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What is This?

How Risky Is Marijuana Possession? Considering the Role of Age, Race, and Gender

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Abstract

Arrest rates per capita for possession of marijuana have increased threefold over the last 20 years and now constitute the largest single arrest offense category. Despite the increase in arrest numbers, rates of use have remained stable during much of the same period. This article presents the first estimates of the arrest probabilities for marijuana, conditional on use in the previous 12 months; this is an appropriate measure of the intensity of enforcement against users. We analyze differences by age, race, and gender from 1982 to 2008. The probabilities of arrest for a marijuana user were similar across age and race categories until 1991. By 2006, that had changed sharply. Arrest rates among current marijuana users are disproportionately high for adolescents, Blacks, and males. The rate has varied between 0.8% and 1.8% across years; the rate per incident of use has ranged between about 1/3,000 and 1/6,000. There is no compelling account of why marijuana arrest probabilities have increased nationally or why the focus has been on youth, minorities, and males but the disproportionate increase for young Black males raises issues of disparate impact.

Keywords

marijuana, drug, arrest, risk, order maintenance

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Introduction

In almost all industrialized nations, cannabis is the most commonly used illicit drug. Not surprisingly, arrest for possession of cannabis account for the majority of drug arrests in Western countries (Room, Fischer, Hall, Lenton, & Reuter, 2010). In the United States, there were an estimated 14,000,000 arrests for all offenses in 2008; of that number, 12.2% were drug abuse violations, the most common type of arrest made (driving under the influence was second at 10.6%). Marijuana possession alone accounted for almost half (45%) of all drug law violations (Federal Bureau of Investigation, 2009). For adolescents, the impact of marijuana possession is even more pronounced. Marijuana appears to be the main drug that brings youths into the criminal justice system; adolescent males are much more likely to be arrested for possession of marijuana than for any other type of drug (Reuter, Hirschfield, & Davies, 2001). For example, in 2008, almost 30% of all juvenile arrests are for marijuana possession. Undoubtedly, the sheer number of arrests is associated with high costs to the arrestees; how costly they are to the criminal justice system is a matter of dispute (Kilmer, Caulkins, Pacula, MacCoun, & Reuter, 2010; Miron, 2003). These costs have been prominent in debates about how possession of marijuana should be handled legally. They have figured in discussions of the decriminalization of possession of small amounts of marijuana (Pacula, Chriqui, & King, 2004; Single, 1989), the negative labeling effects of arrest on the individual (Caulkins & Sevigny, 2005; Levine, Gettman, & Siegel, 2010; Reuter et al., 2001), the costly processing of possession cases (King & Mauer, 2006), and the overburden of Federal and State Correctional Facilities (Caulkins & Chandler, 2006; Caulkins & Sevigny, 2005).

There has been a dramatic rise in the number of arrests for simple possession since 1991. In 2008, about 800,000 individuals were arrested for possession of small amounts of marijuana (typically less than an ounce). That figure was more than three times the number in 1991. In recent years, about half of all drug-related arrests have been for marijuana possession (up from only 30% in 1991). In contrast, the numbers of arrests for property and violent offenses have remained stable during this time. A handful of studies have analyzed this rise in marijuana possession arrests on the national (e.g., Gettman, 2009), state (Levine et al., 2010), and city levels (Geller & Fagan, 2010; Golub, Johnson, & Dunlap, 2007). In the 1980s, a new policing framework emerged which shifted the focus of policing toward targeting minor offenses and disorder, including marijuana possession, as an effective way of reducing minor offenses and more violent and serious crimes (e.g., Wilson & Kelling, 1982). Although marijuana arrests can serve these newly defined policing goals, marijuana use has not declined.¹ In fact, the National Household Survey on Drug Abuse (NHSDA) estimates that the rates of past year use had risen from 6,520 in 1991 to a rate of 9,797 per 100,000 in 2008.²

This study has two purposes. First, it examines at the population level whether marijuana possession has become more risky, in terms of the probability of arrest conditional on use; arrest rates per hundred thousand population do not provide that. That is a first step in understanding whether arrest serves as an effective deterrent to marijuana use. Second, it takes marijuana arrests themselves as an important phenomenon, as they bring a substantial new population into the ambit of the criminal justice system. Previous studies that explore differential rates of arrest in New York City have made the argument that marijuana enforcement has been used to target young, minority males (Golub et al., 2007; Harcourt & Ludwig, 2007). Our analyses of subgroup arrests probabilities and how they have changed over time as the number of arrests has tripled shed some light on this question at the national level. We also offer analyses that take into account differences over time in the intensity of use by the different population subgroups.

Using data from three sources—the Uniform Crime Reports (UCR), the NHSDA (later the National Survey on Drug Use and Health [NSDUH]), and the Decennial Census—we describe the trends of marijuana arrest and marijuana use over time. That allows us to compute the probabilities of arrest and marijuana use over time and across population groups, identifying the age/gender/race distribution of the changes between 1982 and 2008. The article proceeds as follows: First, we review the literature on marijuana arrest patterns. Second, we present the results of the current analysis: The probability of arrest for a marijuana user was close to equal across age and race categories until 1991 when disparities began to emerge with disproportionately high rates for adolescents, Blacks, and males compared with other cannabis users. Finally, potential explanations and policy implications of our findings are discussed.

Literature Review

In a number of large urban areas, such as New York City, Chicago, and counties across California, there was an emphasis on order maintenance policing,³ which is a law enforcement policy that proposes proactive policing against misdemeanor and minor offenses (see Geller & Fagan, 2010; Harcourt, 2001; Levine et al., 2010; Livingston, 1997; Silverman, 1999; Skogan & Harnet, 1999). Many cities expanded local police powers as a

means to obtain order (Roberts, 1999). For some cities, this expansion included stop and frisk campaigns, which resulted in many individuals being arrested for having marijuana in public view (MPV; for example, New York). Order maintenance policing received a great deal of support from the policy makers and the press (Harcourt, 2001). One of the consequences, increases in arrests for possession of small amounts of marijuana, has continued. Of course, order maintenance policing did not affect every population group equally. For example, Gelman, Fagan, and Kiss (2007) looked at pedestrian stops by New York City police department and found that even after controlling for precinct characteristics; individuals from racial and ethnic minority groups were stopped more often than Whites. It is important to note, however, that the rise in marijuana possession arrest rates was consistent across the United States and not just limited to areas that implemented order maintenance policing. Due to the relatively minor nature of possession of marijuana, police are able to use discretion, which can lead to a number of individual-level characteristics playing a role in increasing the probability of arrest. Some of these factors include race, age, and gender.

Race, Age, and Gender

Race has long been recognized as playing a critical role in policing decisions (e.g., D'Allesio & Stolzenberg, 2003; Donohue & Levitt, 2001; Hill & Crawford, 1990). There are a number of explanations offered for the relationship between race and arrest rates. Some studies suggest that differential law enforcement practices are a reality (e.g., Donohue & Levitt, 2001; Nunn, 2002), whereas other studies find that disparate arrest rates are a result of differential involvement in certain types of offenses (Blumstein, 1993; D'Allesio & Stolzenberg, 2003). Other scholars argue the relationship between race and arrests is a mere correlate of other important factors such as family disruption and poverty (Mosher, 2001; Parker & Maggard, 2005; Sampson & Wilson, 1995). Another explanation suggests that African Americans are more likely to engage in risky purchasing behaviors, such as buying marijuana outdoors, from strangers, and away from place of residence (Ramchand, Pacula, & Iguchi, 2006). Studies assessing the racial disparity in drug arrests have typically found that a focus on outdoor drug activity and police perceptions are often the reason for an overrepresentation of Blacks who are arrested (Beckett, Nyrop, Pfingst, & Bowen, 2005; W. T. Johnson, Petersen, & Wells, 1977; Nunn, 2002; Ramchand et al., 2006).

Research specifically examining the issue of race and marijuana arrest rates has found substantially higher arrest rates for Blacks compared with Whites. Golub and colleagues (2007, 2006) examined the increase of marijuana arrests in New York city as a result of the quality of life (QOL) policing initiative, which encourages police officers to arrest and detain individuals for minor offenses with the goal of preventing more serious crime (Silverman, 1999). Under the QOL initiative, the New York City Police Department focused on arresting individuals for smoking MPV. Golub et al. (2007) found that in 2000, Black residents composed less than a quarter of the resident population of New York City but were charged with more than half (52%) of the arrests for smoking MPV. White residents on the other hand accounted for 38% of the residents but only 15% of the MPV arrests. However, the researchers look at the arrest-to-resident ratio and do not adjust for the marijuana use rates of each of the respective populations, so it is unclear the extent to which the rates of arrest reflect the rates of use.

The disproportionate arrests of Blacks were not isolated in New York City. Reuter et al. (2001) analyzed the marijuana arrest rates among individuals in Maryland for the period 1991-1997 and found a similar trend. In 1991, the Black arrest rate was almost identical to the White arrest rate, yet only 6 years later the Black arrest rate was double that of the White arrest rate (413 vs. 209 per 100,000). Data limitations, however, did not allow the researchers to disaggregate the rates by age and race jointly. Levine and colleagues (2010) looked at the 25 largest counties in California from 2004 to 2008 and found that Blacks had at least double the arrest rates of Whites. Although the disparity by race is well documented, there are mixed findings in regard to whether the increase in arrests of marijuana possession is consistent across age groups. Golub et al. (2007) used population rates to determine if individuals who belong to specific groups were overrepresented in the proportion of marijuana possession arrests in 2000. They found that residents with the highest percentage of arrests are 21 to 29 years old (39%) followed by residents aged 18 to 20 (22%). Overall, individuals in their late teens and 20s were disproportionately represented among arrestees for smoking MPV (72% compared with 27% of residents).

Reuter et al. (2001) found that in Maryland, adolescents (12-17 years old) experienced the sharpest rise in marijuana arrests: the number of arrests for possession of marijuana rose sevenfold between 1991 and 1997 for that group. By 1997, 12 to 17 year olds were arrested at a rate of 934 per 100,000, whereas 18 to 44 year olds were arrested at the rate of 433 per 100,000 in the population. This trend was also the case when Reuter et al. (2001) considered

user rates. The researchers calculated that the probability of arrest for possession of marijuana, given marijuana use, rose threefold during the study period (3% to 9%) for adolescents aged 12 to 17, whereas the rate was stable for other age groups.

Studies have consistently found that males are at a higher risk than females for arrest. According to the "chivalry" thesis, women receive preferential treatment throughout the criminal justice process, including being treated more leniently than males by police officers (Simon, 2005; Visher, 1983). Several drug market studies illustrate this to be the case. An earlier study by W. T. Johnson and colleagues (1977) looks at the probability of arrest given marijuana use in three cities and found that females have a disproportionately lower rate of arrest than males. In Golub et al.'s (2007) study, 92% of the marijuana arrests were males. This trend is observed with adolescents as well. More recently, Regoli, Hewitt, and DeLisi (2009) recognized that generally for all crimes, adolescent males are more likely to be arrested than their female counterparts. McCord, Widom, and Crowell (2001) argued that adolescent males are more likely to use drugs frequently and in public places, thereby heightening their risk of arrest. However, early research suggests that males and females are equally likely to be arrested (Smith & Visher, 1981). Small (2000) suggested that the proportion of females arrested for property and violent crimes has risen steadily since the 1960s, whereas the male arrest rates has remained stable.

A confounding factor in comparing arrest rates of men and women is the rate at which they participate in the alleged offenses. For almost all crime types, females participate at a substantially lower rate than males (Steffensmeier, 1980; Steffensmeier & Alan, 1996). However, the rates of marijuana use appear to be much more comparable between the two genders than other crime types. For instance, Reuter et al. (2001) noted that women account for only 10% of all possession arrests; yet, according to the NHSDA, 37% of marijuana users are female.

The Current Focus

To our knowledge, few studies have systematically examined the time pattern of the probability of arrest for possession *conditional* on use.⁴ Using previous studies on differential patterns of arrest for guidance, we disaggregate a national sample by age groups, gender, and race. Doing so allows us to determine whether the trends are merely a reflection of rates of use or potentially selective law enforcement.

Data and Methods

We used three different sources of data for our analyses: the NSDUH, the UCR, and the Decennial Census. Since 1990, the NSDUH (which was entitled the NHSDA until 2002) has been an annual survey that measures the prevalence and correlates of drug use in the United States. The UCR publishes annual statistics on persons arrested. Every 10 years, the Decennial Census provides direct population counts in the United States and in between those years, the U.S. Census Bureau provides estimates of the population. The NSDUH and UCR were downloaded through the Interuniversity Consortium for Political and Social Research (ICPSR) and the population estimates were obtained through the U.S. Census Bureau's website.

The use of three different data sources presented several challenges. First, age categories were recoded to ensure the matching of age groups. Second is the use of different race/ethnicity categories. This section describes each data source, the assumptions, and limitations of our comparisons.

NSDUH

The NSDUH series provides information on the use of illicit drugs, alcohol, and tobacco among members of United States households aged 12 and older. The NSDUH/NHSDA has undergone several methodological changes since 1983. In 1999, the survey underwent a major redesign. The method of data collection was changed from a paper questionnaire administration to a computer-assisted administration. In addition, the sample design was changed from a strictly national design to a state-based sampling plan. In 2002, there were also substantive changes to the NHSDA. It was renamed the NSDUH in 2002 partly to reflect the changes and to give it a more neutral title for respondents. Since 2002, each NSDUH respondent received an incentive payment of US\$30. This change resulted in an improvement in the survey response rate; however, it also created a discontinuity in estimated prevalence rates. The mode of data collection was audio computer-assisted self-interview (ACASI) and computer-assisted personal interview (CAPI).

The variables used in our study are the recoded marijuana use variables, which include indicators for past year, past month, and the mean number of days of marijuana use. These variables stem from the original responses to the recency-of-use question. We also used the imputation-revised race variables when available for two reasons. First, the later publically available surveys do not contain the original race/ethnicity variables and second, Substance Abuse and Mental Health Services Administration (SAMHSA) specifically suggests that "Where imputed or recoded variables are provided, users are encouraged to use them to produce estimates rather than raw or edited variables from the interview" (NSDUH Codebook, 2006). The indicator for past year and past month marijuana use are binary variables, the mean days of marijuana use is a continuous variable, and the race/ethnicity variable recodes the respondents into either one of the categories: White, Black, Hispanic, or Other.

UCR

We used the Uniform Crime Reporting Program Data: arrests by age, sex, and race, summarized yearly from 1982 to 2008. These arrest reports provide data on 43 offenses, including violent crime, gambling, larceny, and drug abuse violations. They provide a record for each of the reporting police agency a count of the arrests by age, sex, and race for a particular offense. We first aggregated these agency level data to the state level and then aggregated to the national level. According to the Department of Justice (2008), in 2008, reporting agencies represent about 95% of the police agencies in the United States; however, there are some noteworthy exceptions. For example, the state of Florida and the District of Columbia do not report their marijuana possession arrests directly to the UCR. For the states with limited or no crime or arrest data, the ICPSR uses an imputation method to fill the missing values.⁵

The UCR provides data on arrestees of all ages. However, the UCR collapses arrestees' ages into categories and disaggregates by gender. Therefore, to match the NSDUH and UCR age categories, we created the following age categories: 15 to 19; 20 to 29; 30 to 49; 50 and above.⁶ The census provides estimates for year-specific ages, so it was not a factor in determining the age categories. For our race categories, we were limited to two: Black and White. The UCR provides data on an arrestee's race and not ethnicity.⁷ The racial categories used in the UCR Program define White as "A person having origins in any of the original peoples of Europe, North Africa, or the Middle East" and Black as "A person having origins in any of the black racial groups of Africa" (Federal Bureau of Investigation, 2004, p. 97).⁸

Decennial Census

The Decennial Census provides a direct count of U.S. residents and provides us with a racial/ethnic composition of the United States. More specifically, we used annual census estimates to determine the proportion of persons who are either White or Black. We then applied the proportion for each year to the population covered by the UCR. One difficulty is that both the census and the NSDUH ask questions about race and ethnic origin but the UCR provides information about race only. Thus, the proportion of White residents were calculated from respondents who reported they were White, alone or in combination, and proportion Black were calculated from respondents who reported they were Black, alone or in combination. This provides the best comparison with the UCR and a more inclusive denominator when calculating the arrest rates, which makes our estimates more conservative.9 Whites and Blacks were further divided into juvenile or adult categories to match the UCR. The proportion of White juveniles in the population declined from 22.2% in 1982 to 19.4% in 2008, whereas the proportion of Black juveniles remained stable at around 4%. White adults also remained stable at around 63% of the population and proportion of Black adults experienced a slight increase from 7.8% in 1982 to 9.6% in 2008. Compilation of these data was conducted with SAS 9.1.

Analysis of Conditional Probabilities

Using the numbers of arrest for marijuana possession and of past year users, we calculate the probability of being arrested conditional on past year use from 1982 to 2008 P (Arrest | Use).¹⁰ Conditional probabilities were computed by dividing the probability of arrest P(A) by the probability of use P(U) in a given category.

Results

To get an overall portrait of national arrest rates, Figure 1 illustrates arrest trends and past year use trends. Figure 1 shows that indeed, for arrests, the arrest rates for possession of marijuana in 1995 was 256 per 100,000 and rose to an all-time high in 1999 to a rate of 367. From 1999 to 2002, there was a substantial decline in arrest rates,¹¹ which thereafter stabilized.¹² Although arrest rates dropped between 1999 and 2002, marijuana use rates rose and thereafter also stabilized. Looking at the national picture (Figure 2), we see that the probability of being arrested among past year marijuana users was the lowest in 1991 (.007) and the highest probability was in 2000 with a probability of a marijuana user being arrested for possession was .019.

To determine whether these rates differ for different groups in the population, we disaggregate the national rates by gender and age. The rates of arrest for males ages 15 to 19 years and 20 to 29 years were very similar from 1982 to 1992 with a rate of 642 and 628, respectively, in 1992. Starting in 1993, there was a surge in the arrest rate for both groups but the increase for the 15 to 19 category was much higher. In 1997, males 15 to 19 were almost twice as likely to be arrested for marijuana possession that males 20 to 29 (2,008 vs. 1,145). This relationship between the two categories remains consistent through to 2008. As expected, the other two age categories, 30 to 49 years and 50 and above, have relatively low rates of arrest. The arrest rates for females follow a similar time trend as for males 15 to 19 was a mere 335 in 2008, just 15% of the male rate for the same age group.

When we contrast the rates of arrest to the rates of past year use, we see that males 15 to 19 years and 20 to 29 years have very similar use rates. For these two age groups, marijuana use was extremely high in the early 1980s but decreased until 1991 and increased to the end of the study period, in 2008. In 1991, the rate of use was 19, 547 and 24, 318 per 100,000 and in 2008 the rate of use was 27,000 and 29,500 for 15- to 19-year-olds and 20- to 29-year-olds, respectively. Female rates of use rival that of males and follow a similar trend for these age groups. In 1991, the rate of female use for 15- to 19-year-olds was 15,626 and 14,634 for 20- to 29-year-old females. This rate increased to 23,461 and 19,933 in 2008.¹³ Tables A1 displays the figures for arrest and use by gender and age for specific years.

Figure 3 shows that the probability of arrest among marijuana users rose sharply from 1991 to 1996 and declined from 2000 to 2002. Since 2002, the probability of arrest has steadily increased again. The probability is highest among 15- to 19-year-olds and lowest for 50+ year olds. In 1991, the probability of being arrested for males 15 to 19 years old was 2.5% among past year users. This probability increased to 8.0% among past year users by 2000 and 11.5% in 2008. While following the same general upward trend, the probabilities for the other age categories are lower and magnitude of the increase is smaller for older age groups. Female probability of being arrested for marijuana possession conditional on past year use is strikingly low (Figure 4). In 1991, the probability of arrest for a female past year marijuana user was .42% and in 2008 it was 1.4%. The discrepancy between male and female rates is extraordinary and difficult to compare with other offenses because there are few offenses where females and males participate at a similar rate. Schwartz (2008) looked at gender differences in the probability of arrest for drunk driving in the United States from 1982 to 2004. Schwartz found that women were increasingly overrepresented in arrest rates relative to their share of offending rates for drunk driving.



Figure 1. Arrests of marijuana possession and past year marijuana use



Figure 2. Probability of arrest for marijuana possession, conditional on use in past year



Figure 3. Probability of arrest for marijuana possession, conditional on use in past year—Males

A number of studies have considered the racial disparity in marijuana arrests (e.g., Beckett et al., 2005; Golub et al, 2007; Ramchand et al., 2006). We analyze racial disparities as they are separated in the UCR: juvenile Black and juvenile White (under 18 years old) and adult Black and adult White (18 years and older). The rates of arrest were almost identical until 1991. After that, the Black juvenile arrest rate increased at a greater rate than for juvenile Whites. The two rates, however, were comparable in 2002 and since then, the Black juvenile arrest rate has been slightly rising again and the White juvenile rate has been stable. Black and White juvenile use rates are very similar especially in the recent years. The probabilities of arrest given past year use shows a general upward trend since 1991 for juvenile Whites and Blacks; however, Blacks were arrested at a consistently higher rate. For example, in 2008, Black past year users had a 1.6% probability of being arrested and White past year users had a 1.1% probability of being arrested (Figure 5).

Finally, Figure 6 shows the trend with adult Whites and adult Blacks. Although Whites and Blacks show an overall increase in arrest rates since 1991, the rates for the two races are markedly different. In 1991, Blacks were arrested twice as often as Whites (219 vs. 108). In 2008, Blacks were more than three times likely to be arrested as Whites (716 vs. 217). This starkly contrasts with their almost identical rates of use (Figure 6). Among Black users, the



Figure 4. Probability of arrest for marijuana possession, conditional on use in past year—Females

probability has generally been increasing from 1.5% in 1991 to 3.5% in 2008. White users had a probability of 0.73% in 1991 and a 1.2% in 2008.¹⁴

Sensitivity Analysis

Past studies that investigate the validity of self-reported substance use show that the survey participants underreport substance use from 12% to 23% (Fendrich, Johnson, Wislar, Hubbell, & Spiehler, 2004; L. Harrison & Hughes, 1997; Harrison, Martin et al., 2007; Hser, Maglione, & Boyle, 1999; Kilmer, Caulkins, Pacula, & Reuter, 2011; Kilmer & Pacula, 2009). Underreporting for less stigmatized drugs such as marijuana is considerably lower compared with more serious drugs such as cocaine. For example, Fendrich and Johnson (2005) found overall concordance rates for marijuana use ranging from 87% to 100% and for cocaine ranging from 81% to 95% among a national representative household sample.

More importantly, underreporting may occur at different rates depending on characteristics such as gender, age, and racial/ethnic background of the participants. Using the National Longitudinal Survey of Youth (NLSY), Fendrich and Vaughn (1994) found that in general, 11.7% of marijuana users



Figure 5. Probability of arrest for marijuana possession, conditional on use in past year—Juveniles

outright denied ever using marijuana. Twenty percent of Black respondents denied using marijuana, whereas 8% of White respondents denied using marijuana. Females and males had similar rates of denial of marijuana use (12.2% and 11.3%, respectively).

We consider the implications of differential underreporting on our estimates. For Black adults to have the same probability of arrest as White adults, the number of individuals who report marijuana use in the past year would need to triple. Similarly, the number of 15- to 19-year-old marijuana users would need to increase by 50% to have comparable arrest probabilities as marijuana users who are 20 to 29 years old and to increase threefold to have similar arrest probabilities as male marijuana users who are 30 to 49 years old. Thus, differential underreporting of marijuana use only accounts for a small portion of the differences in arrest probabilities. However, it is reasonable to say that our estimates are in the upper bound of arrest probabilities, especially for populations that are most likely to underreport marijuana use.



Figure 6. Probability of arrest for marijuana possession, conditional on use in past year—Adults

Exposure Time

In addition to annual and monthly prevalence rates, we look at the average number of days at risk for arrest. Starting in 1999, the NSDUH asked survey respondents who admitted to past year marijuana use to recall the total number of days in which they used in the past year. Table 1 shows that among past year users, males aged 15 to 19 years have a similar number of exposure days as males who are 30 to 49. However, arrest figures demonstrate that 15- to 19-year-old males have a rate of arrest that is six times higher than their 30- to 49-year-old counterparts. Gender differences between users show that although prevalence is almost identical, females have considerably less number of days at risk than males. For example, in 2004, males aged 20 to 29 years used marijuana on 139 days of the year, whereas females in the same age category were exposed on 77 days. However, the difference in exposure time accounts for a modest share of the higher arrest rates of males.

We also looked at the differences in the number of days used between races (Table 2). Among adults, Black marijuana users have a slightly higher exposure time than White marijuana users. The difference between Black and White juveniles, however, is negligible. Thus, the number of days that marijuana is consumed is not the key factor the racial disparity in marijuana possession arrest rates.

		Ma	le	Female				
Year	15-19	20-29	30-49	50+	15-19	20-29	30-49	50+
1999	101	113	92	60	52	76	72	67
2000	104	112	111	67	56	80	76	75
2001	115	119	101	90	57	79	79	70
2002	111	126	100	66	61	78	88	89
2003	118	124	109	104	58	75	87	81
2004	109	132	107	89	57	77	87	81
2005	112	129	108	98	54	81	94	72
2006	109	134	113	82	55	81	92	84
2007	110	134	112	88	60	77	91	81
2008	116	139	131	114	53	88	93	84

Table I. Number of Days of Use Per Year (Gender and Age)

 Table 2. Number of Days of Use Per Year (Race and Age)

	Ad	ult	Juvenile		
Year	White	Black	White	Black	
1999	91	109	77	87	
2000	95	118	81	90	
2001	98	121	81	82	
2002	103	118	84	82	
2003	104	117	85	81	
2004	105	121	81	86	
2005	106	125	79	80	
2006	108	126	80	83	
2007	110	125	84	77	
2008	115	131	87	84	

Discussion

The primary purpose of the current study was to examine the arrest probabilities for the population of marijuana users from 1982 to 2008. Drawing from three sources of data—the UCR, the NHSDA, and the Decennial Census we disaggregated the distributions by age, race, and gender. In most years, a marijuana user's probability of being arrested for marijuana possession is very small, in most groups less than 1% per year. In the aggregate, our results are similar to findings from a handful of studies that have indicated that arrest rates have risen dramatically since the early 1990s. When disaggregated, we discovered that the probability of arrest, although small, greatly varies across subgroups. The rise in the national arrest rates for marijuana possession was specifically driven by increases for adolescents, Blacks, and males.

Our first set of findings suggests that race is an important factor for being arrested for possession of marijuana.¹⁵ Rates of past year use between Blacks and Whites are nearly identical for juveniles and adults. The total number of days in which marijuana is consumed is also comparable for Blacks and Whites. When we consider the conditional probabilities, the greatest discrepancy between Black and White juveniles was in 2000 when the rates of arrest for a Black juvenile marijuana user (12-17 years) was almost double that of his or her White juveniles was two thirds of Black juveniles. This disparity is even more marked for adults: In 2008, the rate of arrest for an adult marijuana user who is Black was three times that of Whites. At its peak in 2000, the rate was four times higher for Black users than White users.

At least two sets of factors might contribute to this discrepancy. First, individual-level factors could place Blacks in riskier positions than Whites. For example, according to Caulkins and Pacula (2006), very few transactions take place outdoors. In fact, 87% of respondents to the 2001 NHSDA report purchasing marijuana indoors and 89% acquired it from a friend or relative, which are relatively safe transactions for individuals to gain access to marijuana. Also using the NHSDA, Ramchand and colleagues (2006) showed that Blacks are overrepresented among individuals who purchase marijuana (rather than obtaining the drug through gifts or barter) and are significantly more likely to buy outdoors, from strangers, and travel further away from home than Whites. As a result, Blacks are involved in many more high-risk transactions. However, even after factoring in differential purchasing patterns, Ramchand et al. (2006) estimated that Whites should still have twice as many arrests than Blacks. The authors conclude that differential purchase patterns only minimally account for the racial disparity between arrest rates for marijuana possession between Blacks and Whites.

Second, certain neighborhood and community characteristics can contribute to the heightened arrest probabilities that Blacks face. For example, Blumstein (1993) addressed the issue of racial disparity in drug arrest rates and the war on drugs. He stated that Blacks were more vulnerable to arrests because of the higher level of police presence in the neighborhoods with dense populations of Blacks, which are often areas that have the most concentrated number of crime. Mosher (2001) applied social disorganization and conflict perspectives across a sample of U.S. cities and found that racial composition has a strong independent effect on drug possession arrest rates. That is, even after controlling for economic-specific deprivation, areas with greater percentage Black had the greater number of possession arrests. Mosher (2001) also noted that the number of police per capita was an important determinant of drug possession rates. The number of police officers assigned to a particular area is often a result of initiatives such as order maintenance policing and varies among communities within cities. The survey data did not provide the opportunity to look at some important structural and neighborhood characteristics. Future research might look at the intersection between structural-level factors and individual-level factors to disentangle the factors related to differential arrest rates.

Our second set of findings suggests that youth (15-19 years old) are arrested for possession at a disproportionately high rate. The rates of use are nearly identical for 15- to 19-year-olds and 20- to 29-year-old males, as is the number of days they consume marijuana, yet the probabilities of arrest for the former was about double that of the latter group. The high arrest rates for this group are troubling as marijuana possession arrests can have particularly serious consequences for youth. According to Levine and Small (2008), since 1997, about 35% of the individuals arrested in New York City for possession of marijuana had never been arrested for anything before. An arrest, if followed by conviction, can mean substantially reduced opportunity for employment and has cumulative disadvantages across the life course (e.g., Bernburg & Krohn, 2003; Grogger, 1995; Laub & Sampson, 2003).¹⁶ As such, many law enforcement officers are given considerable discretion when dealing with youth, especially when caught in a misdemeanor offense (Krisberg, 2005). Police can often use informal methods to deal with the youth, such as verbal reprimands or contacting the youth's parents. The implementation of zero-tolerance policing strategies often removes police discretion, making certain populations, such as juveniles, disproportionately vulnerable to arrest. Juveniles are especially easy to arrest given they are the most likely to consume marijuana outdoors, as they have limited access to private residences without being monitored by their parents or guardians. The tension between expanding police discretionary powers, especially in the case of minors and zero-tolerance polices is an important issue when considering policies that emphasize arresting individuals for minor offenses.

The third set of findings demonstrates that even though males and females consume marijuana at similar rates, there is great disparity in arrest rates. This finding is interesting because for most other crimes, criminal participation is much lower for females than males (Block, Blockland, van der Werff, van Os, & Nieuweerta 2010; Steffensmeier & Allan, 1996). Female and male arrest rates for marijuana use, however, remained comparable across the period of study (1982-2008). Among users, however, the number of days males and females consume marijuana does differ. For example, males 15 to 19 years old consume marijuana on twice as many days as females in the same age category. The greater frequency of use accounts for only about 20% of the 10 times greater rate of arrest for a past year male user. Pollack (1950) more than 60 years ago pointed to the notion of chivalry in the criminal justice system. That is, the criminal justice system shows greater "leniency" and "chivalry" toward females; this may account for a portion of the lower official arrest rates of women, especially for less serious offenses (Smith & Visher, 1981; Stolzenberg & D'Alessio, 2004). Another possibility is that when males and females consume marijuana together, males might be the ones who purchase and carry the marijuana, hence putting themselves at greater risk of arrest than females. Future research might look into the dynamics of marijuana consumption in group settings.

Note that we have calculated conditional arrest rates for annual and monthly (current) users. We also look descriptively at the average number of days of marijuana use.¹⁷ These should not be confused with *event* probabilities. A number of studies estimate that among all past year users the average number of use episodes per annum is about 100 (e.g., Kilmer & Pacula, 2009). Thus, our estimate of a roughly 1 in 30 probability that a past year user is arrested is equivalent to about a 1 in 3,000 risk of arrest per use episode. Even after the large increase in possession arrests, marijuana consumption is a very low-risk activity in terms of criminal justice consequences. Nonetheless, our findings draw attention to a number of factors that affect differential arrest rates for marijuana possession. However, some limitations must be noted when interpreting our results. The UCR uses the hierarchy rule to count crimes. When several crimes occur at the same time, only the most serious offense is recorded in the UCR. The rates in the UCR reflect the fact that individuals whose most serious crime was possession of marijuana experienced a dramatic increase since the 1990s.

Second, the decline in arrests for marijuana possession from 1999 to 2002 is statistically troubling. The change is so sharp and substantial that, lacking some specific event, it smacks of an artifact of arrest data collection. However, the UCR is in general a very stable data collection system. The fact that the decline extends for 3 years, not just 1 year, and is then followed by a moderate rather than sharp increase suggests that something real did happen. Finally, we have taken the rates of past year and past month use in the NHSDA/

NSDUH at face value. The survey is known to substantially underestimate the rates of frequent use of more expensive and dangerous drugs, notably cocaine and heroin. The nonreporting of those populations leads to an underestimate of marijuana prevalence as those who use cocaine and heroin frequently also use marijuana. However, the numbers omitted are modest compared with the total number of marijuana users in the survey; the slow declines in those populations over time are not likely to lead to substantial changes in the undercount.

