Acculturation and smoking behavior in Asian-American populations

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Abstract

The relationship between acculturation and smoking behavior was examined in four Asian-American groups that included recent immigrants and US-born Koreans, Chinese, Vietnamese and Cambodians residing in the Delaware Valley of Pennsylvania and New Jersey. The study was part of a community-based, comprehensive cross-sectional study designed to assess a broad array of knowledge, attitudes and behaviors on tobacco use and tobacco-related cancer issues in the target multi-ethnic and multi-lingual Asian-American community. The sample of 1374 respondents was selected using a stratified-cluster proportional sampling technique, with a response rate of 83%. Findings indicated that acculturation had a variable effect on smoking behavior: more acculturated youth and less acculturated male adults had higher smoking rates than the less acculturated youth and the more acculturated male adults. Smoking rates for all females were generally lower than those of males regardless of acculturation status; however, acculturated adult females had a higher smoking rate than the less acculturated.

Introduction

Acculturation is a process by which individuals or groups accept, selectively, aspects of another culture, often a dominant one, that those individuals or groups intend to adopt without completely relinquishing their own. Aspects of the adopted culture may include beliefs (e.g. religion), values (e.g. generosity, volunteerism, free speech), social norms (e.g. dress, greetings, burial) and lifestyles (e.g. foods and tobacco use) (Marin, 1992). While the process of adaptation is complex, it is often a function of age, cultural heritage and language, and circumstances that individuals or groups face in the new social order. However, those principles are dynamic and not etched in stone. Acculturation is governed by an interplay of forces both external as well as internal to the individual or group experiencing change (Dusenbery et al., 1994; Wiecha et al., 1998; Chen et al., 1999a).

Acculturation may be stressful or liberating and challenging. It is stressful because most individuals or groups are often resistant to change, and consider change a threat to one’s beliefs, values, social order, lifestyle and history. It is liberating and challenging, because the new culture may offer new opportunities unavailable in one’s original social structure (De Leone, 1996).

Except in cultures where smoking is ritualistic, smoking, as we know it today, is a recent historical phenomenon conditioned variously by local cultures across continents. Unlike many products, tobacco has become an integral component of the economies of both developed and developing countries (Inaba and Cohen, 2000).
Sixty percent of the Asian-American population is comprised of new immigrants from Asian countries. They migrate from a culture of social acceptability of tobacco (e.g., China) to one considered a culture of social unacceptability of tobacco (e.g., the US). The prevalence of tobacco use among the Asian-American population exceeds 30%, which is higher than that of US general population. A significant percentage of smokers are male (Centers for Disease Control and Prevention, 1992b, 1997, 2000; Wiecha, 1996; Wiecha et al., 1998; Chen and Unger, 1999). The admixture of first and later generations of Asians, living side by side, contributes to the stability of these communities as well as perpetuation of cultural heritage, and the resulting partial isolation of these communities from the mainstream can impede the process of acculturation and inhibit the utilization of mainstream health and other community-wide resources (Ma, 1999; Ma et al., 2002a). Further, cultural, linguistic and physical isolation have unwittingly exposed these communities to tobacco industry marketers, capitalizing on a culture of social acceptability of tobacco and communities that are benignly oblivious to the deleterious health consequences of the product (Ma et al., 2002a).

While many factors contribute to initiation of tobacco use among Asian-Americans, cultural mores exert substantial influence on use and patterns of use. The high prevalence of tobacco use, especially among new immigrants, signifies social acceptability and cultural mores, as such act as a conduit for tobacco use and as a mask against counter-marketing. These mores, however, are subject to modification depending on an individual’s or group’s perception of and expectations within the new culture. Expectations of personal mastery and success influence individuals’ engagement or non-engagement in certain behaviors as, for example, smoking (Bandura, 1986; McGahee et al., 2000).

Acculturation provides a conceptual bridge for understanding the relationship between migration and changes in smoking behavior, hence the interest of researchers in acculturation’s implications to a variety of behaviors including tobacco smoking (Dusenbery et al., 1994; Klonoff and Landrine, 1996; Wolff and Portis, 1997). The process is of particular interest to health professionals because it has both positive and negative connotations (Rassin et al., 1993; Dusenbery et al., 1994).

Research to date has shown that acculturation has a variable influence on smoking behaviors of different population groups such as youth and adults and men and women. Smoking is more prevalent among less acculturated men and more acculturated women; conversely, the more acculturated men and the less acculturated (traditional) women are more likely to be non-smokers (Marin et al., 1989a; Centers for Disease Control and Prevention, 1992a; Moeschberger et al., 1997; Lee et al., 2000). There are some discrepancies regarding acculturation level and smoking behaviors among males, however. Moeschberger et al. (Moeschberger et al., 1997), for example, found that smoking rates among the less acculturated Cambodian, Laotian and Vietnamese fell between those of the more assimilated and the traditional groups.

Results of studies examining the variable impact of acculturation on smoking behaviors among immigrant youth (Dusenbery et al., 1994; Chen et al., 1999a,b) suggest that smoking rates among Latino and Asian-American adolescents, two large immigrant groups, are significantly associated with levels of acculturation: the more acculturated youth were more likely to be smokers, while the less acculturated to be non-smokers. These findings, however, were inconsistent with those of Wiecha (Wiecha, 1996) and Dusenbery et al. (Dusenbery et al., 1994). In their survey of Vietnamese young, the authors found that acculturation was inversely associated with current smoking. The authors found that acculturation had variable influences on immigrant boys and girls.

Levels of acculturation are also associated with cigarette consumption among various ethnic groups. The Marin et al. (Marin et al., 1989a) study revealed that, independent of gender, the more acculturated Hispanics consumed more cigarettes per day than their less acculturated counterparts. A Centers for Disease Control and Prevention
(Centers for Disease Control and Prevention, 1992) California survey of Chinese males showed similar results. That survey showed that the average number of cigarettes smoked per day increased as a function of lifetime spent in the US.

Measurement of and acculturation scales include, among others, language use, preparation and consumption of native foods, age when a person emigrated to and length of residency in the US, parents’ birthplace, ethnicity of friends, and involvement in cultural groups and activities. Language use, however, is one of the most important measures of acculturation. It has been used as a general measure of an individual’s adaptation to the new social structure as well as his/her specific perception of tobacco use as a function of this adaptation or acculturation (Centers for Disease Control and Prevention, 1992a; Dusenbery et al., 1994; Moeschberger et al., 1997; Wiecha et al., 1998; Chen et al., 1999a,b). Language is also correlated with length of stay in the US (Centers for Disease Control and Prevention, 1992a; Thridan-dam et al., 1998; Wiecha et al., 1998). Results, however, have not shown consistency.

Moeschberger et al. (Moeschberger et al., 1997), Wiecha et al. (Wiecha et al., 1998) and the Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, 1992a) found that, among immigrant adults, a higher level of proficiency in English correlated inversely with lower smoking prevalence, while a lower level of proficiency correlated with a higher prevalence of smoking. Wiecha et al.’s survey of Vietnamese men in Massachusetts, however, found that, after controlling for educational level, higher levels of proficiency in English did not remain an independent predictor of smoking behavior.

Several authors examining the relationship between length of residency in the US and smoking rates found an inverse relationship (Jenkins et al., 1990, 1992; Centers for Disease Control and Prevention, 1992a; McPhee et al., 1995; Thridandam et al., 1998). These findings were inconsistent with those of Wiecha et al. (Wiecha et al. 1998) who did not find this relationship in their survey of Vietnamese men in Massachusetts; but this author’s survey of Vietnamese adolescents in the same region (Wiecha, 1996) found that, while male adolescents with longer residency were less likely to be current smokers, female adolescents with a similar record of US residency faced high risks of becoming smokers.

This article reports the findings of our study focused on the impact of acculturation on smoking behavior in Asian-Americans. It was conducted during the period from October 2000 to February 2001. The study was based on a general assumption that an understanding of the factors that impact behavior change in cultural adaptation (i.e. the acculturation process) could provide insight into how various ethnic Asian subgroups respond to dominant (or different) cultural beliefs, values, social norms and lifestyles. No studies have focused solely on this phenomenon in Asian-American populations to date.

The purpose of the study in this article was to (1) determine the relationship between acculturation and smoking behavior in four Asian-American ethnic-language subgroups that included Koreans, Chinese, Vietnamese and Cambodians residing in the Delaware Valley region of Pennsylvania and New Jersey, (2) examine the differential impact of acculturation on smoking among Asian-American youth and adults, and (3) determine the relative importance of these differences in the design and development of culturally appropriate and sensitive smoking prevention and cessation programs for the four subgroups.

Methods

Sample selection and data collection
A cross-sectional self-report survey method was used in this study. In order to obtain a representative sample size, a stratified-cluster proportional sampling technique was utilized (Federer, 1991). Randomly selected organization clusters were stratified based on four race/ethnicity or language groups: Chinese, Korean, Vietnamese and Cambodians. Federer (Federer, 1991) and Cozby (Cozby, 1997) stated that cluster sampling is useful when
the strata are more homogeneous with respect to the variable or variables of interest than the population as a whole. The selected cluster can be grouped or stratified according to the subgroup characteristics or demographic variables such as gender, age class, race/ethnicity and education, among others—the factors that affect the analysis of research data.

A proportional allocation process was also applied based on the population proportional data obtained from the Census Bureau (US Census Bureau, 2000). The proportional allocation concept refers to the procedure of assigning the sample size proportionally to the subgroups’ size (Federer, 1991). The survey instrument was in five languages: English, Korean, Chinese, Vietnamese and Cambodian. Onsite translation help was an essential procedure to ensure the quality of survey administration. A critical aspect of this study was to examine the relationships between variables rather than to fully describe the population (Cozby, 1997). The sample size was determined by using a statistical power analysis and inflated by an anticipated response rate to ensure an adequate number of participants.

Participants were selected as follows: a current list of Asian community organizations (n = 52) in the Delaware Valley region of Pennsylvania and New Jersey was identified by ATECAR (Asian Tobacco Education, Cancer Awareness and Research), Center for Asian Health, Temple University, in cooperation with a health service agency and ATECAR’s Asian Community Cancer Coalition, comprised of 30 organizational members. The organizations were located in a geographic area that maximized the coverage of Asian-Americans across ethnic groups, ages and socioeconomic status. Twenty-six organizations were randomly selected for the study and grouped as clusters, then stratified based on race/ethnicity and language as follows: Chinese, Korean, Vietnamese and Cambodian. A proportional allocation procedure was applied based on the population proportion data obtained from the latest Census Bureau (US Census Bureau, 2000). Recruitment of participants was accomplished through the organizations’ administrative structures. A representative sample of these organizations included the Southeast Asian Mutual Assistance Associations Coalition, Vietnamese United National Association of Greater Philadelphia, Korean Community Development Services Center, Holy Redeemer Church & School, Korean American Community Services Center of New Jersey, Cambodian American Seniors Association, Delaware County Office of Services for the Aging and Chinatown Pediatric Services.

In total, 1374 Chinese, Koreans, Vietnamese, Cambodians and others were recruited from the 26 randomly selected community organization clusters. The number of participants completing the survey determined the final sample (n = 1174). Of the 1374 total recruited, 1141 completed the survey. The response rate was 83%.

Participant sample size was determined by using statistical power analysis and inflated by an anticipated response rate to ensure an adequate number of participants. Statistical tests used for data analyses included ANOVA, $\chi^2$ and regression analysis. By convention, a power of 0.80 was chosen and each test had a medium effect size. Cambodians, representing only 5% of the Asian-American population of the region, were oversampled to ensure increased probability that the data was representative of the population.

Standard procedures were followed in the conduct of the study including prior approval of Temple University’s Institutional Review Board, and training for survey administrators and bilingual on-site translators. A self-administered questionnaire was translated into Chinese, Korean, Cambodian and Vietnamese languages. Back-translation was performed to ensure quality of the translation. Participants had the option of completing the questionnaire in English or in one of its translated versions. Assistance was provided to those who were either unable to complete the survey on their own or who preferred to respond verbally to the survey. There were 26 survey administration sites, each representing a participating organization. The questionnaire took approximately 25–45 min to complete and was collected on site.
Measurement

A 77-item survey instrument comprised of 10 sections was developed for the study. The primary purpose of the study was to determine smoking and quitting behaviors, extent of exposure to second-hand smoke, knowledge of the relationship between cigarette smoke and cancer, social influences on smoking, impact of acculturation on smoking, and attitudes toward tobacco use among the Asian-American population in the Delaware Valley. Some results of this comprehensive study have been reported elsewhere (Ma and Fleisher, 2002; 2002a–c, 2003a–c). This article focuses primarily on the association of acculturation and current smoking behaviors in Asian-American populations.

