impacTEEN

A Policy Research Partnership to Reduce Youth Substance Use

The Adaptation and Use of Nielsen Media Research Commercial Ratings Data to Measure Potential Exposure to Televised Smoking-Related Advertisements

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Abstract

Televised anti-tobacco advertising in the US began with the Fairness Doctrine, which was in place between 1967 and 1970. More recently, anti-tobacco and smoking-related ads have proliferated as states, not-for-profit organizations, pharmaceutical companies, and even the tobacco industry have produced televised advertisements that promote, at least nominally, an anti-smoking or pro-cessation message. Evidence from the Fairness Doctrine years, along with several more recent studies of state-level counter-advertising campaigns suggest that broadcasting anti-smoking messages is an effective tobacco control strategy. Yet, most previous studies are limited because they typically have examined the impact of such advertising on smoking behavior in a single media market or state. Further, the majority of studies have examined only the state-sponsored tobacco control media campaigns; few have analyzed the influence of the variety of smoking-related advertisers on individual behavior.

The Youth Smoking and the Media (YSM) Project is able to take advantage of the natural experiment presented by the increasing number and variety of anti-smoking and smoking-related television advertisements because it has acquired and adapted a unique data set that quantifies exposure to television advertising across media markets and over time in the US. This paper describes the Nielsen Media Research data set, and the methods employed by YSM to 1) obtain a near census of anti-smoking and smoking-related television advertisements, and 2) to clean and aggregate this massive commercial data set so that it can be used to conduct research. The paper concludes with examples of the analyses that are possible with this unique data set.

Introduction

Cigarette companies were among the first commercial sponsors of broadcast television in the US, and for many years, television was a highly effective promotional medium for the tobacco industry. It was several decades, however, before the first use of television as a medium to promote an anti-smoking message. The first anti-smoking commercials, or counter-advertisements, were televised between 1967 and 1970, when the Fairness Doctrine mandated that broadcasters donate airtime to counter advertisements for cigarettes. Over this three and a half year period, the ratio of counter-advertising to cigarette advertising reached one to three, and several studies concluded that counter-advertising was associated with significant reductions in cigarette consumption and adolescent smoking (Lewit, *et al.*, 1981; Hamilton, 1972; Lewit and Coate, 1982; Warner, 1977; Warner, 1981; Baltagi and Levin, 1986). The fact that the tobacco industry voluntarily agreed to stop broadcast advertising in 1970 provides another indication of the success of the Fairness Doctrine in reducing smoking.

Since the early 1990s, youth and adults across the US have been exposed to a growing number and variety of televised anti-smoking advertisements. The California Tobacco Control Program represented the first and largest state-sponsored anti-smoking media campaign in the US. Funded by earmarked cigarette excise tax revenues, the California anti-smoking media campaign was launched in 1990 to target adult audiences and focus on changing social norms about smoking in order to reduce smoking prevalence. Massachusetts launched a state-wide anti-smoking media campaign in 1994, which promoted a wide range of anti-smoking messages, including denormalization of smoking, youth-oriented smoking prevention, and adult-targeted messages encouraging smokers to quit and explaining the dangers of “light” cigarettes. In 1997, Arizona launched a statewide anti-smoking media campaign, and Oregon followed with its own

campaign in 1998; both of these campaigns included adult and youth-targeted messages. Also in 1998, Florida introduced its Truth campaign, with an exclusively youth-targeted message, which aimed to prevent youth smoking and expose the tobacco industry as a manipulator of youth behavior. Between 1998 and 2002, at least 25 other states launched anti-smoking media campaigns.

In addition to state-level anti-smoking media campaigns, other organizations, such as the American Legacy Foundation (ALF) and the tobacco industry have recently launched sizable anti-smoking television campaigns, which appear in television markets across the US. Similar to the Florida Truth campaign, the ALF ads target a youth market, including young adults. These ads portray the dangers of smoking in graphic and sometimes irreverent messages, and often take aim at the tobacco industry for its marketing practices. The tobacco industry ads have aimed an anti-smoking message at both youth and parents, and have also promoted their corporate image by featuring their charitable activities.

