

Introduction

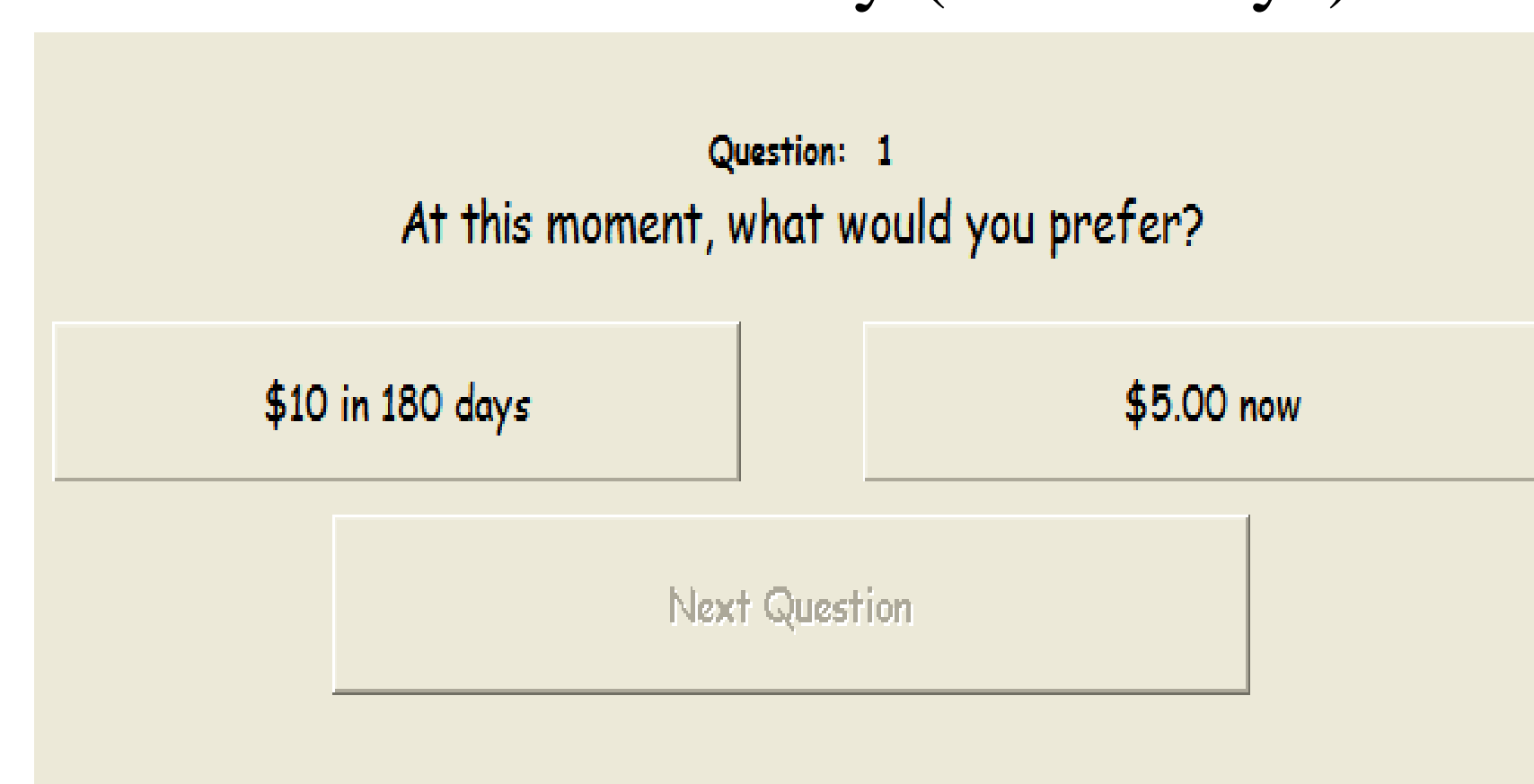
- Delay discounting occurs when the subjective value of rewards is lowered because the reward is only available following a delay.
- Previous studies have shown that drug use is associated with heightened discounting for a wide range of drugs (Weafer et al 2014).
- But the only study examining marijuana uses found not 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).

