Effects of Different Types of Antismoking Ads on Reducing Disparities in Smoking Cessation Among Socioeconomic Subgroups

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Tobacco use inflicts the greatest burden of illness on those least able to afford it.[1,2] An enormous challenge for tobacco control is how to tackle the consistently higher levels of smoking prevalence found among disadvantaged groups,[3–5] especially because these gaps may be widening.[6,7] Televised antismoking campaigns provide an effective population-wide method of preventing smoking uptake,[8,9] promoting adult smoking cessation,[10] and reducing adult smoking prevalence,[11] and research indicates that some types of ads may be more effective than others. Antismoking messages that produce strong emotional arousal, particularly personal stories or graphic portrayals of the health effects of smoking, tend to perform well[12]; they are perceived to be more effective than others, are more memorable, and generate more thought and discussion.[13–16] However, it is unclear whether different types of messages might maintain, increase, or mitigate the disparities in smoking prevalence across population subgroups.

Research on subgroup differences in responses to a range of anti-tobacco ads has not found systematic differences by gender, race/ethnicity, or nationality.[13,17–19] A review of the literature on the use of mass media concluded that in comparison with their effects on other populations, campaigns have often been less effective, sometimes equally effective, but rarely more effective in promoting cessation among socioeconomically disadvantaged populations.[20] However, many of the less effective general-audience campaigns were hampered by minimal reach to smokers of low socioeconomic status (SES) because they were low-cost campaigns unable to afford extensive media exposure.[20]

Most research examining longer-term quit rates in the context of large-scale, well-funded antismoking campaigns found comparable quit rates or reductions in smoking prevalence in low- and high-SES groups.[21–28] However, to our knowledge, no population-based research has examined the relationship between the degree of exposure to different types of antismoking messages and quit rates between low- and high-SES groups.

A variety of theories[29–38] provide guidance about which styles of ads may best encourage quitting, especially among members of lower socioeconomic groups. Consistent with these theories, reviews of the effects of antismoking advertising have concluded that advertisements that evoke strong emotional responses through negative visceral imagery or personal stories about the health effects of smoking can increase attention, generate greater recall and appeal, and influence smoking beliefs and intentions.[12,39,40] Recent research indicates that self-relevant emotional reactions (i.e., emotional reflections about one's life, body, or behavior that are triggered by the ad[41]) may be especially persuasive, because they affect perceptions of future risk of becoming ill,[42] which in turn have been linked with reduced cigarette consumption, increased intentions to quit, and quit attempts.[43]

Antismoking ads that use strong graphic imagery of the health effects of smoking are likely to be predominately associated with high negative emotional arousal, but personal stories of the consequences of smoking may evoke high or low levels of emotion depending on the particular story and the degree to which smokers relate to the characters.[38] However, less emotional personal testimonials may still be more effective than other types of less emotional ads because there is no explicit persuasive intent against which smokers may react[38,44] and because health information is presented in a story-based format, which people learn to process naturally from an early age.[45]

Because lower-SES groups tend to have a greater degree of resistance to messages from the health care sector,[46] lower health literacy levels,[47,48] greater likelihood of belief in myths about cancer risks and prevention,[49] and less perception that smoking increases a person's chance of getting cancer,[48] we proposed that emotional messages and personal stories might be especially influential. Presenting antismoking messages in an emotional or personal testimonial

Objectives. We assessed which types of mass media messages might reduce disparities in smoking prevalence among disadvantaged population subgroups.

Methods. We followed 1491 adult smokers over 24 months and related quitting status at follow-up to exposure to antismoking ads in the 2 years prior to the baseline assessment.

Results. On average, smokers were exposed to more than 200 antismoking ads during the 2-year period, as estimated by televised gross ratings points (GRPs). The odds of having quit at follow-up increased by 11% with each 10 additional potential ad exposures (per 1000 points, odds ratio [OR]=1.11; 95% confidence interval [CI]=1.00, 1.23; $P<.05$). Greater exposure to ads that contained highly emotional elements or personal stories drove this effect (OR=1.14; 95% CI 1.02, 1.29; $P<.05$), which was greater among respondents with low and mid-socioeconomic status than among high–socioeconomic status groups.