Although they promote a commercial product, it is reasonable also to classify ads for nicotine replacement therapies (NRT) in the category with other anti-smoking advertisements, since their goal is to encourage quitting. Televised ads for NRT began to appear across US media markets in 1994. While NRT ads may be designed to encourage quitting among adult smokers, some have hypothesized that these ads could actually encourage smoking among adolescents by conveying the message that quitting can be easy, or at least the difficulty made manageable with NRT (Bloom et al., 2000).

Early evidence suggests that the state sponsored anti-smoking media campaigns may play an important role in reducing smoking among those exposed to the message. For example, Pierce, et al (1990) showed that a comprehensive, media-led tobacco control program that was

initiated in Australia in the early 1980s was associated with significant reductions in adult smoking prevalence (Pierce, *et al.*, 1990). Recently, McVey and Stapleton (2000) found that a televised anti-smoking campaign in England was associated with significantly reduced adult smoking prevalence (McVey and Stapleton, 2000). Hu, et al (1995) analyzed the relationship between California's expenditures on its anti-smoking media campaign and per capita cigarette sales in the state, showing a significant negative relationship between the campaign and cigarette consumption (Hu, *et al.*, 1995; Hu, *et al.*, 1995). Analyzing the impact of the Massachusetts' media campaign's focus on light cigarettes, Koslowski, et al (2000) showed that, compared to the rest of the US, smoking prevalence in Massachusetts was lower and fewer smokers smoked light cigarettes or believed that light cigarettes decreased the health risks of smoking (Kozlowski, *et al.*, 2000). Research also suggested that, prior to its demise, the Florida Truth campaign was associated with a significant decrease in youth experimentation with cigarettes (Sly, et al).

The evaluations of state-level campaigns provide promising evidence that anti-smoking advertising influences adult smoking behavior, but little of this research has focused on youth smoking. Moreover, most studies to date have explored the influence of media campaigns within a single state or country, without exploring variations in behavior across communities with different levels of exposure to anti-smoking advertisements, or with exposure to a wide variety of anti-smoking messages from multiple sponsors.

Analyses of a panel of youth exposed to ALF ads showed a significant increase in anti-tobacco attitudes and beliefs from baseline to follow-up (Farrelly, et al., 2002). There has been no research to date on the impact of the industry's corporate image ads, but Farrelly, and his colleagues (2002), found that youth exposed to the tobacco industry's anti-smoking advertisements were more likely to be open to smoking in the future, compared with youth who

did not see these ads. So far, no studies have analyzed the impact of either the ALF or tobacco industry anti-smoking ads on adolescent smoking behavior.

In order to investigate the impact of the diverse range and growing number of anti-smoking ads to which adolescents across the US are potentially exposed, it is necessary to quantify and characterize the potential exposure in a way that previous studies have not been designed to do.

This paper describes an archival data set, produced by Nielsen Media Research, which quantifies potential exposure to anti-smoking media across 75 of the top media markets in the US. These measures of exposure can then be related to individual data to analyze the impact on youth smoking behavior of the various types and levels of anti-smoking media to which teens in the US are potentially exposed.

Nielsen Ratings

Nielsen Media Research measures exposure to television programming and advertising in households across the US. The Youth Smoking and the Media (YSM) project purchased data from Nielsen, which include commercial ratings for nearly all anti-smoking advertising that aired in Nielsen's 75 top media markets between 1994 and 2002.

The television and advertising industry uses ratings to project the price of commercials for the upcoming television season and to gauge the range of exposure to product advertising across US markets. The use of the Nielsen data by YSM represents one of the first attempts to adapt and apply this commercially produced dataset to research the impact of televised advertising on individual behavior. Further, the YSM project's use of the Nielsen data is novel because it measures and classifies a broad range of anti-smoking advertisements, including private and state-sponsored Public Service Announcements (PSAs), NRT advertising and

tobacco industry anti-smoking and corporate image television campaigns. The final measures of potential exposure to anti-smoking advertising combine both current and past exposure to anti-smoking advertising, by advertiser and as an aggregated measure of total exposure to the broad class of anti-smoking messages. The process involved to classify and aggregate the Nielsen data will be discussed in the remaining part of this paper.

Ratings/Gross Rating Points (GRPs) / Target Ratings Points (TRPs)

Nielsen measures exposure to advertising through individual ratings of television programs. A rating is an estimate of the size of the television audience relative to the total television audience. It is often expressed as a percentage. For example if three households out of a total of ten were tuned into the same program, the program would receive a 30 rating, meaning that it was seen by 30% of television households.

It is customary for the advertising industry to sum rating points for a program over a specified time interval where 100 GRPs is equal to one exposure. These are called Gross Ratings Points (GRPs) or Target Rating Points (TRPs). GRPs provide estimates of audience size for all television households in general, while TRPs provide estimates for targeted populations, such as teens between the ages of 12 and 17, within the household. If an ad receives 500 GRPs across a four-week interval, then an average viewer saw that ad five times in four weeks. Because ratings are averages across the population, it is quite possible that a given individual could have been exposed to the ad more or less than five times.

Designated Market Areas

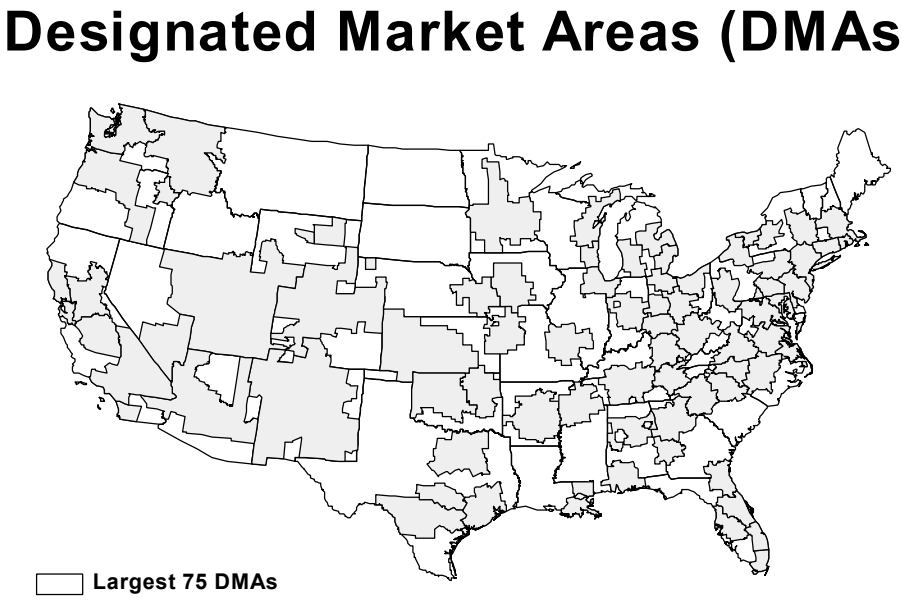
Nielsen obtains ratings estimates for television programs and advertisements by monitoring individual family audiences, called households. These households are located in 210 Designated Market Areas (DMAs) across the United States. A DMA consists of a group of

counties, which comprise a major metropolitan area. The counties in each DMA do not overlap, and receive the largest proportion of programming (audience share) from television stations within the specified metropolitan area. The 210 DMAs are fixed but their boundaries are not. As more suburban communities surround major metropolitan areas, the boundary between two DMAs may shift.

Commercials, or advertisements, are tracked using a network of computerized monitoring sites to collect and identify ad occurrences across all 210 DMAs. Nielsen tracks commercials according to Full Discovery Markets (FDMs) and Automated Discovery Markets (ADMs) and bases its tracking on commercial activity in FDMs. All commercials airing in an FDM will be recorded in both FDMs and ADMs. However, if a commercial appears in an ADM first, it will not be tracked until it is broadcast in an FDM or on a nationally monitored network. FDMs represent the most populous of the 210 DMAs.

The company has added FDMs to its tracking database since its inception in 1986. For years 1994 – 1996, Nielsen tracked the top 50 FDMs. For the years 1997 - 2000, Nielsen increased the FDM total to 75 DMAs. Below, Figure 1 illustrates the 75 FDMs for which Nielsen provided ad ratings data to YSM. In 2001, the 75 top DMAs account for approximately 78 % of the viewing households in the US. (Nielsen Media Research, 2002) (See Appendix A for list of years covered for each DMA)

Figure 1: Nielsen designated market areas (DMAs)



Spot TV

Across these DMAs, Nielsen monitors a variety of televised broadcast media, including network, cable, syndicated, Hispanic, and spot television. (See Appendix B for a list of media broadcast covered and channel names). Because spot TV includes all advertising bought at the

local market level, this measure is integral to the YSM study. Instead of buying advertising time to reach a national audience, state tobacco control agencies can target their advertising to local markets within the state by purchasing ads for spot television. Nielsen only monitors spot buys on network affiliates, independent stations and Hispanic stations. As a result, YSM may not capture some state tobacco control advertisements if the commercials were spot purchases for cable television.

