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Smoking tobacco along with marijuana increases symptoms of cannabis dependence

Geoffrey L. Ream[a,*], **Ellen Benoit**[b], **Bruce D. Johnson**[b], and **Eloise Dunlap**[b]

a *341 School of Social Work Building, Adelphi University, 1 South Avenue, P.O. Box 701, Garden City, NY 11530, USA*

b *Institute for Special Populations Research, National Development and Research Institutes, 71West 23rd Street, 14th Floor, New York, NY 10010, USA*

Abstract

Aim—User practices/rituals that involve concurrent use of tobacco and marijuana – smoking blunts and "chasing" marijuana with tobacco – are hypothesized to increase cannabis dependence symptoms.

Design—Ethnographers administered group surveys to a diverse, purposive sample of marijuana users who appeared to be 17–35 years old.

Setting—New York City, including non-impoverished areas of Manhattan, the transitional area of East Village/Lower East Side, low-income areas of northern Manhattan and South Bronx, and diverse areas of Brooklyn and Queens.

Participants—481 marijuana users ages 14–35, 57% male, 43% female; 27% White, 30% Black, 19% Latino, 5% Asian, 20% of other/multiple race.

Measurements—Among many other topics, group surveys measured cannabis dependence symptoms; frequencies of chasing, blunt smoking, joint/pipe smoking, using marijuana while alone, and general tobacco use; and demographic factors.

Findings—Blunt smoking and chasing marijuana with tobacco were each uniquely associated with five of the seven cannabis dependence symptoms. Across symptoms, predicted odds were 2.4–4.1 times greater for participants who smoked blunts on all 30 of the past 30 days than for participants who did not smoke blunts in the past 30 days. Significant increases in odds over the whole range of the five-point chasing frequency measure (from never to always) ranged from 3.4 times to 5.1 times.

* Corresponding author. Tel.: +1 516 877 4432; fax: +1 516 877 4392. E-mail address: ream@adelphi.edu (G.L. Ream).

Conflict of interest
No author on this manuscript has any personal or financial interest that would influence the results.

Contributors: Geoffrey L. Ream conducted statistical analyses, reviewed the biological literature cited herein, and formatted the final submission. Ellen Benoit and Bruce D. Johnson reviewed the sociological literature included and contributed to the theoretical framing of the manuscript. Bruce D. Johnson advised the operationalization of variables. Eloise Dunlap offered insights from qualitative research that contributed to the theoretical framing of the manuscript, construction of measures, and the choice of variables in the multivariate models. All authors contributed to and have approved the final manuscript.

Conclusions—Using tobacco with marijuana – smoking blunts and "chasing" marijuana with tobacco – contributes to cannabis dependence symptoms. Treatment for cannabis dependence may be more effective it addresses the issue of concurrent tobacco use.

Keywords

Marijuana; Cannabis; Tobacco; Abuse; Dependence; Addiction; Chasing; Blunts; Poly substance use

1. Introduction

1.1. The recent rise in cannabis addictive disorders among Black and Latino youth

Cannabis addictive disorders are on the rise among Black and Latino youth (Compton et al., 2004). Conventional wisdom says that this is because marijuana is stronger today than in the past, but this explanation is inadequate on several levels. Recent reports that marijuana has increased in potency by factors of 10–20 are unsupported (European Monitoring Centre for Drugs and Drug Addiction, 2004, p. 52). The question of whether it actually has increased and by how much is complicated by the fact that marijuana is available in two general quality grades —"commercial" marijuana that is mass-produced and imported, and "designer" marijuana that is specially bred, locally grown, and carefully cultivated. Government studies often ignore this distinction, so increased availability of designer marijuana could cause a mistaken impression that marijuana in general is getting stronger. The Black and Latino youth under the increased burden from addictive disorders, however, usually smoke commercial marijuana (Sifaneck et al., 2007). Potency of commercial marijuana in the United States has only been validly observed to rise to the level it has maintained in European countries for several years. Finally, potency would only cause dependence in a linear dose–response fashion if users consistently smoked the same amount of marijuana, which they probably do not. Users do not set out to consume a certain amount of marijuana but to reach a certain "high" (Dunlap et al., 2005, 2006). Given stronger marijuana, they probably reach the desired effect faster and stop smoking sooner.

1.2. Possible explanation: increased popularity of concurrent use of marijuana and tobacco

Smoking blunts and "chasing" marijuana with tobacco are popular among American urban youth. Blunts are made from shells of inexpensive cigars such as Phillies Blunts (their namesake), Backwoods, or Dutch Masters. Consumers split the cigars lengthwise, tip out the tobacco fillers or "blunt guts," replace them with (usually) $10 worth of marijuana (about 1.5 g of commercial-grade marijuana or enough for three joints; see Sifaneck et al., 2007), roll the cigars back up, and share them among three or more smokers (Dunlap et al., 2005; Sifaneck et al., 2005). Blunts contain some residual tobacco, and some users actually prefer them for this reason. As an additional part of the practice/ritual, blunt users also sometimes pass around a tobacco cigarette or cigarillo "blunt chaser" such as a Black and Mild or Tiparillo immediately after the blunt is finished. Smoking tobacco and marijuana in combination and "chasing" marijuana with tobacco are common worldwide (Amos et al., 2004; Johnson et al., 2006). The practice of smoking joints –defined in the United States as marijuana rolled in a cigarette paper with no tobacco – is arguably exceptional for not necessarily involving any tobacco use.

