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## Association of Peer Influence and Access to Tobacco Products With U.S. Youths' Support of Tobacco 21 Laws, 2015

Rebecca Glover-Kudon, Ph.D., M.S.P.H.<sup>a,\*</sup>, Elizabeth Plunkett, M.P.H.<sup>b</sup>, René Lavinghouze, M.A.<sup>a</sup>, Katrina F. Trivers, Ph.D., MSPH<sup>a</sup>, Xu Wang, Ph.D.<sup>a</sup>, Sean Hu, M.D., Dr.P.H.<sup>a</sup>, David M. Homa, Ph.D., M.P.H.<sup>a</sup>

<sup>a</sup>Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention (CDC), Atlanta, Georgia

<sup>b</sup>MPH Program, Global Health, Rollins School of Public Health, Emory University, Atlanta, Georgia

### Abstract

**Purpose:** Tobacco 21 (T21) is a population-based strategy to prevent tobacco initiation. A majority of U.S. youths support T21; however, the extent to which individual, interpersonal, and community factors influence T21 support is uncertain. This study explored predictors of T21 support among U.S. youth.

**Methods:** We analyzed data from the 2015 National Youth Tobacco Survey (n = 17,683) to assess the association of peer influence and access to tobacco products on T21 support. We used multivariable logistic regression to calculate adjusted odds ratios (aORs) with 95% confidence intervals for T21 support. For tobacco nonusers, the model included peer influence along with covariates including sex, age, race/ethnicity, household tobacco use, and perceived harm. For tobacco users, the model included tobacco access sources (direct purchase, social sources, and other means), the aforementioned covariates, and tobacco product type.

**Results:** Among nonusers, students least receptive to peer influence (aOR = 2.5), those youngest in age (11–14 years, aOR = 2.3), and those who believe tobacco is dangerous (aOR = 2.5) had higher odds of T21 support. Among users, lower odds of T21 support were observed among those who purchased tobacco (aOR = .3) and accessed tobacco through social sources (aOR = .7) or other means (aOR = .6) in the past 30 days. Younger tobacco users (11–14 years, aOR = 2.2), black, non-Hispanic users (aOR = 3.8), e-cigarette users (aOR = 2.5), and users who believe that tobacco is dangerous (aOR = 2.8) had higher odds of T21 support.

**Conclusions:** Low receptivity to peer influence and lack of access to tobacco products are associated with T21 support. Results underscore that T21 implementation may require a social-ecological approach.

\*Address correspondence to: Rebecca Glover-Kudon, Ph.D., M.S.P.H., Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention (CDC), 4770 Buford Hwy NE, MS S107-7, Atlanta, GA 30341. rgloverkudon@cdc.gov (R. Glover-Kudon).

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## Keywords

Tobacco; Prevention; Attitudes; Youth; Adolescents

Preventing tobacco product use among young people is critical, given that nearly 90% of daily adult cigarette smokers first try cigarettes by 18 years of age, with 99% first trying cigarettes by age 26 [1]. Marked declines in cigarette smoking have occurred over the past several decades; however, the tobacco product landscape has evolved in recent years to include a diversity of combustible, noncombustible, and electronic products, many of which are used by young people. In 2015, 2 in 10 young adults (aged 18–24 years), representing 51.8 million people, used a tobacco product “every day” or “some days,” with most using a combustible product [2]. During 2017, 5.6% of middle school students and 19.6% of high school students, representing approximately 3.6 million students, reported current (past 30 day) tobacco use with 1.7 million using two or more tobacco products [3]. Overall, current use of any tobacco product declined during 2011–2017 among middle and high school students. Whereas use of cigarettes, cigars, and smokeless tobacco decreased during this period, use of e-cigarettes increased among both middle and high school students [3].

Youth use of tobacco products in any form is unsafe, irrespective of whether it is combustible, noncombustible, or electronic [1,4,5]. Tobacco products typically contain nicotine, which is highly addictive and can harm the developing adolescent brain [6]. Young smokers who smoke daily have the risk of becoming more intense smokers and being unable to quit, as they may lack the cognitive, environmental, and emotional resources necessary for cessation [7]. Preventing tobacco use initiation is further complicated by marketing strategies that target youth [1] and frequent exposure to pro-tobacco messages through advertising, media, and film [1,8]. A myriad of cognitive, physical, and psychosocial changes during adolescence and young adulthood can also result in increased vulnerability to tobacco use [1,7].

