



# Characterizing Smoking-Related Tweets from California College Campuses

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## Introduction

College-aged youth are very active on social media, yet smoking-related social media engagement in these populations has not been thoroughly investigated. We sought to characterize Twitter messages from California four-year college campuses.

## Methods

Tweets from 2015-2019 with geospatial coordinates in CA college campuses containing smoking-related keywords were annotated for smoking product type, sentiment, and smoking-related observation. College-level data on cost of attendance, race/ethnicity, and academic history were tested for correlation with tweet characteristics.

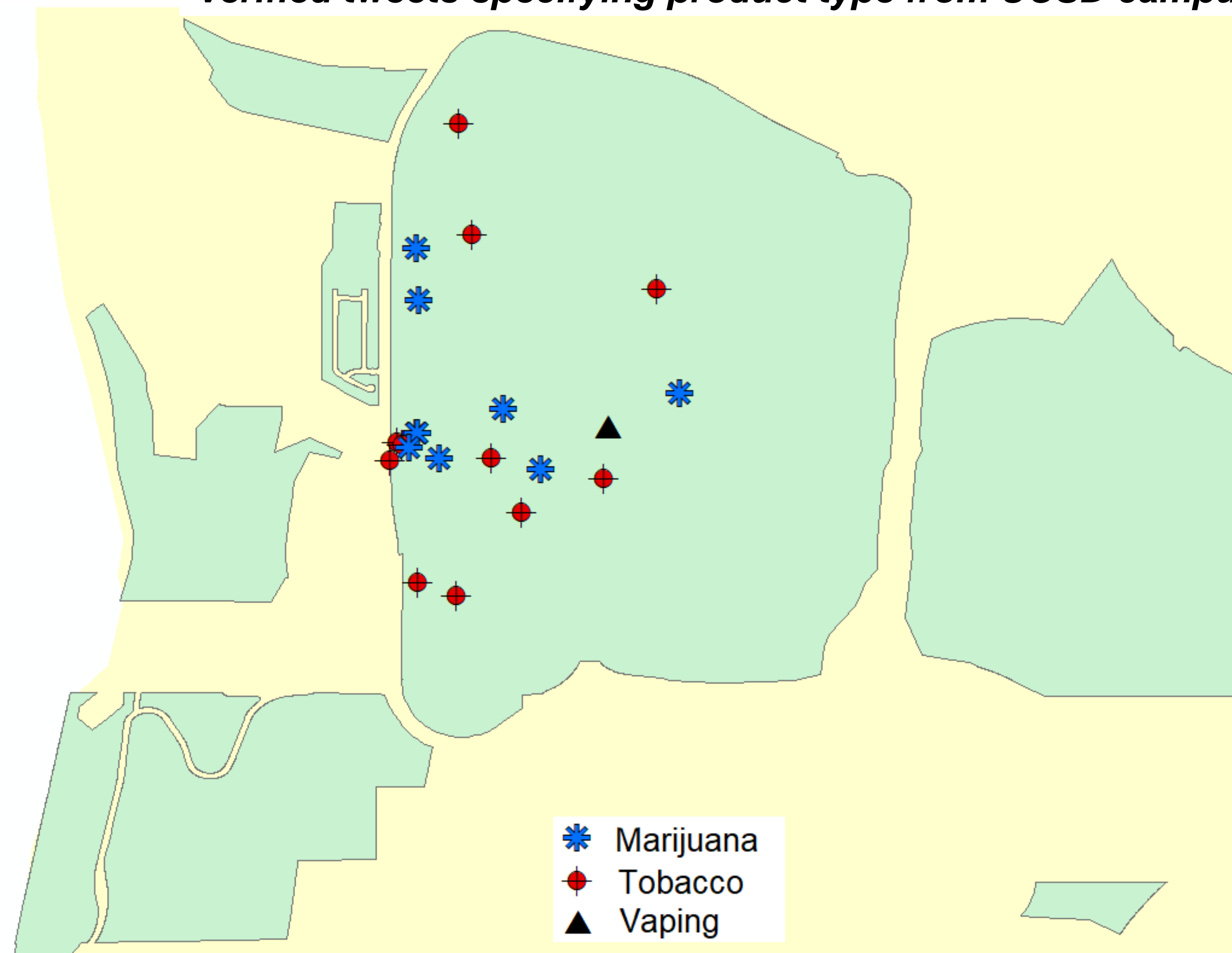
Proportional comparisons of product category by four-year college, for top 20 campuses

