HHS Public Access

Author manuscript

Prev Med. Author manuscript; available in PMC 2018 November 01.

Published in final edited form as:

Prev Med. 2017 November ; 104: 63–70. doi:10.1016/j.ypmed.2017.06.019.

Beyond education and income: Identifying novel socioeconomic correlates of cigarette use in U.S. young adults

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Abstract

Young adulthood is defined by transitions in family life, living situations, educational settings, and employment. As a result, education and income may not be appropriate measures of socioeconomic status (SES) in young people. Using a national sample of young adults aged 18–34 (n = 3364; collected February 2016), we explored novel socioeconomic correlates of ever cigarette use, past 30-day cigarette use, and daily cigarette use, weighted to account for non-response. Measures of SES assessed current education, household income, employment status, and subjective financial situation (SFS) and childhood SES (maternal and paternal education, SFS during childhood, parental divorce before age 18). Parental smoking during childhood was examined in sensitivity analyses. The highest prevalence of ever cigarette use was in young adults whose parents divorced before age 18 (57% vs. 47% overall). In general, current education, subjective financial status, and parental education were inversely correlated with past 30-day and daily cigarette use in bivariate analyses. In multivariable Poisson regression models controlling for age, gender, race/ethnicity, and other SES measures, lower education and poorer SFS were most strongly correlated with ever and past 30-day cigarette use. Lower maternal education emerged as the strongest correlate of daily smoking, conferring a twofold higher prevalence of daily smoking compared to maternal education of a Bachelor's degree or greater. Current household income was not a strong predictor of any cigarette use outcome. Novel measures like SFS may improve estimates of socioeconomic disadvantage during this developmental stage.

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Conflict of interest

The authors declare that there is no conflict of interest.

Keywords

Socioeconomic factors; Health status disparities; Smoking; Tobacco use; Young adult

1. Introduction

Tobacco use, particularly cigarette smoking, remains the greatest preventable cause of death in the United States, responsible for > 480,000 deaths per year (U.S. Department of Health and Human Services, 2014). Estimates from the 2015 National Health Interview Survey indicate that 13.0% of 18–24 year olds are current smokers compared to 24.4% in 2005 when young adults had the highest smoking prevalence of all adult age groups (Jamal et al., 2016). However, even in 2015, the highest adult smoking prevalence remains in subgroups marked by socioeconomic disadvantage: those with lower education, below the poverty level, and on Medicaid or uninsured (Jamal et al., 2016).

Recent studies highlight that smoking onset is highest in young adults, compared to adolescent (Thompson et al., 2017) and older adult populations (Yi et al., 2017). Data from the 2002–2003 and 2010–2011 cohort samples of the Tobacco Use Supplement to the Current Population Survey show that the strongest risk factor for cigarette smoking initiation in adults over a one-year follow-up period is having less than a high school education (Yi et al., 2017). Socioeconomic status also influences continued cigarette smoking beyond initiation: in 2003, smoking prevalence among non-college educated young adults aged 18–34 was twice as high as smoking prevalence among college-educated young adults (Green et al., 2007). Similarly, low-income young adults aged 18–30 had higher current, daily, and nondaily smoking rates than those with higher incomes (Fagan et al., 2007). Using more recent data, the prevalence of cigarette smoking in young adults in 2011–2013 was documented to be significantly higher among those living below the poverty level or having less than a college education (Higgins et al., 2016).

Population studies in the U.S. indicate that younger age (18–29) and lower education independently predict lower cessation and higher relapse to smoking (Yi et al., 2017). Lower cessation in those of lower socioeconomic status persists when examining young adults alone. A cross-sectional study using 2003 data estimated a lower prevalence of quit attempts in non-college educated young adults compared to those who were college-educated (Green et al., 2007). A prospective cohort study of young adults aged 18–24 found lower cessation rates at one-year follow-up among those with lower education (Solberg et al., 2007), which was largely explained by the higher prevalence of daily smoking among those with a high school education or less. A large study comparing recent successful quitters (quit 7–24 months ago and had not relapsed) to current smokers with a failed past-year quit attempt showed that those of younger age (ages 18–34) and lower education were more likely to be in the group that failed to quit (Lee and Kahende, 2007). Together, these studies highlight that socioeconomically-disadvantaged young adults are at risk for higher smoking onset, continued cigarette smoking, and lower smoking cessation, leading to tobacco-related health disparities.

Existing estimates of the relationship between socioeconomic status and cigarette use, however, must be considered in the context of young adulthood, a period bridging adolescence and adulthood that is marked by transitions in family life, living situations, educational settings, and employment (Arnett, 2000). Conventional indicators of socioeconomic status (e.g., educational attainment, income) vary during young adulthood, particularly among those aged 18–24, who are in the midst of obtaining post-secondary education or becoming employed. Similarly, traditional measures of socioeconomic status often used for adolescents, such as household income during childhood and parental education, may not capture current socioeconomic status during young adulthood and the establishment of an independent identity. In response to the limitations of traditional measures of socioeconomic status, subjective measures of social or financial status have been developed and shown to be valid predictors of health in youth (Goodman et al., 2001; Goodman et al., 2007; Karvonen and Rahkonen, 2011; Piko and Fitzpatrick, 2007) and young adults (Finch et al., 2013; Williams et al., 2016).

The purpose of this study was to provide updated estimates of the prevalence of cigarette smoking (ever, past 30-day, and daily) across various measures of socioeconomic status (current and childhood) using recent data from a national sample of young adults aged 18–34.

2. Methods

2.1. Study sample

The Truth Initiative Young Adult Cohort Study was designed to understand the trajectories of tobacco use in a young adult population using a longitudinal cohort sample. Details of the cohort have been described elsewhere (Rath et al., 2012). Briefly, the cohort is comprised of a nationally representative sample of young adults ages 18–34 drawn from GfK's KnowledgePanel®. The wide age range for young adults in this study was informed by prior research on smoking behaviors in young adults (Green et al., 2007). KnowledgePanel® is an online panel of adults ages 18 and older that covers both the online and offline populations in the U.S. (http://www.gfk.com/about-gfk/about-gfk/). The panel was recruited via address-based sampling, a probability-based random sampling method that provides statistically valid representation of the U.S. population, including cell phone-only households. African American and Hispanic young adults were oversampled to ensure sufficient sample sizes for subgroup analyses. The validity of this methodology has been reported previously (Chang and Krosnick, 2009; Yeager et al., 2011), and it has been used broadly in the peer-reviewed medical literature (Fowler et al., 2013; Grande et al., 2013; Kumar et al., 2012; Rhodes et al., 2015; Seckin et al., 2016). The baseline survey (Wave 1; n = 4201) was conducted in July 2011, with subsequent assessments occurring approximately every 6 months; the study is ongoing with the most recent Wave 10 conducted in October 2016. The cohort is refreshed at each wave to maintain the initial sample size.