Conclusions. Emotionally evocative ads and ads that contain personalized stories about the effects of smoking and quitting hold promise for efforts to promote smoking cessation and reduce socioeconomic disparities in smoking. (*Am J Public Health*. 2009;99:2217–2223. doi:10.2105/AJPH.2009.161638)

format may convey health information to these smokers in a way that is difficult to discount, natural and easy to process, and likely to arouse emotions that lead to increased perceptions of susceptibility to smoking-related diseases and motivation to quit.[38,42,44]

Drawing on the only previous study to examine the effect on adult quitting of the degree of exposure to antismoking ads,[10] we first hypothesized that when all types of advertisements were considered together, greater exposure to these antismoking ads would be associated with greater likelihood of quitting by follow-up. Our second hypothesis was that particular types of antismoking ads (those containing highly emotional elements or personal testimonials about the effects of smoking) would be associated with a greater chance of successful quitting by follow-up than would exposure to ads without these elements. Finally, we hypothesized that highly emotional or personal testimonial ads would be especially effective among lower-SES groups.

METHODS

Our data came from the first 2 waves of the UMass Tobacco Study, a longitudinal survey of Massachusetts adults designed to investigate responses to the Massachusetts Tobacco Control Program. During the period surrounding the data collection for the baseline survey (1999–2002), 134 different anti-tobacco television ads aired in Massachusetts. Viewers were exposed to a range of ads from the Massachusetts Tobacco Control Program and the American Legacy Foundation, along with a small proportion from the New York State Tobacco Program where media markets overlapped state lines (i.e. Albany, Schenectady, Troy).

Between January 2001 and June 2002, the baseline survey obtained a probability sample from 6739 adults, oversampling adult smokers, young adults (aged 18–30 years), and recent quitters. Of residential households sampled, 66% were successfully screened, and 70% of eligible adults were interviewed (overall response rate=46%). Recontact was attempted with all adults in the baseline sample (n=4991) between January 2003 and July 2004, and a follow-up rate of 56% (n=2805) was achieved. We analyzed data only from

respondents who were baseline smokers, were successfully recontacted at follow-up, and lived within the 3 largest media markets in Massachusetts for which ratings data were available (n=1491).

Measures

Outcome measure–cessation. At each wave, a current smoker was defined as a respondent reporting lifetime consumption of at least 100 cigarettes who currently smoked some days or every day. Cessation was defined as abstinence from smoking for at least 1 month at the time of the follow-up interview.

Predictors. We assessed the emotional intensity of individual tobacco control ads aired by state sponsors or the American Legacy Foundation by asking 18 adult independent raters to view and rate them. We determined the presence of emotionally arousing content by the mean score (on a scale of 1–7) on 3 items describing the ads as emotional, intense, and powerful. Ads with scores equal to or above the midpoint were classified as highly emotional. This process provided ratings for 74% of the individual ads aired by the state sponsors and the American Legacy Foundation. The remaining ads were viewed by researchers and categorized by characteristics known to relate to strong emotions. Of the 134 ads aired, 35.1% were rated as highly emotional ads.

Ads were categorized as personal testimonials if they portrayed people describing their personal experiences with smoking or how smoking affected their lives or the lives of their families. Often the ads depicted an individual talking to the audience about his or her pain and suffering in a familiar setting such as a home or a hospital. Of all 134 ads, 31.3% were rated as personal testimonial ads (64% of these were rated as highly emotional). Personal testimonial ads categorized by researchers achieved a concordance rate over 95%, and discrepancies were discussed and resolved.

We categorized 20.2% of the ads as both highly emotional and personal testimonial, 13.4% as highly emotional but not personal testimonial, 11.2% as personal testimonial but not highly emotional, and 53.7% as neither. The box on the next page contains a description and examples of each of these types of ads.