Psychopharmacologically, blunts and "chasing" involve concurrent consumption of nicotine and cannabinoids, which interact in ways that have implications for abuse/dependence (Marco et al., 2006). According to a recent, thorough review of the research (Viveros et al., 2006), taking nicotine and cannabinoids together enhances the "reward" effect (Valjent et al., 2002), particularly for males (Penetar et al., 2005), although it may also enhance aversive (unpleasant) effects (Le Foll et al., 2006). Nicotine exacerbates the anxiolytic (anti-anxiety) and antinociception (anti-pain-perception; see Farquhar-Smith, 2002) effects of cannabinoids

(Valjent et al., 2002). Nicotine and cannabis may also lessen each other's undesirable effects, i.e., Δ9-THC (delta-9-tetrahydrocannabinol, the primary psychoactive agent in marijuana) attenuates the anxiety-generating properties of nicotine (Balerio et al., 2006), and marijuana users report smoking tobacco to counteract the sedative effects of cannabis (Viveros et al., 2006).

Marijuana also reduces nicotine withdrawal symptoms (Balerio et al., 2004; Cohen et al., 2005a,b), perhaps because nicotine withdrawal involves the endogenous cannabinoid system (Castane et al., 2002, 2005). Although one might suspect, based on this, that marijuana users have more success in quitting tobacco, the available data indicate that marijuana use actually makes it harder to quit tobacco: "Difficulty in tobacco cessation might be considered one of the most important adverse effects of marijuana use" (Ford et al., 2002, p. 247). Daily cigarette smoking in adolescence is associated with marijuana and other substance use in young adulthood (Patton et al., 2006). A recent editorial in *Addiction* (Humfleet and Haas, 2004) and later research (Timberlake et al., 2007) describe findings that marijuana is a "gateway" to tobacco for many youth.

1.3. Challenges of measuring cannabis abuse/dependence

A logical next step in this line of inquiry is to look for a relationship between cannabis dependence and users' actual smoking practices. This would require survey data, and use of fixed-response self-report data on dependence involves challenges to validity not present in laboratory research. Even if users accurately reported of amounts of marijuana and tobacco consumed, potencies of these products vary so widely that precise dosage of nicotine and cannabinoids could not be inferred (Sifaneck et al., 2007). Moreover, many users already firmly believe any dependence they have to be on nicotine, not cannabis (Dunlap et al., 2006), which could bias their survey responses.

Another challenge is that the validity of some individual criteria for cannabis dependence employed in the bulk of self-report research on cannabis dependence – those defined by the DSM-IV (American Psychiatric Association, 2000) and the ICD-10 (World Health Organization, 2004) – are in dispute (Dunlap et al., 2006; Soellner, 2005). Symptoms of physical tolerance and withdrawal from cannabis are mild relative to those of other drugs; some question their clinical significance (Soellner, 2005) or suggest that they might actually be a "rebound syndrome" of symptoms that the cannabis had been alleviating (Smith, 2002). Moreover, use of marijuana to relieve negative affect is not necessarily part of a dependence syndrome. Marijuana is arguably used to relieve negative effect *because it works*: Cannabinoids help extinguish aversive memories (Cannich et al., 2004; Chhatwal et al., 2005; Chhatwal and Ressler, 2007; Marsicano et al., 2002) and cannabis use is associated with lower depression among non-medical users (Denson and Earleywine, 2006a). Finally, it is also unclear whether the set of criteria for marijuana abuse/dependence describe a single dependence syndrome (Denson and Earleywine, 2006b; Soellner, 2005). Measures based on the DSM-IV and ICD-10 remain standard for survey research and use of them permits easy comparison with other studies, but future inquiry may discover better ways to operationalize cannabis abuse/dependence.

1.4. Hypothesis

Earlier research (Compton et al., 2004) using standard measures of cannabis dependence documented an increase in cannabis use disorders, and this investigation raises the possibility that increased prevalence of practices involving concurrent use of marijuana and tobacco – using blunts and "chasing" marijuana with tobacco – contributed to this rise. Although our cross-sectional data cannot trace the prevalence of these practices and dependence symptoms over time, they can address the question of whether these practices are uniquely associated

with cannabis dependence at all. Our analyses test the hypothesis that both greater frequency of chasing and greater frequency of blunts use – controlling for general tobacco use, use of marijuana in joints/pipes, using marijuana alone, and several demographic variables – contribute to cannabis dependence symptoms.

2. Methods

2.1. Participants and recruitment

Data for these analyses come from responses to the Peer Group Questionnaire (PGQ), the quantitative group survey component (see Ream et al., 2006, for details) that followed, and was greatly informed by, the ethnographic observation and qualitative interview component of a longitudinal mixed-methods study of marijuana users in various areas of New York City (Dunlap et al., 2005; Golub, 2006). Between January 2004 and April 2005, highly experienced ethnographers recruited groups of between 2 and 12 (usually between 3 and 6) youth and young adults who appeared to be between the ages of 17 and 35 who were either current (past 30 days) marijuana users, frequently associated with marijuana users, or who frequented social locations where marijuana use took place.

Employing a non-probability purposive sampling strategy, they intentionally over-sampled those users who are underrepresented in existing samples of arrestees, households, and consumers of drug treatment by contacting users in public or quasi-public settings and targeting users who had no known (at recruitment) contacts with police for marijuana offenses. Typical group locations included streets, parks, and outdoor spaces, college/school campuses or lounges, indoor gatherings/parties, coffee shops and restaurants, and bars and clubs. They varied their time of day for collecting data and paid participants $10 cash for completed surveys. The presence of the ethnographer allowed the participants to ask questions about items they did not understand and discouraged them from rushing through the questionnaire. Although the ethnographers took detailed field notes on each location, only one item from the field notes – the zip code of the location – is used here. The rest of these data are from the PGQ. Weekly meetings of the ethnographic staff and project investigators ensured consistency and quality of data collection procedures.

Because the PGQ collected data on illegal activity, an anonymous consent procedure was used. The cover sheet of the 14-page, 125-item questionnaire gave the name and address of the National Development and Research Institutes (NDRI) as the organization conducting the study and explained the voluntary and anonymous nature of participation. Participants were asked only to place a mark on a line indicating that they agreed to participate and were asked not to write their names on any part of the questionnaire. The Institutional Review Board of NDRI approved data collection and security procedures. The Institutional Review Board at Adelphi University approved secondary analyses of these data.

The valid sample included 481 participants who had reported marijuana use in the past year and whose age was either reported or imputed to be 35 or under. The non-users of marijuana who completed the survey as part of the recruiting strategy were excluded. Valid *N* for analyses is often much lower due to missing data on other measures.

2.2. Measures

2.2.1. Cannabis dependence symptoms—For consistency with previous research, measures were borrowed from the ICD-10 (World Health Organization, 2004), the DSM-IV-TR (American Psychiatric Association, 2000), the NSDUH (National Survey of Drug Use and Health; see Research Triangle Institute, 2007), and the UNCOPE (a marijuana-specific dependence measure; see Johnson and Golub, 2006). Each item is a yes-or-no question that

begins with "In the past 12 months …": "…have you spent more time using marijuana or blunts than you intended?" (found in DSM-IV, UNCOPE, and NSDUH), "have you neglected some of your usual responsibilities because of marijuana/blunts?" (found in DSM-IV, ICD-10, UNCOPE, and NSDUH), "have you wanted to cut down on your marijuana/blunts use?" (found in DSM-IV, UNCOPE, and NSDUH), "have you frequently found yourself thinking about using marijuana or blunts?" (found in UNCOPE), "have you used marijuana/blunts to relieve feelings such as sadness, anger, or boredom?" (found in UNCOPE), "did you have any problems with your emotions, nerves, or mental health that were probably caused or *made worse* by your marijuana/blunts use?" (emphasis in original; found in DSM-IV, ICD-10, and NSDUH), and "did you need to use more marijuana/blunts in order to get the effect you wanted?" (tolerance; found in DSM-IV, ICD-10, and NSDUH). Abbreviations for these symptoms are used in the tables. Because of ambivalence over whether all of these symptoms actually describe a single syndrome and what combination of affirmative responses would indicate a diagnosis of dependence, they were used as separate indicators of dependence and not combined into a composite measure.

2.2.2. Marijuana chasing—Participants were asked, "How often do you usually smoke a cigarette or cigar/cigarillo AFTER smoking …" first "marijuana as a joint, pipe, bong?" then "blunts?" Response was on a five-point Likert scale from Never to Always. Because the two measures were correlated at $r = .79$, another variable was calculated from the maximum of the two, reflecting how often the user chases the form of marijuana they chase most often.

2.2.3. Smoking marijuana alone—Participants were asked "How often do you smoke …" first "marijuana *alone* (in a joint, pipe, bong, bubbler)?" and then "blunts alone?" Response was on a five-point Likert scale from Never to Always. Because the two variables were correlated at $r = .42$, another variable was calculated from the maximum of the two, reflecting how often the individual uses alone the form of marijuana they most often use alone.

2.2.4. Frequency of marijuana use and frequency of tobacco use—These measures included the number of days in the past 30 on which the participant smoked joints/pipes, blunts, and tobacco (maximum of their responses about cigars and cigarettes), as well as the number of cigarettes used yesterday.

2.2.5. Other demographics—These included race, age, sex, educational level, employment status, and whether the participant lived with parents/grandparents (regression imputation was used to fill in missing values for age and educational level). It also included a categorical variable for the neighborhood in which the participant was recruited: *Non-Poverty Manhattan*, a collection of affluent areas including Union Square, Washington Square, and the length of Central Park; *East Village/Lower East Side (LES)*, a diverse transitional area including expensive market-rate apartments, public housing projects, and a significant transient homeless population; *Northern Manhattan/South Bronx*, a largely low-income ethnic minority area, and *Brooklyn/Queens*, a catch-all category for participants recruited in these two boroughs.

2.3. Statistical procedures

Basic bivariate tests – *t*-test, Pearson χ^2, and one-way ANOVA – were run to ascertain simple relationships between the dependence measures, tobacco and marijuana use variables, and demographics. Because many of the independent variables were significantly related and the study depends for its validity on statistical control, a complete set of bivariate results had to be reported in order to allay potential concerns about Type I error due to collinearity. Study hypotheses were tested using seven separate binary logistic regression models, each with a single dependence symptom as the dependent variable and blunts use, "chasing" marijuana with tobacco, marijuana use while alone, use of marijuana in joints/pipes, general tobacco use,

cigarettes used yesterday, recruitment location, race, sex, age, educational level, nonworking/non-student status, and whether the participant lived with parents/grandparents as independent variables. Results are reported as odds ratios. The two graphs that comprise Fig. 1 report predicted probabilities, calculated using the regression equations, of the dependence symptoms as functions of the two key independent variables.

3. Results

3.1. Bivariate relationships

3.1.1. Independent and dependent variables—Table 1 describes rates at which participants reported the various cannabis dependence symptoms and the symptoms' bivariate relationships with the tobacco and marijuana use variables. Joints/pipes use was associated with two cannabis dependence symptoms while blunts use was associated with six. Chasing blunts was associated with six dependence symptoms and chasing joints was associated with all seven. Both solitary use of blunts and solitary use of joints were associated with all seven dependence symptoms. Frequency of both blunts use and joints use were associated with use to relieve negative affect and preoccupation with use, but blunts use was also associated with spending more time using than intended, neglect of usual responsibilities, wanting to cut down, and tolerance. There was also a bivariate association between tobacco use and cannabis dependence symptoms. Both cigarettes used in the past day and recent frequency of tobacco use were significantly associated with the same four cannabis dependence symptoms.

3.1.2. Independent and demographic variables—Table 2 describes prevalence of various demographic factors within the sample and basic associations between demographic variables and the tobacco/marijuana use independent variables. Recruitment location was associated with all tobacco and cannabis use variables. The average smoker in non-poverty areas of Manhattan and the East Village/Lower East Side used joints/pipes – and used them while alone – more often than blunts. The average smoker in Harlem/South Bronx used blunts – and used them while alone – more often than joints. This finding suggests that rather than smoking joints while alone and blunts in groups, the average Harlem/South Bronx smoker simply prefers blunts for all occasions. Overall marijuana use was highest in Harlem/South Bronx, while frequency of tobacco use – including chasing marijuana with tobacco – was lowest.

Race differences were also evident. White users smoked fewer blunts than Blacks or Latinos but chased joints/pipes more often than Blacks or Latinos. There were no significant race differences among means for overall marijuana use, overall chasing, overall solitary use, and overall tobacco use. There were some significant sex differences, however, in that males were more likely than females to engage in riskier patterns—blunts use, chasing, and use of marijuana while alone. Differences between users living with parents/grandparents and other users emerged on the same variables and in the same direction as differences between nonworking/non-student and other users: Less use of joints/pipes, possibly more use of blunts, more frequent blunt chasing, and less frequent smoking while alone.

3.1.3. Demographic and dependent variables—Table 3 describes basic associations between demographic variables and cannabis dependence symptoms. Only tolerance and spending more time than intended had any association with geography. No cannabis dependence symptom had a significant association with race. This is consistent with what could be speculated from Table 2's results, i.e., that Black, Latino, and White users are all at comparable risk for tobacco-exacerbated marijuana dependence but for different reasons—Black and Latino users because of blunts use, and White users because of chasing. Male gender, nonworking/non-student status, and living with parents/grandparents were associated with

modestly increased rates of some of the symptoms. This is consistent with findings reported in Table 2 that these same three variables were associated with behaviors that increase risk of cannabis dependence symptoms.

3.2. Chasing and blunts as unique predictors of cannabis dependence symptoms

In order to isolate the effects uniquely attributable to blunts and chasing, binary logistic regression models predicted cannabis dependence symptoms from blunts use, chasing marijuana with tobacco, and all control variables including solitary marijuana use, joints/pipes use, general tobacco use, cigarettes used yesterday, recruitment location, race, sex, age, educational level, nonworking/non-student status, and whether the participant lived with parents/grandparents. Table 4 describes the results. Joints use was only independently associated with one symptom while blunts use was independently associated with *five* of the seven symptoms. The leftmost window in Fig. 1 describes the increase in predicted probability attributable to blunt use. Chasing marijuana with tobacco was also significantly associated with five cannabis dependence symptoms. The center window in Fig. 1 describes the increases in predicted probabilities attributable to chasing.

