

# Promoting calls to a quitline: quantifying the influence of message theme, strong negative emotions and graphic images in television advertisements

Matthew C Farrelly, Kevin C Davis, James M Nonnemaker, Kian Kamyab, Christine Jackson

RTI International, Research Triangle Park, North Carolina, USA

## Correspondence to

Dr Matthew C Farrelly, RTI International, 3040 Cornwallis Road, PO Box 12194, Research Triangle Park, NC 27709, USA; [mcf@rti.org](mailto:mcf@rti.org)

Received 3 December 2010

Accepted 4 January 2011

Published Online First

2 February 2011

## ABSTRACT

**Objective** To understand the relative effectiveness of television advertisements that differ in their thematic focus and portrayals of negative emotions and/or graphic images in promoting calls to a smokers' quitline.

**Methods** Regression analysis is used to explain variation in quarterly media market-level per smoker calls to the New York State Smokers' Quitline from 2001 to 2009. The primary independent variable is quarterly market-level delivery of television advertisements measured by target audience rating points (TARPs). Advertisements were characterised by their overall objective—promoting cessation, highlighting the dangers of secondhand smoke (SHS) or other—and by their portrayals of strong negative emotions and graphic images.

**Results** Per smoker call volume is positively correlated with total TARPs ( $p < 0.001$ ), and cessation advertisements are more effective than SHS advertisements in promoting quitline call volume. Advertisements with graphic images only or neither strong negative emotions nor graphic images are associated with higher call volume with similar effect sizes. Call volume was not significantly associated with the number of TARPs for advertisements with strong negative emotions only ( $p = 0.71$ ) or with both graphic images and strong emotions ( $p = 0.09$ ).

**Conclusions** Exposure to television advertisements is strongly associated with quitline call volume, and both cessation and SHS advertisements can be effective. The use of strong negative emotions in advertisements may be effective in promoting smoking cessation in the population but does not appear to influence quitline call volume. Further research is needed to understand the role of negative emotions in promoting calls to quitlines and cessation more broadly among the majority of smokers who do not call quitlines.

The Task Force on Community Preventive Services systematic review found that telephone quitlines are effective in promoting smoking cessation.<sup>1</sup> However, quitlines can only effectively promote cessation if smokers call. Typically, quitlines reach 1%–2% of smokers within a state each year.<sup>2</sup> As such, the success of a quitline depends in large part on effectively promoting its use. Common advertisements used to promote smoking cessation, including calls to quitlines, can be grouped into two categories. One set includes advertisements that typically are aimed at smokers who are ready to quit and offers them practical advice on quitting, including the use of telephone quitlines. The second set attempts to persuade smokers to try to quit.

The typical approaches in the latter category include messages that elicit strong negative emotions (eg, sadness and fear), often through the use of personal testimonials, graphic or gruesome illustrations of the damage that smoking causes (eg, diseased lungs, smokers with tracheotomies) or some combination of these two approaches. Another common type of advertisement highlights the dangers of exposure to secondhand smoke (SHS), often featuring children and babies being exposed to SHS. The desired response to these advertisements is to convince the smoker to quit or at least to not smoke around others. The SHS advertisements also vary in their use of personal testimonials and/or use of graphic images intended to evoke strong negative emotions.

A number of studies have shown that increases in exposure to television advertisements are associated with increases in calls to quitlines.<sup>3–10</sup> Fewer studies address the relative effectiveness of various styles of messages in driving calls to quitlines. Carroll and Rock<sup>6</sup> found that combining a television advertisement that illustrated the benefits of the quitline ('Call for Help') with advertisements that graphically illustrate the damage caused by smoking was more efficient in generating calls to Australia's national quitline than the graphic advertisements alone. Although this study also suggests that the 'Call for Help' advertisement was more efficient in generating call volume than the graphic advertisements alone, the former advertisement was placed on air only three times compared with 180 separate placements for the graphic advertisements.<sup>6</sup> A study by Mosbaek and colleagues<sup>9</sup> found that emotional advertisements featuring real-life testimonials by people who lost family members to tobacco and advertisements that offer practical advice on quitting were most effective in increasing quitline call volume.