A number of survey questions for the study were adapted from previous research studies including the 2000 National Health Interview Survey, the 1998 National Household Survey on Drug Abuse, the 1999 Youth Risk Behavior Survey, the Florida Youth Tobacco Survey and the American Indian Cancer Control Project. Survey questions were modified for appropriate cultural context. Items pertaining to acculturation were adapted from the 2000 National Health Interview Survey and the 1991 American Indian Cancer Control Project and are standard validated items.

A pilot test was conducted among 50 Asian-American adults and 10 health professionals to establish reliability, face and content validity of the instrument and to verify data collection methods. The Guttman split half reliability coefficient was 0.67 (SPSS, 1999), indicating that, overall, participants responded consistently to items throughout the questionnaire. The main measures that represented the majority of the questionnaire were chosen and reported acceptable and significant correlation coefficients ($P < 0.05$). Key areas such as identification of ethnic origin, country of birth, smoking status, number of friends who smoke, cessation, environmental smoke exposure, stimulatory and addictive qualities of tobacco had significant correlations ($P < 0.05$), indicating strong internal consistency. The split half reliability correlation coefficients for the items that measured acculturation were significant and ranged from 0.34 to 1.0.

Acculturation level was determined by assessing: (1) frequency of speaking native language, (2) frequency of reading native language, and (3) frequency of preparing and eating native/traditional food. Native language usage and food preference were measured against three scales: never, sometimes and always. Length of time spent in the US and country of birth was considered as a separate independent variable respectively. To measure the relation between acculturation and smoking behavior among subgroups, variables of self-description that included age group, gender and smoking status (current-, former- and never-smoker) were included in the survey instrument. Never-smokers were those who reported that they had never smoked, former-smokers, if it had been 1 year or more since they had last smoked and current-smokers if they smoked within last 12 months.

Data analysis

Data were analyzed using SPSS (version 10.0 for Windows) software. The $\alpha$ level was set at 0.05 to determine statistical significance. ‘Time lived in the US’ was categorized into two groups: $\leq 5$ and $\geq 6$ years (Ma, 1999). Similarly, ‘country of birth’ was categorized into two groups: foreign born and US born. Participants were divided into two age groups: $\leq 21$ and $>21$ years. The 21-year cutoff point was based on National Institute of Health’s inclusion criteria for children (range: birth through 21 years) (US Department of Health and Human Services, 2002) and the observed fact that Asian youth tend to acquire smoking during the latter part of their teen years (Ma et al., 2002a). ‘Smoking status’ was recoded into two groups: non-smokers (including those who had never smoked and former-smokers) and current-smokers. To create a generic variable combining native language speaking and reading, as well as preference for native food, Spearman non-parametric correlations analysis was conducted for variables of (1) frequency of speaking native language, (2) frequency of reading native language, and (3) frequency of preparing and eating native/traditional food.
food. Results indicated that the correlations among these three variables were statistically significant, coefficient 0.592 for language speaking and reading, 0.477 for language speaking and food preference, and 0.467 for language reading and food preference. The ‘native language reading’ variable was excluded from the final data analysis because of the dearth of reading materials for some Asian groups under investigation (e.g. the Cambodian community lacked a Cambodian language newspaper).

A generic variable for measuring ‘native language speaking’ and ‘native food preference’ was created as an acculturation index. Data from participants who responded ‘always’ to both survey questions were recoded to a lower acculturation level, while data from participants who responded ‘never’ or ‘sometimes’ to the same questions were recoded to a higher acculturation level. We combined the variables of native language and food, which gave a more meaningful weight on the ethnic origin.

The influence of ‘native language speaking’, ‘native food preference’ and ‘time spent in the US’ on the smoking rate for the two age groups was examined using the Pearson $\chi^2$-test of significance. A similar test was used to determine if the acculturation variable has an impact on male and female adults (over 21 years). Multiple logistic regressions were applied to identify potential predictors of studied acculturation variables associated with smoking. Table II shows the logistic regression models that were used to simultaneously control for the acculturation variables for youth, female adults and male adults. In Model 1, we examined only acculturation variables for each group, and in Model 2, we controlled for age and education (see Table II).

