A Multilevel Analysis of Gender, Latino Immigrant Enclaves, and Tobacco Use Behavior

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ABSTRACT *Research suggests that immigrant enclaves positively influence health behaviors such as tobacco use through supportive social networks and informal social control mechanisms that promote healthy behavioral norms. Yet, the influence of social cohesion and control on tobacco use may depend on smoking-related norms, which can vary by gender. This study examines the influence of neighborhood Latino immigrant enclave status on smoking and cessation among Hispanic men and women. Data from the Los Angeles Family and Neighborhood Survey was combined with census data to assess the relationship between immigrant enclaves, gender, and smoking using multilevel regression. The effect of the Hispanic enclave environment on smoking differed by gender. Living in an enclave had a harmful effect on tobacco use among Hispanic men, marginally increasing the likelihood of smoking and significantly reducing cessation. This effect was independent of neighborhood socioeconomic status, nativity, and other individual demographics. Neighborhood immigrant concentration was not associated with smoking or cessation for Hispanic women. Research, interventions, and policies aimed at reducing smoking among Hispanics may need to be gender responsive to ensure effectiveness as well as health and gender equity.*

KEYWORDS *Smoking, Neighborhoods, Immigrant, Hispanic/Latino, Gender, Multilevel analysis*

INTRODUCTION

Smoking remains the leading cause of premature death in the USA.¹ Recent studies suggest that neighborhood characteristics have an independent effect on individual smoking behavior and quitting.^{2–16} One understudied area of influence on smoking is the effect of neighborhood immigrant enclaves, specifically Latino enclaves. Some research suggests that enclaves contain processes that positively influence health and health behaviors through stronger social cohesion, supportive networks, and informal social control mechanisms.^{17–21} This may be especially true for Hispanic enclaves, with recent research finding that living in ethnically dense Hispanic communities is protective, particularly for health behaviors.²² Enclaves may influence tobacco use through network ties and informal mechanisms that promote healthy behavioral norms. Yet, such mechanisms may not be unambiguously beneficial. Neighborhoods with strong social cohesion have the potential to enforce unhealthy behavioral norms, depending on the broader normative context surrounding a specific behavior.^{23,24} The influence of cohesion and informal control mechanisms on a behavior such as tobacco use may depend on the norms around smoking.²⁵

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Norms regarding tobacco use behavior may vary along such dimensions as gender. Gender ideologies and roles are deeply rooted in culture and have an important influence on smoking among men and women. While research on Hispanics, gender practices, and smoking is minimal, some evidence suggests that smoking is, if not encouraged, generally accepted and may be an important component of social interaction for men whereas it is considered less acceptable for women.^{26–33} Neighborhoods are physical and social contexts in which gender norms and associated practices may be played out. Hispanic female residents of Latino enclaves, of all cultural backgrounds, may encounter a milieu in which smoking is sanctioned and quitting is encouraged. Hispanic male residents may experience a normative environment in which smoking is acceptable and quitting less common. Thus enclaves may influence Hispanic men and women differently due to gender-specific smoking norms in these residential environments. The purpose of this paper is to examine whether neighborhood Hispanic enclave status affects Hispanic men and women's smoking differently. Specifically, we hypothesize that living in a Hispanic enclave contributes to higher smoking and lower cessation among Hispanic men compared with Hispanic men in non-enclave communities; for Hispanic women, in contrast, we hypothesize that living in an enclave predicts lower smoking and higher cessation compared with Hispanic women in non-enclave neighborhoods.

METHODS

Data Sources

This study used data from the 2000–2001 Wave 1 of the Los Angeles Family and Neighborhood Survey (L.A. FANS),³⁴ a National Institutes of Health-funded panel study representative of all neighborhoods and households in L.A. County. Among 3,085 households identified, 2,564 (82.4 %) completed the adult questionnaire.³⁵ The four-stage random sampling strategy for L.A. FANS involved first sampling neighborhoods (i.e., census tracts); then, sampling blocks within tracts; next, selecting households within blocks; and lastly, sampling children and adults within these households. Disadvantaged neighborhoods and families were oversampled. Sixty-five tracts were selected from a total of 1,624 eligible tracts in the county. For this study, the sample was limited to Hispanic adults who lived in the same neighborhood for at least the previous 12 months to ensure sufficient exposure to local conditions ($n=1,116$). Additionally, demographic data was obtained for each census tract from the Census 2000 Summary File 3 (SF3).³⁶ Neighborhoods are defined as census tracts throughout this study. This study was approved by the institutional review board of Columbia University Medical Center and the Independent Institutional Review Board, Inc.