Note that, in the multivariate model, the tobacco use variables were significantly associated with fewer of the dependence symptoms than they had been in the bivariate analyses, and those associations were in a negative direction. This could be because chasing and tobacco use were collinear, with the result that the coefficient for tobacco use, as the independent variable less-positively/more-negatively correlated with the dependent variable, became less-positive/more-negative than its zero-order association with the dependent variable. It could also be because tobacco use independent of chasing has some protective effect against cannabis dependence. In order to make sure the coefficients for chasing were not the result of collinearity with tobacco use measures, the models in Table 4 were run without tobacco use measures (results not shown). In the models without tobacco use measures, independent effects of chasing on neglect of usual responsibilities and wanting to cut down dropped to non-significance but other coefficients, although they dropped somewhat in magnitude, did not drop to non-significance. Chasing was still significantly associated with four of the seven cannabis dependence symptoms.

4. Discussion

These data confirm that marijuana use practices of smoking blunts and chasing marijuana with tobacco uniquely contribute to cannabis dependence symptoms. These findings hold even after controlling for solitary marijuana use, frequency of marijuana joint/pipe use, tobacco use, and several demographic factors including gender, race, age, recruitment location, and indicators of socioeconomic status. Previous research using animal models (Forget et al., 2005; Valjent et al., 2002; Viveros et al., 2006), humans under laboratory conditions (Penetar et al., 2005), ethnography to elicit users' own perspectives (Amos et al., 2004; Dunlap et al., 2006), and survey research focused on tobacco rather than marijuana dependence (Ford et al., 2002) had already established conclusively that marijuana and tobacco interact in ways that have implications for abuse/dependence. The present analyses, however, may be the first to connect this interaction to actual user rituals/practices involving concurrent use of marijuana and tobacco.

In considering the implications of these findings, it is important to remember the social and economic context of marijuana use. According to our bivariate findings, users living with parents/grandparents and users who were nonworking and non-students – factors that are associated with youth and economic disadvantage – reported less use of joints/pipes, marginally more use of blunts, more frequent blunt chasing, and less frequent solo smoking. The practice of having several smokers chip in for a blunt (and, optionally, a blunt chaser) that they will all smoke together and share equally is not just a personal preference but has an

adaptive value: Marijuana consumers in less advantageous economic conditions are likely to be attracted to the group blunt smoking practice because it requires a lower up-front investment than buying an entire bag or blunt oneself (Sifaneck et al., 2005, 2007). It also does not leave them with leftover marijuana to carry around which could embarrass them in a police stop/search or be stolen in crowded living quarters. Smoking blunts in groups rather than alone is also adaptive for smokers under 18 because many stores will not sell them cigars (Dunlap et al., 2005). Tobacco with marijuana also helps to mask the marijuana smell, which is adaptive for those who do not have a private place to smoke (Sifaneck et al., 2005).

The purposive sampling strategy was both a strength and a weakness of this study. Although this study acquired a diverse sample of cannabis users representing several geographical areas, races, and marijuana use practices, it is not a probability sample and does not necessarily represent different groups of people and experiences in the same proportion in which they exist in the population. The most telling example is that, although part of the impetus for this study was findings from probability sample surveys that marijuana use disorders are rising in Black and Latino youth (Compton et al., 2004), bivariate analyses for this study did not reveal significant associations between race and any dependence symptom. However, it is still possible to be confident about the validity of the key findings about blunts and chasing because of the comprehensive set of control variables and the fact that previous research had already established the interaction between nicotine and cannabinoids with respect to laboratory-administered doses. Present analyses only had to generalize the laboratory finding to users' actual practices.

The purposive sampling strategy also had several advantages. The study's protocol called for targeting certain populations who may spend a significant amount of time away from housing units, may not have land-line phones, do not have valid mailing addresses, have trouble using computers, live in higher-crime areas, and do not trust institutional authority. These factors make them unlikely to participate in a household-based or school-based survey, such as the National Survey of Drug Use and Health (NSDUH, Substance Abuse and Mental Health Services Administration: Office of Applied Studies, 1999), the Youth Risk Behavior Survey (Centers for Disease Control and Prevention, 2007), or Monitoring the Future (Johnston et al., 2006). On the other hand, they may be uniquely likely to be available for contact on the street at their leisure for a relatively brief, simple, and wholly anonymous survey with immediate cash incentive. This project's ethnographers not only found these hidden populations but found them in sufficient numbers to allow for statistical comparison between sub-groups.

Drawing from qualitative insights to construct survey measures probably augmented validity a great deal, arguably giving the present study's measures an edge even over those used in population-based surveys. The Peer Group Questionnaire's questions about dependence symptoms referred to "marijuana/*blunts*" (emphasis added). Participants who believed themselves to be dependent on tobacco in blunts or on the blunt ritual (Dunlap et al., 2006) could still represent themselves authentically by an affirmative response. In contrast, the 2007 NSDUH's dependence questions asked about marijuana or *hashish* (emphasis added; Research Triangle Institute, 2007). This may have led to invalid responses from participants who believed themselves to be dependent on the tobacco in blunts and/or the blunt smoking ritual and were at a loss for how to answer the question. If the present analyses were attempted with NSDUH data, it would likely reveal something about the importance of this difference in wording.

