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Tobacco and Marijuana Initiation Among African American and White Young Adults

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Abstract

Introduction—African American youth use marijuana at similar rates and tobacco at lower rates compared with white youth; however, in adulthood, tobacco use is similar. Tobacco and marijuana use are closely associated; differing initiation patterns may contribute to observed racial differences in tobacco prevalence by age. Therefore, it is important to assess tobacco and marijuana initiation patterns by race.

Methods—Data were obtained from 56,555 adults aged 18–25 who completed the 2005–2012 National Survey on Drug Use and Health. The analysis was restricted to those who reported ever use of marijuana and combustible tobacco (cigarettes and/or cigars). Three mutually exclusive categories of initiation patterns were evaluated: use of marijuana before tobacco; marijuana and tobacco at the same age; and tobacco before marijuana. Multivariable regression models were used to assess changes over time and compare these outcomes by race while controlling for sociodemographics, risk perceptions, and current substance use.

Results—In 2005, 26.6% of African American and 14.3% of white young adults used marijuana before tobacco, compared with 41.5% of African American and 24.0% of white young adults in 2012 ($P < .001$). Overall, African American young adults had greater odds of using marijuana before tobacco (*AOR* = 1.79; 95% CI: 1.67, 1.91) compared with whites.

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Declaration of Interests

None declared.

Disclaimer

The findings and conclusions are the author's, not necessarily the CDC's.

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Conclusion—African American young adults were more likely than whites to use marijuana before tobacco and both groups were increasingly likely to use marijuana before tobacco over time. A greater understanding of how marijuana initiation interacts with tobacco initiation could inform more effective tobacco and marijuana use prevention efforts.

Implications—Among ever users of combustible tobacco and marijuana, greater proportions of African American young adults used marijuana before tobacco or at the same age than their white counterparts. Moreover, both African Americans and whites were more likely to use marijuana before tobacco in 2012 compared with 2005. Tobacco control policy may benefit from a broader understanding of the patterns of initiation to tobacco and marijuana use. Some public health interventions aimed at preventing and reducing combustible tobacco use among African American young adults may be strengthened by considering marijuana use.

Introduction

Tobacco and marijuana use are closely related behaviors among youth and young adults. Cross-sectional studies consistently find that use of one substance is associated with higher use of the other and cohort studies generally indicate that the use of one substance increases the likelihood of future use of the other.[1,2] African American and white youth report initiating marijuana use at similar ages and have similar marijuana prevalence[3–5]; however, African American youth report initiating cigarette use at later ages and have lower cigarette smoking prevalence than white youth.[6–9] Moreover, the lower cigarette smoking prevalence observed among African American youth does not persist into adulthood; African American adults have similar cigarette smoking prevalence compared with white adults.[10–12] One potential factor explaining why lower African American youth tobacco estimates do not persist into adulthood is tobacco and marijuana use initiation patterns.

Since the 1970s, researchers have suggested that tobacco use typically precedes marijuana use.[13] However, tobacco and marijuana use initiation patterns may be different among African American youth compared with white youth. Evidence suggests that African American youth may be more likely than youth of other races to first use marijuana before tobacco.[14–19] Human and animal studies have indicated that exposure to marijuana may increase the reinforcement value of nicotine and the risk of nicotine dependence; therefore it is important to consider nicotine dependence as a health outcome of marijuana use.[19–21] A systematic review by Ramo et al.[2] found several longitudinal studies indicating that marijuana use preceding tobacco use in youth is associated with greater odds of regular tobacco use and increased risk of developing nicotine dependence,[17–19,22] though not all studies found marijuana use to predict future tobacco use.[23–25] As states legalize medicinal and recreational marijuana use, the degree of risk youth and young adults associate with marijuana use could decrease.[26] It will be important to understand how initiation patterns to tobacco and marijuana use may change and how these patterns may differ by race.

Previous studies investigating racial differences in patterns of tobacco and marijuana use have been based on regional samples[14–17,27] or relied on nationally representative data that is more than 9 years old.[15,28] Further, the role of important characteristics such as gender, education, household income, and geographic location have not been well explored in the

literature. Some evidence suggests that substance specific risk perceptions,[29] drug availability,[30] gender,[31,32] income,[33] and neighborhood level factors[16] may be related to patterns of marijuana and tobacco initiation and use. Greater understanding of the sequence of initiation to tobacco and marijuana may increase our understanding of racial differences in smoking patterns and inform culturally appropriate interventions. This study assessed if sequence of initiation to tobacco and marijuana use differs between African American and white young adults in a recent nationally representative sample.