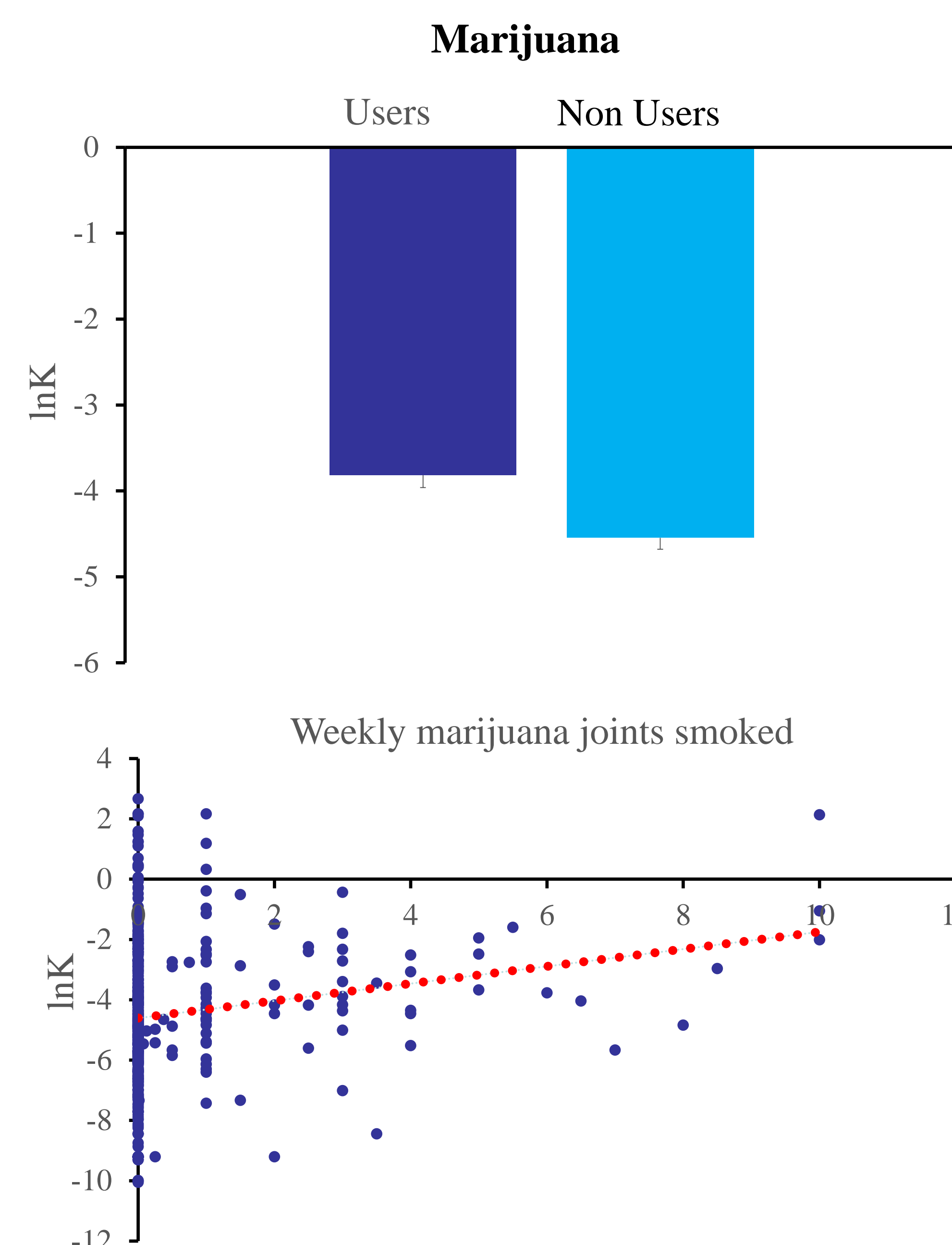
$$Value = \frac{\$10}{1 + k \cdot Delay}$$

k indicates the steepness of the discounting function

Participants

	Marijuana Users	Marijuana Non Users	Statistics	p value
N (Males:Females)	84 (58:26)	379 (186:193)		
Age (Years)	30.27 (11.26)	34.38 (12.67)	t(134) = 2.971	0.004
Mean (SD) amounts of current drug use for those who use				
Cigarettes/day	11.45 (9.13)	8.36 (9.86)	t(129) = -2.747	0.007
Alcohol drinks/week	5.47 (5.93)	2.45 (4.33)	t(104) = -4.408	0.000
Marijuana joints/week	2.4 (2.36)	0 (0)	t(83) = -9.336	0.000
Lifetime recreational drug use (Percent who reported lifetime use)				
Stimulants	45.24%	28.16%	$\chi^2(1) = 9.25$	
Sedatives/traquilizers	29.76%	12.89%	$\chi^2(1) = 14.509$	
Hallucinogens	65.48%	27.63%	$\chi^2(1) = 43.378$	
Opiates	33.33%	13.16%	$\chi^2(1) = 19.911$	
Marijuana	100.00%	55.79%	$\chi^2(1) = 57.896$	
Other (includes inhalants)	28.57%	12.11%	$\chi^2(1) = 14.471$	
Discounting				
k	0.22 (0.99)	0.23 (1.15)	t(137) = 0.016	0.987
lnk	-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

Results



• **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.**

Results Cont.