Numerous evidence-based strategies are effective in preventing tobacco product use among young people [1]. Mass media educational campaigns, pricing strategies, advertising restrictions, smoke-free policies in worksites and public spaces, smoke-free home rules, and product access restrictions comprise a comprehensive set of population-based approaches [1]. Increasing the minimum legal age of sale from 18 years to 21 years (tobacco 21 [T21]) is a more recent strategy [7,9], first implemented in Needham, MA in 2005. As of August 2018, six states (Hawaii, California, Oregon, New Jersey, Maine, and Massachusetts), the District of Columbia, two U.S. territories (Guam, Palau) [10], and over 330 cities and counties in 21 states have passed T21 legislation.

The potential public health benefits of T21 were recently summarized in an Institute of Medicine report, including estimated reduced or delayed tobacco use initiation; lowered tobacco use prevalence among youth and adults; and reduced risk for tobacco-related morbidity and mortality [7]. More specifically, it is estimated that, for the 2010–2019 birth cohort, nationwide T21 would avert 250,000 premature deaths, 45,000 deaths caused by lung cancer, and 4.2 million years of life lost [7]. The estimated impact of nationwide T21 extends further to maternal-child outcomes related to smoking during pregnancy and infants’

exposure to secondhand smoke. Under a T21 assumption, modeling studies project 486,000 fewer cases of low birth weight and 4,000 fewer cases of sudden infant death syndrome by 2100 [7]. While population-based research regarding the effectiveness of statewide T21 policies is limited due to their recent emergence, findings from simulation models [11–13], research in specific communities [14] and other countries [15], and initial evaluation results of nascent policies [16] demonstrate T21's remarkable potential for impact.

By expanding the legal definition of “underage,” T21 policies work directly by restricting more youths' access to tobacco products in retail settings, commonly enacting penalties for vendors and, in some cases, consumers and social sources for tobacco. Given that younger students often obtain tobacco products from older peers [7] and that many adolescents initiate smoking because of the influence of friends who smoke [17], disrupting tobacco access patterns is an important benefit of T21 laws. Increasing the minimum legal age of sale for tobacco products creates additional social distance as a barrier between adolescents and persons of legal purchasing age who will more likely fall outside their social circle [7].

Garnering support for T21 among youth is critical from a behavioral and social norms standpoint. Support for tobacco control policies is generally associated with compliance among youth [18] and young adults [19]. Moreover, public support leads to policy adoption, normalization, and acceleration across populations [4,20]. To gauge public opinion about T21 policies, researchers have examined attitudes in the U.S. about T21. Among adults, overall support for T21 is estimated to be 66%–75% in 2013–2015 [21–25], including nearly two-thirds of current cigarette smokers and more than half of current users of other tobacco products [25]. Among youth, national estimates of support for T21 are 64% among middle and high school students in 2015 [26] and 80% among youth aged 13–17 years from 2014 to 2017 [27]; however, research on factors that may influence youth attitudes toward T21 policies is limited.

Support for T21 may vary by youths' beliefs about the risks posed by various tobacco products, their perceptions and experiences with policy enforcement, and their ability to obtain tobacco through social sources whether or not covered by T21. Moreover, attitudes about increased age restrictions both reflect and shape tobacco-related social norms, which are known to predict individuals' tobacco use behavior [28]. Examination of variation in attitudes about T21 could help identify opportunities for intervention and potential reasons for support, opposition, or indifference that are jointly related to tobacco use prevalence. Therefore, taking a social-ecological approach, we sought to understand individual, interpersonal, and community factors associated with support among youth T21. As conceptualized, individual factors include personal characteristics and tobacco-related beliefs, and interpersonal factors refer to the social environment, particularly among peers and in the home. Community factors encompass aspects of the physical and policy environment as they pertain to tobacco access.

## Methods

### Data source

The National Youth Tobacco Survey [29] is a nationally representative, cross-sectional survey administered annually in U.S. public and private schools using a three-stage cluster sample design. In 2015, 17,711 students (63.4% overall response rate) in grades 6–12 completed a paper-and-pencil questionnaire that, along with demographics, measured tobacco use susceptibility, current tobacco use, and tobacco-related knowledge and attitudes, among other topics. For the present study, 28 records from 9- and 10-year-olds were dropped because of data irregularities (e.g., discrepant age-grade combinations), yielding a final sample of 17,683 students aged 11 years and older. The Centers for Disease Control and Prevention's Institutional Review Board approved the National Youth Tobacco Survey data collection.

### Measures

The dependent variable, support for T21, was assessed by the question: Do you think the minimum age to buy tobacco products should be 21? Response options included: definitely yes, probably yes, probably not, and definitely not. A dichotomous variable for support of T21 was created; respondents who answered definitely yes or probably yes were considered to support T21 (vs. probably not or definitely not).