Methods

Data Source

The National Survey on Drug Use and Health (NSDUH) is a nationwide household based survey that collects data on drug use. An independent, multistage area probability sample produces nationally representative estimates for the civilian, non-institutionalized US population aged at least 12 years. Trained field interviewers visit each selected household. Participants complete the drug use portion of the survey in their homes through audio, computer-assisted self-interview methods, which increases privacy and improves self-report of sensitive behaviors. Detailed information about NSDUH is reported elsewhere.[4]

Study Population

NSDUH oversamples youth and young adults so that the sample is approximately equally distributed between respondents aged 12 to 17, 18 to 25, and at least 26 years. To be consistent with terminology used in this special supplement, African American was defined as participants who self-identified as non-Hispanic Black and no additional race. White was defined as participants who self-identified as non-Hispanic white and no additional race. The study population for this study included African American and white young adults aged 18 to 25 years who reported ever using marijuana and combustible tobacco (cigarettes or cigars), as well as the age of first marijuana and combustible tobacco use. NSDUH does not oversample African Americans.

Beginning in 2002, NSDUH participants received a cash incentive to complete the interview. Due to this and other methodological changes, data collected before 2002 are not comparable to data collected in 2002 and later. Age of initiation of blunt use (use of cigars with marijuana in them, as defined below) was not collected before 2005. Therefore, to ensure consistent marijuana initiation data, this analysis was restricted to data from 2005 to 2012. The total sample from 2005 to 2012 was 56 555 young adults; yearly sample size ranged from 922 (2007) to 1073 (2011) among African American young adults and 5641 (2012) to 6284 (2005) among white young adults. The average interview response rate was 75% during this period, and ranged from 73% (2012) to 76% (2005).

Measures

Ever and Current Use of Combustible Tobacco and Marijuana—This analysis focuses on cigarette and cigar use because these products represent the majority of tobacco use among young adults. Although assessed in NSDUH, pipe and smokeless tobacco use were not included because they do not represent major routes of initiation to tobacco use and

prevalence estimates can be unstable for African American young adults.[12] Each respondent was asked about ever use of cigarettes, cigars, marijuana, and blunts. Cigars were defined as including "big cigars, cigarillos, and even little cigars that look like cigarettes." Respondents who reported ever use of cigarettes and/or cigars were classified as ever combustible tobacco users. NSDUH measured marijuana and hashish use simultaneously. Blunts were described as follows: "sometimes people take some tobacco out of a cigar and replace it with marijuana. Sometimes this is called a blunt." Participants were then asked about "smoking cigars with marijuana in them". Respondents who reported ever use of marijuana, hashish, and/or blunts were classified as ever marijuana users. Current combustible tobacco users included those who reported past 30-day cigarette and/or cigar use. Current marijuana users included those who reported past 30-day marijuana, hashish, and/or blunt use.

Sequence of Initiation—Respondents were asked the age at which they first used each substance that they reported ever trying. For those who reported age of initiation for cigarettes and cigars, the youngest age of initiation was used in the analysis for combustible tobacco use. Similarly, if participants reported age of initiation for marijuana and blunt use, the youngest age of initiation was used for marijuana use. Age of first combustible tobacco use was compared with age of first marijuana use to create three mutually exclusive categories: (1) marijuana before tobacco, (2) tobacco and marijuana at the same age, and (3) tobacco before marijuana.

Tobacco and Marijuana Use Risk Perceptions—Respondents were asked their opinion about the effects of using certain drugs and other substances and were asked to indicate how much they thought people risk harming themselves physically and in other ways when they do each of the following activities: "Risk of smoking 1 or more packs of cigarettes per day" (dichotomized as no risk/slight risk and moderate risk/great risk) and "Risk of smoking marijuana once or twice a week" (dichotomized as no risk/slight risk and moderate risk/great risk).

Respondent Characteristics—Characteristics assessed in this analysis included: sex (male or female), education (less than high school, high school graduate, some college/college graduate), annual household income (less than $10 000, $10 000–$39 999, $40 000 and higher), and metro/nonmetro location status (large metro, small metro, nonmetro).

Data Analysis

Data were weighted during analysis to adjust for the differential probability of selection and response. Descriptive analyses, including point estimates and 95% confidence intervals, were calculated separately for African Americans and whites aged 18 to 25 years for each respondent characteristic. Three separate multivariable logistic regression models were constructed to calculate the odds of first using: (1) marijuana before tobacco compared with marijuana and tobacco at the same age or tobacco before marijuana, (2) marijuana and tobacco at the same age compared with tobacco before marijuana or marijuana before tobacco, and (3) tobacco before marijuana compared with marijuana before tobacco or marijuana and tobacco at the same age. These models were calculated separately for African American young adults and white young adults. Additionally, another multivariable

regression model was constructed to compare the sequence of initiation among African American young adults to white young adults. All models were adjusted for the following characteristics: survey year, sex, education, annual household income, metro/ nonmetro status, risk perceptions, current combustible tobacco use, and current marijuana use. For all comparisons, $P < .05$ was considered statistically significant. Data were analyzed using SAS-Callable SUDAAN version 11.0 (RTI International Research Triangle, NC) to account for complex sampling design and survey weights.

Results

Table 1 shows the proportion of African American and white young adults who initiated marijuana before tobacco, marijuana and tobacco at the same age, and tobacco before marijuana among those who had ever used both marijuana and tobacco.