Measures

The dependent variables for this analysis included two dichotomous measures for *current smoking status* and *cessation status*. Current smoking status compared current smokers versus non-smokers. Respondents were asked, “Do you now smoke cigarettes?” and “On average, how many cigarettes per day do you smoke?” Those who answered yes to the first question and smoked at least one cigarette per day were considered current smokers; thus, these were everyday smokers. Cessation status was also a dichotomous variable defined as former smokers among the sample

of ever smokers. Respondents were asked "Did you ever smoke cigarettes?" Former smokers included individuals who reported that they previously smoked but no longer smoked. Race/ethnicity in L.A. FANS was characterized as Hispanic, non-Hispanic white, non-Hispanic black, non-Hispanic Asian Pacific Islander, non-Hispanic Native American, and non-Hispanic other. Only Hispanics were included in this analysis. Approximately, three-quarters were of Mexican origin, with the majority of those remaining from various Central American countries.

Additional independent variables were selected based on prior empirical literature on individual factors related to smoking and included gender, nativity, age, income (less than US\$20,000/year, US\$20,000–US\$39,999, US\$40,000, and above), and education (high school or less, some college, college, or more). A factor score was constructed using items from the Census 2000 SF3 to represent neighborhood-level immigrant concentration. Items from the census were factor analyzed with the following variables loading on one factor: proportion of the census tract population that were foreign-born non-citizens in 2000, foreign-born in 2000, foreign-born from 1990–94 and from 1995–1999, and adults age 18 or older who spoke Spanish and Hispanic. All items loaded at 0.80 or above. A factor regression score was created for immigrant concentration that weighted each variable by its factor loadings. This variable was categorized into quartiles, and the fourth quartile, with the highest immigrant concentrations, was defined as the enclave and compared to the bottom three quartiles. All models adjusted for neighborhood socioeconomic disadvantage, which has been shown to be an important contextual factor influencing smoking.^{2–7,9–16} This variable was a factor score dominated by high loadings (over 0.70) for tract-level percentages of poverty, low family income, female-headed households, public assistance, non-white, and under 18 years of age.

Statistical Analyses

Unweighted and weighted frequencies were calculated for categorical variables using *Stata* software.³⁷ Weights adjusted for oversampling of strata by tract-level disadvantage and of households with children, as well as adjusting for household selection probabilities and household non-response. Multilevel logistic regression models^{38,39} were run on smoking outcomes with cross-level interactions for immigrant concentration and gender. Models were stratified by gender if interactions were significant. All models controlled for concentrated disadvantage, nativity, age, income, and education. Statisticians disagree on whether sampling weights should be used in multivariate analyses that control for variables on which the sample weights are based. Our multivariate models do not include weights, in accordance with Winship and Radbill.⁴⁰

RESULTS

Table 1 shows unweighted and weighted demographics for the sample. Unweighted data show that approximately 12.6 % of the sample consisted of current smokers and 21.2 % former smokers. The quit ratio (the percentage of former smokers among all ever smokers) was 62.7 %. For the L.A. sample compared with Hispanics nationally in 2000, everyday smoking prevalence was similar (12.6 vs. 12.5 %, respectively) but cessation prevalence was higher (62.7 vs. 42.9 %, respectively).^{41, 42} The sample was composed of more women than men, and the median age was 35. Compared with 2000 census data on Los Angeles, the L.A. FANS sample had similar educational attainment but was older and had lower average income. There was also

TABLE 1 Unweighted and weighted sample statistics of the L.A. FANS Hispanic study population (*n*=1,116)

