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THE DETERMINATION OF SOBRIETY BY TIME DISCOUNTING (BASED ON SOCIOLOGICAL STUDY RESULTS)

This paper reports the results of a simple questionnaire given to 141 active members of Cocaine Anonymous at over a half-dozen distinct meeting groups for the purpose of gauging differences in individual time discounts. Starting with the idea that addicts are notably 'impatient' with respect to rewards, we offer evidence in support of the argument that, among the impacts of a 12-step recovery program such as CA on individual motives, discounts vary endogenously across (and by implication, within) recovering addicts as a function of the duration of their sobriety. Although our analysis is also consistent with the hypothesis that addicts with longer time horizons are more likely to remain in a drug rehabilitation program, our data is also consistent with the hypothesis that regular participation impacts 'impatience' and has its greatest effect with regular (at least once weekly) attendance over a period of five or more years. This study, then, can be viewed as a call for additional research in which the effects of self-selection and endogenous time preference change are sorted out.

Keywords: time discounting, sobriety, drug addiction, «12-step» recovery program.

У статті надані результати соціологічного дослідження, здійсненого фахівцями Університету Огайо (США) методом анкетного опитування серед 141 активного члена груп взаємодопомоги «Анонімні споживачі кокаїну». Відома програма, за якою працюють подібні групи («12 кроків»), допомагає досягти повної тверезості, але лише через тривалий час. Доведено, що одним з результатів програми «12 кроків» є зміна того, як наркозалежні сприймають час: чи орієнтуються вони на теперішній час, чи на віддалену перспективу. Підкреслено, що у своєму дослідженні автор виходив з тези про те, що наркомани особливо «нетерплячі» по відношенню до матеріальних заохочень (тобто бажають негайного задоволення «тут і зараз», навіть якщо відтермінована винагорода буде суттєво перевищувати невідкладну). Виявлено наявність достатньо тісної кореляції між тривалістю періоду тверезості, регулярністю відвідування групи «Анонімні споживачі кокаїну» та сприйняттям часової перспективи. З одного боку, результати дослідження узгоджуються з очевидним припущенням, що наркомани, яким притаманна «більш тривала» часова перспектива, з більшою вірогідністю будуть довше перебувати у реабілітаційних програмах. З іншого – отримані дані також узгоджуються з гіпотезою про те, що участь у групових програмах по боротьбі з наркотичною залежністю впливає на сприйняття індивідом майбутнього (за умови регулярного, не менше одного разу на тиждень, відвідування групи підтримки протягом, як мінімум, п'яти років). Презентоване дослідження також можна розглядати як заклик до додаткового вивчення взаємозв'язку між сприйняттям часу та індивідуальними виборами.

Ключові слова: сприйняття часу, тверезість, наркозалежність, програма «12 кроків».

В статье представлены результаты социологического исследования, проведенного специалистами Университета Огайо (США) методом анкетного опроса среди 141 активного члена групп взаимопомощи «Анонимные потребители кокаина». Известная программа, по которой работают подобные группы («12 шагов»), помогает достичь полной трезвости, но лишь по прошествии длительного времени. Доказывается, что одним из результатов программы «12 шагов» является из-

менение того, как наркозависимые воспринимают время: ориентируются ли они на настоящее или на отдаленную перспективу. Подчеркнуто, что в своем исследовании автор исходил из посылки, что наркоманы особенно «нетерпеливы» по отношению к материальным поощрениям (то есть желают немедленного удовлетворения «здесь и сейчас», даже если отложенное во времени вознаграждение будет многократно превосходить безотлагательное). Выявлено наличие достаточно тесной корреляции между продолжительностью периода трезвости, регулярностью посещения группы «Анонимные потребители кокаина» и предпочитаемой временной перспективой. С одной стороны, результаты исследования согласуются с очевидным предположением, что наркоманы, изначально ориентированные на «более длительную» временную перспективу, с большей вероятностью будут дольше оставаться в реабилитационных программах. С другой – полученные данные также согласуются с гипотезой о том, что участие в групповых программах по борьбе с наркотической зависимостью влияет на восприятие индивидом будущего (при условии регулярного, не реже одного раза в неделю, посещения группы поддержки на протяжении, как минимум, пяти лет). Представленное исследование также можно рассматривать как призыв к дополнительному изучению взаимосвязи между восприятием времени и индивидуальными выборами.