Audience Measurement

Nielsen collects viewing information through diary and electronically metered measurements. For diary measurement, each person in a household over the age of two is asked to write down program and channel information for one week of a four-week measurement period. Nielsen reports this activity during "the sweeps" weeks, which occur in November, February, May, and July.

As of October 2001, Nielsen utilizes a set-tuning meter in 52 of the largest markets (Nielsen Media Research, 2000). The meters record the tuning status of the television (on/off, channel, and time) and provide daily household measurements. These metered markets have an additional diary measurement to augment tuning activity with demographic viewing data. Diary households are sampled separately from metered households. Each person is asked to keep a diary for one week of a four-week measurement period during October, January, and March. The 52 metered markets provide Nielsen with daily and weekly audience estimates based on continuous measurement of the household.

While diaries and set-tuning meters are the principal ratings measurements for local markets (DMAs), Nielsen uses the People Meter to measure cable and national network audiences. The People Meter combines both the paper diary and the set-tuning meter into one

electronic measurement device. A record box is placed on the television and each member of the household is asked to click a personal viewing button when he/she is watching television. The television box records on/off status, channel, time and who is watching. People Meters provide national estimates for the United States households for both network and cable television. Because cable measurement is national, cable audience estimates must be adjusted for the proportion of television households with cable service in each local DMA.

Nielsen selects a representative sample of households in the US to monitor the 262 million television viewers and over 102 million television households in 210 markets. Sample size is based on the size of each market, and within each market, sample households are obtained from telephone listings as well as calling unlisted numbers. Generally for 210 local markets, Nielsen collects around 100,000 diaries for one sweeps month and monitors between 400 – 500 metered households daily. Nielsen's national People Meter sample consists of 5,000 households, which represent approximately 11,000 people, and are randomly sampled from 6,000 geographic areas based on the U.S. Census Bureau's decennial census counts of all housing units in the United States.

Anti-Smoking Advertising Search

The Nielsen ratings database that is compiled from the diaries, meters, and People Meters links television ratings to individual ad occurrences. Before Nielsen can provide YSM with the ratings (GRPs and TRPs) for anti-smoking advertisers in each market, YSM must first provide Nielsen with a list of potential anti-smoking advertisers for each market and search year. YSM compiles its lists of advertisers through a number of sources. First, members of the YSM team participate in the Centers for Disease Control and Prevention's (CDC) State Tobacco Control Programs and Partners forum, which is a network of tobacco control programs across the United

States. The forum has a bimonthly teleconference to discuss new developments in their media campaigns. YSM contacts state media campaign managers for information on their anti-smoking campaigns. In addition, research assistants monitor a variety of advertising and advocacy websites looking for information on new counter-advertising television campaigns. YSM also monitors a database of commercial advertising provided by Video Monitoring Service, a fee-based repository of television advertising. The final list provided to Nielsen includes state health departments and state tobacco control campaigns, professional organizations (such as the American Lung Association or American Cancer Society), Non Governmental Organizations (such as ALF), tobacco companies (anti-smoking and public relations advertising), and pharmaceutical companies (Nicotine Replacement Therapy (NRT) and Zyban).

After Nielsen receives the advertiser list from YSM, it searches its Nielsen Monitor Plus database for those advertisers and potential anti-smoking ads. After verifying that the list of advertisers supplied by YSM is captured in the Monitor Plus database, Nielsen runs string searches on the titles of all ads in the Monitor Plus database, using the following keywords: smok, cancer, tobacco, cigar, lung, heart, community, drug, quit, nico, health, respiratory, and clean air. This approach allows Nielsen to consolidate large volumes of data into a manageable form. It also ensures that YSM receives only the anti-smoking ads for the organizations, like state health departments, which may produce a wide range of advertisements.