Marijuana Before Tobacco

Comparing 2005 to 2012, among those who had ever used marijuana and tobacco, the proportion of African Americans (26.6% to 41.5%, $P < .001$) and whites (14.3% to 24.0%, $P < .001$) who used marijuana before tobacco significantly increased (Table 1). As shown in Table 2, African Americans had greater odds of using marijuana before tobacco in 2011 (Adjust odds ratio [*AOR*]: 1.63, 95% confidence interval [CI] = 1.27 to 2.10) and 2012 (*AOR*: 1.80, 95% CI = 1.44 to 2.24) compared with 2005. Whites had greater odds of using marijuana before tobacco in all years compared with 2005 and the odds of using marijuana before tobacco increased from 1.23 (95% CI = 1.06 to 1.42) in 2006 to 1.70 times (95% CI = 1.50 to 1.93) in 2012.

Among African Americans who had ever used marijuana and tobacco, females had lower odds of using marijuana before tobacco (*AOR*: 0.74, 95% CI = 0.64 to 0.85) compared with males. Those who associated moderate or great risk, compared with no or slight risk, with smoking marijuana once or twice a week had lower odds of using marijuana before tobacco (*AOR*: 0.79, 95% CI = 0.69 to 0.92). Those with some college education or a college degree had greater odds of using marijuana before tobacco (*AOR*: 1.17, 95% CI = 1.01 to 1.37) than those who did not graduate from high school. Current marijuana users had greater odds of using marijuana before tobacco (*AOR*: 1.31, 95% CI = 1.09 to 1.58) compared with those who were not current marijuana users. Among whites, females (*AOR*: 0.82; 95% CI = 0.78 to 0.87), those living in a nonmetro area (*AOR*: 0.79, 95% CI = 0.68 to 0.91), associating moderate or great risk with smoking marijuana once or twice a week (*AOR*: 0.73, 95% CI = 0.68 to 0.78), and current combustible tobacco user (*AOR*: 0.68, 95% CI = 0.63 to 0.72) had lower odds of using marijuana before tobacco. Current marijuana users (*AOR*: 1.36, 95% CI = 1.28 to 1.45) and those who associated moderate or great risk, compared with no or slight risk, with smoking one pack of cigarettes per day (*AOR*: 1.23, 95% CI = 1.07 to 1.41) had greater odds of using marijuana before tobacco.

Tobacco and Marijuana at the Same Age

Comparing 2005 to 2012, the proportion of young adults who used tobacco and marijuana for the first time at the same age did not change among African Americans (31.5% to

31.9%) but significantly increased among whites (25.3% to 29.6%, $P < .001$) (Table 1). Following multivariable adjustment, there was no change in the odds of using marijuana and tobacco at the same age among African Americans between 2005 and 2012 (Table 2). However, whites had greater odds of using tobacco and marijuana at the same age from 2010 to 2012 compared with 2005.

Among African Americans who had ever used marijuana and combustible tobacco, those with at least some college education (*AOR*: 0.74, 95% CI = 0.62 to 0.88) had lower odds of using tobacco and marijuana for the first time at the same age compared with those with less than a high school education. Whites who had at least some college education (*AOR*: 0.90, 95% CI = 0.84 to 0.96), an annual household income between $10 000 and $39 999 (*AOR*: 0.90, 95% CI = 0.84 to 0.96), lived in a small-metro (*AOR*: 0.93, 95% CI = 0.88 to 0.98) or nonmetro area (*AOR*: 0.76, 95% CI = 0.67 to 0.85), and perceived moderate or great risk to be associated with smoking marijuana once or twice a week (*AOR*: 0.93, 95% CI = 0.88 to 0.98) had lower odds of first using tobacco and marijuana at the same age. Whites who were current marijuana users had greater odds of first using tobacco and marijuana at the same age (*AOR*: 1.22, 95% CI = 1.14 to 1.30) compared with those who were not currently marijuana users.

Tobacco Before Marijuana

Comparing 2005 to 2012, the proportion of African Americans (41.9% to 26.6%, $P < .001$) and whites (60.4% to 46.4%, $P < .001$) who first used tobacco before marijuana significantly decreased (Table 1). Following multivariable adjustment, African Americans had lower odds of first using tobacco before marijuana in 2010, 2011, and 2012 compared with 2005 (Table 2). Whites had lower odds of first using tobacco before marijuana from 2008 to 2012 compared with 2005.