Ключевые слова: восприятие времени, трезвость, наркозависимость, программа «12 шагов».

Introduction: Immediate surroundings play a crucial role in a person's descent into and recovery from self-destructive behavior, be it drug or alcohol addiction. Friends, acquaintances and significant others serve as role models and provide support and encouragement for patterns of behavior, good or bad. For example, «drinking ... is a social phenomena in two related ways: (1) what one does with and thinks about alcohol is a function of his or her group membership and identification, and (2) almost all drinking takes place in social group settings which the drinker "believes makes his drinking socially approved"» [1, p. 152-62; see also 2]. Similarly, «the peer group is now widely regarded as an important social environment capable of influencing both the initiation of substance use and the maintenance of patterns involved» [3, p. 129; see also 4] put the matter, «the success of therapeutic communities [and] self help groups such as Narcotics Anonymous ... is not doubt in part a result of the replacement of the addict's subculture with social support and a system of prosocial values, norms and beliefs».

It is well understood, of course, that the difficult problem is sustaining the recovery process even following a «commitment» to sobriety. Too often people relapse back to their self-destructive choices, and here we must acknowledge the success of support programs that effectively help them overcome their addictions – Alcoholics Anonymous (AA), Cocaine Anonymous (CA), Narcotics Anonymous, and so on [5]. The structure and methods of these programs are well-documented and certainly consistent with the academic literature on addiction and social learning. But a critical question is: If «an addict ... may have accurate beliefs about the disastrous effects of the drug on his or her body or purse, and yet ignore them because of an addiction-induced increase in the rate of time discounting» [6, p. 10; see also 7] and if we

extend this argument to say that the recovering addict has accurate perceptions of the «pleasures» of addiction, then what is it in generalized theoretical terms that these organizations, by their readjustment of peer group associations, change in the motives and beliefs of members? If it is not an understanding of the objective costs and benefits of addiction and recovery, what other parameters of choice are changed by sustained participation in a 12-step program?

It is reasonable to conclude, then, that programs such as AA and CA do more than merely communicate costs and benefits when immersing a recovering addict in a sober peer group using a variety of social activities – picnics, camping trips, and so on. Indeed, the literature on addiction presents us with a specific hypothesis. We can begin with Becker and Murphy's [8] summary statement that «addicts are commonly characterized as being impatient prone to their requirements of instant gratification ... Present-oriented individuals are potentially more addicted to harmful goods than future oriented individuals» [8, p. 682] and Becker and Mulligan's [9] theoretically derived proposition that «harmful addictions induce even rational persons to discount the future more heavily» [9, p. 744; 10; 11; 12; 13]. For a potential source of contrary evidence see Ainslie and Haendel's 1982 study of myopic discounting. However, as Winston and Woodbury speculate with respect to the finding that «implicit rates were the same for addicts and normal subjects», is that «very high discount rates, what they called "a monumental impatience", might often be hidden by estimating discount rates over a long period of time» [14, p. 335]. These summary statements, of course, are well supported by empirical research. Here, for example, we can cite Vuchinich and Simpson's conclusion that «heavy social drinkers ... and problem drinkers ... both showed greater temporal discounting

