

# Community Characteristics Affecting Youth's Perceptions of the Ease of Buying Cigarettes



University of Illinois, Health Research and Policy Centers  
 Erin Ruel, PhD • Deborah Harper, BA • Sandy Slater, MS • Frank Chaloupka, PhD

## Introduction

- The tobacco industry has switched marketing strategies to the point of purchase (POP) of stores as policies have banned other advertising arenas.
- Prior ImpacTeen studies show that self-service placement of cigarette packs have decreased significantly, store interior tobacco advertising has increased significantly, and the level of store tobacco promotions has remained constant between 1999 and 2001 (Ruel et al., 2003 ImpacTeen working paper).
- Prior research also shows that self-service placement increases the prevalence of youth smoking and increasing prices decrease the prevalence of youth smoking (Slater et al., 2003 working paper).
- This paper tests whether the retail environment and/or community characteristics impact other tobacco related variables; youths' perceptions of ease of getting cigarettes, where they buy cigarettes, and whether they own tobacco logo'd items

## Data

- Data are from three main sources: the ImpacTeen Project conducted by the University of Illinois at Chicago's Health Research and Policy Centers and funded by the Robert Wood Johnson Foundation, the Monitoring the Future (MTF) study conducted by the University of Michigan's Institute for Social Research (ISR) and funded by the National Institute on Drug Abuse, and 2000 census data.
- MTF Data:** National sample of 8<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> grade public schools from 1999 to 2001. In order to ensure confidentiality issues for those youth interviewed, the MTF student level data provided to ImpacTeen have been aggregated to the school level. These data include substance use behavior data asked in the MTF core surveys. MTF data have been aggregated in such a way as to make creating multiple variables relatively easy.
  - MTF constructs:** (aggregated to school level)
    - 30 day smoking prevalence
    - 30 day average consumption per smoker
    - Own tobacco logo'd item
    - Buy cigarettes in last 30 days from store
    - Easy to get Cigarettes
  - ImpacTeen Data:** communities surrounding the MTF public schools. Communities were defined as the area that captures at least 80% of the students attending the school. Include up to 30 randomly sampled stores that sell tobacco or alcohol.

- ImpacTeen constructs:** (aggregated to community from which school draws its students)
- Advertising:** (scale variable includes interior, low interior, exterior, property ads and functional objects in stores).
  - Placement of cigarette packs:** can be interpreted as the percent of stores in the community with self-assisted cigarette packs.
  - Promotions:** can be interpreted as the percent of stores in the community with tobacco promotions.
  - Price:** can be interpreted as the average price for a pack of premium brand cigarettes in the community.
- Community Data and Constructs:** Census 2000 data were mapped to the communities at the block level and aggregated up to the community level.
- Race/ethnicity:** Percent of the community that is black, Asian, and of Hispanic origin. (White population is not included because the majority of all communities are white and it is highly collinear with the percent black variable.)
  - Median Household Income:**
  - Region:** Four census regions-West, Midwest, Northeast and South
  - Population density:** This comes from the national center for educational statistics and refers to the school neighborhood. It has four categories: urban, suburban, town and rural.

## Methods

- OLS regression. N=321. Time is included as dummies for years 2 and 3.

## Results

Table 1: Descriptives

Variable	Mean/Proportion		
	Year 1 (n=97)	Year 2 (n=110)	Year 3 (n=114)
<b>MTF Outcome Variables</b>			
Prevalence	0.228	0.187	0.180
Average Consumption	4.819	4.346	4.925
<b>MTF Variables</b>			
Own Tobacco Logo'd Item	0.284	0.242	0.227
Prevalence of Buying From Store	0.492	0.416	0.385
Perception of Ease in Obtaining Cigarettes	0.844	0.817	0.810
Average # of Cigarettes Purchased From Store	3.102	2.646	2.338
<b>Retail Environment Variables</b>			
Any Self-Service Placement	0.369	0.212	0.181
Tobacco Promotion	0.519	0.348	0.386
Premium Brand Price	2.990	3.305	3.491
Store Tobacco Advertising	-0.020	-0.017	0.011
<b>Community Environment Variables</b>			
West	0.217	0.191	0.219
Midwest	0.258	0.282	0.254
South*	0.32	0.364	0.342
Northeast	0.206	0.164	0.184
Urban	0.186	0.227	0.246
Suburban	0.454	0.327	0.368
Town*	0.113	0.127	0.140
Rural*	0.247	0.318	0.246
Black	0.103	0.116	0.105
Hispanic	0.142	0.109	0.136
Asian	0.027	0.034	0.030
8th Grade*	0.516	0.518	0.509
10th Grade	0.485	0.482	0.491