Compared with males, African American females (*AOR*: 1.35, 95% CI = 1.19 to 1.53) had greater odds of using tobacco before marijuana. Compared with those living in a large metro area, African Americans living in a small-metro area (*AOR*: 1.18, 95% CI = 1.05 to 1.32) or a nonmetro area (*AOR*: 1.41, 95% CI = 1.01 to 1.97) had greater odds of using tobacco before marijuana. Those who perceived moderate or great risk to be associated with smoking marijuana once or twice a week (*AOR*: 1.32, 95% CI = 1.17 to 1.48) also had greater odds of using tobacco before marijuana. African Americans who perceived moderate or great risk to be associated with smoking a pack or more of cigarettes a day (*AOR*: 0.71, 95% CI = 0.58 to 0.89) and current marijuana users (*AOR*: 0.69, 95% CI = 0.60 to 0.80) had lower odds of first using tobacco before marijuana. Among whites, females (*AOR*: 1.11, 95% CI = 1.06 to 1.16), those with at least some college (*AOR*: 1.12, 95% CI = 1.05 to 1.20), and having an annual household income between $10 000 and $39 999 (*AOR*: 1.10, 95% CI = 1.03 to 1.18) had greater odds of first using tobacco before marijuana. Living in a small metro (*AOR*: 1.09, 95% CI = 1.03 to 1.16) or nonmetro (*AOR*: 1.43, 95% CI = 1.29 to 1.59) area, perceiving moderate or great risk to be associated with smoking marijuana once or twice a week (*AOR*: 1.30, 95% CI = 1.23 to 1.36), and being a current combustible tobacco user (*AOR*: 1.35, 95% CI = 1.28 to 1.46) was also associated with greater odds of using tobacco before marijuana. Those who perceived moderate or great risk to be associated with smoking

a pack or more of cigarettes a day (*AOR*: 0.87, 95% CI = 0.79 to 0.96) and were current marijuana users (*AOR*: 0.69, 95% CI = 0.65 to 0.74) had lower odds of using tobacco before marijuana.

Race Comparison

As shown in Table 3, among ever users of combustible tobacco and marijuana, African American young adults were more likely than white young adults to first use marijuana before tobacco (*AOR*: 1.79, 95% CI = 1.67 to 1.91) after controlling for sex, education, income, risk perceptions, current use, and survey year. African American young adults were also more likely than their white counterparts to use marijuana and tobacco at the same age (*AOR*: 1.17, 95% CI = 1.09 to 1.27). African American young adults were less likely to use tobacco before marijuana (*AOR*: 0.55, 95% CI = 0.52 to 0.59).

Discussion

The findings from this nationally representative study of US young adults reveal that, among ever users of combustible tobacco and marijuana, African Americans are more likely than their white counterparts to use marijuana before tobacco. A greater proportion of African Americans than whites used marijuana before tobacco in all years. Among young adults who had ever used marijuana and combustible tobacco in 2012, nearly three-quarters (73.4%) of African Americans and over half (53.6%) of whites used marijuana before or at the same age as tobacco. Additionally, patterns of initiation to tobacco and marijuana use changed between 2005 and 2012 with use of marijuana before tobacco increasing in both groups and use of tobacco before marijuana decreasing. Use of tobacco and marijuana for the first time at the same age remained stable among African Americans but significantly increased among whites. Taken together, these findings indicate that the order of tobacco and marijuana first use changed among both African American and white young adults from 2005 to 2012 and that there were differences between groups. While these findings cannot explain why these changes occurred, understanding how marijuana initiation interacts with tobacco initiation and its potential impact on racial differences in smoking patterns could inform more effective prevention efforts.

Qualitative research provides insight into why African American youth and young adults might initiate marijuana use before tobacco use. In one small study based on in-depth interviews with 22 African American young adults, participants consistently reported that marijuana was the main reason that they initiated tobacco use.[34] Most participants reported that they started smoking tobacco primarily to enhance the effects of marijuana and many reported using tobacco when they did not have access to marijuana. This suggests that culturally appropriate interventions targeted at African American youth and young adults might consider marijuana use, or susceptibility to marijuana use, as an important risk factor for tobacco use.[34] There is an opportunity to address marijuana and tobacco use simultaneously by educating youth and young adults about the addictive potential of both tobacco and marijuana, and providing information on the relationship between marijuana use and nicotine dependence, particularly among African Americans.

African American and white young adult women were less likely to first use marijuana before tobacco and more likely to first use tobacco before marijuana compared with young adult men. In 2013, African American and white male high school students were more likely to use marijuana before age 13 years than females, but the magnitude of the difference between genders was smaller with regard to initiation of tobacco use before age 13.[31] Other studies have also indicated that adolescent and young adult males are more likely to use marijuana first, compared with their female counterparts.[32] More research is warranted in order to fully understand how gender influences patterns of initiation to tobacco and marijuana use.

African Americans with some college or a college degree were more likely to first use marijuana before tobacco compared with African Americans who did not have a high school degree; in contrast, whites with some college or a college degree were more likely than their counterparts without a high school degree to first use tobacco before marijuana. Though young adults may still be pursuing a higher level of education, this finding suggests that trajectories of educational attainment may have a differential impact on patterns of initiation to tobacco and marijuana use for African Americans and whites. While this finding is worthy of more investigation, it suggests that interventions to address tobacco and marijuana use among young adults may benefit from segmenting target populations by both race/ethnicity and education level.

