

# Price, Tobacco Control Policies and Youth Smoking

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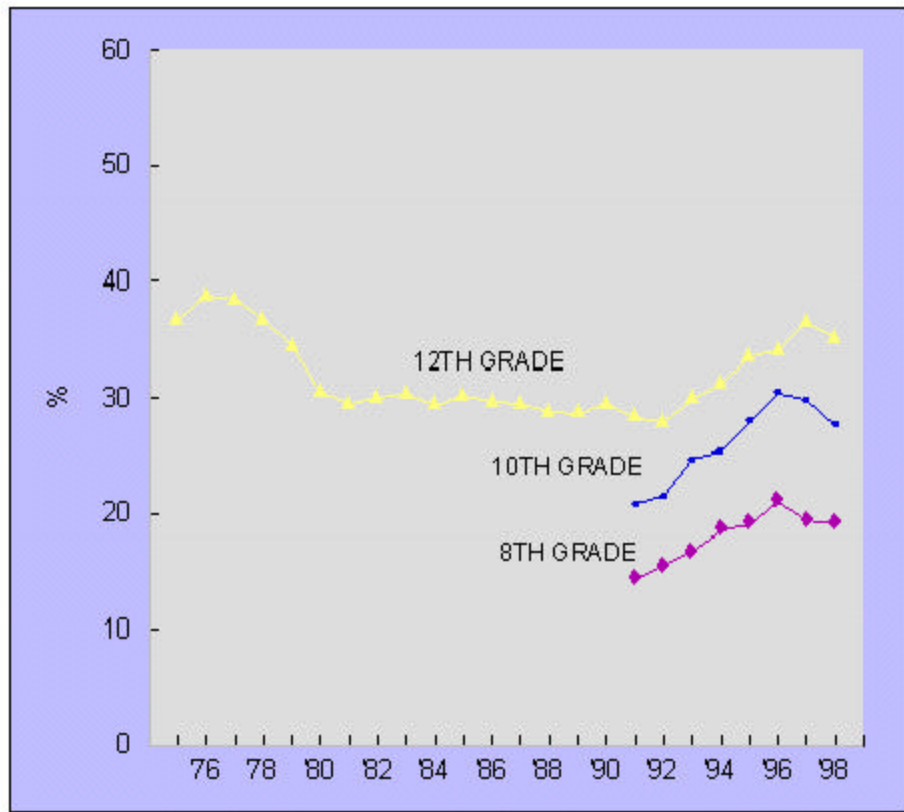
<http://www.uic.edu/~fjc>  
<http://www.uic.edu/orgs/impactteen>

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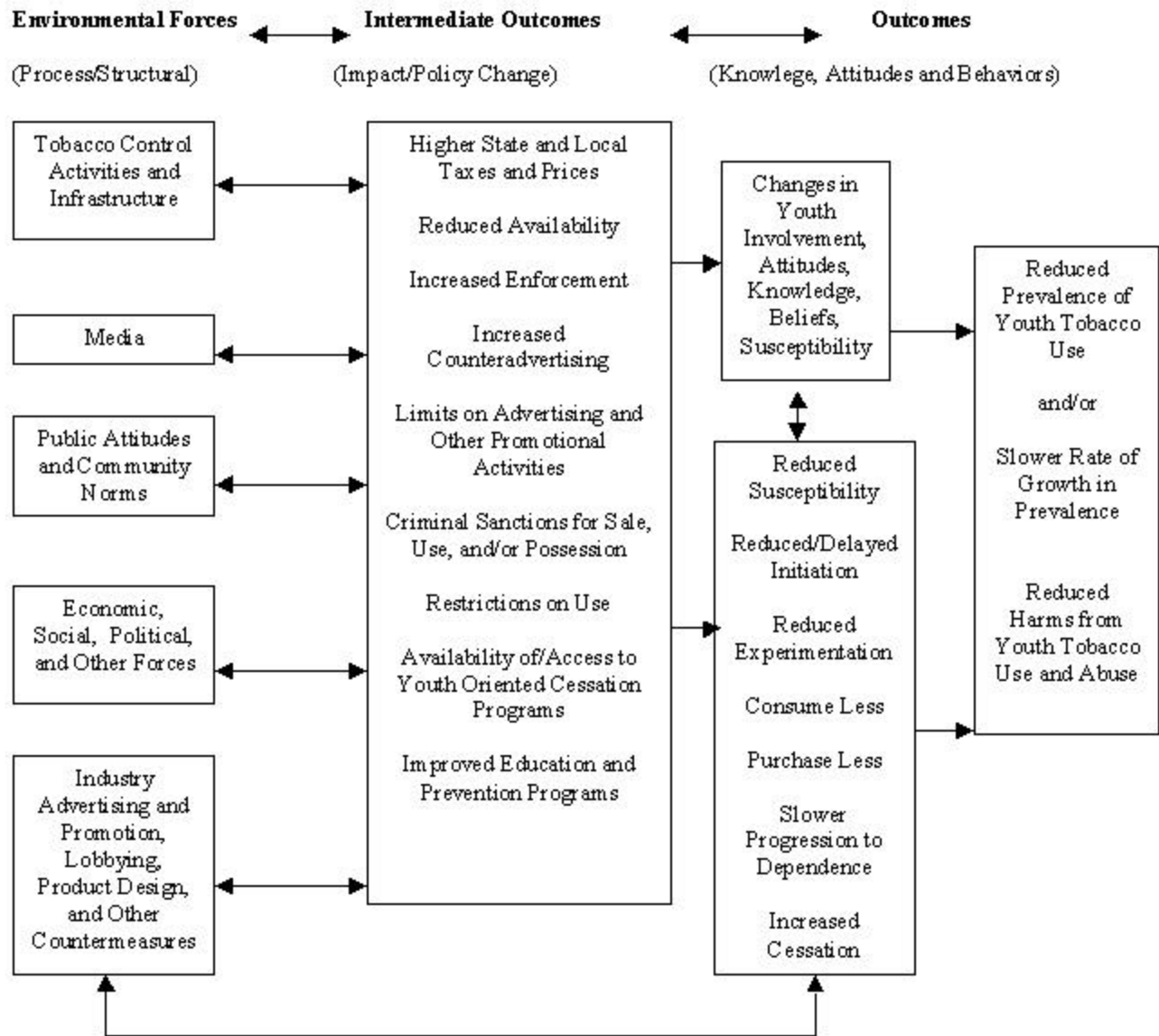


# From the Monitoring the Future Study The University of Michigan

Trends in Thirty-Day Prevalence of Cigarette Smoking  
for Eighth, Tenth, and Twelfth Graders



# Conceptual Framework



# Cigarette Prices and Adult Smoking

**Numerous econometric studies over past three decades conclude that overall cigarette demand responsive to changes in cigarette taxes and prices:**

- **Price Elasticity of Demand:** the percentage change in consumption resulting from a one percent increase in price

- **Estimated Price Elasticity of Cigarette Demand:**

**Short Run:                    -0.3 to -0.5**

**Prevalence:                   -0.1 to -0.2**

**Long Run:                     -0.7 to -0.8**

## Cigarette Prices and Adult Smoking

- **10 percent increase in price reduces duration of smoking by 10 percent**
- **Consistent with economic theory, lower income/less educated persons relatively more responsive to price increases**

**Estimates imply that large cigarette excise tax increases would lead to significant reductions in overall cigarette demand and would lead to sizable increases in cigarette tax revenues**

# Youth Smoking and Cigarette Prices

**Economic theory suggests that younger persons will be more responsive to changes in price than adults:**

- Proportion of disposable income youth spends on cigarettes likely to exceed corresponding portion of adult's income**
- Peer influences much more important for young smokers than for adult smokers**

# **Youth Smoking and Cigarette Prices**

- **Young smokers less addicted than adult smokers**
- **Young people tend to discount the future more heavily than adults**

**Earliest studies produced mixed evidence concerning the relative price responsive of youth and young adults**

## **Past Research on Other Factors Influencing Tobacco Use Among Youth, Young Adults and Adults**

### **Restrictions on smoking in public places, workplaces:**

**Consistent evidence that restrictions  
reduce smoking, even after  
accounting for potential reverse  
causality**

- **Workplace restrictions particularly  
important among adults, reduce  
prevalence by as much as six  
percent**

- **School and other public place  
restrictions also important for  
youth/young adults**



# **Past Research on Other Factors Influencing Tobacco Use Among Youth, Young Adults and Adults**

## **Limits on youth access to tobacco products:**

- **Evidence that policies, merchant education, enforcement and related activities raise retailer compliance**
- **Mixed evidence for their impact on youth tobacco use**

# **Past Research on Other Factors Influencing Tobacco Use Among Youth, Young Adults and Adults**

## **Advertising:**

**Mixed evidence from analyses of aggregate data suggests that advertising has little or no impact on aggregate measures of smoking**

- Econometric methods not well-suited for examining the impact of advertising in aggregate data**

**Almost no econometric analyses of the impact of advertising on youth tobacco use**

## **Past Research on Other Factors Influencing Tobacco Use Among Youth, Young Adults and Adults**

### **Advertising (continued):**

**More recent studies of advertising bans conclude that comprehensive bans on advertising and promotion lead to reductions in cigarette smoking, while partial bans have little or no impact**

