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Acculturation as a Risk Factor for Smoking Among Asian American Adolescents: Is the Association Confounded by Nationality?

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ABSTRACT. *Background.* Acculturation to the United States is associated with tobacco use among Asian American adolescents. Previous studies have not controlled for the possible confounding effects of national origin.

Methods. This study analyzed data from statewide surveys of 2093 Asian-American 10th grade California adolescents. Logistic regression analyses evaluated the independent effects of nationality and acculturation on past-month smoking.

Results. Consistent with previous studies, acculturation was a risk factor for smoking. When nationality was added to the model, acculturation became nonsignificant and nationality became significant. Differences in smoking prevalence across groups were due to low smoking rates among Vietnamese-American and Chinese-American students and higher rates among Korean-American and Japanese-American students.

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Within each national subgroup, acculturation was not associated significantly with smoking.

Conclusions. Research on acculturation and smoking among Asian-American adolescents should consider national origin. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2004 by The Haworth Press, Inc. All rights reserved.]

KEYWORDS. Tobacco, smoking, adolescence, Asian-American, acculturation

INTRODUCTION

Smoking among Asian American adolescents is an increasing public health problem. Although Asian American adolescents generally have a lower prevalence of smoking relative to most other ethnic groups except African-Americans, the difference is diminishing.^{1,2} Furthermore, smoking prevalence increases dramatically as Asian American adolescents enter early adulthood, whereas the risk for smoking initiation generally decreases after mid-adolescence among other ethnic groups.^{1,3,4} The changing patterns of smoking among Asian-American adolescents indicate the need for a better understanding of smoking in this population. The roles of risk factors previously found to be associated with adolescent smoking among Asian Americans, including acculturation, need to be examined in greater depth.

Acculturation as a Risk Factor for Smoking Among Asian American Adolescents

Acculturation to the United States has been identified as a risk factor for smoking among Asian-American adolescents.⁵⁻⁷ Acculturation is the exchange of values, beliefs, language, customs, and mannerisms that occurs when people with diverse cultural backgrounds come into contact with one another.⁸ Typically, immigrants and their families learn some aspects of the new culture and might adopt some practices of the new culture, including health-risk behaviors such as tobacco use.⁷ However, acculturation is not the replacement of the native culture with the new culture; rather it is the incorporation of the new culture into the native culture and the integration of the two cultures into one's ethnic identity.⁸⁻⁹ Several distinct patterns of acculturation can occur; the ac-

culturation process can result in an ethnic identification that contains predominantly the characteristics of the new culture (assimilation), contains predominantly the characteristics of the native culture (separation), contains elements of both the new culture and the native culture (integration), or contains few characteristics of either culture (marginalization).

Many studies of acculturation and smoking have used a linear model of the acculturation process, in which acculturation is viewed as a continuum from native culture orientation to new culture orientation. Although this conceptualization of the acculturation process does not capture the distinct acculturation patterns described by Berry⁸ and others,¹⁰ it does provide a general measure of United States orientation—the extent to which the individual has incorporated the values, beliefs, and practices of the United States culture.

Although United States orientation represents only part of an individual's cultural identity (because United States-oriented individuals can be either assimilated or integrated, and non-United States-oriented individuals can be either separated or marginalized), studies have found associations between United States orientation and health behaviors. In several studies of Asian-American adolescents, those who are less United States-oriented have shown low rates of smoking, but smoking prevalence rates tend to increase as United States orientation increases.^{5,7} By the second or third generation, when United States orientation is high, Asian American adolescents typically smoke at rates comparable to those of whites.^{1,5} Similarly, Asian-American adolescents who report speaking only English at home (a language-based measure of United States orientation) have smoking rates comparable to those of Whites and significantly higher than those of Asian-Americans who speak another language at home.⁷ This has led to the general conclusion that among Asian Americans, contact with the United States culture is a risk factor for adolescent smoking. Some explanations for that finding have included pro-tobacco media influences, more permissive parenting practices, risk-taking peer norms, and a more individualistic, rebellious youth culture.^{7,11,12} The assumption underlying those conclusions is that some element of the United States culture encourages risky behaviors such as smoking among Asian-American youth, who otherwise would not be inclined to smoke.

