

Trends in Perceived Access to Marijuana Among Adolescents in the United States: 2002–2015

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ABSTRACT. Objective: There is concern that changes in marijuana-related policy and public opinion may lead to increased access to marijuana among young people in the United States. However, little research has been conducted on changes in youth's perceptions of marijuana access, and studies have yet to systematically examine trends in perceived access across key sociodemographic and externalizing behavioral subgroups. **Method:** Using population-based data collected between 2002 and 2015 as part of the National Survey on Drug Use and Health, we examined trends in perceived marijuana access among non-Hispanic White, African American, and Hispanic adolescents (ages 12–17, $n = 221,412$). Following the trend analysis method outlined by the Centers for Disease Control and Prevention, we conducted logistic regression analyses to test for secular trends. **Results:** Between 2002 and 2015, we observed a 27% overall reduction in the relative propor-

tion of adolescents ages 12–17—and a 42% reduction among those ages 12–14—reporting that it would be “very easy” to obtain marijuana. This pattern was uniformly observed among youth in all sociodemographic subgroups (i.e., across age, gender, race/ethnicity, household income) and among youth reporting involvement/no involvement in most measures of substance use (alcohol, marijuana) and delinquency (handgun carrying, attacks). However, perceived very easy access remained stable among youth reporting tobacco use and criminal justice system involvement. **Conclusions:** Despite the legalization of recreational and medical marijuana in some states, our findings suggest that, with the notable exception of adolescent tobacco users and juvenile offenders, perceptions that marijuana would be very easy to obtain are on the decline among American youth. (*J. Stud. Alcohol Drugs*, 78, 771–780, 2017)

THE PAST TWO DECADES have witnessed substantial change in policies and public opinion regarding the regulation, distribution, and use of marijuana in the United States. Beginning with California's Proposition 215 (Compassionate Use Act, 1996), which permitted the use of marijuana for medical purposes, a steady stream of states have implemented policies designed to remove marijuana from the sphere of the criminal justice system and begin to regulate its use and distribution (Ammerman et al., 2015). At present, 28 states and the District of Columbia have passed medical marijuana laws, more than a dozen states have passed laws decriminalizing the possession of small amounts of marijuana, and ballot measures allowing for the sale of marijuana for recreational use have passed in 8 states (Drug Policy Alliance, 2016). With more than half of American adults supporting legalization, it seems likely that this liberalizing trend will continue (Hall & Lynskey, 2016; Motel, 2015).

Meanwhile, there is concern that changes in marijuana-related policy and public opinion may influence the attitudes

and behaviors of American youth (Hall & Lynskey, 2016; Hall & Weier, 2015; Salas-Wright & Vaughn, 2016, 2017). To this end, a number of recent epidemiological trend studies have focused on examining potential shifts in marijuana-related outcomes among adolescents in the United States. Despite the aforementioned concerns, the best available data seem to indicate that marijuana use is gradually declining among the general population of American youth. Indeed, evidence from multiple, large-scale national epidemiological studies—Monitoring the Future (MTF), the National Survey on Drug Use and Health (NSDUH), and the Youth Risk Behavior Surveillance System (YRBSS)—indicates that marijuana use among American adolescents has steadily declined over the past 10–15 years (Johnson et al., 2015; Johnston et al., 2014; Salas-Wright et al., 2015). That said, recent evidence also suggests that racial/ethnic differences may exist, with decreases observed among non-Hispanic White youth but not among African American and Hispanic adolescents (Johnson et al., 2015; Lanza et al., 2015). Nonetheless, the overall downward trend in adolescent marijuana use is in keeping with findings from recent epidemiological trend studies examining a wider range of substance use and health-risk behaviors among American youth (Kann et al., 2016; Salas-Wright et al., 2017a; Vaughn et al., 2016b). Recent studies have also examined marijuana-specific risk and protective factors, but results from these investigations are mixed, with some evidence pointing to an

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increase in protective views (Salas-Wright et al., 2015) and others showing declines in protection (Fleming et al., 2016; Maxwell & Mendelson, 2016; Substance Abuse and Mental Health Services Administration [SAMHSA], 2013).

Although a number of recent studies have focused on trends in marijuana use and marijuana-specific factors, little research has been dedicated to examining trends in perceived marijuana access. Perceived access is a timely and crucially important construct for several reasons. First, it is reasonable to surmise that, as a consequence of the recent liberalizing changes in marijuana policy, marijuana may now be more accessible to young people than it was even just a few years earlier. Whereas some evidence suggests that perceived marijuana access may have decreased in recent years (Fleming et al., 2016; Johnston et al., 2014), no prior studies have systematically examined trends in access while taking into account differences among various sociodemographic and externalizing behavioral subgroups. Second, evidence has clearly established that young people reporting perceptions of easy access to marijuana are at markedly greater risk of actually using the drug (Fleming et al., 2016; Vaughn et al., 2015). For instance, Keyes and colleagues (2011) found, in a study using MTF data from 1976 to 2007, that the likelihood of marijuana use among adolescents reporting “very easy” access to marijuana was more than five times greater than among those reporting it would be “probably impossible” to obtain marijuana. Other studies suggest that perceived ease of access to marijuana may be a particularly salient risk factor among younger adolescents, and they underscore the importance of a developmentally specified approach in terms of understanding perceived ease of access and marijuana use (Alter et al., 2006). At present, however, researchers have yet to conduct an in-depth examination of the relationship between perceived marijuana access and key sociodemographic, psychosocial, and behavioral risk factors.

