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Smoking Initiation During Young Adulthood: A Longitudinal Study of a Population-Based Cohort

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Abstract

Purpose—To examine the extent to which young adults initiate smoking between the ages of 18 and 21, characterize the frequency and quantity of use among initiators, and examine predictors of initiation.

Methods—Participants included youth who were part of the Minnesota Adolescent Community Cohort Study and had not smoked a whole cigarette prior to age 18 (n=2,034). Initiation in the present study was defined as having smoked a whole cigarette or more between age 18 and 21. Predictors of initiation were measured at age 18 and included sociodemographic characteristics, social influences, and attitudes and beliefs about smoking.

Results—Twenty-five percent (n=510) of participants initiated smoking between 18 and 21. Among those who initiated, the majority (64%) reported smoking during the past 30 days, and approximately one-quarter (24%) reported smoking 100 cigarettes or more. Predictors of young adult initiation included being male, living in a metropolitan area, having friends who smoke, and the belief that smoking can calm someone down when they are angry or nervous.

Conclusions—This study indicates that smoking initiation during young adulthood is not uncommon. These results highlight the need for tobacco prevention programs that target young adults.

Keywords

smoking; tobacco; initiation; young adults; youth

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Introduction

Concern about young adult smoking initiation is growing¹⁻³, likely because young adults have become an important target of tobacco marketing^{4,5}. Young adults have the highest smoking rate of any age group⁶ and, while smoking initiation often occurs before age 18, young adults remain susceptible. A recent review of the literature revealed only 27 articles on young adult smoking initiation in the U.S. and Canada⁷. Documenting the extent to which young adults initiate smoking and what predicts initiation is the focus of the present study.

The few studies examining smoking initiation during young adulthood indicate between 10 and 25 percent of young adults initiate smoking after the age of 18^{1-3, 8-10}. In a large representative sample of over 15,000 college students, 11% reported having their first cigarette at age 19 or later¹⁰. Another study that included both young adults in college and their same age peers not in college found that 25% initiated smoking within a year of high school graduation².

While much research has focused on adolescent initiation, the factors leading to initiation during young adulthood may be different^{11, 12}. Ellickson and colleagues¹², for example, examined smoking initiation during two developmental periods and found that different factors emerged as important. Factors measured at age 13 predicting initiation at age 18 included gender, race, age, family composition, grades, intentions to smoke, alcohol consumption, deviance, and no prior smoking. In contrast, only a few factors measured at age 18 predicted smoking at age 23 including parental education, age, grades, perceived prevalence of peer smoking, and no prior smoking.

Factors predicting initiation during young adulthood may also be different from those predicting other smoking transitions (e.g., escalation) during this time. Wetter et al., for example, examined predictors of various smoking transitions among college students. Despite identifying significant factors of some smoking transitions during this time, none of the factors examined predicted smoking initiation³. Tercyak² also examined smoking transitions during young adulthood and the only significant predictor of smoking initiation one year after high school graduation was 12th grade alcohol use. Further research on large longitudinal studies is needed to better understand factors in the lives of young people that predict smoking initiation during young adulthood.

The current study addresses the relative dearth of research on smoking initiation during young adulthood. The purpose of the present study is to: (1) examine the extent to which young adults initiate smoking between 18 and 21 years of age, (2) characterize the frequency and quantity of tobacco use among initiators, and (3) examine predictors of smoking initiation during young adulthood. This study addresses two important limitations of the current literature. First, smoking initiation is examined among a population-based cohort of young adults, which includes both college students and their same age peers not attending college. Studies of college students may underestimate the extent of young adult initiation, since college students are less likely to smoke than their same age peers not attending college¹³. Second, this study includes frequent data points and a large sample of youth, which increases our ability to characterize the tobacco use among the participants in this cohort and our ability to differentiate those who initiate and those who remain nonsmokers.