The current study uses data from 18 to 34-year old respondents to the Wave 9 survey (February 2016; N = 3364). The Wave 9 panel recruitment rate (RECR) was 13.2% (American Association for Public Opinion Research, 2015). In 63.9% of the identified households, one member completed a core profile survey in which the key demographic

information was collected (profile rate—PROR). For this particular study, only one panel member per household was selected at random to be part of the study sample and no members outside the panel were recruited. The response rate (RR6) was 60.7%. Thus, the cumulative response rate (CUMRR1; the product of these three rates) was 5.1% for Wave 9. Wave 9 of data collection was approved by the Chesapeake Institutional Review Board, Inc., and online consent was collected from participants before survey self-administration.

2.2. Measures

2.2.1. Socioeconomic status—Measures of socioeconomic status (SES) assessed current SES at Wave 9 and childhood SES at study entry.

2.2.1.1. Current socioeconomic status: Three objective SES measures commonly used for adults were selected for this analysis: respondent-level annual household income, educational attainment, and employment status. Annual household income was determined using items that yielded a 19-category variable ranging from "<$5000" to "$175,000 or over per year". For the purpose of this analysis, household income was collapsed into four categories based on the distribution (quartiles): "<$30,000", "$30,000–$59,999", "$60,000–$84,999" and "$85,000 or more". Respondent education reflected the highest level of education completed by the participant with response options ranging from "Elementary or middle school, but no high school" to "Doctoral or professional degree (PHD, JD, MD)". Responses were collapsed into four categories: less than high school, high school, some college or Associate's Degree, and Bachelor's or Graduate degree. Current job or paid employment status was assessed with a single item that had four response options: "work full-time (35 h/week or more)", "work part-time (15–34 h/week)", "work part-time (<15 h/week)", and "don't currently work for pay".

The subjective financial status measure was developed and validated in the Truth Initiative Young Adult Cohort Study (Williams et al., 2016). This measure has been shown to be positively correlated with traditional SES measures of household income and education, yet the magnitude of the correlations differ significantly by age group (18–24 vs. 25–34) (Williams et al., 2016). The item asked: "Considering your own income and the income from any other people who help you, how would you describe your overall personal financial situation?" Response options consisted of: 1) live comfortably; 2) meet needs with a little left; 3) just meet basic expenses; and 4) don't meet basic expenses.

2.2.1.2. Childhood socioeconomic status: Childhood SES and parental divorce during childhood have been shown to increase risk for smoking in adulthood (Lacey et al., 2011; Martindale and Lacey, 2017). Additionally, the relationship between parental divorce during childhood and adult smoking is mediated by socioeconomic factors (Lacey et al., 2011). Maternal and paternal education, commonly used to assess SES among adolescents, were included as well as parental divorce before age 18 and a subjective measure of childhood financial status. These items were asked at the time of study entry, with 81% of participants completing these items prior to Wave 9. Separate items for maternal and paternal education reflected the highest level of education completed by the parent with response options ranging from "No formal education" to "Doctoral or professional degree (PHD, JD, MD)".

For both items, response options were collapsed into four categories: less than high school, high school, some college or Associate's Degree, and Bachelor's or Graduate degree. Parental divorce before age 18 was comprised of two items. The first asked "Are your parents divorced?" with response options "yes", "no", "mother, father or both parents died", and "parents never married". Those who responded "yes" were then asked, "how old were you when your parents divorced?" Participants whose parents had divorced before age 18 were treated as "yes", and those whose parents had not divorced, had divorced after age 18, or were missing age at parental divorce were treated as "no". The categories "one or more parent died" and "parents never married" were retained in this new four-level categorical variable. Those who did not respond to either question were treated as missing.

Subjective childhood financial status is a measure used by the Health and Retirement Study (University of Michigan, 1998) which asked: "Think about your family when you were growing up, from birth to age 16. Would you say your family during that time was pretty well off financially, about average, or poor?" 1) Pretty well off financially; 2) about average; 3) poor; 4) it varied.

2.2.2. Cigarette smoking—Cigarette smoking were assessed at Wave 9. All participants were asked about ever having tried a cigarette, even one puff (yes/no). Past 30-day cigarette smoking was defined as dichotomous variable based on smoking on one or more days during the past 30 days; those who were never users or smoked on 0 days in the past 30 days were treated as "no". Among past 30-day smokers, daily smoking was defined as smoking on at least 25 of the past 30 days, which has been used as a cut-point in other studies (Berg et al., 2010).

The relationship between childhood socioeconomic disadvantage and adult smoking has been shown to be mediated by exposure to parental smoking (Fergusson et al., 2007). Parental smoking is also a mediator of the association between parental education and nicotine dependence in young adulthood (Pedersen and Soest, 2017). Parental smoking during childhood was assessed at study entry using the following item: "Did your parents or guardians smoke during your childhood?" with response options "yes, one of them", "yes, both of them", and "no, none of them". The two "yes" categories were collapsed to create a dichotomous variable.

2.2.3. Covariates—Sociodemographic characteristics included age (categorized into two groups 18–24 and 25–34), gender, and race/ethnicity (white, non-Hispanic; black, non-Hispanic; other, non-Hispanic; Hispanic) assessed at study entry. GfK conducted hot deck imputation to handle missing data on age, gender, race/ethnicity, education level, and household income (Andridge and Little, 2010). Missing data for household income were imputed for 15.8% of cases, which reflects a comparable rate of missing household income data in the Current Population Survey (CPS). This method of imputation is also used by the U.S. Census Bureau to handle item non-response to the CPS.

2.3. Data analyses

All analyses were performed using Stata/SE 14.2 (StataCorp, 2017) in January 2017. Post-stratification weights were used to offset any non-response or non-coverage bias and

produce nationally representative estimates specific to each wave of data collection. Missing data were handled with list-wise deletion per Stata's survey procedures.