An important question raised by the increase in marijuana arrest probabilities since the early 1990s is whether arrest for simple possession represents a meaningful source of deterrence. The aggregate-level data suggest not. Between 1992 and 2000, the conditional probability of arrest increased by 80%; far from declining, prevalence increased by almost 60%. However, that is only the most superficial test; perhaps marijuana prevalence would have risen to still higher rates without these arrests. A much finer grained analysis, for example, using a panel of state-level indicators over time, is necessary for serious testing. State-level marijuana prevalence rates by age have been available since 2002, but there are enough missing observations in UCR that it would be a major undertaking to conduct that research. Another important issue that requires further attention is the relationship between citizen's perceptions of the penalties faced for illicit activity and actual sanctions. Studies suggest that citizens' perception of punishment is tenuous at best (Kleck, Sever, Li, & Gertz, 2005; Nagin, 1998; Pratt, Cullen, Blevins, Daigle, & Madensen, 2006). MacCoun, Pacula, Chriqui, Harris, and Reuter (2009) directly looked at citizens' perception of the severity of sanctions for marijuana possession and found that comparing decriminalization states with those that had not decriminalized that many individuals had erroneous beliefs about the penalty for simple possession of marijuana; however, individuals who are more experienced marijuana users are more likely to know state sanctions for marijuana use.

In assessing the deterrent effect of enforcement, it is important to know what is the relevant probability for a young person contemplating marijuana use: incident, annual, or lifetime. No theory provides guidance on this, though it is surely related to the far-sightedness of the decision maker. If event probability is what matters, an increase in the probability from 1 in 5,000 to 1 in 3,000 may be so slight as to have no effect. However, if it is lifetime, then the variation may be substantial. We illustrate this with a gedanken exercise. Assume that the average use career for marijuana smoker is 10 years and that

annual arrest probabilities are independent. Then raising the annual arrest rate from 1% to 2% would be equivalent to raising the lifetime risk from 10% to 20%. That might have a substantial effect. However, the very artificialness of this calculation, which requires projections of career lengths and annual probabilities, suggests that it is strained.

The fact that the rise in marijuana arrest probabilities has been concentrated among Blacks and among the young raises concerns about the fairness of the national crackdown on marijuana possession. The vast majority of arrests probably result in no more than a fine or sentence of probation, a finding detailed by Reuter et al. (2001) for Maryland, a state that has not formally decriminalized marijuana possession. More states have moved in recent times to reducing the postarrest penalties for marijuana possession. Notably, in advance of California's 2010 referendum on Proposition 19, which would have legalized cannabis possession and production, Governor Schwarzenegger signed an executive order under which all simple possession arrests would be subject to only a fine. Nonetheless, arrest is not a minor event, particularly in many states in which arrestees lack legal representation at hearings on release status; again the study of Maryland arrestees by Reuter et al. (2001) showed that a third of the arrestees spent time in jail pre-trial.

Is the sharp rise in marijuana arrest rates a function of order maintenance policy initiatives or individual police discretion that, once aggregated, suggest a systematic bias? These questions are beyond the scope of the current study; however, few studies suggest that arresting individuals for simple possession of marijuana does affect overall crime rates. For example, Harcourt and Ludwig (2007) analyzed the pattern of New York City misdemeanor marijuana arrests and found no evidence that arresting individuals on misdemeanor marijuana arrests contributed to the decline of serious crimes in New York City. Similarly, Shepard and Blackley (2007) looked at 1,300 counties across the United States and found marijuana arrests are not associated with reductions in nondrug crime or participation in other drug markets. What our results do suggest is that the most disadvantaged individuals are the most vulnerable to being arrested.

The fact that New York State, in which marijuana arrest disparities by race have become such a prominent concern, is a state that long ago decriminalized marijuana use suggests that this problem of disparity will continue to trouble the country. Group differences cannot be explained either by the prevalence or intensity of use. Indeed, examining these conditional probabilities brings into even sharper focus the possibility that the crackdown by police forces strengthens existing disparities.



Appendix A

Figure A1. Probability of arrest for marijuana possession, conditional on use in past month—Males



Figure A2. Probability of arrest for marijuana possession, conditional on use in past month—Females



Figure A3. Probability of arrest for marijuana possession, conditional on use in past month—Adults



Figure A4. Probability of arrest for marijuana possession, conditional on use in past month—Juveniles

Appendix **B**

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Rates
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		50+	0	420	558	809	322	929	734	1,268	1,651	2,018
r)	Female	30-49	10,709	10,626	6,960	8,006	6,947	5,941	5,122	7,641	6,565	7,102
		20-29	28,021	24,074	17,550	14,634	13,939	13,015	14,688	20,501	20,819	19,933
(past ye:		15-19	32,277	24,968	21,714	15,626	19,530	23,868	23,256	27,074	23,336	23,461
s of use		50+	2,353	2,062	I,653	1,501	2,757	I,839	1,416	3,055	3,893	4,205
Rate	Male	30-49	22,590	22,476	15,046	15,633	13,938	10,649	9,245	14,104	13,456	12,445
		20-29	42,119	38,163	27,981	24,318	23,638	23,484	23,751	31,557	29,294	29,594
		15-19	33,024	33,021	21,119	19,547	24,642	28,408	25,455	30,752	27,032	27,001
	Female	50+	_	_	_	_	_	7	4	4	S	9
		30-49	21	24	27	26	4	57	58	56	61	60
		20-29	105	001	87	72	106	148	168	179	211	223
f arrest		15-19	160	132	95	65	169	286	311	315	312	325
Rates of	Male	50+	<u>~</u>	4	0	œ	4	21	36	29	37	42
		30-49	167	192	184	160	238	306	309	256	275	292
		20-29	875	844	668	520	811	I,I45	1,236	1,102	1,206	1,246
		15-19	1,094	186	714	498	1,346	2,008	2,018	1,791	1,786	1,877
		Year	1982	1985	1988	1661	1994	1997	2000	2003	2006	2008