than light social drinkers» [15, p. 292]; Madden et al's finding that «the rate at which the subjective value of monetary rewards decreased with increasing delays ... was significantly higher for opioid-dependent participants than for control participants» [16, p. 259]; Allen et al's finding that «subjects with a past history of drug dependence evidence more impulsivity in both behavioral and self-reporting measures when compared to subjects with no illicit drug use history» [17, p. 144]; Kirby, Petry and Bickel's summary conclusion that «on average, heroin addicts' discount rates were twice those of controls» [18, p. 78]; and Odum et al's conclusion that «persistent needle sharing may be related to the relative inability of delayed outcomes to impact current behavior» [19, p. 259]. Thus, as Giordano et al summarize matters, «a rapidly growing literature indicates that individuals with substance dependencies might be generally more susceptible to behavioral problems that may stem from diminished sensitivity to delayed outcomes ... drug-dependent individuals are controlled to a greater extent by smaller more immediate consequences at the expense of larger more delayed consequences» [20, p. 174-175]. See also Baker, Johnson and Bickel 2003 [21] and Bickel and Johnson 2003 [22], Bickel 2004 [23] for additional surveys of the relevant literature. A parallel literature exists with respect to delinquency and crime, wherein a similar relationship is established between time discounting and the propensity to delinquency and gang membership as well as the importance of peer group associations. See, for example, Gottfredson and Hirshi 1990 [24], Wilson and Hernstein 1985 [25], Nagin and Pogarsky 2001 [26] and Johnstone 1983 [27].

The specific hypothesis to which this research points and which we consider with a simple interview of recovering addicts in a CA program, is that the time discount addicts apply to the future is influenced by their regular participation in a 12-step recovery program. That is, regular participation in a voluntary recovery program extends people's horizons such that they give future outcomes greater weight and more immediate outcomes less weight in day to day decisions. The data we report here is also consistent with the argument that sustained participation in a program is crucial in the sense that the critical change in time discounting occurs sometime after five years of regular participation. At this point, though, we should note that owing to the simplicity of the instrument (questionnaire) that we are able to apply anonymously at CA meetings, we make no attempt at addressing issues such as hyperbolic versus exponential discounting, a «commodity effect» (the extent to which different discount rates are applied to drugs versus money), differences in discount rates applied to gains ver-

sus losses, and magnitude effects (for a survey of studies that focus on these issues see Baker, Johnson and Bickel 2003 [21]).

We emphasize once again that the data we report on here is simply consistent with these hypotheses and that addition research is required to confirm our findings. However, one might infer the formal recognition of this effect on time discounting in the very philosophy of a «12-step program». Defined so they require years to complete, such programs seem to proceed in accordance with Bickel and Johnson's recommendation that «individuals with sufficient experience in pursuing and accomplishing relatively long-term goals may be less susceptible to allowing the brief, intense reinforcing effects of drugs to commander a large portion of their behavior», and that «an environment rich with such temporally extended activities may serve to condition lower rates of delay discounting» [22, p. 435]. If one completes step 3, there is a degree of instant gratification, but *at the same time* one is encouraged to anticipate the rewards of accomplishing steps 4 through 12. In a similar vein, «12-step approaches, and other addiction counseling strategies, typically provide immediate social reinforcement for abstinence, and withhold praise during periods of relapse» [20, p. 181].

Methods: To explore this relationship between time discounting and participation in a 12-step program, a sample of 141 attendees at Cocaine Anonymous meetings in the Los Angeles California area were supplied with a simple anonymous questionnaire. Strict anonymity was essential in the application of the questionnaire, but because participants in CA are likely to participate in meetings at various locations, respondents were told not to participate in the questionnaire if they had already done so at a previous meeting. In addition to each respondent's age, gender, and religious conviction, three questions in particular concerned us (we note here that no significant differences were found between male and female respondents or between those 40 years or younger vs. over 40 with respect to indicated time preference. Of the 87 males, 36 (41.4%) chose \$200 whereas of the 54 females, 26 (48.1%) chose \$200. Of the 70 respondents under 40 years of age, 30 (42.9%) chose \$200 whereas of the other 70 respondents over 40, 31 (44.3%) chose \$200):

Before proceeding, the evident limitations of our analysis need to be highlighted. Any questionnaire applied in a 12-step program must, of necessity, be brief and absent anything of a time consuming or probing nature. Thus, we must first acknowledge that replies to Question 3 provide only a crude ordinal estimate of time preference. Nevertheless if this question yields, at worst, random responses, then such randomness should appear in our statistical analysis and any statistically significant result becomes all the more meaningful. Second, we cannot suppose

that those who claim, say, five years of sobriety are otherwise no different than those who claim less. If, as we report shortly, those with five years of sobriety are more likely to exhibit longer time horizons, we cannot preclude the possibility that our data merely reflect a process of selection whereby those with shorter horizons are more likely to drop out of the recovery program and less likely to make participation in CA a core ele-

less than 5. With a relationship significant at the .035 level ($\text{Chi}^2 = 6,71$), the data here are consistent with hypothesis that the critical change in individual discount rates occurs sometime after five years – with the hypothesis that during first few years of involvement, recovery may be slow, at least as measured by time discounting. It is only after a full (even lifetime) commitment to the program that the fruits of participation are fully realized.