Both African Americans and whites in small metro and non-metro areas were more likely to use tobacco before marijuana compared with those in large metros, suggesting a traditional pattern of tobacco use followed by marijuana use was more common among young adults in small metro areas. The reasons for this are not clear but differences in access to tobacco and marijuana and variations in community norms may contribute. A longitudinal study that followed 224 boys from age 10–12 years to age 22 years found that youth who lived in neighborhoods with a poorer physical environments or high drug availability frequently used marijuana prior to tobacco.[35] Vaughn et al.[16] speculated that differences in these environmental factors may contribute to the observed difference in initiation patterns.

Young adults, who perceived regular marijuana or tobacco use to be associated with moderate or great risk, were less likely to initiate use with that substance compared with those who perceived no or slight risk. Findings from other studies suggest that declines in perceived marijuana use risk precede increases in marijuana use prevalence.[4] Changes in risk perceptions of marijuana use, increases in marijuana use prevalence, and decreases in combustible tobacco use prevalence, may all be contributing factors influencing changes in the sequence of combustible tobacco and marijuana initiation.[29]

Both African American and white current marijuana users were more likely to first use marijuana before tobacco and less likely to first use tobacco before marijuana compared with those who were not current marijuana users. However, only white current tobacco users were less likely to first use marijuana before tobacco and more likely to first use tobacco before marijuana compared with those who were not current tobacco users. Conclusions cannot be drawn regarding how sequence of initiation impacts future tobacco use using these data. Our study included young adults who may have just experimented with tobacco and

marijuana use but not developed more regular use. Further, this analysis is based on cross-sectional data and data on future outcomes later in adulthood are not available. Future studies based on longitudinal samples could increase understanding of how order of initiation to tobacco and marijuana use may impact regular tobacco use and nicotine dependence.

These findings are subject to limitations. All data were self-reported and not biochemically confirmed. Reports of ever substance use and age at first use may be impacted by recall bias. We included young adults who may have used marijuana and tobacco even just one time; frequency or intensity of combustible tobacco or marijuana use was not examined. The questions on risk perceptions differed by product. The measure of cigarette smoking risk may be perceived as a substantial, regular amount (at least a pack per day) whereas the measure of marijuana risk may be perceived as a smaller, less frequent amount (once or twice a week). Some young adults may initiate tobacco and marijuana use at later ages. Only young adults who reported ever use of cigarettes or cigars were included in the sample so other combustible tobacco users may have been missed. However, cigarettes and cigars comprise a significant proportion of combustible tobacco use in this population.[12] Finally, because the current study related only to comparing African Americans and whites, we did not assess changes among other racial/ethnic groups, such as Hispanics. Despite these limitations, the study's strengths include a large, nationally representative sample and the assessment of sociodemographic characters within racial/ethnic groups.

In conclusion, among ever users of combustible tobacco and marijuana, greater proportions of African American young adults use marijuana before tobacco or at the same age than their white counterparts. Moreover, both African Americans and whites were more likely to use marijuana before tobacco in 2012 compared with 2005. Tobacco control policy may benefit from a broader understanding of the patterns of initiation to tobacco and marijuana use. Some public health interventions aimed at preventing and reducing combustible tobacco use among African American young adults may be strengthened by expanding to include marijuana use, as young adults who have ever used both combustible tobacco and marijuana are increasingly likely to use marijuana before tobacco. As states consider legalizing and decriminalizing marijuana, it will be critical to understand how marijuana use may impact tobacco initiation, dependence, and cessation. Because African American young adults have greater odds of using marijuana before tobacco, greater understanding of how marijuana initiation interacts with tobacco initiation could inform efforts to prevent both tobacco and marijuana use in this population and increase understanding of tobacco related health disparities.

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Table 1

Percentage of African American and White Young Adults Who Reported Ever Use of Marijuana and Tobacco by Sequence of Initiation and Selected Characteristics—National Survey on Drug Use and Health, 2005–2012

