# YOUTHS' DAILY EXPOSURE TO TOBACCO OUTLETS WITHIN THEIR ACTIVITY SPACES AND CIGARETTE SMOKING BEHAVIORS: ARE SOME YOUTHS MORE SUSCEPTIBLE?

**Prevention Research Center**

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## OBJECTIVE

Addressed two research questions:

. Is youths' daily exposure to tobacco outlets within their activity spaces (i.e., number of outlets and time near outlets) associated with cigarette smoking behaviors on that day?

. Do demographic and personal characteristics moderate these associations?

## METHODS

### PARTICIPANTS

. 100 youth (ages 16-20) in 8 California city areas
. 41% Male
. 37% non-Hispanic White
. 40% under 18 years of age

### PROCEDURES

. Observations of all tobacco outlets to document addresses and obtain GPS location coordinates

. Youth carried GPS-enabled smartphones with a survey application for 14 days

. After an initial survey, youth responded to brief daily surveys and GPS location coordinates were obtained at one-minute intervals

. Activity spaces were constructed by joining sequential location points

### MEASURES

Initial Survey

. Age; gender; race/ethnicity; subjective socioeconomic status (SES); problem behaviors; perceived community disapproval of tobacco use

Daily Surveys

. Any cigarette smoking on that day
. Number of cigarettes smoked

Exposure to tobacco outlets

. Number of tobacco outlets within 100m of activity space polylines each day

. Number of minutes within 100m of tobacco outlets each day

### DATA ANALYSIS

. 1,098 assessments from 100 participants

. Multilevel mixed effects logistic and zero-inflated negative binomial regression models to control for clustering of assessments within participants over time

## RESULTS

### DESCRIPTIVE STATISTICS

| Variable | Percent | Mean (SD) | Range |
|---|---|---|---|
| Number of outlets within 100m of activity space polylines per day | | 4.28 (4.94) | 0.00-27.07 |
| Number of minutes within 100m of tobacco outlets per day | | 16.99 (46.72) | 0.00-573.00 |
| Any cigarette smoking on a day | 9.7 | | |
| Number of cigarettes smoked per day | | 0.39 (1.51) | 0.00-18.00 |

### IS YOUTHS' DAILY EXPOSURE TO TOBACCO OUTLETS WITHIN ACTIVITY SPACES ASSOCIATED WITH CIGARETTE SMOKING BEHAVIORS ON THAT DAY?

| | Any daily cigarette smoking[1] | Number of cigarettes per day[2] |
|---|---|---|
| | OR (95% CI) | IRR (95% CI) |
| Number of outlets within activity spaces polylines | 1.06 (0.97, 1.15) | 1.05 (1.01, 1.10)* |
| < 18 years old | 0.64 (0.10, 6.87) | 0.38 (0.12, 1.26) |
| Female | 0.49 (0.10, 4.50) | 1.10 (0.35, 3.27) |
| Non-Hispanic White | 1.74 (0.14, 21.61) | 1.03 (0.33, 3.18) |
| Subjective SES | 0.79 (0.35, 1.79) | 0.75 (0.54, 1.03) |
| Problem behaviors | 11.88 (1.00, 141.37)* | 6.45 (2.13, 19.48)** |
| Community disapproval | 0.32 (0.10, 1.35) | 0.48 (0.24, 0.98)* |

* p ≤ 0.05; ** p ≤ 0.001; [1] Results of multilevel mixed effects logistic regression model; [2] Results of multilevel negative binomial model

. Controlling for demographic and personal characteristics, greater numbers of tobacco outlets within 100m of activity space polylines was associated with increased number of cigarettes smoked per day.

