Modelling value-based decision-making after experimental manipulation of the value of alcohol

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1. Background

- Over 10 million people consume alcohol at levels above the United Kingdom’s ‘low-risk’ drinking guidelines (Public Health England, 2019).
- Harmful alcohol consumption is characterised by overvaluation of alcohol compared to non-alcohol alternatives.
- Devaluation of alcohol is associated with reduced alcohol choice (Rose et al., 2018). However, what is less known are the underlying mechanisms by which this occurs.

Aim of this study:
- Explore whether experimental manipulation of alcohol value alters the internal processes that precede decisions made about alcohol and soft-drink cues (Field et al., 2020).

2. Methods

- Pre-registered experimental manipulation study (within-subject design).
- 36 volunteers took part.
- Participants firstly rated 35 alcohol and 35 soft-drink images according to how much they wanted to consume them.
- They were then primed to devalue and value alcohol (order randomized) using previously validated videos (Di Lemma et al., 2015) before completing the VBDM task.
- Reaction time and choice accuracy were fitted to a drift-diffusion model (DDM) to parameterise the internal processes of decision-making, specifically evidence accumulation (EA) rates and response thresholds.

3. Results

- Devaluation of alcohol results in increases in the value that is ascribed to soft-drinks, reflected in augmented soft-drink EA rates.
- The experimental manipulation had no effect on EA rates for alcoholic drinks or on response thresholds in either priming condition.
- Our findings suggest that the underlying mechanism by which alcohol devaluation influences alcohol choice is through alterations in the value ascribed to the alcohol-free alternative.
- Future research: cross sectional comparisons of harmful drinkers and moderated drinkers or longitudinal follow up studies of people as they enter treatment (Field et al., 2020) or manipulation of the value of other substances (e.g. nicotine deprivation / satiety).

4. Conclusions

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