Media Influences on Adolescent Smoking Behavior

James Sargent, M.D.

Director of Cancer Prevention Research
Norris Cotton Cancer Center
Dartmouth Medical School

Supported by National Institutes of Health (CA077026, AA015591)
Mass Communication

Simple one-way communication
Media Influences on Adolescent Smoking Behavior

Supported since 1997 by National Institutes of Health (CA-77026)

AIMS

• Describe smoking in popular contemporary movies
• Assess exposure to movie smoking among adolescents
• Determine if movie smoking exposure is linked with adolescent smoking

Johnny Depp: “Blow”
### Content Analysis

Jim Carrey: “Me, Myself and Irene”

<table>
<thead>
<tr>
<th>Genre</th>
<th>014-Romantic Comedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>003-1965-1989</td>
</tr>
<tr>
<td>Teen Rebellion</td>
<td>002-Dominant</td>
</tr>
<tr>
<td>Tobacco Salience</td>
<td>003-Extremely salient</td>
</tr>
</tbody>
</table>

**Drug**

- Salience: 003-Moderately salient
- Teen Use: 000-No
- Effects: 001-Yes

**Themes**

- Depressing: 001-Present not dominant
- Positive: 001-Present not dominant
- Suspenseful: 000-Not present
- Excited: 001-Present not dominant
- Angry: 000-Not present

**Drugs Used**

- Marijuana: 001-Use
- Cocaine: 000-No use
- Heroin / Opiates: 000-No use
- LSD / Hall.: 000-No use
- Inhalants: 000-No use
- Club Drugs: 000-No use
- Rx Misuse: 000-No use

**Occurrence Details**

- Occ-230: 002:53
- Occ-232: 005:22
- Occ-233: 005:36
- Occ-234: 007:23
- Occ-235: 007:40
- Occ-242: 009:14
- Occ-236: 009:31
- Epi: 185-Eric
- Inc: 162-Occ Type: -9999
- Brnd: 161-A-Murphy's-005
- Brnd: 160-A-Bacardi-043
- Occ-261: 00:24:58
- Occ-262: 00:27:34
- Occ-265: 00:28:30
- Occ-267: 00:29:02
- Occ-269: 00:30:10
- Occ-270: 00:30:25

**Timer**

- 1:00:00:00

**Stop** | **Play (alt-F2)** | **Pause (alt-F1)** |
--- | --- | --- |
<== | <<<< | < < > > >> > >> > >= |
-1/2 | -1/8 | - + +1/8 +1/2 |
Pause | Status | Setup | Timer
Smoking Episodes in 532 Box Office Hits

![Box plot showing the number of smoking episodes across different MPAA ratings.](image)

- **G**
  - N - Movies (% w smk): 28 (25%)
  - Number of Movie Smoking Episodes: 0
- **PG**
  - N - Movies (% w smk): 71 (44%)
  - Number of Movie Smoking Episodes: 4
- **PG-13**
  - N - Movies (% w smk): 220 (76%)
  - Number of Movie Smoking Episodes: 7
- **R**
  - N - Movies (% w smk): 215 (87%)
  - Number of Movie Smoking Episodes: 64
Smoking Screentime in 532 Box office hits

Percent of Movies

Minutes of Screen Smoking

0 5 10 15 20 25

0 10 20 30 40 50 60 70 80
Linking Smoking in Movies with Adolescent Smoking

Jeff Bridges: “Seabiscuit”
Effect of seeing tobacco use in films on trying smoking among adolescents: cross sectional study

James D Sargent, Michael L Beach, Madeline A Dalton, Leila A Mott, Jennifer J Tickle, M Bridget Ahrens, Todd F Heatherton

Abstract

Objective To test the hypothesis that greater exposure to smoking in films is associated with trying smoking among adolescents.

Design Cross sectional survey of 4919 schoolchildren aged 9-15 years, and assessment of occurrence of smoking in 601 films.

Setting Randomly selected middle schools in Vermont and New Hampshire, USA.