The Nielsen ad occurrence data from years 1994 – 1998 lack commercial title descriptors for state and private-sponsored PSA advertising. Therefore, it was impossible to distinguish whether these ads were anti-smoking ads, or were commercials for other causes sponsored by these organizations. For example, in addition to purchasing anti-smoking advertisements, the state of California also ran ads for low-income health insurance, breast cancer awareness, and a

variety of other health related issues. As a result, YSM was unable to utilize data for 1994-1998 on these anti-smoking PSAs.

Nielsen Variables

Nielsen delivers program ratings data in Excel spreadsheets filed by month. Nielsen presents data at the level of the individual occurrence where the data for one commercial is contained in one line of an Excel spreadsheet. Reporting data by individual occurrence creates an enormous dataset. It is estimated that from 1994 through 2000 YSM dataset contained ten million lines of data.

YSM receives Nielsen data in a raw form, which contain twenty-one variables to describe a commercial occurrence (See Table 1). The YSM study utilizes nine of these variables, including Market Code, Date, Parent, Brand, Creative, Gross Rating Points (GRPs) for Television Households and Target Ratings Points (TRPs) for teens 12-17.

Table 1: Commercial Occurrence Variables

Variable	**Description**
Market Code	Media Market includes top 75 DMAs and National Codes: NC, NN, NS, NH
Call Letters	Broadcast station name
Affiliation	National network affiliation: ABC, CBS, NBC, FOX, UPB, WB
Date	Commercial Date (YYYYMMDD)
Time	Commercial Time (HHMMDD)
Pod Number	Sequence of break during program
Pod Sequence	Sequence of commercial during break
Parent	Parent company who bought advertising
Brand	Name of product or service
Creative	Short title assigned by Nielsen

Variable	Description
PCC Code	Industry and Product Classification Code: B162 - City, State, and Foreign Govt. B170 - Corporate D219 - Misc. Medicine and Proprietary Remedies (Smoking Deterrent)
Daypart	Name of segment of broadcast day
Duration	Commercial duration in seconds
Origin	Type of commercial buy: L = Local spot N = Network clearance, National network B = Syndication clearance, Syndication C = Cable
Program Title	Name of show
Program Type	Program classification codes
TV HHLD	GRPs for television households
P 12-17	TRPs for population age 12 - 17
M 12-17	TRPs for males age 12-17
W 12-17	TRPs for females age 12-17
Expenditures	Estimated cost of commercial

Market Codes

Market Codes identify the local DMA where the commercial was broadcast. In addition to local markets, YSM receives ad occurrence data for a number of national market broadcasts, including National Network, National Cable, National Syndication, and National Hispanic. Nielsen monitors broadcasts of National Network and National Syndication at the local market level, so that the broadcast of national network programs is recorded in the market. National cable markets are not recorded at the market level. In order to allocate national cable data to the 75 markets, the data must be adjusted according to the size of the television population that subscribe to cable service in each DMA.

Parent and Brand Codes

Parent codes identify the company that produced the advertising, and Brand codes describe the product that the Parent company is advertising in each occurrence. Anti-smoking advertising does not fit neatly in the Brand Code because a product *per se* does not exist. In the case of state-sponsored anti-tobacco advertising, often the state agency responsible for the advertising is listed as the brand. For example, advertisements for the California anti-smoking media campaign are listed with the State of California as the Parent and the Department of Health Services as the Brand.

Creative

The creative code is a short four or five word description of the commercial. For the majority of state anti-smoking advertising, the creative code is the key to identifying the commercial as anti-smoking advertising. Often state anti-smoking commercials are coded for Brand at the highest level of state agency. In the example noted above for California, Nielsen codes the Brand as Department of Health Services and not California Tobacco Control Section, which would clarify that an ad is indeed an anti-smoking ad. Because Nielsen's collection protocol involves capturing commercial data for the Brand, Department of Health Services, YSM receives data on all health advertising including HIV awareness, cancer detection, drug prevention, and other health issues. It is therefore impossible to distinguish anti-smoking advertising without the creative description.

Nielsen Data Preparation

Before the Nielsen data can be merged with survey data, it must be extensively cleaned and prepared for data analysis. The Nielsen data is an enormous dataset, which contains a large volume of extraneous health advertising, only some of which can be filtered out by the creative

title. In order to more precisely identify anti-smoking advertisements, the YSM team processes the Nielsen data in stages.

