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## Attempts to Stop or Reduce Marijuana Use in Non-Treatment Seekers

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### Abstract

Daily marijuana smokers (n=19) who intended to quit or reduce in the next month on their own called a phone each night for 28 nights to report marijuana use and reported intentions to change at the end of each week. Outcomes did not differ between those who initially planned to reduce vs. quit in the next month. Participants averaged three attempts to reduce and one attempt to quit during the 28 days. Participants reduced on 11% and abstained on 14% of days. Most participants were successful in reducing or abstaining on half or more of the days they attempted; however, only four participants (21%) reduced  $\geq 50\%$  for  $\geq 7$  consecutive days and only two (10%) abstained for that long. Abstinence or reduction did not appear to change alcohol or caffeine use. We conclude a) initial intentions are poor predictors of outcomes, b) most users make multiple, short-lived attempts to change, c) reduction was as common as abstinence, d) many attempts to change are initially successful but few persist, and e) other drug use does not appear to worsen with marijuana reduction or abstinence.

### Keywords

cannabis; marijuana; cessation; natural history; substance use disorder

## 1. Introduction

Several prospective surveys of non-daily, non-dependent adult ( $\geq 21$  yr old) marijuana users found events (e.g. marriage, employment) were associated with abstinence several months or years later (Aitken et al., 2000; Chen et al., 1997; Chen and Kandel, 1998; Halikas et al., 1984; Hammer and Vaglum, 1990; Kandel and Raveis, 1989; Swift et al., 2000; VonSydow et al., 2001). The few retrospective studies of dependent marijuana users reported “internal reasons” such as health concerns, self-image and social approbation for quitting marijuana were associated with past abstinence (Boyd et al., 2005; Copersino et al., 2006; Cunningham et al., 1999; Ellingstad et al., 2006; VonSydow et al., 2001). However, none of these studies have closely tracked the process of an attempt to stop marijuana. For example, we know of no data on whether intentions to stop marijuana are good predictors of outcomes, the success of attempts to stop marijuana use, and how many users attempt to stop vs. reduce. Given this

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paucity of data, we conducted a detailed natural history description of attempts to change marijuana in adult dependent users who were trying to stop or reduce marijuana use on their own.

## 2.0 Methods

### 2.1. Participants

We recruited via ads in our local newspaper. Inclusion criteria were a)  $\geq 18$  yrs old, b) intend to quit or reduce marijuana in the next 30 days on their own, c) has not changed marijuana use in the last 4 wks, d) has smoked marijuana daily or almost daily, e) DSM-IV cannabis dependence as defined by the DSM-IV checklist (Hudziak et al., 1993), f) no current (last 6 mo) alcohol or illicit drug abuse or dependence, and g) no urgent problems from marijuana or other drug use or psychiatric disorder. We excluded 61 of the 94 callers. The main reasons for exclusion were the callers had already quit or cut down (50% of exclusions) and/or callers did not have plans to change their marijuana use (52%). Among the 33 eligible, 22 entered and all of these completed the study. This study was approved by the University of Vermont Committee on Human Research in the Behavioral Sciences.

Among the 22 who completed the study, three (14%) were missing more than 25% of the daily data for either marijuana use or intentions and were deleted from the analyses. Among the remaining 19 participants, we are missing reports of intentions on 10 days (2% of all days) and reports of marijuana use on 47 (9%) of days.

Forty-two percent of the 19 included participants were women, 5% were Hispanic or non-Caucasians, 26% were married and 16% were unemployed. Participants averaged 32 years old ( $sd = 10$ ). They used marijuana on 92% of days and 68% had tried to stop marijuana in the past. They averaged 3.0 joints/day (2.3) and an age of onset of daily use of 20 (4.9). Ninety-five percent used alcohol in the last month and 5% use daily; 11% had used a non-marijuana illicit drug in the last month and 26% were daily tobacco users. On the DSM-IV checklist, 22% had a past history of alcohol and 11% of drug abuse/dependence. These characteristics are similar to those of most treatment studies except for a lower prevalence of minorities and of prior quit attempts (Stephens et al., 2002).

