



Article

Intergenerational differences in smoking among West Indian, Haitian, Latin American, and African blacks in the United States



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ABSTRACT

Due in large part to increased migration from Africa and the Caribbean, black immigrants and their descendants are drastically changing the contours of health disparities among blacks in the United States. While prior studies have examined health variation among black immigrants by region of birth, few have explored the degree of variation in health behaviors, particularly smoking patterns, among first- and second- generation black immigrants by ancestral heritage. Using data from the 1995–2011 waves of the Tobacco Use Supplements of the Current Population Survey (TUS-CPS), we examine variation in current smoking status among first-, second-, and third/higher- generation black immigrants. Specifically, we investigate these differences among all black immigrants and then provide separate analyses for individuals with ancestry from the English-speaking Caribbean (West Indies), Haiti, Latin America, and Africa—the primary sending regions of black immigrants to the United States. We also explore differences in smoking behavior by gender. The results show that, relative to third/higher generation blacks, first-generation black immigrants are less likely to report being current smokers. Within the first-generation, immigrants who migrated after age 13 have a lower probability of smoking relative to those who migrated at or under age 13. Disparities in smoking prevalence among the first-generation by age at migration are largest among black immigrants from Latin America. The results also suggest that second-generation immigrants with two foreign-born parents are generally less likely to smoke than the third/higher generation. We find no statistically significant difference in smoking between second-generation immigrants with mixed nativity parents and the third or higher generation. Among individuals with West Indian, Haitian, Latin American, and African ancestry, the probability of being a current smoker increases with each successive generation. The intergenerational increase in smoking, however, is slower among individuals with African ancestry. Finally, with few exceptions, our results suggest that intergenerational gaps in smoking behavior are larger among women compared to men. As additional sources of data for this population become available, researchers should investigate which ancestral subgroups are driving the favorable smoking patterns for the African origin population.

Introduction

Migration researchers have begun focusing on the health outcomes of black immigrants, a population of increasing importance for understanding the health trajectories of the U.S. black population as a whole. A growing body of research has found that black immigrants, like other immigrant subgroups, report better health and have lower rates of disability, obesity, and mortality than their U.S.-born counterparts (Bennett, Wolin, Askew, Fletcher & Emmons, 2007; Elo, Vang & Culhane, 2014; Hamilton, 2014; Hamilton & Hummer, 2011; Mehta, Elo, Ford & Siegel, 2015; Singh & Siahpush, 2002). These favorable health outcomes, however, tend to diminish across generations, with second-generation immigrants (U.S.-

born individuals with at least one foreign-born parent) having worse health outcomes than first-generation (foreign-born) immigrants (Hendi, Mehta & Elo, 2015). Prior studies, which primarily focused on the Latino(a) population, have identified changes in health behaviors as one of the primary factors that negatively influence the health trajectories of immigrants as their tenure of U.S. residence increases and across generations (Acevedo-Garcia et al., 2010; Alcántara, Molina & Kawachi, 2014; Antecol & Bedard, 2006; Kimbro, 2009; Kondo, Rossi, Schwartz, Zamboanga & Scaif, 2016; Lopez-Gonzalez, Aravena & Hummer, 2005; Pérez-Stable et al., 2001; Tong et al., 2012; Trinidad, Pérez-Stable, White, Emery & Messer, 2011). This study examines the association between generational status and one important health behavior among blacks: tobacco smoking.

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Smoking is the primary cause of a number of illnesses, such as cancer and cardiovascular disease, and is the leading cause of preventable deaths in the United States (CDC, 2008; O'Malley, Wu, Mayne & Jatlow, 2014). Researchers have suggested that the lower incidence of smoking among the foreign-born is a primary determinant of immigrants' mortality advantage over their U.S.-born counterparts (Blue & Fenelon, 2011; Fenelon, 2013). Prior studies have found that most immigrant subgroups, including black immigrants, are less likely to smoke than their native-born racial/ethnic counterparts upon arrival in the United States (Acevedo-Garcia, Pan, Jun, Osypuk & Emmons, 2005; King, Polednak, Bendel & Hovey, 1999; Singh & Siahpush, 2002; Siahpush, Singh, Jones, & Timsina, 2009). Smoking rates among immigrants, however, tend to increase as their tenure of U.S. residence increases (Acevedo-Garcia et al., 2010a; Alcántara et al., 2015; Kuerban, 2016; Leung, Ang, Thumboo, Wang, Yuan & Koh, 2014; Pérez-Stable et al., 2001; Singh & Siahpush 2002), a factor often thought to produce a convergence in health outcomes between immigrants and the U.S.-born. While a number of studies have investigated changes in smoking behavior among first-generation immigrants, several gaps exist in the extant literature on smoking, particularly among blacks in the United States.

First, few studies have examined smoking differences among foreign-born blacks who migrated to the United States as teens or adults (first generation) and those who migrated as children (known as the 1.5 generation). Relative to individuals who migrated later in life, those who came to the United States as children have spent their formative years in the United States. Thus, they might be more likely to adopt the host country's smoking norms rather than those of their origin countries. Consequently, it is important to understand the ways in which age at migration shape smoking behavior among first-generation blacks in the United States.

Second, due in large part to data limitations, few studies have investigated ancestral health disparities among second-generation black immigrants, which conceals the increasing heterogeneity of the second-generation black immigrant population. Immigrants from the Caribbean have historically comprised the overwhelming majority of the flow (and stock) of black immigrants to the United States. Since the year 2000, however, the number of black immigrants arriving from Africa has surpassed the number of arrivals from the Caribbean (Anderson, 2015), suggesting that the fraction of second-generation black immigrants of African ancestry is likely to increase significantly in the coming decades. Among first-generation immigrants, pre-migration smoking norms vary considerably across the primary source countries (Bilano et al., 2015; Zhao, Palipudi, Ramanandraibe & Asma, 2016). Thus, the process of social adaptation into U.S. smoking behavior might vary considerably among second-generation immigrants depending on their parents' place of birth (Leung, 2014). Understanding how smoking patterns vary by generational status among blacks by regions of origin/ancestry could also provide valuable insights into how the health behaviors and health outcomes of the black population are likely to evolve in the coming decades.

The current study investigates intergenerational patterns in current smoking behavior among blacks in the United States. Specifically, using data from the 1995–2011 waves of the Tobacco Use Supplements of the Current Population Survey (TUS-CPS), we examine intergenerational variation in smoking patterns among first-, 1.5, second-, and third/higher- generation black immigrant men and women. We also explore whether intergenerational smoking patterns vary among blacks by ancestral heritage, including the English-speaking Caribbean (West Indies), Haiti, Latin America, and Africa.

Background

A large literature has documented that some immigrant subgroups have more favorable health and mortality profiles, particularly upon arrival in the country, than their U.S.-born counterparts (Elo, Mehta,

& Huang, 2011; Hamilton, 2014; Hamilton & Hummer, 2011; Singh & Siahpush, 2002). Black immigrants' mortality advantage is particularly striking.¹ Singh and Siahpush (2002) showed that black immigrants have a lower risk of all-cause mortality compared to both U.S.-born blacks and non-blacks, regardless of nativity. These health and mortality advantages, however, tend to decline as immigrants' tenure of U.S. residence increases; a process termed the “healthy immigrant effect” (HIE). Prior research has suggested that selective migration (e.g., individuals with the best health profiles in the origin country are more likely to move to the United States) and immigrant cultural practices that promote good health behaviors play a significant role in producing immigrants' initial health advantage (Jasso, Massey, Rosenzweig & Smith, 2005). Researchers have argued that changes in health behaviors, particularly smoking patterns, are one of the primary factors that generate the decline in immigrants' health as their tenure of U.S. residence increases (Gorman, Lariscy, & Kaushik, 2014; Kuerban, 2016; Siahpush et al., 2009). Singh and Siahpush (2002) showed that while newly arrived immigrants were 52 percent less likely to smoke compared to their U.S.-born counterparts, these nativity advantages decreased to 32 and 18 percent, respectively, for those residing in the United States for 10–15 and more than 15 years.