For public health campaigns to promote behaviour change (eg, smoking cessation), it is important to understand which specific attributes of advertisements evoke distinct and positive reactions, including increased intentions to quit smoking and/or willingness to seek information about smoking cessation through quitlines promoted in smoking cessation advertisements. A growing body of literature suggests that specific characteristics of advertisements have meaningful implications for how an advertisement's message is recalled and processed by the viewer.<sup>11–13</sup> Recent studies suggest that intense imagery in advertisements

## Research paper

aimed at preventing youth smoking generates discrete emotional responses, including fear, anger and sadness, which increase viewers' memory and their likelihood of recalling advertisements.<sup>14–16</sup> For example, Niederdeppe and colleagues<sup>16</sup> found that certain stylistic features of advertisements, such as the use of intense images, loud and fast music and surprise or unexpected endings, were associated with higher recall among youths. Biener and colleagues found that adult smokers, non-smokers and quitters perceived that advertisements were more effective if they included strong negative emotions (eg, sadness and fear).<sup>17</sup> The latter is consistent with the work of Lang and colleagues,<sup>18</sup> which indicates that television broadcasts that elicit negative emotions are more likely to be attended to and remembered than those without such content.

We build on this body of research by investigating whether the use of intense imagery and emotional content in advertisements affect the behavioural response to these advertisements: calls to quitlines.<sup>19</sup> Specifically, we examine how ad content affects the strength of the relation between exposure to television advertisements and calls to the New York State Smokers' Quitline from 2001 to 2009. Based on previous studies it is not clear what message strategy is likely to prompt the most calls to a quitline. Advertisements that elicit strong negative emotions could generate higher call volume for a given dose of exposure compared with an equal dose of advertisements without such content by increasing recall<sup>20</sup> and/or by prompting more smokers to consider quitting. In contrast, smokers who are ready to quit may find less emotional 'how to quit' messages more salient than strongly emotional messages, and thus they may be more likely to call a quitline in response to the former style of advertisement. To answer this empirical question, we first quantify the overall relation between media market potential exposure to antismoking television advertisements (measured by target audience rating points (TARPs), an indicator of delivery of television advertisements) and per smoker calls to the New York State Smokers' Quitline. Next, we address our central research question—whether the relation between potential exposure and per smoker call volume differs across two dimensions of advertisement characteristics: (1) the advertisement's objective (ie, cessation, SHS) and (2) the advertisement's use of graphic/intense images and/or strong negative emotions.

## METHODS

### Data

The main outcome measure is per smoker calls to the New York State Smokers' Quitline for each media market from the first quarter of 2001 through the fourth quarter of 2009. Per smoker calls are calculated by dividing the total number of calls in a media market in a given quarter by the population of smokers aged 18 or older in that market and quarter. The number of smokers in a market and quarter is calculated using prevalence rates from the New York Expanded Behavioural Risk Factor Surveillance System and US census population data. The New York State Smokers' Quitline has been in operation since 2000 and currently offers telephone counselling, taped messages, self-help materials, a website and a free 2-week supply of nicotine replacement therapy to eligible callers. The quitline also offers a fax referral programme for healthcare providers. The primary independent variable is quarterly television TARPs for 10 television media markets in New York State. Data are not available for the New York City market for 2001. In total, there are 356 observations—10 media markets for 36 quarters—four missing quarters for New York City in 2001.

TARPs are defined as the product of the percentage of the audience exposed to a commercial (ie, audience reach) and the frequency of exposure (ie, the number of times a commercial is aired). If 50% of the population were exposed to a commercial three times in a quarter, TARPs would equal 150 (50×3). The data on TARPs come from Nielsen Media Research and the media contractor for the New York State Department of Health and the New York City Department of Health and Mental Hygiene. Both departments aired their own advertisements and those developed by other states and countries available from the Centres for Disease Control and Prevention's Media Campaign Resource Centre.

