UNIVERSITY OF CALIFORNIA, SAN DIEGO

SAN DIEGO STATE UNIVERSITY

Examining contextual settings to explain gender differences in cigarette and alcohol use

among Asian immigrants: work, hospitality venues, and household settings

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in

Public Health (Health Behavior)

by

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2011

The Dissertation of Veronica Lea Irvin is approved, and it is acceptable in quality and

form for publication on microfilm and electronically:

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University of California, San Diego

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2011

DEDICATION

I dedicate this dissertation to my husband, Dewayne, my mother, Jean, and my two girls,

Gwendolyn and Penelope.

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Irvin VL, Hofstetter CR, Norman G, Chambers C, Nichols JF, Usita P, Hovell MF. "Occupational class and gender as intersecting cultures to explain tobacco use and exposure among Koreans in California"

Paper two of this dissertation is in preparation for publication.

Irvin VL, Hofstetter CR, Nichols JF, Chambers C, Usita P, Norman G, Hovell MF. "Social contingencies and smoking in Korean bars and restaurants in CA: Or would you like lung cancer with your soju?"

Paper 3 of this publication is in preparation for publication.

Irvin VL, Hofstetter CR, Usita P, Chambers C, Norman G, Nichols JF, Hovell MF. "Employment, household responsibilities and substance use among Asian immigrants."

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Publications:

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24. Hovell MF, Schmitz KE, Irvin VL. Potential contribution of dental health care providers to reduction of pediatric obesity. Weight of the Nation: CDC's Inaugural conference on obesity prevention and control. Washington, D.C. July 27 – 29, 2009. [Irvin VL delivered the oral presentation.]

25. Irvin VL, Hofstetter CR, Nichols JF, Hovell MF. Osteoporosis among Korean Women in California: Comparison to U.S. Prevalence and Relationship with Acculturation to U.S. Lifestyle. US Public Health Service Annual Conference, May 2010, San Diego, CA.

26. Irvin VL, Schmitz KE, Jones JA, Rubin B, Nichols JF, Hofstetter CR, Rock CL, Hovell MF. Nutritional and physical activity advice by orthodontists: A model for preventive health. Obesity Society 28th Annual Scientific Meeting, October 8 – 12, 2010, San Diego, CA.

Grants:

1. Understanding Networking and Alcohol Consumption among Recent Immigrants awarded to C. Richard Hofstetter, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism, Award # 1RC1 AA018970-01, 2009-2011, Senior Research Associate

2. Clinician Promotion of Healthy Diet and Activity to Reduce Obesity Among Adolescents awarded to Melbourne F. Hovell, National Institutes of Health,

National Cancer Institute, Award # R01 CA1381912-01A2, 2009-2014, Co-Investigator

3. Smoking and ETS: California Residents of Korean Descent awarded to C. Richard Hofstetter, National Institutes of Health, National Cancer Institute. Award # R01CA105199, 2004-2009, Project Coordinator.

4. Tobacco Use and Acculturation: California Residents of Korean Descent awarded to C. Richard Hofstetter, University of California, Tobacco Related Disease Research Program, Award # 9RT-0073, 2000-2003, Project Coordinator.

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ABSTRACT OF THE DISSERTATION

Examining contextual settings to explain gender differences in cigarette and alcohol use

among Asian immigrants: work, hospitality venues, and household settings

By

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Doctor of Philosophy in Public Health (Health Behavior)

University of California, San Diego, 2011

San Diego State University, 2011

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Among Asian immigrants to the U.S., less acculturated males but more
acculturated females report higher present and predicted future rates of smoking[1-3]. These
findings were based on cross-sectional data. Our longitudinal study among Koreans in
California (CA) tested the hypothesis that increased acculturation to the CA environment
would increase social acceptability to smoke among females but simultaneously apply
social pressure against smoking among males. Our findings revealed that increased
acculturation was not statistically related to uptake in household smoking bans or changes

to smoking and quitting rates. However, increased years in CA significantly increased implementation of complete household smoking bans among both genders, significantly reduced smoking and increased quitting among Korean males and positively increased smoking, but not significantly in multivariate analyses, among Korean females[4-6]. Conclusions drawn from these and other studies suggest the need to study the specific social contingencies that are operating and how these differ between the genders to produce the divergent trajectories of smoking prevalence.

This dissertation will examine three separate, contextual settings that may influence smoking prevalence and exposure among Asian immigrants in California. The three settings include the work environment, the hospitality venues of restaurant and bars, and the dynamic household and employment contingencies Data were gathered from different funding sources, at different time points and include different Asian immigrants. However, data collection methodologies were similar across all studies. Telephone calls were conducted with adults in California who had an Asian surname. The first dataset was collected in 2001-2003 and resulted in a representative sample of 2,830 Koreans in California age 18 and older[12]. This sample was re-interviewed in 2005-2006 and 2007-2009[13]. During the 2005-2006 wave, a second representative sample (n=2,085) of Koreans was collected in parallel to the first sample and was also re-interviewed in 2007-2009[13]. In 2010, a new study was funded to generate two new representative samples of adults age 21 and over in California who immigrated from either Korea or China/Taiwan[14]. Data collection is currently in progress with 1,739 interviews completed to date.

PAPER ONE: OCCUPATIONAL CLASS AND GENDER AS INTERSECTING

CULTURES TO EXPLAIN TOBACCO USE AND EXPOSURE AMONG KOREANS

IN CALIFORNIA

Abstract

Purpose: Cigarette use is both allowed and socially prompted for Korean males but not allowed and socially sanctioned for Korean females. Among Korean immigrants, less acculturated males but more acculturated females report higher present and predicted future rates of smoking. This manuscript analyzes data from a representative sample of persons of Korean descent in California who experience tobacco and gender cultures in California that contrast and compete with traditional Korean culture. This manuscript will 1) explore occupational class and industry as markers for contingences that might account for gender differences in smoking by acculturation; and 2) report the prevalence of current smoking, smoke-free workplaces and exposure to SHS in the workplace by occupational class and industries among Koreans in California.

Methods: Data were collected by telephone between 2005 – 2006 and administered by bilingual interviewers. Participants were 18 years of age or older, a California resident of Korean descent, and currently employed at least part-time (N=1,084).

Results: 25.7% of males and 4.4% of females were current smokers. Over 91% of participants reported a smoke-free workplace, but 22% were still exposed to second hand smoke at work. Current smoking significantly differed by occupational class and industry. Differences by occupational class and industry were observed for exposure to secondhand smoke at work among Korean males and for Korean females and a smoke-free workplace.

Conclusions: Exposure to second hand smoke is high among Korean Americans in California, a state with a long tradition of tobacco prevention. Smoke-free workplace laws must not only be enacted, but must be enforced. Occupational class and industry demonstrate pathways for how higher acculturation relates to lower smoking among males but higher smoking among females. Specific contingencies that operate in certain Korean occupations and industries to reduce smoking exposure and prevalence could be replicated across all types of employments.

Introduction

Tobacco remains the number one killer in the U.S. and the world even with current tobacco control policies. Approximately 400,000 persons die per year in the U.S. and 5 million throughout the world; these numbers are expected to increase if current trends persist[1,2]. In almost all countries, males smoke more than females, although the female prevalence rate is increasing because of less social, cultural and political constraints; increased earning power; and intensified marketing by the tobacco industry[1,3]. The World Health Organization (WHO) and U.S. National Institutes of Health (NIH) have called for increased tobacco surveillance that goes beyond prevalence rates. Population research should monitor high-risk populations; include a gender framework when evaluating data; and analyze how societal and environmental factors interact with tobacco control initiatives[1,4].

Korean Americans are an under-studied immigrant population and for whom the smoking prevalence is high among males and low among females[5,6]. Culturally, cigarette use is both allowed and socially prompted for Korean males but not allowed and socially sanctioned for Korean females. Among Korean immigrants, acculturation to the U.S. produces smoking trajectories in opposite directions by gender. Less acculturated males but more acculturated females report higher present and predicted future rates of smoking[5-7]. Increased years in CA significantly increases implementation of complete household smoking bans among both genders, significantly

reduces smoking and increases quitting among Korean males and positively increases smoking among females, but not significantly in multivariate analysess[8-10]. These findings corroborate the WHO and NIH surveillance suggestions and imply the need to study the specific social influences that are operating; how these interact with the California tobacco control policies; and how these differ between the genders to produce the divergent trajectories of smoking prevalence.

This manuscript analyzes data from persons of Korean descent in California who experience tobacco and gender cultures in California that contrast and compete with traditional Korean culture. Our analytical model is guided by the Behavioral Ecological Model (BEM) which explains that individual and population behavior is established from contingencies of reinforcement and interactions among multiple, concurrent contingencies at the individual, environmental and cultural levels[11]. A contingency is the relationship between a behavior and the corresponding consequence which either decreases or increases the probability of the behavior in the future. If a patron started smoking at their desk in California, they would most likely receive criticism from other employees and be asked to go outside by their supervisor. This consequence would likely reduce the probability that the employee would smoke inside their workplace. The context or the setting influences the effect of the contingency. If the workplace allowed smoking (even if illegal), the patron would not receive criticism and would learn to discriminate which types of establishments allowed smoking and which do not. Unfortunately, it is difficult to directly measure these contingencies across different contexts where smoking is reinforced by social attention or criticized by other members

of the social network. This paper will analyze occupational class and industry as markers

for different contingencies that might occur in the workplace. These markers for

contingencies are analogous to biomarkers in medicine such as cotinine concentrations in

urine to record tobacco exposure. Even though we do not see the individual smoking or

exposed to tobacco, their urine concentrations confirm exposure. The BEM also posits

that workplaces and other microenvironments that involve unique groups of people offer

unique subcultures defined by the activities, i.e. work, and by unique attention to or

allowance of smoking. In this context, contrasting rates of smoking, secondhand smoke

(SHS) exposure by occupational class and gender offers a marker of possible unique

contingencies, even if not yet directly measured.   This manuscript will explore

occupational class and industry as markers for contingences that might account for

gender differences in smoking by acculturation among Koreans in California.

In the U.S., certain occupational classes and industries offer unequal protection

from exposure to SHS in the workplace to employees from specific demographic

backgrounds[12]. Fewer smoke-free workplaces and higher rates of smoking are reported

among blue collar and service workers13-17 and higher rates of exposure at work among

younger, male, and low-income [18,19]. Occupational smoking is higher among industry

sub-groups including cleaners, construction workers, material moving occupations,

vehicle maintenance and repairers while lower among teachers[13,20]. Exposure to SHS in

the workplace is lowest among farmers and teachers, but highest among operators,

laborers, production, repair and waiters and waitresses[21]. Among Asian and Pacific

Islanders in the US, laborers have the highest percentage of smokers and sales and

administrative staff report the heaviest smoking [22]. Policies that ban smoking in the workplace significantly decrease the prevalence of smokers, decrease the amount of cigarettes smoked, reduce the exposure to second hand smoke , and increase the health benefit to non-smokers[18,23-26].Policies that emphasize certain occupations or exempt others from such regulations show corresponding differences in level of smoking and SHS exposure. This association also suggests that employment that differs in rates of smoking and SHS exposure may be due to other more proximal contingencies delivered by the social network involved.

The primary objective of this paper is to describe occupational class and industry markers of contingencies that might explain acculturation by gender differences in tobacco use among Koreans in California. We hypothesize that occupational classes and industries which employ more traditional Koreans will report higher tobacco use among males but lower tobacco use among females relative to the smoking prevalence in Korea. Occupational classes and industries that employ more acculturated Koreans will report lower tobacco use among males but higher tobacco use among females relative to the smoking prevalence in Korea.

The second objective of this paper is to test the prevalence of current smoking, smoke-free workplaces and exposure to SHS in the workplace by occupational class and industries among Koreans in California. We hypothesize that fewer smoke-free workplaces will be reported in skilled and unskilled occupations and in industries like repair and outside laborer. We hypothesize that participants with smoke-free workplaces

will more likely be protected from current smoking and exposure to SHS at the workplace as compared to participants without a smoke-free workplace.

Methods

Data were collected by telephone between 2005 – 2006 and administered by bilingual professional interviewers fluent in English and Korean. The sampling frame was purchased that included both listed and unlisted aggregated data from telephone directories, membership lists, utility bills, and other sources. A random list was compiled of individuals in California with the 300 most common Korean surnames. The adult (18 years and older) in the household of Korean descent with the most recent birthday was interviewed as a means of randomly selecting household participants[27]. Interviewers made up to 15 call attempts to each household. Interviews were conducted in the language of the respondent's preference. Inclusion criteria of the study were 18 years of age or older and a California resident of Korean descent. Place of birth or citizenship were not criteria to participate. Prior to the start of the interview, participants confirmed that they were an adult of Korean descent.

The survey was written in English and translated into Korean by a professional translator iteratively involving focus groups and both fore and back translations. Korean translations were reviewed by consultants from Seoul National University and Myongji University in Seoul, Korea. All study procedures were approved by the Institutional Review Board at San Diego State University. The completion rate (percent of eligible persons completing interviews) was 86% with a total of 2,087 completing the survey.

Participants in this manuscript were restricted to those who were employed at least part-time (N=1,084).

Dependent Variables:

Current smoking. Participants responded to "do you currently smoke every day, some days or not at all." Responses were dichotomized to form "current smoker" for participants who smoke some or every days (coded 1, otherwise 0). The CDC criterion for having smoked at least 100 cigarettes was not included in order to capture smokers in the early initiation process[28].

Indoor workplace policies. Tobacco policies inside work area and in common areas of work were measured by responses to "Which best describes your place of work's smoking policy for indoor public or common areas such as lobbies, restrooms, and lunch rooms...and your place of work's smoking policy for work areas- Not allowed in any, allowed in some, allowed in all[29,30,31]. Responses were coded into "complete smoke-free indoor workplace" (coded 1, otherwise 0).

Exposure to SHS at work. Participants were asked "about how many cigarettes are you exposed to at work during a typical day". Responses were dichotomized as any work SHS (1) or no exposure (0).

Independent Variables:

Occupational class and industry. For each individual, their occupational class and industry were coded based on three questions 1) "are you self-employed or do you work

for someone else"; 2) "what is your main occupation, that is, what is the most important job you do to make a living"; and 3) "what specifically do you do on the job". Occupational class and industry codes were created from previous studies[17,20-22,32] and tailored to the Korean community. For example, new industry codes included religious organization and dry cleaners while industry codes like protection (military, police) and farmers were excluded for small sample sizes. Final occupational codes included professional, executive/owner, manager, upper white collar, lower white collar, skilled, unskilled, student, homemaker, and retired. Only 4.3% of the sample was not able to be coded due to incomplete data. Final industry codes included sales (retail and whole), medical/health, finance/insurance/real estate/accounting, administration, science/engineering, education, computer/telecommunications, outside laborer (construction, landscape), mechanic/repair, cleaner/janitor, food service, dry cleaners, transportation and religious. Approximately 13.2% of the sample was not able to be coded due to incomplete data and 4.1% because industry sample sizes were too small.

Acculturation variables: Years in the U.S., percent of life lived in the U.S., age of immigration, and language ability were measured. Percent of life lived in the U.S. was used in multi-variable analyses because it encompassed both years lived in the U.S. and age of immigration. Language ability was dichotomized as speaks mostly or only Korean as 1 or speaks mostly or only English or bilingual as 0.

Social Discouragement and Models for Smoking. A social discouragement for smoking scale was formed by counting the number of persons (spouse, parents, siblings, friends, co-workers, children, grandparents, aunts, uncles, and other persons) who

''discourage you from smoking.'' Responses were coded 0 to 9 (Mean = 4.5, SD = 2.9

Cronbach's alpha = .963). A high score indicated high discouragement from smoking. A

separate scale of models for smoking was computed by counting the number of persons

(same list as above) who respondents reported ''regularly smok(ing) cigarettes.''

Responses ranged from 0 to 7 (Mean = 1.9, SD = 1.5 Cronbach's alpha = .464). Both

scales have previously been reported with tobacco use among this population[6,7].

Demographics: Variables included age, gender, and education (total, in Korea

and in US).

Analyses. Bi-variable analyses of occupational class and industry by demographic

and acculturation variables were conducted separately by gender. Bi-variable analyses

tested for differences in tobacco outcomes (smoke-free workplaces , SHS exposure at

work and current smoking status) by occupational and industry classification.

Multivariable analyses regressed current cigarette use on occupational class, smoke-free

workplace and theoretical predictors from previous Korean smoking manuscripts (age,

social discouragement, models for smoking, and years in the U.S.)[6,7]. Smoke-free

workplaces and exposure to SHS at work were regressed on occupational class. All

multivariable analyses were conducted separately by gender because of the known gender

differences in smoking, smoking predictors and job types. Hosmer amd Lemeshow tests

indicated good model fits. Data were weighted to the age and gender distribution of

Koreans in California according to the 2000 census. Analyses were replicated with and

without weights and no differences were observed.

Results

The sample included 1,084 employed participants– 52.2 % male with a mean age of 40.9 (SD =12.1). The sample was highly educated (16.0 years of formal education SD=2.9) but few years of formal education in the U.S. (Mean 4.9, SD 6.2). The majority of the sample immigrated to the U.S. (90.6%) and lived 17.4 (SD=9.5) years or 45.2% (SD=27.4) of their life in the U.S. Among persons employed, 17.5% were current, 22.8% former and 59.6% never smokers. By gender, 25.7% of males and 4.4% of females were current smokers.

Occupational Class by Acculturation and Demographic Variables. Over 85% of the sample served in a white collar occupation (including professional and executive/owner) versus a skilled or unskilled occupation. Bi-variable analyses of occupational class by independent variables were conducted separately by gender and are shown in the Table 1. Females were significantly more likely to hold professional or lower white collar jobs as compared to males; whereas males were more likely to be executive, owners or upper white collar. Demographic by gender differences appeared in the manager, white collar and unskilled laborer jobs. Both Korean female and male managers reported a high percentage of their life in the U.S., but female managers received more education in the U.S. and were less likely to only speak Korean. Unskilled Korean females were older, immigrated at an older age, received more education in Korea and less in the U.S. and were more likely to speak predominantly Korean as compared to Korean males employed as unskilled laborers.

Industry by Acculturation and Demographic Variables. The industry distributions by gender as well as bi-variable analyses by demographics appear in Tables 2 and 3. The top industry among both genders was sales. Korean females reported high numbers employed in the medical/health, finance, food service and education industries. Korean males were spread out across more industries but reported higher numbers in finance and food service.

Demographic and acculturation variables were similar for genders in similar industries. Religious industry differed by gender with males employed in the religious field more likely to speak only Korean and acquired the highest number of years of education in Korea and in total, even surpassing medical and education industries.

Smoking status with Occupational Class and Industry. Tables 4-6 report tobacco outcomes by occupational class and industry separately by gender. Current smoking significantly differed by occupational class and industry. Among Korean males, skilled, executive/owners, and managers reported the highest smoking prevalence. The smoking prevalence among males surpassed 30% in over half of the industries. Korean males who reported the lowest smoking prevalence (2.9%) worked in the religious industry. Among Korean females, upper white collar occupational class and mechanic and repair industries smoked the highest. Current smoking was regressed on having a smoke-free workplace, occupational class, models of smoking, social discouragement for smoking, age, and percent of life lived in the U.S. In multivariable analyses shown in Table 7, current smoking was significantly more likely among participants who were younger, had a higher number of models who smoked and received less discouragement for smoking.

Occupational class and percent of life lived in the U.S. were related to current smoking, but only among males. Executives and owners and those with less percent of life lived in the U.S. were significantly more likely to smoke among males. Having a smoke-free workplace related to significantly lower odds of smoking among females, and this association was in the same negative direction for males.

Prevalence of smoke-free workplaces. The majority of participants (92.9 %) reported a complete ban in their work area, 91.8 % a complete ban in their common area and 91.1 % in both their work and common areas (i.e. smoke-free workplace). Persons *without* a smoke-free workplace were significantly more likely to be male, current smokers, exposed to second hand smoke at work, and have colleagues who smoked. Persons *without* a smoke-free workplace were significantly more likely to be employed as executives, owners, skilled and unskilled or to work in an outside or repair industry (construction, landscaper, and mechanic).

Smoke-free workplaces significantly differed by industry only among females. Female participants in the following industries reporting 100% smoke-free workplaces-education, computer/telecommunications, cleaner/janitor, dry cleaners and religious industries. The only industry among males where all participants reported a 100% smoke-free workplace was dry cleaners. Smoke-free workplace was regressed on occupational class and percent of life lived in the U.S. (Tables not shown). Occupational class did not retain significant differences at the p<.05 level. A higher percent of life lived in the U.S. was significantly related to having smoke-free workplaces among Korean females, but not males.

Exposure to cigarette smoke at work. Over 22% of employed persons were exposed to any SHS at work. Among persons exposed to any SHS at work, the average number of cigarettes exposed per day at work was 5.1 (SD=5.0) with a range of .05 – 23. Male participants reported significantly higher rates of SHS exposure at work if employed in the following occupational classes - executives, owners, skilled and unskilled – and industries - construction, landscape, food service and janitors. No significant relationships were observed between SHS exposure at work by occupational class or industry among Korean females.

Exposure to any second hand smoke at work was regressed on having a smoke-free workplace, occupational class, colleagues smoked, and participant current smoker (Tables not shown). Male participants exposed to SHS at work were significantly less likely to have a smoke-free workplace, more likely to smoke and to have colleagues who smoked. Occupational class was related to SHS exposure among males (p=.086) in the same directions observed in bi-variable analyses. Among females, current smoking and colleagues smoked significantly increased the likelihood of SHS exposure in the workplace. Having a smoke-free workplace was protective (p=.09) and occupational classes related to SHS exposure but did not retain the statistical significance observed in bi-variable analyses.

Discussion

These findings imply that occupation and industry differences by immigration and demographic variables (i.e. age of immigration, language ability, and years of education

in U.S. vs. Korea) might point to interlocked group contingencies (i.e.

metacontingencies) that explain the tobacco use and acculturation findings among Korean

immigrants to the U.S.

Occupational class differences to explain tobacco outcomes. Korean males who

adhere to traditional culture retain their high rates of smoking. Tobacco use is highest

among executives, owners, managers, skilled and unskilled laborers; the categories with

the highest proportion of predominantly Korean speakers. However, this maintenance of

smoking occurs as a result of different contextual contingencies. Executives and owners

control the smoking policy and enforcement at their place of work. They can establish

and maintain the tobacco contingencies of traditional Korean culture even in a location in

California.   Skilled and unskilled workers do not control the smoking policies at work

but they transition to a similar occupation class in the U.S., where the smoking

prevalence is high for U.S. standards[13-17]. The contingencies that permit smoking in

Korea would be similar to contingencies that permit smoking in labor organizations in the

U.S. (i.e. allowing for smoke breaks, higher number of employees and management who

smoke)[33]. These occupational classes are significantly more likely to report exposure to

SHS at work than the other classes. Managers offer a juxtaposition where Korean males

report a high rate of smoking, preference for Korean language, but are less likely to be

exposed to SHS at work. These participants might move into a Korean company in

California where smoking may be normative but where the smoke-free laws of California

are more likely enforced. The smoke free enforcement is dictated by the corporation and

the manager has less influence. Upper and lower white collar males report trends in the

opposite direction with less smoking and exposure to SHS at work and less likely to only speak Korean. They would have a higher probability of working in a U.S. company with a lower prevalence of smoking. For males, transitioning to an American company from a Korean company may offer protection from tobacco exposure at work.

Professional occupations (i.e. doctor, nurse, teacher) are protective from tobacco use and exposure among both genders. This is the only occupation class to report a smoking prevalence under the California smoking prevalence for Korea males and a zero smoking prevalence for Korean females.

Korean females who are executive and owners report higher levels of smoking and exposure to SHS at work as compared with other female occupational classes. Similar to their Korean male counterparts, Korean female executives and owners have more control of the smoking policies and enforcement. The smoking prevalence of the female executive or owner is most likely not shaped by maintaining traditional Korean contingencies like their Korean male executives. Rather, their smoking may increase because of a higher density of reinforcers and fewer punishers when she smokes as compared to the traditional culture of Koreans. The Korean female now holds a position of authority that she may not have held in Korea. Whereas traditional society may not support females smoking, the contingencies held for persons in higher social and occupational rank may trump gender roles and allow smoking. Korean female executive and owners might smoke to fit in and to receive equal treatment from their male counterparts or competitors. For example, tobacco given as gifts or smoked among the

group is expected during traditional Korean business transactions, even when females are the executives.

The demographics, acculturation variables and tobacco outcomes for Korean women in white collar jobs (lower, upper and managers) diverge from their male counterparts. Lower white collar Korean females immigrated later, lived fewer years and percent of life in the U.S., received less education in the U.S. and had a higher proportion who spoke only or mostly Korean which is opposite to managers. Lower white collar Korean females might work in a Korean company which might explain the lower rates of smoking and higher rates of SHS exposure at work. Upper white collar and managers might work for an American organization, where their SHS exposure at work is lower but their smoking prevalence approaches the California prevalence and is higher than traditional Korean women prevalence. Korean females who work for American organizations would observe a higher dose of female smokers, might be more likely invited to smoke, and receive less social reprimand by verbal or body language relative to Korea. These occupational class differences may explain why we observe a higher smoking prevalence among the more acculturated Korean females.

Korean females employed as skilled and unskilled occupation classes offer another contrast to Korean males that might explain gender differences in smoking. Theoretically, skilled workers should have a higher smoking prevalence because of the norms within those occupations, but this is not true among Korean females. The female, skilled workforce immigrated later in life, received little education in the U.S. and reports the highest prevalence of speaking predominantly Korean. They most likely work in a job

with predominantly Korean employees who would hold the more traditional values that women should not smoke. Therefore, these skilled female laborers would be considered more traditional and would smoke less.

Unskilled workers parallel skilled workers on age of immigration, fewer years of U.S. education and more likely to speak predominantly Korean. Their SHS work exposure does not differ significantly, but their smoking prevalence does differ. Unskilled workers report a smoking prevalence double that of skilled workers. The higher smoking prevalence may be attributed to the specific type of jobs classified as unskilled – hospitality service (restaurant and bar). The Korean culture is more likely to allow smoking at hospitality facilities (restaurant or bar) and often encourages the female workers to facilitate smoking among the male patrons for instance by lighting their cigarettes or smoking with them as companionship[34].

Industry contingencies to explain tobacco behavior. Many of the industries reported smoke-free compliance similar to industries in the U.S. Health and education fields report high protection from exposure, while transportation, mechanic, construction and landscaping report poorer protection from exposure. However, the industries that contradict these results are of interest and may further provide insight into the tobacco by acculturation differences. Sales, administration and food service report high rates of workplace exposure and/or low rates of smoke-free workplaces among Koreans in California. Recent immigrants among both genders are employed in food service and sales, where they may find jobs easiest and experience a culture more similar to Korea than California. Employees of the sale and administration industries would be more likely

to work in a Korean company where the executive or owner would be less likely to establish tobacco restrictions or where the small number of employees exempts them from the statewide smoke-free ordinance. The food service industry is regulated by the government and smoking is not allowed on the premise. Yet, the food industry workers report some of the highest workplace SHS exposure among all industries. This result implies that the food industry does not enforce the smoke-free policy presumably because their clientele are Korean and prefer a venue that allows smoking.

Two industries report the highest smoke-free workplace and lowest SHS exposure which might be attributable to maintaining their business practice and standing. Dry cleaners share similar demographic and acculturation variables to janitors, outdoor laborers and mechanics, but report a 100% smoke-free workplace and low SHS exposure among both genders. Dry cleaners may limit tobacco because of their specific type of business. Tobacco may react with the chemicals used in the dry cleaning process or their clients might not want to pay for dry cleaning that smells of tobacco. Religion is protective from smoking among Koreans[35] and males who work at religious organizations would be more likely to disallow tobacco for religious reasons. These industries highlight specific contingencies that could be replicated in other occupations and industries to improve protection from tobacco for employees and patrons.

Smoke-free workplaces and exposure to SHS at work. Although most participants reported a smoke-free workplace (91%), over 22% of all those employed were exposed to SHS while at work. Current smokers were more likely to report SHS exposure (65.8%) as compared to non-smokers (12.9%). Consistent with previous literature, a smoke-free

workplace significantly reduced the likelihood of exposure to second hand smoke and current smoking status among Koreans in California[18,23-26]. However, over 35% of male participants employed in certain occupational classes and industries reported inside SHS exposure at work. These occupational classes and industries included executives, owners, skilled, and unskilled occupational classes and the sales, food service, mechanic, transportation, janitorial and outside laborer industries.

These findings of incomplete enforcement of the smoke-free policies and rate of tobacco exposure at work is surprising considering smoke-free workplace laws in California were enacted over 10 years prior to data collection. It is not clear from our data if this is due to lack of enforcement within the workplace or because of the exemptions to the ordinance– (employers with 5 or fewer employees; break rooms with smoke directed outside by exhaust fans; and warehouses with more than 100,00 square feet of total floor space and 20 or fewer employees)[12]. The California ordinance continues to offer unequal protection to males, skilled and unskilled workers and recent immigrants of Korean descent[36,37]. These disparities not only increase the risk of exposure and tobacco-related disease outcomes, but may explain the gender by acculturation differences in tobacco use and exposure. These disparities may increase with the increased immigration to the U.S[38]. Asian immigrants are small populations and are often lumped into one ethnic category. Asians report low rates of smoking, but this is not true for Korean males[5]. Koreans are often not considered disparate because of their high education and income levels. This bias allows the smoking contingencies to continue. Finally, the high smoking prevalence among males is assumed normative and may be treated more like a physiological

addiction for which little can be done to help with lower level smoking or cessation. For these reasons, the Korean population in the U.S. may not receive adequate attention and services from the public health community.

Limitations. The above conclusions are ecological inferences based on inspection of the bi-variable tables, multi-variable analyses and our knowledge of Korean culture and migration issues. We do not know how each participant immigrated and transitioned into different jobs. We do not know if they worked for an American or Korean company; we speculated based on language ability of the participant. We also did not ask about number of employees or size of warehouse which would indicate whether the company was exempt from the smoke-free ordinance. We explain the gender by tobacco differences as contingencies operating within different occupational and industry classes. However, we have no data of what specifically is occurring within the workplace (i.e. "How many times have you been told not to smoke at your work area? Does your supervisor smoke at their work area? How many times have you been offered a cigarette by a colleague?"). The occupational and industry classifications appear as markers of contingencies and not the specific contingency itself. Further studies should investigate through direct observation or formal interviews the specific behavior consequences or reinforcers that mediate tobacco use within occupation and industries.

Conclusions. This manuscript serves as an example of how competing contingencies hypothesized through the behavioral ecological model might explain the gender by acculturation tobacco differences by gender. The occupational class and

industry of males and females demonstrate pathways for how higher acculturation relates to lower smoking among males but higher smoking among females.

Smoke-free workplaces must be enforced. Exposure to second hand smoke is high among Korean Americans in California, a state with a long tradition of tobacco prevention. If exposure is due to the exemptions in the smoke-free ordinances of California, the exemptions for number of employees and size of warehouse should be removed. The fines associated with exposure in the workplace should be delivered at both a higher rate and a higher amount. If exposure in the workplace is due to lack of enforcement by the owners/managers, this could be remedied by more frequent inspections and increase severity of fines from OSHA and health departments.

The medical public health community should realize that Koreans can stop smoking and can adhere to smoke-free policies. Physiological addiction or interfering with cultural norms should not be of concern. Our dissection above of workplace policies and tobacco exposure demonstrate that some Koreans have stopped smoking and some businesses have enforced smoke-free environments contrary to what their clientele or their acculturation profile might have suggested. A smoke-free environment improves their business. This type of information could be disseminated to Korean businesses; a smoke-free environment may better protect your product from third hand smoke and attract new American business. Korean retail and hospitality venues suggest they serve as a sanctuary from California norms and policies and that their patrons expect smoking to be allowed. Education and media programs could explain that the rate of smoking is much lower among Koreans in California, where approximately 75% of males and 95%

of female are non-smokers. The traditional Korean contingencies that permit smoking no longer need to be followed. Many of their Korean clients might appreciate venues that protect them, their family and their intended purchases from second and third hand smoke.

Paper one of this dissertation is in preparation for publication.

Irvin VL, Hofstetter CR, Norman G, Chambers C, Nichols JF, Usita P, Hovell MF. "Occupational class and gender as intersecting cultures to explain tobacco use and exposure among Koreans in California"

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PAPER TWO: SOCIAL CONTINGENCIES AND SMOKING IN KOREAN BARS AND RESTAURANTS IN CA: OR WOULD YOU LIKE LUNG CANCER WITH YOUR SOJU?

Abstract

Background: Compliance with California's smoke-free restaurant and bar policies is a function of the social norms of the community frequenting the establishment. In hospitality venues where the clientele allow smoking, compliance with the smoke-free ordinance reduces.

Purpose: To assess the number of participants who observed smoking, ashtrays or non-smoking signs inside Korean bars and restaurants in California and type of enforcement. To analyze participant demographics and geographic characteristics predict who attended bars where smoking was observed, who smoked in bars and who asked others to stop smoking

Methods: Data were collected by telephone between 2007 – 2009 and administered by bilingual interviewers. Participants were 18 years of age or older, a California resident of Korean descent and visited a Korean bar or restaurant at least once in an average month (N= 2,173).

Results: Approximately 68% of our participants observed smoking inside Korean bars while only about 8% observed smoking in Korean restaurants in California. Among

participants who observed smoking, they observed fewer people asking smokers to stop smoking in bars then in restaurants. Participants who smoked in bars were more acculturated while participants who asked or gestured to smokers to put out a cigarette were less acculturated. Participants who attended a bar that did not comply with no-smoking policies were significantly younger and more likely to live in Korea town than participants who attended a bar where smoking was not observed.

Discussion: Increased surveillance and enforcement by police and health inspections are necessary in venues where the demographics of the clientele report high smoking rates. The complaint driven system should ensure access for persons whose primary language is not English. Health programs should target both the patrons and the bar management. Staff in Korean hospitality venues is exposed to toxins in second and third hand smoke at a higher percentage than other California venues and deserve equal protection by the law and health agencies.

Introduction

California was the first state to pass laws implementing smoke-free restaurants (1995) and smoke-free bars (1998). Smoke-free bars and restaurants have proven to protect non-smokers by significantly reducing indoor air pollution, protecting hospitality workers from secondhand smoke, and even significantly preventing youth smoking [1-5]. Proponents of the law were concerned that the laws would not be accepted by patrons and that the laws would result in financial hardship to hospitality venues. Approximately 2.5 years after implementation of smoke-free bars, 14% of persons reported smoking and 20% observed others smoking inside bars in California[6]. Five years after the implementation of smoke-free bars, the number of violations significantly declined in California for patron and employee smoking and for presence of ashtrays indoors[7]. These results document successful acceptance and compliance of the law. The smoke-free laws did not have any long-term negative financial consequences for profits or values and actually showed an increase in tax revenue[8-10].

Although compliance has significantly increased over the years, it is not 100%. The enforcement of the law has been challenging for the following reasons 1) complex and ineffective administrative structure with many municipalities falling within one county and thousands of bars with minimal inspectors; 2) complaint-driven system; 3) lack of funding and priority for enforcement; 4) minimal deterrence with low dollar value of fine and low probability of receiving fine or of case being presided over by a judge[11]. The success of smoke-free hospitality venues has mainly been due to social norms of the community frequenting that bar.

In bars where clientele allow smoking, compliance with the smoke-free ordinance reduces. As recently as 2004 and 2005, direct observation of 50 Asian bars (primarily Korean and Chinese) in San Francisco and Los Angeles revealed 82% of the bars allowed smoking inside the building. Smoking is important for the business of Asian bars and the relationship between staff and patrons is a "commercial friendship" with bar staff smoking along with patrons and even lighting patrons' cigarettes. Staff considers the social consequence of asking patrons to not smoke outweighs the health consequences and possible fines of the smoke-free law. Interviews document that bar staff is reluctant to ask patrons to put out cigarettes because it would be taken as a betrayal by the patron[12]. The high number of smoking observations differs from other California bars where compliance is high. In Korean bars, non-smokers might be reluctant to directly confront smokers because Korean culture dictates that nonsmokers be polite and cautious and not damage social relationships. Within their community, older Korean males might be more likely to directly ask others to stop smoking, but passive communications (sighs, coughing, moving away) are more common by the majority of Koreans[13].

This paper assessed the number of participants who observed smoking, ashtrays or non-smoking signs inside Korean bars and restaurants in California and what type of enforcement occurred and by whom. This is not a prevalence study but rather a descriptive study of the social contingencies within Korean bars and restaurants and how that differs by gender, acculturation variables, and smoking status.

Aims

1. To describe the social contingencies that occur in Korean bars and restaurants in regards to smoking; percent participants who observe non-compliant venues, what type of person enforces the rule (bartender, patron) and what type of patrons ask others to stop smoking (men, women)

2. To analyze if participant demographics (gender, age, years lived in US, acculturation level) and geographic characteristics (Korea town) predict who attended bars where smoking was observed, who smoked in bars and who asked others to stop smoking

Methods

Data for this manuscript were collected as part of longitudinal surveys health surveys among Koreans in California. The primary outcome measures included in this manuscript were only asked during the final wave of interviewing in 2007-2009. Participants included in this sample were recruited in 2001 or 2005 as part of representative samples and completed a follow-up survey in 2007-2009. Eligibility in the study was a person of Korean descent residing in California who was at least 18 years of age during the first interview. This study was approved by the San Diego State University Institutional Review Board and participants were re-consented at each follow-up interview. Translation of this survey included forward and back translations by study co-investigators and review of translation and meaning by focus groups.

The representative sample size collected in 2001 was 2,830 and 1,192 completed the final longitudinal survey. For the representative sample collected in 2005, 2,085 were originally interviewed and 1,447 completed the final longitudinal survey. For this manuscript, we only retained participants who had visited a Korean bar or Korean restaurant at least once in an average month which resulted in a final sample size of 2,173. Cooperation rates exceeded 95% for the follow-up rates among both cohorts.

Attended Korean bar or restaurant. Participants were asked "how often during an average month do you go to bar? If any, how often during the month do you go to a Korean bar?" These questions were repeated for a Korean restaurant. If participant attended a bar or restaurant at least once in an average month, they were asked the following questions about their visit(s).

Observed ashtrays or non-smoking signs. Participants were asked if they saw any "no-smoking" signs or ashtrays.

Observed smoking in venue. Participants were asked the number of times they smoked in the bar, others in their group smoked in the bar and if any other persons smoked while in the bar. Variables created from the above questions include i.) participant smoked inside, ii.) others in group smoked inside; iii.) others in bar smoked inside and iv.) bar non-compliant with smoking laws. Bars were defined as non-compliant if the participant observed any smoking or if they smoked while inside the bar. These questions were repeated for attending a Korean restaurant in an average month and corresponding variables were created.

<u>Observed someone communicating to stop smoking.</u> If participants smoked or observed smoking while in a bar or restaurant, they were asked "Did anyone there tell them [you] to stop smoking when they [you] lit up?" and "Did anyone there make a gesture indicating opposition to smoking?" If the participant responded yes to either of the above, they were asked "was that the bartender, another patron, a policeman, the manager or someone else?" Open-ended responses were allowed for other types of persons who might have communicated to the smoker.

<u>Current smoking.</u> Participants responded to "do you currently smoke every day, some days or not at all." Responses were dichotomized to form "current smoker" for participants who smoke some or every days (coded 1, otherwise 0). The CDC criterion for having smoked at least 100 cigarettes was not included in order to capture smokers in the early initiation process[14].

<u>Acculturation variables.</u> An acculturation scale was adapted from the Suinn-Lew Asian Self-Identity Acculturation Scale to enable telephone administration.[15-17] Items included language ability in Korean and English; preferred language for speaking, reading, and listening to music; ethnic breakdown of friends before the age of 6, between the ages of 6 and 18, and now; self-identity (Korean vs. American); preference for Korean food at home and in restaurants; and percentage of education and life in the U.S. Verbatim items in English and Korean are presented in previous publications.[18] After conversion to a common metric (Z-scores), a mean of the items was computed after allowing up to two missing variables (Cronbach's α=.91). Because responses were right skewed, a logarithm transformation was computed. Percent of life lived in the U.S.,

speaks mostly or only Korean, birth place and age of immigration were also analyzed as separate variables.

Living in Korea Town. At the close of the interview, participants were asked for their address if they wanted a $15 incentive. Participants' zip code was used to classify them as living in Korea Town or not. Korea Town is a neighborhood in Los Angeles County with a high density of Korean residences and businesses. Korea Town is identified by the following zip codes- 90004, 90005, 90006, 90010, 90019, 90020, 90036, 90057[19]. Approximately 7.5% of the sample did not provide a zip code and could not be classified. Participants were dichotomized them as living in Korea Town (1) or otherwise (0).

Demographic variables: Gender, age, marital status, total years of formal education.

Analyses: Only participants who attended a restaurant or bar at least once in an average month were retained in analyses. Uni-variate analyses of percent of participants who observed smoking in bars or restaurants, percent of participants who observed smoke-free regulations (no ashtrays, presence of no-smoking sign etc), percent of participants who observed someone asking or gesturing for someone to stop smoking. Bi-variable (t-tests and chi square analyses) and multi-variable analyses (logistic regressions) were conducted with the above variables and the participants' demographics, acculturation variables, smoking status and whether they lived in Korea Town. Significant results are reported at the $p < .05$ level.

Results

The final sample included 2,173 persons of Korean descent. 1,974 participants

attended a Korean restaurant in an average month but not a bar. Four participants

attended a Korean bar but not a Korean restaurant and 195 attended both a Korean

restaurant and Korean bar in an average month. The sample was comprised of 54.5%

female and reported a mean age of 51.6 years (SD=16.9). The majority of the sample was

born in Korea (94.2%), had lived an average of 21.9 years in the U.S. (SD=9.8) or

approximately 44.9% of their life (SD=21.5). The average age of immigration was 29.6

years (SD=15.5). Approximately 47.4% of participants spoke mostly or only Korean and

12.8% lived in Korea Town. The sample was highly educated with approximately 15.2

years of formal education (SD=3.5) although few years were in the U.S. (3.2 years

SD=5.3 or 19.1% of their total education). Over 75% of the sample was married, 14.3%

single never married, 2.4% divorced or separated, 7.9% widowed and 0.1% cohabitating.

Smoking inside restaurants and bars. Table 1 lists the percent of participants who

observed no smoking signs, ashtrays and smoking while in Korean restaurants and bars in

California. A larger percentage of participants observed ashtrays and smoking in Korean

bars than in Korean restaurants. Approximately 68% of our participants observed

smoking inside Korean bars.

Bi-variates with observed smoking or ashtrays. Participants who were male,

younger and current smokers were more likely to smoke themselves, observe others in

group or others in the bar smoke. Current smokers were *not* more likely to frequent bars

and restaurants that were non-compliant. Participants who lived in Korea town were significantly more likely to attend a Korean bar, observe others in their group smoke and report less compliance in bars than persons who did not live in Korea town.

Participants who were more acculturated were significantly more likely to smoke, observe others in their group smoke in the restaurant or bar than persons less acculturated. Other acculturation variables such as percent of life and education in the U.S., age of immigration and born in Korea or U.S. all worked in similar directions. Participants with younger age of immigration and more percent of life and education were more likely to observe smoking or partaking in smoking themselves as compared to more recent immigrants. Participants born in the U.S. were significantly more likely to smoke and to observe smoking in Korean restaurants and equally likely in Korean bars as participants who were born in Korea.

Ashtrays & No smoking Signs. More ashtrays were observed in Korean bars (43.7%) as compared with Korean restaurants (7.1%). Participants who observed an ashtray were significantly more likely to observe smoking in both bars and restaurants and were significantly more likely to smoke inside.

Asked or gestured for someone to stop smoking. Table 2 reports the number of times someone gestured or asked a smoker to stop smoking in a bar or restaurant. Participants observed smoking on 307 occasions in restaurants and 764 occasions in bars. Participants could have reported observing smoking for multiple occasions. Among participants who observed smoking, they observed someone ask a smoker to stop

smoking 17.6% of the time in a Korean restaurant and 5.5% of the time in a Korean bar

and observed someone gesturing to the smoker 27.0% of the time in a Korean restaurant

and 6.8% of the time in a Korean bar. Participants were more likely to observe a patron

ask or gesture to a smoker than a server or manager. However, participants observed a

higher percentage of staff and management ask smokers to put out a cigarette in a bar

versus a restaurant. Only one participant reported a security guard asking or gesturing to

a smoker to stop smoking.

Bi-variates with asking or gesturing. Participants who asked or gestured at a

smoker in either a bar or restaurant (n=32) were more likely to be older, non-smokers,

born in Korea, speak mostly or only Korean, report less percent of life and education in

the U.S., immigrate to the U.S. at a later age, and were less acculturated to U.S. than

participants who did not ask or gesture to a smoker in a Korean hospitality venue.

Participants who lived outside of Korea town were significantly more likely to observe

others communicate with smokers to stop smoking than participants who lived in Korea

town. Current smokers were significantly less likely to report observing people gesture at

smokers to quit than non-smokers. Observing a no smoking sign in a Korean restaurant

was significantly related to observing someone (patron or bar staff) ask or gesture for a

smoker to put out their cigarette.

Multiple variable regressions. Multi-variable regressions were conducted for 1)

attending a non-compliant bar, 2) participant smoked in bar and 3) others in participant's

group smoked in bars. Each of these variables was regressed on age, gender, percent of

life in the U.S. and lived in Korea town. Participants who attended a bar that did not

comply with no-smoking policies were significantly younger and more likely to live in Korea town than participants who attended a bar where smoking was not observed. Participants who reported smoking in a Korean bar were more likely younger and male than those who did not smoke in a Korean bar. Participants who reported that other people in their group smoked in a bar were more likely to be younger and to live in Korea town than participants who did not report smoking by others in their group. Multiple variable regressions were not conducted for smoking inside restaurants or for asking/gesturing for others to stop smoking because of the limited sample size.

Discussion

Approximately 68% of participants observed smoking while inside a Korean bar in California. The high rate of reported smoking in bars matches direct observation studies conducted in Asian bars in California[11]. Smoking inside bars is of public concern because of the detrimental health effects to bar employees[1-4,20] and because of the possible increase in the smoking prevalence. In our sample, 4.5% of non-smokers admitted to smoking while inside a Korean bar where they observed smoking as compared to 0% of non-smokers admitting to smoking inside a Korean bar compliant with the law. In addition, younger age Koreans were more likely to observe smoking and to partake in smoking themselves. The younger adult audience is a target of the tobacco industry[21] and their acceptance of smoking in bars may maintain the high prevalence of smoking of Koreans in California and may influence how they vote in policies pertaining to tobacco control.

Bi-variate results may help enforcement of the smoke-free policies in hospitality venues. Participants who lived in Korea town were more likely to observe smoking. Approximately 77% of participants who resided in Korea town observed smoking in bars as compared with 46.3% of participants who did not reside in Korea town. Increased surveillance and enforcement by police and health inspections at venues in Korean town may reduce the amount of smoking and protect non-smokers. Participants who smoked or observed smoking in restaurants and bars were not recent immigrants. In fact, U.S. born participants were more likely to smoke in Korean restaurants and equally likely in Korean bars as Korean immigrants. Participants who were more acculturated or had more percent of life or education in the U.S. were more likely to smoke or have others in their group smoke in Korean bars and restaurants than participants less acculturated. Smokers in Korean bars are *not* recent immigrants who may not know the California smoke-free laws. Koreans who are in the U.S. longer and identify more with U.S. culture and language are more likely to smoke possibly because they 1) may have more time and money than recent immigrants, 2) may know that enforcement of smoke-free law is rare and 3) may want to frequent venues that allow smoking.

The environment and social contingencies within Korean bars differ from that of Korean restaurants. Almost all participants who smoked in a Korean bar did not smoke while in a Korean restaurant (47 participants smoked in a Korean bar but only 3 of them smoked in a Korean restaurant). Participants reported more ashtrays in Korean bars than in Korean restaurants. If a participant observed an ashtray, they were significantly more likely to smoke or to observe others smoking in the restaurant or bar. Ashtrays serve as a

conditioned stimulus for smoking smoke and increase the urge to smoke[22]. Social

sanctions were more relaxed in Korean bars than Korean restaurants. Participants

observed four times more gestures and two times more verbal communication towards

smokers in restaurants than in bars.

Patrons were more likely to gesture to smokers in bars than to verbally

communicate with them. Participants reported a higher percentage of bar staff and

management asking smokers to put out a cigarette in bars than in restaurants. Only one

participant observed a security guard asking or gesturing to a smoker which matches our

previous publications[23]. Few Koreans expect to receive a ticket from a policeman for

smoking. The more proximal effects of social criticism outweigh the rare and distal

occurrences of receiving a reprimand or a ticket from a policeman. Among our

participants who did gesture or ask someone to stop smoking, they were more likely to be

older which was as expected[13] but were less acculturated to U.S. Less acculturated

patrons might have been older which would provide them social ranking to reprimand

smokers or less acculturated patrons might have been more sensitive to smoke-free laws

and want to fit in with the new culture.

Limitations. Main limitations to this study were the sampling frame, incomplete

measures and ecological liabilities. Data were from a final wave in a series of

longitudinal surveys and as such suffered from loss to follow-up. This sample may not

remain representative. In terms of measures, we did not define an ashtray or a bar.

According to our Korean staff, origami or other temporary objects can serve as ashtrays.

We did not ask participants about Korean or mixed patron bars and restaurants, nor did

we ask the specific location or if the bar freestanding or part of a restaurant. Our findings revealed significantly more observances of smoking in bars among persons who lived in Korea town. The liability is that we assume characteristics of bars in Korea town when we do not have specific data. We assumed that participants frequented a bar in their neighborhood (people who lived in Korea town frequented bars in Korea town, while others did not). However, we did not measure whether participants were exposed to smoke in bars near their home or if they travelled to bars outside their neighborhood.

Conclusions. This study expands on the direct observation studies which observed high rates of smoking in Asian bars in California. Direct observation studies may result in biased behavior of the bar staff and patrons when they are being observed[12]. Our telephone study allows Korean participants to provide proxy accounts of smoking behaviors and enforcement in Korean establishments.

Increased enforcement should occur at Korean bars and any hospitality venue where the demographics of the clientele report high smoking rates. Regulation by the health department should include inspection for smoking inside venues. Presence of ashtrays, cigarettes for sale or tobacco butts should be considered a violation and affect the establishment's health inspection score and letter grade. The complaint driven system should ensure access for persons whose primary language is not English. Health programs should target both the patrons and the bar management. No smoking signs increase the likelihood of patrons and staff communicating with smokers to stop smoking in the bar. Signs in multiple languages providing hotlines to call to complain about smoking violations might increase the number of complaints filed.

Health education materials could be provided to bar management about the prevalence of smoking among Koreans. Information could include that the majority of Koreans in bars do not smoke and prefer to not be exposed to smoke[13] and that those who do smoke may not be recent immigrants struggling to fit into American society. A smoke-free environment might also benefit the bar financially. Smoke-free establishments might increase clientele, reduce the likelihood of fire and lower the costs to clean the inside of venues, such as flooring, countertops, curtains, etc[24,25]. Finally, California law needs to be strengthened. Currently, bars are fined $100 and $200 for 2 violations in a year. A third violation increases the fine to $500 and notifies California Occupational Safety and Health Administration (Cal OSHA). Many Asian bars consider these fines as part of their operating expenses and an inspection by Cal OSHA is rare or non-existent[11,26]. There needs to be changes in California's smoke-free laws to increase the penalties for smoking and to notify Cal OSHA sooner. Bar staff in Korean venues are exposed to toxins in second and third hand smoke at a higher percentage than other California venues and deserve equal protection by the law and health agencies.

Paper two of this dissertation is in preparation for publication.

Irvin VL, Hofstetter CR, Nichols JF, Chambers C, Usita P, Norman G, Hovell MF. "Social contingencies and smoking in Korean bars and restaurants in CA: Or would you like lung cancer with your soju?"

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PAPER THREE: EMPLOYMENT, HOUSEHOLD RESPONSIBILITIES AND

SUBSTANCE USE AMONG ASIAN IMMIGRANTS

Abstract

Purpose: This paper will examine the relationship between roles in the home and work force and alcohol and tobacco use among immigrants from China and Korea.

Methods: Data were collected by telephone between 2010 – 2011 and administered by bilingual professional interviewers fluent in English, Korean or Mandarin. Participants were immigrants from Korea, China or Taiwan; currently resided in the Los Angeles metropolitan statistical area; were age 21 years and over; and spoke English, Korean or Mandarin. (N=893 Korean, 723 Chinese)

Results: Increased hours of participant's household work was protective from higher rates of drinking among Korean males. Higher number of hours employed strongly related to increased likelihood of smoking among Chinese males and Korean females and increased moderate and heavy drinking among Korean males. Acculturation, immigrant stress or depression did not mediate tobacco or alcohol among Koreans. Among Chinese males, number of hours employed was mediated by acculturation to explain increased smoking.

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Discussion: Future research could assess contingencies within the workplace (i.e. smoking breaks, supervisor smokes, clients allowed to smoke), socializing with co-workers during work and outside work and the norms of smoking and drinking among co-workers. Tobacco cessation interventions as well as tobacco prevention materials should be available at work sites because of the increased likelihood of these behaviors with employment.

Introduction

  This paper will examine the relationship between roles in the home and work force and alcohol and tobacco use among immigrants from China and Korea. Immigrants from China and Korea are similar populations because there is 1) limited research on these populations, 2) divergent gender rates for smoking and alcohol consumption (high for men and low for women among both populations), 3) traditional patriarchal society, 4) increased downward mobility and corresponding acculturative stress, 5) increase in women in workforce in US as compared to home country due to financial pressures and 6) large enclaves geographically located in the Los Angeles metropolitan statistical area[1-8]. However, they may serve as strong juxtapositions in terms of gender empowerment.

  Gender roles in the U.S. contrast the traditional social contingencies in Korean and Chinese cultures[19]. Social contingencies of reinforcement are set by cultures and influence both individual and population behavior (i.e. norms)[9]. Korean gender roles are clearly separated and distinguished, even in the US. Men provide the finances and women assume domestic responsibilities. There is limited negotiation between Korean husbands and wives with the husband serving as the ultimate decision maker[1]. Since the founding of the People's Republic in 1945, China enacted a series of laws and movements that improved the sexual equality of women and increased protection of legitimate rights such as land ownership, the right to vote and increased formal education[5]. The republic of Korea ranks one of the lowest in the world (69out of 78) on the United Nation's Gender Empowerment Measure and reports a lower ratio of female to male earned income as compared to China and the U.S.[19] In recent decades, more women participate in the labor

market due to economical and societal changes and this may be especially true for immigrant women.

With the evolving role of women in the workforce, there has been interest in how these changes impact women's empowerment in the household. Women still perform the bulk of household labor but the gap has declined in recent years. Change in household duties is due to women's participation in the labor force, contribution to the family income, time availability and to some extent, gender-role attitudes[10-13]. Traditional gender-role attitudes diminish the association between economic independence and housework hours, but they do not surpass the effect of economic independence[14].