Age at time of arrival

Another important but less studied source of variation in smoking behavior among foreign-born blacks is age at the time of immigration. Research has suggested that individuals who immigrated to the United States as children played a limited role in the migration decision. Consequently, if the decision to move among immigrants is strongly correlated with both good health and favorable health behaviors, those who came to the United States at younger ages might be less favorably selected on good health behaviors than those who migrated as adults. Moreover, studies have also shown that smoking habits tend to form at relatively early ages and are heavily influenced by family- and community- level contexts (Harrell, Bangdiwala, Deng, Webb & Bradley, 1998; Lipperman-Kreda, Grube & Friend, 2014). A number of studies have also found that children who migrate prior to becoming teenagers are at an increased risk of substance abuse or having psychiatric disorders (Breslau et al., 2007a; Breslau, Aguilar-Gaxiola, Borges, Kendler, Su & Kessler, 2007b). Consequently, first-generation immigrants who arrive in the United States during childhood might be more likely to smoke relative to those who migrate during adulthood.

To our knowledge, no prior studies have examined smoking behavior among black immigrants who arrived in childhood, also known as the 1.5 generation. Studies of Latino and Asian immigrants, however, have found that age at migration is significantly associated with smoking behavior (Kimbrow, 2009; Wilkinson et al., 2005). For example, Kimbro (2009) investigated differences in smoking and binge drinking among U.S.- and foreign- born Latinos, with a focus on the role of age of migration. She found that foreign-born Latinos were less likely to smoke or binge drink than their U.S.-born counterparts. Moreover, relative to individuals who migrated earlier in life, foreign-born individuals who migrated later in life were less likely to engage in poor health behaviors. These patterns were especially pronounced among women.

Generational differences in smoking

Research has found that smoking patterns also change across immigrant generations (Acevedo-Garcia et al., 2005; Kopak, 2013; Singh & Siahpush, 2002). There are a number of potential explanations. First, studies have shown that parents transmit social norms

¹ One important exception is mental health. For black immigrants from majority black countries, the stress of migration has been shown to be associated with schizophrenia, depression and other mental health outcomes (Bourque et al., 2011; Cantor-Graae et al., 2005).

surrounding smoking to their offspring (Melchior, Chastang, Mackinnon, Galéra & Fombonne, 2010; White, Johnson & Buyske, 2000). Immigrant parents who come to the United States with healthier behaviors (e.g. lower smoking rates) may transmit social norms around smoking that are more common to their countries of origin. However, these effects may weaken from the second to the third generation, resulting in increased smoking rates across immigrant generations (Kopak, 2013; Singh & Siahpush, 2002; Vega, Gil & Kolody, 2002).

Segmented assimilation theory posits that some subgroups of nonwhite immigrants, particularly black and Mexican immigrants, are at risk of experiencing downward assimilation into U.S. society, which could result in the adoption of cultural practices found among U.S.-born Mexicans and blacks (Portes & Zhou, 1993), including suboptimal behaviors such as smoking. Similarly, studies have suggested that Mexican and black immigrants, in particular, experience high levels of discrimination. The stressors associated with discrimination might also lead to the use of tobacco smoking as a coping mechanism for discrimination (Tran, Lee & Burgess, 2010).

Kopak (2013), one of the only studies to our knowledge that has examined the relationship between generational status and smoking behavior using longitudinal data (National Longitudinal Survey of Adolescent Health), found that relative to the first generation, second- and third- generation Mexican youth showed significant increases in smoking levels from adolescence to early adulthood. Similarly, using cross-sectional data from the 1995–1996 Tobacco Use Supplements of the Current Population Survey, Acevedo-Garcia et al. (2005) showed that smoking rates were lower among first- and second- generation immigrants compared to the third/higher generation. These associations, however, varied across racial/ethnic groups. For black adults, the researchers found that while first-generation black immigrants had a lower probability of being a current smoker than third/higher generation blacks, only second-generation black immigrants with a U.S.-born mother and a foreign-born father had a lower probability of being a daily smoker than third/higher generation blacks. Acevedo-Garcia et al., however, were unable to distinguish differences in smoking patterns by region of ancestry.

Region (country) of origin

Smoking rates differ significantly across countries of origin (Baluja, Park & Myers, 2003). Moreover, social norms surrounding smoking in countries or regions of origin can influence immigrants' receptiveness to smoking (Leung, 2014). Currently, the primary sending regions for black immigrants are experiencing different stages of the tobacco epidemic.² For example, smoking prevalence in Africa is currently low. However, because of declining smoking rates in many high-income countries, tobacco companies are increasing marketing efforts in African countries (Zhao et al., 2015). Consequently, most of the countries with increased smoking rates over the past 15 years are located in sub-Saharan Africa (Bilano et al., 2015). In contrast, researchers have projected that Latin American countries will continue to experience declines in smoking prevalence (Bilano et al., 2015). Panama, an important sending country for Latin American blacks (Kent, 2007), has implemented increasingly stringent tobacco control policies since 2005 (Sebrié et al., 2012; Sebrié & Glantz, 2007). It has also seen some of the largest declines in smoking prevalence over the past decade (Bilano et al., 2015). These trends suggest that there might be important variation in first-generation immigrants' attitudes toward smoking (and subsequent variation in second-generation smoking behaviors) over time.

² Lopez, Collishaw, and Piha (1994) proposed four distinct stages of the tobacco epidemic in developed countries. Movement from Stage 1 to Stage 4 is characterized by increases and then decreases in tobacco prevalence, consumption, and smoking-related deaths.

With a few notable exceptions, due primarily to data limitations, most prior studies have been unable to examine sending region heterogeneity among first- and second- generation black immigrants. Bennett et al. (2008) found that African- and Caribbean- born blacks were less likely to be current smokers than U.S.-born blacks. The authors did not, however, detect significant smoking differences between African- and Caribbean- born blacks, but noted that the number of African-born individuals in the sample was very small. Another important limitation of Bennett et al. (2008) is that the authors do not distinguish between second- and third/higher generation blacks. Another notable study is Lacey, Sears, Govia, Forsythe-Brown, Matusko, and Jackson (2015). These authors showed that substance use and mental/physical health differs among first-generation immigrants from the Caribbean (Jamaica and Guyana) and that second- and third/higher- generation Caribbean adults experienced increased odds of substance abuse relative to the first-generation (Lacey et al., 2015).

Gender

Research indicates that the associations between duration of U.S. residence and health behaviors such as smoking vary significantly by gender (Gorman et al., 2014; Kimbro, 2009; Leung, 2014; Lopez-Gonzalez et al., 2005). Lopez-Gonzalez, Aravena, and Hummer (2005) found that while both male and female immigrants generally tend to have lower smoking rates relative to the U.S.-born, the initial nativity advantage is strongest among women.

Similarly, Acevedo-Garcia et al. (2005) found gender differences in smoking across immigrant generations. For example, relative to third/higher generation women, second-generation immigrant women with two foreign-born parents had lower odds of being a daily smoker. Although a similar association was found for men, the association was more pronounced among women. This result might be explained by gender differences in smoking between immigrants' countries of origin compared to the United States. The latest available data for U.S.-born blacks suggests that approximately 21 percent of males are current smokers compared to 13 percent of females. For black immigrants, the overall numbers are lower but the gap is similar (approximately 11 percent of males and 1 percent of females report smoking).³ However, differences in male and female current cigarette smoking rates are far larger among adults in key Caribbean sending countries such as Jamaica (22.9 vs. 7.5 percent) and Trinidad and Tobago (33.5 vs. 9.4 percent) (WHO Report on the Global Tobacco Epidemic, 2013). In contrast, while overall smoking rates are lower among prominent African sending countries, the gender gap, in absolute terms, is somewhat closer to that found among U.S.-born blacks. For example, in Nigeria, a primary African sending country for black immigrants, about 9 percent of adult males report being current cigarette smokers compared to only 0.2 percent of women (WHO Report on the Global Tobacco Epidemic, 2013).