### Results

The participant sample ($n = 1174$) was comprised of 410 Chinese, 436 Koreans, 196 Vietnamese, 100 Cambodians and 32 Other category, that included 16 Hmong, eight Filipino, four Japanese, three Laotian and one Indian. Because of the small sample size, this category was excluded from the study. The sampling criteria were based on recruits who were of Asian descent and a confirmed affiliation with one of the 26 organizations. Distribution by gender and age were as follows: 55% males and 44% females, ranging in age from 14 to 80 years (mean = 41 years; SD = 16). Approximately 70% of the sample was between 23 and 60 years of age. Among the four subgroup participants, about 15% were younger than 21 years. Of the total sample, 1050 were born in an Asian country (males 51.2%, females 42.2%) and the remaining in the US (males 3.8%, females 2.8%).

Average ever-smoking rate for all subgroups was 40.1% and current-smoking rate was 29.6%. Current-smoking rates varied significantly by race. The current tobacco use rates among the four groups were: Chinese 24.1%, Korean 26.8%, Vietnamese 40.3% and Cambodian 42.4%. The educational level of participants ranged from less than high school to graduate level training. The residency status of all subgroups was as follows: 74% had lived at least 6 years in the US, while the remaining percentage had lived less than 6 years [for more details on participants, see (Ma et al., 2002b)].

Table I presents Pearson $\chi^2$-test results of the overall relations of smoking and acculturation for youth and, by gender, for adults. ‘Time spent in the US’ has a significant but opposite effect on smoking for youth and adults. Youth who lived in the US 6 years or more reported higher smoking rates than those who lived less than 6 years (32.6 and 6.9%, respectively, $P = 0.005$). The smoking rate for adult women who lived in the US longer than 6 years was significantly lower than that for those who lived less than 6 years (11.5 and 20%, respectively, $P = 0.022$). A similar trend was found in men, but was not statistically significant (39.8 and 49.3%, respectively, $P = 0.056$).

Country of birth did not reveal statistically significant impact on smoking to either youth or adults. Youth and adult women who scored high (i.e. more acculturated) on the acculturation level of ‘native language speaking’ and ‘native food
preference’ had higher smoking rates than those who scored low (i.e., less acculturated) on the same scales. In contrast, the rate of smoking was significantly lower among more acculturated adult males than that of the less acculturated males.

As shown in Table II, the results of the logistic regression analyses reveal a pattern of the association between acculturation and current smoking among youth and adults. Acculturation dimensions associated with smoking differed among the two age groups. For youth, after controlling for age, gender, and education, acculturation levels did not show significant effects on smoking behavior, but a higher level of acculturation was still associated with increased smoking (OR = 2.04). Male, older youth and those who had lived in the US longer than 6 years smoked more than female, younger youth and those who had lived in the US 5 years or less. Youth who lived in the US 6 or more years were about 6 times (OR = 5.68 raw, OR = 6.2 adjusted) more likely to be current smokers than those who lived 5 years or less. The more acculturated youth had twice the risk of being current smokers. For adults, it was found that the more acculturated males were less likely to smoke, while the more acculturated females were more likely to smoke (OR = 1.61 raw, OR = 1.39 adjusted). However, there are no significant differences between male and female adults with regard to the impact of time living in the US and education level on smoking. Specifically, the data indicated that less smoking was associated with higher education and longer residency in the US for both male and female adults.

### Discussion

Theoretical and methodological studies on acculturation processes of migrant groups have been on the increase in recent years. Much of the current research on the relationship between acculturation and smoking, however, has been on African-Americans (Klonoff and Landrine, 1996) and Hispanics (Marin et al., 1989a,b; Dusenbery et al., 1994; Marin and Gamba, 1996; Wolff and Portis, 1997). Asian-Americans, comprising one of the fastest growing ethnic/racial group and one that has the second largest recent immigrant population, has received minimal attention from researchers, leaving the area of acculturation and smoking in Asian-American populations open for speculation (Moeschberger et al., 1997; Wiecha et al., 1998; Chen et al., 1999a,b; Lee et al., 2000). Previous studies have provided us with some insights on local populations collectively (Wiecha, 1996; Moeschberger et al., 1997; Wiecha et al., 1998; Lee et al., 2000; Ma et al., 2002a); however, these

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**Table I. Smoking behavior of current smokers by age and acculturation**

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<th>Youth (&lt;21 years)</th>
<th>Adult (&gt;21 years)</th>
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<tr>
<td></td>
<td>Smoking (%)</td>
<td>P</td>
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<tr>
<td>Time in US</td>
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<tr>
<td>≤5</td>
<td>6.9</td>
<td>0.005</td>
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<tr>
<td>≥6</td>
<td>32.6</td>
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<tr>
<td>Country of birth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>foreign born</td>
<td>24.6</td>
<td>0.16</td>
</tr>
<tr>
<td>US born</td>
<td>35.6</td>
<td></td>
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<tr>
<td>Acculturation</td>
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<tr>
<td>lower</td>
<td>19.1</td>
<td>0.032</td>
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<td>higher</td>
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Pearson χ²-test.
have not yielded a comprehensive picture of the relationship between acculturation and smoking behavior in the population at large.