Table 2: Proportion of Adolescents who Perceive Obtaining Cigarettes is Easy

	Model 1	Model 2
Intercept	0.828*** (0.049)	0.822*** (0.031)
Premium Price	-0.009 (0.013)	-0.009 (0.010)
Any Self-serve	0.075** (0.027)	-0.009 (0.016)
Advertising	-0.016 (0.012)	0.001 (0.007)
Tobacco Promotion	0.017 (0.023)	-0.008 (0.013)
Year 2		-0.027** (0.009)
Year 3		-0.030** (0.010)
West		-0.012 (0.012)
Midwest		0.011 (0.009)
North		0.017 (0.012)
Urban		0.006 (0.010)
Suburban		0.016 (0.008)
Proportion Black		-0.121*** (0.021)
Proportion Hispanic		-0.087*** (0.021)
Proportion Asian		-0.254*** (0.060)
10th Grade		0.157*** (0.007)
R2	0.0392	0.7239

### Model 1 Results

Prior to adding in community controls, as the proportion of stores with self service placement in a community increases, the proportion of youth who perceive obtaining cigarettes as easy increases by 7.5%.

### Model 2 Results

Over time, the proportion of kids who perceive obtaining cigarettes as easy declines.  
 Youth living in communities with higher proportions of blacks, Asians or Hispanics are less likely to perceive obtaining cigarettes as easy.  
 10th graders are significantly more likely than 8th graders to perceive obtaining cigarettes as easy.

\*\*\*p < .001  
 \*\*p < .01  
 \*p < .05

**Table 3: Average # of Times Adolescents Buy Cigarettes at Store**

	Model 1	Model 2
Intercept	2.485* (1.070)	1.474 (1.180)
Premium Price	-0.043 (.296)	0.514 (.389)
Any Self-serve	0.470 (.594)	-0.375 (.606)
Advertising	-0.537 (.273)	-0.307 (.276)
Tobacco Promotion	0.541 (.505)	0.220 (.509)
Year 2		-0.658 (.350)
Year 3		-1.050** (.378)
West		-0.937* (.445)
Midwest		-0.055 (.344)
North		-0.271 (.462)
Urban		-0.075 (.400)
Suburban		0.112 (.318)
Proportion Black		-0.979 (.811)
Proportion Hispanic		-0.614 (.825)
Proportion Asian		-1.501 (2.310)
10th Grade		1.195*** (.253)
R2	.0154	.1336

**Model 1 Results**

- On average, youth who smoke, buy cigarettes themselves from a store 2.5 times in 30 days.
- Price, placement, advertising and promotions do not impact how often youth buy cigarettes from stores.

**Model 2 Results**

- In 2001, youth bought cigarettes themselves from stores less than once per month which is a significant decrease from 1999 (1.5 times/month)
- Youth living in the west bought cigarettes from stores with significantly less frequency than youth in other regions.
- 10th graders are significantly more likely to buy from stores 1.2 times in 30days than are 8th graders.

**Discussion**

- 10th graders appear to be a problematic population. They are more likely to perceive getting cigarettes as easy and are more likely to buy cigarettes themselves from a store with greater frequency, though they are less likely to own tobacco logo'd items. Tenth graders also have a higher prevalence of smoking and tend to consume more cigarettes on average.
- Tobacco strategy appears to be more effective in terms of brand identification. The level of store advertising, promotions and self-service placement of cigarettes (Pack placements serves as own advertising method) significantly influence the owning of tobacco logo'd items. These same store measures have much less influence on youth smoking.
- There is considerable variance among communities. Cigarettes are perceived as harder to obtain in black, Asian and Hispanic communities. Youth in the West are less likely to buy cigarettes in stores or own tobacco logo'd items and have lower prevalence of smoking.
- Tobacco strategy is more like to impact a school's smoking prevalence than the number of cigarettes smoked, meaning that the tobacco industry's POP strategy has an impact on youth who are experimenters or the susceptible non-smokers.