Bivariate analyses were conducted using the survey commands in Stata to provide the distribution of SES characteristics by age (18–24 vs. 25–34). Additional bivariate analyses estimated the prevalence of ever, past 30-day, and daily cigarette smoking by the various SES measures. Differences in prevalence estimates were assessed using p values from bivariate Poisson models with robust variance estimation adjusted for survey weights due to high prevalence of each outcome (Zou, 2004). Separate multivariable Poisson models with robust variance were used to examine the correlations between SES measures and the prevalence of ever, past 30-day, and daily cigarette smoking, controlling for age, gender, and race/ethnicity. Prevalence ratios were used instead of odds ratios, as odds ratios overstate effects when outcomes are common (Greenland, 2004; McNutt et al., 2003; Pearce, 2004; Robbins et al., 2002). First, a full model was run that included all SES measures. Using the findings from the full model, a final model was run that included age, gender, race/ethnicity, and any SES measure that had a significant correlation with the outcome at $p < 0.05$ in the full model.

Given the known association between parental smoking and cigarette use in adolescents (Bauman et al., 2001; Chassin et al., 1986; Chassin et al., 1984; Mays et al., 2014; Villanti et al., 2011) and influence of parental smoking on the pathway between childhood socioeconomic disadvantage and adult smoking (Fergusson et al., 2007; Pedersen and Soest, 2017), we conducted sensitivity analyses to examine whether correlations between childhood SES and the cigarette use outcomes, in particular, were confounded by parental smoking during childhood. Bivariate analyses were conducted for parental smoking during childhood with all SES measures and with all cigarette use outcomes. Parental smoking was added to the full multivariable Poisson model for each cigarette use outcome to determine the impact on the coefficients for the SES covariates.

3. Results

Of the 3364 participants included in these analyses, 31% were aged 18–24 years and 69% were aged 25–34. Slightly more than half (51%) were female, 58% were non-Hispanic white, 13% were non-Hispanic black, 21% were Hispanic, and 8% were another race.

Table 1 presents current and childhood socioeconomic status by age group. Overall, the majority of the sample had currently completed at least some college education (64%), 35% reported a current household income of $60,000 or greater, 65% reported a subjective financial status of "meet needs with a little left" or "live comfortably", and 52% reported working full-time. More than half of participants reported maternal (57%) or paternal (51%) education of some college or more, 67% perceived that they were "about average" or "pretty well off financially" during childhood, and 60% did not have parents who divorced before age 18. There were few differences in SES by age group: a significantly greater proportion of those aged 25–34 had completed a Bachelor's degree or greater compared to those aged 18–24 ($p < 0.001$). Similarly, a greater proportion of those aged 25–34 worked full-time compared to those aged 18–24 ($p < 0.001$).

Bivariate analyses highlighted a number of significant associations between the SES measures and cigarette use outcomes (Table 2). The highest prevalence of ever cigarette use was in young adults whose parents divorced before they turned 18 (57% vs. 47% overall). In general, past 30-day cigarette use and daily smoking were inversely correlated with current education, subjective financial status, and parental education. Compared to the overall prevalence of the cigarette use outcomes, lower current household income and current job/paid employment status were not associated higher past 30-day or daily cigarette use.

In multivariable Poisson regression models with robust variance estimation controlling for age, gender, race/ethnicity, and other SES measures, lower education and poorer subjective financial status were most strongly correlated with ever and past 30-day cigarette use (Table 3). Lower paternal, but not maternal, education was associated with ever and past 30-day cigarette use in the full and final models. Parental divorce before age 18 was associated with higher prevalence of ever cigarette use; working less than full time was correlated with lower ever cigarette use. Lower maternal education emerged as the strongest correlate of daily smoking, conferring a twofold higher prevalence of daily smoking compared to maternal education of a Bachelor's degree or greater. Current household income was not a strong predictor of any outcome.

Sensitivity analyses in Table 4 showed that parental smoking during childhood was correlated with all current and childhood measures, such that lower SES groups had higher prevalence of parental smoking compared to higher SES groups. Parental smoking during childhood was also associated with each cigarette use outcome: 55% of participants with parental smoking had ever used a cigarette (vs. 38% without parental smoking); 24% with parental smoking reported past 30-day smoking (vs. 8% without parental smoking); and 70% with parental smoking reported daily cigarette use (vs. 46% without parental smoking). When parental smoking was added to the full multivariable models, it was significantly associated with ever cigarette use (aPR 1.34; 95% CI 1.20, 1.49) and past 30-day cigarette use (aPR 2.20; 95% CI 1.68, 2.88). In the model for ever use, paternal and maternal education were omitted due to collinearity; in the model for past 30-day use, paternal education was no longer significant. In the past 30-day use model with parental smoking, maternal high school education was negatively associated with the outcome. Parental smoking was not associated daily cigarette use in the multivariable model, yet maternal education remained a strong predictor.

4. Discussion

The current study uses a large national sample to provide 2016 estimates of the prevalence of ever, past 30-day, and daily cigarette smoking across a breadth of common and novel measures of socioeconomic status. As in previous studies, current socioeconomic status remains inversely correlated with ever and past 30-day cigarette use in young adults. However, in this study, current household income was not a strong correlate of cigarette use and may be of limited utility in this age group, given the transitions inherent to this developmental period (Arnett, 2000). While current educational attainment was correlated with ever and past 30-day cigarette use in multivariable models, this study highlights the utility of subjective financial status as a key measure of current socioeconomic status in

young adults (Williams et al., 2016). Subjective financial status was the only measure of SES significantly correlated with all three cigarette use outcomes in the sample. This study also revealed that measures of childhood socioeconomic status, including maternal and paternal education, may be of interest when considering the impact of socioeconomic status on health behavior in young adults. Sensitivity analyses suggest that parental smoking is collinear with parental education in the model for ever cigarette use, but a strong predictor of past 30-day cigarette use. It was not associated with daily cigarette use. Maternal education was strongly associated with daily cigarette smoking, even after controlling for parental smoking during childhood.

Findings of this study have important implications for future tobacco reduction or cessation efforts in young adults. A 2012 review on socioeconomic status and smoking highlighted that disadvantaged smokers perceive smoking as a coping strategy to deal with life stresses and that future cessation interventions could be made more effective for groups with low socioeconomic status by tailoring campaigns to meet the specific needs of these disadvantaged smokers (Hiscock et al., 2012). Indeed, earlier work showed that nearly 90% of a national sample of young adult current smokers aged 18–34 had less than a college education and the most prevalent barrier to quitting was “loss of a way to handle stress”, endorsed by 59% of current smokers (Villanti et al., 2016). Revising the measures we use to assess socioeconomic status in young adults may better identify target populations for tobacco or other health behavior interventions for this age group.