Our research is guided not only by broader policy changes affecting the social and cultural norms surrounding marijuana access, but also by theoretical views regarding the importance of the externalizing spectrum of behavior (Krueger et al., 2002; Vaughn et al., 2014) and ecodevelopmental theory (Szapocznik & Coatsworth, 1999). From the vantage point of the externalizing spectrum, we expect reported access to marijuana to be greater among youth who are also higher in externalizing behaviors generally. As such, we expect that substance use, delinquency, and criminal justice system involvement would be important behavioral correlates of marijuana access. Ecodevelopmental theory is used to identify and organize key risk and protective factors related to substance use in the intrapersonal (i.e., risk propensity, religiosity, drug use views) and ecodevelopmental domains (i.e., parental warmth/control and conflict, school engagement and marijuana-related behaviors of school peers) (Prado et al., 2009).

Present study

The present study aimed to address the aforementioned gaps by using data from a population-based study (i.e., NSDUH) of adolescents ages 12–17 in the United States between 2002 and 2015. Specifically, we examined trends in perceived marijuana access among adolescents in general and across key sociodemographic (i.e., age, gender, race/ethnicity, household income) and externalizing behavioral (i.e., substance use, antisocial behavior, criminal justice system involvement) subgroups. In addition, we examined a wide array of sociodemographic, intrapersonal and ecodevelopmental, and behavioral correlates of marijuana access among youth. We expected that variables occurring along the externalizing spectrum of behavior would be associated with greater risk of perceived marijuana access and that risk and protective factors known to be related to substance use would be similarly related to perceived access to marijuana.

Method

Sample and procedures

This study examines public-use data collected between 2002 and 2015 as part of the NSDUH. The NSDUH uses multistage area probability sampling methods to select a representative sample of the U.S. civilian, non-institutionalized population ages 12 years or older for participation in the study. Multistage sampling designs are commonly used when attempting to provide nationally representative estimates. With respect to the NSDUH, all 50 states and the District of Columbia were used. Participants include household residents; residents of shelters, rooming houses, and group homes; and civilians residing on military bases.

NSDUH study participants were interviewed in private at their places of residence. Potential participants were assured that their names would not be recorded and that their responses would be kept strictly confidential. The NSDUH interview uses a computer-assisted interviewing (CAI) methodology to increase the likelihood of valid respondent reports of illicit drug use behaviors (Turner et al., 1998). CAI methodologies provide the respondent with a highly private and confidential means of responding to questions of a sensitive nature. Additional information on the NSDUH procedures is available elsewhere (U.S. Department of Health and Human Services, 2016), as is information on the demographic and behavioral risk characteristics of youth (Center for Behavioral Health Statistics and Quality, 2016; Vaughn et al., 2016a). Since 2002, a total of 778,108 respondents have completed the NSDUH survey; however, the current study restricted analyses to non-Hispanic White, African American, and Hispanic adolescent respondents

between ages 12 and 17 ($n = 220,693$) to ensure stable prevalence estimates for stratified trend analyses.

Measures

Marijuana access. We examined perceived ease of access to marijuana on the basis of the following question: “How difficult or easy would it be for you to get some marijuana, if you wanted some?” The response options were 1 (*probably impossible*), 2 (*very difficult*), 3 (*fairly difficult*), 4 (*fairly easy*), and 5 (*very easy*).

Intrapersonal factors. We examined four intrapersonal factors: risk propensity, religiosity, marijuana-specific attitudes, and marijuana risk perception. Risk propensity was based on two items measuring adolescent enjoyment of risky behavior. These items include: “How often do you like to test yourself by doing something a little risky?” and “How often do you get a real kick out of doing things that are a little dangerous?” Consistent with prior research (DeLisi et al., 2015a), youth who responded *sometimes/always* were coded as 1 and youth who responded *never/seldom* were coded as 0. These two variables were, in turn, summed and treated as an ordinal (1 = *low*, 4 = *high*; $\alpha = .74$) variable in all statistical analyses. Religiosity was examined on the basis of a four-item scale (1 = *low*, 4 = *high*; $\alpha = .72$) tapping both public religious engagement (i.e., religious service attendance, participation in religious groups) and private religious importance (i.e., importance and influence of religious beliefs). These public and private religiosity questions have been widely used and are described in greater detail elsewhere (Salas-Wright et al., 2014a, 2014b). Marijuana-specific attitudes were assessed using the following prompt: “How do you feel about someone your age using marijuana once a month or more?” with response options ranging from 0 (*neither approve nor disapprove*) to 2 (*strongly disapprove*). Marijuana risk perception was based on the following prompt: “How much do people risk harming themselves physically and in other ways when they smoke marijuana once a month?” with response options ranging from 1 (*no risk*) to 4 (*great risk*).

