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Tobacco use among Latinx adolescents: exploring the immigrant paradox

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Abstract

Background: Research suggests that an immigrant paradox exists where those who were not born in the United States (1st generation) have significantly better health than those who were born in the U.S. (2nd generation or more). The aim of the current study was to examine the immigrant paradox with respect to tobacco-related perceptions and parenting influences in smoking initiation among Latinx adolescents.

Methods: Data came from the 7th and 10th grade Healthy Passages™ assessments of Latinx participants in three U. S. urban areas ($N = 1536$) who were first (18%), second (60%), and third (22%) generation. In addition to demographics, measures included perceived cigarette availability and peer smoking, intentions and willingness to smoke, and general monitoring by parents. Parents reported on generational status and their own tobacco use. The primary outcome was participant's reported use of cigarettes.

Results: By 10th grade, 31% of Latinx youth had tried a cigarette, compared to 8% in 7th grade. After controlling for age, gender, and socioeconomic status, regression analyses indicated that there were no significant differences related to generational status in cigarette smoking initiation in either 7th or 10th grade. Youth tobacco-related perceptions, general parental monitoring, and parental tobacco use predicted Latinx adolescent cigarette use initiation by 10th grade.

Conclusions: Latinx adolescents might not have differential smoking rates based on generation status, suggesting that the immigrant paradox concept may not hold for smoking initiation among Latinx adolescents. Rather, factors influencing cigarette initiation generally in adolescents as a group appear to apply to Latinxs as well.

Keywords: Latinxs, Immigrant paradox, Generational status, Tobacco use, Adolescent

Background

Over 37 million adults in the U.S. are current smokers [1] and most (80%) of these smokers began smoking cigarettes before the age of 17 [2]. Despite significant public health efforts to reduce the prevalence of smoking in the U.S., tobacco use continues to be the leading cause of preventable death and is associated with numerous negative health outcomes, including respiratory problems, lung cancer, and cardiovascular disease [3]. National health data suggest that time of smoking initiation varies by race/ethnicity [4], with Latinxs initiating much earlier than (non-Latinx) Whites. With thousands of youth beginning to smoke each day [2] and more male Latinx youth initiating cigarette smoking before age 13

years (13%) compared to their White (10%) and Black (10.5%) peers [4], there is a need to understand factors associated with smoking initiation during adolescence. Such information may help with the development of prevention efforts, especially those targeted at Latinx youth.

Previous research has indicated that immigrants to the U.S. and children of immigrants may be less likely to engage in behaviors that are harmful to health and may have a morbidity and mortality advantage compared to those without a recent immigration history, regardless of level of socioeconomic status or race/ethnicity [5]. This finding has been reported for a variety of health risk behaviors [6–8], and health conditions [9, 10], such as mental health disorders and certain types of cancers and cancer outcomes. This phenomenon of engaging less frequently

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in risk behaviors and having better overall health in the current and recent immigrant generation is referred to as the *immigrant paradox* [11, 12]. Moreover, for adults, there is an overall mortality advantage, where 1st and 2nd generation Latinxs have a longer life expectancy compared to 3rd generation Latinxs, defined as those born in the U.S. to parents born in the U.S. [13].

Despite studies documenting the immigrant paradox for a broad range of health issues, we are aware of only two studies that have examined the role of immigrant generational status on smoking among Latinx youth. Both studies used data from the National Longitudinal Study of Adolescent Health (Add Health), a national, longitudinal study following youth from 7th grade into young adulthood. One study found evidence to support the paradox [14] after controlling for demographic covariates (age, gender, parental education, and household composition), whereas the other found no significant difference by generational status after controlling for other covariates, including parental control and parental smoking [15]. Consequently, conclusions regarding the existence of the paradox in relation to Latinx adolescent smoking are unclear. Findings for Latinx adults have also been mixed, with two studies reporting that 1st [16, 17] and 2nd [18] generation Latinxs were less likely to be smokers compared to 3rd generation and that 3rd generation have the highest overall tobacco use, but another study reporting no difference by generational status [19].