Is Nationality a Confounding Variable?

When Asian American adolescents are studied as a single group in population-based studies, acculturation emerges as a risk factor for smoking.

ing.^{5,7} However, Asian American adolescents are not a homogeneous group; they represent a variety of national origins, immigration patterns, and cultural traditions. Therefore, the association between acculturation and smoking within the larger population of Asian Americans might be conflated with variation in smoking behaviors across different Asian nationalities. Most previous studies of acculturation and smoking among Asian Americans have not had sufficient sample sizes to stratify by nationality.^{7,13} Analyses of large samples of Asian Americans, however, have found considerable variation among Asian subgroups in adolescent smoking. For example, Chen and colleagues¹ found that lifetime smoking prevalence among Filipino-Americans (19%) was nearly twice that among Chinese-American adolescents (11%). The average age of smoking initiation varied across national groups as well. A study of Asian American adults¹⁴ found that smoking prevalence varied across Asian national subgroups and between U.S.-born and foreign-born Asian Americans within each national subgroup. The variation across nationalities indicates that country of origin should not be ignored in studies of smoking among Asian American adolescents. In other words, the assumption that Asian-American adolescents are a homogeneous group with uniformly low smoking rates, unless persuaded to smoke by a risk-inducing United States culture, might be incorrect.

Why National Origin Is an Important Factor in Understanding Adolescent Smoking

The historic patterns of immigration from various Asian countries to the United States have influenced the social integration, economic opportunities, and health status of those immigrant groups. Historically, the United States has experienced waves of immigration from Asia. Therefore, the length of time in the United States differs across Asian national subgroups.

Recent waves of immigration from China and Vietnam. The most recent wave of immigration to the United States has been from China. Immigration from China to the United States has increased since the normalization of relations between China and the United States in 1979.¹⁵ In addition, a large number of Hong Kong residents emigrated to the United States prior to the takeover of Hong Kong by China in 1997.¹⁶ Therefore, many adolescents of Chinese origin living in the United States today are first-generation or second-generation immigrants and therefore are less United States-oriented. An obvious exception to this is the descendants of the Chinese-Americans who immi-

grated to the United States during the Gold Rush in the 1840s and helped to build the transcontinental railroad.¹⁷ However, the descendants of those early Chinese-American immigrants are far outnumbered by the numerous Chinese-Americans who immigrated to the United States after 1979.^{15,16}

Most Vietnamese-American immigrants to the United States arrived during or after the 1970s.¹⁸ Waves of immigration from Vietnam to the United States occurred after the Vietnam War. Although the first wave of immigration included primarily well-educated, urban, middle-class professionals, government officials, military personnel, and religious leaders, the later waves of immigration included many refugees who lacked economic, social, and educational resources.¹⁹ Consequently, the Vietnamese-American population in the United States, in general, is recently-arrived and socioeconomically diverse.

Earlier waves of immigration from Korea and Japan. Immigration to the United States from Korea increased dramatically after the Immigration Act of 1965 eliminated immigration quotas based on nationality.^{20,21} The resulting wave of immigration from Korea consisted of family members of Korean-Americans and skilled workers, who were given priority.²² Therefore, most adolescents of Korean origin living in the United States today are 2nd or 3rd generation.

The peak period of immigration to the U.S. from Japan occurred between 1880 and 1920, and decreased sharply at the time of World War II as a result of anti-Japanese sentiment.¹⁵ Therefore, a large proportion of Japanese-American adolescents living in the United States today are descendants of the earlier immigrants and are 3rd or 4th generation.²³

If the Asian American national subgroups with more recent immigration patterns (i.e., those groups with a higher proportion of recently-arrived immigrants) also tend to be those that have low adolescent smoking prevalence rates, then nationality might be a confounder of the observed relationship between acculturation and smoking among Asian American adolescents. If so, it would be a mistake to conclude that exposure to the United States culture is causing Asian American adolescents to smoke.