Parental factors. We examined two parental factors: parental affirmation and parental conflict. Parental affirmation was based on a two-item index (1 = *low*, 4 = *high*; $\alpha = .86$) comprising variables reflecting youth perceptions of parental support and encouragement. These items include the following: “During the past 12 months, how often did your parents let you know when you’d done a good job?” and “During the past 12 months, how often did your parents tell you they were proud of you for something you had done?” Parental limit setting was based on the following prompt: “During the past 12 months, how often did your parents limit the amount of time you went out with friends on school nights?” For the aforementioned parenting items, response options included 1 (*never*), 2 (*seldom*), 3

(*sometimes*), and 4 (*always*). Parental conflict was based on the following question: “During the past 12 months, how many times have you argued or had a fight with at least one of your parents?” Youth reporting 10 or more conflicts were coded as 1 and all other youth coded as 0.

School-related factors. We examined adolescent self-reports of academic engagement, academic difficulty, and perceived school-peer marijuana use. Academic engagement was based on a five-item scale (1 = *low*, 5 = *high*; $\alpha = .77$) measuring perceived importance and interest in learning and school activities. Sample items include: “During the past 12 months, how often did you feel that the schoolwork you were assigned to do was meaningful and important?” and “How important do you think the things you have learned in school during the past 12 months are going to be for you later in life?” Numerous NSDUH-based studies have used these variables and describe them in greater detail (Salas-Wright et al., 2014a; Vaughn et al., 2013). To measure grades/academic difficulty, youth were asked to report their average grades for the last semester or grading period that they completed. Response options included 1 (*A average*), 2 (*B average*), 3 (*C average*), and 4 (*D average or lower*), with youth reporting a C average or higher coded as 0 and those reporting a D average or lower coded as 1. Perceived school-peer marijuana use was based on the following question: “How many of the students in your grade at school would you say use marijuana or hashish?” with response options ranging from 1 (*none of them*) to 3 (*most/all of them*).

Externalizing behavioral correlates. In terms of substance use, we examined past-12-month use (0 = *no use*, 1 = *one or more instances of use*) of tobacco, alcohol, and marijuana/hashish. Delinquency was examined using self-reports of past-year involvement in a fight at school/work and group fighting (0 = *no involvement*, 1 = *one or more instances of involvement*) as well as youth reports of having been arrested and booked for a criminal offense in the past year (0 = *no arrests*, 1 = *one or more arrests*).

Sociodemographic factors. Sociodemographic factors included age (12–14 years, 15–17 years), gender (male, female), race/ethnicity (non-Hispanic White, African American, Hispanic), and annual household income (<\$20,000; \$20,000–\$39,999; \$40,000–\$74,999; \$75,000 or higher).

Statistical analyses

The statistical analyses were conducted in three phases. First, we examined the annual prevalence of perceived marijuana access—presenting the proportion of youth selecting each of the five response options—among adolescents ages 12–17 between 2002 and 2015 (Figure 1). Next, we examined trend data for each of the response options that were found to have significantly changed over the course of the study (i.e., *very easy* and *probably*