Peer influence (among tobacco nonusers) and access to tobacco (among tobacco users) were assessed for associations with support of T21. Receptivity to protobacco peer influence was measured for three separate tobacco product types (cigarette; cigar/little cigar/cigarillo; and e-cigarette) as follows: If one of your best friends were to offer you a [PRODUCT], would you [use/smoke] it? Categorical response options for each question were: “definitely yes,” “probably yes,” “probably not,” and “definitely not.” This question has previously been used to create the construct of susceptibility (along with two other questions assessing intentions to use tobacco “soon” and in the “next year”) [30]. For our analyses, however, we were interested in exploring the role of peer receptivity as a social determinant of T21 support, consistent with a socio-ecological approach. To assess for dose-response along the gradient of receptivity consistent with an established coding convention [30], peer receptivity, taking into account all three products assessed, was categorized as non-receptivity (coded as 0; responses of “definitely not” on all three questions), low receptivity (coded as 1; “probably not” response on at least one question and no response of “definitely yes” or “probably yes”), and high receptivity (coded as 2; responses of “definitely yes” or “probably yes” on at least one question). Past 30-day access to tobacco products was classified by the source type: direct purchase (bought from point-of-sale location themselves); social sources (bought from another person, had someone else buy them, asked someone for them, or were offered them by someone); and alternate means (taking them or accessing them through some other way not already described).

Sociodemographic characteristics (sex, age, and race/ethnicity), as well as two tobacco use-related covariates, were also assessed. Current use of any tobacco product was measured by use on at least one day in the past 30 days: cigarettes; cigars, cigarillos, or little cigars;

smokeless tobacco (chewing tobacco, snuff, dip, snus, and/or dissolvable tobacco products); electronic cigarettes; bidis; hookah or water pipe; and/or pipe filled with tobacco. Use of tobacco products then was grouped into mutually exclusive categories: nonuser (no current use of any tobacco product); e-cigarettes only (current use of e-cigarettes but no other tobacco product); combustibles only (current use of cigarettes, cigars/little cigars/cigarillos, pipe tobacco, hookah, and/or bidis but not e-cigarettes or smokeless tobacco products); smokeless tobacco only (current use of chewing tobacco, snuff or dip, dissolvable tobacco products, and/or snus but not e-cigarettes or combustible tobacco products); and multiproduct use (current use of at least one product in more than one category). In addition, household exposure to tobacco use was captured in binary form by the question: Does anyone who lives with you now [use any form of tobacco]? Affirmative selections of “no one” were coded as 0 for no; otherwise, responses were coded as 1 for yes. Perceived risk of tobacco use was measured by a single item: How strongly do you agree with the statement “All tobacco products are dangerous”? Response options were strongly agree, agree, disagree, and strongly disagree.

## Analysis

Data were weighted [29] to account for the complex survey design, adjusted for nonresponse, and analyzed using complex survey analysis procedures in SAS, version 9.3 [31]. We computed overall and stratified prevalence estimates (with 95% confidence intervals) for the unadjusted associations of support for T21 by each independent variable for both tobacco users and nonusers. Within-group differences were assessed by chi-squared tests ( $\alpha = .05$ ). Estimates with a relative standard error  $<30\%$  were considered statistically reliable. We then used multivariable logistic regression to examine associations between receptivity to protobacco peer influence (among nonusers) and access to tobacco products through direct purchase, social sources, and other means (among users) and T21 support. For each multivariable logistic regression (i.e., nonusers and users modeled separately), we computed adjusted odds ratios (aORs) with 95% confidence intervals that controlled for demographic characteristics, perceived risk of tobacco use, and (among users) type of tobacco product used.  $p$  values  $<.05$  were considered statistically significant.

## Results

Overall, a majority of youth younger than 18 years expressed support for T21 (Table 1). Younger students aged 11–14 years were more supportive of T21 than older students aged 15–17 years (72.5 vs. 58.5%, respectively). Less than half (42.9%) of students aged 18 years and older supported T21. Greater support for T21 was observed among females (66.5% vs. 61.8% for males), tobacco nonusers (70.9% vs. 30.3% for users of tobacco in any form [data not shown]), and students without a tobacco user in their household (68.4% vs. 57.8% who live with a tobacco user). Over two-thirds (68.8%) of students who believed tobacco products are dangerous supported T21 compared to 35.1% who held opposite risk conceptions.

Among current nonusers, support for T21 varied inversely by receptivity to protobacco peer influence. Over three-fourths (76.5%) of nonusers who reported not being receptive to using

tobacco products if offered by a friend supported the proposed age restriction. Among nonusers with low receptivity, 70.4% supported T21, while 51.9% of those most vulnerable to peer influence expressed support.

