Correlation between marijuana use and delay discounting

Austin A. Phanouvong¹, Suzanne H. Mitchell²,³

¹ Biology, Portland State University, ²Behavioral Neuroscience, ³Psychiatry, Oregon Health & Science University

Introduction

• Delay discounting occurs when the subjective value of rewards is lowered because the reward is only available following a delay.
• Previous studies have shown that drug use is associated with heightened discounting for a wide range of drugs (Weafer et al. 2014).
• But the only study examining marijuana uses found no effect – perhaps because the sample size was small (Johnson et al. 2010).
• In the present study, we compared delay discounting in marijuana users and nonusers, controlling for cigarette smoking, by compiling data from 11 previous studies that recorded usage of marijuana and assessed delay discounting.

Methods

• A composite database was created by combining the demographic and delay discounting data from 11 studies previously conducted by SHM.
• Criteria for study inclusion in the database were that the study collected basic demographic information from adults aged 18 or older, and that delay discounting was assessed using a task based on that described in Mitchell (1999).
• 133 subjects from an original 597 subjects were excluded due to subjects missing demographic or discounting data.

Delay Discounting Task (Mitchell & Wilson 2010): Participants make a series of choices between: A smaller amount of money ($0 - $10.00) available immediately OR $10.00 available after a delay (0-365 days).

To assess the rate at which the more delayed outcome was discounted we fitted a hyperbolic equation to each person’s choice data (Mazur 1987).

\[ Value = \frac{10}{1 + k \cdot Delay} \]

\( k \) indicates the steepness of the discounting function

Results

Participants

<table>
<thead>
<tr>
<th>Marijuana Users</th>
<th>Marijuana Non Users</th>
<th>Statistics</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (Males:Females)</td>
<td>84 (58:26)</td>
<td>379 (186:193)</td>
<td>t(134) = 2.971</td>
</tr>
<tr>
<td>Age (Years)</td>
<td>30.27 (11.26)</td>
<td>34.38 (12.67)</td>
<td></td>
</tr>
</tbody>
</table>

Mean (SD) amounts of current drug use for those who use

<table>
<thead>
<tr>
<th>Cigarettes/day</th>
<th>Alcohol drinks/week</th>
<th>Marijuana joints/week</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.45 (9.13)</td>
<td>5.47 (5.93)</td>
<td>2.4 (2.36)</td>
</tr>
</tbody>
</table>

Lifetime recreational drug use (Percent who reported lifetime use)

<table>
<thead>
<tr>
<th>Stimulants</th>
<th>Sedatives/traquiliizers</th>
<th>Hallucinogens</th>
<th>Opiates</th>
<th>Marijuana</th>
<th>Other (includes inhalants)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.24%</td>
<td>25.76%</td>
<td>65.48%</td>
<td>33.37%</td>
<td>100.00%</td>
<td>28.57%</td>
</tr>
</tbody>
</table>

Discounting

- k = 0.22 (0.09) 0.23 (1.15) t(137) = 0.016 0.987
- ln = -3.87 (2.12) -4.57 (2.39) t(108) = -2.662 0.009
- AUC = 0.43 (0.26) 0.49 (0.3) t(134) = -0.488 0.671

Marijuana users discounted more than non users. t(461) = -2.474, p = 0.014.

Marijuana was positively correlated with degree of delay discounting, r(464) = 0.158, p = 0.001.

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References:


