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Research Paper

Trends in use of marijuana and attitudes toward marijuana among youth before and after decriminalization: The case of California 2007–2013

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ABSTRACT

Background: This analysis examines decriminalization as a risk factor for future increases in youth marijuana acceptance and use. Specifically, we examine marijuana-related behaviors and attitudes of 8th, 10th, and 12th graders in California as compared to other U.S. states during the years before and after California passed legislation in 2010 to decriminalize marijuana.
Methods: Data come from Monitoring the Future, an annual, nationally representative survey of 8th, 10th, and 12th grade students.
Results: In 2012 and afterwards California 12th graders as compared to their peers in other states became (a) 25% more likely to have used marijuana in the past 30 days, (b) 20% less likely to perceive regular marijuana use as a great health risk, (c) 20% less likely to strongly disapprove of regular marijuana use, and (d) about 60% more likely to expect to be using marijuana five years in the future. Analysis of 10th graders raises the possibility that the findings among 12th graders may reflect a cohort effect that was set into place two years earlier.
Conclusion: These results provide empirical evidence to support concerns that decriminalization may be a risk factor for future increases in youth marijuana use and acceptance.

Introduction

This analysis examines decriminalization as a risk factor for future increases in youth marijuana acceptance and use. We test competing hypotheses about 2010 decriminalization legislation in California that changed existing laws so that possession of small amounts of marijuana is not a misdemeanor or higher-level crime and does not enter an individual's criminal record. Currently, a misdemeanor marijuana possession can disqualify college students from receiving federal student loans (U.S. Department of Education, 2014), and disqualifies individuals from a wide range of government and private jobs (Stuart, 2010). Typically, in a state that has decriminalized marijuana the use or possession of small quantities is treated as an infraction that is subject to a modest monetary fine. On September 30, 2010 Governor Schwarzenegger of California signed into law S.B. 1449 (California State Legislature, 2010), which reduced the penalty for possession of less than one ounce of marijuana to an infraction – a penalty similar to a parking ticket. The law officially took effect January 1, 2011, although it received significant media attention in 2009 and 2010.

The California 2010 decriminalization law may have served as a risk factor for future increases in youth marijuana prevalence. Opponents of decriminalization predict that it sends a signal to youth that marijuana use is not dangerous and thereby leads to increases in youth acceptance and use of marijuana – a proposition we henceforth refer to as the "signaling hypothesis" (DuPont & Voth, 1995). In this perspective decriminalization is viewed as a threat to public health (American Academy of Pediatrics, 2004; DuPont & Voth, 1995; Joffe & Yancy, 2004; Svrakic et al., 2012) because it is associated with a host of negative health outcomes that will be expected to increase as marijuana prevalence increases (Gordon, Conley, & Gordon, 2013; Volkow, Baler, Compton, & Weiss, 2014). These outcomes include large airway inflammation, symptoms of bronchitis, increased airway resistance, lung hyperinflation (Lee & Hancox, 2011), lung cancer (Callaghan, Allebeck, & Sidorchuk, 2013), reduced educational attainment (Lynskey & Hall, 2000), lower earnings (Ringel, Ellickson & Collins, 2006), increased

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Table 1
Competing, predicted patterns of results for youth attitudes and use of marijuana after decriminalization.

Prediction	Change in youth marijuana acceptance specific to California after decriminalization	Change in youth marijuana prevalence specific to California after decriminalization
Decriminalization changes behavior		
Signalling effect	Increase	Increase
Effect, but not through signalling	None	Increase
No behavioral effect of decriminalization		
No effect	None	None
No effect on marijuana use	Increase	None

probability of progression to "harder" drug use (Lynskey et al., 2003) and loss of IQ points (Meier et al., 2012).

A contrasting view is that decriminalization is not a risk factor and marijuana acceptance and use among youth will remain unchanged across states that have decriminalized marijuana as compared to states that have not. Such a finding would support the case for decriminalization, which argues that adolescent marijuana use and attitudes are largely impervious to anti-marijuana laws (Joy, Watson, & Benson, 1999; MacCoun & Reuter, 2001). In this perspective, laws against personal marijuana use are viewed as expensive, ineffective, and unnecessarily detrimental to many young lives. For example, in the year 2012 U.S. arrests for marijuana possession outnumbered arrests for any other drug violation and led to more than 650,000 arrests, at great cost to local communities and individuals (Federal Bureau of Investigation, 2013).

The argument that decriminalization is not a risk factor for future increases in marijuana use among U.S. youth has been supported by a flurry of studies based on data from the 1970s and 1980s. In these years "decriminalization" sometimes refers to legislation to remove criminal sanctions for marijuana possession, which California removed in 1975, and presumably the passage of these laws would send a stronger pro-marijuana signal than the current 2010 California legislation. On the basis of analysis of 1975–1979 data from Monitoring the Future (Johnson, O'Malley, & Bachman, 1981) concluded that "Overall, the preponderance of the evidence which we have gathered and examined points to the conclusion that decriminalization has had virtually no effect either on the marijuana use or on related attitudes and beliefs about marijuana use among American young people." The lead author of this study delivered this conclusion in testimony to a U.S. Senate Subcommittee (Johnston January 16, 1980). Numerous studies based on U.S. data from the 1970s and 1980s further supported this conclusion (Maloff, 1981; Pacula, 1998; Single, Christie, & Ali, 2000; Suggs, 1981; Thies & Register, 1993), or concluded that decriminalization leads to only a small, transitory increase in youth marijuana use (Single, 1989).

Research on decriminalization and adolescent marijuana prevalence using more recent data is rarer – perhaps because the research question seemed to have been answered and closed – and suggests that analyses of decriminalization may warrant an update (Damrongplasit & Hsiao, 2009). Analysis of nationally representative data from the late 1980s onward supports the conclusion that decriminalization is associated with a higher likelihood of marijuana use, by about 8% (Saffer & Chaloupka, 1999) to 16% (Damrongplasit, Hsiao, & Zhao, 2010). Analysis of Monitoring the Future data from 1992 to 1994 led to the conclusion that "youths living in decriminalized states are significantly more likely to report currently using marijuana and may consume more frequently" (Chaloupka, Pacula, Farrelly, Johnston, & O'Malley, 1999). Further, analysis of states that have passed decriminalization laws indicates that not all decriminalization is the same, and it is the removal of criminal penalties for small levels of personal marijuana use – which the California legislation enacts – that is a key factor linked to increases in marijuana use among youth (Pacula, Chriqui, & King, 2004).

Predicted patterns of results

Different predictions about the influence of decriminalization lead to different expected patterns of results that we empirically test in this study and that are summarized in Table 1. Row 1 summarizes the key predictions of the "signaling hypothesis": after decriminalization (a) youth marijuana prevalence will increase as a result of (b) youth developing more accepting attitudes of regular marijuana use. Row 2 summarizes a process through which decriminalization leads to increases in youth marijuana prevalence, but not through an effect of signaling on youth attitudes. This could occur if youth increases in marijuana use are driven by factors such as increased availability or decreased fear of punishment, or if the marijuana attitudes under study are not the key ones linked to marijuana use. Rows 3 and 4 outline empirical predictions if decriminalization is not a risk factor for increases in youth marijuana prevalence. Row 3 summarizes the strongest evidence for lack of an effect: no increase in youth prevalence of marijuana and, as well, no increase in youth acceptance of marijuana. Finally, filling out all the possible combinations in the table, Row 4 summarizes a variant in which decriminalization increases youth acceptance of marijuana, but is not associated with an increase in youth marijuana prevalence.

Contribution

The present analysis contributes to the literature in five ways. First, to our knowledge it is the first detailed analysis of trends in marijuana prevalence and attitudes both before and after the 2010 California decriminalization legislation. This analysis is of substantial interest for policy and theory, given that decriminalization today may be related to changes in marijuana use in ways that have not been seen in the past. Second, the analysis can discern whether any higher prevalence of marijuana in California is newly emerged or pre-existing, because the data include measures of marijuana use in California and other U.S. states prior to the 2010 decriminalization legislation. Third, the large sample size allows analysis of the outcome of past 30-day marijuana use, which is sensitive to regular and chronic marijuana use. Fourth, the analysis includes information for multiple years after the enactment of the 2010 California legislation, and can therefore detect both sleeper effects that may take years to develop, as well as any immediate effects that turn out to be transitory. Finally, the analysis includes measures of key attitudes that are strongly linked to marijuana use, such as perceptions of risk of harm from marijuana use and personal disapproval of marijuana use (Bachman, Johnston, & O'Malley, 1998; Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2014).

Method

Data

Data come from the annual Monitoring the Future study, which since 1975 has used questionnaires administered in classrooms to survey nationally representative samples of American students