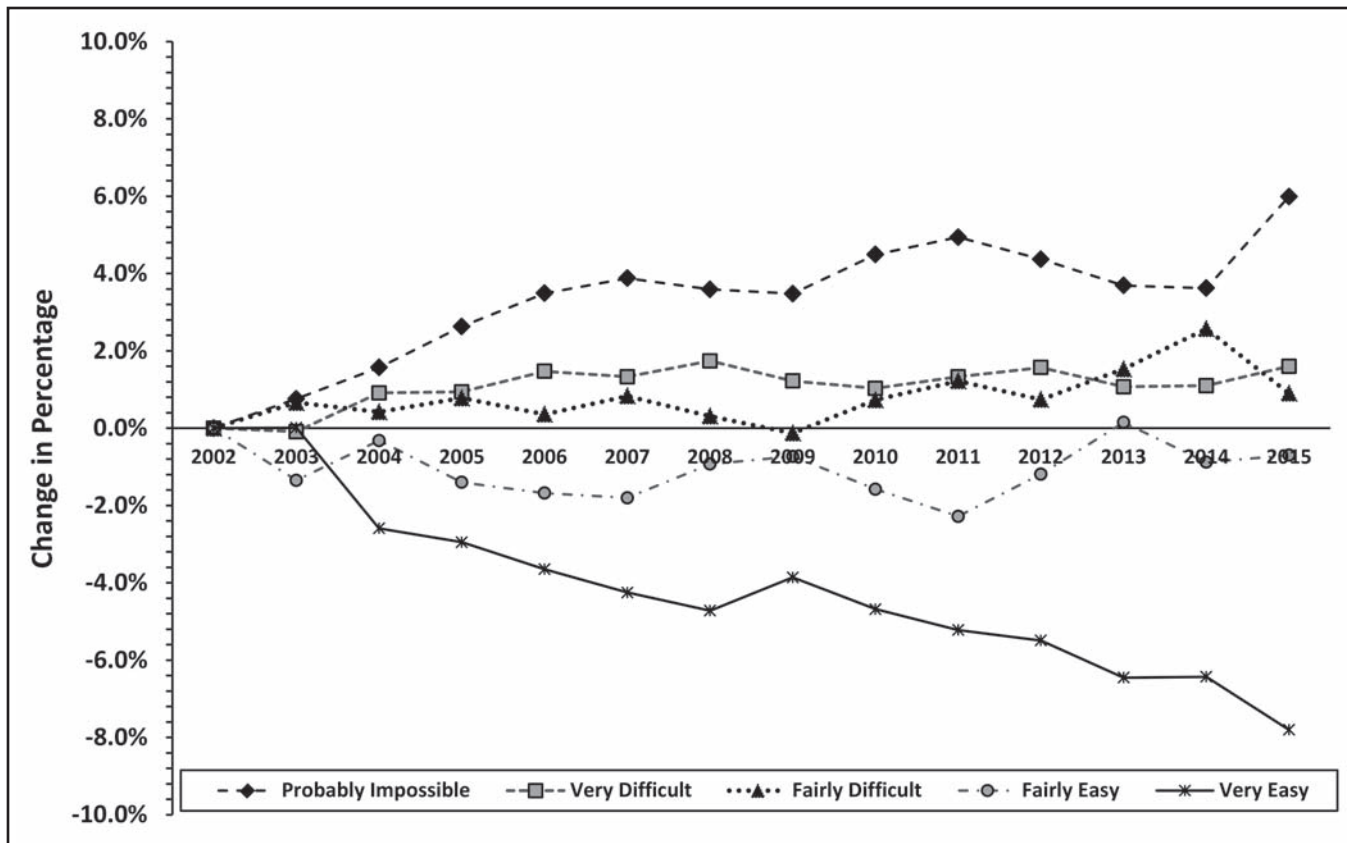


FIGURE 1. Percentage change in perceived marijuana accessibility among adolescents between 2002 and 2015

impossible) for the full sample of youth as well as among key demographic and externalizing behavioral subgroups. Specifically, for perceived very easy access, we present survey-adjusted prevalence estimates (Figure 2) and odds ratios (ORs) from logistic regression analyses used to examine the significance of trend changes (Table 1). Trend results for the proportion of youth reporting it would be “probably impossible” to obtain marijuana are summarized in the body of the text.

For tests of trend, survey year was included—along with age, gender, race/ethnicity, and family income—as a continuous independent variable in logistic regression models predicting marijuana access. This approach follows the trend analysis method outlined by the Centers for Disease Control and Prevention (2016) and is consistent with highly cited studies (Ogden et al., 2006) and recent NSDUH-based trend studies (Salas-Wright et al., 2015; Vaughn et al., 2016a, 2016b). Last, we used logistic regression analyses to examine the associations between various sociodemographic, intrapersonal and ecodevelopmental, and behavioral correlates and “very easy” access to marijuana, controlling for sociodemographic characteristics (Table 2). All estimates were weighted to abide by the Substance Abuse and Mental Health Data Archive’s 2014 guidelines, accounting for the

NSDUH’s stratified cluster sampling design (SAMHSA, 2014).

Results

Trends in perceived marijuana accessibility among adolescents

Figure 1 displays the percentage change (from 2002) in the proportion of youth reporting varying degrees of perceived marijuana access over the course of the study. Between 2002 and 2015, the proportion of youth reporting perceived very easy access to marijuana decreased significantly (adjusted odds ratio [AOR] = 0.968, 95% CI [0.964, 0.971]) from a high of 30.1% in 2002 to a low of 22.1% in 2015. During the same period, the proportion of adolescents reporting that it would be probably impossible to obtain marijuana increased significantly (AOR = 1.028, 95% CI [1.023, 1.032]) from 17.6% in 2002 to 24.1% in 2015. Stated in relative terms, we see that, between 2002 and 2015, the proportion of adolescents reporting perceived very easy access to marijuana decreased by 27%. Larger proportional decreases were observed among younger adolescents (ages 12–14; 42%). Concurrently, we observed a 37% increase