Local DMA Files

The first stage of cleaning involves creating separate local DMA files for each year of data available. The majority of the commercial occurrences in the local files occur on network television. These files are labeled, "RAW" along with the DMA name and year. After yearly DMA files are created, month and year variables are added to each commercial occurrence.

The second phase consists of extracting anti-smoking commercial occurrences by type of advertiser (See Table 2). Advertisers are identified in the RAW dataset by filtering for both Parent and Brand codes. Type codes are then assigned to each occurrence and pasted into new local DMA files, labeled, "CLEAN" along with the DMA name.

Table 2: Advertiser types aggregated from commercial occurrence data

Type Codes	**Description of Advertising Campaign**	**Advertiser/Product**
NRT	National anti-smoking	Habitrol, Nicorette, Nicoderm, Nicotrol, Zyban
ALF	National youth anti-smoking	American Legacy Foundation; The Truth Campaign
State	Local anti-smoking	California, Massachusetts, Arizona, Florida, Minnesota
NGO	National anti-smoking	American Cancer Society, American Lung Association, American Heart Association
TobYouth	National youth anti-smoking by tobacco companies	Philip Morris Lorillard
TobParent	National youth anti-smoking by tobacco companies targeting parents	Philip Morris
TobCorp	National public relations by tobacco companies	Philip Morris
NoSmok	Anti-smoking advertising lacking advertiser or product identification	
Other	Local	Local health departments; local chapters of NGOs

The majority of anti-smoking advertising can be identified through the name of the advertiser provided by the Parent and Brand codes; in the case of state sponsored advertising, the creative code is also included in the sorting process. While YSM captures the majority of anti-smoking advertisements through sorting, the search can be further complicated by the ambiguity of many of the creative descriptions. For example, a California anti-smoking ad, which depicts a woman inhaling a cigarette through her laryngectomy stoma is described as, "Woman with short hair," leaving the classification of this ad ambiguous unless it is physically viewed or is recognized and confirmed as anti-smoking by its sponsor. In addition, ads are also likely to have more than one creative description throughout the database. In order to identify all likely creative titles, YSM collaborates with state media campaign managers to verify advertising themes and creative approaches. YSM obtains copies of all television counter advertising from each state, along with media plans that document exposure, location, and description of advertising. Nielsen also provides digital copies of ads from state health departments. Copies are only available starting in 1999.

National Cable Files

The third step in the cleaning process involves the allocation of National Cable ratings to local DMA markets. Although broadcast television in US households dominates the markets with 98% of television households reporting broadcast TV, cable television represents a substantial communication medium for advertisers. Nielsen estimates cable penetration in the US to be around 68% (Nielsen Media Research; 2000).

National Cable data is reported in a similar way to local DMA data. Commercial occurrence data is filtered for relevance and assigned types according to advertiser (See Table 2). Separate files for each year are created; and month and year variables are added. Because cable

penetration varies by market, ratings for each occurrence must be weighted to reflect the size of the market. An audience index is created for each market and for each television year (September-August). The index consists of the percentage of cable penetration of local television households divided by the percentage of cable penetration of total television households. The index is then multiplied by the rating of each commercial occurrence. The code for National Cable is replaced with the appropriate market code and added to the local DMA files.

Aggregations

The final stage of data preparation involves the aggregation of the local DMA dataset, which contains cleaned commercial occurrences for local network television along with adjusted national cable. An Excel pivot table is used to aggregate commercial occurrences by advertiser, market, month and year. Monthly aggregates were chosen in order to reduce the volume of data and to directly relate the data to behavioral data from surveys of youth. Aggregated data from state advertisers are validated with media plans and direct communication with state tobacco control media managers.

Data Analyses

Characterize potential exposure to anti-smoking messages

With the cleaned and aggregated Nielsen data set, YSM is able to accomplish several research goals. First, YSM is able to calculate levels of exposure to anti-smoking ads across DMAs and over time, providing a rich description of the large majority of televised anti-smoking and smoking-related media in the US. YSM can aggregate total GRPs or TRPs for all anti-smoking advertisements for a given period and market, or separately examine the potential

exposure to a single advertiser, such as a state media campaign, ALF, or Philip Morris. YSM will also be able to compare the relative volume of ads from each advertiser appearing in a given market and time period, and to compare both volume and ad type across markets.