Ads categorized as highly emotional, personal testimonial, or both were considered together (44.8%) and were compared with ads without these elements, the comparison ads.

We ascertained the volume of broadcast, measured in gross ratings points (GRPs), of antismoking ads aired in Massachusetts from Nielsen Media Research monitoring records. GRPs represent the sum of all household rating points achieved by a schedule of advertisements for a particular period within a particular media market. For example, 30 GRPs for an ad or program indicates that 30% of the households in a given media market were tuned to that program at that time. GRPs for an ad or program summed over a given time provide estimates of how often the total media market has potentially been exposed to an ad or type of ad over that period. For example, 1000 GRPs for a 2-year period can indicate that all (100%) of the target population has been exposed, 10 times on average, to an ad or program. GRPs provide estimates of potential exposure to ads for households within a particular population area, but they do not equate to actual individual exposure. Some viewers may have been reached more often and some less often, depending on their TV-watching frequency. We computed the sum of monthly GRPs for tobacco control ads for each of the media markets and merged this with the individual adult data according to the interview month and the media market in which the respondent lived. GRPs for 2 ads sponsored by American Legacy Foundation were not able to be identified by Nielsen Media Research, so the GRPs for these ads were removed from the analysis. For these unidentified ads there were only 2.62 GRPs in 2001 and 228.96 in 2002.

We computed 3 ad exposure measures for each respondent, 1 for total tobacco control ads (state and American Legacy Foundation ads combined), 1 for the tobacco control ads that contained highly emotional or personal testimonial elements, and 1 for the comparison ads (Table 1). Each measure was a sum of GRPs for 24 months, reflecting an individual's total potential exposure to ads over the 2 years prior to the date of the baseline interview in the media market where the respondent lived. We divided these sums by

Highly Emotional and Personal Testimonial Ads	**Highly Emotional Ads That Did Not Include Personal Testimonials**
Personal stories of the health effects of smoking experienced by narrators or by close family members. *Examples*: Rick Stoddard series; I can't breathe campaign (Pam Laffin); Shower; Janet Sackman	Anti-tobacco industry ads that depict the victims of tobacco; depictions of family scenes with a family member missing because of smoking-related death; depictions of a person exposing family/friends to environmental smoke. Scenes of credible people realizing the harmful nature of environmental smoke. *Examples*: Baby Monitor; Body Bags NYC; Kids; Ghost; Careful series.
Personal Testimonial Ads That Were Not Highly Emotional	**Comparison Ads**
Personal stories of the quitting process, including quitting motivation, quitting strategies, how family/friends were supportive; how much better narrators feel now they've quit. *Examples*: Chuck; Birthday; Teacher; Wonderful Grandfather; I Did It	Ads that depict how smoking effects fitness, appearance, and social standing; ads that use information-based approaches detailing ill effects of smoking (including environmental smoke effects); humorous ads that highlight the ridiculous nature of smoking; anti-tobacco industry ads that use humor/irony or statistics/information to attack the industry. *Examples*: Stamina; House Party; Auto-shop; Numbers; Smelly puking habit ads; Daily Dose series

Note. Detailed descriptions of the ads are available for viewing on the Media Campaign Resource Center (MCRC) Web site: http://www.cdc.gov/tobacco/media_communications/countermarketing/mcrc/index.htm.

1000 to aid interpretation of effects: each 1-unit increase in the 3 GRP measures represented 10 additional potential exposures over the 24-month period to (1) all tobacco control ads, (2) highly emotional or personal testimonial ads, and (3) comparison ads. Because the baseline data collection period spanned 18 months, there was wide variation in potential exposure to the ads among individual smokers who were interviewed at different times and in different media markets.

