

Nativity and Cigarette Smoking among Lower Income Blacks: Results from the Healthy Directions Study

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Abstract Blacks in the United States bear the greatest disease burden associated with cigarette smoking. Previous studies have shown that the rapidly increasing population of foreign-born Blacks has lower smoking rates compared to their native-born counterparts. However, less is known about whether cigarette smoking among Blacks varies by region of birth (US, Africa, or the Caribbean), generational status, or acculturation. We examined the association between nativity and cigarette smoking among 667 Black adult men and women enrolled in the Harvard Cancer Prevention Program project. In multi-variable analyses, US-born Blacks were more likely to be smokers compared to those born in the Caribbean (OR = 0.16, 95% CI 0.08 and 0.34) or in Africa (OR = 0.24, 95% CI 0.08, and 0.74). Language acculturation was positively associated with cigarette smoking (OR = 2.62, 95% CI 1.17, and 5.85). We found that US-born Blacks were more likely to be current cigarette smokers than those born in either Caribbean or African countries. Our findings highlight the importance of intervening early new Black immigrants to stem the uptake of cigarette smoking behaviors as individuals become acculturated.

Keywords Nativity · Acculturation · Smoking · Blacks

Introduction Cigarette smoking remains a primary preventable cause of death in the United States, particularly for Blacks, who experience disproportionately higher rates of tobacco-related chronic disease incidence and mortality. Previous research has found that the prevalence of cigarette smoking among Blacks varies by place of birth; lower smoking rates are generally found among foreign-born Blacks compared to those who are US-born. This is a key concern for intervention efforts and US tobacco control policy, as immigration rates among individuals from African nations have risen steadily over the past decade. Similarly, immigration from Caribbean nations is increasing again after declines in 2002–2003. [Immigration from both regions is projected to increase; though knowledge about smoking patterns among immigrants from these areas is limited. While studies have compared smoking prevalence among foreign-born Blacks and US-born Blacks, little research to date has disaggregated the foreign-born category and considered potential variation in cigarette smoking by region of origin.

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Compared to other immigrants, Blacks may be more likely to reside in lower socioeconomic position (SEP) once in the US [8]. For example, in 2002 a higher proportion of immigrants with a household income under

\$20,000 came from the Caribbean (33.1%) compared to other world regions. SEP remains a potent predictor of smoking, however very little is known about the smoking patterns of lower income Black immigrants.

Linguistic acculturation is among the most studied determinants of immigrant smoking prevalence; most studies (which have been conducted primarily among Latinos) have demonstrated lower smoking rates among those who are less acculturated [3]. In contrast however, a series of smaller investigations have shown an inverse association between language acculturation and smoking rates among Blacks [4, 15] it remains unclear whether these inconsistencies result from methodological limitations, or whether acculturation maintains no protective effects on smoking among Blacks.

The primary aim of the present investigation was to examine the associations of region of birth and language acculturation with current cigarette smoking among Black adults.

Methods

Study Design

These data are from the Harvard Cancer Prevention Program Project (HCPPP); the overarching goal of the HCPPP was to create a new generation of cancer prevention interventions that would be effective in promoting health behavior change among lower income, multi-ethnic populations. The HCPPP was comprised of two randomized controlled trials, one in health centers (HC) [6], and one in small businesses (SB) [7]. Together, the two arms of the trial were successful in enrolling a sub-population of the multi-ethnic working class population in eastern Massachusetts [8]. The two studies, which comprised the HCPPP, had some differences in their sampling methods; study aims and sampling strategies are published in great detail elsewhere [6, 17]. Together, the studies presented a unique opportunity to investigate nativity and smoking in a largely underserved population.

Sample

Health Centers

Healthy Directions-HC [6] was a randomized controlled trial conducted in collaboration with a large health care delivery system, comprised of 14 multi-specialty medical groups that serve over 270,000 patients. Ten of the fourteen HC were invited to participate in this study, and

Health center served as the unit of randomization and intervention. All providers practicing in the Internal Medicine departments of the HC were approached for permission to recruit from among their patient pools. Provider participation averaged 83% across sites (range 50–100%; 97 clinicians). Patients scheduled for appointments with the participating providers and in the eligible age range were identified through the automated central appointment system. Patients who resided in low income, multi-ethnic neighborhoods [6] were identified and approached for participation through their health center. Individuals identified through geocoding to be residents in the target neighborhoods were deemed eligible if they met the following criteria: (1) being 18–75-year old, (2) having a well-care or follow-up visit scheduled with a participating provider, (3) being able to speak and read either English or Spanish, (4) not having cancer at the time of enrollment, (5) not being employed by the participating HC, (6) not being employed by a worksite participating in the companion small business study, and (7) providing consent to participate in the randomized study.

