Youth Smoking Behavior and Exposure to Television Anti-Smoking Advertising

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State and Community Tobacco Control Initiative
National Cancer Institute
and
The National Institute on Drug Abuse
Youth Smoking and the Media
Research Team

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Goals of Presentation

• Describe unique dataset that measures exposure to anti-smoking media

• Explain model of smoking behavior and exposure to anti-smoking media

• Discuss implications and future directions
Background

Some evidence that anti-smoking advertising can reduce youth smoking

Most studies involve research demonstration projects, effects of tobacco control advertising at the state level (eg. CA, MA, FL) or national level (Fairness Doctrine; ALF)

Background (cont’d)

Natural Experiment in US: Huge variation in exposures over time and between communities in exposure to anti-smoking advertising

Few analyses of effects of tobacco company advertising (undermining effects?)

Little attention to effect of pharmaceutical company advertising for NRT and Zyban on youth smoking (incr. youth optimism about quitting?)
Research Aims

- Describe the amount and type of televised anti-smoking advertising to which youth in different communities are exposed

- Examine the relationship between amount and type of anti-smoking advertising and youth smoking
Research Hypotheses

Exposure to anti-smoking media messages on TV is associated with:

+ Increased recall of anti-smoking ads
+ Increased anti-smoking attitudes and beliefs
- Reduced adolescent smoking
Research Strategy

Map anti-smoking advertising data (measures of exposure) to individual-level survey data (outcomes) from a national sample of youth
Study design: outcome measures

- Monitoring the Future (funded by the National Institute on Drug Abuse) survey data from 50,000 youth each year from 1994-2002

- School-based sampling frame

- Smoking attitudes and behaviors of 8th, 10th and 12th graders

- Individual level records for each youth
### Basic Descriptive Statistics

18 media markets: 14 with state campaigns; 4 without

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>8th</td>
<td>10th</td>
<td>12th</td>
</tr>
<tr>
<td></td>
<td>20,070 (37.6%)</td>
<td>16,299 (30.5%)</td>
<td>17,072 (32.0%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>53,411 (100%)</td>
</tr>
<tr>
<td>Mean age</td>
<td></td>
<td></td>
<td>15.4</td>
</tr>
<tr>
<td>% watch 3+ hrs TV/day</td>
<td></td>
<td></td>
<td>47.47</td>
</tr>
<tr>
<td>% recall seeing ads ≥ 1x/week</td>
<td></td>
<td></td>
<td>55.3</td>
</tr>
<tr>
<td>% Current smoker</td>
<td></td>
<td></td>
<td>19.7</td>
</tr>
<tr>
<td>% Minority</td>
<td></td>
<td></td>
<td>49.4</td>
</tr>
</tbody>
</table>
Study design: exposure measures

• Archival records of televised anti-smoking advertising from Nielsen Media Research

• 1994-2002

• Top 75 Designated Market Areas (DMAs) covering 80% of US population

• Early analyses examining 18 of 75 DMAs
Measuring Exposure to Anti-smoking Ads

**Dataset:** Nielsen Monitor Plus
Single occurrence (every commercial)

**Length:** 1994 – 2002

**Range:** Top 75 Designated Market Area in US

**Variables:**
- Date and Time
- Market and Station (Network, Local Affiliate, Cable)
- Advertiser, Creative Title, Program Title
- **Gross Rating Points (GRPs) for Total Television Households**
- **Target Rating Points (TRPs) Total Teens 12 - 17, M, F**
Rating Points

- Customary unit for measuring exposure to ads
- Audience Exposure
  
  \[
  \text{GRPs} = \text{Gross Rating Points} \text{ for Total TV Households}
  
  \text{TRPs} = \text{Targeted Rating Points} \text{ for Teens (12 - 17 year olds)}
  
  \]

- Aggregated weekly/monthly to estimate the average number of times an ad exposed to an audience

  \[
  100 \text{ GRPs/TRPs} = 1 \text{ exposure}
  
  250 \text{ GRPs/TRPs} = 2.5 \text{ exposure}
  \]
Data Cleaning

- Nielsen Monitor Plus dataset contains ratings data on all television advertising

- Nielsen narrows advertising through string searches (tobacco, smoking, lung, cancer) and a provided list of advertisers with tobacco control media campaigns

- Creates a large pool of anti-tobacco advertising (seven million+)

- Identify counter advertising by networking with CDC; establishing contacts with media directors at state tobacco control agencies; and viewing ads to match creative titles
<table>
<thead>
<tr>
<th>Advertisers</th>
<th>Details</th>
</tr>
</thead>
</table>
| **State Health Dept**    | The Big Four and other newcomers  
California, Massachusetts, Florida, Arizona                                                                                             |
| **American Legacy**      | Funded by Master Settlement Agreement  
Began advertising in 2000 with the Truth Campaign                                                                                      |
| **Pharmaceutical Corp**  | Nicotine Replacement Therapies and Zyban                                                                                                |
| **Non Profits**          | Local and National Orgs (e.g. ACS, ALA)                                                                                                |
| **Tobacco Industry**     | Philip Morris – Counter and Corporate PR Advertising  
Lorillard – Counter Advertising                                                                                                           |
Final Exposure Measures

After extensive cleaning, we have a record of:

- Nearly all anti-smoking advertisements that appeared in US (top 75 DMAs = 80% of US population) 1994-2002, sorted by DMA
- Identification of advertiser (State campaign, ALF, tobacco industry, NRT) for each ad
- Measurement of exposure (GRP/TRP) for each ad
Average Monthly Exposure by Advertiser 2000