Taken together, existing evidence suggests that it is critical to evaluate the complex and potentially unique intergenerational patterns in smoking behavior among foreign-born black men and women and their descendants. Based on the extant literature, we make four conjectures regarding intergenerational patterns in smoking among blacks in the United States: 1) relative to immigrants who migrated during early childhood (age 13 or younger), first-generation immigrants who migrated after age 13 will have a lower probability of being current smokers; 2) the probability of smoking will increase across immigrant generations; 3) compared to second-generation immigrants with one foreign-born parent, second-generation immigrants with mixed nativity parents (one foreign-born parent, one U.S.-born parent) will have a higher probability of being current smokers; 4) first-

³ Calculations from 2011 TUS data.

Table 1

Descriptive Statistics for U.S.-born and Immigrant Black Adults by Generational Status, Men and Women Aged 18+.

Source: These data are taken from the 1995–2011 Tobacco Use Supplements of the Current Population Surveys for blacks aged 18 or older. The nonresponse weights from the Tobacco Use Supplements are used for all calculations.

	(1)	(2)	(3)	(4)	(5)
	First/1.5 Generation		Second-Generation		Third/Higher Generation
	Arrived Age > 13	Arrived < =13	Both Parents Foreign-Born	One Parent Foreign-Born	
Current Smoker	0.074	0.080	0.135	0.212	0.212
<i>Region/Country of Origin or Ancestry</i>					
West Indian Ancestry	0.360	0.461	0.313	0.287	
African Ancestry	0.229	0.084	0.062	0.058	
Haitian Ancestry	0.175	0.155	0.146	0.027	
Latin American Ancestry	0.179	0.204	0.170	0.248	
Other Ancestry	0.057	0.095	0.219	0.380	
<i>Social and Demographic Characteristics</i>					
Age	43.342	30.665	30.752	34.858	42.381
Female	0.512	0.516	0.530	0.546	0.562
Married	0.492	0.308	0.230	0.268	0.344
Family Size	3.155	3.388	3.234	2.842	2.779
Education	12.685	13.357	13.143	13.105	12.561
Resides in a Metropolitan Area	0.976	0.982	0.980	0.949	0.866
<i>Occupation</i>					
Managers	0.168	0.204	0.193	0.188	0.143
Technical	0.161	0.284	0.267	0.261	0.199
Service	0.227	0.139	0.117	0.115	0.145
Agriculture	0.009	0.002	0.004	0.007	0.009
Production	0.067	0.063	0.032	0.037	0.049
Operators	0.131	0.076	0.063	0.094	0.128
Unemployed	0.238	0.232	0.324	0.298	0.326
<i>Distribution of Family Income</i>					
Less than 5000	0.047	0.049	0.061	0.056	0.073
5000 to 7499	0.036	0.028	0.034	0.040	0.062
7500 to 9999	0.036	0.026	0.025	0.039	0.051
10,000 to 12,499	0.047	0.033	0.043	0.039	0.060
12,500 to 14,999	0.044	0.019	0.029	0.034	0.049
15,000 to 19,999	0.066	0.049	0.056	0.060	0.073
20,000 to 24,999	0.099	0.072	0.077	0.097	0.084
25,000 to 29,999	0.088	0.081	0.065	0.081	0.080
30,000 to 34,999	0.079	0.069	0.067	0.069	0.069
35,000 to 39,999	0.071	0.083	0.065	0.053	0.062
40,000 to 49,999	0.095	0.106	0.095	0.089	0.084
50,000 to 59,999	0.076	0.095	0.078	0.081	0.072
60,000 to 74,999	0.071	0.085	0.098	0.085	0.069
More than 75,000	0.146	0.205	0.208	0.176	0.111
Family Income	37,048.055	42,341.957	41,335.457	38,787.356	33,027.299
Observations	8838	1633	1588	1395	104,812

generation immigrant women will have lower smoking rates than first-generation men; however, the intergenerational increase in smoking rates will be more rapid for immigrant women.

Data, measures, and methods

Data

The Current Population Survey (CPS) is a monthly survey conducted in the United States designed primarily to study labor market dynamics. Certain months of the CPS, however, include a supplement that asks respondents a range of questions pertaining to tobacco use. The analytic sample for this study comes from the 1995–2011 waves of the Tobacco Use Supplements of the Current Population Survey (TUS-CPS) obtained from the Integrated Public Use Micro Series (IPUMS) at the Minnesota Population Center (Ruggles et al., 2004).⁴ Although the TUS-CPS began in 1992, early

years were excluded because the TUS-CPS did not start collecting data on place of birth until 1995.⁵

For uniformity, we restrict the sample to individuals who are 18 years or older. The study is restricted to individuals who self-reported their race as black. The analytic sample also excludes individuals born abroad to American parents and individuals born in U.S.-outlying areas or territories to avoid including people in the immigrant sample who are more similar to the U.S.-born than to immigrants.

The CPS is one of the few nationally representative surveys that collects data on the nativity status of respondents’ parents, allowing us to examine smoking disparities among first-, second-, and third/higher generation blacks. For our analyses, immigrants, also referred to as the first-generation, are defined as individuals born outside of the United States. Prior research has suggested that the process of social assimilation varies considerably between immigrants who migrated as young children and those who arrived as adolescents or as adults (Portes &

⁵ For detailed information regarding survey response rates see <http://cancercontrol.cancer.gov/brp/tcrb/tus-cps/>

⁴ We use all available surveys from 1995–2011.

Table 2
 Descriptive Statistics for U.S.-Born and Immigrant Black Adults by Generational Status and Ancestry, Men and Women Aged 18+.
 Source: See Table 1.

Panel 1.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	West Indian Ancestry				African Ancestry			
	Arrived Age > 13	Arrived < =13	Both Parents Foreign-Born	One Parent Foreign-Born	Arrived Age > 13	Arrived < =13	Both Parents Foreign-Born	One Parent Foreign-Born
Current Smoker	0.070	0.068	0.091	0.168	0.069	0.051	0.052	0.151
<i>Social and Demographic Characteristics</i>								
Age	46.377	30.313	31.408	34.480	38.114	29.485	28.495	28.954
Female	0.571	0.530	0.514	0.567	0.418	0.455	0.397	0.565
Married	0.478	0.248	0.176	0.236	0.487	0.313	0.214	0.184
Family Size	3.028	3.438	3.092	2.885	3.059	2.974	3.241	2.794
Education	12.767	13.398	13.570	13.499	13.818	13.886	14.257	13.207
Resides in a Metropolitan Area	0.985	0.992	0.981	0.946	0.968	0.982	0.994	0.929
<i>Occupation</i>								
Managers	0.195	0.213	0.242	0.205	0.224	0.195	0.247	0.296
Technical	0.184	0.293	0.249	0.271	0.186	0.334	0.196	0.220
Service	0.216	0.108	0.096	0.088	0.221	0.164	0.146	0.087
Agriculture	0.004	0.000	0.007	0.009	0.002	0.000	0.000	0.000
Production	0.082	0.075	0.032	0.028	0.031	0.017	0.039	0.038
Operators	0.086	0.077	0.050	0.086	0.144	0.098	0.023	0.068
Unemployed	0.234	0.235	0.323	0.313	0.193	0.192	0.350	0.291
<i>Distribution of Family Income</i>								
Less than 5000	0.035	0.048	0.052	0.050	0.058	0.077	0.057	0.061
5000 to 7499	0.028	0.031	0.013	0.032	0.033	0.018	0.012	0.013
7500 to 9999	0.030	0.020	0.018	0.033	0.030	0.017	0.014	0.000
10,000 to 12,499	0.037	0.029	0.014	0.018	0.034	0.044	0.060	0.088
12,500 to 14,999	0.035	0.016	0.021	0.024	0.037	0.006	0.018	0.052
15,000 to 19,999	0.051	0.034	0.052	0.063	0.065	0.101	0.029	0.076
20,000 to 24,999	0.082	0.055	0.060	0.103	0.095	0.060	0.026	0.116
25,000 to 29,999	0.085	0.085	0.061	0.084	0.096	0.079	0.055	0.052
30,000 to 34,999	0.079	0.072	0.065	0.040	0.083	0.112	0.088	0.101
35,000 to 39,999	0.080	0.105	0.077	0.059	0.052	0.034	0.056	0.048
40,000 to 49,999	0.100	0.113	0.082	0.097	0.103	0.177	0.174	0.025
50,000 to 59,999	0.081	0.098	0.080	0.101	0.094	0.065	0.053	0.082
60,000 to 74,999	0.091	0.093	0.118	0.116	0.068	0.032	0.131	0.009
More than 75,000	0.187	0.201	0.289	0.181	0.151	0.178	0.225	0.276
Family Income	41,120.511	43,348.564	47,429.970	41,676.473	37,802.681	8246.247	5300.415	39,339.130
Observations	3173	725	462	395	2165	161	118	88