	African American							White						
		Marijuana before tobacco		Marijuana and tobacco same age		Tobacco before marijuana			Marijuana before tobacco		Marijuana and tobacco same age		Tobacco before marijuana	
	Sample size	%	(95% CI)	%	(95% CI)	%	(95% CI)	Sample size	%	(95% CI)	%	(95% CI)	%	(95% CI)
Overall	8024	32.1	(30.9, 33.4)	31.5	(30.2, 32.8)	36.4	(34.9, 37.9)	48 531	20.4	(19.8, 20.9)	27.4	(27.0, 27.8)	52.2	(51.6, 52.8)
Year														
2005	997	26.6	(23.4, 29.7)	31.5	(28.1, 34.9)	41.9	(38.6, 45.3)	6284	14.3	(13.3, 15.4)	25.3	(23.9, 26.6)	60.4	(58.9, 61.9)
2006	1007	28.1	(25.1, 31.2)	31.8	(28.1, 35.4)	40.1	(36.1, 44.1)	6134	17.0	(15.6, 18.4)	25.4	(23.8, 26.9)	57.6	(55.7, 59.5)
2007	922	29.0	(24.9, 33.0)	28.9	(24.7, 33.1)	42.2	(38.2, 46.1)	6119	17.8	(16.4, 19.2)	27.5	(26.0, 29.1)	54.7	(53.0, 56.4)
2008	1031	29.2	(25.4, 32.9)	29.8	(25.9, 33.6)	41.1	(37.1, 45.0)	6061	20.5	(19.1, 21.9)	26.7	(25.1, 28.2)	52.8	(51.1, 54.5)
2009	997	32.8	(29.2, 36.5)	30.1	(25.7, 34.5)	37.1	(33.0, 41.1)	6059	21.6	(20.0, 23.2)	27.7	(26.3, 29.0)	50.7	(49.1, 52.4)
2010	969	30.5	(26.9, 34.2)	37.5	(32.9, 42.0)	32.0	(27.4, 36.5)	6147	23.9	(22.4, 25.4)	29.4	(28.1, 30.7)	46.7	(45.2, 48.2)
2011	1073	38.5	(34.4, 42.6)	30.8	(27.6, 33.9)	30.8	(27.0, 34.5)	6086	24.5	(22.9, 26.0)	28.1	(26.5, 29.8)	47.4	(45.9, 48.9)
2012	1028	41.5	(38.0, 44.9)	31.9	(28.1, 35.7)	26.6	(22.9, 30.4)	5641	24.0	(22.5, 25.4)	29.6	(28.2, 31.1)	46.4	(44.8, 48.0)
Sex														
Male	4232	35.4	(33.7, 37.1)	32.0	(30.4, 33.6)	32.6	(31.0, 34.3)	24 898	22.1	(21.5, 22.7)	27.6	(27.0, 28.2)	50.3	(49.6, 51.0)
Female	3792	28.1	(26.2, 30.1)	30.9	(29.1, 32.7)	41.0	(38.7, 43.3)	23 633	18.4	(17.7, 19.0)	27.2	(26.6, 27.9)	54.4	(53.6, 55.2)
Education														
Less than high school	2057	30.6	(28.1, 33.1)	36.2	(34.1, 38.3)	33.2	(31.2, 35.2)	8053	19.6	(18.6, 20.6)	28.4	(27.1, 29.8)	51.9	(50.6, 53.3)
High school graduate	3149	31.9	(30.0, 33.8)	31.4	(29.5, 33.4)	36.6	(34.1, 39.1)	16 563	20.1	(19.2, 21.1)	27.7	(26.9, 28.5)	52.2	(51.3, 53.1)
Some college/ degree	2818	33.3	(31.5, 35.2)	28.4	(25.6, 31.1)	38.3	(35.8, 40.7)	23 915	20.7	(19.9, 21.5)	27.0	(26.3, 27.6)	52.3	(51.4, 53.2)
Household income														
Less than $10 000	1985	29.4	(26.6, 32.1)	35.2	(32.3, 38.0)	35.4	(32.8, 38.1)	8264	21.4	(20.2, 22.6)	28.4	(27.2, 29.6)	50.3	(48.8, 51.7)
$10 000–$39 999	3796	32.1	(30.1, 34.2)	31.3	(29.9, 32.8)	36.5	(34.3, 38.8)	18 877	19.9	(19.2, 20.6)	25.9	(25.2, 26.7)	54.2	(53.4, 55.0)
≥$40 000	2243	34.0	(31.6, 36.3)	29.3	(26.6, 31.9)	36.8	(34.2, 39.3)	21 390	20.4	(19.6, 21.2)	28.2	(27.6, 28.9)	51.4	(50.5, 52.2)
Metro/nonmetro status														
Large metro	4688	33.7	(32.0, 35.3)	31.6	(29.9, 33.3)	34.7	(33.0, 36.5)	17 025	21.2	(20.3, 22.1)	28.6	(27.9, 29.3)	50.2	(49.3, 51.2)
Small metro	3060	29.8	(28.1, 31.5)	31.4	(29.3, 33.5)	38.8	(36.5, 41.1)	27 515	20.0	(19.3, 20.7)	26.9	(26.3, 27.5)	53.1	(52.3, 53.9)
Nonmetro	276	26.0	(18.8, 33.1)	30.4	(23.5, 37.3)	43.6	(36.7, 50.6)	3991	16.3	(14.6, 18.0)	22.7	(20.9, 24.5)	61.0	(58.8, 63.2)