Study staff attempted to recruit 8,963 potentially eligible candidates; 2,547 (28%) were unreachable, 867 (10%) were ineligible, 3,330 (37%) refused, and 2,219 (25%; 40% of those reached and eligible) were enrolled. The cohort recruited at baseline was contacted by telephone after the intervention period to complete a follow-up survey. Of the 2,219 who completed the baseline survey (1,088 in intervention condition, $n = 1,131$ control condition), 1,954 (88%) completed the follow-up survey. The follow-up response rate was equivalent across conditions.

The Healthy Directions-SB study [7] was a randomized controlled trial in which the worksite served as the unit of randomization and intervention. Worksites were identified using the Dun and Bradstreet database to locate SB with Standard Industrial Classification (SIC) codes 20–39 (manufacturing industries) and employing between 50 and 150 employees. Additional inclusion criteria included: (1) employing a multi-ethnic population (defined as 25% of workers being first- or second-generation immigrants or people of color), (2) having a turnover rate of 20% in the previous year, (3) being autonomous in decision-making to participate in a study, and (4) agreeing to be randomly assigned to the intervention condition. One hundred thirty-three (133) companies met the eligibility criteria and of these, 26 agreed to participate [9].

Data were collected using interviewer-administered surveys among individuals who were permanent employees and worked 20 h or more per week on site. Interviews were administered on company time in the language (English, Spanish, Portuguese, or Vietnamese) preferred by respondents. The survey response rate in the 26 sites was 84% (range 70–98%, total = 1,740 in the 26 sites).

Of the 3,959 subjects in the combined (HC and SB) HCPPP sample, our analyses were limited to the 671 (17% of total samples) individuals enrolled at baseline who reported their racial/ethnic group as non-Hispanic Black or Black American. We excluded participants who were missing data on smoking, which resulted in a final sample of 667 participants. All sampling procedures were fully approved by the relevant human subject committees.

Measures

Respondents self-reported their date of birth, gender, and all racial/ethnic designations. For HC participants, we combined information about the respondent's employment status and job title into a three-category job status variable: employed in a blue-collar job, non-blue collar position, or unemployed/retired. In SB, job title was obtained from worksite management. Jobs were then coded as blue or white collar. We chose to use this measure because it is likely a more sensitive measure of US SEP compared to traditional indices (e.g., education) among immigrant populations.

Cigarette Smoking

Smoking status was assessed by self-report using standardized questions concerning lifetime smoking (e.g., having smoked at least 100 cigarettes in lifetime) and 7-day point-prevalence smoking status.

Nativity

Participants self-reported their country of birth. Due to the variability of responses and the sample size, responses were grouped by region: US-born, Caribbean-born, African-born, and other.

Language Acculturation

Using the method described by Marin et al., participants were classified as low acculturated, moderately

Statistical Analyses
All analyses utilized mixed modeling methods to account for the clustering of respondents in worksites and HC. We computed a mixed model logistic regression analysis with business or center included as a random effect. We also included a term for site (HC versus SB) as a fixed effect to account for the differences in recruitment approach in the two studies. Analyses were conducted using the GLIMMIX macro to the SAS statistical software, Version 8.0 (SAS Institute Inc., Cary, NC). This macro uses iteratively re-weighted likelihoods to fit a logistic regression model where the participants are clustered in the random effect.

Table 1 shows the baseline characteristics of study participants. The majority of participants were either never or past smokers (82%*n* = 546), while 18% were current smokers. Most were born in the US (67%*n* = 447), yet nearly a quarter (*n* = 163) of the sample was born in the Caribbean. A small percentage (6%*n* = 40) were born in Africa, or in other regions (2%*n* = 15). Of those born in the US, most were born to parents who were also US-born (89%). Participants were more likely to work in blue collar jobs (58%*n* = 378) than in white collar occupations (36%, *n* = 234). The mean age (SD) was 47.1 (12.8); smokers and non-smokers did not differ in age (*p* = 0.70).

A significantly higher percentage of non-smokers were born outside the US (38% vs. 11%, *p* < 0.0001), compared to smokers. Smokers were slightly more likely than non-

Table 1 Descriptive characteristics of study sample by smoking status

	Current smoker (<i>n</i> = 121)	Never or past smoker (82%, <i>n</i> = 546)	Total (<i>n</i> = 667)
Region of birth			<i>p</i> < 0.0001
USA	88% (107)	62% (340)	67% (447)
Caribbean	7% (9)	28% (154)	25% (163)
Africa	3% (4)	7% (36)	6% (40)
Other	1% (1)	3% (14)	2% (15)
Language acculturation			<i>p</i> = 0.02
Low or moderate	7% (8)	15% (78)	13% (86)
High	93% (107)	85% (440)	87% (547)
Generation			<i>p</i> < 0.0001
Second + generation	24% (95)	76% (302)	60% (397)
First generation	24% (12)	76% (37)	7% (49)
Foreign-born	6% (14)	94% (205)	33% (219)
Sex			<i>p</i> = 0.01
Male	40.5% (49)	29% (159)	31% (208)
Female	59.5% (72)	71% (387)	69% (459)
Occupation			<i>p</i> = 0.55
Blue collar	62% (73)	57% (305)	58% (378)
White collar	32% (37)	37% (197)	36% (234)
Not working	6% (7)	6% (33)	6% (40)
Age (mean, SD)	46.7 (11.7)	47.2 (13.0)	<i>p</i> = 0.71 47.1 (12.8)

Numbers may not sum to total because of missing values

smokers to be employed in blue collar jobs (62% vs. 57%, *p* = 0.55). The majority of current smokers (59.5%) and plus generation participants. never or past smokers were women (71%). Both smokers and non-smokers had similar levels (31% vs. 30% experienced sometimes or more) of discrimination experiences (31% vs. 30% experienced sometimes or more).