Among users, support varied by product type used, from 18.8% among multiproduct users to 49.5% among exclusive users of e-cigarettes. Among users who recently made a direct tobacco purchase, 1 in 10 (12.1%) supported T21. Among users who obtained tobacco through social sources, 1 in 4 (25.0%) supported T21. Similar support was observed among users who reported taking tobacco products or getting them some other way (24.0%).

Among nonusers, adjusted results (Table 2) revealed that the odds of supporting T21 differed based on receptivity to peer influence. Compared with highly receptive students, those with low or no receptivity had two-fold higher odds (low receptivity, aOR = 1.9; nonreceptivity, aOR = 2.5) of supporting T21. In contrast, users who bought tobacco through a direct purchase had 70% lower odds (aOR = .3) of supporting T21 (Table 3). Similarly, users who reported recently accessing tobacco through social sources or obtaining tobacco products through alternate means had 30% (aOR = .7) and 40% (aOR = .6) lower odds, respectively, of supporting T21.

## Discussion

This study demonstrates that the majority of middle and high school students support T21. Given adults' majority support of T21 [21–25], findings reinforce that T21 favorability spans generations. Among tobacco nonusers, the strongest support for T21 was found among students with lower receptivity to pro-tobacco peer influence. Among tobacco users, those who accessed tobacco products through direct purchase, social sources, or other means (e.g., theft) were less supportive of T21 compared with those who did not report accessing tobacco in these ways. Exclusive users of e-cigarettes had greater odds of supporting T21 compared with users of other types of tobacco products, possibly reflecting confusion about e-cigarettes' categorization as a tobacco product [5] and an assumption that e-cigarettes would not be included in T21 policies. Those who were younger (i.e., further away from proposed age restriction) and those who believed tobacco products are dangerous had greater odds of supporting T21. These findings indicate that individual, interpersonal, and community factors are associated with T21 support among youth, which could serve as a useful evidence base for states and communities considering T21.

The Family Smoking Prevention and Tobacco Control Act of 2009 ("Tobacco Control Act") gave the U.S. Food and Drug Administration (FDA) broad authority over the manufacturing, marketing, and sale of tobacco products. This authority granted by the U.S. Congress allows FDA, among other regulatory powers, the right to restrict advertising and cigarette and smokeless tobacco sales to youth [7]; as of 2016, the FDA's authority further extends to a wider range of tobacco products, including e-cigarettes [5]. The Tobacco Control Act, however, prohibits the FDA from setting a national minimum legal age above 18 years for selling tobacco products. Importantly, the Tobacco Control Act does not preempt state and local efforts with regard to many tobacco prevention and control strategies, including T21. Therefore, efforts to increase the minimum legal age above 18 years are left to states and



local jurisdictions. Presently, 25% of the U.S. population is covered by a T21 policy at the state or local level (<http://tobacco21.org>).

Under the assumption of a national T21 policy, simulation studies have been conducted to estimate the public health implications of an increased minimum legal age for tobacco product sales. Over time, tobacco use initiation among adolescents aged 15–17 years would be expected to decline 25% following implementation of a national T21 policy. Researchers predicted that, by 2100, smoking prevalence among adults would drop 12% beyond expected declines, resulting from current tobacco control policies. Furthermore, 250,000 smoking-related deaths would be averted, including 36% premature deaths to persons < 65 years of age [7]. Absent a uniform minimum legal age of 21 years for tobacco product sales, these predicted outcomes depend on collective state and local action to restrict legal access to tobacco. In real-world conditions, change will depend on specific T21 policy elements, adequate policy implementation and enforcement, and sufficient time for shifts in social norms to occur [32,33].

To offer the full scope of public health protection across the numerous types of tobacco products being used in the U.S. marketplace, model T21 policies address the diversity of tobacco products (specifically including e-cigarettes and other electronic products [9]), emphasize penalties and enforcement for under-age sales (not possession), carry no exemptions for special populations (e.g., military), and disallow pre-emption of stronger, local ordinances [34]. To protect youth and young adults from the harms of nicotine addiction, the U.S. Surgeon General outlined a multipronged, evidence-based strategy that includes increasing and enforcing minimum age laws for selling tobacco products, including e-cigarettes [5]. Given e-cigarettes' potential to renormalize smoking, and the growing body of science suggesting that e-cigarette use among youth may lead to subsequent conventional cigarette smoking [35,36], continued examination of attitudes toward T21 by product use is warranted. To curtail underage access, enforcement of age restrictions is a critical component of T21 laws aimed primarily at the retail environment [7]. Frequently cited best practices for implementing T21 include intentional planning of enforcement strategies, compliance inspections, effective penalties for violations (including criminal prosecution), and merchant education [32].