### **Counteradvertising:**

**Consistent evidence from national and state-level data that counteradvertising significantly reduces cigarette smoking**

## Data

**1992, 1993, 1994 Monitoring the Future  
Surveys of 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grade  
students**

**110,717 students, mostly ages 12-18 years**

**cigarette smoking:**

- **indicator for smoking in past 30 days**
- **average daily cigarette consumption for smokers**

**smokeless tobacco use:**

- **indicator for smokeless tobacco use**
- **frequency of past month use**

**wide variety of socioeconomic and  
demographic information**

# Data

## Longitudinal data from MTF

- Panels formed from 1976-1993 high school senior surveys
- Followups through 1995
- up to 8 observations on some individuals
- nearly 200,000 observations/almost 50,000 persons
- mostly ages 18-32 years

## Data

### **1993, 1997 and 1999 Harvard College Alcohol Surveys**

**16,000+ students in 140 4-year colleges  
and universities**

#### **cigarette smoking:**

- **indicator of smoking in past 30 days**
- **average daily cigarette consumption by smokers**

**wide variety of socioeconomic and  
demographic data**

**some information on school  
characteristics and college smoking  
policies**

## Data

### **1996 RWJF/Audits & Surveys Youth and Young Adults Surveys**

**five separate surveys - in school youth, in college young adults, in home youth/young adults, school administrator survey, in-store observations**

**detailed information on cigarette smoking and other tobacco use, including anticipated responses to price increases of varying size**

**unique information on cigarette prices, promotions, advertising, placement, and more from stores**

# Data

## **Tobacco Prices and Taxes**

### **Tobacco Institute**

- state-level weighted average price per pack of 20 cigarettes
- state cigarette and smokeless tobacco tax rates

### **American Chamber of Commerce Researchers' Association**

- city-level price per carton for Winston king-sized

### **Observational data**

- prices per pack/carton for Marlboro, Camel, Winston, Newport and generic brands
- information on promotional discounts and other promotions



# Data

## Tobacco Prices

### "Scanner" data

- prices per pack/per carton at the UPC code level for all brands
- 50 major markets, supermarkets/large groceries and pharmacies only
- includes relatively detailed data on store-specific promotional discounts (i.e. 3 for 2 deals, in-store coupons)

### Self Reported Prices

- RWJF/A&S Survey



# Data

## Tobacco Control Policies

### CDC/OSH and Coalition on Smoking OR Health

variety of state tobacco related policies

- restrictions on smoking in public places/worksites
- limits on advertising
- limits on youth access to tobacco products
- "smoker protection" policies
- indicators of state preemption

# Data

## NCI/ANR

### **local tobacco control policies**

- **restrictions on smoking in public places/worksites**
- **limits on youth access to tobacco products**
- **limits on advertising**

## School Administrators (HCAS and A&S surveys)

### **High school/college smoking policies and enforcement**

- **restrictions on smoking on campus and their enforcement**
- **limits on availability and advertising**
- **anti-smoking programs, etc.**

# Data

## Downey and Gardiner (1996) -- 1994 only

### State implementation of Synar Amendment

- indicator of statewide vs. local activity
- indicator of stings vs. observation
- indicators of vending machine policy/enforcement
- over the counter compliance rates
- vending machine compliance rates

## Center for Substance Abuse Prevention 1996-present

### Synar-related data on retail compliance



# Data

## Advertising data

- **Magazine advertising measures constructed from CMR, ABC, Mediamark Research, and Simmons Research**
- **Observational data on in-store, storefront, and billboard advertising and counteradvertising**

# Estimation

- **Cragg's Two-Part Model:**
  - Probit estimates of smoking/smokeless tobacco use prevalence equations
  - Least squares estimates of conditional cigarette demand and frequency of smokeless tobacco use
- **Ordered probit estimates for categorical measures of use**
- **Threshold of change methods for smoking uptake analyses**
- **Multiple model specifications**
  - multicollinearity vs. omitted variables bias

# Estimation

- **Full vs. Restricted Samples to account for potential cross-border shopping**
- **Subsamples defined by race and gender**
- **Longitudinal analysis:**
  - individual, state, and year fixed effects models
  - duration modelling for cessation behavior

# Results

- **Cigarette Prices:**
  - **Negative and significant effects in nearly all equations for youth and young adult samples**
  - **Estimated price elasticities of demand:**