	Unweighted (%)	Weighted (%)
Current smoker	12.6	15.7
Former smoker ^{a/}	21.2	21.9
Quit ratio ^{b/}	62.7	58.3
Female	59.0	43.8
Foreign-born	76.2	69.6
Age		
<35 years	47.5	44.4
35 years +	52.5	55.1
Income		
<US\$20,000/year	46.7	44.3
US\$20,000–US\$39,999/year	31.5	30.9
US\$40,000/year +	21.8	24.8
Education		
High school and less	71.1	69.7
Some college	23.3	24.8
College +	5.6	5.5
Has children under 18	82.4	62.4

L.A. FANS Los Angeles Family Neighborhood Survey

^{a/}Former smokers is the percentage of former smokers among the total population

^{b/}Quit ratio is the percentage of former smokers among all ever smokers

a larger percentage of foreign-born individuals in the L.A. FANS compared with L.A. county, with census data indicating that 49.2 % of the Hispanic county population was born outside the USA ³⁶ in 2000 compared with nearly three-quarters of the L.A. FANS unweighted Hispanic sample. Table 2 shows unweighted current smoking and cessation prevalence for the top quartile of immigrant concentration and the lower three quartiles stratified by gender. The results indicated significantly higher current smoking and lower cessation prevalence for men in the highest quartile compared with men in the lower quartiles. Women’s smoking and cessation prevalence was not significantly different for the highest versus lowest quartiles of immigrant concentration.

Interactions between immigrant concentration and gender in multilevel models were also significant for both the current smoking and cessation outcomes. Table 3 shows the models stratified by gender. For current smoking, the highest quartile of immigrant concentration was positive but only marginally significant (at *P*=0.08)

TABLE 2 Current smoking and cessation prevalence for the L.A. FANS sample by quartiles of tract immigrant concentration stratified by gender (unweighted)

	Bottom 3 quartiles (%)	Fourth quartile (enclave)(%)	Chi-square value
Current smoking prevalence			
Men	17.0	27.0	0.012
Women	7.7	6.6	0.633
Cessation prevalence			
Men	63.1	42.3	0.004
Women	70.8	71.7	0.905

L.A. FANS Los Angeles Family Neighborhood Survey

TABLE 3 Odds ratios (and 95 % confidence intervals) for individual-level current smoking and cessation regressed on neighborhood factors and individual sociodemographics for Hispanic males and females (unweighted)

	Current smoking status		Cessation status	
	Male (<i>n</i> =447) OR (95 % CI)	Female (<i>n</i> =649) OR (95 % CI)	Male (<i>n</i> =212) OR (95 % CI)	Female (<i>n</i> =165) OR (95 % CI)-
Individual level				
Foreign-born				
Age 35+	0.55 [†] (0.28, 1.07)	0.50* (0.25, 1.00)	1.83 (0.83,4.05)	1.03 (0.47, 2.24)
<US\$20,000/year (Ref)	1.95* (1.15, 3.31)	0.99 (0.51, 1.96)	0.73 (0.39, 1.37)	1.36 (0.62, 2.96)
US\$20,000–US\$39,999/year	1.00	1.00	1.00	1.00
≥US\$40,000/year	0.86 (0.49, 1.49)	0.56 (0.24, 1.32)	1.14 (0.59, 2.20)	1.31 (0.49, 3.48)
≤High school (Ref)	0.42* (0.18, 0.97)	1.01 (0.44, 2.32)	1.93 (0.73, 5.08)	1.07 (0.41, 2.74)
Some college	1.00	1.00		
College degree or more	0.93 (0.49, 1.76)	0.71 (0.31, 1.62)	0.99 (0.46, 2.11)	1.66 (0.66, 4.21)
Has children <18 years	0.00 (0.00, 0.00)	1.30 (0.42, 4.03)	0.00 (0.00, 0.00)	1.01 (0.27, 3.79)
Neighborhood level	0.71 (0.40, 1.27)	0.38** (0.18, 0.79)	1.86 (0.87, 3.95)	2.77* (1.17, 6.56)
Neighborhood immigrant concentration				
Q1–Q3 (Ref)	1.00	1.00	1.00	1.00
Q4 (enclave)	1.89 [†] (0.93, 3.85)	0.77 (0.36, 1.65)	0.46* (0.21, 0.97)	1.34 (0.57, 3.19)
Neighborhood disadvantage	1.11 (0.73, 1.69)	1.03 (0.68, 1.54)	0.93 (0.59, 1.46)	1.01 (0.65, 1.58)