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Rumbaut, 2007). To account for this factor, the first generation is separated into two categories: those who arrived at age 13 or younger, and those who arrived after age 13. We follow prior research that traditionally uses age 13 to mark the beginning of adolescence (Breslau et al., 2007a, 2007b). Using data on the birthplace of respondents' parents, we divide second-generation immigrants into two groups: U.S.-born individuals with two foreign-born parents and U.S.-born individuals with one U.S.-born parent and one foreign-born parent. The third/higher generation is defined as U.S.-born individuals who have two U.S.-born parents.

We also analyze variation in smoking for four ancestral subgroups: immigrants from the West Indies (English-speaking Caribbean), Haiti, Latin America, and Africa.⁶ All first-generation immigrants are assigned to a country/region of origin based on their place of birth, including Haiti, the West Indies, Latin America, or Africa.^{7,8} Similarly, second-generation immigrants are assigned to a region of ancestry based on parental birthplace. For the subgroup

analyses, the second generation is defined as individuals who have two parents who were born in the same region (or Haiti) or individuals with one parent born in one of the defined places and one parent born in the United States. Because of the inability to categorize individuals who have two foreign-born parents who were born in different regions of the world into a unique ancestral grouping, we exclude these individuals (approximately 9 percent of the second-generation with two foreign-born parents) from the subgroup analysis but include them in the aggregate analysis. The final analytic sample contains information on 104,812 individuals who are third/higher generation, 1395 individuals with one foreign-born parent, 1588 individuals with two foreign-born parents, 1633 individuals who immigrated at or prior to age 13, and 8838 individuals who immigrated after age 13.

Measures

The dependent variable of interest is whether an individual is a self-reported current smoker. Using data from the smoker recode variable, which identifies individuals as either an "everyday smoker," a "non-daily smoker," a "former smoker," or a "never smoker," we generate a

⁶ The Africa category only includes immigrants from Sub-Saharan Africa.
⁷ See Appendix 1 for a description of the countries included in each ancestral grouping.
⁸ Those individuals born outside of these major sending areas are included in the analysis of the overall sample but are excluded from subgroup analyses.

Table 2 (continued)

Panel 2.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Haitian Ancestry			Latin American Ancestry				
	Arrived Age > 13	Arrived < =13	Both Parents Foreign-Born	One Parent Foreign-Born	Arrived Age > 13	Arrived < =13	Both Parents Foreign-Born	One Parent Foreign-Born
Current Smoker	0.049	0.034	0.091	0.144	0.095	0.121	0.145	0.194
<i>Social and Demographic Characteristics</i>								
Age	44.238	30.139	25.258	29.021	43.511	32.029	29.348	35.444
Female	0.510	0.536	0.481	0.481	0.516	0.535	0.554	0.547
Married	0.495	0.364	0.177	0.114	0.502	0.372	0.270	0.335
Family Size	3.453	3.625	3.835	2.956	3.295	3.457	3.320	2.947
Education	11.998	13.497	13.312	12.459	11.352	12.800	12.687	12.733
Resides in a Metropolitan Area	0.988	0.976	0.998	0.941	0.968	0.973	0.973	0.970
<i>Occupation</i>								
Managers	0.099	0.224	0.218	0.115	0.076	0.143	0.153	0.158
Technical	0.119	0.269	0.259	0.392	0.114	0.291	0.323	0.255
Service	0.315	0.181	0.174	0.182	0.214	0.171	0.107	0.153
Agriculture	0.014	0.010	0.000	0.000	0.024	0.001	0.000	0.004
Production	0.049	0.031	0.021	0.005	0.095	0.077	0.017	0.039
Operators	0.157	0.054	0.052	0.149	0.191	0.087	0.095	0.109
Unemployed	0.248	0.232	0.276	0.157	0.285	0.230	0.305	0.284
<i>Distribution of Family Income</i>								
Less than 5000	0.065	0.029	0.056	0.020	0.035	0.055	0.063	0.036
5000 to 7499	0.031	0.014	0.011	0.042	0.063	0.029	0.049	0.042
7500 to 9999	0.032	0.027	0.022	0.000	0.059	0.048	0.030	0.034
10,000 to 12,499	0.060	0.019	0.037	0.022	0.074	0.048	0.047	0.045
12,500 to 14,999	0.076	0.033	0.034	0.035	0.045	0.024	0.028	0.053
15,000 to 19,999	0.081	0.055	0.082	0.144	0.084	0.061	0.046	0.058
20,000 to 24,999	0.121	0.123	0.080	0.165	0.110	0.092	0.074	0.098
25,000 to 29,999	0.086	0.049	0.076	0.105	0.097	0.101	0.086	0.099
30,000 to 34,999	0.065	0.075	0.084	0.099	0.084	0.064	0.060	0.095
35,000 to 39,999	0.084	0.075	0.055	0.046	0.072	0.075	0.080	0.058
40,000 to 49,999	0.091	0.074	0.091	0.142	0.081	0.092	0.113	0.077
50,000 to 59,999	0.055	0.074	0.090	0.031	0.065	0.082	0.065	0.092
60,000 to 74,999	0.049	0.076	0.069	0.064	0.054	0.077	0.075	0.070
More than 75,000	0.104	0.276	0.212	0.086	0.075	0.152	0.185	0.143
Family Income	32,344.419	44,670.957	41,043.729	33,924.469	31,013.749	37,639.295	39,055.748	37,020.456
Observations	1429	238	208	36	1543	349	274	343

dichotomous variable that identifies whether an individual is a current smoker, which equals 1 for individuals who are either non-daily smokers or everyday smokers, and is equal to 0 for individuals who report their smoking status as a never smoker or a former smoker.⁹

To control for demographic differences among respondents within the sample, our regressions include age, marital status, family size, and a dummy variable that indicates whether the respondent is male or female. To account for social and economic differences, regression models control for years of education, respondents' occupation, and family income. Each of the demographic covariates above are based on self-report. Smoking patterns within the United States vary by place of residence. To account for this factor, regression models include state of current residence fixed effects and a dummy variable that captures whether a respondent resides in a metropolitan area. Models also include survey year fixed effects to adjust for any period effect on current smoking status.

⁹ For the survey years used in this study, less than one percent of first-generation black immigrants, second-generation black immigrants, and third/higher generation blacks provided indeterminate responses to the smoker recode variable, the variable used to create current smoking status.

Methods

We present descriptive statistics and probit regression models for the entire sample and separately for each major ancestral subgroup. Regression results are shown as marginal effects for ease of interpretation. Robust standard errors are used to determine the significance of estimates. To account for differences in self-response as well as the CPS-TUS complex multistage sampling design, the survey's non-self-response weights are used for both descriptive and regression estimates.