Our current study fills a gap in our knowledge and provides a broader perspective on the topic of acculturation and smoking behavior in the Asian-American population, considered to be one of the last frontiers of the tobacco industry’s marketing targets, capitalizing on the populations’ propensity to perceive smoking as a socially acceptable behavior. Our focus on acculturation and current smoking was aimed at improving and strengthening prevention and intervention programs to counter both tobacco marketing as well as cultural mores that contradict Asian cultural values, in particular those that relate to health. The study represents the first attempt to examine the relationship between acculturation and smoking exclusively among Asian-Americans.

There are no widely accepted acculturation measures for Asian-Americans similar to those for the Hispanic or African-American populations (Marin et al., 1989b; Dusenbery et al., 1994; Marin and Gamba, 1996; Wiecha, 1996; Wiecha et al., 1998). This study included a number of acculturation variables, deemed important in Asian cultures, and their association with smoking behavior yielded important information about the relative impact of acculturation on Asian-Americans’ smoking behavior.

Our findings were consistent with those of previous studies on subsets of Asian populations (Marin et al., 1989a; Centers for Disease Control and Prevention, 1992a; Dusenbery et al., 1994; Marin and Gamba, 1996; Wiecha, 1996; Moeschberger et al., 1997; Wiecha et al., 1998; Chen et al., 1999a,b; Lee et al., 2000). Higher levels of acculturation, as measured on the scale of preference for ‘speaking a native language’ or ‘preparing and consuming native foods’, were associated with increased consumption of tobacco, especially among youth and adult females. The converse was observed in the counterparts whose score results on the same scales indicated a lower level of acculturation. In contrast, adult males who scored high on acculturation had lower smoking rates.

In this study, we first used food preference as a measure of acculturation because food is considered an important component in Asian cultures. We then combined the use of native

| Table II. Logistic regression odd ratios (ORs) in relations of smoking and acculturation |
|---------------------------------|-------|-------|-------|-------|-------|-------|
|                                 | Raw (Model 1) | Adjusted (Model 2) |
|                                 | OR      | CI       | P      | OR      | CI       | P      |
| Youth (≤21 years)               |         |         |       |         |         |       |
| acculturation (high/low)        | 2.03    | 0.96–4.32 | 0.065 | 2.04    | 0.89–4.63 | 0.09  |
| time in the US (≥6/≤5 years)    | 5.68    | 1.28–25.25 | 0.022 | 6.22    | 1.33–29.2 | 0.02  |
| education³                     |         |         |       |         |         |       |
| agelasting                     | 0.72    | 0.41–1.27 | 0.26  | 1.19    | 0.95–1.48 | 0.14  |
| female (male)                  | 0.23    | 0.1–0.53  | 0.001 |         |         |       |
| Adult (>21 years), male         |         |         |       |         |         |       |
| acculturation (high/low)        | 0.65    | 0.44–0.96 | 0.029 | 0.59    | 0.39–0.91 | 0.015 |
| time in the US (≥6/≤5 years)    | 0.68    | 0.45–1.01 | 0.062 | 0.85    | 0.55–1.30 | 0.44  |
| education                      |         |         |       |         |         |       |
| agelasting                     | 0.70    | 0.59–0.81 | 0.001 | 0.96    | 0.95–0.98 | 0.001 |
| Adult (>21 years), female       |         |         |       |         |         |       |
| acculturation (high/low)        | 1.61    | 0.85–3.06 | 0.14  | 1.39    | 0.71–2.73 | 0.34  |
| time in the US (≥6/≤5 years)    | 0.47    | 0.26–0.85 | 0.012 | 0.60    | 0.32–1.12 | 0.11  |
| education                      |         |         |       |         |         |       |
| agelasting                     | 0.82    | 0.64–1.06 | 0.13  | 0.98    | 0.96–1.01 | 0.15  |

³Education level: elementary/middle school, high school, trade/associate degree, college and graduate school.
Age interval: 1 year old.
language and food preference to give more weight to cultural cognition. Results showed that the combined measures yielded a superior acculturation index, and a powerful predictor of acculturation and its association with smoking behavior.

