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## Environmental Influences on Tobacco Use Among Asian American and Pacific Islander Youth

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### Abstract

There is growing interest in understanding individual and environmental influences on youth risk behaviors, including tobacco use. The purpose of this article is to describe the processes and findings from a study that sought to increase the capacity of Asian American and Pacific Islander (AAPI) community-based organizations to understand and address the environmental influences on tobacco use among AAPI youth. Using a multimethod approach to data collection that included GIS (geographic information system) mapping, Photovoice, and individual youth surveys, a team of community and university researchers conducted a 3-year study to assess and address the environmental influences of tobacco use among youth. Community-based participatory research principles guided the study and facilitated unique capacity building and analyses throughout the study period. Results in Long Beach from all three methods highlighted the associations between youth smoking and environmental factors: GIS mapping identified at least 77 separate locations of pro-tobacco influences, photographs captured many of these locations and provided youth leaders with opportunities to identify how other influences contributed to smoking risk, and surveys of youth indicated that perceived community safety and proximity to pro-tobacco influences were associated with smoking in the past 30 days. Subsequent community-based organization activities undertaken by study partners are also discussed, and lessons learned summarized.

### Keywords

advocacy; Asian; minority health; community-based participatory research; health research; Pacific Islander; tobacco prevention and control

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## INTRODUCTION

Despite decades of aggressive educational and advocacy efforts in the United States, tobacco use remains high among American adolescents and young adults, with one in five being daily cigarette smokers at age 18 (Johnson, O'Malley, Bachman, & Schulenberg, 2009). Available data on Asian American and Pacific Islander (AAPI) youth point to similarly high rates of use. For instance, smoking prevalence in Californian and Hawaiian ninth graders was 12.1% among Filipinos and 19.7% among Pacific Islander ninth graders compared with 16.3% among Whites (Wong, Klingle, & Price, 2004). Such data may not be surprising since tobacco use is highly ingrained in the culture of Asian countries, where smoking rates are high (e.g., over 40% of men in East and Southeast Asia) in large part because it is considered socially and culturally acceptable (Banta et al., 2012; Yel, Bui, Job, Knutsen, & Singh, 2011). Because of gender norms, tobacco use prevalence among AAPI adult men is among the highest in this country: (e.g., 48% to 72% among Laotian, 24% to 71% among Cambodian, and 42% among Native Hawaiian males; Friis et al., 2012; Lew & Tanjasiri, 2003).

Effective youth tobacco prevention must consider the environmental context in which youth live. Access to tobacco products, commercial images through local advertising, as well as movie images all may influence youth decisions to smoke (Cummings & Coogan, 1992; DiFranza, Norwood, Garner, & Tye, 1987; Lipton, Banerjee, Levy, Manzanilla, & Cochrane, 2008). In addition, research has shown AAPIs to be at high risk for such environmental exposures. For instance, researchers studying tobacco industry marketing found that tobacco advertising (including billboards and storefront displays) are more prevalent in ethnically diverse and low-income communities compared with White, affluent ones (Laws, Whitman, Bowser, & Krech, 2002; Wildley et al., 1992). In another study of tobacco industry documents, AAPI youth were targeted with free cigarette giveaways and other promotion campaigns (Muggli, Pollay, Lew, & Joseph, 2002). Interestingly, perceived community social cohesion and living in an ethnic enclave were found to be important protective factors against youth smoking in AAPI neighborhoods (Kandula, Wen, Jacobs, & Lauderdale, 2009).

The purpose of this article is to describe the processes and findings from a study that sought to increase the capacity of youth within AAPI community-based organizations (CBOs) to assess and address the environmental influences on tobacco use in their communities. This effort helped identify important tobacco prevention needs and contribute to youth and CBO efforts to develop and implement education programs and advocacy efforts.

## METHOD

This was a 3-year (2005–2008) descriptive study of the perceived individual and environmental influences on tobacco use among AAPI youth aged 15 to 25 years. The goals were (a) to design and test the feasibility of environmentally-oriented data collection methods to understand tobacco use influences on AAPI youth and (b) to use a community-based participatory research (CBPR) approach that promotes capacity building in each community to not only understand but also develop policy advocacy-oriented actions to

address the environmental influences in their lives. Four CBOs in California and Washington were approached during the study design phase, due to their previous involvement in a national AAPI tobacco control network through which they had expressed their interests in better understanding and addressing issues facing their Cambodian, Chamorro, Laotian, and multi-AAPI communities. Once the study was funded, the research partnership incorporated core principles of CBPR in all phases of the study design, implementation, and evaluation (Israel, Schulz, Parker, & Becker, 1998; Tanjasiri, Kagawa Singer, Nguyen, & Foo, 2002): shared principal investigators representing both CBO and university researchers, monthly conference calls with the community and university investigators, and biannual in-person daylong meetings with the entire study team during which assessment approaches and instruments were drafted and finalized. CBO staff selected youth who served in leadership positions within their agencies to participate in the design and implementation of the study. Trainings on recruitment and data collection procedures, as well as on public speaking and advocacy planning, were provided at these meetings by university researchers to address needs and requests by the CBO adults and youth leaders. All study protocols, instruments, and consent forms that involved data collection by youth and adults were submitted and approved by the university institutional review board. All CBOs received monetary support from the grant for their involvement.

### Data Collection Methods

Our community-informed assessment of environmental influences on AAPI youth smoking was informed by three mixed-method data collection strategies: geographic information system (GIS) mapping, Photovoice, and individual youth surveys.

**GIS mapping**—GIS mapping involves the collection of geo-coded data to locate sites of interest on maps and has been used to show the correlation between perceived access and objective access in studies of healthy environments (Caspi, Kawachi, Subramanian, Adamkiewicz, & Sorensen, 2012; Moore, Diez Roux, & Brines, 2008). In this study, we used global positioning system (GPS) devices to collect and store location data (called “waypoints,” which are exact longitude and latitude coordinates) on community locations of particular interest. Through discussions at biannual in-person meetings, our study community partners were most interested in identifying the locations of items (e.g., tobacco advertisement) or activities (e.g., hangouts where youth smoked together) that promoted smoking as an appealing behavior for youth. Furthermore, CBO adult staff were also interested in identifying those places (e.g., community centers) where healthy behaviors were promoted that could help protect youth from smoking. Next, key informant interviews with 36 youth and community leaders (e.g., social service agency staff, ministers, and elders) were conducted to (a) understand the physical boundaries of the ethnic community, (b) identify the kinds of locations they perceived as having *protobacco* (our term for locations that promoted smoking) influences on youth, and (c) identify the kinds of locations that they perceived as having *anti-tobacco* (our term for locations that promoted healthy behaviors other than smoking) influences on youth. In Year 1, key informant interview trainings were conducted by CBO adult staff and youth leaders to discuss informed consent, informant selection, and interview processes. Each interview lasted approximately 1 hour,

and after completion CBO adult staff and youth leaders wrote summaries of the interviews based on written notes and tape recordings.

Summaries from key informant interviews were shared with all study team members, who then developed a list of all types of community influences on youth tobacco use. Each item on this list was assigned a waypoint code number and categorized as a protobacco or anti-tobacco influence. In Year 2, GPS devices (Garmin eTrex) were purchased from a local sporting goods store and programmed with the waypoint code numbers. For approximately a 2-month period, pairs of CBO adult staff and youth leaders walked through the entire community (using boundaries defined via key informant interviews) and inputted the waypoints ( $n = 111$  total) by perceived category (pro-tobacco or anti-tobacco) into their GPS devices. For each waypoint, youth also used written log forms to provide brief descriptions of each location.

**Photovoice**—Photovoice is a process that promotes community empowerment by engaging people in identifying the needs of their own communities through photography by using the photographs as the focal point of group discussions about why these needs exist and sharing the photographs with policy makers in order to create positive community changes (Wang & Burris, 1997). During GIS data collection in Year 2, a total of 32 youth leaders also took pictures of any community location that they believed influenced youth toward tobacco use. Photographs were uploaded onto the CBO computer and displayed for the youth, at which time the youth selected specific photographs that appealed to them. The youth then used the Photovoice “SHOWeD” mnemonic to develop written analyses of each picture that described what they saw, why they believed the situation existed, and what they recommended to address the situation (Wang & Burris, 1997). A more in-depth description of our Photovoice methodology and results are presented in a previous publication (Tanasiri, Lew, Kuratani, Wong, & Fu, 2011).