### 2.2. Procedures

We instructed participants to call a toll-free dedicated phone line each night before retiring and report the number of times they used marijuana that day using a questionnaire we developed. Also participants retrospectively reported their intentions for marijuana use for each day of the past week using a questionnaire we developed that used a Time Line Follow Back (TLFB) format (Sobell et al., 1996). We compensated participants (including bonuses for compliance) up to \$233 for completion of calls and questionnaires.

## 3. Results

### 3.1. Initial Goals

At study entry, 12 participants intended to reduce but not stop marijuana use in the next month. Seven intended to stop: 1 intended to stop abruptly and 6 intended to reduce and then stop. The number of days of actual abstinence or reduction did not differ between these groups and thus their results were combined.

### 3.2. Individual Outcomes

Figure 1 illustrates the outcomes from individual participants within each initial intention category from the participants with the most amount of change to least amount of change. For

this figure and the results below, reduction was defined as smoking  $\leq 50\%$  of usual amount based on the 30 day TLFB taken at study entry. This figure illustrates a) the variability in outcomes across users, b) the large number of transient episodes of abstinence and reduction even within a single month and c) that the outcomes were not logically related to initial goals.

### 3.3. Intentions

Eleven participants (58%) reported an attempt to stop at some point in the study and 17 (89%) reported an attempt to reduce. Participants attempted to stop on a median of 4% of days and to reduce on 25% of days. Attempts to reduce were more common than attempts to abstain (median of 3 attempts vs. 1 attempt, Wilcoxon Signed Rank,  $p = .002$ ).

### 3.4 Actual Abstinence and Reduction

Abstinence and reduction can be due to intended changes or can be due to unintended reasons; e.g., inability to obtain marijuana or being in a setting in which use is prohibited for the entire day. We report outcomes below only for intended changes. We defined abstinence as no use for a day when participants reported trying to quit for the day or for good. Eleven participants attempted to quit and they were successful on a median of 86% of the days they attempted to abstain; however, only two participants (18%) were able to abstain for a week or more. The median duration of the longest intentional abstinence was only 2 days (interquartile range = 0–6).

We defined reduction as using  $\leq 50\%$  in joints/day compared to the average joints/day during the 30 days prior to study entry (based on a Time Line Follow Back). This measure included no use of marijuana on days participants stated they attempted to reduce. Seventeen participants attempted to reduce and they were successful on a median of 43% of the days; however, only four (24%) reduced for a week or more. The median duration of the longest intentional reduction was 1 day (1–2). The median joints/day when participants were not trying to reduce was 2 (1–4) and when they were trying to reduce was 1 (0–2) (Wilcoxon test,  $p = .02$ ). Reduction occurred immediately before a quit attempt in only 8% and immediately after a quit attempt in only 3% of participants.

### 3.5 Use of Other Drugs

The amount of alcohol use on days of abstinence or reduction during the study (whether intentional or not) was similar to that on days marijuana use did not change. Similar negative findings occurred among the 18 participants who used caffeine daily. There were too few tobacco and illicit drug users to test for changes. There was no new onset of use of alcohol, caffeine, tobacco or illicit drugs during abstinence and reduction among those who had not used these drugs.

### 3.6 Qualitative Interview

The main reasons for wanting to stop or reduce marijuana were to become more motivated/ have energy (33%) and health concerns (19%). The most difficult situations for reducing/ quitting were stress/negative affect (24%) and exposure to others smoking marijuana (24%). The most useful strategies cited were keeping busy (33%) and exercise (24%). Among the seven participants who had previously tried to stop cigarettes or alcohol, three (43%) said stopping marijuana was harder, three (43%) said easier and one (14%) said they were equally difficult.

## 4. Discussion

### 4.1. Summary of Results

Our major findings are a) initial goals for changing marijuana use over the next month are poor predictors of outcomes, b) most users make multiple attempts to change even over a single month, c) reduction is a common goal and outcome and appears to be independent of abstinence attempts, d) attempts to change are often initially successful but do not persist, and e) other drug use does not appear to change with abstinence or reduction.