This study examined the association between acculturation and smoking across Asian American national subgroups and determined whether that association would remain statistically significant after controlling for nationality. We hypothesized that acculturation would be associated with a higher risk of smoking among Asian American adolescents, but that some of that effect would be attributable to nationality, which happens to be confounded with acculturation level. Therefore, we expected

that the association between acculturation and smoking would diminish, or become nonsignificant, after controlling for nationality.

METHOD

Data Source

This study used data from three cross-sectional surveys of 10th-grade California public school students conducted as part of the Independent Evaluation of the California Tobacco Control, Prevention, and Education Program.²⁴ In 1996, 1998, and 2000, the Independent Evaluation conducted school-based surveys of representative samples of 10th-grade California youth ($N = 23,759$). The data were collected in 18 California counties, which were selected based on population density. The sampling procedures are described in detail elsewhere.²⁵ The 1996, 1998, and 2000 surveys each comprised a representative sample of California 10th-graders attending public schools. The three samples were combined in this analysis to obtain a sufficiently large number of Asian American students.

The survey used an IRB-approved implied consent procedure (students were assumed to have parental consent if their parents did not return a signed form declining their children permission to participate). Even if their parents did not decline participation, students were free to decline participation. Of the students in the selected classrooms, 99% provided implied parental consent and student assent. During a single class period (45-50 minutes), students completed a paper-and-pencil questionnaire about their tobacco-related attitudes and behaviors.

Analytic Sample

A total of 23,759 students completed the survey. The respondents who self-identified as Chinese-American, Korean-American, Vietnamese-American, or Japanese-American were included in the analytic sample. Filipino-Americans and Pacific Islanders were not included in the sample because those groups typically learn English as a primary language, even if they grow up in the Philippines or Pacific Islands. Therefore, the acculturation measure used in this study, a measure of English language usage in the home, was judged not to be a valid measure of acculturation for those groups. Other Asian-American subgroups (e.g., Hmong, Laotian) were not included in the sample because their

sample sizes were not large enough to permit between-group analyses. Of the 23,759 students surveyed, 2,093 (9%) self-identified as members of one of the four Asian-American subgroups described above and provided complete data on all of the variables of interest. Those 2,093 Asian-American students comprise the analytic sample. The mean age of the students was 15.4 years old; 52% were Chinese-American, 24% were Vietnamese-American, 14% were Japanese-American, and 10% were Korean-American.

Measures

Smoking status. Past-month smoking was coded as 1 if the respondent reported smoking cigarettes in the past 30 days, or 0 if the respondent had not smoked in the past 30 days.

Acculturation. Acculturation was measured with a single item that asked what language the student spoke at home, rated on a 5-point scale ranging from "only English" to "only another language." The acculturation process is complex, and a multi-item scale would have been a more complete measure of acculturation. However, the only measure available in the dataset was the single-item language usage measure. Although language usage is only one of the components of the acculturation process, such single-item language measures have been shown to correlate highly with more comprehensive acculturation scales, accounting for a large proportion of the variance in other acculturation measures.^{26,27} Therefore, although language-based acculturation measures admittedly do not capture the richness of the acculturation experience, they tend to be highly correlated statistically with other dimensions of acculturation and therefore can be viewed as one of the many manifestations of the acculturation process.

Data Analysis

Logistic regression analyses were used to determine the odds ratios of past-month smoking according to the respondents' level of acculturation. The logistic regression model was run twice. The first model examined the odds of smoking according to acculturation. In the second model, nationality was included as a predictor variable along with acculturation, and the odds ratio for acculturation was re-examined. Chinese was used as the reference group for the odds ratios because it was the group with the lowest smoking prevalence. All analyses controlled for age, gender, and the year in which the survey was completed.

An additional analysis examined the association between acculturation and smoking within each national group. The sample was stratified by nationality, and the logistic regression model described above was repeated within each group, controlling for age, gender, and year.