## Youth:

- **Smoking prevalence: -0.675**
- **Conditional demand: -0.638**

## Young Adults (college students):

- **Smoking prevalence: -0.53**
- **Conditional demand: -0.58**



# Price, Tobacco Control Policies and Youth Smoking

## Longitudinal sample:

- Smoking prevalence: -0.122
  - Conditional demand: -0.661
- 
- Some evidence of border crossing in response to interstate price differentials
  - Effects of price vary with stage of smoking uptake, with larger effects on heavier smoking
  - Young males smokeless tobacco demand also responsive to price of smokeless tobacco products

## Results

- **Strong evidence that increases in cigarette prices significantly raise the probability of cessation among young adults; magnitude of the estimates consistent with estimates for effects of price on prevalence**
- **Consistent with qualitative evidence from CDC's Network of Prevention Research Centers**
- **Consistent with self-reported anticipated responses to price increases from the A&S surveys**

# Results

- **Smoking Restrictions:**
  - **Strong limits on smoking in public places/private worksites significantly reduce the probability of youth and young adult smoking**
  - **Worksite restrictions for employed young adults significantly raise the probability of cessation**
  - **Daily cigarette consumption by youth smokers reduced by restrictions on smoking in schools, when enforced**

## Results

- **Daily cigarette consumption by college students also reduced by restrictions on smoking in other public places (i.e. shopping malls...)**
- **Comprehensive, well-enforced restrictions on smoking on college campuses reduce smoking prevalence among college students**
- **Home bans lead to significant reductions in youth smoking prevalence, with greatest reductions associated with most comprehensive bans; magnitude of effect larger than for public place or school bans**

## Results

- **For youth, estimate that strong comprehensive public place/worksites restrictions would lead to about a 3-4 percent reduction in youth smoking prevalence; effects of home bans 2 to 3 times larger**

### **Limits on Youth Access to Tobacco and/or Availability:**

- **generally insignificant effects of:**
  - **minimum legal purchase ages**
  - **signage requirements**
  - **restrictions on vending machine sales**
  - **limits on distribution of free samples**
  - **tobacco licensing requirements**
  - **limits on availability on campus**

## Results

- **some weak evidence that comprehensive approach to limiting youth access (combination of policies above) reduces youth smoking**
- **likely due to weak enforcement**

### **Enforcement of Limits on Youth Access:**

- **Growing evidence that comprehensive statewide approach that's aggressively enforced and that achieves high compliance rates significantly reduces youth smoking prevalence**

## Results

- **Estimate that an ideal implementation of Synar amendment could reduce youth smoking prevalence by about 18 percent**
- **Based on very early data; more recent/better data needed for more careful analysis**

### **Other Tobacco Related Policies**

- **Cigarette Tax Earmarking:**
  - **Strong negative and significant impact on both smoking prevalence and cigarette consumption by smokers**

## Results

- **Smoker protection legislation:**
  - **little impact on youth smoking prevalence**
  - **positive effect on cigarette consumption by young smokers**
- **Preemption:**
  - **significant, positive impact on both measures of youth smoking**

## Advertising

- **find a positive, albeit generally not significant, relationship between cigarette advertising in magazines and youth smoking**



# Results

## **Advertising (continued)**

- **some evidence that state and local restrictions on advertising lead to some reductions in smoking among youth/young adults, but very preliminary**
- **measures of exposure relatively weak**

## **Tobacco Control and Other Substance Use**

- **Consistent evidence of complementary relationship between cigarette smoking and marijuana use; higher cigarette prices reduce both cigarette smoking and marijuana use**

# Results

## Gender and Race Differences:

- **Consistent evidence that young men respond more to price than young women; consistent with limited evidence from US for men**
  
- **Consistent evidence that young African-Americans respond more to price than young Whites**
  - **Similar evidence for adults that African-Americans and Hispanics much more responsive to price than Whites**
  - **May reflect income differences; limited evidence that lower-income persons more responsive to price than higher income persons, as predicted by economic theory**

# ImpacTeen Project

- **Collecting detailed state and community data on variety of policy and other environmental influences on youth tobacco, alcohol, and other drug use**
  - **Community observations**
  - **Key informant interviews**
  - **Retailer interviews**
  - **Archival sources**
- **Will be merged with data on youth substance use to determine which policies/programs/other influences most significantly impact on youth tobacco, alcohol and other drug use**



# ImpacTeen Project

- **Early analyses:**
  - **Impact of MSA billboard advertising ban on advertising at the point-of-purchase**
    - Found that indoor and outdoor store advertising, promotions (cents-off, multipack discounts, and gifts with purchase), and functional items more likely after billboard advertising ban
  - **Relationship between store environment and community characteristics**
    - interior advertising more likely/more extensive in lower income neighborhoods, and those with a higher percentage of African-Americans and youths aged 12-17.
    - Exterior advertising more likely/more extensive in lower income neighborhoods.