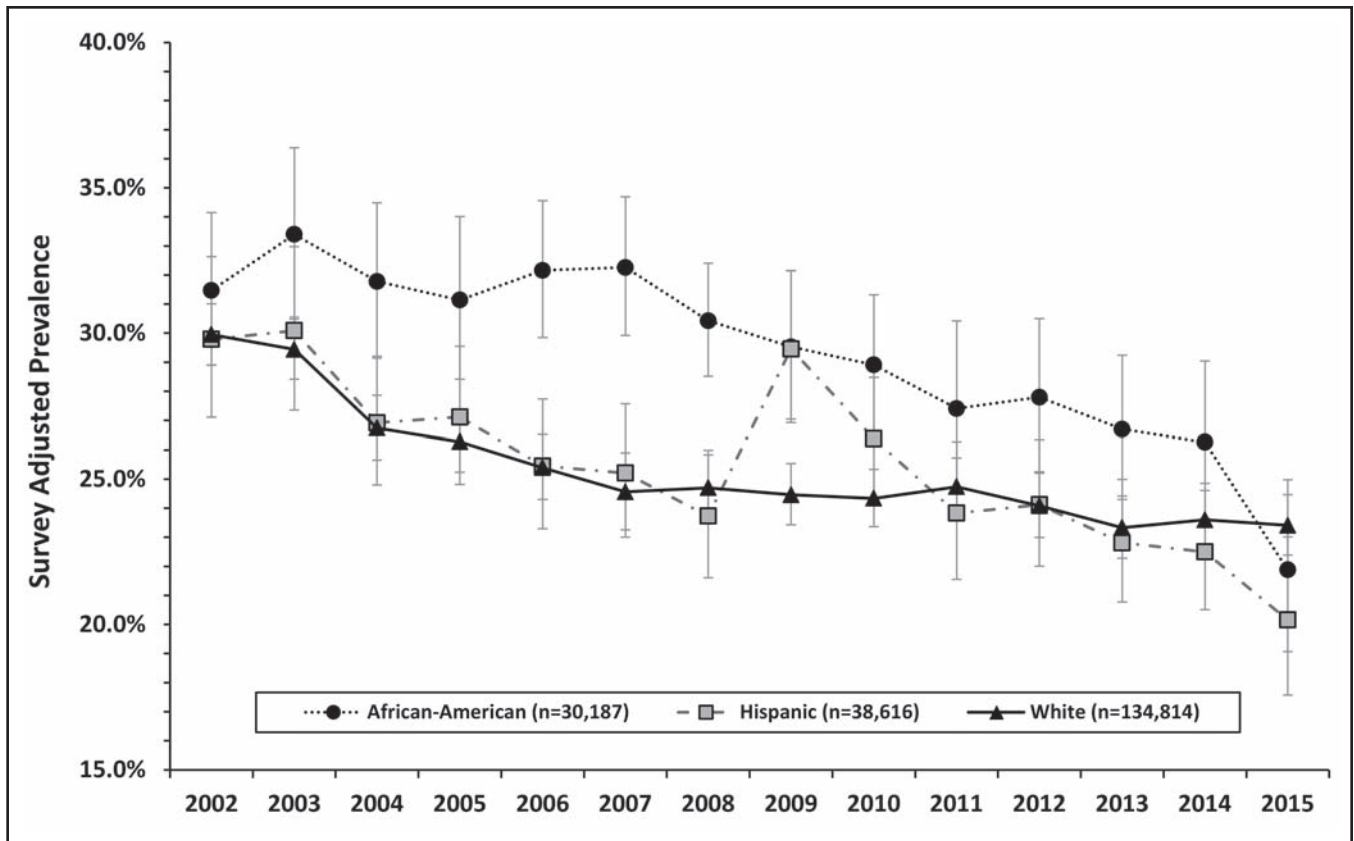


FIGURE 2. Trends in perceived very easy access to marijuana among adolescents by race/ethnicity, 2002–2015

in the relative proportion of youth reporting it would be probably impossible to access marijuana. No significant trend differences were observed for the proportion of youth reporting that it would be fairly easy, fairly difficult, or very difficult to obtain marijuana.

As shown in Table 1, tests of trend revealed that decreases in perceived very easy access were significant for the full sample of adolescents (ages 12–17) and among younger (ages 12–14) and older (ages 15–17) adolescents. Moreover, decreases were found to be universally significant—even when stratified by age subgroup—for all gender, racial/ethnic, and household income subgroups. Figure 2 displays the prevalence estimates among non-Hispanic White, African American, and Hispanic adolescents. An examination of the 95% confidence intervals (CIs) reveals that, although the proportion of African American youth reporting perceived very easy access was at times greater than that of non-Hispanic White (i.e., 2003–2010, 2012–2013) and Hispanic (i.e., 2004, 2006–2008) youth, no racial/ethnic differences in prevalence were observed during the most recent survey years (i.e., 2014–2015). Supplementary analyses (not shown) also found that increases in the proportion of youth reporting it would be probably impossible to obtain marijuana were significant for the full sample (AOR = 1.028, 95% CI [1.023, 1.032]) and among youth from all demographic

subgroups examined (i.e., age groups, gender, race/ethnicity, household income).

We also examined trends in perceived very easy access to marijuana across a number of key externalizing behavioral subgroups. We observed a uniform pattern in which the proportion of youth reporting perceived very easy access to marijuana decreased significantly among those reporting no recent substance use, delinquent behavior, or criminal justice system involvement. Declines were also observed among adolescents reporting past-year alcohol (AOR = 0.988, 95% CI [0.983, 0.993]) and marijuana use (AOR = 0.983, 95% CI [0.974, 0.991]), handgun carrying (AOR = 0.945, 95% CI [0.928, 0.963]), and violent attacks (AOR = 0.963, 95% CI [0.951, 0.975]). No declines in perceived very easy access were found for youth reporting tobacco use or criminal justice system involvement.