Increased demands of women in the workforce and home may increase alcohol and tobacco use. Depression, stress and gender role attitudes may moderate these relationships. Gender role conflicts among Korean male college students increased depression[15]. U.S. girls who endorsed more traditional (rather than more egalitarian) gender roles revealed a stronger, positive association between depressive symptoms and smoking[16]. Among Korean adult men in US, anxiety and frustration over their current status leads to increased alcohol consumption[5]. Women in the labor market were more likely to drink because of increased access to alcohol and drinking opportunities, exposure to different drinking patterns and norms in occupational cultures that encourage social drinking, adoption of traditional male behaviors in order to succeed, and the stress resulting from combination of paid employment and parenthood[17-19]. The increased empowerment may also lead to changes in negotiating household rules with their partner. The aims of this paper are:

Aims

1. To analyze employment, financial contribution to the family, and amount of household responsibilities

2. To test the direct effects of employment and household responsibilities with alcohol consumption and smoking among men and women

3. To test the mediators of depression, immigrant stress and acculturation on the relationship between employment and household responsibilities with alcohol consumption and smoking among men and women

Methods

The National Institute on Alcohol Abuse and Alcoholism provided the funding for the parent project to assess how social networks influence alcohol consumption among immigrants. Data were collected by telephone between 2010 – 2011 and administered by bilingual professional interviewers fluent in English, Korean or Mandarin. Inclusion criteria include country of birth as Korea, China or Taiwan; age 21 years and over; and ability to speak English, Korean or Mandarin; and currently live in the Los Angeles metropolitan statistical area (LA, Orange, Riverside and San Bernardino counties). All study procedures were approved by the Institutional Review Board at San Diego State University.

The majority of the sample was collected through a surname-based sampling strategy. A list was compiled of households in the Los Angeles metropolitan statistical

area with 300 common Korean and 600 common Chinese surnames. The list was randomly ordered and the person with the most recent birthday was interviewed[20]. This sampling frame was purchased from a vendor that included only listed names and phone numbers. Additional convenience sampling strategies were initiated to target younger immigrants and cell phone only households. These strategies included referrals by other participants, Asian stores, religious organizations, newspaper and radio announcements and yellow page searches. Analyses showed that the listed sample was older, had fewer years of formal education, more years lived in the U.S., was more likely female and Chinese and was less likely to smoke and drink.

The data collection resulted in 2,472 Chinese and Korean immigrants. Less than 1% of participants were cohabitating and approximately 2% of persons married outside their ethnicity and both of these groups were excluded. Participants married to someone of the same ethnicity were retained in this manuscript (893 for Korean and 723 for Chinese). Approximately 71% of the married participants were derived using the listed sampling methodology.

The survey focused on questions relating to social networks, alcohol consumption, tobacco uptake and corresponding predictors (i.e. acculturation) or consequences (i.e. self-reported health). The survey was written in English and translated into Mandarin and Korean. Translations were reviewed by co-investigators at San Diego State University. Interviews were conducted in the language of the respondent's preference. The completion rate (percent of eligible persons completing interviews) was higher among Korean participants (75%) than among Chinese (65%).

Dependent Variables:

Current smoking. Participants responded to "do you currently smoke every day, some days or not at all." Responses were dichotomized to form "current smoker" for participants who smoke some or every days (coded 1, otherwise 0). The CDC criterion for having smoked at least 100 cigarettes was not included in order to capture smokers in the early initiation process[21].

Current alcohol use. Alcohol variables were formed from the following questions "During the last 12 months, how often did you usually have any kind of drink containing alcohol" and "In the last 12 months, how many alcoholic beverages do you drink per week (or month or year, if less than weekly)?". If participant stated "Never" a follow-up question was "So you have never had a drink containing alcohol in your entire life." Participants who answered "No, I did not drink" were classified as never drinkers. From these variables, three separate dichotomous variables were formed: drink daily (Yes = 1,No =0), drink weekly (Yes = 1,No =0), drink monthly (Yes = 1,No =0). An alcohol variable encompassing both frequency and volume was adapted from the NHIS survey data. Light drinkers were coded as drinking on average 3 or less drinks per week. Moderate drinkers were defined as drinking more than 3 drinks per week but not more than 14 for males and not more than 7 drinks for females. Adults who drank more than 14 drinks per week for males and 7 drinks per week for females were classified as heavy drinkers[22].

Independent Variables:

Employment and Income. Participants were asked about number of hours worked in an average week at their main job for both participant and spouse. Participants were asked "Would you say that all, most, some or few of the persons in the place you work are of Korean (or Chinese) descent?" This variable was dichotomized as most or all = 1, otherwise = 0. Participants considered total income for their household and provided the percent that came from their own wages and that of their spouses.

Household responsibilities. A battery of questions was adapted from the National Survey of Families and Households[23]. Participants provide the total number of hours that they, their spouse, and parents spent performing household tasks. The original survey instrument included 9 specific household tasks. In our survey instrument, we limited it to 6 items which included equal number of traditionally females tasks (preparing and cleaning after meals; cleaning house; repairing, washing, ironing and mending clothes,) and male tasks (outdoor and other household maintenance such as lawn, yard work, or household; paying bills and keeping financial records; automobile maintenance and repair) plus taking care of children. A final variable were calculated for total number of hours and percent performed by wife and husband. The total and percentages did not include 1) total hours of child care because some participants reported childcare for every hour of the week and 2) parental hours because only 8% of the sample had parents assisting them. The variable for husband hours of household work was slightly skewed. A log transformed version is used in all bi-variate and multi-variate analyses.

Spouse Alcohol and Cigarette Use. Participants were asked if their spouse used alcohol (Yes =1,No=0) or smoked cigarettes (Yes = 1;No =0).

Immigrant stress. The Demands of Immigration Scale is a 22-item index that describes demands related to loss, novelty, language difficulties, occupational adjustment and discrimination, and not feeling at home and has been validated among Korean immigrants[24,25]. Response options for a 4-point scale range from high immigrant stress (+2) to low levels (-2). Positive values indicate higher immigrant stress; negative values indicate more satisfaction with immigration. Items were summed and the mean was calculated (Cronbach's alpha = 0.72).

Depression. Participants completed the 10-item Center for Epidemiological Studies Depression Scale that has been validated among Korean immigrants[26-28].Response values ranged from 0 to 25 (Cronbach's a=0.78), with higher scores indicating higher levels of distress. A log transformation was used to constrain a right skew in distribution.

Acculturation variables. An acculturation scale was adapted from the Suinn-Lew Asian Self-Identity Acculturation Scale to enable telephone administration[29-31]. Items included language ability in Korean/Chinese and English; preferred language for speaking, reading, and listening to music; ethnic breakdown of friends before the age of 6, between the ages of 6 and 18, and now; self-identity (Korean or Chinese vs.

American); preference for Korean/Chinese food at home and in restaurants; and percentage of education and life in the U.S. Verbatim items in English and Korean are presented in previous publications.[32] After conversion to a common metric (Z-scores), a mean of the items was computed after allowing up for missing variables (Cronbach's α=.82). Because responses were right skewed, a logarithm transformation was computed. Higher values indicate more acculturation to U.S. and lower values indicate more adherence to traditional culture.

Demographics. Gender, age, number of children under age 18 and under age 5, country of birth (Korea, China/Taiwan), total years of education.

Analysis: Only one person from each household was interviewed. Details about the spouse's employment and household responsibilities were provided by the participant and are included as independent variables. Adequate details about spouse's tobacco and alcohol use were not asked; only participant's tobacco and alcohol use are included as dependent variables. Therefore, employment and household variables are classified as "husband or wife" while alcohol and tobacco use are classified as "Korean male or Korean female", etc. Bi-variates of tobacco and alcohol use with employment and household duties were conducted followed by multi-variable logistic regressions controlling for other independent variables. Because the main alcohol variable was 4 levels, a polychotomous regression analysis was conducted. Path analysis tested the direct effects of paid hours, household responsibilities and employment on alcohol and tobacco use; and tested these effects mediated by immigrant stress, depression and years in the U.S.[33-35] Because of differences in methodologies, demographics and outcome

variables between listed and convenience samples, all multi-variable analyses controlled

for sample (listed vs. convenience). The majority of the analyses were conducted in SPSS

v. 18 but polychotomous regressions were conducted using the proc logistic command in

SAS v 9.1 and path analyses were conducted using the pathreg command in STATA[33].

Results

Sample. The sample included 1,616 married Korean and Chinese immigrants

residing in the Los Angeles metropolitan statistical area. Approximately 55% of the

sample was Korean immigrants and 52% male. Both immigrant groups reported similar

age (mean=47.1 sd =11), years lived in the U.S. (mean=16.8, sd=10), years of total

education (mean=15.5,sd=3) and years of education in the U.S. (mean=2.0,sd=3).

Korean immigrants were significantly more likely to identify as exclusively Korean

(76.3%) than Chinese immigrants (48.8%) who were more likely to identify as Chinese

American. Koreans were more likely to have a child under the age of 18 and under the

age of 5 (61.4% and 18.7% of households, respectively) than Chinese households (50.3%

of households had a child under 18 and 14.6% under age 5).

Household responsibilities, employment and finance. Table 1 reports totals of

household and employment hours and percentages. Details of household responsibilities

can be found in Appendix Table 1. More Chinese males were unemployed (6.3%) or

retired (12.5%) than Korean males (2.3% unemployed, 9.6% retired). Chinese females

were more likely unemployed (8.2%) but less likely retired (5.4%) than Korean females

(0.7% unemployed, 9.6% retired). More Chinese wives worked (56%) compared to

Korean wives (46%) and double the number of Chinese households reported only the wife worked (7.3%) compared to Korean households (3.1%). More Koreans owned their own business (25.1%) compared to Chinese (6.4%).

Korean women reported greater total hours and percentage of household responsibilities than Chinese women, while Chinese women reported more hours of employment than Korean women. Korean husbands worked more hours and contributed to a higher percentage of family income but performed a lower percentage of household responsibilities than Chinese husbands. Males worked more hours than their wives while their wives spent more hours on household responsibilities. Men contributed to approximately two-thirds of the household income.

Relationship with depression, immigrant stress and acculturation. The depression index was significantly higher among all males whose wives worked more hours and contributed to a larger percent of household income. For Chinese participants, depression index increased with more hours of household work for both husband and wife. Depression scores increased among Korean wives with increased hours of household work but were reduced with increased hours and percent contribution from husband. Immigrant stress increased with more hours husbands spent on household tasks, but was reduced with higher percentages of income from husbands among Chinese participants and Korean males. In contrast, Korean females reported significantly lower immigrant stress related to a larger percentage of household work by husbands and with larger percentage of income from the wife.

Acculturation was not related to household responsibilities of husbands or Chinese wives. However, Korean wives who were more acculturated reported significantly greater percentage of husband and lower percentage of wife household duties. For all participants, higher acculturation related significantly to more hours husband was employed. Among Korean women, higher acculturation significantly related to more hours employed by wives.

Smoking and alcohol. Table 2 shows the percent of smokers and drinkers in the sample. Males regardless of nationality smoke and drank significantly more than their female counterparts. Korean males and females reported significantly higher rates of smoking, drinking weekly and monthly, and heavy drinking than Chinese males and females. There was no difference between male or female smoking rates by nationality. Non-smokers were significantly more likely to never drink and less likely to drink weekly or monthly.

Table 3 reports smoking status with household responsibilities, employment and percent of financial contribution. Being employed significantly increased the likelihood of smoking among Korean males and females. Korean males who smoked worked about 4 hours more per week than Korean non-smokers. Korean females who smoked reported twice the number of hours worked, double the percentage they contributed to household finances and higher hours and percentages of husbands performing household work than non-smokers. No significant relationships were observed for Chinese males or females between smoking and household and employment responsibilities. Smoking was related

to immigrant stress among Korean females and Chinese males. Higher depression scores and lower acculturation significantly related to smoking among Chinese males.

Moderate and heavy drinking was low across the samples. Table 4 shows the bi-variate associations between drinking level and employment and household tasks. Korean and Chinese men employed were more likely to be moderate or heavy drinkers than those unemployed. Among Korean males, never drinkers reported higher amounts of household work by husband and lower amounts by wife as compared with heavy drinkers. Korean males who were moderate or heavy drinkers reported more hours of employment and percent income as compared to light and never drinkers. Among Korean females, immigrant stress increased linear between never, light, moderate and heavy drinking. Among Chinese females, heavy drinking was related to higher scores on depression index and never drinkers were significantly less acculturated.

Multivariate and path analyses. Current smoking was regressed on household responsibilities, employment, immigrant stress and other demographic variables. Only the models for Chinese males and Korean females produced significant relationships. Table 5 displays the Chinese male regression. Among Chinese males, higher probability for smoking was observed among lower acculturated, those who worked more hours and were employed in predominantly Chinese workplaces. Increased immigrant stress increased probability of smoking, but did not reach significant levels. The direct and indirect influences of co-variants on smoking among Chinese males are illustrated in Figure 1 and listed in Table 5. Path analyses tested whether mediation occurred either through acculturation or immigrant stress. These results do no support a mediated

influence through immigrant stress. However, number of hours employed did not have a direct effect with smoking but was mediated by acculturation level.

For Korean women, current smoking was regressed on spouse smokes, immigrant stress, man and wife employment hours, and husband and wife hours of household responsibilities (Table 6). Having a husband who smoked and a higher number of hours of employment of the wife significantly increased the odds of smoking among Korean women. Higher levels of satisfaction with immigration (the opposite of immigrant stress), fewer hours husband employed but more participation by husband in household responsibilities increased the probability of female smoking, but did not maintain significant values (p<.10). Path analyses tested mediation by immigrant stress (or satisfaction). Direct and indirect influences of the co-variates are listed in Table 6 and show that husband smoking status and hours of women's employment and both spouse's hours of household responsibility influenced smoking status directly and were not mediated through immigrant stress (or satisfaction).

Multi-variable regressions were conducted for alcohol consumption only with Korean males because they had sufficient numbers of moderate and heavy drinkers and produced a significant model. The 4-level drinking variable (never, light, moderate and heavy) was regressed on age, number of hours employed and number of hours participate in household tasks by husband, and the CESD depression index using a polychotomous regression (Table 7). Higher number of hours employed and higher scores on the CESD index significantly related to higher heavy alcohol drinking. Never drinkers reported significantly more hours than light drinkers and in the same direction for moderate and

heavy drinking. Direct and indirect influences were calculated using path analyses and are presented in Table 8. Hours of employment, household responsibilities and age directly influenced drinking level and were not mediated through the CESD depression index.

Discussion

Smoking prevalence was high (approximately 25%) among males and low among females (< 3%). In all cases, the rate of moderate or heavy drinking was low and could only support multi-variable analyses among Korean males. The lower rate of moderate or heavy drinking concurs with data in National Health Interview Survey where 22% of white Americans were moderate or heavy drinkers in comparison to 7% of Chinese Americans and 10% of Korean Americans[22]. Possible explanations for low rates of moderate or heavy drinking are that Koreans and Chinese do not engage in frequent and high quantities of alcohol consumption or that the assessment tool may not be adequate for Asians. Asians have a lower body weight and therefore lower cut points for moderate and heavy drinking might be necessary.

Household Responsibilities. Current estimates show women in the U.S. perform 75% of household work or two to three times the number of hours of their male partners[10,11,36]. Our data show similar findings among Koreans but slightly higher participation by Chinese husbands. Total hours of household tasks was higher among Korean wives than for other women in the U.S.[10] Korean women reported greater total hours and percentage of household responsibilities than Chinese women; while Chinese

women reported more hours of employment than Korean women. The more hours a participant was employed, the fewer hours they spent but more hours their spouse spent on household tasks.

In households where the wife worked, the total amount of housework completed by wife, husbands and parents was significantly lower than in households where the wife did not work. This finding suggests that either less housework was tolerated (i.e. a less clean house) or more of the housework was outsourced. Recent trends in U.S. housework suggest that families are purchasing services instead of performing the housework themselves (i.e. fast food, house cleaners, gardeners) [10].

Increased hours of participant's household work was protective from higher rates of drinking among Korean males. The relationship between household duties and tobacco and alcohol were not mediated by stress or depression and might not be related to gender roles. The relationship might be simpler. Alcohol use might be physically incompatible with household tasks. Drinking is typically a social behavior where one is often sitting; household chores are not. The more hours a Korean male is performing household duties, the fewer hours he physically can sit at a bar.

For smoking, increased household chores might reduce likelihood of women smoking not because of incompatible behaviors (one could do the laundry while smoking), but women may be less likely to smoke because they do not want to dirty their house or have laundry that smells of smoke. Analyses were conducted (but not shown here) relating having a smoke-free household policy to household chores. Korean women

spent half as much time cleaning if they had a complete smoking ban in their home as compared with Koreans who allowed smoking inside their home. For Korean women, independent variables pertaining to her husband were related to her smoking. She was more likely to smoke if her husband smoked presumably because smoking was more permissible or she had more access to cigarettes. However, higher rates of husband's household hours related to increase likelihood of smoking of the wife. This co-variate maintained a strong, but marginally significant relationship with smoking even after adjusting for employment hours of the husband and wife and household hours of the wife.

Employment. A higher number of hours employed increased the likelihood of smoking among Chinese males and Korean females and increased moderate and heavy drinking among Korean males. For Korean females, this may be due to increase permissibility in the workforce, increased models or access to tobacco. Hours of employment was not mediated by acculturation, immigrant stress or depression among Korean males and females. However, among Chinese males, number of hours employed was mediated by acculturation to explain cigarette use. A higher number of hours employed was significantly related to higher acculturation level which related to lower odds of smoking. However, if their co-workers were predominantly Chinese, they were more likely to smoke. The direct effect of Chinese co-workers was similar to the direct effect of acculturation on smoking, but in the opposite direction.

Children. There were only 6 Chinese women in our sample who smoked and no multi-variable models were found significant. One of the few finding was with children

(data not presented). All Chinese female smokers had a child under the age of 18 living in the household. This finding is consistent with the literature where having a child in the home was not related to having a complete home ban on smoking among Chinese in the U.S. or Koreans in the U.S. or Seoul[37-39].

Limitations. Two different sampling procedures were used in order to capture a more representative sample of the Asian immigrant population. The two samples differed on independent and dependent variables. Multivariate analyses had to control for sampling method for all outcomes. Some of the measures were not adequate or were difficult to define. Low amounts of alcohol can be healthy; high amounts of alcohol are not. Our instrument did not define lifetime use of alcohol or adequately measure spouse's alcohol or tobacco use. Employment was only asked about the main job. Information about multiple jobs was not ascertained which could have influenced depression and immigrant stress. These additional measures would have influenced the path analyses and might have produced alternate conclusions.

Future research and programs. Smoke-free workplace laws in California have strong compliance[40]; yet our results show higher likelihood of smoking with more hours of employment among both genders. Either workplaces are not in compliance with smoke-free laws or the social contingencies at work outweigh the environmental regulations or both could occur to explain the strong relationship between smoking and employment. Theories pertaining to social contingencies assume that higher density of models performing the behavior relate to higher prevalence of behavior in the population. However, the smoking prevalence in California continues to decrease for the entire

population and declines for Asian males with immigration[7,8,41]. The social contingencies in the workplace that increase smoking might not be density of smokers but rather the effect of certain types of individuals who smoke (i.e. a supervisor, a close friend). Social contingencies might be influenced by a few persons if they are highly respected (i.e. the top salesman). This manuscript cannot determine which specific mechanism or contingencies at a workplace increase smoking. Future research could assess contingencies within the office (i.e. smoking breaks, supervisor smokes, clients allowed to smoke), socializing with co-workers during work and outside work and the culture and norms of smoking and drinking among co-workers. These findings could help develop programs to reduce tobacco and moderate or heavy alcohol use. Tobacco cessation interventions as well as tobacco prevention materials should be available at work sites because of the increased likelihood of these behaviors with employment.

Paper 3 of this publication is in preparation for publication.

Irvin VL, Hofstetter CR, Usita P, Chambers C, Norman G, Nichols JF, Hovell MF. "Employment, household responsibilities and substance use among Asian immigrants."

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Table 1. Occupational class by demographic and acculturation variables among employed Koreans in California[a]									
Occupational Class	N[b]	Age	Age of Immigration	Years live in US	Percent of Life U.S.	Years of Education U.S.	Years of Education Korea	Years of Education Total	Speak Mostly Korean[c]
MALES									
Professional	37	38.3(12.1)	19.0(13.2)	19.3(12.3)	51.4(31.7)	10.2(7.5)	9.5(8.0)	19.4(3.9)	13.5%
Executive/Owner	207	47.3(11.2)	29.2(11.7)	18.0 (8.8)	39.0(19.7)	2.7 (4.5)	13.1(4.3)	15.9(2.5)	41.3%
Manager	25	33.8 (9.6)	18.8(14.4)	14.9 (8.4)	49.1(31.9)	7.2 (6.0)	8.5(6.1)	16.0(2.4)	36.0%
Upper White Collar	79	36.6 (9.1)	18.6(13.6)	17.7(10.4)	51.4(31.4)	7.6 (6.5)	8.9(6.7)	17.0(2.0)	11.4%
Lower White Collar	116	40.0(14.3)	21.8(15.7)	18.1(10.3)	50.3(31.4)	6.5 (6.3)	10.1(7.1)	16.9(3.3)	28.4%
Skilled	27	41.3(10.9)	28.9(13.6)	12.4 (8.8)	32.1(25.4)	2.6 (4.8)	10.9(5.2)	14.1(3.8)	55.6%
Unskilled	33	38.6(16.9)	20.3(16.6)	18.3 (8.5)	55.0(31.3)	5.3 (6.4)	7.9(6.2)	13.5(1.9)	39.4%
Total	524								
Significance Test		p<.001	p<.001	P=.065	p<.001	p<.001	p<.001	p<.001	p<.001
FEMALES									
Professional	85	39.0 (9.9)	20.5(11.7)	18.5 (9.9)	48.8(28.0)	6.6(7.2)	10.5(6.9)	17.3(2.1)	23.5%
Executive/Owner	107	44.4 (8.1)	27.5(10.0)	16.9 (8.8)	38.5(21.5)	1.8(4.1)	13.4(4.2)	15.3(2.5)	53.3%
Manager	23	36.3 (9.8)	14.2(11.9)	22.1(10.0)	62.5(28.9)	8.4(6.4)	6.9(6.2)	15.3(1.6)	26.0%
Upper White Collar	64	36.5(11.0)	20.3(11.1)	16.2 (8.6)	45.9(25.1)	5.8(5.7)	10.5(5.9)	16.7(1.9)	25.0%
Lower White Collar	142	37.6(12.0)	21.6(13.4)	15.9 (8.9)	45.6(28.5)	4.7(6.0)	10.1(5.9)	15.0(2.2)	44.0%
Skilled	27	42.3(10.9)	28.5(10.1)	13.7 (8.4)	32.8(19.0)	1.3(3.2)	11.8(3.9)	13.7(3.6)	59.3%
Unskilled	37	42.8(13.0)	27.8(12.8)	15.0 (8.4)	37.2(25.6)	2.2(4.8)	10.8(5.2)	13.1(2.9)	54.1%
Total	485								
Significance Test		p<.001	p<.001	P=.011	p<.001	p<.001	p<.001	p<.001	p<.001

a. Numbers in cells represent mean and standard deviations, unless otherwise noted. One-way ANOVAs conducted for each demographic and acculturation variable with occupational class. Analyses run separately by gender. Sample size for each occupational class among males and females aged 18 and over.

b. Percent who speak only or mostly Korean (dichotomous variable). Analyses run by chi-square with * p<.05.

Table 2. Industry by demographic and acculturation variables among employed Korean males in California									
Industry	N[b]	Age	Age of Immigration	Years live in US	Percent of Life U.S.	Years of Education U.S.	Years of Education Korea	Years of Education Total	Speak Mostly Korean[c*]
MALES									
Sales –Retail, Whole	1223	40.7(14.1)	24.7(14.8)	15.9 (7.9)	43.6(26.3)	4.5(5.7)	10.9(5.8)	15.5(2.5)	42.8%
Medical/Health	37	38.0 (9.1)	19.2(12.9)	18.7 (9.7)	51.6(28.9)	8.8(7.1)	9.4(6.7)	18.1(3.0)	26.0%
Finance/Insur/Real	43	39.6(12.5)	17.1(13.9)	22.4(10.2)	60.0(28.6)	7.7(6.3)	8.5(6.7)	16.4(1.4)	25.0%
Administration	13	40.8(13.5)	21.8(11.6)	19.0(12.0)	44.8(27.5)	4.3(6.1)	11.5(5.8)	15.8(1.5)	34.8%
Science/Engineer	35	38.0(11.2)	21.6(14.3)	16.4(10.9)	46.3(33.8)	6.4(7.2)	10.1(7.4)	17.2(2.7)	10.6%
Education	28	39.4(14.9)	22.2(12.7)	17.1(11.4)	45.2(27.4)	8.2(6.7)	10.9(7.6)	18.9(4.4)	25.3%
Computer/Telecom	35	36.9 (7.4)	18.9(12.3)	18.0 (9.3)	50.9(28.7)	6.9(5.8)	9.3(6.2)	16.5(2.2)	25.4%
Construction/Garden	28	51.8(11.0)	32.2(12.9)	19.6 (9.4)	39.1(21.3)	1.7(4.6)	12.5(4.7)	14.3(2.7)	42.9%
Mechanic/Repair	29	47.3(10.8)	29.2(13.5)	18.0 (9.6)	40.4(26.5)	2.2(4.5)	11.7(5.1)	14.1(2.7)	41.9%
Cleaner/Janitor	5	56.0(12.8)	38.6 (9.1)	17.4 (6.2)	31.1 (7.1)	0.0(0.0)	13.0(3.0)	13.0(3.0)	68.8%
Food Service	40	40.0(14.4)	25.2(14.2)	14.7 (8.6)	41.3(28.4)	3.4(5.2)	11.5(6.2)	15.5(2.6)	51.5%
Dry Cleaners	7	51.5(10.6)	32.0(18.1)	19.5 (4.7)	39.0(10.3)	1.5(2.8)	11.8(4.2)	13.4(4.4)	42.0%
Transportation	13	43.6(12.7)	22.4(15.6)	21.1 (7.8)	53.8(28.2)	5.5(6.0)	9.0(6.6)	14.5(2.0)	44.4%
Religious	34	46.7(10.9)	29.7(11.3)	16.9(11.0)	36.1(23.6)	5.2(6.1)	15.2(4.4)	20.2(2.9)	41.0%
Total	470								
Significance Tests		p<.001	p<.001	P=.040	P=.016	p<.001	P=.002	p<.001	p<.001

a. Numbers in cells represent mean and standard deviations, unless otherwise noted. One-way ANOVAs conducted for each demographic and acculturation variable with occupational class. Analyses run separately by gender. All analyses were significant at p<.05 except years in the U.S. among males where the p=.06.
b. Sample size for each occupational class among males and females aged 18 and over.
c. Percent who speak only or mostly Korean (dichotomous variable). Means and standard deviations not available. Analyses run by chi-square with * p<.05.

Table 3. Industry by demographic and acculturation variables among employed Korean females in California[a]									
FEMALES		Age	Age of Immigration	Years live in US	Percent of Life U.S.	Years of Education U.S.	Years of Education Korea	Years of Education Total	Speak Mostly Korean[c*]
Sales –Retail, Whole	106	40.6(11.3)	26.1(12.1)	14.4(9.0)	37.1(25.5)	2.9(5.0)	11.8(4.8)	14.7(2.4)	54.7%
Medical/Health	67	42.8(11.1)	22.8(11.7)	19.9(11.1)	47.1(26.6)	4.3(6.4)	11.7(6.3)	16.6(2.1)	28.3%
Finance/Insur/Real	65	37.0(9.0)	18.4(10.7)	18.6(8.0)	52.5(24.1)	6.2(6.1)	9.9(6.2)	16.3(1.3)	29.2%
Administration	33	36.7(12.5)	18.0(11.6)	18.6(8.9)	53.5(25.3)	5.5(5.9)	9.6(9.3)	15.1(2.0)	33.3%
Science/Engineer	12	31.3(10.7)	17.3(13.2)	14.0(8.1)	49.7(34.7)	7.5(6.6)	9.0(7.3)	16.7(3.4)	8.3%
Education	1	36.1(10.2)	19.2(13.0)	16.8(8.6)	50.3(29.6)	7.1(7.0)	10.0(6.9)	17.1(2.6)	29.4%
Computer/Telecom	6	37.6(12.4)	20.9(11.2)	16.6(9.2)	44.6(24.5)	4.0(5.3)	11.8(5.8)	16.3(1.9)	37.5%
Construction/Garden	0	---	---	---	---	---	---	---	---
Mechanic/Repair	2	52.3(6.3)	30.0(4.2)	22.5(10.6)	41.9(15.1)	0.0(0.0)	9.0(4.2)	9..0(4.2)	100.0%
Cleaner/Janitor	11	50.9(11.8)	31.5(12.6)	19.3(8.9)	39.0(22.4)	1.6(4.8)	10.6(5.3)	12.2(4.4)	72.7%
Food Service	57	43.8(8.6)	30.6(8.5)	13.1(6.8)	29.9(14.9)	0.7(1.8)	13.5(2.5)	14.2(1.9)	57.8%
Dry Cleaners	12	50.2(9.2)	30.6(8.5)	19.5(4.6)	39.7(9.2)	0.1(0.3)	12.5(4.4)	13.8(3.0)	33.3%
Transportation	5	36.6(5.1)	19.9(15.1)	16.7(10.2)	49.1(34.1)	5.2(5.5)	9.4(6.8)	14.6(1.9)	40.0%
Religious	5	39.4(13.2)	17.6(16.3)	21.8(10.7)	60.7(38.2)	6.8(9.3)	8.0(8.6)	14.8(5.0)	20.0%
Total	442								P<.001

a. Numbers in cells represent mean and standard deviations, unless otherwise noted. One-way ANOVAs conducted for each demographic and acculturation variable with occupational class. Analyses run separately by gender. All analyses were significant at p<.05 except years in the U.S. among males where the p=.06.

b. Sample size for each occupational class among males and females aged 18 and over.

C. Percent who speak only or mostly Korean (dichotomous variable). Means and standard deviations not available. Analyses run by chi-square with * p<.05.

Table 4. Occupational class by tobacco-related variables among Korean, employed males in California[a]

Occupational Class	N [b]	Current Smoker	Smoke-free Workplace	Secondhand Smoke Exposure at Work
MALES				
Professional	37	10.8%	97.3%	13.5%
Executive/Owner	207	36.2%	85.5%	38.5%
Manager	25	32.0%	96.0%	24.0%
Upper White Collar	79	25.3%	91.1%	21.5%
Lower White Collar	116	18.3%	89.7%	19.0%
Skilled	27	37.0%	85.2%	48.1%
Unskilled	33	26.4%	78.8%	42.4%
Total	524	p=.003	p=.153	p<.001
FEMALES				
Professional	85	0.0%	97.6%	10.6%
Executive/Owner	107	8.5%	90.6%	18.7%
Manager	23	8.7%	95.6%	4.3%
Upper White Collar	64	12.5%	95.3%	12.5%
Lower White Collar	142	5.6%	93.0%	19.0%
Skilled	27	3.7%	92.6%	11.1%
Unskilled	37	8.1%	91.9%	8.1%
Total	485	P=.077	P=.586	P=.209

a. Numbers in cells represent percentages unless otherwise noted. Chi-square analyses were conducted for each tobacco variable with occupational class. Analyses run separately by gender. This table reflects only data for employed females of Korean descent in California.
b. Sample size for each occupational class among males aged 18 and over

Table 5. Industry by tobacco-related variables among employed Korean males in California[a]

Industry	N [b]	Current Smoker	Smoke-free Workplace	Secondhand Smoke Exposure at Work
MALES				
Sales –Retail, Whole	123	34.4%	85.3%	35.0%
Medical/Health	37	18.9%	94.6%	27.0%
Finance/Insur/Real	43	27.9%	90.7%	30.2%
Administration	13	30.8%	76.9%	15.4%
Science/Engineer	35	17.1%	91.4%	25.7%
Education	28	10.7%	92.9%	17.9%
Computer/Telecom	35	31.4%	91.4%	25.7%
Construction/Garden	28	28.6%	75.0%	50.0%
Mechanic/Repair	29	34.5%.	75.9%	34.5%
Cleaner/Janitor	5	40.0%	80.0%	40.0%
Food Service	40	37.5%	97.5%	42.5%
Dry Cleaners	7	14.3%	100.0%	14.3%
Transportation	13	35.3%	84.6%	38.5%
Religious	34	2.9%	97.1%	2.9%
Total	470	P=.013	P=.172	P=.01

a.Numbers in cells represent percentages unless otherwise noted. Chi-square analyses were conducted for each tobacco variable with occupational class. Analyses run separately by gender. This table reflects only data for employed females of Korean descent in California.
b. Sample size for each occupational class among males aged 18 and over.

Industry	N [b]	Current Smoker	Smoke-free Workplace	Secondhand Smoke Exposure at Work
Table 6. Industry by tobacco-related variables among employed Korean females in California [a]				
FEMALES				
Sales –Retail, Whole	106	6.5%	93.4%	22.6%
Medical/Health	67	1.5%	95.5%	10.4%
Finance/Insur/Real	65	12.3%	96.9%	13.8%
Administration	33	15.2%	90.9%	9.1%
Science/Engineer	12	0.0%	91.6%	0.0%
Education	51	2.0%	100.0%	11.8%
Computer/Telecom	16	0.0%	100.0%	12.5%
Construction/Garden	0	---	---	---
Mechanic/Repair	2	50.0%	50.0%	50.0%
Cleaner/Janitor	11	0.0%	100.0%	9.1%
Food Service	57	10.5%	80.7%	17.5%
Dry Cleaners	12	0.0%	100.0%	16.7%
Transportation	5	0.0%	80.0%	0.0%
Religious	5	0.0%	100.0%	20.0%
Total	442	P=.021	P=.002	P=.362

a.Numbers in cells represent percentages unless otherwise noted. Chi-square analyses were conducted for each tobacco variable with occupational class. Analyses run separately by gender. This table reflects only data for employed females of Korean descent in California.

b. Sample size for each occupational class among males aged 18 and over.

Table 7. Current Smoking Status Regressed on Occupation and Demographic Variables and Percent of Life Lived in the U.S. among Koreans in California, 2005-2006 [a]

	Employed Males				Employed Females			
	B	SE	OR	p	B	SE	OR	p
Smoke-free workplace	-.452	.30	.63	.141	-1.34	.63	.26	.035
Occupational Class[b]				.005				.362
Professional	___	___	___	___	___	___	___	___
Executive/Owner	.752	.21	2.121	.000	1.769	2.3	5.864	.452
Manager/	.187	.40	1.205	.646	1.012	2.4	2.750	.677
Upper White Collar	-.162	.28	.851	.563	1.735	2.3	5.667	.461
Lower White Collar	-.312	.26	.732	.241	.585	2.3	1.796	.803
Skilled	.225	.39	1.252	.571	-.218	2.5	.805	.931
Unskilled	.246	.37	1.279	.515	1.247	2.3	3.479	.601
Models of smoking	.386	.07	1.471	.000	.663	.14	1.940	.000
Discouragers of smoking	-.136	.04	.873	.001	-.202	.07	.817	.008
Age	-.027	.01	.973	.006	-.072	.02	.931	.003
Percent of Lived U.S.	-1.053	.43	.349	.016	.924	.78	2.518	.240
Constant	.553	.63			-1.14	2.6		
Model Fit	X^2=91.8, df=11, p<.001 Nagelkerke R^2 = .232				X^2=76.4, df=11, p<.001 Nagelkerke R^2 = .386			

a. A current smoker was defined as currently smoking some or every days, regardless if they have smoked 100 cigarettes in their lifetime. Participants included in this table are only those currently employed outside the home (N= 1,084).Numbers in cells represent unstandardized betas, standard errors, odds ratios and p-values
b. Professional is the reference group.

Table 8. Percent of participants who observed ashtrays, no smoking signs and smoking inside Korean bars and restaurants in California during an average month.		
	Korean Restaurant (N=2,169)	Korean Bar (N=199)
Observed no-smoking sign	63.4%	63.6%
Observed ashtrays	7.1%	44.4%
Participant smoked inside	0.4%	23.6%
Others in group smoked inside	0.9%	51.5%
Others in venue smoked inside	7.4%	65.1%
Observed non-compliant bars	7.8%	68.2%

Table 9. Number of times participants observed smoking and someone communicating to the smoker to stop and types of persons who enforced the smoke-free rule		
	Restaurant	Bar
Number of participants attended in past month	2,169	199
Number of times observed smoking	307	764
Times someone asked smoker to stop[a]	54 (17.6%)	42 (5.5%)
By whom?[b]		
Server/Manager	24 (44.4%)	25 (59.5%)
Security Guard	1 (1.9%)	0
Patron (including study participant)	31 (57.4%)	16 (38.1%)
Times someone gestured to stop[a]	83 (27.0%)	52 (6.8%)
By whom?[b]		
Server/Manager	11 (13.3%)	4 (7.7%)
Security Guard	1 (1.2%)	0
Patron (including study participant)	72 (86.7%)	48 (92.3%)
a. Percentage is out of number of times observed smoking.		
b. Percentage is out of number of times observed someone asking/gesturing to smoker.		

Table 10. Number of weekly hours spent on household tasks, employment and percent contributed to family income by gender and nationality, 2010-2011.				
	Korean (N=893)		Chinese (N=723)	
	Wife	Husband	Wife	Husband
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Household hours without child care[b]	21.2 (10.3)	6.8 (5.9)	16.0 (10.8)	6.7 (7.1)
Percent share of household tasks[a,b]	73.8 (19.8)	26.0 (21.4)	68.8 (23.7)	31.6 (26.7)
Employment hours[a,b]	16.4 (19.2)	34.6 (18.1)	19.7 (19.9)	32.8 (18.6)
Percent contribution to family income[a]	28.2 (27.3)	70.3 (29.6)	28.8 (28.2)	65.6 (31.0)
Numbers in cells represents average number of hours spent on tasks, plus total and percentage. One participant per household provided responses for their own estimated hours and that of their spouse. All participants included in data were married a. Denotes significant difference p<.05 between Korean and Chinese husbands. b. Denotes significant difference p<.05 between Korean and Chinese wives.				

Table 11. Smoking and drinking status of participant by nationality and gender, 2010-2011.				
	Korean (N=893)		Chinese (N=723)	
	Female (N=421)	Male (472)	Female (N=354)	Male (N=369)
Smoke some or every day	2.9%	26.7%	1.7%	24.4%
Drink alcohol				
Daily	0.2%	3.2%	0.6%	4.6%
Weekly	11.7%	29.7%	5.9%	20.4%
Monthly	26.6%	58.4%	11.0%	39.4%
Drinking level				
Never	16.9%	3.8%	38.7%	13.0%
Light	81.4%	88.9%	59.3%	77.8%
Moderate	1.2%	6.0%	1.7%	8.7%
Heavy	0.5%	1.3%	0.3%	0.5%
Values in cells represent percentages within gender and nationality.				

Table 12. Distribution of household responsibilities, employment and percent contribution to family income of husband and wife by smoking status of participant, 2010-2011.				
	Korean (N=893)			
	Female (N=421)		Male (N=472)	
	Smoker (N=12)	Non-smoker (N=409)	Smoker (N=126)	Non-smoker (N=346)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Total household hours husband[b]	10.9 (7)	5.4 (5)	7.8 (5)	7.9 (5)
Total household hours wife[b]	16.5 (11)	23.4 (10)	20.7 (9)	18.9 (9)
% share of household tasks husband[b]	38.9 (27)	19.4 (17)	28.7 (21)	32.1 (22)
% share of household tasks wife	66.3 (26)	80.0 (17)	69.9 (19)	68.2 (20)
Employment hours husband[a]	27.0 (20)	33.3 (17)	39.0 (15)	34.9 (18)
Employment hours wife[b]	31.2 (18)	14.3 (18)	18.9 (19)	17.5 (19)
% contribution to family income husband[b]	50.0 (8)	71.8 (29)	72.6 (29)	68.2 (29)
% contribution to family income wife[b]	45.4 (16)	28.1 (28)	25.2 (26)	28.8 (25)
	Chinese[c] (N=723)			
	Female (N=354)		Male (N=369)	
	Smoker (N=6)	Non-smoker (N=348)	Smoker (N=90)	Non-smoker (369)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Total household hours husband	5.0 (7)	5.0 (6)	9.2 (8)	8.1 (6)
Total household hours wife	18.6 (10)	18.2 (11)	13.9 (9)	13.5 (9)
% share of household tasks husband	16.5 (22)	21.2 (21)	45.1 (31)	40.0 (26)
% share of household tasks wife	84.0 (23)	77.0 (20)	61.3 (24)	60.1 (23)
Employment hours husband	38.3 (9)	33.1 (18)	32.6 (21)	32.4 (17)
Employment hours wife	15.0 (23)	18.3 (19)	21.3 (21)	20.9 (19)
%contribution to family income husband	65.0 (41)	67.1 (32)	60.9 (32)	65.3 (28)
% contribution to family income wife	18.3 (28)	27.7 (29)	29.6 (29)	30.2 (26)

   a. Denotes significant differences p<.05 between Korean male smokers and non-smokers.
   b. Denotes significant differences p<.05 between Korean female smokers and non-smokers.
   c. No significant differences observed between Chinese smokers and non-smokers for either gender.