Limitations of this study include the self-reported nature of current and childhood socioeconomic status measures and cigarette use. The study sample’s cumulative response rate is low, yet similar to other health studies that have relied on KnowledgePanel (Fowler et al., 2013; Grande et al., 2013; Kelly et al., 2015; Kumar et al., 2012). This may limit the generalizability of our findings, though other work suggests that surveys with a low response rate can still be representative of the sample population, even though the risk of nonresponse bias is higher (Brick, 2011; Halbesleben and Whitman, 2013). Studies assessing nonresponse to panel recruitment in KnowledgePanel have found little indication of nonresponse bias on core demographic and socioeconomic variables (Garrett et al., 2010; Heeren et al., 2008). Previous estimates from this cohort for key smoking outcomes of interest were consistent with national survey data (Rath et al., 2012), though the prevalence of past 30-day cigarette smoking in the current wave was lower than reported for 18–24 year olds in the National Survey on Drug Use and Health (26.7% in 2015; Center for Behavioral Health Statistics and Quality, 2016) and Population Assessment of Tobacco and Health Study (28.8% in 2013–2014; Kasza et al., 2017).

When examining the relationship between socioeconomic status and cigarette use, our study supports that neither current education nor income are reliable correlates of ever, past 30-day, and daily cigarette use in young adults. This is consistent with the developmental period of young adulthood, which is marked by transitions in attainment of both education and income (Finch et al., 2013; Williams et al., 2016). Additionally, the strong correlation between parental education and parental smoking and strong relationship between parental smoking during childhood and ever or past-30 day smoking in young adulthood accentuate the complexity of influences on cigarette use in youth and young adults. As of 2014, living

in a parent's home was the most common living arrangement for young adults aged 18–34 in the U.S. (Fry, 2016). Thus, it is difficult to determine whether the relationship between parental smoking and young adult cigarette use most accurately reflects childhood socioeconomic status, genetic, or other environmental factors, including living situation. Including various measures of socioeconomic status, as well as parental smoking, and information on other social and contextual influences on smoking in future studies will allow for a more comprehensive and nuanced understanding of this complex behavior.

5. Conclusion

This study highlights that socioeconomic disadvantage remains a strong predictor of ever, past 30-day and daily cigarette use in U.S. young adults. Novel measures, including subjective financial status, may improve estimates of socioeconomic disadvantage during this developmental stage and new approaches are needed to understand the impact of SES on health behaviors in young people, particularly the relative contributions of childhood and current SES.

Acknowledgments

This study was funded by Truth Initiative. Dr. Villanti was supported by in part by Truth Initiative, the Centers of Biomedical Research Excellence P20GM103644 award from the National Institute of General Medical Sciences, and the Tobacco Centers of Regulatory Science (TCORS) award P50DA036114 from the National Institute on Drug Abuse and Food and Drug Administration (FDA). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Food and Drug Administration.

References

American Association for Public Opinion Research. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 8th. AAPOR; Oakbrook Terrace, IL.: 2015.

Andridge RR, Little RJ. A review of hot deck imputation for survey non-response. Int Stat Rev. 2010; 78:40–64. [PubMed: 21743766]

Arnett JJ. Emerging adulthood. A theory of development from the late teens through the twenties. Am Psychol. 2000; 55:469–480. [PubMed: 10842426]

Bauman KE, Carver K, Gleiter K. Trends in parent and friend influence during adolescence: the case of adolescent cigarette smoking. Addict Behav. 2001; 26:349–361. [PubMed: 11436927]

Berg CJ, Parelkar PP, Lessard L, Escoffery C, Kegler MC, Sterling KL, Ahluwalia JS. Defining "smoker": college student attitudes and related smoking characteristics. Nicotine Tob Res. 2010; 12:963–969. [PubMed: 20675365]

Brick JM. The future of survey sampling. Public Opin Q. 2011; 75:872–888.

Center for Behavioral Health Statistics and Quality. Key Substance Use and Mental Health Indicators in the United States: Results From the 2015 National Survey on Drug Use and Health. 2016. HHS Publication No. SMA 16-4984, NSDUH Series H-51Retrieved from. http://www.samhsa.gov/data/

Chang L, Krosnick JA. National surveys via RDD telephone interviewing versus the internet comparing sample representativeness and response quality. Public Opin Q. 2009; 73:641–678.

Chassin L, Presson CC, Sherman SJ. Cigarette smoking and adolescent psychosocial development. Basic Appl Soc Psychol. 1984; 5:295–315.

Chassin L, Presson CC, Montello D, Sherman SJ, McGrew J. Changes in peer and parent influence during adolescence: longitudinal versus cross-sectional perspectives on smoking initiation. Dev Psychol. 1986; 22:327–334.

Fagan P, Augustson E, Backinger CL, O'Connell ME, Vollinger RE Jr, Kaufman A, Gibson JT. Quit attempts and intention to quit cigarette smoking among young adults in the United States. Am J Public Health. 2007; 97:1412–1420. [PubMed: 17600244]

Fergusson DM, Horwood LJ, Boden JM, Jenkin G. Childhood social disadvantage and smoking in adulthood: results of a 25-year longitudinal study. Addiction. 2007; 102:475–482. [PubMed: 17298656]

Finch KA, Ramo DE, Delucchi KL, Liu H, Prochaska JJ. Subjective social status and substance use severity in a young adult sample. Psychol Addict Behav. 2013; 27:901–908. [PubMed: 23915371]

Fowler FJ Jr, Gerstein BS, Barry MJ. How patient centered are medical decisions?: results of a national survey. JAMA Intern Med. 2013; 173:1215–1221. [PubMed: 23712194]

Fry R. For First Time in Modern Era, Living With Parents Edges Out Other Living Arrangements for 18- to 34-Year-Olds. 2016

Garrett, J., Dennis, JM., DiSogra, CA. Non-response Bias: Recent Findings From Address-based Panel Recruitment Annual Conference of the. American Association for Public Opinion Research; Chicago, IL: 2010.