Previous research has shown that initiation of tobacco use among youth is associated with many sociodemographic factors and tobacco-related perceptions and attitudes. The theory of planned behavior is a widely used theoretical framework for understanding factors associated with smoking initiation among youth [20, 21] and links behavior with intentions and perceptions about external influences [22]. Adolescent tobacco use initiation has been shown to be strongly associated with availability of cigarettes [23], peer smoking [24, 25], parent smoking [26], parental monitoring [27], and intentions and willingness to smoke [28–30], with at least one previous study finding that intentions to smoke are associated with smoking among Latinx adolescents [30]. Further, having friends who smoke cigarettes [25] is associated with increased smoking intentions, willingness, and future initiation. Being closely monitored by a parent has also been found to be related to decreased smoking willingness and initiation [24]. Few studies, however, have examined the extent to which these influences are significant for Latinx adolescents specifically, and we know of none that considers immigrant generational status together with tobacco-related perceptions (intentions and willingness to smoke).

The current study updates previous work and examines tobacco use among Latinx adolescents beginning in

middle school (7th grade). We also examine the immigrant paradox together with demographic and parent and perceptual factors in cigarette smoking initiation. We hypothesized that among Latinx adolescents, (1) more recent immigrant generations (1st vs. 3rd and 2nd vs. 3rd) evidence lower prevalence of smoking initiation by 7th and 10th grade and tobacco-related perceptions of willingness and intent to use in 7th grade compared to 10th grade. Based on past findings, we further hypothesized (2) that tobacco-related perceptions and parenting influences in 7th grade predict, beyond generational status differences, smoking initiation by 10th grade. Specifically, we examined as predictors perceptions of tobacco availability and peer smoking, future smoking intentions and willingness to smoke, and parental tobacco use and general monitoring.

Methods

Data came from the Healthy Passages™ study, a longitudinal (2004–2011), multi-site cohort study of health and health behaviors in youth in 5th, 7th, and 10th grades [31, 32].

Participants

Fifth-grade students were recruited from public school classrooms in three locations (Birmingham, Alabama; Los Angeles, California; Houston, Texas) to participate in the Healthy Passages™ study. Using a two-stage probability sampling procedure, participants were selected. To ensure adequate sample sizes of students who identified as Black, Latinx, and White, schools within Birmingham, Los Angeles, and Houston were randomly selected with probabilities proportionate to a weighted measure of the scarcity of a school's students relative to targets of these three racial/ethnic groups. Within these selected schools, all 5th grade students were invited to participate [32]. Among the participants (and their parents/caregivers) that granted permission to be contacted and completed interviews in 5th grade ($N = 5147$; 51% female; 35% Latinx), 4773 (93%) and 4521 (89%) completed follow-up assessments at the second (2 years later) and third (3 years later) wave, corresponding to when the participants generally were in 7th and 10th grade.

The analysis sample ($n = 1536$) contained participants who had reported no tobacco use at baseline (5th grade), identified as Hispanic/Latinx based on their parent's report, completed all three waves, and could be classified as first- (18.4%), second- (59.9%), or third (21.7%) generation (see below for definition). The sample (51% female) had a mean age of 11.13 ($SD = 0.58$) at 5th grade, 13.10 ($SD = 0.63$) at 7th grade, and 16.12 ($SD = 0.64$) at 10th grade. Selected sample characteristics are shown in Table 1 (see [32] for further details).

Table 1 Sample characteristics (N = 1536)

| | N | Wtd % |
|------------------------------|------|-------|
| Female | 774 | 50.5 |
| Generational Status | | |
| 1 st Generation | 272 | 18.4 |
| 2 nd Generation | 883 | 59.9 |
| 3 rd Generation | 381 | 21.7 |
| Parental level of education | | |
| Some HS or less | 631 | 44.9 |
| HS diploma/GED | 360 | 23.6 |
| Some college/2 year degree | 351 | 21.8 |
| 4 year degree or higher | 186 | 9.8 |
| Parent household composition | | |
| Single parent household | 532 | 33.2 |
| Two- parent household | 1002 | 66.8 |

Wtd Weighted, % is calculated with weights to reflect sampling, HS High School, GED General Equivalence Diploma

Procedure

Following standard procedures approved by the Institutional Review Boards at all study sites, two trained interviewers completed the Healthy Passages™ assessment protocol with the adolescent and one parent/caregiver at their home or another agreed upon location at each assessment. Written informed consent was provided by the parent, and the adolescent provided written assent. The interviews were conducted using both computer-assisted personal and self-interview procedures with the adolescent and parent separated in private spaces [31]. A Spanish version could be chosen by either at each assessment, except for youth at 10th grade (applied partly or fully at 5th grade: 8% of youth, 23% of parents; 7th grade: 4% of youth, 30% of parents; 10th grade: 30% of parents). Third-generation adolescent participants were the largest group to complete the interview mainly or entirely in English (98%), followed by second- (81%), and first- (50%) generation.

