



Short Communication

Alcohol consumption in young adults: The role of multisensory imagery



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ABSTRACT

Little is known about the subjective experience of alcohol desire and craving in young people. Descriptions of alcohol urges continue to be extensively used in the everyday lexicon of young, non-dependent drinkers. Elaborated Intrusion (EI) Theory contends that imagery is central to craving and desires, and predicts that alcohol-related imagery will be associated with greater frequency and amount of drinking. This study involved 1535 age stratified 18–25 year olds who completed an alcohol-related survey that included the Imagery scale of the Alcohol Craving Experience (ACE) questionnaire. Imagery items predicted 12–16% of the variance in concurrent alcohol consumption. Higher total Imagery subscale scores were linearly associated with greater drinking frequency and lower self-efficacy for moderate drinking. Interference with alcohol imagery may have promise as a preventive or early intervention target in young people.

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1. Introduction

The association between consummatory behavior and craving is well documented (Fortuna, 2012). As there is accumulating evidence that craving plays an important role in substance use disorders (SUD) (Leggio, 2009; Tiffany & Wray, 2012), the recently released DSM-5 now includes *craving or a strong desire or urge to use a substance* as a diagnostic SUD criterion (American Psychiatric Association, 2013). There is little research on the role of craving in non-clinical, substance using populations. This is in spite of common reporting of urges and desires for drinking used in the everyday lexicon of non-dependent drinkers. There is some empirical evidence that craving is experienced by young, recreational drinkers (Connor, Feeney, Jack, & Young, 2010; Love, James, & Willner, 1998; McEvoy, Stritzke, French, Lang, & Ketterman, 2004). For example, in a sample of college students ($n = 309$), Connor et al. (2010) found that a widely used measure of alcohol craving, the Obsessive Compulsive Drinking Scale (OCDS, Anton, Moak, & Latham, 1995), predicted approximately half of the variance in Alcohol Use Disorder Identification Test scores (AUDIT, Saunders, Aasland, Babor, De La

Fuente, & Grant, 1993) and a quarter of the variance in average consumption per drinking occasion.

Definitional and measurement problems have hindered progressing a more comprehensive understanding of craving in both clinical and non-clinical studies. Often measures confound craving with behaviors, or cognitive phenomena such as expectancies, intentions, or perceived behavioral control (Kavanagh et al., 2013). This has likely inflated estimates of predictive power in previous research and restricted our capacity to disentangle key psychological mechanisms of craving. Broadly, craving can be defined as an affectively-charged cognitive event in which an object or activity is associated with pleasure or relief of discomfort (Kavanagh, Andrade, & May, 2005). Reliable and valid measures of alcohol craving and desire are now available to capture key components of alcohol craving (e.g., frequency, intensity, salience) (Kavanagh et al., 2013; Statham et al., 2011).

A component of craving which has drawn increasing attention is the role of imagery (Kavanagh, May, & Andrade, 2009). Little is known about the role that imagery plays in non-dependent drinking. Elaborated Intrusion (EI) Theory (Kavanagh et al., 2005) places sensory imagery at the heart of craving. Vivid sensory imagery is seen as central to desires, eliciting anticipatory consummatory pleasure. Laboratory research in non-clinical samples confirms that imagery is multisensory and accompanies consummatory desires, with more vivid imagery associated with stronger desires (May, Andrade, Kavanagh, & Penfound,

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2008; May, Andrade, Panabokke, & Kavanagh, 2004). Competing visual or olfactory imagery are more effective in reducing craving for cigarettes (May, Andrade, Panabokke, & Kavanagh, 2010; Versland & Rosenberg, 2007), food (Kemps & Tiggemann, 2007; Kemps & Tiggemann, 2013) and coffee (Kemps & Tiggemann, 2009), than are auditory imagery or verbal tasks.

The Alcohol Craving Experience (ACE) questionnaire (Statham et al., 2011), based on EI Theory (Kavanagh et al., 2005), includes an Imagery scale that measures key sensory components of craving: imagining taste, smell and sensations of drinking. Identifying additional targets of hazardous drinking may result in novel prevention and early intervention approaches for young, 'at risk' drinkers. Recent evidence suggests that imagery-based techniques can strengthen behavior change plans and increase the chance of success (Hackman, Bennett-Levy, & Holmes, 2011; Knäuper et al., 2011). An initial step is to assess the relationship between imagery and drinking in a large community sample. Based on laboratory evidence, we expect that more vivid imagery will be associated with higher levels of alcohol consumption and harmful use.