Goodman E, Adler NE, Kawachi I, Frazier AL, Huang B, Colditz GA. Adolescents' perceptions of social status: development and evaluation of a new indicator. Pediatrics. 2001; 108:E31. [PubMed: 11483841]

Goodman E, Huang B, Schafer-Kalkhoff T, Adler NE. Perceived socioeconomic status: a new type of identity that influences adolescents' self-rated health. J Adolesc Health. 2007; 41:479–487. [PubMed: 17950168]

Grande D, Mitra N, Shah A, Wan F, Asch DA. Public preferences about secondary uses of electronic health information. JAMA Intern Med. 2013; 173:1798–1806. [PubMed: 23958803]

Green MP, McCausland KL, Xiao H, Duke JC, Vallone DM, Healton CG. A closer look at smoking among young adults: where tobacco control should focus its attention. Am J Public Health. 2007; 97:1427–1433. [PubMed: 17600242]

Greenland S. Model-based estimation of relative risks and other epidemiologic measures in studies of common outcomes and in case-control studies. Am J Epidemiol. 2004; 160:301–305. [PubMed: 15286014]

Halbesleben JR, Whitman MV. Evaluating survey quality in health services research: a decision framework for assessing nonresponse bias. Health Serv Res. 2013; 48:913–930. [PubMed: 23046097]

Heeren T, Edwards EM, Dennis JM, Rodkin S, Hingson RW, Rosenbloom DL. A comparison of results from an alcohol survey of a prerecruited Internet panel and the National Epidemiologic Survey on Alcohol and Related Conditions. Alcohol Clin Exp Res. 2008; 32:222–229. [PubMed: 18162076]

Higgins ST, Kurti AN, Redner R, White TJ, Keith DR, Gaalema DE, Sprague BL, Stanton CA, Roberts ME, et al. Co-occurring risk factors for current cigarette smoking in a U.S. nationally representative sample. Prev Med. 2016; 92:110–117. [PubMed: 26902875]

Hiscock R, Bauld L, Amos A, Fidler JA, Munafo M. Socioeconomic status and smoking: a review. Ann N Y Acad Sci. 2012; 1248:107–123. [PubMed: 22092035]

Jamal A, King BA, Neff LJ, Whitmill J, Babb SD, Graffunder CM. Current cigarette smoking among adults - United States, 2005–2015. MMWR Morb Mortal Wkly Rep. 2016; 65:1205–1211. [PubMed: 27832052]

Karvonen S, Rahkonen O. Subjective social status and health in young people. Sociol Health Illn. 2011; 33:372–383. [PubMed: 21241335]

Kasza KA, Ambrose BK, Conway KP, Borek N, Taylor K, Goniewicz ML, Cummings KM, Sharma E, Pearson JL, et al. Tobacco-product use by adults and youths in the United States in 2013 and 2014. N Engl J Med. 2017; 376:342–353. [PubMed: 28121512]

Kelly B, Squiers L, Bann C, Stine A, Hansen H, Lynch M. Perceptions and plans for prevention of Ebola: results from a national survey. BMC Public Health. 2015; 15:1136. [PubMed: 26572610]

Kumar S, Quinn SC, Kim KH, Daniel LH, Freimuth VS. The impact of workplace policies and other social factors on self-reported influenza-like illness incidence during the 2009 H1N1 pandemic. Am J Public Health. 2012; 102:134–140. [PubMed: 22095353]

Lacey RE, Cable N, Stafford M, Bartley M, Pikhart H. Childhood socio-economic position and adult smoking: are childhood psychosocial factors important? Evidence from a British birth cohort. Eur J Pub Health. 2011; 21:725–731. [PubMed: 21131349]

Lee CW, Kahende J. Factors associated with successful smoking cessation in the United States, 2000. Am J Public Health. 2007; 97:1503–1509. [PubMed: 17600268]

Martindale SE, Lacey RE. Parental separation in childhood and adult smoking in the 1958 British birth cohort. Eur J Pub Health. 2017

Mays D, Gilman SE, Rende R, Luta G, Tercyak KP, Niaura RS. Parental smoking exposure and adolescent smoking trajectories. Pediatrics. 2014; 133:983–991. [PubMed: 24819567]

McNutt LA, Wu C, Xue X, Hafner JP. Estimating the relative risk in cohort studies and clinical trials of common outcomes. Am J Epidemiol. 2003; 157:940–943. [PubMed: 12746247]

Pearce N. Effect measures in prevalence studies. Environ Health Perspect. 2004; 112:1047–1050. [PubMed: 15238274]

Pedersen W, Soest TV. How is low parental socioeconomic status associated with future smoking and nicotine dependence in offspring? A population-based longitudinal 13-year follow-up Scand. J Public Health. 2017; 45:16–24.

Piko BF, Fitzpatrick KM. Socioeconomic status, psychosocial health and health behaviours among Hungarian adolescents. Eur J Pub Health. 2007; 17:353–360. [PubMed: 17130141]

Rath JM, Villanti AC, Abrams DB, Vallone DM. Patterns of tobacco use and dual use in US young adults: the missing link between youth prevention and adult cessation. J Environ Public Health. 2012; 2012:679134. [PubMed: 22666279]

Rhodes DJ, Radecki Breitkopf C, Ziegenfuss JY, Jenkins SM, Vachon CM. Awareness of breast density and its impact on breast cancer detection and risk. J Clin Oncol. 2015; 33:1143–1150. [PubMed: 25732156]

Robbins AS, Chao SY, Fonseca VP. What's the relative risk? A method to directly estimate risk ratios in cohort studies of common outcomes. Ann Epidemiol. 2002; 12:452–454. [PubMed: 12377421]

Seckin G, Yeatts D, Hughes S, Hudson C, Bell V. Being an informed consumer of health information and assessment of electronic health literacy in a national sample of internet users: validity and reliability of the e-HLS instrument. J Med Internet Res. 2016; 18:e161. [PubMed: 27400726]

Solberg LI, Asche SE, Boyle R, McCarty MC, Thoele MJ. Smoking and cessation behaviors among young adults of various educational backgrounds. Am J Public Health. 2007; 97:1421–1426. [PubMed: 17600256]

StataCorp. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP; 2015.

Thompson AB, Mowery PD, Tebes JK, McKee SA. Time trends in smoking onset by sex and race/ethnicity among adolescents and young adults: findings from the 2006–2013 National Survey on Drug Use and Health. Nicotine Tob Res. 2017 (Epub ahead of print).

U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress A Report of the Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; Atlanta, GA: 2014.

University of Michigan. Health and Retirement Study. MI, Ann Arbor: 1998.