Measures

The outcome of focus was **cigarette smoking initiation**, measured at 7th and 10th grade with the question, “Have you ever tried cigarette smoking, even one or two puffs?” (0 = no; 1 = yes).

Generational Status. During enrollment in the study, each parent was asked whether they had been born inside or outside the U.S. Parents were also asked whether their child was born inside or outside the U.S. Based on a classification scheme described by Coll and Marks [11], the child was classified as one of the following: 1) *first-generation*, if both the participant (child) and the parent were born outside the U.S.; 2) *second-generation*, if the participant (child) was born in the U.S. but the

parent was born outside the U.S.; and 3) *third-generation*, if both the participant (child) and the parent were born inside the U.S.

Perceived peer smoking was measured in 7th grade with one question, “How many of your closest friends do you think have smoked cigarettes?” (1 = none, 3 = many). This was dichotomized into 0 = no peer use or 1 = peer use.

Perceived cigarette availability was assessed in 7th grade with one question, “Has anyone ever offered you a cigarette?” (0 = no or 1 = yes).

Intentions to smoke were measured in 7th grade with one question, “Do you think you will smoke cigarettes at any time during the next year?” with responses ranging from 0 = no, 1 = maybe, or 2 = yes. This was recoded into a dichotomized variable with 0 = no and 1 = maybe/yes.

Willingness to smoke was measured in 7th grade with one question, “If one of your closest friends offered you a cigarette, would you smoke it?” with responses ranging from 0 = no, 1 = maybe, or 2 = yes. This was recoded into a dichotomized variable with 0 = no and 1 = maybe/yes.

Monitoring was measured in 7th grade using five questions from a previous study [31] in which the adolescent was asked to indicate on a four-point scale (1 = do not know much, 4 = know a lot) how much his or her parent knew generally about what he or she did with free time (e.g., “How much do your parents know about where you are most afternoons after school?”) and who his or her friends were (e.g., “How much do your parents know about who your friends really are?”). The five items were summed with scores ranging from 5 to 20 ($\alpha = .80$).

Parent tobacco use was measured in 7th grade with two questions posed to the parent, “During the past 12 months, how many cigarettes did you smoke per day?” (0 = none; 7 = more than 30 per day) and, “During the past 12 months, did you use chewing tobacco, snuff, or dip, or smoke cigars or a pipe? (1 = Yes; 2 = No)”. These were combined to create a dichotomized variable, where “None” (0) or “No” (2) on both questions was recoded as a “No” (0) and all other response combinations were coded as “Yes” (1).

Control Variables. Several covariates were included in the analysis including age, gender (male/female), highest level of education in household, and household composition. Highest level of education reported for either parent was classified into four categories ranging from less than high school graduation (1) to completion of a four-year college degree or higher (4). Household composition was coded based on parent report as either “two-parent” household or “other” (i.e., “single” parent).

Data analysis

All analyses were conducted with design weights to account for differential probabilities of selection of

students according to their school and a cluster variable to account for clustering of students within schools using IBM SPSS Statistics™ Complex Sampling module. Weighting also accounted for non-participation (by school, race/ethnicity, gender, and combinations thereof) initially, dropout, and differences between the retained sample (10th grade) and the original sample (5th grade), producing unbiased estimates among respondents if the characteristics used in the weights account for all nonresponse bias. Sensitivity analyses indicated that participants who completed all three waves (analytic sample) did not differ on any of the demographic or tobacco-related factors from participants who did not complete the second or third (final) wave except on highest level of education in household and household composition. For highest level of education in household, participants who did not complete all waves were more likely to have some high school education or less (49.7%) and not be from a two-parent household (48.3%) versus those who completed all waves (40.4 and 56.7%, respectively; *p*'s < .05). Two variables had missing data present [education (0.5%) and cigarette smoking initiation (8.1%)] therefore, participants with missing data on these variables were excluded from the analysis. Analyses indicated they did not significantly differ from the analysis sample on any demographic variables. To further test the potential role of missing data, the multiple imputation method was used to estimate these missing values. This approach produced substantively identical results (available upon request).