Methods

Minnesota Adolescent Community Cohort (MACC) Study Design

This study includes data from the MACC Study. The MACC study is a population-based cohort study that began in 2000. Prior to participant recruitment in Minnesota, the state was divided into 129 areas thought to reflect the local tobacco control environment, from which 60 were randomly selected. A combination of probability and quota sampling methods (to assure equal age distribution) was then used to recruit participants. Recruitment was conducted by telephone by Clearwater Research, Inc., using modified random digit dial (RDD) sampling. Households were called to identify those with at least one teenager between the ages of 12 and 16, and within eligible households, respondents were selected at random from among age quota cells that were still open (response rate: 58.5%). In 2000, participants were between 12 and 16 years of age and included youth living in Minnesota, as well as four other upper Midwest states (North Dakota, South Dakota, Kansas, and Michigan). An additional cohort of 12 year old participants (n=584) were recruited in 2001, for a total sample of 4,825 participants.

Participants completed telephone surveys every six months that included questions about smoking-related attitudes and behaviors. Response rates have remained high throughout the study (Round 15 (October 2007–March 2008) response rate: 60.5%). Telephone interviews lasted 10 to 20 minutes, depending on the smoking status of the participant. The interview was structured so that spoken responses would not be revealing to anyone overhearing the participant. Participants received \$15 for completion of each survey. Additional details about the study can be found elsewhere¹⁴. The University of Minnesota Institutional Review Board approved this study.

Present Study

The present study includes seven rounds of data collected when participants were between 18 and 21 years of age. Inclusion criteria were completing three or more interviews between the ages of 18 and 21, and reporting never having smoked a whole cigarette by age 18, yielding a final sample of 2,034 participants.

Measures

Outcome Variable

Smoking Initiation: Participants who reported having smoked a whole cigarette or more between the ages of 18 and 21 were considered to have initiated smoking.

Predictor Variables—The predictor variables were all measured at age 18, with the exception of educational enrollment which was assessed at age 19. Two major theoretical models guided variable selection for the present study: Social Learning Theory¹⁵ which emphasizes the modeling and reinforcement of behavior by family members and peers and the Theory of Reasoned Action¹⁶ which emphasizes social normative perceptions that influence behavior. Sociodemographic characteristics included were gender, race, parent education, residence, and educational enrollment. Details are provided below.

Race: Race is a 6-level variable where “1” denotes African American or Black, “2” American Indian or Alaskan Native, “3” denotes Asian, “4” denotes Hispanic or Latino, “5” denotes White, and “6” denotes another race.

Parent Education: Participants indicated the highest level of education completed by their mother and father separately. A 4-level variable representing the highest level of education

completed by either their mother or father was created where “1” denotes less than high school, “2” denotes high school diploma or GED, “3” denotes some college or associates degree, and “4” denotes college/graduate degree.

Residence: A 9-level rural-urban continuum code was assigned based on the county in which the participant lived at age 18. The rural-urban continuum code is based on the 2003 definition of metropolitan and nonmetropolitan counties established by the Office of Management and Budget (<http://www.ers.usda.gov/briefing/rurality/ruralurbcon/>) and classifies counties by degree of urbanization and proximity to a metropolitan area. The 9-levels were recoded to represent metropolitan (codes 1–3) and nonmetropolitan counties (codes 4–9).

Educational Enrollment: Educational enrollment was assessed at age 19 and is a 3-level variable where “1” denotes not enrolled, “2” denotes enrollment in a 2-year college or technical school, and “3” denotes enrollment in a 4-year college.

Perceived Prevalence of Smoking: Participants indicated on a five-point scale their perceptions of how many adults and peers smoke cigarettes (1=Almost all of them, 2=most, 3=some, 4=a few, and 5=none). For analysis purposes, the five categories were reduced to three categories (most or all of them, some, and a few or none).

Bother Parents: Participants were asked how much it would bother their parents if they smoked. Response options included: a lot, a little, or not at all. A dichotomous variable was created for analysis purposes where “0” denotes a little or not at all and “1” denotes a lot.

Household Smoking: Participants indicated if anyone in their current household smokes (0=no, 1=yes).

Household Smoking Ban: Participants indicated whether smoking is allowed by residents or guests inside their current residence (0=no, 1=yes).

Friend Smoking: Participants indicated the number of their four best friends who smoke cigarettes (0–4).