**Youth surveys**—Due to a limitation in funding, a self-administered survey of youth was undertaken only in Long Beach to quantitatively explore the relative influences of interpersonal and community factors on youth smoking. The survey included standard items from the National Health Interview Surveys and California Tobacco Surveys on the use of tobacco and other drugs, as well as demographics and ethnic identity (Pierce et al., 1998; Pierce, Fiore, Novotny, Hatziandreu, & Davis, 1989). In addition, items were also included on community safety and violence, youth access to tobacco and other drugs, and youth participation in leadership and/or other protective programs in their communities. This subjective assessment of a youth’s neighborhood provides some insight into environment/neighborhood stressors and mitigators of stress that might bear on tobacco use. At the end of Year 1, the survey was pilot-tested with 12 youth to confirm comprehension and time duration, and was then implemented in Year 2. A total of 10 youth leaders at each CBO were trained on identifying and recruiting youth respondents (from shopping malls and other youth hangouts), consent procedures, and administering the surveys. At the conclusion of each completed survey, youth respondents were given two movie tickets valued at approximately \$15. By the end of Year 2, a total of 298 surveys were completed by Cambodian youth 15 to 25 years old. A total of 33 youth who were approached refused to

participate (for an overall response rate of 90%) with reasons for refusal including the lengthiness of the survey and disinterest in the incentive items.

### Data Collection, Management, and Analyses

Due to the multiple data activities and unique CBO efforts in each geography area, the remainder of this article will focus on describing the processes in Long Beach, California. Data collection proceeded over approximately 8 months in Year 2, during which time GPS and Photovoice data were conducted, and individual surveys were collected in Long Beach. Because youth were interested in seeing a different city environment, they also went to Pasadena, California, and conducted Photovoice. Throughout this time, CBO staff coordinated the transfer of GPS data and log forms, photographs with SHOWeD analyses, and individual surveys to the university study team members for data input and analyses. Geo-coded data was downloaded from the GPS devices and coded as either a pro-tobacco or an anti-tobacco community influence on youth tobacco use. Photos were stored as image files on CDs, whereas any text-based data were maintained in electronic word-processing files. All of the photos were reviewed and coded for themes reflective of the concerns raised by the SHOWeD analyses.

All individual survey data were entered using SPSS Version 16. Outcome variables for this study were *ever smoking* and *smoking* within the past 30 days, whereas predictor variables included a six-item scale that assessed negative attitudes toward smoking (e.g., I dislike being around people who are smoking), number of similar-aged peers they know who smoke cigarettes or use other tobacco products, perceived level of safety and perceived level of stress in the neighborhood they live in, and having ever participated in a community youth program where they live (yes or no). In Year 3, descriptive statistics were calculated for the variables listed above, as well as for the demographic variables of age, ethnicity, gender, grade in school, born in the United States (yes or no), and the approximate amount of discretionary money that participants have per week to spend on themselves. Two multiple logistic regression models were calculated: one predicting smoking 100 cigarettes and one for past 30 day smoking. These models included only predictor variables and demographic variables mentioned that were significantly associated with the outcome variable in bivariate analyses. Last, survey and GIS data were also analyzed in Year 3 to determine associations between smoking and proximity to pro- or anti-tobacco influences in the community. Average distance (in miles) between home address (obtained from individual surveys) and positive influence locations for smoking (collected by GPS devices) were calculated and then entered as a predictor variable in a logistic regression with the outcome smoking in the past 30 days (yes or no) and ever having smoked 100 cigarettes for one's whole life (yes or no).

## RESULTS

As shown in Table 1, the overwhelming majority ( $n = 74$ ) of waypoints in Long Beach were categorized as pro-tobacco because youth leaders perceived these locations as promoting smoking as appealing to youth. These pro-tobacco locations included tobacco advertisement, convenience shops, fast-food restaurants, residences, schools, community spaces, faith

institutions, and bus stops. Many locations ( $n = 27$ ) were perceived by youth leaders to be both anti- and protobacco, such as one middle school (that was perceived to fight smoking through anti-tobacco education but that also had areas on campus where youth commonly smoked) and one church (where healthy community values were promoted but also where smokers congregated and left their butts on the sidewalk). Only 10 locations were perceived by the youth leaders to be anti-tobacco influences, including three liquor stores (that did not promote tobacco sales), the community recreational center, and a high school (both of which strictly enforced no-smoking policies).

Spatial analyses found associations between proximity to pro-tobacco influences and youth smoking behavior. As shown in Table 2, youth who smoked within the past 30 days lived significantly closer in proximity to negative influences compared with youth who did not smoke in the past 30 days. Youth who smoked at least 100 cigarettes in their lifetime, however, did not appear to live any closer in proximity to negative influences, perhaps indicating that such sites did not influence maintenance as much as initiation. Last, youth who were involved in leadership programs (e.g., at their schools, at CBOs, etc.) lived significantly farther away from negative influences than youth who did not participate in such programs.