Descriptive statistics and tests for group differences in tobacco use initiation, tobacco-related perceptions, and

parental influences by generational status were conducted first using one-way ANOVA and chi-square tests. Logistic regression analyses followed to examine associations between tobacco-related perceptions and parental influences with tobacco use initiation in 7th grade and to predict initiation in 10th grade, starting with generational status (Model 1) and then adding in turn, tobacco-related perceptions (Model 2) and then parental tobacco use and general monitoring (Model 3). All models controlled for the covariates of age, gender, and household education and composition. Two-way interactions between generational status and other predictors (e.g., monitoring, perceived peer smoking) were tested in the model; interaction results are not presented as none were significant.

Results

Descriptive statistics are presented in Table 1. As shown in Fig. 1, approximately 8% of the overall sample of Latinx adolescents reported having tried cigarette smoking by 7th and 31% by 10th grade. For smoking-related perceptions reported in the 7th grade, 34% reported that they believed their friends smoked cigarettes, 16% reported having been offered a cigarette, 9% reported that they had future intentions to smoke and 8% that they would be willing to smoke in the future if offered cigarettes (Table 2). Seventeen percent of parents reported using tobacco.

Generational status

Results (Tables 2 & 3) indicated that there were no significant differences in cigarette smoking initiation

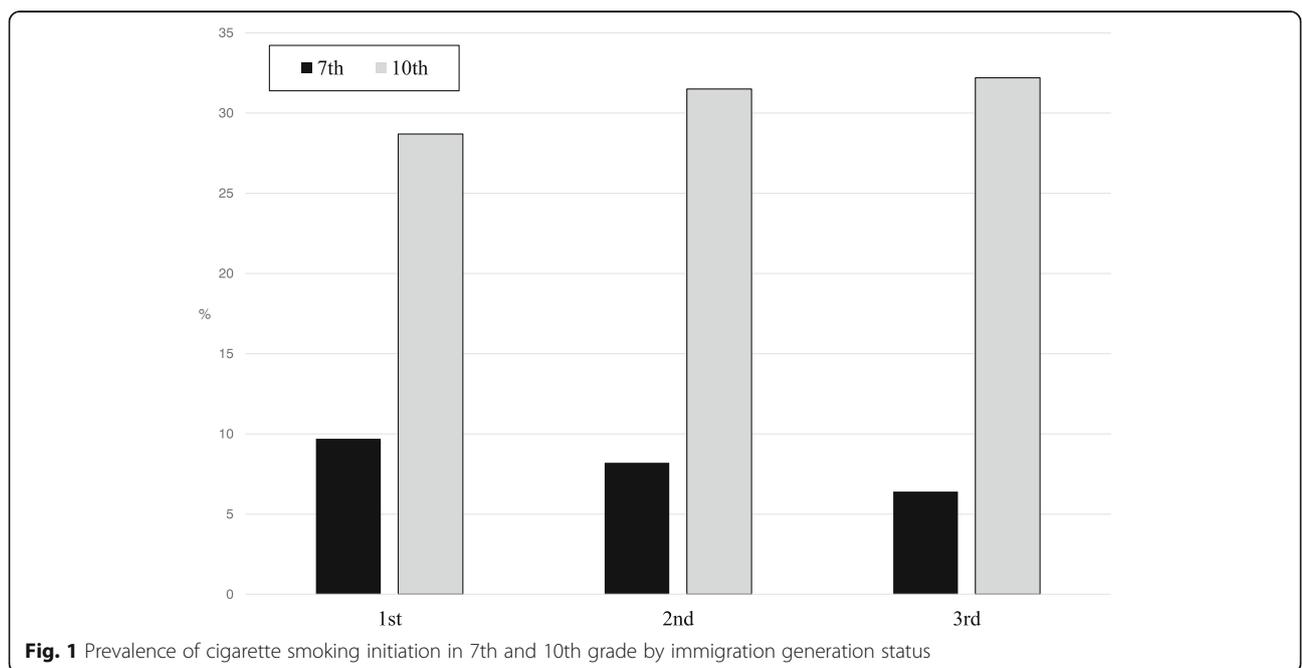


Table 2 Tobacco-related variables by generational status ($N = 1536$)