	African American							White						
		Marijuana before tobacco		Marijuana and tobacco same age		Tobacco before marijuana			Marijuana before tobacco		Marijuana and tobacco same age		Tobacco before marijuana	
	Sample size	%	(95% CI)	%	(95% CI)	%	(95% CI)	Sample size	%	(95% CI)	%	(95% CI)	%	(95% CI)
Risk of smoking ≥ 1 pack of cigarettes per day														
No risk/slight risk	809	30.1	(26.0, 34.3)	30.3	(25.9, 34.8)	39.6	(34.4, 44.7)	4214	17.9	(16.2, 19.6)	27.6	(25.8, 29.3)	54.5	(52.3, 56.8)
Moderate risk/great risk	7188	32.4	(31.1, 33.7)	31.6	(30.3, 33.0)	36.0	(34.5, 37.4)	44 248	20.6	(20.0, 21.1)	27.4	(27.0, 27.8)	52.0	(51.4, 52.6)
Risk of smoking marijuana once or twice a week														
No risk/slight risk	4870	35.4	(33.8, 37.0)	32.4	(30.5, 34.3)	32.2	(30.3, 34.0)	30 333	22.9	(22.2, 23.6)	28.5	(28.0, 29.1)	48.6	(47.9, 49.3)
Moderate risk/great risk	3119	26.8	(24.9, 28.8)	29.8	(28.1, 31.5)	43.4	(41.4, 45.3)	18 089	16.0	(15.3, 16.7)	25.5	(24.8, 26.2)	58.5	(57.6, 59.4)
Current combustible tobacco use[a]														
No current use	3536	30.6	(28.8, 32.4)	29.6	(27.7, 31.4)	39.8	(37.9, 41.8)	19 035	23.2	(22.4, 24.0)	27.5	(26.8, 28.2)	49.2	(48.2, 50.2)
Current use	4462	33.4	(31.7, 35.2)	33.0	(31.1, 35.0)	33.5	(31.7, 35.4)	29 390	18.5	(17.8, 19.1)	27.3	(26.8, 27.9)	54.2	(53.5, 54.9)
Current marijuana use[b]														
No current use	4675	28.5	(26.7, 30.3)	29.9	(28.3, 31.5)	41.6	(39.8, 43.5)	31 867	18.2	(17.6, 18.7)	25.8	(25.2, 26.4)	56.0	(55.3, 56.7)
Current use	3349	37.0	(34.7, 39.3)	33.7	(31.4, 36.0)	29.3	(27.1, 31.5)	16 664	24.4	(23.5, 25.3)	30.4	(29.5, 31.3)	45.3	(44.2, 46.3)

AOR = adjusted odds ratio; CI = confidence interval.

[a] Current combustible tobacco use is past 30-day cigarette and/or cigar use.

[b] Current marijuana use is past 30-day marijuana use.

Table 2

Adjusted Odds of African American and White Young Adults Sequence of Initiation to Tobacco and Marijuana Use Among Those Who Reported Ever Use of Marijuana and Tobacco by Selected Characteristics—National Survey on Drug Use and Health, 2005–2012

	African American			White		
	Marijuana before tobacco	Marijuana and tobacco at the same age	Tobacco before marijuana	Marijuana before tobacco	Marijuana and tobacco at the same age	Tobacco before marijuana
	AOR (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)
Year						
2005	1.00	1.00	1.00	1.00	1.00	1.00
2006	1.10 (0.86, 1.39)	0.99 (0.78, 1.27)	0.93 (0.75, 1.17)	**1.23 (1.06, 1.42)**	1.00 (0.89, 1.13)	0.90 (0.80, 1.01)
2007	1.11 (0.85, 1.45)	0.87 (0.68, 1.11)	1.04 (0.82, 1.32)	**1.28 (1.10, 1.49)**	1.12 (1.00, 1.26)	0.89 (0.80, 1.00)
2008	1.08 (0.85, 1.37)	0.91 (0.71, 1.17)	1.03 (0.80, 1.31)	**1.48 (1.31, 1.68)**	1.06 (0.95, 1.19)	**0.76 (0.70, 0.82)**
2009	1.30 (1.02, 1.65)	0.94 (0.73, 1.20)	0.84 (0.68, 1.04)	**1.53 (1.34, 1.74)**	1.10 (1.00, 1.22)	**0.72 (0.66, 0.81)**
2010	1.15 (0.89, 1.48)	1.28 (0.99, 1.66)	**0.69 (0.54, 0.89)**	**1.73 (1.51, 1.98)**	**1.20 (1.08, 1.32)**	**0.62 (0.56, 0.68)**
2011	**1.63 (1.27,2.10)**	0.93 (0.75, 1.16)	**0.67 (0.52, 0.86)**	**1.77 (1.59, 1.98)**	**1.13 (1.02, 1.26)**	**0.63 (0.58, 0.69)**
2012	**1.80 (1.44, 2.24)**	1.01 (0.80, 1.28)	**0.55 (0.42, 0.71)**	**1.70 (1.50, 1.93)**	**1.22 (1.10, 1.35)**	**0.61 (0.56, 0.68)**
Sex						
Male	1.00	1.00	1.00	1.00	1.00	1.00
Female	**0.74 (0.64, 0.85)**	0.98 (0.87, 1.11)	**1.35 (1.19, 1.53)**	**0.82 (0.78, 0.87)**	1.03 (0.98, 1.08)	**1.11 (1.06, 1.16)**
Education						
Less than high school	1.00	1.00	1.00	1.00	1.00	1.00
High school graduate	1.07 (0.93, 1.23)	0.82 (0.72, 0.95)	1.14 (0.98, 1.32)	0.96 (0.88, 1.03)	0.96 (0.88, 1.04)	1.04 (0.97, 1.10)
Some college/college degree	**1.17 (1.01, 1.37)**	**0.74 (0.62, 0.88)**	1.16 (1.00, 1.36)	0.93 (0.86, 1.02)	**0.90 (0.84, 0.97)**	**1.12 (1.05, 1.20)**
Household income						
Less than $10 000	1.00	1.00	1.00	1.00	1.00	1.00
$10 000–$39 999	1.09 (0.90, 1.30)	0.87 (0.75, 1.00)	1.07 (0.92, 1.25)	0.99 (0.90, 1.08)	**0.90 (0.84, 0.96)**	**1.10 (1.03, 1.18)**
≥$40 000	1.13 (0.94, 1.36)	0.82 (0.67, 1.02)	1.08 (0.93, 1.27)	0.97 (0.89, 1.06)	0.99 (0.92, 1.07)	1.03 (0.96, 1.10)
Metro/nonmetro status						
Large metro	1.00	1.00	1.00	1.00	1.00	1.00
Small metro	0.87 (0.77, 1.01)	0.97 (0.85, 1.10)	**1.18 (1.05, 1.32)**	0.95 (0.87, 1.05)	**0.93 (0.88, 0.98)**	**1.09 (1.03, 1.16)**
Nonmetro	0.73 (0.49, 1.09)	0.92 (0.64, 1.32)	**1.41 (1.01, 1.97)**	**0.79 (0.68, 0.91)**	**0.76 (0.67, 0.85)**	**1.43 (1.29, 1.59)**