Intrapersonal and ecodevelopmental correlates of marijuana access

Results from the logistic regression analysis are presented in Table 2. With respect to intrapersonal factors, youth reporting perceived very easy access reported elevated levels of risk propensity (AOR = 1.991, 95% CI [1.956, 2.026])

TABLE 1. Test of significance for trends in adolescent reports of very easy access to marijuana: NSDUH 2002–2015

| Variable | Full sample (Ages 12–17) | | Younger adolescents (Ages 12–14) | | Older adolescents (Ages 15–17) | |
|------------------------------------|-----------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------------|-----------------------|
| | AOR | [95% CI] | AOR | [95% CI] | AOR | [95% CI] |
| Full sample | 0.968 | [0.964, 0.971] | 0.960 | [0.953, 0.967] | 0.971 | [0.967, 0.975] |
| Demographic subgroups | | | | | | |
| Gender | | | | | | |
| Male | 0.967 | [0.962, 0.972] | 0.961 | [0.952, 0.971] | 0.969 | [0.963, 0.975] |
| Female | 0.968 | [0.964, 0.973] | 0.959 | [0.950, 0.969] | 0.972 | [0.967, 0.978] |
| Race/ethnicity | | | | | | |
| White | 0.972 | [0.968, 0.975] | 0.964 | [0.956, 0.972] | 0.974 | [0.970, 0.979] |
| African American | 0.959 | [0.950, 0.968] | 0.954 | [0.939, 0.969] | 0.962 | [0.951, 0.972] |
| Hispanic | 0.963 | [0.954, 0.972] | 0.957 | [0.941, 0.972] | 0.966 | [0.956, 0.977] |
| Household income | | | | | | |
| < \$20,000 | 0.964 | [0.955, 0.973] | 0.957 | [0.942, 0.972] | 0.968 | [0.957, 0.980] |
| \$20,000–\$39,999 | 0.971 | [0.963, 0.978] | 0.960 | [0.947, 0.973] | 0.975 | [0.967, 0.984] |
| \$40,000–\$74,999 | 0.968 | [0.962, 0.973] | 0.961 | [0.951, 0.971] | 0.970 | [0.963, 0.978] |
| ≥\$75,000 | 0.967 | [0.962, 0.973] | 0.963 | [0.950, 0.977] | 0.969 | [0.962, 0.976] |
| Externalizing behavioral subgroups | | | | | | |
| Substance use | | | | | | |
| Alcohol | | | | | | |
| No | 0.975 | [0.970, 0.980] | 0.969 | [0.960, 0.977] | 0.979 | [0.972, 0.985] |
| Yes | 0.988 | [0.983, 0.993] | 0.989 | [0.976, 1.002] | 0.988 | [0.982, 0.993] |
| Tobacco | | | | | | |
| No | 0.974 | [0.970, 0.979] | 0.968 | [0.960, 0.976] | 0.977 | [0.972, 0.983] |
| Yes | 0.997 | [0.991, 1.004] | 0.997 | [0.981, 1.012] | 0.997 | [0.990, 1.004] |
| Marijuana | | | | | | |
| No | 0.964 | [0.960, 0.968] | 0.959 | [0.951, 0.966] | 0.966 | [0.961, 0.971] |
| Yes | 0.983 | [0.974, 0.991] | 0.977 | [0.958, 0.997] | 0.984 | [0.975, 0.992] |
| Delinquency | | | | | | |
| Carry handgun | | | | | | |
| No | 0.968 | [0.965, 0.972] | 0.962 | [0.955, 0.969] | 0.971 | [0.967, 0.975] |
| Yes | 0.945 | [0.928, 0.963] | 0.922 | [0.896, 0.950] | 0.959 | [0.938, 0.980] |
| Violent attack | | | | | | |
| No | 0.971 | [0.967, 0.975] | 0.964 | [0.957, 0.972] | 0.974 | [0.969, 0.978] |
| Yes | 0.963 | [0.951, 0.975] | 0.946 | [0.928, 0.965] | 0.975 | [0.959, 0.992] |
| Arrested and booked | | | | | | |
| No | 0.970 | [0.967, 0.974] | 0.963 | [0.956, 0.970] | 0.973 | [0.969, 0.977] |
| Yes | 0.985 | [0.968, 1.003] | 0.972 | [0.936, 1.010] | 0.990 | [0.971, 1.008] |

Notes: Odds ratios (AOR) adjusted for age, gender, race/ethnicity, annual household income, and urbanicity. AORs in **bold** are significant. NSDUH = National Survey on Drug Use and Health; CI = confidence interval.

and lower levels of religiosity (AOR = 0.686, 95% CI [0.675, 0.698]). Perceived very easy access to marijuana was also associated with the decreased likelihood of youth reporting greater disapproval and greater perceived risk of marijuana use. In terms of ecodevelopmental factors, we examined several variables in the domains of parenting and school experiences. In the domain of parenting, youth perceptions of very easy access to marijuana were associated with lower levels of parental affirmation/warmth (AOR = 0.740, 95% CI [0.727, 0.752]) and limit setting/control (AOR = 0.726, 95% CI [0.711, 0.742]), and the increased likelihood of recurrent child–parent conflict (AOR = 1.985, 95% CI [1.926, 2.045]). In the domain of school-related factors, youth reporting perceived very easy access to marijuana reported lower levels of academic engagement (AOR = 0.510, 95% CI [0.493, 0.527]) and were more likely to report poor grades/academic difficulty (AOR = 1.908, 95% CI [1.786, 2.037]) and perceived peer marijuana use. Supplementary analyses

also indicated that perceived very easy access to marijuana was robustly associated with the increased likelihood of past-year substance use (alcohol: AOR = 3.850, 95% CI [3.734, 3.967]; tobacco: AOR = 3.817, 95% CI [3.700, 3.937]; marijuana: AOR = 5.338, 95% CI [5.142, 5.542]) and delinquency (handgun carrying: AOR = 2.373, 95% CI [2.221, 2.534]; violent attack: AOR = 2.751, 95% CI [2.617, 2.892]; criminal justice system involvement: AOR = 3.565, 95% CI [3.314, 3.835]).