College	Marijuana	Tobacco	Vaping
CSU East Bay	42.1%	57.9%	0.0%
CSU Humboldt	28.6%	67.9%	3.6%
CSU Long Beach	44.4%	33.3%	22.2%
CSU Los Angeles	55.6%	37.0%	7.4%
CSU Northridge	40.7%	57.6%	1.7%
CSU San Bernardino	28.6%	64.3%	7.1%
CSU San Diego	50.0%	31.8%	18.2%
CSU San Francisco	53.0%	47.0%	0.0%
CSU San Jose	19.4%	71.0%	9.7%
CSU San Marcos	30.0%	50.0%	20.0%
CSU Sonoma	45.5%	40.9%	13.6%
UC Berkeley	28.6%	57.1%	14.3%
UC Davis	35.3%	64.7%	0.0%
UC Irvine	48.6%	43.2%	8.1%
UC Los Angeles	44.1%	52.9%	2.9%
UC Riverside	48.5%	42.4%	9.1%
UC San Diego	40.9%	54.5%	4.5%
UC Santa Barbara	48.9%	48.9%	2.1%
UC Santa Cruz	47.3%	47.3%	5.5%
USC	60.0%	27.5%	12.5%

## Results

Out of all tweets with smoking-related behavior, 48.2% related to tobacco, 43.3% to marijuana, and 8.0% to vaping. Of these tweets, 40.8% reported first-person use or second-hand observation of smoking. Out of 865 tweets with user sentiment, 77.5% were positive, ranging from 56.0% for California State University, Humboldt to 95.2% for California State University, Los Angeles. College cost was positively correlated with proportion marijuana-related tweets and negatively related to tobacco-related tweets. Percentages for White and Native American students were negatively correlated to proportion tweets with positive sentiment.

Verified tweets specifying product type from UCSD campus



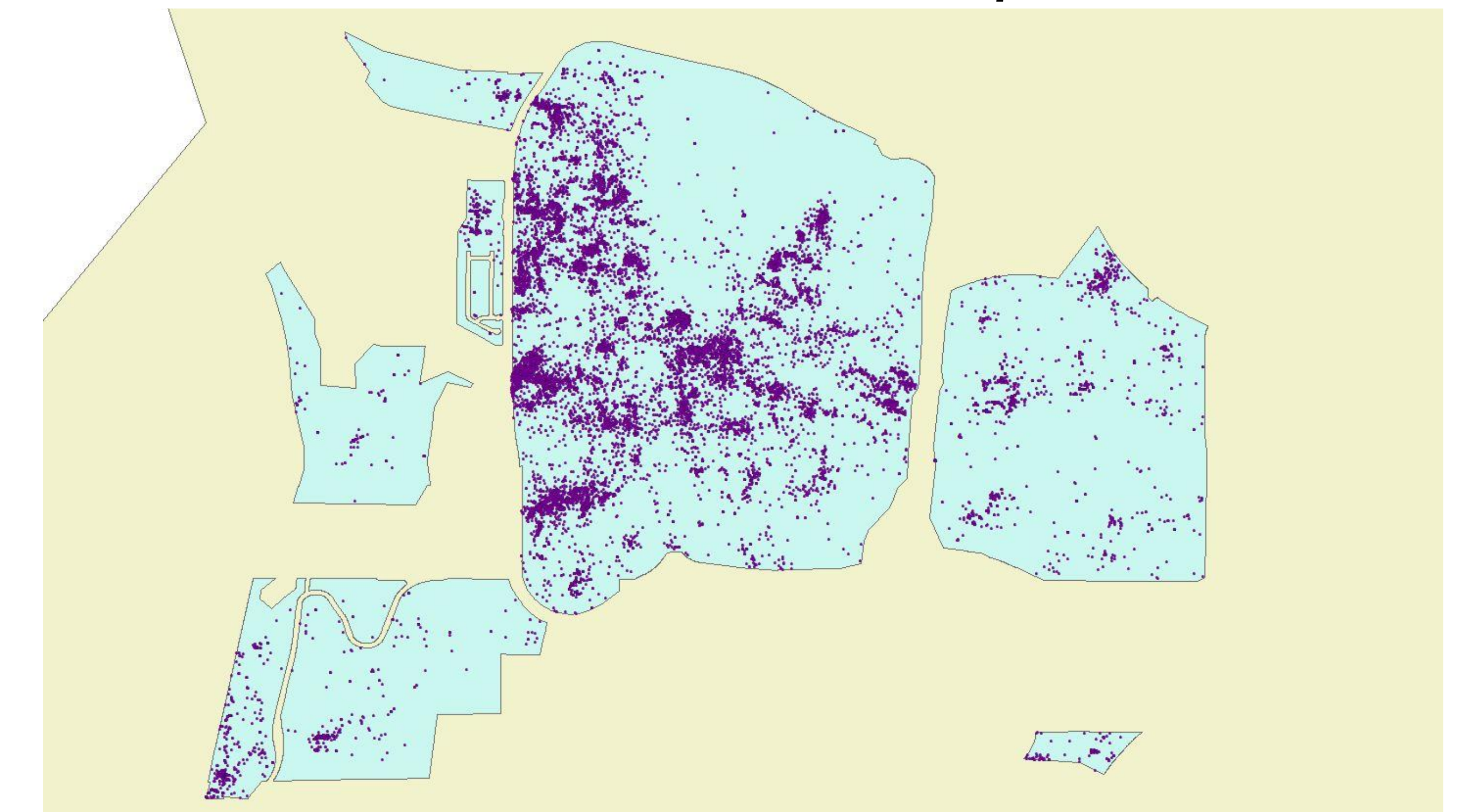
Pearson's correlation coefficients denoting relationship between percentage of product type, pro sentiment, or first-person observation with covariates relating to race/ethnicity, finances, and academic history. Correlations with p values under 0.10 are denoted in red. \*p < 0.05