| | Overall | | 1 st Generation | 2 nd Generation | 3 rd Generation | χ^2 |
|---|---------------|-------|----------------------------|----------------------------|----------------------------|-------------|
| | N | Wtd.% | Wtd.% | Wtd. % | Wtd. % | |
| Total | 1536 | – | 18.4 | 59.9 | 21.7 | |
| 7 th grade Cigarette Smoking Initiation | 118 | 8.1 | 9.7 | 8.2 | 6.4 | 2.34 |
| 10 th grade Cigarette Smoking Initiation | 430 | 31.2 | 28.7 | 31.5 | 32.2 | 0.92 |
| Perceived Cigarette Availability | 243 | 16.1 | 18.1 | 15.5 | 16.3 | 1.14 |
| Perceived Peer Smoking | 513 | 33.8 | 28.9 | 34.1 | 37.4 | 4.95 |
| Intentions to Smoke | 134 | 8.7 | 7.7 | 9.1 | 8.4 | 0.58 |
| Willingness to Smoke | 123 | 8.4 | 7.4 | 8.3 | 9.5 | 0.93 |
| Parent Tobacco Use | 256 | 16.8 | 13.9 ^a | 15.8 ^b | 22.2 ^c | 9.15 |
| | <i>M (SE)</i> | | | | | <i>F</i> |
| Monitoring | 16.81 (0.11) | | 16.87(0.14) ^{a,b} | 16.68(0.13) ^a | 17.12(0.17) ^b | 2.38 |

Wtd Weighted, % is calculated with weights to reflect sampling, HS High School

^{a,b,c}Different superscripts within generational status subgroups for row variable indicates statistically significant difference as per χ^2 or *F* tests. Boldface indicates statistical significance ($p < .05$)

among Latinx youth of varying generational status in 7th ($\chi^2 [2, N = 1536] = 2.34, p = .39$) or 10th grade ($\chi^2 [2, N = 1536] = 0.92, p = .73$). There were no significant differences among generational status groups in tobacco-related perceptions or general parental monitoring or tobacco use (p 's $> .05$).

Adolescent tobacco-related perceptions

As shown in Table 3, Model 2 for cigarette smoking, Latinx adolescents who reported cigarette availability in the 7th grade were at least twice as likely to report initiating cigarette smoking in both the 7th and 10th grades compared to those who did not report being offered cigarettes ($p = .004, p = .001$, respectively). Believing that friends smoked cigarettes was associated with a higher likelihood of having initiated cigarette smoking by 7th grade ($p < .001$), and was predictive of cigarette smoking initiation by 10th grade ($p = .001$). Both intentions to smoke in the next year and willingness to smoke if offered cigarettes were associated with a higher likelihood of initiating smoking by 7th grade (p 's $< .05$), and Latinx adolescents reporting intentions and willingness were twice as likely to smoke by 10th grade ($p < .001$ and $p = .012$, respectively).

Parental influences

As shown in Table 3, Model 3, when added to the regressions predicting tobacco use in 7th and 10th grade, having increased general parental monitoring was associated with a decreased odds of cigarette smoking initiation in 7th grade ($p = .001$) and predicted a lower likelihood of trying cigarettes in the 10th grade ($p < .001$). Finally, parental tobacco use was predictive of cigarette smoking in the 10th grade ($p = .021$), but was not associated with cigarette smoking in the 7th grade ($p = .208$). Perceptual variables generally remained significant

predictors of tobacco use when parental variables were added to the regression model.

Demographic influences

Increased age was associated with an increased odds of cigarette smoking initiation in 10th grade ($p = .005$) but was not associated with cigarette smoking in the 7th grade ($p = .544$). Gender, level of education, and household composition were not significantly associated with cigarette smoking in the 7th or 10th grades (p 's $> .05$).

Discussion

Cigarette smoking among Latinx adolescents increased almost four-fold between 7th (ages 12–13) and 10th (15–16) grade, from 8 to 31%. However, there is little evidence for the immigrant paradox accounting for this pattern, at least when based on the adolescents' generational status. Smoking in Latinx youth in 10th grade was predicted, as expected, by tobacco-related cognitive processes present in 7th grade pertaining to peer norms, cigarette availability, and intentions and willingness to try cigarettes, as well as by a parent who uses tobacco and provides less general monitoring.