Nativity was strongly associated with current smoking. In the present investigation, we found strong support for an association of nativity with cigarette smoking among a sample of Black adults. US-born Blacks were more likely to be current cigarette smokers, compared to those born in other regions of the world did not differ from US-born Blacks from small numbers in the African-born category. In contrast to previous findings among Blacks [15], we found consistent in models subsequently adjusted for sex and occupation. In comparing African and Caribbean-born Blacks, we found that there were no differences in smoking prevalence between first and second generation Blacks, while a difference did exist between foreign-born and US-born Blacks.

Language acculturation was positively associated with current smoking. In age and gender adjusted analyses, Foreign-born participants were less likely to be current individuals in the high acculturation group were more cigarette smokers, a finding that is consistent with the literature reporting the enhanced lifestyle behaviors and health-related outcomes often found among some immigrant populations compared to the US natives [27].

Participants born outside the US were significantly less likely than second plus generation participants to smoke. This has been generally hypothesized to result from differing social norms; that is, poorer lifestyle behavior practices may be less common in many immigrants' native

Table 2 Adjusted odds ratios (95% CI) of smoking by region of birth, language acculturation, and generation

	Age adjusted	Age and sex	Age, sex, occupation
Nativity			
US-born	1.0	1.0	1.0
Caribbean-born	0.16 (0.08, 0.34)	0.16 (0.08, 0.33)	0.16 (0.08, 0.34)
African-born	0.24 (0.08, 0.74)	0.22 (0.07, 0.69)	0.23 (0.08, 0.73)
Born in other region	0.24 (0.03, 1.86)	0.21 (0.03, 1.67)	0.22 (0.03, 1.74)
Language acculturation			
Low-moderate	1.0	1.0	1.0
High	2.76 (1.23, 6.18)	2.80 (1.26, 6.22)	2.62 (1.17, 5.85)
Generation			
Second + generation	1.0	1.0	1.0
First generation	0.94 (0.47, 1.91)	0.97 (0.48, 1.98)	1.06 (0.52, 2.18)
Foreign-born	0.18 (0.10, 0.33)	0.17 (0.09, 0.32)	0.18 (0.10, 0.34)

All analyses adjust for clustering of subjects within worksite or health center

countries than in the US. Selection effects may also emerge, as individuals who successfully immigrate to the US may be those with better overall health practices. These findings suggest, consistent with the general literature, that factors associated with the US social context may promote the adoption of adverse health behaviors, including cigarette smoking cessation among our study population are rette smoking, among immigrants over time. Much of this

work however, has been conducted among Latino populations. A limited number of studies [46, 28, 29] have examined differences in smoking behaviors between US-born and foreign-born Blacks; only one study could be identified that examined cigarette smoking patterns within Black immigrant populations [4]. Although we found no significant differences between African-born and either other foreign-born or US-born Blacks. Although we found no significant differences between African-born and Caribbean-born participants, future studies with larger samples should investigate this question further.

In stark contrast to the literature demonstrating positive associations between language acculturation and smoking among Latinos [13], a few smaller studies have shown the range of languages spoken by Black immigrants [15]. Our findings however, supported the expected positive association; highly acculturated individuals were 2.5 times more likely to be smokers than were those with lower acculturation levels. Importantly however, our findings support the general pattern of acculturation and acceptance of mainstream American social norms and cigarette smoking among immigrants may become increasingly prevalent. The precise mechanisms underlying the association between acculturation and smoking are largely unclear. However, it is possible that the penetration of US-based views of smoking as glamorous and socially acceptable increases in salience as immigrants acculturate. It is also possible that new immigrants began to see cigarette smoking as functional, perhaps for its perceived value

many challenges inherent in conducting research in this setting. Non-response is a continuing and worsening challenge [47, 48] and constrains the representativeness of our sample to the responding portion of the population. Our estimates may be biased if variation exists between the responding and non-responding portions of the target population.

To conclude, we found that US-born Blacks were more likely to be current smokers than foreign-born Blacks. We found a positive association between language acculturation and cigarette smoking in this sample of Black adults. Efforts to stem the rates of cigarette smoking among US-born Blacks may be well served to rigorously investigate those factors that protect against access cigarette smoking patterns among foreign-born Blacks.

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