Previous studies suggested that the relationship between smoking and length of residency in the US was either inverse or non-existent (Jenkins et al., 1990, 1992; Centers for Disease Control and Prevention, 1992a; McPhee et al., 1995; Thridan-dam et al., 1998). Our results showed that length of residency in the US is an important predictor of acculturation and smoking behavior. Increased length of residence in the US correlated with increased risk of being a current-smoker in the Asian youth sample: those who have lived more than 6 years were more likely to be current-smokers. An inverse relationship was found in the adults. Longer residence in the US correlated with decreased smoking behavior. However, this study did not reveal a significant difference of smoking behavior between foreign-born and US-born respondents, neither youth nor adults. This might be caused by the relative small portion of US-born respondents. Overall, only 6.2% of respondents were born in the US; more youth reported US born than adults (27.6% for youth versus 2.8% for adults).

Acculturation and its concomitant health behavior change have been and will continue to be important aspects of the US changing demography. As long as the US pursues a relatively open immigration policy, external and internal forces will continue to be an integral part of America’s socio-cultural dynamic. The implications of acculturation to health behavior change as a consequence of this dynamic are not only unavoidable issues that demand attention of public health officials but, in and of themselves, represent the venues that lead to improvement in the design of viable, culturally sensitive prevention and intervention programs that would have lasting and positive effects on health behavior. Our study clearly indicated that the process of acculturation could be a double-edged sword: it could engender behavioral change that improves health or contribute to deterioration of health. This predicament is evident in tobacco use where the latter consequences are observed in recent immigrant youth and adult females, and the former, in males, with a few exceptions. In the process of acculturation, immigrants tend to achieve homeostasis wherein the norms of the dominant culture become their own; however, the rate of acculturation varies as a function of the impact of external social forces on existing or permanent structures. Asian-American populations today are comprised of 51.3% recent immigrants and 48.7% either earlier immigrants or US-born Asians (Reeves and Bennett, 2003). Because recent immigrants, by and large, import with them the culture of social acceptability of tobacco, their sheer numbers tend to perpetuate behavior that would otherwise be inhibited by the dominant culture (Ma et al., 2002). Congregation of the majority of Asians proximal to or in China town further reinforces imported cultural values and hence impedes the process of behavioral change that accompanies acculturation. In that sense, Asian populations differ rather substantially from other US ethnic and cultural groups that have greater margins of movement within the population at large (e.g. Europeans, African-Americans and Hispanics). The cigarette industry is aware of this difference and the difference is reflected in the industry’s increased effort to target Asian communities, especially women and youth, as lucrative markets for their product(s). These observations and findings underscore the need for developing culturally and linguistically specific strategies that would be applicable to both recent immigrants as well as newer and older generations of Asian-Americans.

An understanding of the relationship of acculturation and smoking in Asian-American populations is an important step toward constructing more effective and relevant prevention, intervention and cessation programs. The implications of our study findings are significant particularly in the light of the fact that Asian populations comprise one of the tobacco industry’s most sought after populations, not only in the US, but throughout southeast and east Asia. The US Asian population, like its
counterpart abroad, faces nearly insurmountable health problems that have a potential to tax the resources of families, and to cripple health delivery systems nationally and worldwide. Because our findings are corroborated by others at the national level (Marin et al., 1989a; Centers for Disease Control and Prevention, 1992a; Dusenbery et al., 1994; Moeschberger et al., 1997; Chen et al., 1999a,b; Lee et al., 2000), we believe that they will be applicable to other Asian-American populations with similar demographic features, and mix of new and older immigrants.

This study has three limitations. First, a cross-sectional research design was used. Although the logistical regression model accounts for a substantial part of the variance in tobacco use, it cannot be used to indicate causality. Second, the data of this study are based on self-reports and are restricted to the limitation inherent in self-reports. These data may be an underestimate of tobacco use among Asians. Third, given the cultural and community context of the sample, a simple random sample was implausible. The focus of the article is association between the variables and is less a statement of the generalization to the larger population. These limitations aside, this study indicates that Asian-American tobacco use patterns are associated with factors related to acculturation.

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References


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