Our finding that there were not significant differences between Latinx adolescents of varying generational status for smoking initiation is consistent with one previous study that controlled for demographic, behavioral, and parental factors [15], but is in contrast with the second study that found that 3rd generation adolescents were more likely to smoke cigarettes compared to 2nd and 1st generation [14]. Our findings may have differed as our study was conducted in three specific metropolitan areas in the U.S, while previous work used national data from Add Health. Although not previously examined, we also found that there were no differences in tobacco-related

Table 3 Logistic Regression Model for Tobacco Use Initiation by 7th and 10th Grade

| OR (95% CI) | Cigarette Smoking | | | | | |
|--|--------------------------|-------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 7 th Grade | | | 10 th Grade | | |
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| <i>Generational Status</i> | | | | | | |
| 1 st generation | Ref. | Ref. | Ref. | Ref. | Ref. | Ref. |
| 2 nd generation | 0.93 (0.48, 1.78) | 0.73 (0.32, 1.64) | 0.69 (0.30, 1.57) | 1.29 (0.85, 1.95) | 1.18 (0.77, 1.81) | 1.15 (0.75, 1.77) |
| 3 rd generation | 0.70 (0.36, 1.34) | 0.48 (0.21, 1.07) | 0.46 (0.20, 1.03) | 1.26 (0.77, 2.07) | 1.21 (0.72, 2.04) | 1.17 (0.70, 1.97) |
| Age | 1.80 (1.25, 2.59) | 1.12 (0.81, 1.55) | 1.11 (0.79, 1.55) | 1.61 (1.37, 1.90) | 1.29 (1.09, 1.52) | 1.28 (1.08, 1.52) |
| Female (referent: male) | 0.79 (0.51, 1.24) | 0.71 (0.44, 1.13) | 0.78 (0.49, 1.24) | 0.98 (0.74, 1.31) | 0.98 (0.70, 1.36) | 1.03 (0.74, 1.45) |
| <i>Parental level of education</i> | | | | | | |
| Some HS or less | Ref. | Ref. | Ref. | Ref. | Ref. | Ref. |
| HS diploma/GED | 1.49 (0.72, 3.07) | 1.21 (0.55, 2.68) | 1.15 (0.52, 2.55) | 1.30 (0.84, 2.02) | 1.25 (0.80, 1.94) | 1.24 (0.79, 1.93) |
| Some college | 1.27 (0.59, 2.71) | 0.92 (0.36, 2.36) | 0.91 (0.36, 2.35) | 1.29 (0.84, 1.98) | 1.15 (0.74, 1.81) | 1.12 (0.70, 1.78) |
| 4 year degree or higher | 1.63 (0.73, 3.64) | 1.37 (0.55, 3.41) | 1.23 (0.49, 3.04) | 1.39 (0.95, 2.02) | 1.26 (0.86, 1.87) | 1.18 (0.79, 1.76) |
| Single parent household (referent: two-parent) | 1.66 (1.13, 2.42) | 1.18 (0.75, 1.85) | 1.18 (0.75, 1.85) | 1.30 (1.01, 1.68) | 1.12 (.85, 1.49) | 1.08 (0.82, 1.42) |
| <i>Perceptions /Attitudes</i> | | | | | | |
| Cigarette availability | 2.36 (1.34, 4.13) | | 2.21 (1.25, 3.90) | 2.00 (1.40, 2.87) | | 1.91 (1.33, 2.74) |
| Peer smoking | 3.05 (1.88, 4.94) | | 3.08 (1.89, 5.04) | 1.74 (1.26, 2.40) | | 1.72 (1.25, 2.37) |
| Future smoking intentions | 3.72 (2.23, 6.21) | | 3.62 (2.18, 6.00) | 2.62 (1.70, 4.04) | | 2.53 (1.67, 3.83) |
| Smoking willingness | 4.25 (2.64, 6.83) | | 3.54 (2.14, 5.86) | 2.25 (1.33, 3.80) | | 1.92 (1.16, 3.18) |
| <i>Family Influences</i> | | | | | | |
| Monitoring | | | 0.90 (0.84, 0.96) | | | 0.92 (0.88, 0.96) |
| Parental Tobacco Use | | | 1.44 (0.81, 2.55) | | | 1.59 (1.08, 2.34) |