Match Nielsen Data to Behavioral Data

Once YSM has characterized the volume and type of anti-smoking advertising that occurred in each DMA over time, it is then possible to match the potential exposure data to individual-level data from the Monitoring the Future Surveys (MTFS), based on the zip code of the school attended by the respondents. This will allow YSM to explore the extent to which potential exposure to anti-smoking advertisements influences youth attitudes, beliefs, and smoking behavior. YSM will explore the effect on youth behavior of total volume of potential exposure; the independent effect of potential exposure to ads purchased by each category of sponsor: state, ALF, and tobacco industry; and the possible interactions between potential exposure levels for the ads from different sponsors. Further, YSM will be able to specifically examine the differential impact of these exposures across gender, and controlling for amount of television watched by individual adolescents in the Monitoring the Future Surveys.

With these data, it will be possible to explore multiple hypotheses. For example, it will be possible to analyze whether there are threshold effects, whereby behavior changes only after a given level of exposure is achieved. Also of interest is the potential existence of lagged effects, where the effect of anti-smoking ads on adolescent behavior is only realized after some cumulative exposure. Similarly, the project will explore the idea of novelty effects, where new ads or new campaigns could produce a dramatic change in behavior, followed by little or no subsequent effect.

Furthermore, it will be possible to include the NRM data in models that analyze the influence on youth smoking behavior of other policy variables, such as tobacco taxes and clean indoor air laws. We will explore the independent effect of each of these variables, as well as potential interactions that could suggest a synergy between tobacco control policies and exposure to anti-smoking media.

Finally, the YSM project recognizes the possibility that all anti-tobacco ads are not created equally, and therefore GRPs or TRPs may not produce an equivalent impact across different types of anti-smoking advertisements. In another arm of the project, YSM assessed youth responses to a sample of actual anti-smoking ads, and developed a method of categorizing ads based on youth's responses to the sample ads (Wakefield, *et al.*, 2002). YSM will use this information to explore methods of differentially weighting various categories of anti-smoking ads, and relating weighted exposure levels to adolescent smoking behavior.

Data Limitations

It is worth bearing in mind several limitations of the Nielsen data. First, Nielsen do not collect records of spot cable television, so that ads appearing on spot cable TV will not be included in the dataset. To the extent that advertisers choose this form of broadcast for their ads, this may introduce some degree of underestimation of the overall amount of potential exposure to anti-smoking ads. Second, the relatively accurate identification of ads became possible only after creative titles were added to each ad occurrence during late 1998 and into 1999, so that data collected before this time are largely not available to be linked to outcome measures. As has been mentioned, even after 1999, the labeling of the same ads with different creative titles still means that ad identification is not necessarily a straightforward procedure and requires input from state tobacco control campaign personnel. Finally, the data are relatively expensive and

time-consuming to prepare for analysis. Nonetheless, once this preparation process is completed, the resulting data set on potential exposures offers a valuable resource for analysis.

Summary

In sum, the data from Nielsen Media Research represent a wealth of information about potential exposure to televised anti-smoking smoking messages, across media markets and over time. Because these data are collected for commercial purposes that are much different from the research applications designed by YSM, it has been necessary to develop a complex system of cleaning and validating these data. Once the data are cleaned, however, they provide the opportunity to explore many facets of the relationship between exposure to anti-smoking advertising and smoking behavior, in ways that have not previously been possible.

Appendix A

State	DMA	Market Name	Data Years
AL	BR	Birmingham, AL	1994-2002
AR	LR	Little Rock, AR	1994-2002
AZ	PX	Phoenix, AZ	1994-2002
CA	FV	Fresno-Visalia, CA	1994-2002
CA	LA	Los Angeles	1994-2002
CA	SD	San Diego, CA	1994-2002
CA	SF	San Francisco-Oakland, CA	1994-2002
CA	SS	Sacramento-Stockton, CA	1994-2002
CO	DV	Denver, CO	1994-2002
CT	HT	Hartford-New Haven, CT	1994-2002
DC	WA	Washington, DC	1994-2002
FL	JA	Jacksonville, FL	1994-2002
FL	MF	Miami-Fort Lauderdale, FL	1994-2002
FL	MP	Mobile, AL - Pensacola, FL	1994-2002
FL	OD	Orlando-Daytona-Melbourne, FL	1994-2002
FL	TM	Tampa-St.Petersburg-Sarasota, FL	1994-2002
FL	WP	West Palm Beach-Fort Pierce, FL	1994-2002
GA	AT	Atlanta, GA	1994-2002

