Delay discounting of money and alcohol in actively using alcoholics, currently abstinent alcoholics, and controls.

Petry (2001)

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I (named above) declare that this assignment is my own work and that I have correctly acknowledged the work of others. This assignment is in accordance with University and School guidance on good academic conduct (and how to avoid plagiarism and other assessment irregularities).

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The following paper will critique Petry’s (1) research into impulsivity and alcohol dependence. Included will be an overview of the study, an outline of key limitations and possible future directions for further study.

Overview

Impulsivity is an associated feature of substance use disorders (2) such as alcoholism. Delayed discounting is a method of measuring impulsivity (3), as it presents a time delay trap (4) where there is a choice of an immediate small reward or delayed larger reward. More rapid delayed discounting has been associated with substance disorders such as in heroin addicts (5). Delayed discounting rates also have been shown to correlate with Eysenck’s impulsivity score (6). Also found previously was rewards of a greater magnitude are discounted more rapidly (7) and drug rewards are discounted more rapidly than money rewards (8, 9).

The aim of this study was to investigate if there were any differences in the rate of discounting for; alcoholics compared to abstinent individuals and non-users, high and low rewards and type of reward (money vs. alcohol).

Methods and Results

The study used a sample of 19 alcohol dependent individuals, 12 with a history of dependence but hadn’t been intoxicated for 30 days and 15 with no history of alcohol abuse. The criteria used for alcohol abuse was assessed using items from structured clinical interviews for the DSM (10). The study was advertised, with a $50 dollar reward, through newspaper adverts and flyers distributed in various places e.g. substance abuse treatment programs. All participants were screened for eligibility over the phone between 1-10 days before the study.

Participants were asked to make hypothetical choices between immediate and delayed rewards of money and alcohol. The trials would begin at the maximum immediate reward ($1000, $100, 150 bottles or 15 bottles) and reduce by increments of 1 unit, until participants
decided they would prefer the delayed reward. To avoid order effects the same procedure was carried out in reverse for some trials. The points of indifference were determined for 8 different delay intervals. The rate of discounting was proportional to the constant k.

The reported findings were that alcoholics had the highest delayed-discount rate, followed by abstinent alcoholics, then the non-alcoholics for all the conditions apart from the $1000 condition. Also reported was smaller monetary rewards were discounted more rapidly, alcohol discounted more rapidly than money and Eysenck’s impulsivity scores were significantly correlated to discounting rates of money, but not alcohol. These results support the hypotheses made and suggest that alcoholism is related to impulsivity.

Implications

The results demonstrate that alcoholics are more susceptible to fall into time delay traps for money and alcohol. If the cause is an increase in impulsivity this may be more generalizable to other time delay traps, for example they may find it hard to diet as they may give in to cravings sooner\(^{(4)}\). If alcoholics are more susceptible to these time delay traps then there is an increased risk of financial difficulty in individuals who regularly use alcohol and as these individuals are less able to plan they may find it more problematic to find solutions to these financial difficulties.

Critique

The sample collected was split into three groups causing the representation in each condition to be small. The sample was also recruited on a voluntary basis with a monetary reward which may create a bias in the type of participant signing up\(^{(11)}\), for example individuals who sign up may be more money focused than average. This combined with the sample being below average for annual income per capita for the time\(^{(12)}\), may suggest the sample might not give reliable result for normal financial attitudes. This would mean that results couldn’t be generalised to the population as a whole.
Individuals taking part in the study may not be entirely honest about their alcohol and substance usage. It can be a sensitive topic which individuals may not be comfortable in revealing the truth. The research attempted to control for this by collecting breath and urine samples, to examine for any substances in participants’ systems; these however can only reveal recent usage of substances. If for example the alcoholic group were on underestimating their alcohol intake then the results may be showing a more dramatic difference than would be expected for the reported alcohol usage. However if the control group used more alcohol in the past than reported then the result may not be demonstrating the true extent of the disparity between groups.

As a further point of evaluation, the use of ex-alcoholics as a control may be flawed. These individuals differ from the alcoholics as they have managed to give up. They may never have been as impulsive in the first place. If this is the case then the difference between the two groups is expected and doesn’t support the point that impulsivity decreases after substance use stops. This potential bias could be tested by following up the group of alcoholics and investigating if the less impulsive individuals are more successful in abstaining from alcohol.

A major concern over this study was that participants were making hypothetical decision which would have no future consequences. This may mean that participants were not making realistic judgements that were reflective of real life situations. If the results don’t reflect behaviour outside of the lab then the conclusions drawn have little use. However the researchers defended the study’s ecological validity, noting that the results were concordant with similar studies using real rewards\(^6\).

Another issue with the paper is the analysis may have missed a possible relationship. The study reported that the rate of discounting increased for alcohol compared to money in general. On inspection of the k values it appears this relationship exists however it appears to
be a more dramatic increase for the alcohol condition compared to the controls. For example, the k value for the $1000 dollar condition to the 150 beer goes from 0.006 to 0.007 for the controls but for the active alcoholics goes from 0.042 to 0.142. If this relationship does exist, it would imply that alcoholics are not only more impulsive in general but vastly more impulsive when alcohol is involved.

**Future Research**

I will now go on to suggest possible ideas for related further study. One possible avenue for further investigation is to explore if substance users are more at risk of other time delay traps. For example, an investigation into how successful substance users are at dieting or paying off credit cards on time. This would potentially build on the evidence for substance abusers being more impulsive than non-substance users. It also may have implications for treatment programmes as it may be of use to include extra support in areas such as finance and healthy eating.

Another suggestion for further study is a longitudinal study of delayed-discounting. The current study used ex-alcoholics and found that their rate of discounting had dropped. This could indicate that the presence of alcohol in the system increases impulsivity or, as mentioned previously, it could be that these individuals were never as impulsive in the first place. If a study was conducted measuring alcoholics impulsivity and then retested after a length of time and examined if any alcoholics abstained and what effect this had on their rate of discounting. This would allow for a greater understanding of the relationship between impulsivity and abstention.

All in all the paper has some weaknesses, which this paper has tried to cover the most crucial ones. Despite this, the paper contributes some strong evidence to the body of research that is investigating impulsivity in substance users.
References