All models controlled for: gender, child age in years at 7th grade, parent household composition, and parent education. OR odds ratio, CI confidence interval. Model 1: Generation status and covariates only; Model 2: Tobacco use attitudes and perceptions added; Model 3: Parental influences added. Boldface indicates statistical significance ($p < .05$)

perceptions (intentions and willingness) due to generational status. The association between these tobacco-related cognitive processes reported in middle school (7th grade) and smoking initiation in high school (10th grade) supports previous findings that youth who report intentions and willingness to smoke in the future are more likely to initiate smoking [27, 28]. Finally, results indicating that perceptions about cigarette availability, peer and parental smoking, and parental general monitoring predicted smoking initiation also supported previous findings among Black, Latinx, and White adolescents [29, 30].

Several limitations in this research should be noted. The longitudinal cohort design hinders causal inferences based on these findings. As noted previously, this study was conducted in three specific metropolitan areas in the U.S, and caution should be exercised in generalizing to other populations. Further, Latinx youth in this study predominantly have Mexican and Central America heritage, also raising caution about generalizing to Latinx groups with other origins. Immigration status was only recorded for one parent. Further, generational status is often used as a proxy for acculturation which may have limitations. Acculturation is a complex psychological

and sociological process that has multiple dimensions and may be better assessed with both psychometric measures and specific age of migration for youth and both parents. Tobacco use and all covariates, except generational status, were measured by youth self-report.

Despite these limitations, this is one of the first studies to examine longitudinally how generational status measured in middle school is associated with tobacco use in high school. It is the first study we know of to examine generational status together with sociodemographic and tobacco-related perceptions and attitudes. The current study differs from previously published work by examining both smoking-related future intentions and willingness to smoke and actual initiation of smoking among Latinx adolescents from primary school (5th grade) to middle school (7th grade). Our results add to previous findings suggesting that the immigrant paradox may not apply specifically for cigarette smoking among Latinx youth. Although findings from this study do not support the concept of the immigrant paradox, results suggest that believing that cigarettes were available and having family or friends who smoked increased the likelihood that Latinxs would try cigarette smoking by 10th grade. This has implications for smoking prevention efforts with this population, where interventions should aim to address these social and perceptual influences. The association with perceived cigarette availability may be due to increased access to tobacco for school age youth, as previous research has shown that tobacco retailers are often clustered in higher concentrations near schools [33]. Strong policies banning the sale of tobacco and enforcement of these policies for neighborhoods with schools and large school-aged populations could protect youth from tobacco products.

Conclusion

Finding no significant differences in tobacco initiation and related perceptions due to generational status and finding that predictors of tobacco initiation for Latinx youth are highly similar to those demonstrated repeatedly in general samples of youth suggest that there is little basis for substantially different prevention approaches. Therefore, current tobacco use prevention efforts mainly implemented through public schools are likely to be applicable to Latinx youth with varying personal and family migration histories. Nonetheless, there may be benefits to certain cultural adaptations of generally applicable prevention programs, such as those used for HIV-prevention and alcohol abuse programs among Latinxs [34, 35]. Our findings raise questions about the immigrant paradox as it applies to tobacco use for Latinx adolescents. It is hoped that these findings and this line of research may help practitioners and

researchers further determine effective components of prevention and intervention efforts.

Abbreviations

Add Health: National Longitudinal Study of Adolescent Health; HIV: Human immunodeficiency virus

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Availability of data and materials

The data that support the findings of this study are available from the Healthy Passages Project Committee but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of the Healthy Passages Project Committee.

Authors' contributions

AEE analyzed data and co-drafted the initial manuscript. JLW supervised the statistical analysis and co-drafted the initial manuscript. JLW, MNE, and MAS made substantial contributions to the conception and design of the study and acquisition of data. All authors have read the manuscript, have been involved in revising it critically for important intellectual content, and have approved the final version.

Ethics approval and consent to participate

Written informed consent was provided by the parent, and the adolescent provided written assent. All procedures were approved by the Institutional Review Boards at all study sites.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests to disclose.

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