Functional Meaning: On a five-point Likert-type scale (1=strongly agree, 5=strongly disagree), participants were asked to indicate their agreement with the following items: “When a person is feeling down, a cigarette can really make them feel better”; “Cigarettes can help people control their weight”; and “When someone’s angry or nervous, a cigarette can calm them down”. Higher scores on each variable represent greater perceived utility of tobacco use.

Negative Perception of the Tobacco Industry: Using a five-point Likert-type scale (1=strongly agree, 5=strongly disagree), participants indicated their agreement with the following three statements: “Cigarette companies are trying to get young people to smoke” “Cigarette companies get too much blame for young people smoking” “Cigarette companies are making too much money off of young people”. All items were coded so that higher scores represented a more negative perception of the tobacco industry. The three items were averaged for analysis purposes ($\alpha=.58$).

Data Analytic Strategy—First, we identified how many young adults initiated smoking during young adulthood (defined as those who smoked at least a whole cigarette between 18 and 21). Among those who initiated, we examined the highest level of smoking reported

between ages 18 and 21 and those who reported smoking 100 cigarettes or more in their lifetime. Next, chi-square analyses were used to examine differences between the young adults who initiated smoking and those who did not on a variety of socio-demographic characteristics. Following the chi-square analyses, multivariate logistic regression models were performed to identify significant predictors of smoking initiation ($p < 0.05$) during young adulthood after controlling for all other variables in the model. These models included all variables that were significant at the traditional $p < .05$ cutoff from the chi-square analyses. Interaction terms were also included where theoretically relevant. All analyses were conducted in SAS 9.1¹⁷.

Results

The characteristics of the study participants are shown in Table 1. Approximately an equal number of males and females participated in the study (49% vs. 51%). The majority of respondents were White (89%) and lived in a metropolitan area at age 18 (65%). Over half of the respondents had a parent with a college degree (58%), and over half were enrolled in a four-year college themselves (59%).

Of the 2,034 participants who were nonsmokers through age 18, one-quarter ($n=510$) initiated smoking between 18 and 21 years of age. Of those who initiated we examined the highest level of smoking reported between 18 and 21; 36% ($n=185$) reported having ever smoked a whole cigarette but did not smoke in the past 30 days (< monthly smoker), 21% ($n=107$) indicated smoking in the past 30 days but not in the past week (experimenter), 25% ($n=128$) reported smoking in the past 7 days, but <20 days in the past month (regular smoker), and 18% ($n=90$) reported smoking 20 or more days of the past 30 (established smoker). Nearly one-quarter (24%; $n=123$) of the initiators indicated smoking 100 cigarettes or more between the ages of 18 and 21.

Chi-square analyses revealed significant associations between smoking initiation during young adulthood and several socio-demographic characteristics (see Table 2). Participants who were male, White or American Indian, lived in a metropolitan area, lived with someone who smoked, had more friends who smoked, and believed smoking would lift one's mood, was good for controlling weight, and had a calming effect were also more likely to initiate smoking compared to their counterparts.

Logistic regression results showed that a number of these associations remained significant after controlling for age at study entry and the other variables we found to be associated with smoking initiation in the bivariate analyses at the traditional cutpoint of $p < .05$ (see Table 2). Initially, interaction terms were included in the logistic regression model to assess if the relationship between the functional meeting (e.g., smoking lifts mood, smoking controls weight, and calms one down) items and smoking differed by gender. None of the interaction terms were significant so they were removed from the model. In the final model, males had a greater odds of initiating smoking, compared to females. African American and Asian youth had lower odds of initiating smoking than White youth. Participants who were living in a nonmetropolitan area had lower odds of initiating than those living in a metro area. Having friends who smoked and stronger beliefs that smoking can calm someone down were both associated with increased odds of initiating smoking.