RESULTS

Table 1 shows the respondents' demographic characteristics, acculturation, and past-month smoking. The 4 subgroups differed significantly on age ($F = 4.99, p < .0001$). The gender distribution was not significantly different among the subgroups ($\chi^2 = 8.32, p = .139$), but gender was retained as a covariate in the subsequent analyses because gender has been associated with smoking among Asian American adolescents in previous studies.^{5,28} Acculturation varied significantly by subgroup; the Korean-American adolescents were significantly more likely to speak only or mostly English in the home than were the other three groups ($\chi^2 = 108.16, p < .0001$). Smoking prevalence varied threefold among the subgroups, ranging from 13% among Chinese-American adolescents to 36% among Korean-American adolescents.

Table 2 shows the results of the logistic regression analyses of the association between acculturation and smoking. In a multivariate logistic regression model controlling for year of survey administration, age and gender (top of Table 2), acculturation was found to be a risk factor for smoking ($OR = 1.12; 95\% CI: 1.01 - 1.25$). In a similar model controlling for nationality (bottom of Table 2), acculturation became non-significant ($OR = 1.05; 95\% CI: 0.95 - 1.18$). In this model, Korean-American and Japanese-American nationality replaced acculturation as significant risk factors for smoking.

In Table 3, the odds ratios for smoking according to acculturation are presented separately for each national group. The acculturation-smoking association was not significant within any of the Asian American national subgroups.

DISCUSSION

Several previous studies have reported that acculturation to the United States is a risk factor for smoking among Asian American adolescents.⁵⁻⁷ However, the associations observed in those studies might

TABLE 1. Demographic Characteristics and Past-Month Smoking by Nationality

	Chinese-American	Japanese-American	Korean-American	Vietnamese-American	Total	Significance test of between-group differences
N	1084	300	208	501	2093	-
Mean age (years)	15.3 [0.5] ^a	15.5 [0.6] ^b	15.4 [0.6] ^{ab}	15.4 [0.5] ^a	15.4 [0.6]	$F = 4.99, p < .0001$
Female (%)	46%	47%	53%	49%	47%	$\chi^2 = 8.32, ns$
Acculturation						
Only / mostly another language	24%	26%	8%	20%	21%	$\chi^2 = 108.16, p < .0001$
½ English, ½ another language	45%	43%	33%	57%	46%	
Only / mostly English	31%	32%	60%	23%	32%	$\chi^2 = 73.75, p < .0001$
Past-month smoking	13%	23%	36%	14%	17%	

Note. Numbers with the same superscript letter are not significantly different at $p < .05$.

TABLE 2. Odds Ratios for Past-Month Smoking According to Acculturation

Variable	Model 1: Not controlling for nationality	
	OR	95% C.I.
Year of survey	0.89*	(0.84, 0.96)
Age	1.45*	(1.20, 1.75)
Female	0.61*	(0.49, 0.76)
Acculturation	1.12*	(1.01, 1.25)
Model 2: Controlling for nationality		
Variable	OR	95% C.I.
Year of survey	0.89*	(0.83, 0.96)
Age	1.37*	(1.13, 1.66)
Female	0.58*	(0.46, 0.72)
Acculturation	1.05	(0.95, 1.18)
Vietnamese-American	1.11	(0.82, 1.52)
Japanese-American	1.91*	(1.38, 2.65)
Korean-American	3.71*	(2.62, 5.26)

*p < .05

Note. Reference group is Chinese.

have been confounded by differences across Asian national groups. Most previous studies of Asian-American adolescents have not had large enough sample sizes to examine each nationality separately; therefore, they combined various diverse national groups into an "Asian-American" category, which was assumed to be homogeneous. However, the Asian-American group is not homogeneous; it represents several distinct waves of immigration from multiple countries, each of which is characterized by unique social, political, and economic circumstances. This study, which combined three representative cross-sectional samples of California adolescents, was large enough control for nationality and to examine the data separately by nationality, allowing a more rigorous examination of the complex associations between acculturation and smoking.