Results

Table 1 provides detailed descriptive statistics for the entire sample. Columns 1 and 2 present summary statistics for foreign-born blacks who either migrated after age 13 or up to age 13 (including age 13), respectively. Columns 3 and 4 show summary statistics for second-generation black immigrants with two or one foreign-born parent(s), respectively. Finally, Column 5 shows summary statistics for third/higher generation individuals.

As expected, Table 1 indicates that third/higher generation blacks (Column 5) have the highest proportion of current smokers (0.212). First-generation immigrants (those born outside of the United States)

Table 3

Marginal Effects of Probit Regression Models of Current Smoking by Generational Status, Adults Aged 18+.

Source: These data are taken from the 1995–2011 Tobacco Use Supplements of the Current Population Surveys for blacks aged 18 or older. Notes: The nonresponse weights from the Tobacco Use Supplements are used for all calculations. 95% confidence intervals are shown in parenthesis. All models include controls for survey year. The fully adjusted model also controls for state of current residence.

	Model 1		Model 2	
	Entire Sample		Entire Sample	
	MFx	95% CI	MFx	95% CI
Generational Status: (Reference Group: Third/Higher Generation)				
Immigrated After Age 13	-0.137 ^{***}	[-0.143,-0.130]	-0.131 ^{***}	[-0.138,-0.125]
Immigrated At or Prior to Age 13	-0.120 ^{***}	[-0.134,-0.107]	-0.104 ^{***}	[-0.119,-0.089]
Both Parents Foreign-born	-0.064 ^{***}	[-0.082,-0.046]	-0.048 ^{***}	[-0.068,-0.029]
One Parent Foreign-born & One Parent U.S.-born	0.005	[-0.018,0.029]	0.018	[-0.006,0.043]
Social and Demographic Characteristics				
Age	0.000 ^{***}	[0.000,0.001]	0.001 ^{***}	[0.000,0.001]
Female	-0.078 ^{***}	[-0.083,-0.073]	-0.074 ^{***}	[-0.080,-0.069]
Married			-0.023 ^{***}	[-0.029,-0.017]
Family Size			-0.003 ^{***}	[-0.005,-0.002]
Education			-0.012 ^{***}	[-0.013,-0.011]
Occupation:(Reference Group: Managerial and Professional)				
Technical			0.020 ^{***}	[0.010,0.030]
Service			0.062 ^{***}	[0.050,0.074]
Agriculture			0.112 ^{***}	[0.077,0.146]
Production			0.097 ^{***}	[0.081,0.114]
Operators			0.084 ^{***}	[0.071,0.097]
Unemployed			-0.009	[-0.019,0.001]
Log(Family Income)			-0.047 ^{***}	[-0.050,-0.044]
Resides in a Metropolitan Area			0.000	[-0.008,0.008]
Observation	118,266		118,266	
Pseudo R-Squared	0.026		0.063	
LR chi2	2371.297		5591.852	

***p < 0.001.

**p < 0.01.

*p < 0.05.

have the lowest proportion of current smokers, with little difference between those who migrated at or prior to age 13 (0.080) and those who migrated after age 13 (0.074). Column 3 shows that the proportion of second-generation black immigrants with two foreign-born parents who report being a current smoker (0.135) is higher than the proportion of first-generation immigrants who are smokers. The proportion of smokers among second-generation individuals with only one foreign-born parent, however, is the same as that of the third/higher generation (0.212).

Table 1 also shows the ancestral distribution of the sample by generational status. For example, Column 1 shows that among immigrants who arrived after age 13, individuals from the West Indies are the largest immigrant subgroup (proportion: 0.360) followed by immigrants from Africa (0.229), Latin America (0.179), and Haiti (0.175). Due partly to differences in the length and intensity of different immigration streams to the United States, the ancestral distribution of the second generation (Columns 3 and 4) varies considerably from that of the foreign-born (Column 1 and 2). Column 3 shows that 31.3 percent of the second generation with two foreign-born parents has parents who both hail from the West Indies, 14.6 percent have parents who both come from Haiti, and another 17 percent have parents who were born in Latin America. Because most contemporary waves of African immigrants arrived in the United States after 1990, a relatively small percent of second-generation immigrants have parents who were born in Africa, 6.2 percent.

Table 2 presents descriptive statistics for the West Indian, Haitian, African, and Latin American ancestral groupings. Similar to Table 1, Table 2 shows very modest differences in smoking patterns among foreign-born individuals by age at arrival. Perhaps the most striking pattern that emerges from Table 2 is the difference in smoking patterns among members of the second generation by the number of foreign-born parents. For every subgroup, U.S.-born individuals with one foreign-born parent report far higher smoking rates than those with two foreign-born parents. This gap in smoking status is largest among individuals whose parents were born in Africa (0.151 versus 0.052) and the West Indies (0.168 versus 0.091), respectively. The gap is smallest among individuals from Haiti and Latin America.

Table 3 shows estimates from probit regression models examining the associations between generational status and smoking for the entire sample. As we noted earlier, the results are shown as marginal effects. Table 3 presents two regression models. First, Model 1, our baseline model, controls for immigrant generational characteristics, including whether an individual migrated at or prior to or after age 13 (first-generation immigrants) and whether an individual had one or two foreign-born parents (second-generation immigrants). The third/higher generation (U.S.-born individuals who have two U.S.-born parents) is the reference group. We also control for age, sex, and survey year. In addition to the variables contained in Model 1, Model 2 includes controls for marital status, family size, education, occupation, family income, metropolitan area status, and state of current residence.

Model 1 of Table 3 shows that after controlling for age and sex, relative to the third or higher generation, the proportion of current smokers is 0.137 (95% CI: -0.143, -0.130) points lower for immigrants who arrived after age 13 and 0.120 (95% CI: -0.134, -0.107) points lower for immigrants who arrived at or before age 13. The relationship between second-generation status and smoking behavior, however, differs depending on the number of foreign-born parents. Second-generation individuals with two foreign-born parents are less likely than the third/higher generation to report smoking (-0.064 points: (95% CI: -0.082, -0.046)). We find no statistically significant difference in smoking status between the third/higher generation and second-generation immigrants with one foreign-born parent. Taken together, results from Model 1 show a steady increase in the probability of being a current smoker moving from the first generation to the second generation with two foreign-born parents to second-generation members with mixed nativity parentage (one U.S.-born and one foreign-born parent). The confidence intervals shown in Table 3 confirm that differences across generational groups in the probability of being a current smoker are statistically significant across generations at conventional levels. Although the magnitude of these estimates changes somewhat after controlling for relevant demographic variables (Model 2), the qualitative significance of most of the results remains the same.

Table 4 shows results from models partitioned by sex. In contrast to the pooled results, Model 2 of Table 4, our fully adjusted model, shows no statistically significant difference in the probability of being a current smoker among the first generation males in the sample by age at migration. This table also shows that relative to the third/higher generation, the

probability of being a current smoker is 7.6 percentage points lower for second-generation black males with two foreign-born parents. Among men, there is no statistically significant difference in the probability of being a current smoker among individuals with one-foreign-born and one U.S.-born parent relative to the third/higher generation.

However, our findings suggest that among women, there is a more pronounced increase in current smoking across immigrant generations. For example, the marginal effect for immigrant women who arrived at or before age 13 is 4.6 points greater than the marginal effect for women who migrated after age 13 (Table 4, Model 2, Women). In contrast, there is no statistically significant difference between these two groups for men. Similarly, while there is a sizable second-generation advantage in current smoking among second-generation men with two foreign-born parents, this estimate for women is considerably smaller (-0.076 vs. -0.027) and marginally significant. Similar to men, there is no statistically significant difference in the probability of being a current smoker between third/higher generation women and second-generation women with one foreign-born parent.