Although the self-report nature of the data could be called a weakness, self-report data were the only way to address our research question, as discussed above. Self-report data are, moreover, the data that are most easily available to clinicians about their clients, making self-report findings arguably particularly easy to translate into clinical applications. Individuals

frequently seek help cutting down or quitting marijuana (Roffman and Stephens, 2006). According to these findings, efforts to treat cannabis dependence may be more successful if the issue of concurrent tobacco use is also addressed.

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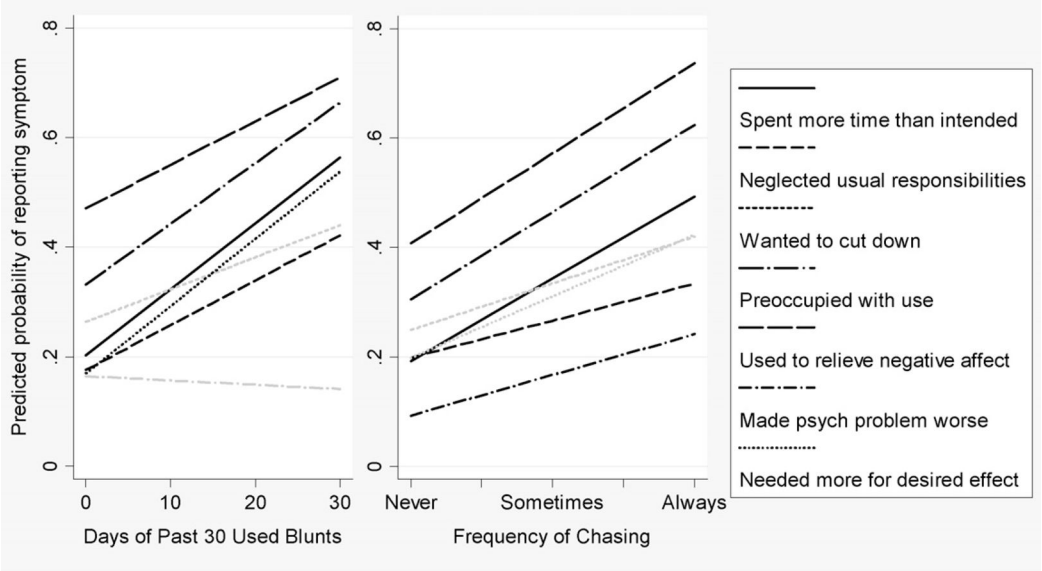

Fig. 1.

Binary logistic regression estimated probability dependence symptoms by frequency of blunts use and chasing, based on analyses reported in Table 4 and narrated in Section 3.2. Black lines refer to significant coefficients; gray lines correspond to marginally significant or non-significant coefficients.

Table 1

eporting and not reporting cannabis dependence symptoms in marijuana and tobacco use, “Chasing,”

at more time than intended		Neglected usual responsibilities		Wanted to cut down		Preoccupied with use		Used to relieve negative affect		Made psychological problem worse		Needed more for desired effect	
No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
21	147	347	120	316	148	263	200	210	253	398	75	323	131
3.9	10.3	8.8	10.7+	9.6	9.1	7.9	10.9**	6.4	12.0****	9.1	10.3	9.0	10.2
7.9	14.3****	8.6	13.5****	8.8	12.2**	7.8	12.5****	7.9	11.5***	9.9	9.5	8.0	14.8****
2.3	3.0****	2.4	2.8*	2.4	2.8**	2.2	2.9****	2.1	2.9****	2.4	3.1***	2.3	2.9***
2.3	3.0****	2.4	2.8*	2.4	2.9**	2.1	3.0****	2.1	2.9****	2.5	2.9+	2.3	3.0***
2.5	3.3****	2.6	3.0*	2.6	3.1**	2.4	3.2****	2.3	3.1****	2.6	3.3**	2.5	3.2***
2.0	2.5****	2.0	2.4***	2.0	2.3**	1.9	2.4****	1.8	2.4****	2.1	2.5*	2.0	2.5***
1.6	2.3****	1.6	2.3****	1.6	2.2****	1.5	2.3****	1.5	2.1****	1.7	2.2***	1.6	2.3****
2.1	2.9***	2.2	2.9****	2.2	2.7****	2.0	2.8****	2.0	2.7****	2.3	2.8***	2.2	2.8****
1.2	15.9**	12.5	13.1	12.0	14.3+	10.8	14.7**	10.6	14.8***	12.3	14.5	11.4	15.0**
3.2	5.7***	3.7	4.7	3.8	4.4	3.0	5.1***	3.4	4.5*	3.8	4.6	3.3	5.1**

t at + $p < .10$,

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Table 2

Group differences by demographic variables on marijuana and tobacco use variables