- ALF GRP
- ALF TRP
- NRT GRP
- NRT TRP
- State GRP
- State TRP
- TobYouth GRP
- TobYouth TRP
- Total GRP
- Total TRP

- State Campaign
- No State Campaign
**GRP Computation Methods**

Using exposure measures for the 6 consecutive months prior to survey administration for each respondent:

- **Straight sum** = $S_6\text{GRP}$

- **Straight average** = $(S_6\text{GRP})/6$

- **Decay function of cumulative exposure**: 
  \[ \text{GRP}_{\text{stock}}_t = [\gamma(\text{GRP}_{\text{stock}}_{t-1}) + ((1 - \gamma)\text{GRP})] \]

*Pollay et al. 1996*
Basic Model

Smoking Behavior_{i,t} = f[(\text{amount TV watched, year, gender, race, grade in school, parental education, earned income })_{i,t}; \text{GRP/TRPs}_{m(i,t)}]

The exposure measures (GRP/TRPs) include direct effects, quadratic term, and interaction w/TV

Models look at exposure to ads sponsored by

- State Campaigns alone
- All advertisers in same model
  - Pharmaceutical Companies (NRT)
  - Tobacco Corporate
  - Tobacco Youth
  - All Anti-tobacco combined (State, ALF, other not-for-profits)

Reported models use data from 8th and 10th grade respondents (12th w/out TV)
# State Campaign Model Results

<table>
<thead>
<tr>
<th></th>
<th>State GRP</th>
<th>State TRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall</td>
<td>1.14</td>
<td>1.19</td>
</tr>
<tr>
<td>Dislike being near smokers</td>
<td>1.12</td>
<td>1.09</td>
</tr>
<tr>
<td>Easy to quit</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Definitely will NOT smoke in 5 yrs</td>
<td>1.07</td>
<td>NS</td>
</tr>
<tr>
<td>Peers disapprove</td>
<td>1.14</td>
<td>NS</td>
</tr>
<tr>
<td>Current Smoking</td>
<td>0.89</td>
<td>NS (0.89)</td>
</tr>
</tbody>
</table>
## Model Results: Recall by Advertiser Type

<table>
<thead>
<tr>
<th></th>
<th>Gross Rating Points</th>
<th>Targeted Ratings Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRT</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Corp.</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Youth</td>
<td>1.42 (NS)</td>
<td>NS</td>
</tr>
<tr>
<td>Anti-Tobacco</td>
<td>1.18 (1.25)</td>
<td>1.22 (1.33)</td>
</tr>
</tbody>
</table>
Model Results: **Dislike Being Near Smokers by Advertiser Type**

<table>
<thead>
<tr>
<th>Advertiser Type</th>
<th>Gross Rating Points</th>
<th>Targeted Ratings Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRT</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Corp.</td>
<td>0.87</td>
<td>0.57</td>
</tr>
<tr>
<td>Tobacco Youth</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Anti-Tobacco</td>
<td>1.11</td>
<td>1.08</td>
</tr>
</tbody>
</table>
Model Results:
Definitely will not smoke in 5 years by Advertiser Type

<table>
<thead>
<tr>
<th>Advertiser Type</th>
<th>Gross Rating Points</th>
<th>Targeted Ratings Points (12-17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRT</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Corp.</td>
<td>0.87 (NS)</td>
<td>0.58 (NS)</td>
</tr>
<tr>
<td>Tobacco Youth</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Anti-Tobacco</td>
<td>NS (1.09)</td>
<td>NS (1.14)</td>
</tr>
</tbody>
</table>
Model Results: **Peers Disapprove by Advertiser Type**

<table>
<thead>
<tr>
<th></th>
<th>Gross Rating Points</th>
<th>Targeted (12-17) Ratings Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRT</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Corp.</td>
<td>NS (0.87)</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Youth</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Anti-Tobacco</td>
<td>1.09 (1.11)</td>
<td>1.08 (1.16)</td>
</tr>
</tbody>
</table>
## Model Results: Current Smoking by Advertiser Type

<table>
<thead>
<tr>
<th></th>
<th>Gross Rating Points</th>
<th>Targeted Ratings Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRT</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Corp.</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Tobacco Youth</td>
<td>0.77 (0.79)</td>
<td>NS</td>
</tr>
<tr>
<td>Anti-Tobacco</td>
<td>0.92 (0.92)</td>
<td>NS (0.91)</td>
</tr>
</tbody>
</table>
Conclusions

• Nielsen Data allow comparisons across markets and by advertiser type

• Tobacco and Pharmaceutical (NRT) companies are largest anti-tobacco advertising across markets, even those with state campaigns

• Evidence suggests that NRT ads are not influencing youth attitudes about smoking or behavior

• Tobacco Corporate ads may increase tolerance of smoking

• While these initial data indicate that tobacco youth ads may be related to decreased smoking, these results contradict previous findings (Farrelly et al., 2002). We believe the reason for this is that current models combine both parental and youth advertising (as opposed to corporate ads). Next steps will be to separate GRPs/TRPs for parental and youth ads and then re-run models with data from all 75 markets.
Conclusions, cont.

Higher exposure to state and other anti-smoking advertisers appears to be associated with:

- Higher recall of anti-smoking ads
- Higher likelihood of reporting anti-smoking attitudes
- Reduced smoking