### 4.2. Assets and Liabilities of the Study

One major asset of the study is that participants were trying to change their marijuana use in a “real-world” setting in which no treatment was sought; i.e., the scenario for the large majority of attempts to stop marijuana use (Kessler et al., 1999). Our low rate of missing data decreased bias. The prospective design with near-real time data collection for marijuana use avoided the inaccuracy and biases of retrospective designs (National Institutes of Health, 2005). The recording of outcomes to a recorded voice in a confidential manner probably increased valid reporting (Frank, 1985).

One major liability is the use of a small sample size of volunteers. The study examined only daily, dependent users and, thus, may not generalize to the attempts by recreational users to stop use. Our retrospective reports of intentions could have produced a bias toward concordance of intentions and behavior; thus, our success rates may have been inflated. Our intensive monitoring of drug use may have been reactive; i.e., could have decreased use on its own (Kopp, 1988). However, almost identical studies done with alcohol users reporting use on a daily basis found no or very little reactivity (Helzer et al., 2002). Another limitation is that we did not collect data from a month when users were not trying to change to serve as a comparator. A final limitation is that our reduction measure is likely imprecise given possible changes in marijuana potency and smoking topography when number of joints is changed.

### 4.3. Initial goals and outcomes

We found a poor concordance between initial change goal and outcome. In the only prior study of this issue (Lozano et al., 2006) among those in treatment with an abstinence goal, 33% were engaged in reduction at the first follow-up and among those with a reduction goal, 15% were abstinent at follow-up. Thus, our results and those of others suggest treatment providers need to recognize that many marijuana users change their goals in treatment.

### 4.4. Multiple attempts to change

We were surprised at the multiple repeated attempts to reduce or abstain even over the short 28 day period. Anecdotally, clinicians have described several “false starts” when drug users attempt to change; however, we could find no detailed empirical descriptions of how often these occur. We have previously described that many tobacco smokers change their intentions to quit from week to week (Hughes et al., 2005) and that only 50% of tobacco smokers who planned to quit in the next month, actually make an attempt to quit during that month (Hughes et al., 2005).

### 4.5 Reduction

We found that reduction was a common intention and outcome, even among those with an initial goal of abstinence. Data from treatment studies for marijuana users trying to abstain report many users end up reducing rather than abstaining (McRae et al., 2003). We know of no generalizable surveys of how many marijuana users want to reduce vs. stop marijuana as a goal. Some data suggests those who chose a reduction goal are less motivated and have less

successful outcomes than those who chose an abstinence goal (Lozano et al., 2006; Peters et al., 2007); however, our study did not find this. We did not find reduction to be a precursor to or aftermath of an abstinence attempt, suggesting reduction may be an alternate to abstinence.

#### 4.6. Success of Abstinence and Reduction Attempts

Success rates for abstaining and reducing on a given day were high, but few users abstained or reduced for long periods of time. These high rates of relapse early on after an attempt in the current study are similar to that observed with other drug dependencies (Hughes et al., 2004) and suggest cannabis may be as dependence producing as other drugs. As importantly, such early relapse also suggests treatment programs need to schedule sessions very early on in any attempt to maintain marijuana abstinence.

#### 4.7 Changes in Other Drug Use

Abstinence/reduction did not change alcohol or caffeine use. We located only two prior studies of whether other drug use changes with abstinence from marijuana. In a small retrospective study of daily marijuana users, about one third of marijuana abstainers reported alcohol and tobacco increased compared to only < 10% who reported alcohol decreased; in this same study, users reported caffeine and illicit drug use did not appear to change (Copersino et al., 2006). However, in a large prospective treatment trial, abstinence from marijuana did not change alcohol use (Marijuana Treatment Project Research Group, 2003). Thus, whether drug substitution occurs with marijuana abstinence is unclear and needs to be resolved.