Conclusions

The purpose of this study was to examine the extent to which young adults initiate smoking and to examine factors differentiating young adults who initiated smoking and those who remained nonsmokers. One-quarter of the young adults in this study began smoking between the ages of 18 and 21. While national data on young adult smoking initiation is limited, data

from the 2009 National Health Interview Survey indicate that 38 percent of smokers aged 18 to 25 initiated regular smoking after age 18¹⁸. Thus, the results of the present study seem consistent with the limited national data available. Young adult initiation is of particular concern because it is a strong predictor of adult smoking. One study found that 72% of young adult smokers continued smoking into adulthood¹⁹, underscoring the importance of tobacco prevention efforts to reach the young adult population.

The rate of initiation in this study is in the upper range of those reported in previous studies^{1-3, 9, 10}. This may be, in part, due to our inclusion of young adults not attending college, who are more likely to smoke than college students. It is also possible that this reflects a less stringent definition of initiation as having smoked a whole cigarette or more. We found, however, the majority of participants who initiated smoking in this study did so with some regularity. Among those who initiated, we found the majority (64%) reported smoking during the past 30 days, and approximately one-quarter (24%) reported smoking 100 cigarettes or more between the ages of 18 and 21.

While few predictors of young adult initiation have been identified in previous studies, several of the socio-demographic characteristics we examined were significant predictors of initiation. Gender was an important predictor, with 30% of males initiating smoking compared to 20% of females. Findings from previous studies on young adult initiation have been equivocal, with some studies indicating that males are more likely to initiate smoking during young adulthood¹, and others showing no gender differences in young adult initiation². More research is needed to better understand the relationship between gender and young adult initiation, but our results suggest that perhaps there is a need to focus on males.

Young adults living in non-metropolitan areas being less likely to initiate than those living in metropolitan areas was a somewhat surprising because it is well established that adolescents and adults living in rural (or non-metropolitan) areas are more likely to smoke than those living in metropolitan areas^{20, 21}. This finding may reflect differences in age of initiation among rural and urban youth. Rural youth may be more likely to initiate at younger ages than youth living in metropolitan areas. Although initiation is occurring, later initiation among youth living in metropolitan areas may be considered a more positive outcome, as early initiation of substances often leads to less favorable outcomes^{22, 23}.

Having friends who smoke has been well established as a risk factor for adolescent smoking²⁴⁻²⁶, and these results suggest that having friends who smoke continue to be a risk factor in young adulthood. Research on adolescents suggests that having friends who smoke during adolescence may be more influential for nonsmokers than for smokers²⁵. This may be the case for young adults as well, as number of friends who smoke has been related to smoking initiation, but not progression².

Beliefs about the functional meaning of tobacco were also significant predictors of smoking initiation. The belief that smoking can calm someone down when they are angry or nervous was a significant predictor of initiation. Interventions to prevent the initiation of smoking among young adults will need to address individual attitudes towards smoking. These factors may be particularly important for young adults, as smoking may be perceived as a mechanism for coping with important, and perhaps stressful, life changes¹¹.

In the present study, we did not find an association between education and smoking initiation, despite studies^{13, 27} reporting a difference in smoking status among young adults by education. We only examined educational status at age 19, and educational enrollment can fluctuate during young adulthood. These fluctuations may account for the lack of association between educational enrollment and smoking initiation in the present study. It is

also possible that differences in smoking initiation among youth who attend college and their same age peers not attending college occurred prior to young adulthood; that is, youth who are not college bound begin smoking at earlier ages. This hypothesis is consistent with research that suggests that youth with higher educational aspirations in high school are less likely to smoke²⁸.

This study has several limitations that should be considered when interpreting the results. First, we only examined smoking initiation based on a cohort within the Midwestern United States and may not be generalizable to other areas of the country. Relatedly, the sample was primarily White. While this matches the demographics of the states included, the findings of this study may not generalize to states with a different racial and ethnic composition. In addition, due to the small number of participants of certain race/ethnicities, the results presented regarding racial differences in initiation should be interpreted with caution. Another potential limitation is that while the Minnesota cohort was designed to be representative of youth in Minnesota at its inception, the cohort may no longer be representative due to attrition that has occurred during the eight-year study period. We have, however, maintained a high response rate throughout this study. Also, this study includes a large and diverse sample of young adults that were drawn from a population-based cohort, which likely provides a more accurate assessment of young adult smoking initiation than would have been obtained from other sampling methods. Finally, we did not measure alcohol consumption, which has been shown to be a predictor of smoking onset during young adulthood^{2, 29}. While these limitations exist, this study addresses an important limitation of the current literature on young adult smoking by including a population-based cohort of young adults.

