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Short Communication

Positive expectancies and perceived impaired control mediate the influence of reward drive and rash impulsiveness on alcohol use

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ABSTRACT

Recent factor analytic studies indicate that the broad trait of impulsivity comprises at least two distinct dimensions with regard to substance use. Thus, a two-factor model of impulsivity, comprising reward drive (i.e., sensitivity to rewarding stimuli) and rash impulsiveness (i.e., rash behaviour devoid of forethought), has been proposed. It is argued that distinct cognitive processes may mediate the association of these impulsivity factors with alcohol use. Specifically, it was hypothesised that drinking expectancies would mediate the association between reward drive and alcohol use, and that perceived impaired control would mediate the effect of rash impulsiveness on alcohol. Utilising established scales, 132 participants aged 18 to 70 years were surveyed in order to assess the capacity of the two-factor model to differentially predict alcohol use through distinct cognitive mediators. The hypotheses were supported, providing support for a two-factor approach. Thus, reward drive and rash impulsiveness appear to influence alcohol use through distinct cognitive processes.

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1. Introduction

Research has consistently revealed a positive association between impulsivity and alcohol use (Dawe et al., 2007). The conceptualisation of the broad trait of impulsivity has, however, differed across such studies, leading some to suggest that impulsivity may not be uni-dimensional (e.g., Dawe & Loxton, 2004; Quilty & Oakman, 2004). Indeed, factor analytic studies have provided evidence that impulsivity comprises at least two dimensions (e.g., Miller, Joseph, & Tudway, 2004; Quilty & Oakman, 2004). Subsequently, Dawe and Loxton (2004) have proposed a two-factor model of impulsivity, comprising reward drive (RD) and rash impulsiveness (RI), which is particularly relevant to substance use. Drawing from Gray's (1987) Reinforcement Sensitivity Theory, RD reflects individual differences in sensitivity to rewarding stimuli in the environment. Accordingly, reward sensitive individuals are more likely to be aware of and crave rewards (e.g., alcohol, money), and are more prone to engage in approach behaviour toward such rewards (Gray, 1987). The second dimension, RI, draws on the Eysenckian conceptualisation of impulsivity reflecting a tendency to act spontaneously without reflection or consideration of negative consequences (Eysenck & Eysenck, 1985).

Whilst much research has considered the relationship between impulsivity and alcohol use, few studies have investigated possible mediators of the impulsivity-alcohol use association. Cognitive processes are of particular interest as they may be able to explain the distinct associations of the two factors of impulsivity with alcohol use (e.g., Gullo, Dawe, Kambouropoulos, Staiger, & Jackson, 2010). Drinking expectancies and perceived impaired control are two such cognitive processes that are argued to mediate the associations of reward drive and rash impulsiveness with alcohol use.

Positive drinking expectancies (i.e., the expectation that consuming alcohol will result in a positive behaviour, cognition, mood, or emotion) have been strongly associated with drinking behaviour (e.g., Barnow et al., 2004; Lee & Oei, 1993). Furthermore, according to the Acquired Preparedness Model (APM), impulsive individuals are said to suffer from a learning bias in that they are prone to learning the positively reinforcing, rather than punishing, consequences of behaviour (Smith & Anderson, 2001). In support of the APM, studies have revealed that positive drinking expectancies mediate the association between impulsivity and alcohol use (e.g., Barnow et al., 2004; Urban, Kokonyei, & Demetrovics, 2008). However, other studies have been unable to replicate these results (e.g., Anderson et al., 2005). These inconsistent findings may be due to the APM emphasising rash-impulsivity in its conceptualisation; however, it appears more plausible that a learning bias in favour of rewarded outcomes is the result of sensitivity to reward (i.e., RD) (Gullo et al., 2010). Thus, the focus of the current study was to investigate whether positive drinking expectancies mediated the relationship between RD and alcohol use.

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Whilst RD appears to be characterised by heightened reward expectations, RI may be more closely linked with impaired behavioural control. Impaired control (i.e., drinking more than anticipated or intended) is a major feature of addiction, but is also seen to varying degrees in the general population (Heather, Booth, & Luce, 1998). Perceived impaired control (i.e., the cognitive component of impaired control) represents an individual's belief in their capacity to control their alcohol consumption (Heather, Tebbutt, Mattick, & Zamir, 1993). Studies have demonstrated that impaired control is a strong predictor of level of alcohol use and problem drinking (e.g., Nagoshi, 1999). Furthermore, impaired control has been shown to cross-sectionally (e.g., Leeman, Fenton, & Volpicelli, 2007) and prospectively (e.g., Leeman, Toll, Taylor, & Volpicelli, 2009) predict problem drinking in adolescents and young adults with relatively brief drinking histories.