2. Method

2.1. Participants

A community sample of 1535 age stratified 18–25 year olds were surveyed online using a market research company. The average age of participants was 22.7 years (SD 2.39), and 54% were female (816/1522). Ethics approval was obtained from the Queensland University of Technology Human Ethics Research Committee.

2.2. Measures

2.2.1. Alcohol Craving Experience (ACE, Statham et al., 2011)

Based on the EI theory of desire (Kavanagh et al., 2009), the Imagery scale of the ACE (ACE-Imagery, Statham et al., 2011) measures five sensory aspects of craving in the past week (see Table 1: imagining taste, smell, sensations in the mouth, sensations in the body, picturing drinking) and is significantly associated with problem drinking and other features of craving (Statham et al., 2011). In this study the ACE is scored on a five-point scale from 1 (Not at All) to 5 (Constantly). The ACE-Imagery has excellent internal reliability (.94) and construct validity (Statham et al., 2011). Internal reliability in the current sample was .95.

2.2.2. Alcohol consumption

Indices of alcohol consumption were assessed to capture range and intensity of drinking over the previous 12 months. Quantity of drinking per day was measured by asking "When you are drinking, how many drinks containing alcohol do you typically consume?" Respondents were shown standard drinks pictures and nominated how many drinks they consumed between Monday and Sunday. Average quantity of

drinks per day was then calculated (quantity/frequency). Binge drinking frequency was measured by "How often do you have more than 4 drinks on one occasion (in the last month)". Maximum drinking per drinking occasion was calculated by: "In the last month, what is the maximum number of drinks (on one occasion) you had consumed". Frequency of drinking was measured by AUDIT Item 1 (Saunders et al., 1993) "How often do you have a drink containing alcohol"? (Responses ranged from *never* to 4 or more times per week).

2.2.3. Self-efficacy for moderate drinking

Self-efficacy was measured by adapting Perugini and Bagozzi (2001) and Bagozzi and Dholakia (2002) scales to the goal of moderate drinking "Thinking about the next 4 weeks, how confident are you that you can maintain moderate drinking behavior (4 or less drinks for women; 6 or less drinks for men) if you are [in a particular drinking situation]?" Drinking situations included: at a party with friends, not relaxed in social situations, in a 'shout' [a 'shout' is an Australian colloquial expression which means one's turn to buy drinks for companions at a bar or restaurant, equivalent to a 'round' in UK English], when wanting to feel more confident, and when offered free drinks. The total score had an internal reliability coefficient of .93.

2.3. Procedure

Following consent, questionnaires were administered online to age stratified panel members as a battery that additionally asked about smart phone usage and peer group communication. Questionnaires were de-identified before being returned to researchers. Participants were reimbursed for their participation.

3. Results

3.1. Alcohol consumption

On average, participants consumed 1.06 standard drinks (10 g alcohol) daily (SD = 1.59, range 0–15.57), exceeded 4+ drinks (in one session) per month an average of 1.97 times (SD = 3.09, range 0–30) and had an average of 5.01 maximum number of drinks per drinking occasion (SD = 5.84, range 0–30).

To examine if subsequent findings were influenced by heavier drinking outliers, we removed subjects that scored in the top 10% of consumption ranges. With heavier drinkers removed, consumption was: *quantity of drinks per day* (.66 standard drinks, SD = .68, range 0–2.57, n = 1382), *binge drinking frequency* (1.24 times, SD = 1.45, range 0–5, n = 1400) and *maximum drinking per drinking occasion* (3.62 times, SD = 3.44, range 0–12, n = 1393). These supplementary data are applied below (Section 3.2) to assess if heavier drinkers in the sample altered key findings.

Table 1
ACE Imagery by alcohol consumption indices.

Predictor (ACE-Imagery) Over the last week, ...	Mean	SD	Average alcohol per day			4+ drinks per month			Max number of drinks		
			R ²	β	r	R ²	β	r	R ²	β	R
how often did you <i>picture</i> alcohol or drinking?	1.71	1.00	.143	.156***	.34***	.160	.228***	.38***	.120	.313***	.32***
how often did you imagine what it would <i>taste</i> like?	1.72	1.02		.086	.31***		.164**	.34***		.072*	.22***
how often did you imagine what it would <i>smell</i> like?	1.61	1.00		.005	.29***		-.024	.31***		-.173**	.17***
how often did you imagine what it would <i>feel like in your mouth or throat</i> ?	1.62	1.02		-.096	.28***		-.092	.29***		-.097***	.17***
how often did you imagine how your <i>body would feel</i> if you had a drink?	1.75	1.05		.249***	.35***		.147***	.34***		.199***	.27***

**** p < .10.

* p < .05.

** p < .01.

*** p < .001.

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