- Q1: Would you say that your attendance at CA meetings is
 _____ : regular (not less than once a week)
 _____ : intermittent (on average at least once a month)
 _____ : sporadic (a few times a year)
 _____ : this is relatively new to me
- Q2: How many months/years of sobriety can you claim?
 _____ : less than 6
 _____ : between 6 and 12 months
 _____ : between 1 and 2 years
 _____ : between 2 and 5 years
 _____ : more than 5 years
- Q3: Would you prefer to receive \$200 today or \$500 in six months.
 _____ : \$200 today
 _____ : \$500 six months from today

We use the word «commitment» meaningfully. If we consider Question 1 about the regularity of participation, of those indicating regular attendance, 43 (40,6%) chose \$200 while 63 (59,4%) chose \$500, whereas irregular attendees divide nearly equally between \$200 and \$500 (although only 35 (24,8%) respondents reported less than regular attendance and a bare majority chose \$200, the relationship is in the anticipated direc-

ment of their lives. That is, instead of inferring that a 12-step program «causes» an addict to extend their time horizons, the data we report here is also consistent with the argument that self-immersion in such a program is a consequence of a prior commitment to sobriety and a lengthened horizon. Finally, there are inherent ambiguities in our questions as a consequence of our inability to conduct in-depth interviews of CA participants, the necessity for a brief informally applied survey, and (so as to ensure strict anonymity) the impossibility of a follow-up interview. We cannot, for instance, preclude the possibility that some respondents over-state the duration of their sobriety or the regularity of their attendance, nor can we be sure, in answering question 2, how respondents treat short-term relapses.

Results: Despite these qualifications, our results are suggestive. First, consider the data in Table 1 of which a part divides our sample approximately in half according to the reported length of sobriety. The data here are striking and the imputed relationship statistically significant at the .01 level of significance ($\text{Chi}^2 = 6,69$). Specifically, we observe a nearly inverse relationship between length of sobriety and one's choice of an immediate reward of \$200 over the more distant \$500. A somewhat finer breakdown of the data is more revealing. Table 1 also divides those who claim being sober less than five years into two categories – sober less than a year and sober for more than a year but

and significant at the .032 level: $\text{Chi}^2 = 4,61$). What is perhaps more interesting is the suggestion of an interactive effect for regularity and years of sobriety. Looking at the data as reported in Table 2, notice the relationship between years of sobriety and inferred time discount among those reporting less than regular attendance and the weaker but still highly suggestive relationship among those reporting regular attendance (at the .089 level, $\text{Chi}^2 = 2,9$). With only 19 respondents reporting irregular attendance, conclusions must be tentative, but it appears that, although years of sobriety bears the stronger relationship, if we choose to infer

Table 1

Choice and Length of Sobriety

	prefer \$200 today	prefer \$500 in 6 months
sober less than a year	31 (53,4%)	27 (46,6%)
1 < sober < 5 years	13 (52%)	12 (48%)
sober < 5 years	44 (52%)	39 (47%)
sober greater than 5 years	18 (31%)	40 (69%)

a causal relationship, regular attendance can «substitute» somewhat for duration of sobriety.

As a final assessment of the relationship in our data between sobriety and attendance on time preference, we note that respondents were also asked their gender, age, and religious conviction. Hence, the logical issue to explore is whether these more traditionally sociological variables account for some of the apparent impact of sobriety and attendance. Table 3, then, reports the results of two logit regressions which differ only in the coding of length or sobri-

ety. In the first measure, the variable «sobriety length» is coded according to the categories of the questionnaire whereas in the second it is dichotomous (less than 5 years versus greater than 5). The important thing to notice, now, is that none of these three «sociological» variables is statistically significant in either regression and that the regularity of attendance is marginally significant (at .05) only in the second. However, in both cases, the coefficient for length of sobriety is strongly significant (at .005). Insofar as gender, age and religious convictions are concerned, males and those 40 and over seem less

ters on that preference so that those with high discounts relapse before five years.