T21 policies can also help shape societal norms and reinforce the denormalization of tobacco use behaviors. At a group or organizational level (e.g., school, sports team), compliance with T21 policies (and, otherwise, smoke-free campus policies) may impact actual and perceived tobacco use prevalence norms, both of which are associated with tobacco product susceptibility and/or use [28,37]. In family systems, parental controls (e.g., home punishments) possibly in response to legal and social risks posed by violations of T21 laws that include penalties for individuals' possessing, using, and furnishing tobacco to under-age persons may further denormalize youth tobacco use [7]. Over time, a decline in tobacco prevalence may also be accelerated by younger students' behavioral modeling of their older peers who may increasingly adapt to shifting social norms unfavorable to tobacco use [32]. Support for T21 is associated with lower intentions to initiate cigarette smoking and increased intentions to quit [26]. Thus, as an indicator of social norms, periodic

assessment of youth attitudes toward T21 can be useful to examine associated changes in tobacco use susceptibility, initiation, and prevalence.

Our study is subject to some limitations. First, given the study's cross-sectional design, we are unable to ascertain whether factors had a temporal influence on support for T21. Absent longitudinal data, we can only detect that certain associations exist. Second, the receptivity to protobacco peer influence scale was newly developed for this study; its psychometric properties are unknown without further validation. Third, because students self-reported their attitudes and tobacco use behavior, estimates are subject to response and recall biases; however, research supports the validity of self-reporting smoking behavior among youth [38]. Finally, the findings might not be generalizable to all youth; those who are home-schooled, have dropped out of school, or are in detention centers are not included in this survey. However, despite these limitations, overall trends are generally similar to other nationally representative surveys of tobacco use among youth [39,40].

T21 policies reflect one of the several strategies that comprise a comprehensive approach to population-based tobacco prevention and control [5]. As a strategy to reduce tobacco use initiation, T21 garners support that spans generations. Results demonstrate that individual, interpersonal, and community factors influence support of T21 among youth. For states and communities considering T21, results underscore the importance of taking a social-ecological approach to T21 implementation.

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**IMPLICATIONS AND CONTRIBUTION**

Tobacco nonusers with less receptivity to peer influence had greater odds of supporting tobacco 21 (T21) policies. Tobacco users with recent access to tobacco products through direct or social sources had lower odds of supporting T21 policies. These results can inform states and communities considering or implementing T21 policies.

Table 1

Favorability toward 21 years as the minimum age to purchase tobacco products, U.S. middle and high school students, aged 11 to 18p, NYTS 2015<sup>a</sup>

Characteristic	Overall	Tobacco users			Tobacco nonusers		
	<i>b</i> <i>n</i>	Favorability prevalence, weighted % (95% CI) <sup>d</sup>	<i>b</i> <i>n</i>	Weighted % (95% CI) <sup>c</sup>	Favorability prevalence, weighted % (95% CI) <sup>d</sup>	<i>b</i> <i>n</i>	Weighted % (95% CI) <sup>c</sup>
Receptivity to protobacco peer influence <sup>e</sup>							
Nonreceptivity						8,478	60.4 (58.2, 62.6)
Low receptivity						3,285	23.4 (22.2, 24.5)
High receptivity						2,299	16.3 (14.8, 17.7)
Accessed tobacco through direct purchase <sup>f</sup>							
Yes			686	23.6 (20.8, 26.4)	12.1 (8.9, 15.4)		76.5 (74.8, 78.2)
No			2,153	76.4 (73.6, 79.2)	35.9 (32.7, 39.1)		70.4 (67.4, 73.4)
Accessed tobacco through social sources <sup>g</sup>							
Yes			1,339	47.5 (44.9, 50.0)	25.0 (21.9, 28.1)		
No			1,500	52.5 (50.0, 55.1)	35.1 (31.1, 39.1)		51.9 (48.7, 55.1)
Accessed tobacco some other way <sup>h</sup>							
Yes			365	12.8 (11.0, 14.6)	24.0 (19.5, 28.5)		
No			2,474	87.2 (85.4, 89.0)	31.2 (27.9, 34.6)		
Sex							
Female	8,379	49.2 (47.5, 50.8)	1,161	40.3 (37.5, 43.2)	34.3 (30.7, 37.9)	7,211	51.0 (49.2, 52.8)
Male	8,584	50.8 (49.2, 52.5)	1,714	59.7 (56.8, 62.5)	27.8 (24.2, 31.4)	6,859	49.0 (47.2, 50.8)
Age (years)							
11–14	8,655	48.9 (42.9, 54.9)	716	22.7 (19.1, 26.3)	44.6 (39.4, 49.8)	7,924	54.3 (48.0, 60.5)
15–17	7,044	42.6 (37.5, 47.6)	1,686	59.7 (56.1, 63.3)	28.3 (25.2, 31.4)	5,355	39.0 (33.7, 44.4)
18+	1,319	8.5 (7.1, 10.0)	480	17.6 (14.8, 20.4)	19.1 (12.5, 25.7)	838	6.7 (5.3, 8.0)
Race/ethnicity							
White, non-Hispanic	7,706	54.1 (49.2, 59.0)	1,322	53.7 (47.0, 60.4)	21.7 (18.9, 24.6)	6,382	54.2 (49.3, 59.0)
							73.4 (71.5, 75.3)