### IS TIME SPENT NEAR TOBACCO OUTLETS EACH DAY ASSOCIATED WITH CIGARETTE SMOKING BEHAVIORS ON THAT DAY?

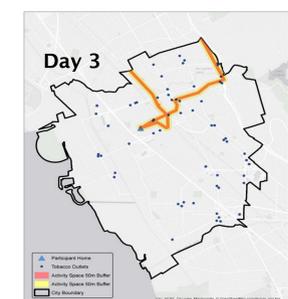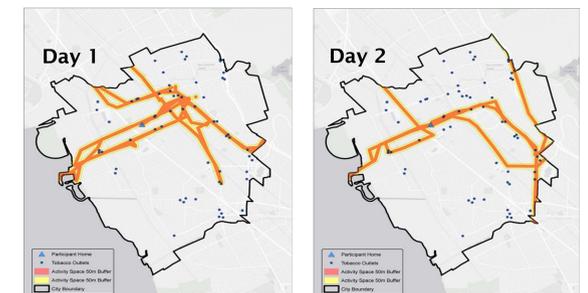| | Any daily cigarette smoking[1] | Number of cigarettes per day[2] |
|---|---|---|
| | OR (95% CI) | IRR (95% CI) |
| Number of minutes within 100m of tobacco outlets | 0.99 (0.98, 1.02) | 1.00 (0.99, 1.01) |
| < 18 years old | 0.65 (0.10, 7.12) | 0.38 (0.11, 1.26) |
| Female | 0.51 (0.10, 4.78) | 1.09 (0.36. 3.25) |
| Non-Hispanic White | 1.85 (0.14, 23.95) | 1.00 (0.33, 3.06) |
| Subjective SES | 0.79 (0.34, 1.80) | 0.74 (0.53, 1.02) |
| Problem behaviors | 11.47 (0.92, 143.34) | 7.04 (2.32, 21.42)** |
| Community disapproval | 0.32 (0.10, 1.38) | 0.46 (0.22, 0.95)* |

* p ≤ 0.05; ** p ≤ 0.001; [1] Results of multilevel mixed effects logistic regression model; [2] Results of multilevel negative binomial model

. Controlling for demographic and personal characteristics, time spent within 100m of tobacco outlets was not associated with any cigarette use on that day or number of cigarettes smoked.

### DO DEMOGRAPHIC OR PERSONAL CHARACTERISTICS MODERATE THE ASSOCIATIONS BETWEEN DAILY EXPOSURE TO TOBACCO OUTLETS WITHIN ACTIVITY SPACES AND CIGARETTE SMOKING BEHAVIORS?

. None of the demographic or personal characteristics (i.e., age group, female, race/ethnicity, subjective SES, problem behaviors, and community disapproval) moderated the effects of exposure to tobacco outlets within activity spaces (both number of outlets and time) on any daily cigarette smoking.

. Being a female moderated the association between number of minutes within 100m of tobacco outlets and number of cigarettes smoked per day (IRR = 0.98, p ≤ 0.05).

. Subjective SES (from poor to rich) moderated the association between number of minutes within 100m of tobacco outlets and number of cigarettes smoked per day (IRR = 0.99, p ≤ 0.05).

. Involvement in problem behaviors (from never to often) moderated the associations between

  . Number of outlets within activity spaces (IRR = 1.10, p ≤ 0.05) and the of number of cigarettes smoked per day.

  . Number of minutes within 100m of tobacco outlets (IRR = 1.01, p ≤ 0.05) and the of number of cigarettes smoked per day.

## ACTIVITY SPACES OF ONE PARTICIPANT ACROSS THREE CONSECUTIVE DAYS



Day 1

Day 2

Day 3

## NUMBER OF MINUTES WITHIN 100M OF TOBACCO OUTLETS FROM 0 TO >10.
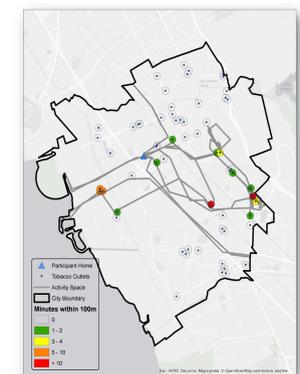


## CONCLUSIONS

. Daily exposure to tobacco outlets within activity spaces was not associated with any cigarette smoking on that day.

. Daily exposure to greater numbers of tobacco outlets within activity spaces increased the number of cigarettes youths smoked on that day.

. Moderation effects suggest that males, low SES youths and those more involved in problem behaviors are more susceptible to exposure to tobacco outlets in their daily routine activity spaces.

. Results may indicate different mechanisms by which these types of exposure matter (e.g., norms versus availability).

. Community-level policies and preventive interventions should target high outlet densities and locations to reduce youths' cigarette smoking.