State	DMA	Market Name	Data Years
IA	DM	Des Moines, IA	1994-2002
IL	CH	Chicago	1994-2002
IN	IL	Indianapolis, IN	1994-2002
KS	WH	Wichita-Hutchinson, KS	1994-2002
KY	LE	Lexington, KY	1994-2002
KY	LO	Louisville, KY	1994-2002
LA	NO	New Orleans, LA	1994-2002
MA	BS	Boston, MA	1994-2002
MA	PN	Providence, RI - Bedford, MA	1994-2002
MD	BT	Baltimore, MD	1994-2002
MI	DE	Detroit, MI	1994-2002
MI	FS	Flint-Saginaw-Bay City, MI	1994-2002
MI	GR	Grand Rapids-Kalamazoo-Battle Creek, MI	1994-2002
MN	MS	Minneapolis-St. Paul, MN	1994-2002
MO	KC	Kansas City, MO	1994-2002
MO	SL	St. Louis, MO	1994-2002
NC	CT	Charlotte, NC	1994-2002
NC	GH	Greensboro-High Point, NC	1994-2002
NC	RD	Raleigh-Durham, NC	1994-2002
NE	OM	Omaha, NE	1994-2002
NM	AL	Albuquerque-Sante Fe, NM	1994-2002
NV	LV	Las Vegas	1994-2002
NY	AS	Albany-Schenectady-Troy, NY	1994-2002
NY	BF	Buffalo, NY	1994-2002
NY	NY	New York	1994-2002
NY	RO	Rochester, NY	1994-2002
NY	SY	Syracuse, NY	1994-2002
OH	CA	Cleveland, OH	1994-2002
OH	CN	Cincinnati, OH	1994-2002
OH	CO	Columbus, OH	1994-2002
OH	DY	Dayton, OH	1994-2002
OH	TO	Toledo, OH	1994-2002
OK	OC	Oklahoma City, OK	1994-2002
OK	TL	Tulsa, OK	1994-2002
OR	PR	Portland, OR	1994-2002
PA	HL	Harrisburg-Lancaster, PA	1994-2002
PA	PH	Philadelphia, PA	1994-2002
PA	PT	Pittsburgh, PA	1994-2002
PA	WB	Wilkes Barre-Scranton, PA	1994-2002
SC	GS	Greenville-Spartanburg, SC	1994-2002
TN	KN	Knoxville, TN	1994-2002
TN	MM	Memphis, TN	1994-2002
TN	NA	Nashville, TN	1994-2002
TX	AU	Austin, TX	1994-2002
TX	DL	Dallas-Fort Worth, TX	1994-2002

State	DMA	Market Name	Data Years
TX	HN	Houston, TX	1994-2002
TX	SA	San Antonio, TX	1994-2002
UT	SC	Salt Lake City, UT	1994-2002
VA	NP	Norfolk-Portsmouth-Newport News, VA	1994-2002
VA	RL	Roanoke-Lynchburg, VA	1994-2002
VA	RP	Richmond-Petersburg, VA	1994-2002
WA	SK	Spokane, WA	1994-2002
WA	ST	Seattle-Tacoma, WA	1994-2002
WI	GB	Green Bay-Appleton, WI	1994-2002
WI	MI	Milwaukee, WI	1994-2002
WV	CG	Charleston-Huntington, WV	1994-2002

Appendix B

Media	Network
National Network	ABC CBS NBC FOX UPN WB
National Cable	Arts and Entertainment Animal Planet Black Entertainment Television Comedy Central Country Music Television Cable News Network Consumer News and Business Channel Discovery Channel Entertainment Television ESPN ESPN2 Family Channel Food Network FX Home and Garden Television History Channel Headline News Lifetime MTV Nickelodeon/Nick at Nite SCFI TBS Learning Channel Cartoon Network Nashville Network TNT TV Land Weather Channel USA VH-1
National Hispanic	Telemundo Univision

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