Sensitivity check

In the present study, we made use of the broadest window of data available as part of the NSDUH (i.e., 2002–2015). Of note, however, there is concern that changes in the 2015 NSDUH have led to some actual or potential breaks in the comparability of variables from prior years (Center for Behavioral Health Statistics and Quality, 2016). In particular,

TABLE 2. Intrapersonal and ecodevelopmental correlates of perceived very easy access to marijuana among adolescents

| Variable | Adolescents ages 12–17 | | AOR | [95% CI] |
|---------------------------------------|--|-------------------|---------------|-------------------------|
| | Perceived very easy access to marijuana? | | | |
| | No % [95% CI] | Yes % [95% CI] | | |
| Sociodemographic factors | | | | |
| Age, in years | | | | |
| 12–14 (ref.) | 88.3 [88.0, 88.5] | 11.7 [11.5, 12.0] | 1.000 | – |
| 15–17 | 60.9 [60.5, 61.3] | 39.1 [38.7, 39.5] | 4.896 | [4.754, 5.042] |
| Gender | | | | |
| Male (ref.) | 74.5 [74.1, 74.9] | 25.5 [25.1, 25.9] | 1.000 | – |
| Female | 73.4 [73.0, 73.8] | 26.6 [26.2, 27.0] | 1.059 | [1.029, 1.091] |
| Race/ethnicity | | | | |
| White (ref.) | 74.6 [74.2, 74.9] | 25.4 [25.1, 25.8] | 1.000 | – |
| African American | 70.5 [69.8, 71.2] | 29.5 [28.8, 30.2] | 1.248 | [1.197, 1.301] |
| Hispanic | 74.8 [74.2, 75.3] | 25.2 [24.7, 25.8] | 1.034 | [0.990, 1.079] |
| Household income | | | | |
| <\$20,000 | 73.8 [73.2, 74.4] | 26.2 [25.6, 26.8] | 1.018 | [0.971, 1.067] |
| \$20,000–\$39,999 | 72.6 [72.0, 73.2] | 27.4 [26.8, 28.0] | 1.087 | [1.042, 1.134] |
| \$40,000–\$74,999 | 74.2 [73.7, 74.7] | 35.8 [25.3, 26.3] | 1.001 | [0.967, 1.036] |
| ≥\$75,000 (ref.) | 74.7 [74.2, 75.1] | 25.3 [24.9, 25.8] | 1.000 | – |
| Intrapersonal factors | | | | |
| Risk propensity (index 1–4) | – | – | 1.991 | [1.956, 2.026] |
| Religiosity (index 1–4) | – | – | 0.686 | [0.675, 0.698] |
| Attitude regarding marijuana use | | | | |
| Neither approve nor disapprove (ref.) | 46.0 [45.4, 46.7] | 54.0 [53.4, 54.6] | 1.000 | – |
| Somewhat disapprove | 66.8 [66.1, 67.5] | 33.2 [32.5, 33.9] | 0.448 | [0.430, 0.466] |
| Strongly disapprove | 84.5 [84.2, 84.8] | 15.5 [15.2, 15.8] | 0.205 | [0.198, 0.213] |
| Perceived risk of using marijuana | | | | |
| No/slight risk (ref.) | 59.8 [59.4, 60.3] | 40.2 [39.7, 40.6] | 1.000 | – |
| Moderate risk | 81.1 [80.7, 81.4] | 19.0 [18.6, 19.3] | 0.384 | [0.371, 0.398] |
| Great risk | 84.5 [84.2, 84.9] | 15.5 [15.1, 15.8] | 0.318 | [0.307, 0.329] |
| Ecodevelopmental factors | | | | |
| Parental factors | | | | |
| Affirmation/warmth (index 1–4) | – | – | 0.740 | [0.727, 0.752] |
| Limit setting/control (index 1–4) | – | – | 0.726 | [0.711, 0.742] |
| Recurrent conflict | | | | |
| No | 81.2 [90.9, 81.5] | 18.8 [18.5, 19.1] | 1.000 | – |
| Yes (ref.) | 67.9 [67.6, 68.4] | 32.0 [31.6, 32.4] | 1.985 | [1.926, 2.045] |
| School-related factors | | | | |
| Academic engagement (index 1–5) | – | – | 0.510 | [0.493, 0.527] |
| Grades/academic difficulty | | | | |
| Passing | 73.4 [73.1, 73.7] | 26.6 [26.3, 26.9] | 1.908 | [1.786, 2.037] |
| Failing (i.e., D or lower) (ref.) | 58.8 [57.5, 60.1] | 41.2 [39.9, 42.5] | 1.000 | – |
| Perceived school-peer marijuana use | | | | |
| None (ref.) | 95.2 [84.9, 95.5] | 4.8 [4.5, 5.1] | 1.000 | – |
| A few | 78.4 [78.1, 78.8] | 21.6 [21.2, 21.9] | 3.912 | [3.634, 4.212] |
| Most/all | 40.2 [39.5, 40.9] | 59.8 [59.1, 60.5] | 18.928 | [17.469, 20.510] |