[†]*P* value <0.10; **P* value <0.05; ***P* value <0.01

for Hispanic males (OR=1.89; CI, 0.93, 3.85). High immigrant concentration was negative and significantly associated with cessation for males (OR=0.46; CI, 0.21, 0.97). We found no significant associations between enclave and current smoking or cessation for Hispanic females.

DISCUSSION

This study is the first to examine the influence of neighborhood Hispanic immigrant concentration on smoking and cessation status among Hispanic men and women. The findings indicate that the effect of the Hispanic enclave environment on tobacco use differs by gender. Living in an enclave has a harmful effect on male tobacco use behavior among Hispanic men in the enclave, marginally increasing the likelihood of smoking and significantly reducing cessation. This effect was independent of neighborhood socioeconomic status, nativity, and other individual demographics. As the sample in this study was largely of Mexican heritage, results may be limited to Mexican and Mexican-American subgroups.

For Hispanic women, neighborhood immigrant concentration was not associated with smoking or quitting, after controlling for other factors. These findings are in contrast to much of the theory around enclaves, which suggests that supportive social networks and social control mechanisms of enclaves reinforce healthy behavioral norms and sanction unhealthy ones.^{17–21} The findings from this study suggest that this process may differ by gender and the associated gender norms surrounding a specific health behavior.

Further clarity on the enclave environment as a risk for smoking among Hispanic men may require a fuller conceptualization of gender norms and social interaction within the neighborhood context. Smoking may be a highly social activity in the Hispanic context and an important part of male social interaction.^{26,30,32,33} Highly social and gendered practices of smoking may shape local norms of behavior in enclaves, with tobacco use displayed in local public spaces, shared during social situations and permeating neighborhood-based social networks. In addition, given that residence in non-immigrant and, in many cases, neighborhoods with higher socioeconomic status is generally socially valued, men living in areas known as “immigrant enclaves” may perceive themselves as having a lower social standing⁴³ in relation to the broader social hierarchy. Such perceptions may lead Hispanic men to engage in certain “hypermasculine” risky behaviors such as smoking to reclaim social status via traditional hierarchies of masculinity.^{10,29,33,44–48}

If male smoking is public and on display in communities with many immigrants, Hispanic male smokers may be both more likely to smoke and less likely to quit to keep up the appearance of gender-based behavioral norms. Further, Hispanic men may have a more difficult time quitting if occasionally exposed to the “cueing” effects from seeing and interacting with other men who smoke. Gender-specific behaviors do not exist in the abstract, but rather are lived out and practiced in physical and social space. Neighborhood spaces in which men’s tobacco use could be displayed or may operate to influence men’s social networks may include the home environment and certain open spaces in the community. While California’s smoke-free air laws encompassed all indoor workplaces by the year 2000 (including restaurants, bars, and gaming clubs), it was not until 2007 that Los Angeles approved an ordinance banning smoking at county parks, beaches, golf courses, and other public places. Thus, neighborhood parks and other open space arenas in 2000,

the year of this survey, and sidewalk spaces and the home today, could be possible sites of smoking display among Hispanic men in enclave environments.

The hypothesis that neighborhood immigrant context would be protective against smoking for Hispanic women was not borne out by the data. There was no relationship between enclave residence and smoking behaviors for women. Patterns of interaction and normative influence on smoking behavior within the neighborhood context may differ for Hispanic women compared with men. Other neighborhood characteristics may be more important in shaping women's tobacco use behavior, such as mechanisms related to crime or poverty.^{12,16,29} The literature on the differential contextual effects of the neighborhood environment on smoking behaviors for men and women is sparse, and findings are too tentative to draw firm conclusions; yet, some evidence suggests that neighborhood factors shape tobacco use differently for men and women.^{9,10,15,16,49,50} It may also be the case that women's tobacco use behavior is more strongly influenced by family members, pregnancy status, individual acculturation, or the workplace environment. Further research is needed to clarify these differences.