Covariate		Marijuana (%)	Tobacco (%)	Vape (%)	Pro (%)	First-Person Observation (%)
Race/Ethnicity	Black, %	0.162	-0.023	-0.211	0.229	0.319
	Hispanic, %	-0.030	-0.031	0.103	0.326	-0.017
	White, %	-0.061	-0.009	0.111	-0.405	-0.160
	American Indian, %	-0.258	0.237	-0.027	<b>-0.486*</b>	-0.346
	Asian, %	0.046	0.038	-0.141	<b>-0.034</b>	0.170
Finances	In-State Price, \$	<b>0.417</b>	<b>-0.401</b>	0.077	0.049	0.032
Academics	SAT Reading, 25th percentile	0.223	-0.166	-0.053	-0.244	-0.075
	SAT Reading, 75th percentile	0.187	-0.137	-0.049	-0.302	-0.051
	SAT Math, 25th percentile	0.204	-0.173	-0.009	-0.246	-0.092
	SAT Math, 75th percentile	0.195	-0.118	-0.096	-0.214	-0.059

## Conclusions

Among tweets about smoking from California colleges, high levels of positive sentiment suggest that campus climate may be less receptive to anti-smoking messages or adherence to smoking bans. Further research should investigate the degree to which positive attitudes about smoking varies by colleges and their respective demographics

All tweets from UCSD campus



Proportional comparisons of product category by four-year college, for top 20 campuses

College	Positive	Negative	Neither	n
CSU East Bay	77.2%	15.8%	7.0%	57
CSU Humboldt	50.0%	39.3%	10.7%	28
CSU Long Beach	50.0%	33.3%	16.7%	18
CSU Los Angeles	74.1%	3.7%	22.2%	27
CSU Northridge	78.0%	11.9%	10.2%	59
CSU San Bernardino	85.7%	14.3%	0.0%	14
CSU San Diego	65.9%	22.7%	11.4%	44
CSU San Francisco	72.3%	9.6%	18.1%	83
CSU San Jose	71.0%	19.4%	9.7%	31
CSU San Marcos	70.0%	30.0%	0.0%	20
CSU Sonoma	72.7%	18.2%	9.1%	22
UC Berkeley	71.4%	23.8%	4.8%	21
UC Davis	76.5%	17.6%	5.9%	17
UC Irvine	54.1%	27.0%	18.9%	37
UC Los Angeles	52.9%	38.2%	8.8%	34
UC Riverside	78.8%	15.2%	6.1%	33
UC San Diego	59.1%	18.2%	22.7%	22
UC Santa Barbara	80.9%	12.8%	6.4%	47
UC Santa Cruz	67.3%	18.2%	14.5%	55
USC	72.5%	17.5%	10.0%	40

This research was supported by the Tobacco-Related Disease Research Program (Awards #T29IP0465 and #T29IP0384).