Characteristic	Overall			Tobacco users			Tobacco nonusers		
	<i>b</i> <i>n</i>	Weighted % (95% CI) <sup>c</sup>	Favorability prevalence, weighted % (95% CI) <sup>d</sup>	<i>b</i> <i>n</i>	Weighted % (95% CI) <sup>c</sup>	Favorability prevalence, weighted % (95% CI) <sup>d</sup>	<i>b</i> <i>n</i>	Weighted % (95% CI) <sup>c</sup>	Favorability prevalence, weighted % (95% CI) <sup>d</sup>
Black, non-Hispanic	2,292	13.3 (10.4, 16.1)	65.3 (63.2, 67.3)	338	11.7 (8.0, 15.4)	47.6 (38.4, 56.7)	1,952	13.6 (10.7, 16.5)	68.5 (66.4, 70.6)
Hispanic	4,634	23.5 (20.1, 26.9)	62.2 (59.7, 64.6)	837	24.9 (20.7, 29.1)	37.4 (33.0, 41.7)	3,788	23.2 (19.7, 26.6)	67.7 (65.2, 70.3)
Other, non-Hispanic	943	4.9 (3.6, 6.1)	67.6 (64.0, 71.3)	126	4.2 (1.6, 6.9)	33.9 (24.7, 43.2)	816	5.0 (3.9, 6.1)	73.6 (69.4, 77.8)
Multiple races	774	4.3 (3.6, 5.1)	62.0 (57.4, 66.7)	160	5.5 (3.9, 7.1)	35.9 (25.8, 45.9)	613	4.1 (3.4, 4.8)	69.4 (64.7, 74.1)
<i>i</i>									
Tobacco product use									
Nonuser	14,155	82.9 (81.1, 84.7)	70.9 (69.3, 72.5)				14,155	100.0	70.9 (69.3, 72.5)
E-cigarettes only	719	4.4 (3.7, 5.0)	49.5 (45.7, 53.3)	719	25.5 (21.8, 29.2)	49.5 (45.7, 53.3)			
Combustibles only	757	4.2 (3.5, 4.9)	31.4 (25.4, 37.3)	757	24.5 (21.1, 27.9)	31.4 (25.4, 37.3)			
Smokeless tobacco only	161	1.1 (.7, 1.6)	28.2 (19.5, 36.9)	161	6.7 (4.4, 9.0)	28.2 (19.5, 36.9)			
Multiproduct use	1,260	7.4 (6.4, 8.4)	18.8 (15.8, 21.7)	1,260	43.3 (40.5, 46.1)	18.8 (15.8, 21.7)			
<i>j</i>									
Perceived tobacco danger									
Agree or strongly agree	14,642	86.1 (85.2, 87.1)	68.8 (66.9, 70.7)	1,940	66.2 (63.9, 68.6)	36.9 (33.1, 40.7)	12,686	90.2 (89.5, 91.0)	73.6 (72.1, 75.2)
Disagree or strongly disagree	2,306	13.9 (12.9, 14.8)	35.1 (31.7, 38.4)	936	33.8 (31.4, 36.1)	17.5 (13.8, 21.1)	1,370	9.8 (9.0, 10.5)	47.6 (43.9, 51.4)
<i>k</i>									
Tobacco product use in household									
Yes	6,870	41.2 (38.8, 43.7)	57.8 (55.1, 60.5)	1,845	64.1 (60.9, 67.3)	29.5 (26.3, 32.7)	5,011	36.5 (34.3, 38.7)	68.1 (65.8, 70.4)
No	10,081	58.8 (56.3, 61.2)	68.4 (66.5, 70.2)	1,028	35.9 (32.7, 39.1)	31.8 (27.9, 35.8)	9,048	63.5 (61.3, 65.7)	72.6 (71.0, 74.2)

CI = confidence interval; NYTS = National Youth Tobacco Survey.

