.64**	-	
10.Beer (ml)	-.06	.13	.10	.18	.05	.33**	.30**	.34**	.34**	-
Mean	28.57	23.27	21.67	34.21	28.40	34.56	23.10	21.93	9.84	184.65
Standard deviation	7.01	5.84	5.67	7.45	9.17	27.97	22.02	17.14	5.36	155.25

3.2 Mood Ratings

Table 2 shows the pre-mood induction and post mood-induction means for HT and EA separately for each mood induction group. As noted above, we only report on the EA and HT scales here, as the mood adjectives in these scales are of most relevance to the mood states we sought to induce. EA increased significantly in the positive high-activation condition, $F (1, 33) = 16.03$, $p < .0001$, $\eta^2 = 0.33$, but did not change significantly for the

positive low-activation or neutral conditions (both p > .05). HT significantly increased (i.e. became more positive) in the positive low-activation mood condition, F (1, 37) = 31.34, $p <$ .0001, η^2 = 0.46, and the positive high-activation mood condition, F (1, 33) = 35.92, $p <$ .0001, η^2 = 0.52. HT also significantly increased, albeit more modestly, in the neutral condition, F (1, 33) = 5.85, p = .02, η^2 = 0.15. Additionally, positive urgency did not significantly correlate with pre (r = -.06, p = .52) or post EA, (r = -.10, p = .29), or with pre (r = -.14, p = .14) or post HT, (r = -.13, p = .17) mood ratings.

Table 2
Means and Standard Deviations for Self-reported Mood Ratings Pre and Post
Neutral, High and Low Activation Mood Inductions

Measure	Pre-Induction	Post-induction
Neutral		
Energetic arousal	20.94 (4.77)	20.73 (3.66)
Hedonic tone	23.79 (4.98)	25.21 (4.87)
Positive low- activation		
Energetic arousal	20.44 (4.58)	20.23 (3.74)
Hedonic tone	24.19 (5.35)	27.00 (4.71)
Positive high- activation		
Energetic arousal	19.82 (4.45)	22.38 (4.22)
Hedonic tone	24.79 (4.53)	27.67 (4.42)

3.3 Mood induction and alcohol consumption

Participants on average drank a total of 176.11 ml of beer following the neutral mood induction (SD = 172.88 ml), 186.47 ml of beer after the low-activation positive mood induction (SD =140.86), and 191.14 ml of beer after the high-activation positive mood induction (SD =155.25 ml). Moderated regression analysis was conducted to assess the effect of mood induction group on beer consumption, as a function of positive urgency. Mood

group was dummy coded prior to the moderated regression analyses, with the high-activation positive mood condition used as the reference group. The total amount of beer consumption (measured in ml) was entered as the dependent variable. In step one of the analysis, the dummy variables for mood group, along with centred positive urgency scores, were entered. The interaction terms for mood group and positive urgency were entered in the second step of the model. The results of this analysis are shown in Table 3. The main effects of mood group and positive urgency did not significantly predict beer consumption. The results did show, however, that there was a significant interaction between positive urgency and the high-low activation positive mood contrast. While individuals with high levels of positive urgency in the low-activation positive mood condition consumed less beer, high-activation positive mood predicted higher levels of beer consumption among those with higher positive urgency.

Table 3
Hierarchical Multiple Regression of Beer Consumption (ml) on Positive Urgency and Mood Induction Group

Predictor	R^2	F change	b	SE	B	t
Step 1	.00	.16				
PU			.97	1.67	.05	.58
PHA-Neutral			-16.86	38.24	-.05	-.44
PHA-PLA			-6.45	37.22	-.02	-.17
Step 2	.05	2.97*				
PU			6.51	2.90	.38	2.24*
PHA-Neutral			155.47	128.24	.47	1.21
PHA-PLA			254.33	113.87	.78	-2.23*
PU x PHA-neutral			-6.29	4.34	-.58	-1.44
PU x PHA-PLA			-9.35	3.86	-.91	-.2.42*

Note. PU = Positive Urgency; PHA = Positive High-Activation; PLA= Positive Low-Activation

Significance of the slopes for the three mood groups were tested in three separate linear regression analyses, with positive urgency as predictor of total beer consumption for high- activation positive, low-activation positive and neutral mood conditions. Figure 1

depicts these relationships. The results revealed that positive urgency significantly and positively predicted total beer consumption only among those in the high-activation positive mood group ($\beta = .38$, $t = 2.36$, $p = .02$), but not in the low-activation positive ($\beta = -.20$, $t = -1.22$, $p = .23$) or neutral ($\beta = .01$, $t = 0.06$, $p = .95$) mood conditions. The comparison between the low-activation positive mood group and the neutral group was not significant in terms of the positive urgency and beer consumption relationship.
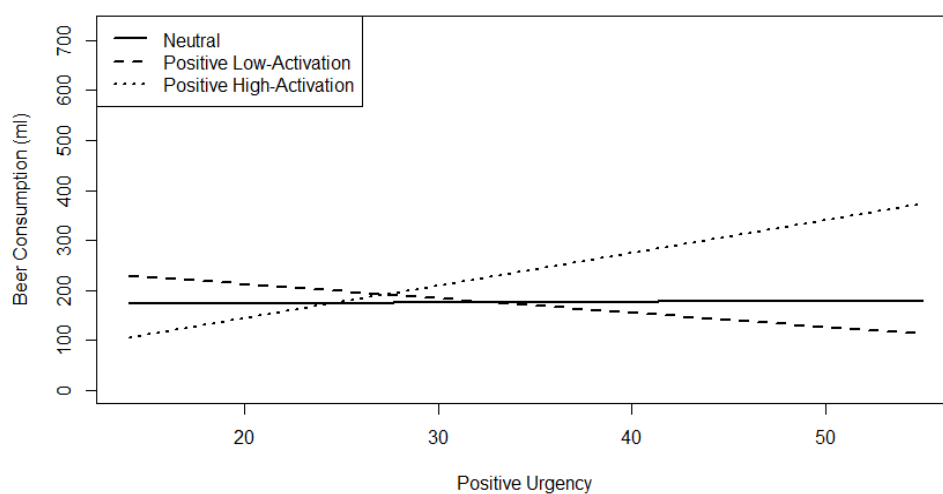