Year		A	dult		Juvenile				
	White arrest	Black arrest	White use	Black use	White arrest	Black arrest	White use	Black use	
1982	167	458	23,184	25,328	111	119	19,951	16,744	
1985	153	485	20,727	23,880	101	117	19,737	16,638	
1988	130	341	14,705	13,672	62	76	13,702	9,103	
1991	108	219	14,814	14,948	36	43	10,614	8,841	
1994	161	415	15,186	15,379	121	174	12,183	10,332	
1997	207	666	14,021	12,845	187	286	18,136	14,413	
2000	225	735	14,541	14,316	186	252	14,254	10,262	
2003	207	541	19,825	20,203	171	178	16,886	13,282	
2006	210	681	18,737	19,544	156	216	13,498	12,534	
2008	217	716	18,782	20,571	158	213	13,609	13,360	

Table A2. Rates of Arrest and Use by Race and Age (Per Hundred Thousand)

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Notes

- Changes in police philosophy have spawned a number of more specific policies such as order maintenance policing, zero-tolerance policing, and quality of life policing. Each of the policies has various goals and whether these policies have been effective in reducing violent and serious crime has been an important empirical issue (see Eck & Maguire, 2006; Kubrin, Messner, Deane, McGeever, & Stucky, 2010; Sherman, 1998).
- 2. This increase is partially attributed to a methodological change in the National Household Survey on Drug Abuse (NHSDA) in 2002, which resulted in an increase in reporting marijuana use.

- 3. We use the term *order maintenance policing* to capture a number of initiatives inspired by the broken windows theory, such as proactive and quality of life policing (Wilson and Kelling, 1982). Broken windows theory posits that reducing petty crimes, low-level deviance will be deterred and in turn prevent more serious crimes.
- For exception, see Kilmer (2002) and Kilmer, Caulkins, Pacula, MacCoun, and Reuter (2010).
- 5. Algorithms used to prepare the county-level Uniform Crime Reports (UCR) data for the years 1977 to 1993 are available in each respective year's codebooks. From 1994 onwards, Consortium for Political and Social Research (ICPSR) uses similar estimation procedures as the FBI (see the Uniform Crime Reporting Program Resource Guide).
- 6. We calculated rates for a 10- to 14-year-old category but because the National Survey on Drug Use and Health (NSDUH) surveys individuals 12 years and above and the UCR's categories were 10 to 12 and 13 to 14 years, we would either over count the arrests or undercount the proportion of users. We included the 10 to 12 years old arrest category in our calculations because it was extremely rare for 10- or 11-year-olds to be arrested for possession of marijuana. Regardless, the rates were very low and are excluded in the presentation of the results.
- From 1980 to 1987, the Office of Management and Budget (OMB) authorized the collection of ethnic origin data and ethnicity was collected until 1987 (Uniform Crime Reporting Handbook, 2004).
- 8. Several scholars have looked at the potential bias in the UCR. In general, researchers conclude that there are biases from measurement error that arise from such things as variation in victim reporting and differential recording policies across police departments. Racial biases in reporting of racial categories of the arrestee would be fall under the larger aforementioned categories. The general consensus is that the UCR is a valid indicator of crime and should not be precluded from being used in research (Gove, Hughes, & Geerken, 1985; Levitt, 1998).
- 9. We did, however, calculate arrest rates using the proportion of respondents who reported they were White, non-Hispanic, and not of mixed race as White and respondents who reported they were Black, non-Hispanic, and not of mixed race as Black to compare our results. Indeed, the arrest rates were slightly higher, but the trends remain consistent.
- 10. As a form of sensitivity analysis, we also calculate conditional probabilities on past month use (see Appendix A). Results show that the trends are consistent with annual prevalence rates.
- 11. Similar offenses such as disorderly conduct and public drunkenness also had arrest rates that fell between 1999 and 2002. However, for these crimes, the decline was part of a downward trend between 1982 and 2008 and was therefore not as striking as for possession of marijuana.

- 12. It is also interesting to note that the 1980s, for which there are only a few prevalence measures, show that even though arrests went down, rates of use fell even more sharply.
- 13.
- Table A2 (Appendix B) displays the figures for arrest and use by race and age for specific years.
- 15. The UCR provides information on two offenses that could potentially be targeted by policing strategies: disorderly conduct and public drunkenness. We look at the trends in arrest rates over time to consider this possibility. Results suggest that for public drunkenness, the trends are comparable across age groups and race groups. However, for disorderly conduct the arrest disparity are similar to those of rates of arrests for marijuana possession. For example, Blacks are arrested approximately three times the rate of Whites. This suggests that order maintenance tactics have broader implications to minority groups and warrants further attention.
- 16. To be sure, arrest for marijuana possession may have less of a consequence than arrests for more serious offenses. However, an adult conviction of marijuana possession results in a criminal record which in and of itself is stigmatizing. Youth who are convicted may or may not have their record expunged as adults, depending on which state the conviction occurred.
- 17. We are not able to calculate the conditional probability of arrest on the number of days used because we do not have the raw numbers for the number of users in a given population, just the probability of use in a given population.

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