Villanti A, Boulay M, Juon HS. Peer, parent and media influences on adolescent smoking by developmental stage. Addict Behav. 2011; 36:133–136. [PubMed: 20855170]

Villanti AC, Bover Manderski MT, Gundersen DA, Steinberg MB, Delnevo CD. Reasons to quit and barriers to quitting smoking in US young adults. Fam Pract. 2016; 33:133–139. [PubMed: 26733658]

Williams VF, Smith AA, Villanti AC, Rath JM, Hair EC, Cantrell J, Teplitskaya L, Vallone DM. Validity of a subjective financial situation measure to assess socioeconomic status in US young adults. J Public Health Manag Pract. 2016 (Epub ahead of print).

Yeager DS, Krosnick JA, Chang L, Javitz HS, Levendusky MS, Simpser A, Wang R. Comparing the accuracy of RDD telephone surveys and internet surveys conducted with probability and non-probability samples. Public Opin Q. 2011:nfr020.

Yi Z, Mayorga ME, Hassmiller Lich K, Pearson JL. Changes in cigarette smoking initiation, cessation, and relapse among U.S. adults: a comparison of two longitudinal samples. Tob Induc Dis. 2017; 15:17. [PubMed: 28316562]

Zou G. A modified Poisson regression approach to prospective studies with binary data. Am J Epidemiol. 2004; 159:702–706. [PubMed: 15033648]

Table 1

Current and childhood socioeconomic status by age group, U.S. young adults ages 18–34 years, Truth Initiative Young Adult Cohort Study, 2016.

	Ages 18–24 (30.6%)		Ages 25–34 (69.4%)		Total		p-Value
	%	95% CI	%	95% CI	%	95% CI	
Current SES measures							
Education completed							<**0.001**
Less than high school	11.7	(9.3, 14.7)	9.6	(7.8, 11.8)	10.3	(8.8, 12.0)	
High school	29.5	(26.4, 32.9)	23.4	(21.2, 25.8)	25.3	(23.4, 27.2)	
Some college/AA degree	45.7	(42.4, 49.1)	31.1	(28.8, 33.4)	35.5	(33.7, 37.5)	
Bachelor's or Graduate degree	13.0	(11.3, 14.9)	35.9	(33.8, 38.1)	28.9	(27.3, 30.6)	
Annual household income - quartile							0.448
<$30,000	38.4	(35.1, 41.9)	32.5	(30.0, 35.0)	34.3	(32.3, 36.3)	
$30,000–$59,999	26.6	(23.7, 29.6)	32.2	(29.9, 34.6)	30.5	(28.7, 32.4)	
$60,000–$84,999	13.2	(11.2, 15.5)	16.1	(14.5, 17.9)	15.2	(13.9, 16.6)	
$85,000 or more	21.8	(19.2, 24.7)	19.2	(17.5, 21.0)	20.0	(18.6, 21.5)	
Subjective financial status							0.530
Don't meet basic expenses	6.5	(4.9, 8.6)	7.5	(6.1, 9.1)	7.2	(6.1, 8.5)	
Just meet basic expenses	30.4	(27.2, 33.7)	26.4	(24.2, 28.7)	27.6	(25.8, 29.5)	
Meet needs with a little left	37.7	(34.5, 41.0)	40.3	(37.9, 42.8)	39.5	(37.6, 41.5)	
Live comfortably	25.4	(22.6, 28.4)	25.8	(23.8, 27.9)	25.7	(24.0, 27.4)	
Current job/paid employment status							<**0.001**
Work full-time (35 h/week or more)	32.4	(29.4, 35.6)	60.5	(58.0, 62.9)	51.9	(49.9, 53.9)	
Work part-time (15–34 h/week)	21.1	(18.5, 23.9)	11.4	(9.9, 13.0)	14.3	(13.0, 15.8)	
Work part-time (<15 h/week)	12.9	(10.8, 15.4)	4.5	(3.6, 5.7)	7.1	(6.1, 8.2)	
Don't currently work for pay	33.6	(30.4, 36.9)	23.6	(21.4, 26.0)	26.7	(24.8, 28.6)	
Childhood SES measures							
Maternal education (highest completed)							0.247
Less than high school	15.3	(12.9, 18.1)	15.7	(13.6, 18.1)	15.6	(13.9, 17.4)	
High school	25.5	(22.5, 28.6)	28.0	(25.7, 30.3)	27.2	(25.4, 29.1)	
Some college/AA degree	31.7	(28.7, 35.0)	30.8	(28.5, 33.1)	31.1	(29.2, 32.9)	
Bachelor's or Graduate degree	27.5	(24.6, 30.5)	25.6	(23.7, 27.6)	26.2	(24.6, 27.8)	

	Ages 18–24 (30.6%)		Ages 25–34 (69.4%)		Total		p-Value
	%	95% CI	%	95% CI	%	95% CI	
Paternal education (highest completed)							0.088
Less than high school	20.0	(17.3, 23.1)	19.9	(17.6, 22.3)	19.9	(18.1, 21.8)	
High school	25.3	(22.4, 28.5)	30.7	(28.4, 33.1)	29.1	(27.2, 31.0)	
Some college/AA degree	25.7	(22.8, 28.8)	23.6	(21.7, 25.7)	24.3	(22.6, 26.0)	
Bachelor's or Graduate degree	28.9	(26.0, 32.1)	25.8	(23.9, 27.8)	26.8	(25.1, 28.4)	
Parental divorce before age 18							0.094
Yes	20.1	(17.5, 23.0)	21.8	(19.8, 24.0)	21.3	(19.7, 23.0)	
No	60.5	(57.0, 63.8)	59.0	(56.5, 61.5)	59.5	(57.4, 61.5)	
One or both parents died	3.6	(2.6, 5.0)	8.4	(7.0, 10.0)	6.9	(5.9, 8.1)	
Parents never married	15.8	(13.2, 18.8)	10.7	(9.2, 12.5)	12.3	(10.9, 13.8)	
Subjective childhood financial status							0.082
Pretty well off financially	16.6	(14.3, 19.2)	13.5	(12.0, 15.1)	14.4	(13.2, 15.8)	
About average	53.1	(49.7, 56.5)	52.9	(50.4, 55.5)	53.0	(50.9, 55.0)	
Poor	20.1	(17.4, 23.1)	23.6	(21.4, 26.0)	22.5	(20.8, 24.4)	
	10.2	(8.3, 12.4)	10.0	(8.5, 11.7)	10.1	(8.9, 11.4)	

Bold text indicates $p < 0.05$ from bivariate Poisson regression model with robust variance estimation.

Table 2

Bivariate associations between socioeconomic conditions and smoking behaviors, U.S. young adults ages 18–34 years, Truth Initiative Young Adult Cohort Study, 2016.