Moderator variable. Socioeconomic status was determined by education and income. Respondents with high school or less education and with an income of $50 000 per year or less were classified as low SES. Those who had at least some college education and earned more than $50 000 per year were classified as high SES. Participants who had lower levels of education but a higher income level or who had higher education but a lower income were classified as mid-SES. At baseline, 218 smokers did not provide their income or their education level and were therefore categorized as undetermined SES.

Covariates. Covariates included minority status (minority versus non-Hispanic White), gender, age (at baseline), and addiction level

(heavy or light). Respondents who reported smoking within 30 minutes of waking or smoking more than 20 cigarettes per day were classified as heavily addicted. We classified smokers at a lower addiction level if they reported not smoking within 30 minutes of waking and smoking fewer than 20 cigarettes per day. We also included as a covariate usual TV watching between 8 PM and 11 PM in a typical week (0–3 days/week, 4–6 days/week, or 7 days/week). We included this as a proxy measure of individual TV-watching frequency. We also included the number of months between the baseline and follow-up interviews (range=21–35 months; 89% of the sample was reinterviewed between 21 and 26 months after baseline) and the media market in which the respondent lived as covariates in all analyses.

Statistical Analysis

For the baseline sample, we computed survey weights to adjust for the probability of selection. As in any longitudinal study, attrition from wave to wave may have reduced representativeness. Analyses of the baseline differences between adult respondents at follow-up and those who failed to respond indicated

that responders were significantly more likely to be older, female, non-Hispanic White, and more educated. We used these variables in an iterative raking procedure to create adjustments to the weights, which yielded distributions on these demographic characteristics at follow-up that either were identical to those at baseline or differed by at most 0.4 percentage points.

Multivariate logistic regression analyses tested our first hypothesis, that total potential exposure to tobacco control ads would predict quitting at follow-up, as well as whether there was an interaction between total potential exposure to tobacco control ads and SES status. We also used multivariate logistic regression to test our second hypothesis, that exposure to ads with highly emotional or personal testimonial elements would raise the probability of quitting by follow-up, compared with exposure to the comparison ads. We added interaction terms to the multivariate logistic regression to test our third hypothesis, that the emotionally evocative or personal testimonial ads would be especially effective among respondents with low SES. We ran a set of multiple logistic regression analyses separately for each SES group to

TABLE 1—Sample Characteristics for the Total Sample and by SES Group: UMass Tobacco Study, 2001–2004

	Total Sample (n = 1491)	Low SES (n = 348)	Mid SES (n = 459)	High SES (n = 466)	Undetermined SES (n = 218)
Age, y, mean (SE)	40.5 (0.5)	43.4 (0.9)	38.7 (0.7)	38.7 (0.9)	42.8 (1.4)
Interview gap, mo, mean (SE)	23.8 (0.1)	23.6 (0.2)	24.0 (0.1)	23.7 (0.1)	23.7 (0.1)
Total tobacco control ad GRPs,[a] mean (SE)	853.4 (2.2)	850.6 (5.0)	854.2 (3.4)	856.6 (4.4)	849.9 (4.9)
Total tobacco control ad GRPs,[b] mean (SE)	20 480 (50)	20 410 (120)	20 500 (80)	20 560 (110)	20 400 (120)
Average monthly HE/PT GRPs,[a] mean (SE)	438.2 (1.9)	440.5 (3.8)	439.9 (3.6)	434.8 (3.1)	438.0 (5.8)
Summed HE/PT GRPs,[b] mean (SE)	10 520 (190)	10 570 (90)	10 560 (90)	10 430 (70)	10 510 (140)
Average monthly comparison GRPs,[a] mean (SE)	415.2 (1.7)	410.0 (3.6)	414.4 (3.0)	421.8 (2.6)	411.9 (5.4)
Summed comparison GRPs,[b] mean (SE)	9960 (40)	9840 (90)	9950 (70)	10 120 (60)	9890 (130)
Quitting status at follow-up, %					
Continuing smoker	82.4	87.1	81.8	80.8	79.0
Quitter	17.6	12.9	18.2	19.2	21.0
Education, %					
Some college or above	51.5	0	51.7	100	38.7
High school or lower	46.1	100	48.3	0	44.5
Not disclosed	2.5	0	0	0	16.9
Income, %					
≤ $50 000	41.8	100	51.7	0	8.6
> $50 000	45.8	0	48.3	100	7.1
Not disclosed	12.4	0	0	0	84.3
Race/Ethnicity, %					
Minority	16.1	23.1	13.8	12.6	16.1
Non-Hispanic White	83.9	76.9	86.2	87.4	83.9
Gender, %					
Women	55.2	51.8	56.7	53.1	61.6
Men	44.8	48.2	43.3	46.9	38.4
Addiction level, %					
Heavy[c]	59.5	66.8	64.0	48.0	61.0
Light[d]	40.5	33.2	36.0	52.0	39.0
TV-watching frequency, %					
0–3 d/wk	32.2	37.1	30.2	27.3	37.9
4–6 d/wk	26.1	18.6	26.2	33.7	22.6
7 d/wk	41.8	44.3	43.5	39.0	39.5
Media market, %					
Boston, MA	87.0	82.7	86.1	92.1	85.8
Albany–Schenectady–Troy, NY	2.8	3.6	3.4	1.0	3.8
Providence–New Bedford, MA	10.2	13.7	10.5	6.8	10.5