It is proposed that RI individuals are likely to perceive a lower degree of control over their drinking and therefore drink more than they intend, as a result of their tendency to act spontaneously without considering the consequences. Studies revealing a positive correlation between perceived impaired control and RI (Nagoshi, 1999; Patock-Peckham, King, Morgan-Lopez, Ulloa, & Moses, 2011) provide initial support for the assertion that perceived impaired control may mediate the effect of RI on alcohol use; however, this prediction is yet to be investigated.

The aim of the current research was to examine whether drinking expectancies and perceived impaired control mediate the relationships between the two impulsivity factors and alcohol use. It was hypothesised that positive drinking expectancies would mediate the effect of RD on alcohol use, and that perceived impaired control would mediate the relationship between RI and alcohol use.

2. Methods

2.1. Participants

This study involved a community sample of 132 adults (35 males, 97 females) between the ages of 18 and 70 years (M = 33.96, SD = 14.91). Mean AUDIT score of participants in the current study was 6.8 (SD = 5.22) with a range from 0 to 25.

2.2. Measures

2.2.1. Reward drive

The 24-item Sensitivity to Reward scale of the Sensitivity to Punishment and Sensitivity to Reward Questionnaire (Torrubia, Avila, Molto, & Caseras, 2001) was utilised as a measure of reward drive. Cronbach's alpha (α) in the present study was .78.

2.2.2. Rash impulsiveness

The 19-item impulsiveness subscale of the Eysenck Impulsiveness Questionnaire (I_7; Eysenck, Pearson, Easting, & Allsopp, 1985) was employed as a measure of rash impulsiveness (α = .85).

2.2.3. Alcohol use

The 10-item Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aaslanders, Babor, De La Fuente, & Grant, 1993) was employed to assess alcohol consumption and identify hazardous drinkers (α = .81). Scores on the AUDIT range between 0 and 40, with a score of 8 or more resulting in the classification of 'hazardous drinker'.

2.2.4. Drinking expectancies

The 43-item Drinking Expectancies Questionnaire (Young & Oei, 1996) total scale was utilised to assess individual expectations regarding the outcome of drinking (α = 91).

2.2.5. Perceived impaired control

The 10-item perceived impaired control subscale of the Impaired Control Scale (Heather et al., 1993) was used to assess beliefs regarding the ability to control drinking in the future (α = .84). Higher perceived impaired control scores represent a higher perceived level of impaired control over alcohol use.

2.3. Procedure

Participants were asked to complete an online questionnaire incorporating the above measures and were informed that by submitting their results they were consenting to participate in the research project.

2.4. Statistical treatment

Path analyses were conducted with AMOS to determine the best fitting model predicting alcohol use. A pseudo-latent variable model was employed with one indicator for each latent construct. As recommended by Bollen (1989), the error variance of each indicator was set to SD^2 (1-Cronbach's α). The χ^2 test was used as a statistical test of model fit ($p < .05$). In addition, the following indices were also utilised to assess model fit: Comparative Fit Index (CFI > .95), Standardised Root Mean Square Residual (SRMR $\leqslant$ .08), Root Mean Square Error of Approximation (RMSEA $\leqslant$ .06) (Hu & Bentler, 1999). The Akaike Information Criterion (AIC) was selected to assist in model comparison, whereby smaller values represent a better-fitting model (Bollen, 1989). To assess mediation, bias-corrected bootstrap re-sampling was used to test the significance of indirect effects (Shrout & Bolger, 2002). Standardised regression coefficients (β) are presented throughout.

3. Results

3.1. Descriptive statistics

A correlation matrix of all the variables analysed is presented in Table 1.

3.2. Model estimation and evaluation

The first model (see Fig. 1) tested the hypotheses that drinking expectancies would mediate the influence of reward drive on alcohol use, and that perceived impaired control would mediate the effect of rash impulsiveness on alcohol use. In order to assess the extent to which the opposing mediational pathways may explain the data, an alternative model was tested by specifying drinking expectancies as a mediator of rash impulsiveness, and perceived impaired control as a mediator of reward drive. The hypothesised model provided a very good fit to the data and was substantially better fitting than the alternative model (see Table 2).

As displayed in Fig. 1, RD positively predicted drinking expectancies, which in turn positively predicted alcohol use. Furthermore, there was a significant direct effect of RD on alcohol use; however, this relationship was significantly mediated by drinking expectancies (indirect effect: β = .13, CI_{95}: .06–.23, $p < .001$). In addition, RI positively predicted perceived impaired control, which in turn positively predicted alcohol use. Whilst RI was not a significant predictor of alcohol use, perceived impaired control was found to significantly mediate the effect of RI on alcohol use (indirect effect: β = .09, CI_{95}: .03–.19, $p < .01$). In total, 64% of the variance in alcohol use was explained by the hypothesised model.

In the alternative model, RD was not a significant predictor of perceived impaired control (β = .14, p = .19), nor was RI a significant predictor of drinking expectancies (β = .18, p = .06). Given that

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