Main outcome measure Number of schoolchildren who had ever tried smoking a cigarette, tobacco advertising. Yet the typical adolescent spends 2-3 hours per day watching television and films.1-4

Movie channels and home videos have greatly increased children’s access to films.5-9 A recent survey found that American adolescents watch an average of three films a week (150 a year).7 Although cigarette smoking is infrequent on primetime television,8 it is depicted in almost all films.7-10 Adolescents see film stars smoking in the context of sexuality (Sharon Stone in Basic Instinct), toughness (John Travolta in Broken Arrow), romance (Charlie Sheen in The Chase), and Nicholas Cage: “Matchstick Men”
Effect of viewing smoking in movies on adolescent smoking initiation: a cohort study

Madeline A Dalton, James D Sargent, Michael L Beach, Linda Titus-Ernstoff, Jennifer J Gibson, M Bridget Ahrens, Jennifer J Tickle, Todd F Heatherton

Scarlett Johansson: “Lost in Translation”
Exposure to Movie Smoking: Its Relation to Smoking Initiation Among US Adolescents

James D. Sargent, Michael L. Beach, Anna M. Adachi-Mejia, Jennifer J. Gibson, Linda T. Titus-Ernstoff, Charles P. Carusi, Susan D. Swain, Todd F. Heatherton and Madeline A. Dalton

*Pediatrics* 2005;116;1183-1191
DOI: 10.1542/peds.2005-0714
Study Design

• Random digit dial telephone (RDD) survey
• Telephone protocol identified U.S. households with 10-14 year-old adolescents (N = 6522)
• Major undertaking, 400,000 RDD numbers
  • Could never have been accomplished without NIH funding
### Exposure Measurement

**Select Popular Movies**

<table>
<thead>
<tr>
<th>Box office hits</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 100, 1998-2002</td>
<td>500</td>
</tr>
<tr>
<td>$10mil revenues, 2003</td>
<td>325</td>
</tr>
</tbody>
</table>
Select Popular Movies

- Box office hits N
  Top 100, 1998-2002 500
  > $10mil revenues, 2003 32

Content Analysis

- Count the tobacco use occurrences in each movie
Generate Movie Lists

- Randomly select 50 movies for each survey
- Use stratified sampling to ensure representative distribution by rating (R, PG 13, PG, G)

Select Popular Movies

- Box office hits
  - Top 100, 1998-2002
  - > $10mil revenues, 2003
  - N
  - 500
  - 32

Survey Adolescents (Sep 2003)

- Questionnaire assesses which of the 50 movies the adolescent has ever seen

Content Analysis

- Count the tobacco use occurrences in each movie
**Select Popular Movies**

- Box office hits N
  - Top 100, 1998-2002 500
  - > $10mil revenues, 2003 32

**Generate Movie Lists**

- Randomly select 50 movies for each survey
- Use stratified sampling to ensure representative distribution by rating (R, PG 13, PG, G)

**Survey Adolescents (Sep 2003)**

- Questionnaire assesses which of the 50 movies the adolescent has ever seen

**Content Analysis**

- Count the tobacco use occurrences in each movie

**Merge**

**Movie Smoking Exposure Variable**

- Number movie tobacco use occurrences seen
Exposure to Movie Smoking and Adolescent Smoking by Race/Ethnicity

Overall Smoking Prevalence

Prevalence of Smoking Initiation

Quartile 1  |  Quartile 2  |  Quartile 3  |  Quartile 4

W  White
H  Hispanic/Latino
B  Black
O  Other/Multiple

Overall Smoking Prevalence
Controlling for Covariates

**Sociodemographics**
- Grade in school
- Gender
- Parent Education

**Social Influences**
- Parent smoking
- Sibling smoking
- Friend smoking

**Personality Characteristics**
- Self esteem
- Sensation seeking
- Rebelliousness

**Parenting**
- Maternal responsiveness
- Maternal supervision
- Parental disapproval of smoking
## Multivariate Analyses

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude Adjusted</td>
<td>Crude Adjusted</td>
<td>Crude Adjusted</td>
</tr>
<tr>
<td>Movie smoking exposure</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Quartile 1</td>
<td>3.1 1.9 (1.3, 2.7)</td>
<td>3.0 2.0 (1.3, 3.2)</td>
<td>2.9 1.7 (1.1, 2.6)</td>
</tr>
<tr>
<td>Quartile 2</td>
<td>5.5 2.6 (1.8, 3.7)</td>
<td>3.7 2.2 (1.4, 3.4)</td>
<td>5.5 1.8 (1.2, 2.8)</td>
</tr>
<tr>
<td>Quartile 3</td>
<td>8.8 2.5 (1.7, 3.5)</td>
<td>5.3 2.7 (1.7, 4.3)</td>
<td>12.6 2.6 (1.7, 4.1)</td>
</tr>
<tr>
<td>Quartile 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
STATE ATTORNEYS GENERAL

A Communication From the Chief Legal Officers of the following States and Jurisdictions:

Arkansas • California • Colorado • Connecticut • Hawaii • Illinois • Maine • Maryland • Massachusetts • Minnesota • Mississippi • Northern Mariana Islands • New Hampshire • New Jersey • New Mexico • New York • Ohio • Oklahoma • Oregon • Pennsylvania • Tennessee • Utah • Vermont • Washington • West Virginia

August 26, 2003

Jack Valenti, President
Motion Picture Association of America
15503 Ventura Boulevard
Encino, California 91436

Dear Mr. Valenti:

We, the undersigned Attorneys General, write to ask you, with your longstanding prominence and influence in the American motion picture industry, to exercise your exemplary leadership to effect potentially far reaching benefits for public health. A Dartmouth Medical School study released last month confirms what other research has suggested: reducing the prevalence of cigarette smoking in motion pictures could significantly decrease the initiation of smoking in youth. With this new evidence of how effective reducing smoking in motion pictures would be in preventing youth smoking, the motion picture industry stands in a uniquely powerful position to bring about a profoundly beneficial impact on the health and well-being of millions of Americans.
**Movie Character Smoking Trends**

*Motion Picture Association of America rating:  G/PG = General audiences + Parental Guidance suggested; PG-13 = Parental advisory, may not be appropriate for audiences under 13; R = No one under age 17 admitted without parental permission
†Downward trend is statistically significant

Pierce Brosner: “Die Another Day”
Movie Character Smoking--Adolescents

* Monitoring of the Future Survey
† p-value < 0.01 for downward trend among teen movie characters

Selma Blair: “Down to You”
What’s in Store?

- Reach—Gross impressions
  - U.S. adolescents 10-14: 2003

Elizabeth Perkins: “All I Want”
Select Popular Movies

- Box office hits
  - Top 100, 1999-2003: 500
  - Top 50, 2003 (assessed 5/03): 32

Generate movie lists

- Randomly select 50 movies for each survey
- Use stratified sampling to ensure representative distribution by rating (R, PG 13, PG, G)

Survey Students

- Questionnaire assesses which of the 50 movies the adolescent has ever seen

Adolescent randomly assigned to a representative sample of about 550 U.S. adolescents
So a representative sample of about 550 U.S. adolescents responded to each movie
Lifetime Smoking Impressions
US Adolescents 10-14 in 2003, 532 Popular Contemporary Movies

• Impression: each time an adolescent saw a smoking scene
• These movies delivered:
  • 13.8 billion lifetime smoking impressions
    – Does not count repetitive viewing
<table>
<thead>
<tr>
<th>Movie Name</th>
<th>Impressions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Perfect Storm</td>
<td>376,864,857</td>
</tr>
<tr>
<td>Wild Wild West</td>
<td>289,696,946</td>
</tr>
<tr>
<td>Lord of the Rings: The Fellowship</td>
<td>262,477,026</td>
</tr>
<tr>
<td>Saving Private Ryan</td>
<td>243,563,364</td>
</tr>
<tr>
<td>Catch Me If You Can</td>
<td>194,780,852</td>
</tr>
<tr>
<td>Mr. Deeds</td>
<td>191,206,820</td>
</tr>
<tr>
<td>Atlantis: The Lost Empire</td>
<td>183,341,250</td>
</tr>
<tr>
<td>Hardball</td>
<td>169,479,480</td>
</tr>
<tr>
<td>Pearl Harbor</td>
<td>158,866,496</td>
</tr>
<tr>
<td>Men of Honor</td>
<td>156,232,560</td>
</tr>
<tr>
<td>Die Another Day</td>
<td>155,236,802</td>
</tr>
<tr>
<td>Charlie's Angels</td>
<td>145,904,308</td>
</tr>
<tr>
<td>Men in Black II</td>
<td>136,704,258</td>
</tr>
</tbody>
</table>
What’s in Store?

• Reach—Gross impressions

• Contextualized smoking
  – Movie industry response
    • Eliminate G and PG smoking
Movie smoking – Kid smoking relation by smoking rating

- GPG movie smoking
- PG-13 movie smoking
- R movie smoking

Proportion of Adolescent Ever Smokers vs. Episodes of Movie Smoking Exposure
What’s in Store?

• Reach—Gross impressions
• Contextualized smoking
  – Movie industry response
    • Eliminate G and PG smoking
    • “Most smoking is bad guy smoking”
Movie smoking – Kid smoking relation by character type

Proportion of Adolescent Ever Smokers

Episodes of Movie Smoking Exposure

- Bad Guy Smoking
- Good Guy Smoking
- Mixed Character