	Valid *N*	Days used joints/ pipes	Days used blunts	Days used most often used type	How often chase joints/ pipes[a,]	How often chase blunts[a]	How often chase most often chased type[a]	How often use joints/ pipes while alone[a]	How often use blunts while alone[a]	How often use most often used alone type while alone[a]	Days used tobacco	Cigarettes used yesterday
Location												
Non-poverty Manhattan	112	9.5****	6.2****	11.5*	3.0****	2.8**	3.1***	2.2**	1.6***	2.3	15.5**	4.9
East Village/LES	98	11.6	5.6	13.2	2.7	2.4	2.6	2.3	1.5	2.4	11.9	3.4
Harlem/S. Bronx	127	5.4	14.5	15.3	1.8	2.2	2.3	1.8	2.1	2.3	9.6	3.5
Brooklyn/Queens	117	9.9	11.5	15.3	2.8	2.9	3.1	2.3	2.1	2.6	13.2	4.0
Race												
White	128	10.7+	4.3****	12.1	2.7*	2.4	2.8	2.3*	1.4***	2.3	12.8	4.2
Black	143	7.3	13.7	15.6	2.4	2.6	2.7	1.9	2.1	2.4	12.6	3.8
Latino	89	8.7	10.8	13.7	2.0	2.3	2.4	2.0	1.8	2.2	10.7	3.3
Asian	25	8.8	9.0	14.6	2.8	2.8	2.7	2.2	1.6	2.4	15.1	4.2
Other/mixed	96	10.2	9.9	14.4	2.8	2.7	2.9	2.3	1.9	2.6	12.9	4.2
Sex												
Male	265	8.6	11.2**	15.0+	2.6	2.6*	2.8+	2.2	2.0****	2.5**	12.5	4.1
Female	200	9.9	7.8	13.0	2.4	2.3	2.5	2.1	1.5	2.2	12.2	3.4
Nonworking/non-student												
No	366	9.8*	9.2+	14.1	2.5	2.4*	2.7	2.2*	1.7*	2.4	12.0	3.6+
Yes	115	7.1	11.3	13.8	2.7	2.8	2.9	1.9	2.0	2.3	14.1	4.8
Live with parents/grandparents												
No	280	10.5***	8.9+	14.4	2.5	2.3*	2.6	2.3**	1.7*	2.4	11.9	3.5
Yes	201	7.1	10.8	13.5	2.6	2.8	2.9	1.9	2.0	2.3	13.3	4.4

One-way ANOVA, *t*-test of differences between means of column factor attributable to row factor, or $\chi 2(1$ d.f.) test of independence between row factor and column factor significant at + $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$,

**** $p < .0001$.

[a]Responses range from 1 = never to 5 = always.

Table 3

Group differences by demographic variables on cannabis dependence symptoms

	Spent more time than intended % Yes	Neglected usual responsibilities % Yes	Wanted to cut down % Yes	Preoccupied with use % Yes	Used to relieve negative affect % Yes	Made psych problem worse % Yes	Needed more for desired effect % Yes
Location							
Non-Pov. Manhattan	22**	23	33	47	63+	16	23*
East Village/LES	31	23	23	41	52	18	23
Harlem/S. Bronx	43	33	35	46	47	14	34
Brooklyn/Queens	33	27	38	44	60	17	37
Race							
White	24+	24	26+	46	60	20	25
Black	39	26	38	40	50	17	35
Latino	28	22	28	44	51	9	28
Asian	24	36	48	42	75	16	33
Other/mixed	36	28	30	44	52	16	25
Sex							
Male	32	28	35*	46	54	15	32+
Female	29	22	25	39	53	16	24
Nonworking/non-student							
No	27***	24	30	40*	52+	17	26*
Yes	45	31	37	53	62	12	38
Live with parents/grandparents							
No	28	23+	29+	38**	52	14	25+
Yes	36	30	36	50	59	19	34

Note: Chi-square test of association between row factor and cannabis dependence symptom significant at + $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 4

Blunts use and chasing marijuana with tobacco as unique predictors of dependence symptoms independent of marijuana use, tobacco use, and other controls