	Ever cigarette use (n = 3335)		Past 30-day cigarette use (n = 3333)		Daily cigarette use (n = 412)	
	%	95% CI	%	95% CI	%	95% CI
	46.8	(44.8, 48.8)	14.9	(13.5, 16.6)	58.8	(53.2, 64.1)
Education completed						
Less than high school	50.4	(42.0, 58.8)	27.7	(20.9, 35.8)	66.2	(50.8, 78.7)
High school	48.0	(43.5, 52.5)	20.3	(16.9, 24.3)	60.6	(50.2, 70.2)
Some college/AA degree	47.9	(44.7, 51.2)	14.4	(12.3, 16.9)	61.2	(52.9, 68.9)
Bachelor's or Graduate degree	43.1	(40.2, 46.0)	6.3	(5.0, 8.1)	35.0	(24.2, 47.6)
Annual household income - quartile						
<$30,000	45.1	(41.3, 48.9)	18.4	(15.6, 21.7)	62.5	(53.5, 70.7)
$30,000–$59,999	49.9	(46.2, 53.5)	15.1	(12.4, 18.2)	65.4	(55.0, 74.4)
$60,000–$84,999	43.7	(39.2, 48.4)	10.3	(7.9, 13.3)	39.5	(26.9, 53.6)
$85,000 or more	47.3	(43.3, 51.3)	12.3	(9.6, 15.6)	48.9	(36.1, 61.9)
Subjective financial status						
Don't meet basic expenses	49.9	(41.4, 58.5)	26.4	(19.3, 34.9)	66.9	(50.2, 80.3)
Just meet basic expenses	51.3	(47.2, 55.3)	20.4	(17.3, 24.0)	61.9	(52.6, 70.4)
Meet needs with a little left	47.7	(44.5, 50.9)	12.3	(10.3, 14.7)	65.1	(56.0, 73.2)
Live comfortably	40.5	(36.8, 44.2)	10.3	(8.0, 13.2)	34.4	(22.8, 48.2)
Current job/paid employment status						
Work full-time (35 h/week or more)	52.0	(49.3, 54.8)	14.3	(12.3, 16.5)	57.8	(49.8, 65.5)
Work part-time (15–34 h/week)	42.5	(37.6, 47.7)	13.0	(10.0, 16.9)	44.8	(31.6, 58.9)
Work part-time (<15 h/week)	38.7	(31.6, 46.3)	15.6	(10.3, 22.9)	66.6	(45.0, 83.0)
Don't currently work for pay	41.8	(37.7, 46.0)	16.9	(13.9, 20.4)	62.9	(52.6, 72.1)
Maternal education (highest completed)						
Less than high school	41.1	(35.2, 47.3)	14.9	(11.1, 19.7)	65.3	(50.8, 77.4)
High school	50.7	(46.7, 54.7)	17.5	(14.5, 21.0)	66.3	(56.2, 75.1)
Some college/AA degree	48.1	(44.6, 51.7)	16.6	(13.9, 19.8)	64.1	(54.3, 72.8)
Bachelor's or Graduate degree	44.2	(40.8, 47.7)	10.1	(8.0, 12.6)	31.1	(21.2, 43.1)

	Ever cigarette use (n = 3335)		Past 30-day cigarette use (n = 3333)		Daily cigarette use (n = 412)	
	%	95% CI	%	95% CI	%	95% CI
Paternal education (highest completed)						
Less than high school	42.5	(37.3, 48.0)	14.4	(11.0, 18.7)	64.3	(50.3, 76.2)
High school	52.3	(48.4, 56.1)	22.3	(19.0, 25.9)	63.3	(54.2, 71.5)
Some college/AA degree	49.7	(45.8, 53.6)	13.4	(10.8, 16.4)	57.5	(46.2, 68.1)
Bachelor's or Graduate degree	40.5	(37.1, 43.9)	8.1	(6.3, 10.4)	40.3	(28.2, 53.7)
Subjective childhood financial status						
Pretty well off financially	47.5	(42.6, 52.4)	11.1	(8.2, 14.9)	58.1	(42.2, 72.5)
About average	44.9	(42.2, 47.6)	13.1	(11.3, 15.2)	52.5	(44.5, 60.4)
Poor	50.8	(46.1, 55.5)	20.2	(16.4, 24.5)	71.4	(60.8, 80.1)
It varied	46.9	(40.4, 53.6)	16.9	(12.5, 22.4)	55.8	(39.7, 70.7)
Parental divorce before age 18						
Yes	56.9	(52.4, 61.2)	18.9	(15.5, 22.8)	68.9	(58.7, 77.6)
No	43.4	(40.8, 45.9)	11.7	(10.0, 13.6)	48.7	(40.7, 56.8)
One or both parents died	51.3	(42.9, 59.6)	21.9	(15.5, 30.0)	77.2	(60.5, 88.2)
Parents never married	44.3	(38.0, 50.8)	19.2	(14.5, 25.0)	61.2	(45.8, 74.7)

Table 3

Multivariable Poisson regression models with robust variance estimation of ever, past 30-day, and daily cigarette use on current and childhood socioeconomic status, U.S. young adults ages 18–34 years, Truth Initiative Young Adult Cohort Study, 2016.