Implications and Contribution

In conclusion, smoking initiation was observed in 25% of young adults between 18 and 21. The acquisition of smoking is not uncommon among young adults and indicates the need for young adult targeted prevention efforts.

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References

1. Myers MG, Doran NM, Trinidad DR, Wall TL, Klonoff EA. A prospective study of cigarette smoking initiation during college: Chinese and Korean American students. *Health Psychol.* 2009 Jul; 28(4):448–456. [PubMed: 19594269]
2. Tercyak KP, Rodriguez D, Audrain-McGovern J. High school seniors' smoking initiation and progression 1 year after graduation. *Am J Public Health.* 2007 Aug; 97(8):1397–1398. [PubMed: 17600259]
3. Wetter DW, Kenford SL, Welsch SK, Smith SS, Fouladi RT, Fiore MC, et al. Prevalence and predictors of transitions in smoking behavior among college students. *Health Psychol.* 2004 Mar; 23(2):168–177. [PubMed: 15008662]
4. Sepe E, Glantz SA. Bar and club tobacco promotions in the alternative press: targeting young adults. *Am J Public Health.* 2002 Jan; 92(1):75–78. [PubMed: 11772765]

5. Sepe E, Ling PM, Glantz SA. Smooth moves: bar and nightclub tobacco promotions that target young adults. *Am J Public Health*. 2002 Mar; 92(3):414–419. [PubMed: 11867322]
6. Substance Abuse and Mental Health Services Administration. Results from the 2008 National Survey on Drug Use and Health: National Findings. Rockville, MD: Office of Applied Studies, NSDUH2009 Contract No.: Series H-36, HHS Publication No SMA 09-4434;
7. Freedman KS, Nelson NM, Feldman LL. Smoking initiation among young adults in the United States and Canada, 1998–2010: a systematic review. *Prev Chronic Dis*. 2012 Jan.9:E05. [PubMed: 22172172]
8. Costa F, Jessor R, Turbin M. College student involvement in cigarette smoking: the role of psychosocial and behavioral protection and risk. *Nicotine Tob Res*. 2007 Feb; 9(2):213–224. [PubMed: 17365752]
9. Everett SA, Husten CG, Kann L, Warren CW, Sharp D, Crossett L. Smoking initiation and smoking patterns among US college students. *J Am Coll Health*. 1999 Sep; 48(2):55–60. [PubMed: 10500367]
10. Wechsler H, Rigotti NA, Gledhill-Hoyt J, Lee H. Increased levels of cigarette use among college students: a cause for national concern. *JAMA*. 1998 Nov 18; 280(19):1673–1678. [PubMed: 9831998]
11. Chassin L, Presson CC, Sherman SJ, Edwards DA. Four pathways to young-adult smoking status: adolescent social-psychological antecedents in a midwestern community sample. *Health Psychol*. 1991; 10(6):409–418. [PubMed: 1765036]
12. Ellickson PL, McGuigan KA, Klein DJ. Predictors of late-onset smoking and cessation over 10 years. *J Adolesc Health*. 2001 Aug; 29(2):101–108. [PubMed: 11472868]
13. Green MP, McCausland KL, Haijun X, Duke JC, Vallone DM, Heaton CG. A closer look at smoking among young adults: Where tobacco control should focus its attention. *American Journal of Public Health*. 2007; 97(8):1427–1433. [PubMed: 17600242]
14. Forster JL, Chen V, Perry CL, Oswald J, Willmorth M. The Minnesota Adolescent Community Cohort Study: Design and baseline results. *Prevention Science*. 2011; 12(2):201–210. [PubMed: 21360063]
15. Bandura, A. *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall; 1977.
16. Ajzen, I.; Fishbein, M. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice Hall; 1980.
17. SAS Institute Inc.. Cary, North Carolina USA: 2001.
18. National Center for Health Statistics. National Health Interview Survey, 2009. Atlanta, GA: U.S. Centers for Disease Control and Prevention; 2009. Available from: http://www.cdc.gov/NCHS/nhis/nhis_2009_data_release.htm.
19. Chassin L, Presson CC, Rose JS, Sherman SJ. The natural history of cigarette smoking from adolescence to adulthood: demographic predictors of continuity and change. *Health Psychol*. 1996 Nov; 15(6):478–484. [PubMed: 8973929]
20. Hebert R. What's new in Nicotine & Tobacco Research? *Nicotine Tob Res*. 2008 Feb; 10(2):247–252. [PubMed: 18236289]
21. Martino SC, Ellickson PL, McCaffrey DF. Developmental trajectories of substance use from early to late adolescence: a comparison of rural and urban youth. *J Stud Alcohol Drugs*. 2008 May; 69(3):430–440. [PubMed: 18432386]
22. Merline A, Jager J, Schulenberg JE. Adolescent risk factors for adult alcohol use and abuse: stability and change of predictive value across early and middle adulthood. *Addiction*. 2008 May; 103(Suppl 1):84–99. [PubMed: 18426542]
23. Zucker RA. Anticipating problem alcohol use developmentally from childhood into middle adulthood: what have we learned? *Addiction*. 2008 May; 103(Suppl 1):100–108. [PubMed: 18426543]
24. Flay BR, Hu FB, Siddiqui O, Day LE, Hedeker D, Petraitis J, et al. Differential influence of parental smoking and friends' smoking on adolescent initiation and escalation of smoking. *J Health Soc Behav*. 1994 Sep; 35(3):248–265. [PubMed: 7983337]