Photographs and descriptions developed by the youth exemplified four different kinds of environmental factors on smoking: (a) youth-targeted cigarette advertisements, (b) the abundance of smoke shops displaying cigarette advertisements of any kind, (c) the poor physical appearance of their community, and (d) anger at tobacco companies that were profiting from their community. One youth took a picture of a tobacco outlet (Figure 1) and described it as promoting youth smoking via youth-targeted advertisements and sales by stating,

A smoke shop is on PCH (Pacific Coast Highway), so when people drive by they can see the smoke shop. There are a lot of advertisements on the window and it is near an elementary school. To stop kids from using drugs, we need to start a program to tell the teens about the consequence of drugs. Someone can buy the store and make the smoke shop move.

As shown in Figure 2, another youth selected and described a photograph depicting the poor physical quality of the city as part of the reason why youth also smoke. According to this youth,

Driving by the ditch, people can see all the graffiti and all the litter. The graffiti is in a neighborhood and it's gang related. All the litter and graffiti make Long Beach look bad. We should make a place, so they can tag and start a gang prevention program.

In contrast, when they went to Pasadena the youth were struck by the lack of cigarette and other promotions, as well as the general cleanliness and beauty of the city environment. In describing Figure 3, one youth wrote,

This picture shows how clean Pasadena is and the environment around it. Pasadena is a clean place and isn't as dirty as Long Beach. ... Not a lot of people smoke in

Pasadena and there is barely any cigarette ads around. After looking at this picture and how clean it is I want Long Beach to be the same, to be clean, pretty, and a great place.

Last, youth surveys indicated that perceptions of the environment were associated with smoking status. Of the 298 youth who participated in the survey, 93.6% were all or part Cambodian, 52.9% were male, and 83.2% were between 16 and 19 years old. The majority were born in the United States (92.7%), were 11th or 12th graders (71.7%), and had more than \$10 of discretionary spending money per week (68.9%; data not shown). Cronbach's alpha was .83 for the positive attitudes toward smoking scale; with possible scores ranging from 0 to 18, the mean score was 5.8 ( $SD = 4.1$ ). Nearly all participants (90.2%) indicated that at least "a few" of the same-aged peers whom they knew smoked cigarettes or other tobacco products. Close to 1 in 4 participants indicated that their neighborhoods were either "unsafe" or "very unsafe" to live in (25.3%) and either "stressful" or "very stressful" to live in (22.9%). Nearly half (49.3%) had ever participated in a youth program within their community. Of the entire sample of 298 participants, 138 (46.3%) indicated that they had ever tried smoking, and 61 (20.5%) indicated that they smoked at least one cigarette in the past 30 days (data not shown).

Table 3 presents multiple logistic regression results of the two outcome variables: smoking 100 cigarettes in lifetime and smoking in past 30 days. Smoking 100 cigarettes in lifetime was positively associated with positive attitudes toward smoking. Past 30-day smoking was associated with positive attitudes toward smoking and perceived neighborhood safety and was marginally associated with the number of known peers who smoke. Although preliminary bivariate analyses indicated that males had higher rates of lifetime smoking, that discretionary income was positively associated with past 3-day smoking, and lifetime participation in a youth program within their community was negatively associated with past 30-day smoking, none of these associations were significant in the multivariate analyses.

## DISCUSSION

We found that perceived environmental factors/features had a substantial influence on AAPI youth smoking risk and behaviors. Data from all three mixed-methods (survey, Photovoice, and GIS mapping) identified the many and diverse environmentally oriented influences on youth smoking, including not only tobacco-related factors (e.g., cigarette advertisements) but also community-related factors (e.g., perceived safety of the community, which was slightly more predictive of 30-day smoking than number of smoking peers) that put youth at risk for using tobacco products.

Perhaps more important, youth were empowered to use the study results to positively influence their environment. When the youth in Long Beach compiled their Photovoice and GIS mapping results in Year 3, they were motivated to share the findings with local stakeholders. The youth created a display that was presented to the Coalition for a Smoke Free Long Beach, which was working on a tobacco retailer permit (TRP) ordinance. The coalition arranged for the youth to present to the city councilperson of the sixth district, with the message that there were too many smoke shops and liquor stores selling cigarettes in



their community. In the words of one youth leader, “Though I know that tobacco alone can be harmful . . . but growing up and living in the ghetto part [of] Long Beach is also dangerous. I’ll probably die from gang violence before dying from cancer.” One month later, that city councilperson put the TRP on the city council agenda where it was unanimously passed, and the youth leaders were credited with helping the council recognize the importance of promoting citywide policies for positive community change.