Table 5 shows results for our fully specified model for each of the ancestral subgroups. Similar to the full-sample results (Table 3), first-generation immigrants from each of the ancestral subgroups are substantially less likely to report being current smokers relative to the third/higher generation. Among immigrants from Latin America, the magnitude of this association is stronger among first-generation immigrants who came to the United States after age 13 than for those who migrated at or before age 13. Age at migration does not appear to be associated with the probability of

Table 4

Marginal Effects of Probit Regression Models of Current Smoking by Generational Status, Men and Women Aged 18+.

Source: These data are taken from the 1995–2011 Tobacco Use Supplements of the Current Population Surveys for blacks aged 18 or older. Notes: The nonresponse weights from the Tobacco Use Supplements are used for all calculations. 95% confidence intervals are shown in parenthesis. All models include controls for survey year. The fully adjusted model also controls for state of current residence.

	Model 1		Model 2		Model 1		Model 2	
	Men				Women			
	MFx	95% CI	MFx	95% CI	MFx	95% CI	MFx	95% CI
Generational Status: (Reference Group: Third/Higher Generation)								
Immigrated After Age 13	-0.133***	[-0.145,-0.122]	-0.122***	[-0.136,-0.109]	-0.142***	[-0.148,-0.136]	-0.138***	[-0.144,-0.131]
Immigrated At or Prior to Age 13	-0.139***	[-0.163,-0.114]	-0.116***	[-0.143,-0.088]	-0.104***	[-0.120,-0.089]	-0.092***	[-0.109,-0.075]
Both Parents Foreign-born	-0.099***	[-0.127,-0.070]	-0.076***	[-0.107,-0.045]	-0.036**	[-0.059,-0.013]	-0.027*	[-0.051,-0.003]
One Parent Foreign-born & One Parent U.S.-born	-0.01	[-0.049,0.028]	0.009	[-0.031,0.049]	0.018	[-0.011,0.047]	0.025	[-0.004,0.055]
Social and Demographic Characteristics								
Age	0.001***	[0.001,0.001]	0.001***	[0.001,0.002]	0.000	[-0.000,0.000]	0.000	[-0.000,0.000]
Married			-0.029***	[-0.040,-0.019]			-0.022***	[-0.029,-0.015]
Family Size			-0.006***	[-0.009,-0.003]			-0.001	[-0.003,0.001]
Education			-0.014***	[-0.017,-0.012]			-0.010***	[-0.012,-0.008]
Occupation:(Reference Group: Managerial and Professional)								
Technical			0.025*	[0.006,0.045]			0.014*	[0.003,0.025]
Service			0.074***	[0.053,0.095]			0.059***	[0.045,0.072]
Agriculture			0.121***	[0.079,0.163]			0.087*	[0.008,0.167]
Production			0.119***	[0.096,0.142]			0.065***	[0.031,0.098]
Operators			0.099***	[0.080,0.119]			0.078***	[0.059,0.096]
Unemployed			0.002	[-0.016,0.021]			-0.013*	[-0.024,-0.002]
Log(Family Income)			-0.059***	[-0.064,-0.054]			-0.036***	[-0.040,-0.033]
Resides in a Metropolitan Area			-0.003	[-0.018,0.011]			0.002	[-0.008,0.012]
Observation	48,974		48,974		69,292		69,292	
Pseudo R-Squared	0.017		0.057		0.022		0.061	
LR chi2	678.461		2312.364		903.855		2787.622	

*** p < 0.001.

** p < 0.01.

* p < 0.05.

Table 5
Marginal Effects of Probit Regression Models of Current Smoking by Generational Status, Men and Women Aged 18+.
Source and Notes: See Table 3.

	West Indian		African		Haitian		Latin American	
	MFx	95% CI	MFx	95% CI	MFx	95% CI	MFx	95% CI
Generational Status: (Reference Group: Third Higher Generation)								
Immigrated After Age 13	-0.133***	[-0.143,-0.122]	-0.135***	[-0.148,-0.121]	-0.157***	[-0.168,-0.146]	-0.132***	[-0.145,-0.119]
Immigrated At or Prior to Age 13	-0.122***	[-0.143,-0.102]	-0.145***	[-0.184,-0.106]	-0.156***	[-0.187,-0.126]	-0.078***	[-0.117,-0.040]
Both Parents Foreign-born	-0.089***	[-0.120,-0.057]	-0.135***	[-0.192,-0.078]	-0.091***	[-0.141,-0.040]	-0.050*	[-0.098,-0.002]
One Parent Foreign-born & One Parent U.S.-born	-0.013	[-0.056,0.031]	-0.026	[-0.130,0.078]	-0.044	[-0.176,0.087]	-0.009	[-0.055,0.037]
Social and Demographic Characteristics								
Age	0.001***	[0.000,0.001]	0.001***	[0.000,0.001]	0.001***	[0.000,0.001]	0.001***	[0.000,0.001]
Female	-0.074***	[-0.080,-0.068]	-0.075***	[-0.081,-0.069]	-0.075***	[-0.081,-0.069]	-0.075***	[-0.081,-0.069]
Married	-0.024***	[-0.031,-0.018]	-0.024***	[-0.031,-0.018]	-0.024***	[-0.030,-0.017]	-0.025***	[-0.031,-0.018]
Family Size	-0.003***	[-0.005,-0.001]	-0.003***	[-0.005,-0.001]	-0.003***	[-0.005,-0.001]	-0.003***	[-0.005,-0.001]
Education	-0.013***	[-0.015,-0.011]	-0.013***	[-0.014,-0.011]	-0.013***	[-0.014,-0.011]	-0.013***	[-0.015,-0.012]
Occupation:(Reference Group: Managerial and Professional)								
Technical	0.020***	[0.010,0.031]	0.022***	[0.011,0.034]	0.022***	[0.011,0.033]	0.022***	[0.011,0.033]
Service	0.070***	[0.057,0.082]	0.072***	[0.059,0.084]	0.074***	[0.061,0.086]	0.073***	[0.060,0.086]
Agriculture	0.121***	[0.085,0.157]	0.124***	[0.087,0.161]	0.127***	[0.090,0.164]	0.121***	[0.085,0.157]
Production	0.104***	[0.086,0.122]	0.106***	[0.088,0.125]	0.107***	[0.089,0.125]	0.107***	[0.089,0.125]
Operators	0.093***	[0.079,0.106]	0.093***	[0.079,0.106]	0.094***	[0.080,0.107]	0.093***	[0.079,0.107]
Unemployed	-0.006	[-0.017,0.004]	-0.006	[-0.017,0.005]	-0.005	[-0.016,0.006]	-0.005	[-0.015,0.006]
Log(Family Income)	-0.048***	[-0.051,-0.045]	-0.049***	[-0.052,-0.046]	-0.049***	[-0.052,-0.045]	-0.049***	[-0.052,-0.045]
Resides in a Metropolitan Area	0.000	[-0.009,0.009]	0.001	[-0.008,0.009]	0.001	[-0.008,0.009]	0.000	[-0.009,0.009]
Observation	109,567		107,344		106,723		107,321	
Pseudo R-Squared	0.058		0.055		0.056		0.053	
LR chi2	5075.938		4777.669		4838.498		4726.418	

*** p < 0.001.
** p < 0.01.
* p < 0.05.

Table 6
Marginal Effects of Probit Regression Models of Current Smoking by Generational Status, Men Aged 18+.
Source and Notes: See Table 3