	African American			White		
	Marijuana before tobacco	Marijuana and tobacco at the same age	Tobacco before marijuana	Marijuana before tobacco	Marijuana and tobacco at the same age	Tobacco before marijuana
	AOR (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)	*AOR* (95% CI)
Risk of smoking ≥ 1 pack of cigarettes per day						
No risk/slight risk	1.00	1.00	1.00	1.00	1.00	1.00
Moderate risk/great risk	1.19 (0.96, 1.48)	1.19 (0.95, 1.48)	**0.71 (0.58, 0.89)**	**1.23 (1.07, 1.41)**	1.01 (0.92, 1.11)	**0.87 (0.79, 0.96)**
Risk of smoking marijuana once or twice a week						
No risk/slight risk	1.00	1.00	1.00	1.00	1.00	1.00
Moderate risk/great risk	**0.79 (0.69, 0.92)**	0.93 (0.80, 1.07)	**1.32 (1.17, 1.48)**	**0.73 (0.68, 0.78)**	**0.93 (0.88, 0.98)**	**1.30 (1.23, 1.36)**
Current combustible tobacco use[a]						
No current tobacco use	1.00	1.00	1.00	1.00	1.00	1.00
Current tobacco use	1.03 (0.90, 1.18)	1.09 (0.95, 1.31)	0.90 (0.79, 1.02)	**0.68 (0.63, 0.72)**	0.95 (0.90, 1.00)	**1.35 (1.28, 1.46)**
Current marijuana use[b]						
No current marijuana use	1.00	1.00	1.00	1.00	1.00	1.00
Current marijuana use	**1.31 (1.09, 1.58)**	1.11 (0.95, 1.31)	**0.69 (0.60, 0.80)**	**1.36 (1.28, 1.45)**	**1.22 (1.14, 1.30)**	**0.69 (0.65, 0.74)**

AOR = adjusted odds ratio; CI = confidence interval. Bold values are statistically significant ($P < .05$).

[a] Current combustible tobacco use is past 30-day cigarette and/or cigar use.

[b] Current marijuana use is past 30-day marijuana use.

Table 3

Adjusted Odds Ratios of Sequence of Initiation by Race Among African American and White Young Adults Who Reported Lifetime Use of Marijuana and Tobacco—National Survey on Drug Use and Health 2005–2012

	Marijuana before tobacco	Marijuana and tobacco at the same age	Tobacco before marijuana
	***AOR*[a] (95% CI)**	***AOR*[a] (95% CI)**	***AOR*[a] (95% CI)**
White	1.00	1.00	1.00
African American	**1.79 (1.67, 1.91)**	**1.17 (1.09, 1.25)**	**0.55 (0.52, 0.59)**

AOR = adjusted odds ratio; CI = confidence interval. Bold values are statistically significant ($P < .05$).

[a]Odds ratio adjusted for year, sex, education, annual household income, metro status, perceived risk of cigarette smoking, perceived risk of marijuana use, current tobacco use, and current marijuana use.