**Table 4: Owns Tobacco Logo's Items**

	Model 1	Model 2
Intercept	0.398*** (.050)	0.353*** (.052)
Premium Price	-0.051*** (.014)	0.005 (.017)
Any Self-serve	0.058* (.027)	0.037 (.027)
Advertising	0.040** (.013)	0.045*** (.012)
Tobacco Promotion	0.011 (.023)	-0.008 (.023)
Year 2		-0.040** (.016)
Year 3		-0.054** (.017)
West		-0.087*** (.020)
Midwest		-0.032* (.015)
North		-0.026 (.020)
Urban		-0.049** (.018)
Suburban		-0.039** (.014)
Proportion Black		-0.148*** (.036)
Proportion Hispanic		-0.010 (.037)
Proportion Asian		-0.135 (.102)
10th Grade		-0.022* (.011)
R2	.1660	.3195

**Model 1 Results**

- Approximately 40 % of youth own tobacco logo'd items.
- In communities with higher priced premium brand cigarettes, the percent of youth owning tobacco logo'd items decreases.
- As the proportion of stores in communities with self-service placement or advertising increases, the percent of youth owning tobacco logo'd items increases significantly.

**Model 2 Results**

- The effect of store tobacco advertising is sustained after adding in control variables.
- Over time, significantly fewer youth own tobacco logo'd items.
- Fewer youth own tobacco logo'd items in the West and Midwest.
- Fewer youth own tobacco logo'd items in Urban and suburban areas.
- Fewer youth own tobacco logo'd items living in communities with larger black populations.
- Fewer 10th graders own tobacco logo'd items than do 8th graders.

**Limitations**

- Data are aggregated to the school level as opposed to the individual level
- Endogeneity between owning tobacco logo items, where cigarettes are obtained ease of obtaining cigarettes, and smoking behavior not accounted for in these models—due to aggregated nature of the data, it is impossible to account for this.

**Future Work**

- Have not truly included intervening variables as moderators. Will run simultaneous equation models to capture moderating effects of easy to get cigarettes, self-purchase of cigarettes in stores, and owning tobacco logo'd items.
- Add in community tobacco control and cessation efforts to see if they are effective counters to tobacco industry POP strategy.

**Table 5: Prevalence of Smoking in the Last 30 Days**

	Model 1	Model 2	Model 3
Intercept	-0.258*** (.033)	-0.122* (.048)	0.036 (.069)
Perception of Ease in Obtaining Cigarettes	0.452*** (.042)	0.425*** (.041)	0.232** (.072)
Own Tobacco Logo'd Item	0.296*** (.037)	0.232*** (.039)	0.204*** (.042)
Average # of times Cigarettes Purchased From Store	0.003 (.003)	0.003 (.002)	0.002 (.002)
Premium Price		-0.035*** (.009)	-0.030* (.012)
Any Self-serve		0.050** (.019)	0.048* (.019)
Advertising		-0.014 (.009)	-0.018 (.009)
Tobacco Promotion		0.015 (.016)	0.017 (.016)
Year 2			-0.008 (.011)
Year 3			-0.002 (.013)
West			-0.037* (.015)
Midwest			-0.005 (.011)
North			0.004 (.015)
Urban			-0.020 (.013)
Suburban			-0.027** (.011)
Proportion Black			-0.051 (.028)
Proportion Hispanic			-0.004 (.027)
Proportion Asian			-0.042 (.076)
10 <sup>th</sup> Grade			0.043** (.014)
R <sup>2</sup>	.4888	.4344	.5343

**Model 1 Results**

- As the proportion of youth in a school who perceive easy access to cigarettes increases, the prevalence of smoking significantly increases.
- As the proportion of youth owning tobacco logo'd items in a community increases, the prevalence of smoking significantly increases.
- Buying cigarettes from a store has no impact on smoking prevalence.

**Model 2 Results**

- Adding in store variables does not affect the relationships between ease of obtaining cigarettes or owning tobacco logo'd items.
- As premium brand prices increase, the prevalence of youth smoking decreases.
- As the proportion of stores with self-service placement increases, the prevalence of youth smoking increases.

**Model 3 Results**

- Adding in community variables does not effect the relationships between ease of obtaining cigarettes, owning tobacco logo'd items, prices or placement.
- The prevalence of smoking is significantly lower in the West, in suburban areas and among 8<sup>th</sup> graders.