Discussion: As always, of course, correlation cannot imply cause, especially in a cross-sectional study where self-selection can impact our sample of respondents. Indeed, it is especially dangerous to infer cause since our data does not allow us to test various hypotheses as to the specific mechanisms whereby participation in a CA program impacts time preference. If there is a direct impact on time preference, is it, for instance, through a process of socialization via a new and different peer group, through the program's educational ob-

Choice, Length of Sobriety and Regularity of Attendance

		\$200	\$500
		<i>Not regular</i>	
	< 5 yrs sobriety	15 (68.2%)	7 (31.8%)
	> 5 yrs sobriety	4 (30.8%)	9 (69.2%)
<i>Regular</i>	< 5 yrs sobriety	19 (54.3%)	16 (45.7%)
		29 (47.5%)	14 (52.5%)
	> 5 yrs sobriety	14 (31.1%)	31 (68.9%)
		43 (40.6%)	63 (59.4%)

likely to choose \$500 tomorrow over \$200 today, although no coefficient here is statistically significant, and religious conviction has no discernible impact whatsoever (males are coded 0 and females 1; respondents 39 and under are coded 1, those 40 and over are coded 2. Insofar as religion is concerned, coding is as follows: 0 – none; 1 – few if any in a formal sense; 2 – weak convictions; 3 – strong but irregular church attendance; 4 – strong and regular church attendance).

Certainly it would be valuable to apply similar questions to addicts whose participation in CA failed to yield the desired sobriety or to those who, for one reason or another, ceased participation in the program, since, as we suggest earlier, this study leaves several important questions unanswered. For example, although there are good reasons for believing that programs such as CA are designed to operate directly on an addict's time preference, it may also be the case that for biological reasons alone recovery requires an initially longer time horizon and less impatience. More critically, the bimodal distribution in our data in the duration of reported sobriety (i.e., the relatively fewer respondents indicating participation between 1 and 5 years in Table 1) suggests selection bias whereby those who sustain participation beyond a year in a recovery program are those with low discounts initially. That is, our data are also consistent with the hypothesis that rather than impact time preference, a 12-step program merely fil-

Table 2
jectives of teaching persons the full consequences of their addiction, the attention given to long term goals set by a 12-step program, or simply that recovering addicts physiologically require less immediate gratification in the form of drugs as length of sobriety increases. Nevertheless, our data do lend weight, tentative as it might be, to the idea that not only is the discount people apply to the future subject to endogenous change, but that

that change can be effected by a drug recovery program. This study, then, is consistent with the findings of Bickel, Odum and Madden [28; 29] that delay discounting is impacted by treatment experience. Moreover, our finding that the inferred impact of a 12-step program becomes evident only

Logit Regressions on Choice (standard errors in parenthesis)

variables	Model 1	Model 2
Constant	-.261 (.821)	-.302 (.815)
Gender	-.580 (.385)*	-.493 (.379)
Age	-.607 (.402)*	-.556 (.396)
Attendance	.317 (.240)	.403(.236)*
Sobriety length	.315 (.116)***	-
Sobriety (0. 1)		
Religion	-	1.04 (.384)***
	.062 (.139)	.065 (.139)
R ²	.109	.110

after a sustained period of participation is consistent with the logical view that «addiction does not immediately diminish in strength when drug use stops, but addiction declines incrementally with sustained nonuse [30, p. 1153], to which we would only add that the period of nonuse should not be measured in weeks or months, but in years and until the basic parameters of individual choice that correlate with addiction are changed. Hopefully, then, this note will encourage further exploration of the relationship between recovery from addiction and participation in 12-step programs with an eye to understanding more fully the impact, if any, such programs have on the time preferences of participants.

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