Note. GRPs = gross ratings points; HE/PT = highly emotional/personal testimonial; SES = socioeconomic status.
[a]Monthly average GRPs of state-sponsored and American Legacy Foundation–sponsored ads aired in the 24 months before the baseline interview.
[b]Summed GRPs of state-sponsored and American Legacy Foundation–sponsored ads aired in the 24 months before the baseline interview.
[c]Smoked within 30 minutes of waking or smoked more than 20 cigarettes per day.
[d]Did not smoke within 30 minutes of waking and smoked fewer than 20 cigarettes per day.

provide odds ratios for Figure 1. All analyses included as covariates age, gender, minority status, addiction level, TV-watching frequency, number of months between baseline and follow-up interviews, and the media market in which each participant resided.

RESULTS

Of the 1491 individuals who were smoking at baseline, 16.1% had quit for 1 month or more at the time of the follow-up interview. Just under half had, at most, a high school education (46.1%), and 41.8% earned $50 000 per year or less; 24.6% reported both of these low-SES indicators. Half had more than a high school education (51.5%), and 45.8% earned more than $50 000 per year; 29.8% reported both of these high-SES indicators. A further 30.9% had 1 low- and 1 high-SES indicator (mid-SES group), and 14.7% did not disclose their
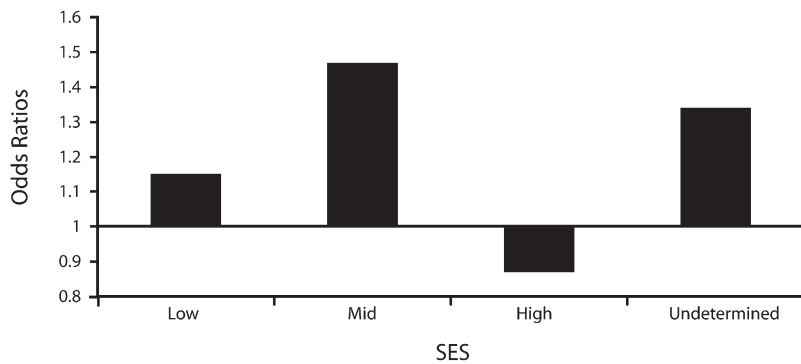
FIGURE 1—Likelihood of quitting smoking at follow-up (odds ratios) associated with potential exposure to each 10 additional highly emotional or personal testimonial ads, by socioeconomic status (SES) group: UMass Tobacco Study, 2001–2004.