Figure 1. The regression of beer consumption (ml) on positive urgency as a function of mood induction group.

The moderated regression model described above was repeated, with negative urgency instead of positive urgency included in the model. This analysis showed that there was no main effect of negative urgency on beer consumption, nor a significant interaction between negative urgency and mood induction group predicting beer consumption. The interaction between other UPPS facets and mood groups also did not significantly predict beer consumption. These analyses were also repeated controlling for gender and typical alcohol use; the results remained essentially similar.

4. Discussion

The current study hypothesised that individuals with elevated positive urgency scores would consume more beer when in a highly activated positive mood state, as compared to a low-activation positive mood state. This hypothesis was supported. Positive urgency significantly moderated the relationship between mood condition and beer consumption, with a significant positive relationship between positive urgency and beer consumption only being shown for those in the high-activation mood group.

The results of this study support and extend those of Cyders et al. (2010), where it was shown that positive urgency significantly predicted increased beer consumption following a positive mood manipulation, even when controlling for the other UPPS-P traits. In their study, Cyders et al. (2010) used a single positive mood induction condition; in the current study, we used two positive mood conditions, varying these conditions by level of activation. As predicted, positive urgency was only related to beer consumption in the high-activation positive mood condition. This supports the notion that high scorers on positive urgency measures may be more likely to engage in alcohol consumption when in a highly activated positive mood state. Previous studies have shown that while trait positive affect is associated with fewer drinking days and fewer alcohol dependence symptoms, state positive affect is associated with an increased likelihood of drinking that day and heavier consumption (Simons et al., 2010; Simons et al, 2014). This might suggest that highly positive urgent individuals are particularly at risk for problem drinking in social contexts that generate feelings of excitement and anticipation. The effects of positive urgency found in the current study were unaffected by controlling for level of typical alcohol use; this would suggest that the effects of positive urgency are not limited to those who are heavy drinkers or who suffer from drinking-related problems. Also, negative urgency did not significantly predict beer consumption, nor did it significantly moderate the relationship between the positive mood

inductions and beer consumption, providing some support for the discriminant validity of positive and negative urgency despite their relatively high inter-correlation ($r = 0.65$ in this sample).

Similarly to Cyders et al. (2010), variation in positive urgency was found to be unrelated to variation in baseline mood state and to the reported changes in affect following high and low-activation positive mood inductions. It appears that individuals high on this trait did not experience positive emotions more intensely in this setting than did individuals with low positive urgency. This suggests positive urgency reflects a propensity to risky behaviour involvement while experiencing positive affect, but it does not lead individuals to experience positive affect more intensely, or more often than others. In terms of typical alcohol use and alcohol-related problems, we found that all of the UPPS-P traits showed positive and significant relations with all of the alcohol measures, with the exception that negative urgency showed non-significant relationships with the measures of typical alcohol use. This supports work from recent meta-analyses showing all of the UPPS-P traits have moderate relations with a range of drinking measures (Coskunpinar et al., 2013; Stautz and Cooper, 2013), although we might have expected the urgency traits to have stronger relationships with the more problem focused alcohol measures (e.g. binge drinking, AUDIT). In this sample, however, lack of premeditation and sensation-seeking had the strongest relationships with these problem measures.

The current study has several limitations that should be noted. First, the sample was drawn from among university students, thus generalization to other populations should be tested. On the other hand, a university student sample is of interest in studies of alcohol use, as they are typically in the young adult developmental period linked with more impulsive behaviours, which can potentially lead to problems (Cyders et al., 2010; Hingson et al., 2009; Simons et al., 2010). Secondly, despite the laboratory setting providing stringent control over

the environment and facilitating the opportunity for direct observations of behaviours, the results obtained from such settings may not generalise particularly well to real-life social settings where alcohol is consumed.

Examining the way in which emotion states lead to engagement in risky behaviours will help to better understand the role of positive affect in impulsive actions, and may help guide prevention and intervention strategies. Interventions that focus on modifying decision-making when in a heightened emotional state, and that seek to modify alcohol-related cognitive biases that become activated when in an aroused emotional state, may be particularly relevant for those who score highly on measures of positive urgency (Murphy et al., 2012; Wiers et al., 2013). The current study suggests that level of emotional arousal may play a crucial part in determining the degree to which the urgency traits affect potentially risky behaviour.

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