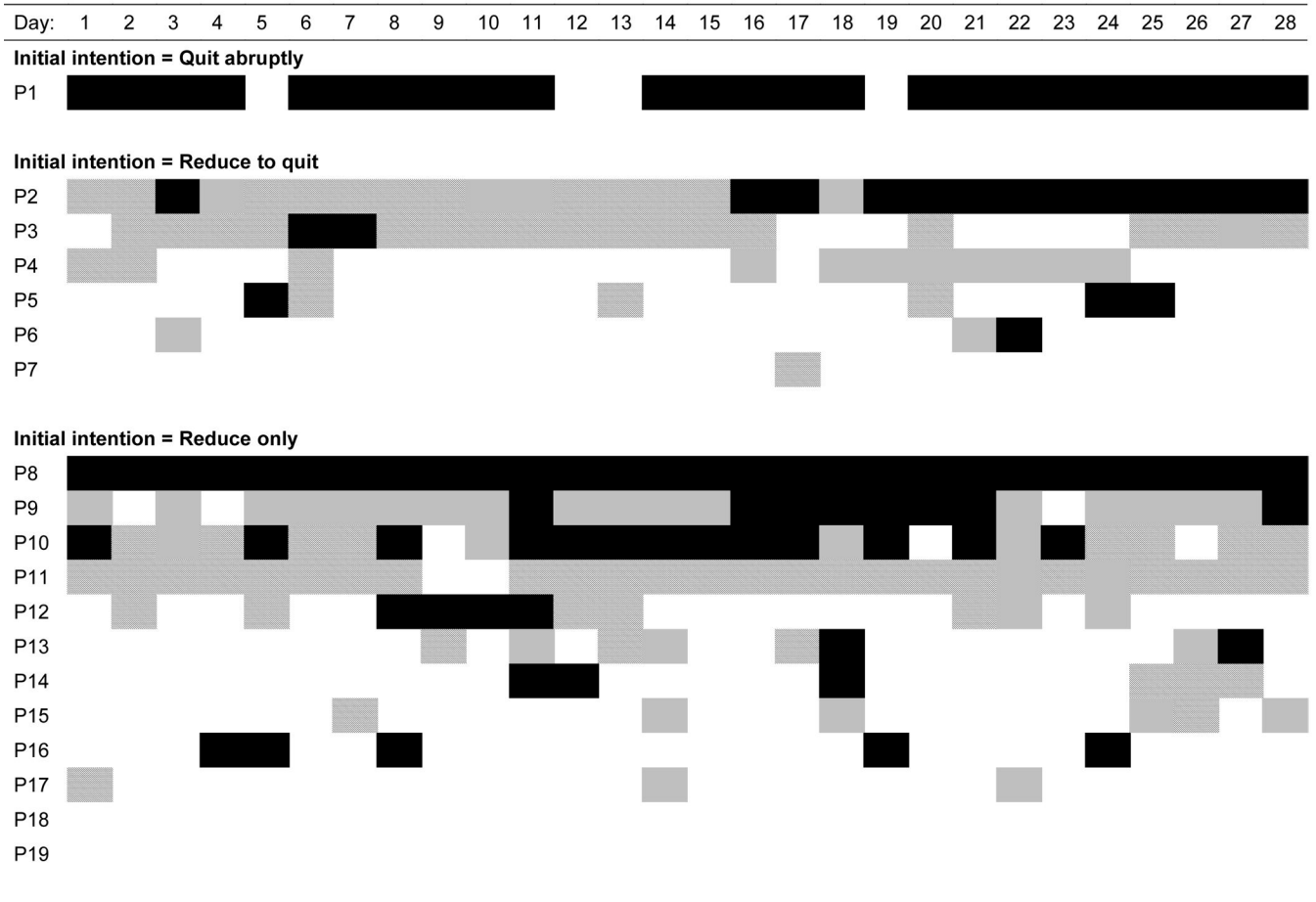
#### 4.8 Concluding Remarks

Our results suggest dependent users who attempt to stop or reduce marijuana do not simply pick a date to change, attempt to do and, if not successful, then return to prior use. Instead, many users appear to fluctuate often among intended abstinence, intended reduction, unintended abstinence/reduction and continued use, even over a short time frame. In addition, intentions appear to be a weak indicator of future behavior. These results suggest treatment programs will need to be very flexible to accommodate these many fluctuations in goals and outcomes.

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**Figure 1.** Major outcomes of abstinence (black pixels) or reduction of  $\geq 50\%$  (grey pixels) on days participants intended to change; abstinence or reduction (striped pixels) on days participants did not intend to change; and no actual change in marijuana use (white pixels) on days intending or not intending to change. Participant identification numbers were reassigned and the most successful participants placed at the top of each of the three panels. Missing data were imputed with last point carried forward.