TABLE 2—Effects of Potential Exposure to 2 Types of Ads on Odds of Quitting Smoking: UMass Tobacco Study, 2001–2004

Main Predictors	OR (95% CI)
Highly emotional or personal testimonial ad GRPs[a]	1.14** (1.02, 1.29)
Comparison ad GRPs[a]	0.93 (0.61, 1.40)
Age,[b] y	1.00 (0.98, 1.01)
Interview gap, mo	1.00 (0.92, 1.08)
SES	
Low (Ref)	1.00
Mid	1.70** (1.02, 2.83)
High	1.70* (0.95, 3.03)
Undetermined	2.11** (1.07, 4.14)
Race/ethnicity	
White (Ref)	1.00
Minority	0.55* (0.29, 1.04)
Gender	
Women (Ref)	1.00
Men	1.09 (0.75, 1.59)
Addiction level	
Heavy[c]	0.42*** (0.29, 0.60)
Light[d] (Ref)	1.00
TV-watching frequency, d/wk	
0–3 (Ref)	1.00
4–6	1.09 (0.70, 1.71)
7	1.00 (0.63, 1.58)
Media market	
Boston, MA (Ref)	1.00
Albany–Schenectady–Troy, NY	0.43 (0.01, 15.22)
Providence–New Bedford, MA	0.85 (0.34, 2.13)

Note. CI = confidence interval; GRPs = gross ratings points; OR = odds ratio; SES = socioeconomic status.
[a]Summed GRPs, divided by 1000, of state-sponsored and American Legacy Foundation–sponsored ads aired in the 24 months before the baseline interview.
[b]The continuous age variable (each smoker's baseline age in years (range = 18–83 y) was included as a covariate in each analysis. The odds ratio of 1.00 was rounded up from 0.997.
[c]Smoked within 30 minutes of waking or smoked more than 20 cigarettes per day.
[d]Did not smoke within 30 minutes of waking and smoked fewer than 20 cigarettes per day.
*$P < .10$; *$P < .05$; ***$P < .001$.

education or income (undetermined SES). Table 1 displays characteristics of the sample by demographic subgroup.

On average, smokers were exposed to 853.4 (SE = 2.2) tobacco control ad GRPs per month, or an average overall total of 20 480 (SE = 50) tobacco control ad GRPs over the 24 months that preceded the baseline interview. These comprised 438.2 (SE = 1.9) highly emotional or personal testimonial ad GRPs per month (10 520 GRPs overall) and 415.2 (SE = 1.7) comparison ad GRPs per month (9960 GRPs overall).

Our analysis of the effect of potential exposure to total tobacco control ads indicated that this was a significant predictor of quitting status at follow-up: the odds of having quit increased by 11% with each 10 additional potential antismoking ad exposures (per 1000 GRPs, odds ratio [OR] = 1.11; 95% confidence interval [CI] = 1.00, 1.23; $P < .05$). We found no significant interaction between total potential exposures and SES status (interaction $\chi^2 = 5.21$; $P > .05$).

Our analysis of the effect of potential exposure to different types of ads indicated that level of potential exposure to emotionally evocative or personal testimonial ads was a significant predictor of quitting at follow-up (Table 2). For each 10 additional potential exposures over the 2-year period to these types of ads, the odds that smokers quit were 1.14 times as high. However, level of potential exposure to comparison ads was not a significant predictor of quitting at follow-up (OR = 0.93; 95% CI = 0.61, 1.40; $P > .05$; Table 2).

We also examined the interaction between potential exposure to each type of ad and SES group. We observed a significant interaction between SES group and potential exposure to the emotionally evocative ads (interaction $\chi^2 = 9.57$; $P < .05$), but no interaction between SES group and the comparison ads (interaction $\chi^2 = 1.52$; $P > .05$). Figure 1 shows the odds ratios for the relationship between potential exposure to highly emotional or personal testimonial ads and quitting, calculated for each separate SES group after adjustment for all covariates. The figure shows an increased likelihood of quitting for each 10 additional potential exposures to an emotionally evocative or personal testimonial ad for respondents in the low-SES group, the mid-SES group, and the undetermined-SES group. By contrast, smokers in the high-SES group showed a decreased likelihood of quitting with each 10 additional potential exposures to these types of ads. We also conducted an alternate set of analyses without the undetermined-SES group, and the overall interaction findings remained the same.