Notes: Odds ratios (AOR) adjusted for age, gender, race/ethnicity, annual household income, urbanicity, and year. AORs in bold are significant. CI = confidence interval; ref. = reference.

it is uncertain as to whether “changes seen in the risk and availability measures [including perceived marijuana access] are due to context effects or if these changes in perceptions reflect true changes in the population” (Ahrnsbrak et al., 2016, p. 10). As such, for all analyses reported in the present article, we ran supplementary analyses using only data from 2002–2014. We are confident in reporting findings using the 2015 data as no noteworthy changes in significance, directionality, or magnitude were identified in contrasting the findings for the 2002–2014 and 2002–2015 data.

Discussion

Our findings from the present study suggest that, despite liberalizing changes in marijuana-related policies and public opinion, recent years have seen significant declines in the proportion of American youth reporting perceived very easy access to marijuana. That is, between 2002 and 2015, we observed a 27% overall reduction in the relative proportion of adolescents ages 12–17—and a 42% reduction among youth ages 12–14—reporting that it would be very easy

to obtain marijuana, if desired. Notably, the proportion of adolescents who felt it would be probably impossible to obtain marijuana increased significantly during the same period. This pattern was uniformly observed among youth in all sociodemographic subgroups examined. The data from the present study do not allow us to assess why perceived very easy access is declining; however, it may be that unmeasured factors—such as changes in illegal drug markets or strong diversion efforts—are contributing to the observed changes.

The findings described above suggest that the proportion of youth reporting very easy access to marijuana has meaningfully declined. However, one important caveat should be highlighted. Specifically, we found that—despite declines among youth in many demographic and externalizing subgroups—perceived access remained stable among youth reporting past-year tobacco use and criminal justice system involvement. These findings are noteworthy as they suggest that, whereas youth in general are less likely to report perceived very easy access to marijuana, perceived access has remained stable among youth in several high-risk subgroups. Of note, this finding is in keeping with recent studies highlighting the clustering of psychosocial and behavioral risk among youth with substance use and behavior problems (DeLisi et al., 2015a; Salas-Wright et al., 2014a, 2016a, 2016b; Shook et al., 2013; Vaughn et al., 2016c).

In addition to trend data, we also examined the intrapersonal, ecodevelopmental, and behavioral correlates of marijuana access. Our findings indicate that perceived very easy access is associated not only with greater risk of adolescent marijuana use, but also a number of salient risk and protective factors. Specifically, we found that—controlling for age, gender, race/ethnicity, and household income—adolescents reporting very easy access to marijuana were substantially more likely to report elevated levels of intrapersonal, parental, and school-related risk. This is noteworthy as research has made it clear that the aforementioned psychosocial factors are robustly linked with substance use and health-risk behavior during adolescence (Córdova et al., 2016; de Wit, 2009; Salas-Wright et al., 2012; Vaughn et al., 2013). This link is also consistent with our finding that perceived very easy access to marijuana is strongly associated with generalized risk exemplified by the increased likelihood of tobacco, alcohol, and marijuana use, and involvement in externalizing behavior.

Study limitations

Our findings should be interpreted in light of several limitations. First, all variables used in the present analysis were derived exclusively from self-report. As such, it is certainly possible that some youth may have been influenced by social desirability. Second, although we

examined an array of sociodemographic, intrapersonal and ecodevelopmental, and behavioral correlates of perceived marijuana access, the NSDUH does not include contextual and situational variables that likely would help us understand the precise nature of youth's marijuana access. For instance, we are unable to discern whether youth might access marijuana from a friend or family member, or whether marijuana might originate from a dispensary or from an illicit drug market. The NSDUH is also, with the exception of perceived peer marijuana use, quite limited in terms of the measurement of relevant peer-related factors. Last, the publicly available NSDUH does not allow researchers to examine state-level differences among survey respondents. This is, of course, an important limitation because of state-level differences in marijuana policy across the United States.

Conclusions

In recent years, we have seen increased interest in examining trends in marijuana use and marijuana-specific risk and protective factors among adolescents in the United States. Findings from the present study suggest that—despite important changes related to the medicalization, decriminalization, and legalization of marijuana—there has been a steady decline in the proportion of American adolescents reporting that they feel it would be very easy to obtain marijuana. Notably, we found this to be the case among younger and older, male and female, and African American, Hispanic, and non-Hispanic White youth as well as youth across the spectrum of family income. Although we observed declines among youth independent of involvement in most externalizing behaviors, perceptions of very easy marijuana access were stable among adolescents reporting past-year tobacco use and criminal justice system involvement. Overall, study findings suggest that, with the notable exception of adolescent smokers and juvenile offenders, perceptions that marijuana would be very easy to obtain are on the decline.

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