<sup>a</sup>Favorability is defined as a response of “definitely yes” or “probably yes” to the question: Do you think the minimum age to buy tobacco products should be 21?<sup>b</sup>Unweighted.<sup>c</sup>Cases with missing values were excluded from analysis.<sup>d</sup>p-values for prevalence estimates are based on chi-squared test. p-values <.05 are significant and appear in boldface.<sup>e</sup>Receptivity to protobacco peer influence is based on responses to this question for three product types (cigarette, cigar/cigarillo/little cigar, e-cigarette): “If one of your best friends were to offer you a [PRODUCT] would you [use/smoke] it?” “Definitely not” on all three questions = nonreceptivity; “probably not” on at least one question and no “definitely yes” or “probably yes” responses = low receptivity; “definitely yes” or “probably yes” on at least one question = high receptivity.<sup>f</sup>Among tobacco users, having access to tobacco products through direct purchase includes those who reported personally buying tobacco from a point of sale in the past 30 days.

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<sup>g</sup> Among tobacco users, having access to tobacco products through social sources includes those who reported obtaining tobacco products in the past 30 days through either purchasing them from another person, having someone else buy them, asking someone for them, or being offered them by someone.

<sup>h</sup> Among tobacco users, having access to tobacco products through some other way includes those who reported obtaining tobacco products in the past 30 days by taking them or through other means not already listed.

<sup>i</sup> Nonuser includes those who reported no use of any tobacco product (combustibles, smokeless tobacco, and e-cigarettes) within the past 30 days. Combustibles include cigarettes, cigars, pipes, hookah, and bidis. Smokeless tobacco includes chewing tobacco, snuff, dip, dissolvables, and snus. E-cigarettes only include those who reported current (i.e., in past 30 days) use of e-cigarettes but not any other tobacco product. Combustibles only include those who reported current use of at least one combustible product but neither smokeless tobacco nor e-cigarettes. Smokeless tobacco only includes current use of at least one smokeless tobacco product but not combustibles or e-cigarettes. Multiproduct use includes those who reported use of at least one product in more than one category (i.e., e-cigarettes, combustibles, smokeless tobacco).

<sup>j</sup> Respondents were asked "How strongly do you agree with the statement 'All tobacco products are dangerous'?"

<sup>k</sup> Respondents were asked "Does anyone who lives with you now use any form of tobacco?"

<sup>l</sup> Sixty cases with data conflicts were removed from analysis (e.g., answered "I did not get any of my own tobacco products in the past 30 days" and selected at least one of 7 sources for getting tobacco products in the same time period).



**Table 2**

Favorability toward 21 years as the minimum age to purchase tobacco products among tobacco nonusers<sup>a</sup>, U.S. middle and high school students, aged 11 to 18+, NYTS 2015<sup>b</sup>

Characteristic	aOR <sup>c,d</sup> (95% CI)
Receptivity to protobacco peer influence <sup>e</sup>	
Non-receptivity	<b>2.5 (2.1, 2.9)</b>
Low receptivity	<b>1.9 (1.7, 2.3)</b>
High receptivity	1.0
Sex	
Female	1.1 (1.0, 1.3)
Male	1.0
Age (years)	
11–14	<b>2.3 (2.0, 2.8)</b>
15–17	<b>1.8 (1.5, 2.2)</b>
18+	1.0
Race/ethnicity	
White, non-Hispanic	1.0
Black, non-Hispanic	.9 (.8, 1.0)
Hispanic	.8 (.7, 1.0)
Other, non-Hispanic	1.0 (.8, 1.2)
Multiple races	.9 (.7, 1.1)
Perceived tobacco danger <sup>f</sup>	
Agree or strongly agree	<b>2.5 (2.2, 2.9)</b>
Disagree or strongly disagree	1.0
Tobacco product use in household <sup>g</sup>	
Yes	1.0
No	1.2 (1.0, 1.3)

Boldface indicates statistical significance at  $p < .05$ .

aOR = adjusted odds ratio; CI = confidence interval; NYTS = National Youth Tobacco Survey.

<sup>a</sup>Nonuser includes those who reported no use of any tobacco product within the past 30 days.

<sup>b</sup>Favorability is defined as a response of “definitely yes” or “probably yes” to the question: Do you think the minimum age to buy tobacco products should be 21?

<sup>c</sup>aOR is obtained using binary logistic regression for survey data, adjusted for covariates listed in the table.