25. Hu FB, Flay BR, Hedeker D, Siddiqui O, Day LE. The influences of friends' and parental smoking on adolescent smoking behavior: The effects of time and prior smoking. *Journal of Applied Social Psychology*. 2006; 25(22):2018–2047.
26. Kobus K. Peers and adolescent smoking. *Addiction*. 2003 May; 98(Suppl 1):37–55. [PubMed: 12752361]
27. Lawrence D, Fagan P, Backinger C, Gibson J, Hartman A. Cigarette smoking patterns among young adults aged 18–24 years in the United States. *Nicotine Tob Res*. 2007 Jun; 9(6):687–697. [PubMed: 17558826]
28. Tyas SL, Pederson LL. Psychosocial factors related to adolescent smoking: a critical review of the literature. *Tob Control*. 1998 Winter;7(4):409–420. [PubMed: 10093176]
29. Reed M, Wang R, Shillington A, Clapp J, Lange J. The relationship between alcohol use and cigarette smoking in a sample of undergraduate college students. *Addict Behav*. 2007 Mar; 32(3): 449–464. [PubMed: 16844313]

Table 1

Demographic Characteristics of Study Participants (N=2034)

Demographic Characteristics	N (%)
<i>Gender</i>	
Male	994 (48.9%)
Female	1040 (51.1%)
<i>Race/Ethnicity</i>	
African American or Black	81 (4.0%)
American Indian or Alaskan Native	23 (1.1%)
Asian	45 (2.2%)
Hispanic or Latino	37 (1.8%)
White	1802 (88.6%)
Another Race	46 (2.3%)
<i>Parent Education</i>	
Less than High School	12 (<1%)
High School Diploma or GED	317 (17.3%)
Some College or Associates Degree	440 (24.0%)
College Degree/Graduate Degree	1064 (58.1%)
<i>Residence</i>	
Metropolitan	1321 (65.2%)
Nonmetropolitan	706 (34.8%)
<i>Age 19 Educational Enrollment</i>	
Not Enrolled	405 (22.4%)
2-Year College/Technical School	342 (18.9%)
4-Year College	1064 (58.8%)

Table 2

Chi-Square and T-Test Results Examining Association Between Age 18 Predictor Variables and Young Adult Initiation.