	West Indian		African		Haitian		Latin American	
	MFx	95% CI	MFx	95% CI	MFx	95% CI	MFx	95% CI
Generational Status: (Reference Group: Third Higher Generation)								
Immigrated After Age 13	-0.119***	[-0.141,-0.097]	-0.123***	[-0.149,-0.098]	-0.166***	[-0.189,-0.143]	-0.135***	[-0.160,-0.109]
Immigrated At or Prior to Age 13	-0.140***	[-0.178,-0.101]	-0.174***	[-0.232,-0.116]	-0.175***	[-0.243,-0.107]	-0.113***	[-0.175,-0.050]
Both Parents Foreign-born	-0.124***	[-0.176,-0.071]	-0.148***	[-0.246,-0.050]	-0.108**	[-0.186,-0.031]	-0.039	[-0.125,0.046]
One Parent Foreign-born & One Parent U.S.-born	-0.05	[-0.120,0.019]	-0.093	[-0.278,0.092]	-0.146*	[-0.275,-0.018]	-0.025	[-0.102,0.051]
Social and Demographic Characteristics								
Age	0.001***	[0.001,0.002]	0.001***	[0.001,0.002]	0.001***	[0.001,0.002]	0.001***	[0.001,0.002]
Married	-0.031***	[-0.042,-0.020]	-0.030***	[-0.042,-0.019]	-0.030***	[-0.041,-0.019]	-0.032***	[-0.043,-0.021]
Family Size	-0.005**	[-0.008,-0.002]	-0.005**	[-0.009,-0.002]	-0.005**	[-0.009,-0.002]	-0.006**	[-0.009,-0.002]
Education	-0.016***	[-0.018,-0.013]	-0.016***	[-0.018,-0.013]	-0.016***	[-0.018,-0.013]	-0.016***	[-0.018,-0.013]
Occupation:(Reference Group: Managerial and Professional)								
Technical	0.023*	[0.003,0.044]	0.027*	[0.005,0.048]	0.026*	[0.005,0.047]	0.026*	[0.005,0.048]
Service	0.081***	[0.059,0.104]	0.081***	[0.058,0.103]	0.085***	[0.062,0.108]	0.086***	[0.063,0.109]
Agriculture	0.128***	[0.084,0.172]	0.129***	[0.085,0.173]	0.134***	[0.089,0.179]	0.128***	[0.084,0.171]
Production	0.127***	[0.103,0.152]	0.131***	[0.106,0.156]	0.132***	[0.107,0.158]	0.132***	[0.107,0.157]
Operators	0.109***	[0.088,0.130]	0.108***	[0.087,0.129]	0.110***	[0.089,0.132]	0.110***	[0.089,0.131]
Unemployed	0.006	[-0.013,0.026]	0.006	[-0.014,0.025]	0.008	[-0.012,0.028]	0.009	[-0.011,0.029]
Log(Family Income)	-0.061***	[-0.067,-0.056]	-0.062***	[-0.068,-0.056]	-0.062***	[-0.068,-0.056]	-0.062***	[-0.067,-0.056]
Resides in a Metropolitan Area	-0.003	[-0.017,0.012]	-0.004	[-0.019,0.011]	-0.004	[-0.018,0.011]	-0.004	[-0.019,0.011]
Observations	44,869		44,223		43,761		43,985	
Pseudo R-Squared	0.053		0.052		0.052		0.049	
LR chi2	2115.848		2042.075		2039.283		2004.445	

*** p < 0.001.
** p < 0.01.
* p < 0.05.

Table 7
Marginal Effects of Probit Regression Models of Current Smoking by Generational Status, Women Aged 18+.
Source and Notes: See Table 3.

	West Indian		African		Haitian		Latin American	
	MFx	95% CI	MFx	95% CI	MFx	95% CI	MFx	95% CI
Generational Status: (Reference Group: Third Higher Generation)								
Immigrated After Age 13	-0.138***	[-0.147,-0.130]	-0.149***	[-0.159,-0.138]	-0.152***	[-0.160,-0.144]	-0.128***	[-0.142,-0.115]
Immigrated At or Prior to Age 13	-0.106***	[-0.129,-0.083]	-0.123***	[-0.173,-0.072]	-0.138***	[-0.163,-0.114]	-0.051*	[-0.100,-0.002]
Both Parents Foreign-born	-0.060**	[-0.099,-0.020]	-0.127***	[-0.189,-0.065]	-0.071*	[-0.141,-0.002]	-0.056*	[-0.109,-0.002]
One Parent Foreign-born & One Parent U.S.-born	0.014	[-0.041,0.068]	0.021	[-0.100,0.141]	0.062	[-0.158,0.282]	0.006	[-0.050,0.062]
Social and Demographic Characteristics								
Age	0.000	[-0.000,0.000]	0.000	[-0.000,0.000]	0.000	[-0.000,0.000]	0.000	[-0.000,0.000]
Married	-0.022***	[-0.030,-0.014]	-0.022***	[-0.030,-0.014]	-0.021***	[-0.029,-0.013]	-0.022***	[-0.030,-0.014]
Family Size	-0.001	[-0.003,0.001]	-0.001	[-0.003,0.001]	-0.001	[-0.003,0.001]	-0.001	[-0.003,0.001]
Education	-0.010**	[-0.012,-0.009]	-0.010**	[-0.012,-0.008]	-0.010**	[-0.012,-0.009]	-0.010**	[-0.012,-0.009]
Occupation:(Reference Group: Managerial and Professional)								
Technical	0.016**	[0.004,0.028]	0.018**	[0.006,0.030]	0.017**	[0.005,0.029]	0.017**	[0.004,0.029]
Service	0.066***	[0.052,0.081]	0.069***	[0.054,0.084]	0.069***	[0.054,0.084]	0.068***	[0.053,0.083]
Agriculture	0.104*	[0.018,0.190]	0.115*	[0.025,0.204]	0.113*	[0.024,0.202]	0.110*	[0.021,0.198]
Production	0.067**	[0.031,0.102]	0.069**	[0.033,0.105]	0.069**	[0.033,0.105]	0.071**	[0.035,0.108]
Operators	0.086***	[0.066,0.105]	0.089***	[0.069,0.108]	0.087***	[0.067,0.107]	0.086***	[0.067,0.106]
Unemployed	-0.011	[-0.023,0.001]	-0.010	[-0.022,0.002]	-0.010	[-0.022,0.002]	-0.010	[-0.023,0.002]
Log(Family Income)	-0.038**	[-0.042,-0.034]	-0.039**	[-0.043,-0.035]	-0.039**	[-0.043,-0.035]	-0.039**	[-0.043,-0.035]
Resides in a Metropolitan Area	0.002	[-0.008,0.013]	0.004	[-0.007,0.015]	0.004	[-0.007,0.014]	0.003	[-0.008,0.014]
Observations	64,698		63,121		62,962		63,336	
Pseudo R-Squared	0.053		0.050		0.050		0.047	
LR chi2	2510.826		2335.993		2414.38		2331.964	

*** p < 0.001.
** p < 0.01.
* p < 0.05.

smoking among first-generation West Indian, African, and Haitian immigrants.

The second-generation immigrant advantage (relative to the third generation) is largest among individuals with two African-born parents [-0.135 (95% CI: -0.192, -0.078)]. Across each ancestral subgroup, we detect no statistically significant differences in current smoking status between the third/higher generation and second-generation immigrants with only one foreign-born parent. Tables 6 and 7 present these estimates separately for men and women, revealing a similar pattern of smoking as shown in Table 5. Because of the small sample sizes that generate these estimates, however, these results should be viewed with caution.

Discussion, limitations, and conclusion

Discussion

This study extends prior work on the relation between generational status and tobacco use among black immigrants and their descendants (Acevedo-Garcia et al., 2005). To our knowledge, this is the first study to examine the associations between generational status and smoking behavior among the major ancestral black immigrant subgroups. Four key findings emerge from our analyses. First, both in the full sample and across the four ancestral subgroups, we find that first-generation immigrants are far less likely to report being current smokers than third/higher generation blacks. First-generation immigrants who came to the United States after age 13 have a lower probability of smoking than those who migrated at or before age 13; this difference is particularly pronounced among blacks with Latin American ancestry. Second, while the results show that second-

generation immigrants with two foreign-born parents are generally less likely to smoke than the third or higher generation, there is no statistically significant difference in smoking between second-generation immigrants with mixed nativity parents and the third or higher generation. Third, among individuals with West Indian, Haitian, and Latin American ancestry, the probability of being a current smoker increases with each successive generation. In contrast to these groups, smoking patterns are more stable among individuals with African ancestry. Finally, both the magnitude and significance of our results appear to differ by gender, particularly in the analyses not partitioned by ancestry (Table 5). These findings raise four important questions regarding generational differences in smoking among blacks in the United States.