Strengths of this study include the population-based sample from the L.A. FANS, which is based on a strong design, has a high response rate and uses questions found to be valid and reliable in other established national population surveys.^{35,51} Limitations include the cross-sectional and observational nature of the study, which does not allow for causality and temporality to be established. Temporality was partially addressed by restricting all analyses to individuals who had lived in their neighborhood for at least 12 months prior to the survey to ensure sufficient neighborhood exposure. Like most neighborhood effects research, residential-related selection poses a threat to internal validity. We attempted to control confounding by adjusting for key individual-level variables considered to be associated with neighborhood choice and the smoking outcomes, which may reduce concerns related to endogeneity.⁵²⁻⁵⁴ Yet, additional unmeasured confounders may still not have been captured. Secondly, the smoking assessment questions from the L.A. FANS survey did not allow for assessment of some-day smokers. Some-day smoking is more common among Hispanics⁵⁵⁻⁵⁹; thus, smoking prevalence among this group may have been underestimated, which could have affected the results. Further, the impact of neighborhood norms and interactions may be stronger with a sample that includes lighter and some day smokers, given that these smokers may be more susceptible to environmental and situational stimuli than heavier smokers⁶⁰ suggests that the influence of neighborhood norms and interactions may have been underestimated. There is no operationalized definition of a Hispanic immigrant enclave; thus, we used a measure comparable to others used in the literature.^{17,61-64} Sample size limitations in the stratified models may have limited the power to detect effects, as prior literature has found that neighborhood studies with respondent samples of less than 500 generally find null associations.^{22,65} Further, sample sizes were not large enough to examine differences in the influence of immigrant concentration on smoking behavior within Hispanic subgroups that differ by country of origin or by acculturation status. Given that the Hispanic sample was predominantly of Mexican heritage and foreign-born, generalizability of results may be limited. Lastly, larger studies would be useful in further understanding pattern differences by Hispanic subgroups.

Findings here point to the need for more nuanced theory building as well as qualitative research on immigrant enclaves and gender processes, particularly in terms of elucidating processes of social interaction, informal social controls, and cohesion in conjunction with norms around smoking behavior and how these processes may differ by gender; for example, how and where do men interact with each other in immigrant neighborhoods, how does smoking occur as part of these

interactions and, what are the social meanings attached to these practices? Gender is an often overlooked determinant of tobacco use.⁶⁶ A fuller conceptualization of gender as a social construct and practice that varies across different physical and social contexts can provide important theoretical insights into smoking patterns as well as other health behaviors for men and women and how these are linked to the neighborhood environment. Lastly, research is needed on the development of measures for capturing norms around smoking behavior that may differ by gender.

This study provides support for a small but growing body of research that suggests differential neighborhood effects on tobacco use among men and women^{9,10,15,16,49,50} and is the first to examine differences in the impact of neighborhood immigrant concentration by gender. Results are important for smoking policies and programs both in terms of the appropriate targeting and content of interventions. For example, rather than targeting men or immigrant neighborhoods, interventions and campaign messages may need to develop more refined targeting of subgroups within communities at higher risk, such as men living in immigrant enclave neighborhoods. Further, intervention content may need to be gender responsive. The association between Hispanic immigrant enclaves and higher smoking risk among Hispanic men living in these areas suggests that programs targeted at immigrant communities must take into account gender relations, social networks, and related social interactions to ensure effective public health messaging. Research examining the impact of immigrant enclaves on additional health behaviors such as nutrition, exercise, and other substance use may further elucidate how enclave processes function for different health behaviors and their potentially varying impact on men and women.^{21,67-70} Finally, incorporating gender as a social construct into research and intervention work, particularly as it interacts with social and environmental factors, is critical for successful tobacco control as well as health and gender equity.

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