DISCUSSION

Potential exposure to all antismoking ads was associated with a greater likelihood of quitting at follow-up; the odds of baseline smokers having quit at follow-up increased by 11% with each 10 additional potential exposures to a tobacco control antismoking ad (or 1000 antismoking ad GRPs). This confirms our first hypothesis and is consistent with the only previous study to examine this question in

adults.[10] When converted to relative risks associated with exposure to 5000 GRPs, as in the previous study,[10] this effect equates to a 48.9% increase in the relative risk of quitting. This is somewhat greater than the 10% increase found by Hyland et al.,[10] but similar to the 40% increase estimated by Levy et al.[50]

We also found that emotionally evocative ads drove this effect, confirming our second hypothesis. Smokers who were exposed to more highly emotional and personal testimonial ads were significantly more likely to have quit smoking by follow-up: the odds of baseline smokers having quit by follow-up increased by 14% with each 10 additional potential exposures to these ads (70.6% increase in relative risk of quitting per 5000 emotionally evocative ad GRPs). Potential exposure to the comparison ads was not associated with quitting.

Our results are consistent with previous laboratory-based research that showed that highly emotional antismoking ads are more likely to be recalled, to be perceived as more effective, and to be thought about and discussed.[13–16] Often public health agencies are reluctant to air hard-hitting emotional ads. However, our findings underscore the importance of developing emotionally evocative ads rather than messages that are considered more palatable and upbeat.

Our findings also add to the theory and emerging literature on the utility of narrative communication in persuasion.[38,42,44] Narratives, by contrast to ads featuring experts or scientific demonstrations, can reduce the tendency toward counterargument (e.g., self-exemptions), increase viewers' insight into what it would be like to have a specific illness, and increase perceptions of group and personal vulnerability through identification with characters in the ads.

We found no interaction between the extent of potential exposure to all tobacco control antismoking ads considered together and SES, consistent with the majority of previous research examining the overall effects of well-funded campaigns on quitting and smoking prevalence across SES groups.[23–26] Our study adds to this literature by examining the relationship between quitting and the extent of potential exposure, rather than only whether respondents were in the jurisdiction or community that was exposed.

Consistent with our third hypothesis, we found an interaction between SES and the level of potential exposure to emotionally evocative or personal testimonial ads. The pattern of quitting across groups indicated that greater potential exposure to these types of ads was associated with a greater likelihood of quitting among low-SES, mid-SES, and undetermined-SES groups but not in the high-SES group. This indicates that extensive exposure to emotionally evocative antismoking messages may be particularly effective among populations with the highest smoking rates (low SES) and with the highest proportion of smokers (mid-SES). Thus, the pattern of greater effect among low-SES than high-SES groups indicates that wide distribution of these highly emotional and story-based ads may contribute to the reduction of socioeconomic disparities in smoking.

A limitation of our study was that GRPs measure potential exposure at a population level rather than confirmed individual-level exposure; however, studies have shown a strong association between GRP levels and self-reported recall of ads.[16,51] A strength of our study was matching media exposure data to the timing of interviews and to the media market of each individual over an extended period (24 months) and examining the effects of the extent of potential exposure to antismoking ads. We also adjusted for variation between individuals in the time between the baseline and follow-up interviews, which avoided potential problems of inflated quit rates among some respondents caused by a longer period until follow-up (follow-up range=21–35 months).

Our findings indicate that public health agencies may contribute to reducing smoking rates in their communities, especially among socioeconomically deprived populations, by developing and widely airing emotionally evocative antismoking ads and ads that feature personalized stories about the effects of smoking and the experience of quitting. ∎

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Human Participant Protection

The protocol was approved by the institutional review board of the University of Massachusetts, Boston.

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