Although many positive processes and outcomes arose from this study, we also faced many challenges that limit the generalizability and replicability of our efforts for other communities and populations. Given the focus on youth empowerment, nonprobability sampling based on youth organizational affiliation was used throughout all data collection efforts. Thus, results may not be applicable to the larger Chamorro, Cambodian, and Laotian communities. Since the survey was only administered to Cambodian youth in Long Beach, we are uncertain about the applicability of results to the other AAPI subgroups. Given the exploratory nature of the study, we did not measure the validity or reliability of the scales and coding methods. Last, we did not measure the impacts of the CBPR-informed trainings on changes in individual knowledge and skills. Despite these challenges, however, partnering CBO and university institutions emerged from this process with greater understanding of and capacities to address larger community-level influences on AAPI youth tobacco use.

### Lessons Learned

Ultimately, we hope this article describes how innovative, mixed-methods approaches can not only provide critical community assessment information to plan future interventions but also creatively engage youth and community members in tobacco control. From our experience, we also found that GIS and Photovoice yielded visually powerful information that could be used to facilitate discussions of environmentally oriented community recommendations. To the degree that these assessments and recommendations are shared with policy makers, they become advocacy tools that can contribute to community-wide tobacco policy change.

Furthermore, we credit the CBPR approach as essential in our efforts to develop innovative and community-responsive research strategies and engagement mechanisms. CBPR efforts such as daylong biannual meetings that included trainings on research knowledge and advocacy skills helped promote community readiness to support policy opportunities as they arose, such as Long Beach’s TRP ordinance. Close collaborations between university researchers and CBO staff informed the design, development, testing, implementation, analysis, and dissemination of all GIS and Photovoice activities in our AAPI communities. We strongly feel that CBPR should be a key strategy for populations that have not been effectively reached for tobacco prevention and control, and hope that future research builds on our efforts to take a community-informed approach in assessing and addressing the many environmental influences on youth tobacco smoking.

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**FIGURE 1.**  
Smoke Shop in Long Beach



**FIGURE 2.**  
Community Conditions in Long Beach

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**FIGURE 3.**  
Environmental condition in Pasadena

**TABLE 1**

Types of Pro- and Anti-Tobacco Locations Influencing Youth Smoking in Long Beach

	Anti-Tobacco	Pro-Tobacco	Both Pro and Anti
Ads			
Cigarette ad		4	
Shops			
Liquor store	3	10	2
Smoke shop	—	4	—
Gas station	—	1	2
Small market	—	5	2
Supermarket	—	2	—
Other	1	2	2
Food			
Fast food	1	1	2
Donut shop	—	2	—
Restaurant	—	—	1
Coffee shop	1	—	—
Residential			
House	1	7	—
Apartment	—	2	—
Schools			
Elementary	—	2	—
Middle	—	—	2
High	1	1	1
Community			
Park	—	6	4
Recreation center	1	—	3
Library	—	1	—
Faith			
Church	—	—	1
Temple	—	—	1
Transportation			
Bus stop	—	2	2
Parking lot	—	4	1
Health			
Clinic	—	1	—
Hospital	1	—	—
Other			
Alley	—	9	—
Ditch	—	5	—
Sidewalk	—	3	—
Laundromat	1	—	—

	<b>Anti-Tobacco</b>	<b>Pro-Tobacco</b>	<b>Both Pro and Anti</b>
Total	10	74	27

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**TABLE 2**

Associations Between Proximity (in Miles) to Pro-Tobacco Influences and Youth Smoking in Long Beach

Variable	Proximity to Pro-Tobacco Influences	<i>p</i>
Smoked in last 30 days		
Yes	1.49	*
No	2.06	
Smoked 100+ cigarettes in lifetime		
Yes	1.97	<i>ns</i>
No	1.98	
Participated in leadership programs		
Yes	2.26	*
No	1.70	

\*  $p < .05$ 

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**TABLE 3**Logistic Regression of Self-Reported 100-Cigarette and Past 30-Day Smoking ( $n = 298$ )

	<u>Smoked 100 Cigarettes During Lifetime</u>		<u>Smoked in Past 30 Days</u>	
	Odds Ratio	<i>p</i>	Adjusted Odds Ratio	<i>p</i>
Predictor variables				
Positive attitudes toward smoking	1.21	**	1.47	***
Number of known peers who smoke	—	—	1.46	<i>ns</i>
Perceived neighborhood safety (not safe)	—	—	1.88	**
Demographic variables				
Gender (female)	—	—	1.03	<i>ns</i>
Discretionary money per week	—	—	1.08	<i>ns</i>

\*\*  
 $p < .01$ .

\*\*\*  
 $p < .0001$ .

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