<sup>d</sup>Individuals with missing data on the covariates listed in the table were excluded from the analysis, yielding a sample size of 13,242.

<sup>e</sup>Receptivity to protobacco peer influence is based on responses to this question for three product types (cigarette, cigar/cigarillo/little cigar, e-cigarette): “If one of your best friends were to offer you a [PRODUCT] would you [use/smoke] it?” “Definitely not” on all three questions = nonreceptivity; “probably not” on at least one question and no “definitely yes” or “probably yes” responses = low receptivity; “definitely yes” or “probably yes” on at least one question = high receptivity.

<sup>f</sup>among tobacco users, Respondents were asked “How strongly do you agree with the statement ‘All tobacco products are dangerous?’”

<sup>g</sup> Respondents were asked “Does anyone who lives with you now use any form of tobacco?”

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**Table 3**

Favorability toward 21 years as the minimum age to purchase tobacco products U.S. middle and high school students, aged 11 to 18+, NYTS 2015<sup>a</sup>.

Characteristic	aOR <sup>b,c</sup> (95% CI)
Accessed tobacco through direct purchase <sup>d,g</sup>	
Yes	<b>.3 (.2, .5)</b>
No	1.0
Accessed tobacco through social sources <sup>e,g</sup>	
Yes	<b>.7 (.5, .8)</b>
No	1.0
Accessed tobacco some other way <sup>f,g</sup>	
Yes	<b>.6 (.4, .8)</b>
No	1.0
Sex	
Female	1.1 (.9, 1.4)
Male	1.0
Age (years)	
11–14	<b>2.2 (1.3, 3.6)</b>
15–17	1.3 (.8, 1.9)
18+	1.0
Race/ethnicity	
White, Non-Hispanic	1.0
Black, Non-Hispanic	<b>3.8 (2.3, 6.3)</b>
Hispanic	<b>2.0 (1.6, 2.5)</b>
Other, Non-Hispanic	1.6 (1.0, 2.6)
Multiple races	<b>2.1 (1.3, 3.5)</b>
Tobacco product use <sup>h</sup>	
E-cigarettes only	<b>2.5 (1.9, 3.3)</b>
Combustibles only	1.2 (.9, 1.6)
Smokeless tobacco only	1.4 (.9, 2.3)
Multiproduct use	1.0
Perceived tobacco danger <sup>i</sup>	
Agree or strongly agree	<b>2.8 (2.2, 3.6)</b>
Disagree or strongly disagree	1.0
Tobacco product use in household <sup>j</sup>	
Yes	1.0 (.8, 1.1)
No	1.0

Boldface indicates statistical significance at  $p < .05$ . aOR = adjusted odds ratio; CI = confidence interval; NYTS = National Youth Tobacco Survey.

<sup>a</sup>Favorability is defined as a response of “definitely yes” or “probably yes” to the question: Do you think the minimum age to buy tobacco products should be 21?

<sup>b</sup>aOR is obtained using binary logistic regression for survey data, adjusted for covariates listed in the table.

<sup>c</sup>Individuals with missing data on the covariates listed in the table were excluded from the analysis, yielding a sample size of 2,676.

<sup>d</sup>Having access to tobacco products through direct purchase includes those who reported personally buying tobacco from a point of sale in the past 30 days.

<sup>e</sup>Having access to tobacco products through social sources includes those who reported obtaining tobacco products in the past 30 days through either purchasing them from another person, having someone else buy them, asking someone for them, or being offered them by someone.

<sup>f</sup>Having access to tobacco products through some other way includes those who reported obtaining tobacco products in the past 30 days by taking them or through other means not already listed.

<sup>g</sup>Sixty cases with data conflicts were removed from analysis (e.g., answered “I did not get any of my own tobacco products in the past 30 days” and selected at least one of the seven sources for getting tobacco products in the same time period).

<sup>h</sup>Combustibles include cigarettes, cigars, pipes, hookah, and bidis. Smokeless tobacco includes chewing tobacco, snuff, dip, dissolvables, and snus. E-cigarettes only include those who reported current (i.e., in past 30 days) use of e-cigarettes but not any other tobacco product. Combustibles only include those who reported current use of at least one combustible product but neither smokeless tobacco nor e-cigarettes. Smokeless tobacco only includes current use of at least one smokeless tobacco product but not combustibles or e-cigarettes. Multi-product use includes those who reported use of at least one product in more than one category (i.e., e-cigarettes, combustibles, smokeless tobacco).

<sup>i</sup>Respondents were asked “How strongly do you agree with the statement ‘All tobacco products are dangerous’?”

<sup>j</sup>Respondents were asked “Does anyone who lives with you now use any form of tobacco?”