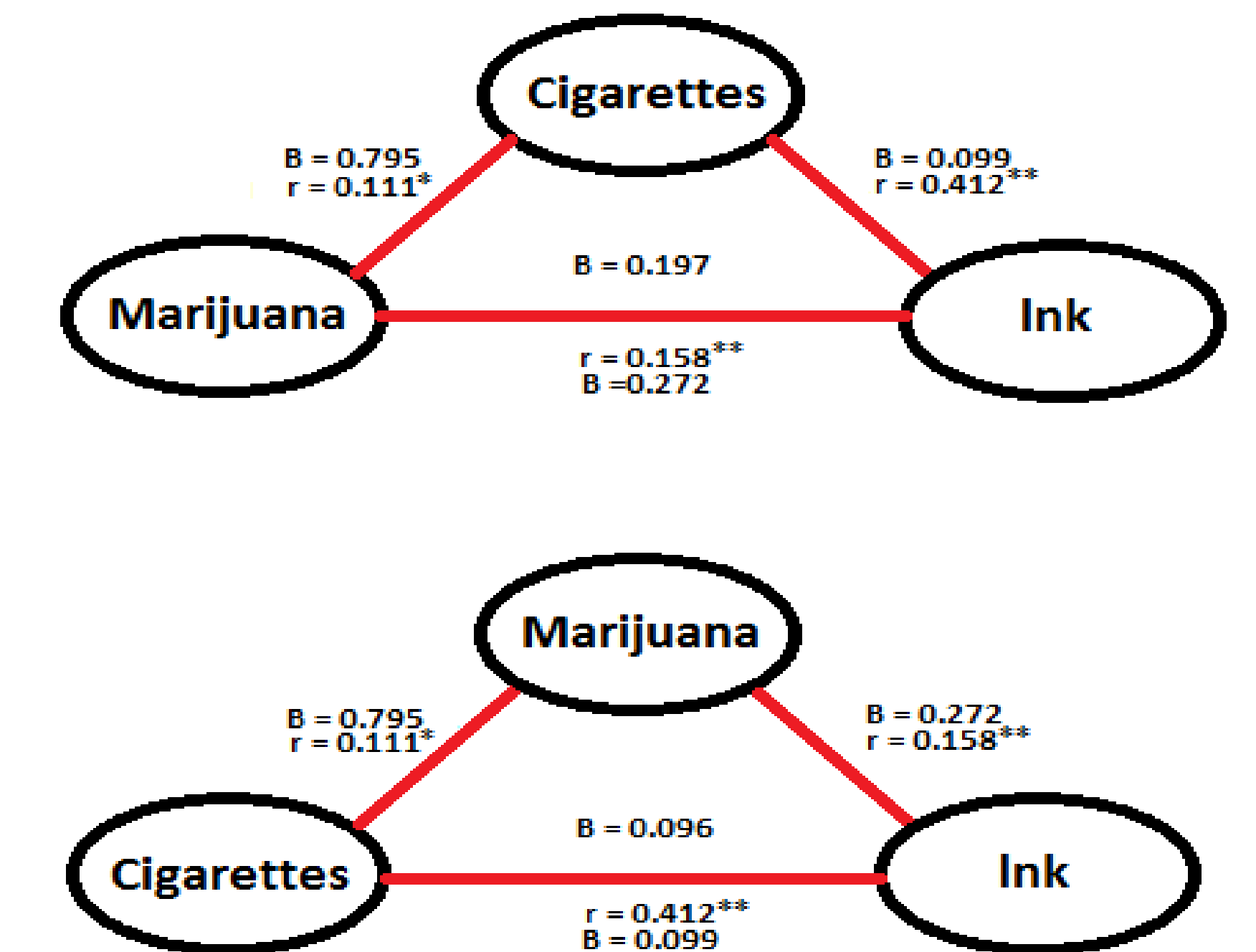


Figure 1: The correlations and mediation values between marijuana, cigarettes, and delay discounting. * = p<0.05, ** = p<0.01

Conclusions

- Marijuana users have a larger k value than non users, indicating they discounted more.
- Cigarette smokers also discounted more than non users as has previously been found e.g., Mitchell (1999).
- **Data indicated that amount of marijuana smoked accounted for a significant proportion of the variance in a regression model.**
- **However, a stepwise model suggested that the contribution of marijuana use was driven by its association with cigarette smoking.**
- Future studies are needed to understand whether observed relationships between drug use and discounting are also mediated by cigarette smoking.

Acknowledgements: The research was supported in part by grants from BUILD EXITO. This research was also supported in part by grants from the National Institute on Health (AA 10760, DA015543, DA027580)

References:
Johnson, M. W., Bickel, W. K., Baker, F., Moore, B. A., Badger, G. J., & Budney, A. J. (2010). Delay discounting in current and former marijuana-dependent individuals. *Experimental and clinical psychopharmacology*, 18(1), 99.

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Weafer, J., Mitchell, S. H., & de Wit, H. (2014). Recent Translational Findings on Impulsivity in Relation to Drug Abuse. *Current Addiction Reports*, 1(4), 289-300. doi: 10.1007/s40429-014-0035-6