1. What factors might explain the favorable smoking patterns of the first generation? Why does migrating at a later age negatively influence the probability of smoking?

The large and negative associations between first-generation immigrant status and smoking are consistent with prior research on smoking behavior and substance abuse among foreign-born blacks and their descendants (Acevedo-Garcia et al., 2005; Broman, Neighbors, Delva, Torres & Jackson, 2008). In the context of the “healthy immigrant effect” (HIE) framework (Antecol & Bedard, 2006), researchers have argued that immigrants might be more likely to adhere to cultural practices that promote healthy eating and discourages detrimental health behaviors, such as alcohol, drug, and tobacco use (Abraido-Lanza et al., 2005; Amaro, Whitaker, Coffman & Heeren, 1990). Others have argued that selective migration is a more salient explanation for the HIE (Kennedy, Kidd, McDonald & Biddle, 2015). Although we are unable to disentangle the

relative importance of culture versus selective migration in explaining the favorable smoking patterns of the first generation relative to the third/higher generation, the lower levels of tobacco use among first-generation immigrants that we find are consistent with predictions based on the HIE.

At least two important potential factors could explain why smoking patterns differ among the first generation based on their age at arrival. First, because individuals who migrate as children play a limited role in the decision to migrate, these individuals might not be as favorably selected on health behaviors as those who migrated as adults. Second, most adult smokers begin smoking before the age of 18 (Riordan, 2009). First-generation immigrants who migrate at older ages might spend their formative years in countries with relatively stronger anti-smoking norms and might be less likely to take up smoking in adulthood than individuals who migrated earlier in life (Kopak, 2013). Although not addressed in our analyses, studies have also suggested that friendship networks might be an important means of understanding intergenerational changes in smoking behavior. For example, one study from Canada on adolescents suggested that first-generation immigrants are the least likely to have friends who smoke, followed by the second- and the third/higher-generation (Georgiades, Boyle, Duku & Racine, 2006).

2. Why do second-generation immigrants with one foreign-born parent show a higher probability of smoking than those with two foreign-born parents?

In general, children are more likely to smoke if their parents smoke; the risk is elevated further if both parents smoke (Gilman et al., 2009). In both the United States and the United Kingdom, black immigrant mothers are less likely to smoke relative to native-born women (Elo & Culhane, 2010; Elo et al., 2014; Green, 2014; Jackson, McLanahan & Kiernan, 2012), which is potentially a reflection of the social norms surrounding smoking in their respective countries of origin. Differences within the second-generation by the number of foreign-born parents may reflect the intensity of and variation in attitudes toward smoking among black immigrant families, though further research is needed in this area (Acevedo-Garcia et al., 2005; Thomas, 2009).

3. What explains the variation (or lack thereof) across black immigrants from the West Indies, Africa, Haiti, and Latin America?

We generally find that the gap in smoking between the first- and 1.5-generation is similar across ethnic groups, with an important exception. Among Latin American black women, there seems to be a much larger smoking advantage among those who immigrated after age 13 compared to those who came to the United States at or before age 13. This finding is consistent with prior research among Latinos that suggests that age at migration is associated with smoking (Kimbrow, 2009). Kimbro (2009) found that the impact of age at migration is positively correlated with smoking and binge drinking. Given that immigrants who arrived prior to adolescence might be more acculturated than immigrants who arrived later in life, the higher smoking rates among Latin American immigrants who migrated prior to age 13 are in line with prior research. Additional research, however, is needed to explain why this pattern only exists for black immigrants, particularly black women, with Latin American ancestry.

Relative to third/higher generation, second-generation individuals with two immigrant parents are less likely to smoke. These results are most pronounced among African immigrants, which might suggest that African parents—many of whom come from countries with lower smoking rates than Caribbean and Latin American countries (WHO Report on the Global Tobacco Epidemic, 2015)—might place particular emphasis on anti-smoking behavior.

4. Why are intergenerational differences in smoking generally larger among women compared to men?

Prior research among Hispanics has found that, relative to male immigrants, the health behaviors of female immigrants converge more rapidly to U.S. norms (Kimbrow, 2009; Lopez-Gonzalez, Aravena & Hummer, 2005). Our results extend these findings and generally suggest that intergenerational gaps in smoking behavior are larger among women compared to men in both relative and absolute terms. Specifically, we show that while there is virtually no difference in the likelihood of smoking among the first- and 1.5-generation among men, there is a more meaningful first generation advantage among women. Similarly, the intergenerational decline in the immigrant smoking advantage (moving from the first- to the second-generation) is more pronounced among women relative to men.

Limitations

Our study has a few important limitations. First, we rely on self-reported smoking, rather than biological measures of tobacco consumption, such as serum cotinine levels (Perezstabile, Benowitz & Marin, 1995). To the extent that survey participants might underreport smoking, this might bias our observed estimates. We have no evidence, however, that individuals self-report differently based on generational status or region of ancestry. Second, while our study explores the role of region of origin, data limitations prevent us from exploring generational differences in smoking for specific countries in the West Indies, Africa, and Latin America. Consequently, we are not able to determine which ancestral subgroups are driving the regional results. Third, our cross-sectional data do not allow us to investigate how smoking behaviors evolve over time among first- and second-generation immigrants from the same family. Finally, we are unable to explore the role of specific stressors (i.e. discrimination) on gender-specific intergenerational smoking trajectories among black immigrants (Tran, Lee & Burgess, 2010).

Conclusion

Our findings suggest the importance of accounting for variation in smoking within and across generations of black immigrants and their descendants. We also show that both gender and region of ancestry/origin shape intergenerational changes in current smoking. These results have important implications for a broader research agenda investigating the health behaviors and health outcomes of black immigrants. We believe that future research should consider the potential links between gender, household structure and smoking behavior among the children of black immigrants, including immigrant parents' smoking behavior during children's formative periods (Acevedo-Garcia et al., 2005). In addition, understanding differences in contextual factors such as gender-specific smoking norms during critical periods of development can help clarify why women who migrate after adolescence are much more likely to report better health behaviors compared to those who migrate prior to this period. Future research should also explore the roles of stress and exposure to discrimination in explaining variation in smoking among black immigrants in the United States (Slopen et al., 2012; Tran, Lee & Burgess, 2010; Ladrine & Klonoff, 1999). Finally, further qualitative and quantitative studies should consider how and why intergenerational smoking patterns differ by ancestry. Answers to these questions will better equip public health decision makers with the information needed to better target scarce resources toward smoking cessation and prevention efforts to the subgroups most at risk.

Appendix A1. Countries that comprise each ancestral subgroup

Latin America	West Indies	Sub-Saharan Africa
Mexico	Jamaica	Ghana
Belize/British Honduras	Bahamas	Nigeria
Costa Rica	Barbados	Cameroon
El Salvador	Dominica	Cape Verde
Guatemala	Grenada	Liberia
Honduras	Trinidad and Tobago	Senegal
Nicaragua	Antigua and Barbuda	Sierra Leone
Panama	St. Kitts–Nevis	Eritrea
Central America, n.s.	St. Lucia	Ethiopia
Cuba	Vincent and the Grenadines	Kenya
Dominican Republic	Caribbean, n.s.	Somalia
Argentina	Guyana/British Guiana	Tanzania
Brazil		Uganda
Chile		Zimbabwe
Colombia		South Africa (Union of Africa, n.s./n.e.c.
Ecuador		
Peru		
Uruguay		
Venezuela		
South America, n.s.		

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