	Ever cigarette use				Past 30-day cigarette use				Daily cigarette use			
	Full model		Final model		Full model		Final model		Full model		Final model	
	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)
Education completed												
Less than high school	1.40	(1.15, 1.72)	1.37	(1.12, 1.67)	4.73	(3.14, 7.14)	4.19	(2.83, 6.22)	1.22	(0.80, 1.87)		
High school	1.21	(1.06, 1.39)	1.20	(1.06, 1.37)	2.91	(2.05, 4.12)	2.60	(1.86, 3.63)	1.25	(0.83, 1.89)		
Some college/AA degree	1.22	(1.10, 1.35)	1.21	(1.09, 1.34)	2.23	(1.65, 3.00)	2.13	(1.58, 2.87)	1.27	(0.87, 1.86)		
Bachelor's or Graduate degree	Ref.		Ref.		Ref.		Ref.		Ref.			
Annual household income - quartile												
<$30,000	0.87	(0.76, 0.99)	0.86	(0.76, 0.99)	0.87	(0.64, 1.20)	0.85	(0.62, 1.16)	1.15	(0.82, 1.60)		
$30,000–$59,999	0.92	(0.82, 1.04)	0.92	(0.82, 1.04)	0.83	(0.61, 1.12)	0.83	(0.61, 1.13)	1.18	(0.86, 1.61)		
$60,000–$84,999	0.82	(0.72, 0.94)	0.82	(0.72, 0.94)	0.65	(0.45, 0.94)	0.64	(0.44, 0.93)	0.76	(0.50, 1.15)		
$85,000 or more	Ref.		Ref.		Ref.		Ref.		Ref.			
Subjective financial status												
Don't meet basic expenses	1.33	(1.08, 1.64)	1.34	(1.09, 1.65)	2.02	(1.36, 3.00)	2.02	(1.35, 3.04)	1.67	(1.12, 2.48)	1.71	(1.16, 2.53)
Just meet basic expenses	1.33	(1.17, 1.50)	1.34	(1.18, 1.51)	1.75	(1.29, 2.38)	1.78	(1.30, 2.43)	1.49	(1.05, 2.13)	1.59	(1.13, 2.24)
Meet needs with a little left	1.17	(1.05, 1.31)	1.18	(1.05, 1.32)	1.16	(0.85, 1.58)	1.19	(0.88, 1.62)	1.71	(1.21, 2.43)	1.67	(1.18, 2.36)
Live comfortably	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Current job/paid employment status												
Work full-time (35 h/week or more)	Ref.		Ref.		Ref.				Ref.			
Work part-time (15–34 h/week)	0.85	(0.74, 0.97)	0.85	(0.74, 0.97)	0.82	(0.59, 1.14)			0.82	(0.62, 1.10)		
Work part-time (<15 h/week)	0.79	(0.65, 0.97)	0.80	(0.65, 0.97)	1.01	(0.66, 1.53)			1.01	(0.71, 1.44)		
Don't currently work for pay	0.79	(0.70, 0.90)	0.79	(0.70, 0.90)	0.85	(0.66, 1.10)			0.94	(0.77, 1.15)		
Maternal education (highest completed)												
Less than high school	0.85	(0.69, 1.03)			0.77	(0.48, 1.22)			1.90	(1.19, 3.04)	2.13	(1.43, 3.16)
High school	0.97	(0.85, 1.10)			0.81	(0.58, 1.12)			1.75	(1.16, 2.65)	1.93	(1.34, 2.78)
Some college/AA degree	0.94	(0.84, 1.05)			0.98	(0.74, 1.30)			1.69	(1.14, 2.51)	1.91	(1.32, 2.77)
Bachelor's or Graduate degree	Ref.				Ref.				Ref.		Ref.	

	Ever cigarette use				Past 30-day cigarette use				Daily cigarette use			
	Full model		Final model		Full model		Final model		Full model		Final model	
	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)	aPR	(95% CI)
Paternal education (highest completed)												
Less than high school	1.03	(0.85, 1.24)	0.96	(0.81, 1.13)	1.06	(0.65, 1.71)	0.98	(0.65, 1.48)	0.98	(0.64, 1.50)		
High school	1.18	(1.03, 1.35)	1.15	(1.02, 1.30)	1.83	(1.29, 2.60)	1.75	(1.28, 2.40)	0.99	(0.69, 1.44)		
Some college/AA degree	1.19	(1.06, 1.35)	1.16	(1.04, 1.31)	1.31	(0.93, 1.84)	1.31	(0.95, 1.79)	1.02	(0.71, 1.46)		
Bachelor's or Graduate degree	Ref.		Ref.		Ref.		Ref.		Ref.			
Parental divorce before age 18												
Yes	1.22	(1.10, 1.36)	1.22	(1.10, 1.35)	1.21	(0.94, 1.55)	1.25	(0.98, 1.60)	1.17	(0.95, 1.44)		
No	Ref.		Ref.		Ref.		Ref.		Ref.			
One or both parents died	1.15	(0.97, 1.37)	1.15	(0.97, 1.37)	1.55	(1.12, 2.14)	1.59	(1.14, 2.22)	1.26	(1.00, 1.60)		
Parents never married	1.07	(0.90, 1.27)	1.06	(0.89, 1.26)	1.15	(0.82, 1.63)	1.22	(0.85, 1.73)	1.05	(0.77, 1.42)		
Subjective childhood financial status												
Pretty well off financially	Ref.		Ref.		Ref.				Ref.			
About average	0.87	(0.77, 0.98)	0.87	(0.77, 0.98)	1.02	(0.72, 1.45)			0.89	(0.66, 1.20)		
Poor	0.89	(0.77, 1.03)	0.88	(0.76, 1.02)	1.22	(0.84, 1.78)			1.06	(0.78, 1.45)		
It varied	0.89	(0.75, 1.06)	0.88	(0.74, 1.06)	1.10	(0.71, 1.70)			0.83	(0.57, 1.21)		

NOTE: All models control for current education, current income, current subjective financial status, current job/employment status, subjective childhood financial situation, parental divorce before age 18, age, gender, and race/ethnicity.

Table 4

Sensitivity analyses including parental smoking during childhood in multivariable models of ever, past 30-day, and daily cigarette use, U.S. young adults ages 18–34 years, Truth Initiative Young Adult Cohort Study, 2016.

	Ever cigarette use		Past 30-day cigarette use		Daily cigarette use	
	aPR	**(95% CI)**	**aPR**	**(95% CI)**	**aPR**	**(95% CI)**
Parental smoking during childhood						
No	Ref.		Ref.		Ref.	
Yes	1.34	(1.20, 1.49)	2.20	(1.68, 2.88)	1.12	(0.86, 1.46)
Maternal education (highest completed)						
Less than high school	–		0.71	(0.45, 1.13)	1.88	(1.15, 3.07)
High school	–		0.65	(0.46, 0.92)	1.95	(1.24, 3.05)
Some college/AA degree	–		0.86	(0.63, 1.17)	1.78	(1.15, 2.76)
Bachelor's or Graduate degree	Ref.		Ref.		Ref.	
Paternal education (highest completed)						
Less than high school	–		0.70	(0.41, 1.18)	1.14	(0.71, 1.83)
High school	–		1.35	(0.91, 1.99)	1.06	(0.70, 1.62)
Some college/AA degree	–		1.08	(0.74, 1.57)	1.10	(0.72, 1.67)
Bachelor's or Graduate degree	Ref.		Ref.		Ref.	

– omitted because of collinearity.

NOTE: All models control for current education, current income, current subjective financial status, current job/employment status, subjective childhood financial situation, parental divorce before age 18, age, gender, and race/ethnicity.