Categorical Predictor Variables	Nonsmokers (n=1524) N (%)	Initiators (n=510) N (%)	Chi-Square	p-value
<i>Gender</i>			24.91	<.001
Male	696 (70.0)	298 (30.0)		
Female	828 (79.6)	212 (20.4)		
<i>Race/Ethnicity</i>			9.61	.048
African American or Black	69 (85.2)	12 (14.8)		
American Indian or Alaskan Native	17 (73.9)	6 (26.1)		
Asian	39 (86.7)	6 (13.3)		
Hispanic or Latino	30 (81.1)	7 (18.9)		
White	1331 (73.9)	471 (26.1)		
<i>Parent Education</i>			.52	.915
Less than High School	9 (75.0)	3 (25.0)		
High School Diploma for GED	232 (73.2)	85 (26.8)		
Some College or Associates Degree	329 (74.8)	111 (25.2)		
College Degree/Graduate Degree	800 (75.2)	264 (24.8)		
<i>Residence</i>			4.30	.038
Metropolitan	970 (73.4)	351 (26.6)		
Nonmetropolitan	548 (77.6)	158 (22.4)		
<i>Age 19 Educational Enrollment</i>			1.91	.385
Not Enrolled	300 (74.1)	105 (25.9)		
2-Year College/Technical School	248 (72.5)	94 (27.5)		
4-Year College	809 (76.0)	255 (24.0)		
<i>Perceived Prevalence of Peer Smoking</i>			2.10	.349
Most or All of Them	272 (72.5)	103 (27.5)		
Some	891 (76.0)	281 (24.0)		
A Few or None	359 (74.0)	126 (26.0)		
<i>Perceived Prevalence of Adult Smoking</i>			1.56	.459
Most or All of Them	247 (77.7)	71 (22.3)		
Some	1052 (74.4)	363 (25.7)		
A Few or None	222 (74.5)	76 (25.5)		
<i>Bother Parents if Smoked</i>			3.75	.053
A lot	1344 (79.3)	351 (20.7)		
A little or not at all	149 (73.4)	54 (26.6)		
<i>Someone in Household Smokes</i>			4.32	.038
Yes	347 (71.4)	139 (28.6)		
No	1174 (76.1)	369 (23.9)		
<i>Household Smoking Ban</i>			3.18	.075
Yes	1287 (75.8)	412 (24.3)		

Categorical Predictor Variables	Nonsmokers (n=1524) N (%)	Initiators (n=510) N (%)	Chi-Square	p-value
No	231 (71.1)	94 (28.9)		
Continuous Predictor Variables	M (SD)	M (SD)	t	p-value
<i>Number of Four Best Friends who Smoke (0–4)</i>	.60 (.96)	.80 (1.02)	4.02	<.001
<i>Smoking Lifts Mood (1–5)</i>	1.55 (.94)	1.66 (1.00)	2.36	.018
<i>Smoking Helps Control Weight (1–5)</i>	1.84 (1.13)	2.02 (1.26)	2.83	.005
<i>Smoking Calms One Down (1–5)</i>	2.09 (1.25)	2.40 (1.29)	4.75	<.001
<i>Negative Perception of the Tobacco Industry (1–5)</i>	4.18 (.82)	4.11 (.86)	1.69	.092

Table 3Logistic Regression Results Predicting Young Adult Initiation[/]

Variable	Initiators (n=510) vs. Nonsmokers (n=1524)	
	OR	95% CI
Gender (Male vs. Female)	1.68	1.37, 2.07
Race/Ethnicity		
African American or Black vs. White	.50	.26, .94
American Indian or Alaskan Native vs. White	.99	.38, 2.60
Asian vs. White	.40	.16, .95
Hispanic or Latino vs. White	.63	.27, 1.47
Other Race vs. White	.56	.25, 1.22
Residence (Non-Metro vs. Metro)	.79	.63, .98
Number of Friends Who Smoke (0–4)	1.20	1.08, 1.33
Someone in Household Smokes (None vs. Someone)	.83	.65, 1.06
Smoking Lifts Mood	.96	.84, 1.09
Smoking Helps Control Weight (1–5)	1.05	.94, 1.16
Smoking Calms One down (1–5)	1.15	1.03, 1.28

[/] Age of study entry was included in the model as a covariate