When nationality was added to the analysis as a covariate, the association between acculturation and smoking became non-significant; instead, Japanese-American and Korean-American nationalities emerged

TABLE 3. Nationality-Specific Odds Ratios for Past-Month Smoking According to Acculturation

Nationality	OR	95% C.I.
Chinese-American	1.04	0.88, 1.25
Japanese-American	0.92	0.71, 1.21
Korean-American	1.09	0.82, 1.45
Vietnamese-American	1.40	0.99, 1.97

as the significant correlates of smoking. The observed association between acculturation and smoking was due to the higher overall prevalence of smoking among Japanese-American and Korean-American respondents. These results suggest the existence of an ecological fallacy (i.e., associations that are significant across groups at a macro level are not significant across individuals within groups at the micro level). When the association between acculturation and smoking was examined separately within nationality groups, it became non-significant in all groups. In other words, within each Asian-American national subgroup, acculturation is not associated with an increased risk of smoking. The observed association is due to differences in acculturation and smoking across groups, not among individuals within each group.

The results of this study indicate that it is not acculturation to the United States culture per se that leads adolescents to smoke, but other social, economic, cultural, and psychological factors that differ across Asian national groups according to their immigration history and length of time in the United States. Further research is needed to identify those factors, which might include socioeconomic status, perceived discrimination, contact with peers of other ethnic groups, cultural norms about smoking, parenting styles, parental supervision, and/or access to cigarettes.

Although each Asian nation has a unique history of emigration to the United States, some general similarities in immigration patterns and adolescent smoking are evident in this study. The groups with the highest smoking prevalence (Korean-American and Japanese-American) are those that experienced their major influxes of immigration several generations ago. The groups with the lowest smoking prevalence (Chinese-American and Vietnamese-American) are groups with more recent immigration patterns. This does not necessarily mean that exposure to the United States culture causes adolescents to smoke, but that changes in the social contexts, socioeconomic status, and interpersonal relation-

ships over multiple generations within acculturating families might combine to place adolescents in social situations in which they have access to cigarettes and social support for experimenting with smoking. Further research is needed to understand the changes that occur at the individual, family, and community levels as individuals and families acculturate to the United States culture, and as ethnic communities become established in various areas.

Limitations

Because these data are cross-sectional, causal inferences cannot be made. The students might have biased their self-reports of their smoking behavior, and the extent of this self-report bias might vary by nationality and acculturation level. Other factors that might play a role in the association between acculturation and adolescent smoking, including socioeconomic status, neighborhood characteristics, and family functioning, were not available in this dataset. Because this survey was administered in English-speaking classrooms, the sample did not include adolescents who could not read English. However, in compliance with California law, students with limited English proficiency are mainstreamed into English-speaking classrooms. Furthermore, our pilot research with Asian-American adolescents in California public schools has indicated that students with limited English reading ability typically are not proficient readers in another language either, even if they can speak or understand some of that language.

This study used a single-item measure of acculturation (English language usage), rather than a multi-item acculturation scale. Acculturation is a multidimensional construct that involves other attitudes and behaviors not assessed by this measure.²⁹ Other dimensions of acculturation include historical familial identification, contacts with the country of origin, ability to read and write in the native language, association with friends, and food selection.³⁰ Nevertheless, single-item measures of acculturation have been shown to correlate highly with multi-item acculturation scales, suggesting that language usage might be a proxy for acculturation.²⁶ A definite limitation of this acculturation measure, however, is that it does not assess multiple cultural affiliations (biculturalism), and it does not distinguish among the different patterns of acculturation, such as integration, assimilation, separation, and marginalization.⁸

Implications

Despite these limitations, these findings have potential implications for community-based and school-based programs to prevent smoking

among Asian American adolescents. They indicate that acculturation to the United States per se might not increase the risk of smoking among Asian American adolescents, but that other characteristics of Asian American families who immigrated to the United States several generations ago, as well as the characteristics of the social contexts in which Asian American families live after becoming more integrated into the United States culture, might make adolescents more prone to high-risk behaviors such as smoking. These results provide new information about how the association between acculturation and smoking among Asian adolescents might be confounded by nationality. A more complete understanding of how the acculturation process differs across Asian American subgroups, and how contact with a new culture influences adolescent smoking, are necessary for the development of improved smoking prevention programs. Furthermore, future studies could benefit by disentangling such cohort effects from acculturation effects. These results provide evidence for this need. The resulting knowledge then could be used to create improved smoking prevention programs for Asian American adolescents of all nationalities and stages of acculturation.

NOTE

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