	Spent more time using than intended		Neglected usual responsibilities		Wanted to cut down but could not		Preoccupied with use		Used to relieve negative affect		Made psychological problem worse		Needed more for desired effect	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Days of past 30 used blunts	1.04**	[1.01, 1.06]	1.03*	[1.01, 1.06]	1.01	[0.99, 1.03]	1.04**	[1.01, 1.07]	1.03*	[1.00, 1.06]	0.98	[0.95, 1.01]	1.05***	[1.02, 1.07]
Often chase marijuanaw/ tobacco	1.41**	[1.12, 1.78]	1.36*	[1.06, 1.75]	1.24+	[0.99, 1.55]	1.36**	[1.09, 1.70]	1.51**	[1.19, 1.90]	1.45*	[1.09, 1.91]	1.26+	[0.99, 1.59]
Days of past 30 used joints/ pipes	1.00	[0.97, 1.03]	1.01	[0.98, 1.04]	0.98	[0.96, 1.01]	1.01	[0.98, 1.04]	1.05**	[1.02, 1.08]	1.00	[0.97, 1.03]	0.99	[0.96, 1.02]
Often use marijuana alone	1.51***	[1.21, 1.89]	1.44**	[1.15, 1.80]	1.48***	[1.19, 1.83]	1.60***	[1.29, 1.99]	1.49**	[1.18, 1.87]	1.42**	[1.10, 1.84]	1.47**	[1.18, 1.84]
Days of past 30 used tobacco	0.99	[0.96, 1.02]	0.96**	[0.92, 0.99]	1.00	[0.97, 1.03]	0.98	[0.95, 1.01]	1.00	[0.97, 1.03]	0.99	[0.96, 1.03]	0.98	[0.95, 1.01]
Cigarettes smoked yesterday	1.02	[0.97, 1.07]	1.01	[0.96, 1.07]	0.95*	[0.90, 1.00]	1.01	[0.95, 1.06]	0.93*	[0.88, 0.98]	0.98	[0.92, 1.04]	1.00	[0.95, 1.06]
Location														
Non-poverty Manhattan (ref)														
East Village/LES	2.22*	[1.06, 4.68]	1.01	[0.47, 2.14]	0.52+	[0.25, 1.09]	0.62	[0.31, 1.25]	0.55	[0.27, 1.12]	1.31	[0.58, 2.97]	1.22	[0.56, 2.68]
Harlem/South Bronx	2.68*	[1.15, 6.22]	2.23+	[0.93, 5.33]	0.97	[0.46, 2.08]	0.86	[0.39, 1.87]	0.66	[0.30, 1.49]	1.11	[0.41, 3.05]	1.04	[0.45, 2.42]
Brooklyn/Queens	1.27	[0.61, 2.66]	0.96	[0.45, 2.04]	0.99	[0.51, 1.93]	0.68	[0.34, 1.33]	0.80	[0.40, 1.61]	0.88	[0.38, 2.03]	1.57	[0.75, 3.26]
Missing	0.63	[0.16, 2.51]	0.16+	[0.02, 1.37]	0.52	[0.15, 1.76]	0.46	[0.15, 1.44]	0.34*	[0.12, 0.97]	0.64	[0.13, 3.23]	0.62	[0.15, 2.49]
Race														
White (ref)														
Black	0.97	[0.45, 2.10]	0.34*	[0.15, 0.80]	0.96	[0.46, 1.97]	0.26**	[0.12, 0.56]	0.36**	[0.17, 0.75]	0.73	[0.30, 1.74]	0.68	[0.30, 1.50]
Latino	0.63	[0.27, 1.46]	0.39*	[0.16, 0.95]	0.64	[0.29, 1.44]	0.47+	[0.22, 1.01]	0.42*	[0.19, 0.90]	0.36+	[0.12, 1.05]	0.67	[0.29, 1.52]
Asian	0.75	[0.23, 2.47]	1.83	[0.64, 5.19]	2.77*	[1.00, 7.64]	0.64	[0.22, 1.85]	2.11	[0.66, 6.72]	0.71	[0.20, 2.55]	1.31	[0.40, 4.30]
Other/mixed	0.94	[0.45, 1.93]	0.64	[0.30, 1.36]	0.85	[0.42, 1.75]	0.44*	[0.22, 0.88]	0.37**	[0.18, 0.74]	0.54	[0.23, 1.25]	0.55	[0.25, 1.21]
Sex														
Male (ref)														
Female	1.36	[0.81, 2.29]	1.00	[0.59, 1.71]	0.64+	[0.39, 1.05]	0.95	[0.59, 1.54]	1.09	[0.67, 1.78]	0.98	[0.53, 1.81]	1.19	[0.70, 2.03]
Missing	1.80	[0.44, 7.28]	2.09	[0.52, 8.41]	3.50	[0.78, 15.7]	1.08	[0.25, 4.57]	7.02+	[0.76, 65.1]	1.84	[0.37, 9.13]	1.08	[0.23, 5.13]
Age	0.98	[0.92, 1.04]	1.00	[0.93, 1.06]	1.02	[0.96, 1.09]	1.02	[0.96, 1.08]	1.00	[0.94, 1.06]	1.03	[0.95, 1.11]	1.02	[0.95, 1.09]
Educational level	1.02	[0.84, 1.24]	0.92	[0.76, 1.12]	0.95	[0.79, 1.14]	0.85+	[0.70, 1.02]	1.05	[0.87, 1.26]	1.15	[0.91, 1.46]	0.81*	[0.66, 0.99]
Live with parents/ grandparents	0.99	[0.56, 1.77]	0.96	[0.52, 1.77]	1.14	[0.66, 1.99]	1.35	[0.77, 2.36]	1.57	[0.87, 2.85]	2.43*	[1.15, 5.10]	1.03	[0.58, 1.86]
Nonworking/non-student	1.78*	[1.01, 3.11]	1.22	[0.68, 2.18]	1.28	[0.74, 2.20]	1.42	[0.83, 2.44]	2.21**	[1.26, 3.90]	0.77	[0.37, 1.60]	1.56	[0.88, 2.78]
Valid *N*		412		409		406		405		405		415		396
Likelihood ratio χ^2 (23 d.f.)		90.8***		64.4***		55.7***		96.9***		117.6***		37.0*		70.9***

Note: Each column of odds ratios represents the results of a binary logistic regression analysis with a dependence symptom as its dependent variable. Odds ratio or model fit statistic significant at + $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$.