Table 13. Distribution of household responsibilities, employment and percent contribution to family income of husband and wife by level of alcohol consumption of participant, 2010-2011.				
	Korean Females			
	Never (N=70)	Light (N=337)	Moderate (N=5)	Heavy (N=2)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Total household hours husband	5.2 (4.8)	5.7 (5.8)	5.2 (7.0)	7.0 (7.0)
Total household hours wife	23.8 (11.3)	22.9 (10.5)	32.6 (9.1)	15.0 (5.6)
% of household tasks husband	19.5 (15.8)	20.3 (18.5)	11.8 (13.3)	27.0(16.4)
% of household tasks wife	79.7 (15.4)	79.4 (18.4)	85.1 (12.6)	71.3 (21.8)
Employment hours husband[a]	27.0 (21.4)	34.4 (17.0)	40.0 (0)	40. 0 (0)
Employment hours wife	11.8 (17.8)	15.3 (19.3)	9.0 (17.4)	30.0 (14.4)
Husband's % of family income	67.1 (30.8)	72.3 (28.9)	88.0 (17.8)	50.0 (--)
Wife's % of family income	28.7 (29.0)	28.5 (28.5)	20.0 (20.0)	50.0 (--)
	Korean Males			
	Never (N=18)	Light (N=417)	Moderate (N=28)	Heavy (N=6)
Total household hours	11.2 (8.9)	7.8 (5.8)	7.1(5.5)	5.5 (2.1)
Total household hours wife[b]	18.7 (10.1)	19.2 (9.4)	20.7 (9.5)	31.4 (9.6)
% of household tasks husband	39.0 (25.6)	30.8 (21.9)	31.0(27.4)	15.5 (7.2)
% of household tasks wife	61.4 (25.6)	68.5 (19.9)	74.1 (15.0)	80.7 (6.3)
Employment hours husband[b]	22.7 (20.2)	35.9 (18.1)	45.7 (10.4)	45.0 (8.3)
Employment hours wife	11.1 (18.4)	18.1 (19.3)	22.6 (19.2)	6.6 (16.3)
Husband % of family income[b]	55.2 (37.6)	69.2 (29.7)	71.4 (24.1)	100 (0)
Wife's % of family income	28.7 (29.8)	28.0 (26.2)	32.6 (20.9)	0 (0)

Table 13 Continued. Distribution of household responsibilities, employment and percent contribution to family income of husband and wife by level of alcohol consumption of participant, 2010-2011.				
	Chinese Females			
	Never (N=137)	Light (N=210)	Moderate (N=6)	Heavy (N=1)
Total household hours husband	4.6 (6.7)	5.3 (6.6)	2.7 (3.8)	2.0 (0)
Total household hours wife	17.5 (11.6)	18.5 (11.8)	19.0 (8.9)	25.5 (--)
% of household tasks husband	20.2 (23.2)	22.0 (19.9)	10.3(13.4)	7.2 (--)
% of household tasks wife	76.2 (23.6)	77.2 (19.2)	88.4 (14.0)	96.4(--)
Employment hours husband[c]	29.9 (20.1)	34.9 (17.2)	46.6 (8.1)	40.0 (--)
Employment hours wife	18.9 (21.3)	17.6 (18.9)	28.3 (22.2)	0 (0)
Husband % of family	63.3 (32.8)	69.2 (32.5)	73.3 (23.3)	100 (--)
Wife % of family income	31.1 (30.4)	25.3 (28.6)	26.6(23.3)	0 (0)
	Chinese Males[d]			
	Never (N=48)	Light (N=287)	Moderate (N=32)	Heavy (N=2)
Total household hours husband	9.2 (9.3)	8.2 (6.8)	8.2 (7.4)	10.7 (4.5)
Total household hours wife	14.8 (11.8)	13.7 (9.1)	11.8 (7.8)	9.0 (2.8)
% of household tasks husband	39.5 (28.5)	41.1 (27.2)	45.3 (32.0)	53.6 (18.4)
% of household tasks wife	58.2 (27.4)	60.9 (22.7)	59.7 (24.6)	46.4 (18.4)
Employment hours husband	28.3 (24.5)	32.8 (17.8)	35.2 (16.5)	22.5 (31.8)
Employment hours wife	18.2 (19.5)	21.3 (19.8)	23.0 (19.6)	22.5 (31.8)
Husband % of family income[b]	59.3 (29.5)	65.2 (29.2)	65.2 (30.4)	25.0 (35.3)
Wife %of family income[b]	30.6 (26.7)	30.2 (27.3)	28.4 (25.5)	25.0 (35.3)
Numbers in cells are means and standard deviations from one-way ANOVA analyses of the 4-level drinking variable. Significant differences at $p<.05$ are denoted by the following: a. Denotes significant differences $p<.05$ between Korean female drinking status. b. Denotes significant differences $p<.05$ between Korean male drinking status. c. Denotes significant differences $p<.05$ between Chinese female drinking status. d. No significant differences observed between Chinese male drinking status.				

Table 14. Current smoking status of Chinese American males regressed on hours employed, ethnicity of co-workers, immigrant stress and acculturation and effect decomposition from path analyses, 2010-2011.

	OR[a]	P=[a]	95% CI[a]	Direct Effects[b]	Indirect Effects Immigrant Stress[b]	Indirect Effects Acculturation[b]	Total Effects[b]
Listed sample	0.63	.14	(0.34, 1.16)	-.12	--	--	-.12
Predominantly Chinese co-workers (1=yes , 0=no)	2.07	.03	(1.07, 4.01)	.24	.04	-.04	.24
Hours husband employed	1.03	.05	(0.99, 1.05)	--	--	-.04	-.04
Immigrant stress	1.71	.10	(0.90, 3.25)	.25	--	.03	.28
Acculturation	0.16	<.001	(0.04, 0.60)	-.31	.03	--	-.28

a. Numbers in cells represent odds ratios, p-values and 95% confidence intervals from logistic regression. Chi-square = 42.86, df=5,p<.001, Nagelkerke R^2=.205.
b. Numbers in cells represent direct, indirect and total effects calculated from path analyses testing mediation by immigrant stress and acculturation.

Table 15. Current smoking status of Korean American females regressed on husband smoking status, hours of employment and household responsibilities for husband and wife, and immigrant stress and effect decomposition from path analyses, 2010-2011.

	OR[a]	P=[a]	95% CI[a]	Direct Effects[b]	Indirect Effects Immigrant Stress[b]	Total Effects[b]
Listed sample	0.61	.48	(0.15, 2.41)	-.10	-.01	-.11
Husband smokes (1=yes , 0=no)	4.42	.03	(1.15, 16.98)	.13	.01	.14
Hours husband employed	0.96	.06	(0.92, 1.00)	--	--	--
Hours wife employed	1.03	.04	(1.00, 1.07)	.15	-.02	.13
Hours household tasks husband	7.98	.07	(0.82, 77.45)	.14	-.01	-.13
Hours household tasks wife	0.99	.098	(0.92, 1.07)	-.08	.01	-.07
Immigrant stress	0.38	.09	(0.12, 1.16)	-.10	--	-.10
a. Numbers in cells represent odds ratios, p-values and 95% confidence intervals from logistic regression. Chi-square = 24.99, df=7,p<.001, Nagelkerke R^2=.274. b. Numbers in cells represent direct, indirect and total effects calculated from path analyses testing mediation by immigrant stress and acculturation.						

	Direct Effects[b]	Indirect Effects[b]	Total Effects[b]
Table 16. Direct and indirect effect decomposition from path analyses for drinking level among Korean American males in California, 2010-2011.			
Listed sample	-.16	-.01	-.17
Age	-.09	-.01	-.10
Hours husband employed	.20	.03	.23
Hours household tasks husband	-.09	-.01	-.10
CESD depression index	.10	--	.10
Numbers in cells represent direct, indirect and total effects calculated from path analyses testing mediation by CESD depression index. Drinking level is coded 0 = never, 1 = light, 2= moderate, 3=heavy.			

Table 17. Adjusted polychotomous regression of four levels of alcohol consumption among Korean American males in California, 2010-2011

	Heavy vs. Never			Moderate vs. Never			Light vs. Never		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
Listed sample	0.38	(0.04, 3.33)	.38	0.12	(0.02, 0.60)	.01	0.40	(0.10, 1.53)	.18
Age	1.00	(0.90, 1.11)	.99	0.99	(0.92,1.06)	.85	1.00	(0.95, 1.04)	.98
CESD Depression Index	4.33	(1.05, 17.8)	.04	2.22	(0.91, 5.42)	.07	1.98	(0.96, 4.06)	.06
Hours Husband Employed	1.07	(1.00 , 1.13)	.03	1.07	(1.03, 1.12)	.<.001	1.03	(1.01, 1.06)	.01
Hours household tasks husband	0.84	(0.67, 1.04)	.11	0.91	(0.83, 1.01)	.09	0.93	(0.67, 1.04)	.02

a. Information presented represent a polychotomous logistic regression where the reference category is never drinker (0). Chi-square= 43.93, df = 15, p<.001. Numbers in cells represent odds ratios, 95% confidence intervals, and significance tests comparing each level of drinking to never drinker.

| Appendix Table1. Hours per week of household tasks by family role and nationality, 2010-2011						
	Korean(N=893)			Chinese (N=723)		
	Wife	Husband	Parents	Wife	Husband	Parents
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Meal preparation & cleaning[b]	15.4 (8.0)	3.5 (4.4)	5.9 (6.7)	9.5 (7.0)	3.2 (4.4)	4.5 (5.6)
Cleaning house[a,b]	2.3 (2.6)	1.0 (1.1)	2.7 (12.5)	3.7 (4.1)	1.3 (2.3)	2.3 (5.5)
Outdoor/ household maintenance[a,b]	0.18 (0.5)	0.37 (0.7)	0.87 (2.3)	0.39 (1.4)	0.78 (1.8)	0.50 (1.7)
Washing, ironing, mending[a,b]	2.3 (1.9)	0.62 (0.4)	0.88 (1.0)	1.7 (2.1)	0.44 (1.2)	0.57 (2.4)
Pay bills; financial records[b]	0.74 (2.3)	0.62 (1.8)	0.08 (0.2)	0.46 (0.5)	0.52 (1.2)	0.06 (0.2)
Auto maintenance & repair[a]	0.19 (0.4)	0.65 (0.9)	0.03 (0.1)	0.17 (0.3)	0.39 (0.6)	0.03 (0.1)
Child care[b]	20.2 (23.6)	6.3 (9.5)	8.5 (12.9)	17.2 (28.7)	7.2 (16.0)	13.6 (27.0)
Total without child care[b]	21.2 (10.3)	6.8 (5.9)	10.4 (14)	16.0(10.8)	6.7 (7.1)	7.8 (9)
Percentage without child care[ab]	73.8% (19)	26.0% (21)	24.7% (23)	68.8% (23)	31.6% (26)	24.2% (24)
Numbers in cells represents average number of hours spent on tasks, plus total and percentage. One participant per household provided responses for their own estimated hours and that of their spouse and of their parents. All participants included in data were married. Only 132 of the participants had parents living with them. a. Denotes significant difference p<.05 between Korean and Chinese husbands. b. Denotes significant difference p<.05 between Korean and Chinese wives. c. Denotes significant differences were observed between Korean and Chinese parents.						
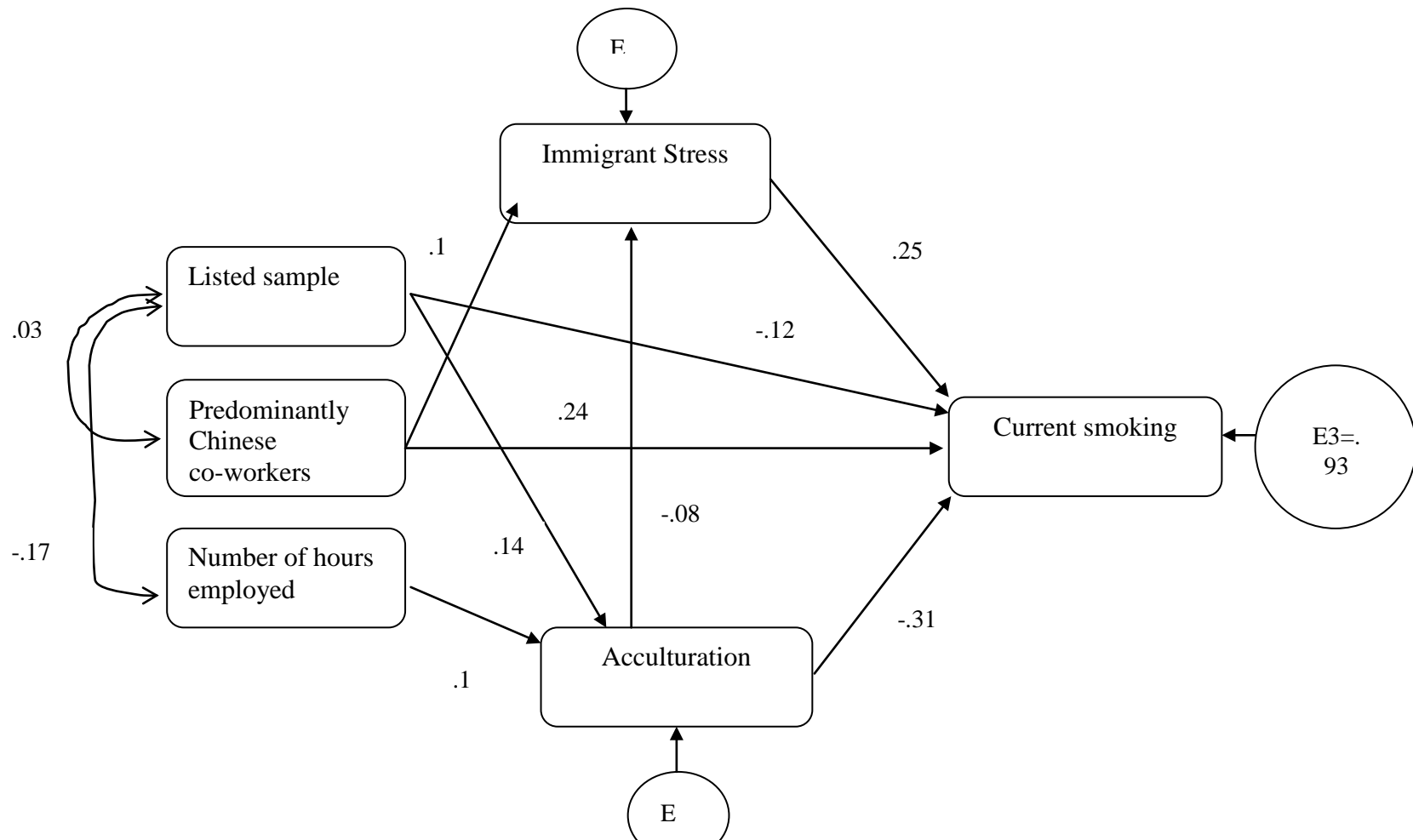
Figure 1. Observed path model of Chinese men's current smoking (some or all days). Numbers are standardized regression weights using path analysis after insignificant associations deleted. All associations were statistical significant atp<.05.