Copies of the 176 advertisements were obtained from Nielsen Media Research, the advertising agency that created the advertisement, or by viewing advertisements from the Media Campaign Resources Centre. Advertisements were first categorised by objective—promoting cessation or highlighting the health consequences of smoking, highlighting the dangers of SHS, or other advertisements (eg, supporting New York's Clean Indoor Air Act, industry manipulation). Because the advertisements supporting New York's 2003 amendment to the Clean Indoor Air Act were sufficiently different from all other advertisements highlighting the dangers of SHS, we grouped them in the 'other' category. All of the advertisements end with the toll-free number for the quitline.

Following the work of Biener *et al*<sup>14–17</sup> and Niederdeppe *et al*,<sup>16</sup> all advertisements were coded to indicate the presence of intense or graphic images and the strength of negative emotions (eg, sadness and fear). The coders indicated the strength of emotions (a lot vs some/a little/none) they expected would be elicited from the viewer. Some examples of graphic images include diseased lungs, clogged arteries, tracheotomies, amputations and hospital patients connected to medical devices. Advertisements were reviewed and coded by at least two coders in multiple rounds to allow for resolution of differing characterisations. After each coding round, Cohen's kappa coefficient ( $\kappa$ ) was calculated to determine areas of weakness. Based on Landis and Koch's  $\kappa$ -scale, indicators of graphic images and strong emotions resulted in 'substantial' (0.61–0.80) or 'almost perfect' rater agreement (0.81–1.00).<sup>21</sup> We then grouped advertisements into four categories: (1) strong negative emotions only, (2) graphic images only, (3) strong negative emotions and graphic images, and (4) neither strong negative emotions nor graphic images.

Table 1 presents a summary of the number of ads by theme (ie, cessation, SHS, other) and stylistic features (eg, strong negative emotions) and the statewide average number of TARPs for each category, weighted by the population of each media market. An example of an advertisement with strong negative emotions only would be a personal testimonial from someone who has suffered personally or through the loss of a loved one as a result of smoking (eg, Rick Stoddard Series). An example of an advertisement that is graphic only would be one that depicts diseased lungs and presents factual information about the health impact of smoking (eg, Australia's Every Cigarette Does You Damage Campaign). One series that has both strong negative emotions and graphic images is the Pam Laffin series from Massachusetts, about a young woman who started smoking at age 10, developed emphysema and had a lung transplant at age 24 and died at age 31 leaving behind two children. A common cessation advertisement with neither strong negative emotions nor graphic images would be one that offers practical tips on quitting and/or highlights the benefits of calling the quitline (eg, Quitting Takes Practice).

**Table 1** Summary of antismoking commercials aired in New York, 2001–2009

Ad type	Number of ads aired	Population-weighted total TARPs	Average number of TARPs per ad
Cessation only ads	96	38 284	399
Graphic	8	1463	183
Strong negative emotions	21	7877	375
Both graphic and strong negative emotions	13	13 692	1053
Neither graphic nor strong negative emotions	54	15 253	282
SHS only ads	30	6708	224
Graphic	2	751	375
Strong negative emotions	6	342	57
Both graphic and strong negative emotions	1	307	307
Neither graphic nor strong negative emotions	21	5308	253
All other ads	50	7828	157
All ads	176	52 820	300

SHS, secondhand smoke; TARP, target audience rating points.

### Analysis

We began by presenting annual statewide average per smoker call volume and TARPs and the distribution of TARPs by advertisement type. Next, we regressed market-level quarterly per smoker call volume on total quarterly TARPs. To account for seasonal variations in call volume across quarters, we included three quarterly indicator variables (quarter 1 is the reference category). In addition, a linear time trend is included to control for changes in the population over time. Average cigarette prices are controlled for using Nielsen scanner data. These data are quarterly measures for each of four markets covering 59 of New York's 62 counties. The three counties falling outside Nielsen's four primary markets were assigned the upstate average. Finally, to account for market-to-market variations in call volume caused by factors other than media (eg, tobacco control activities unique to a market), we included nine indicator variables for each of the media markets (with the tenth serving as the reference category).

Specification tests (Linktest in Stata 11.0) of this model indicated that the natural log of per smoker call volume fit the data better (owing to skewness) across all model specifications. Post-estimation analyses supported by comparisons of model fit

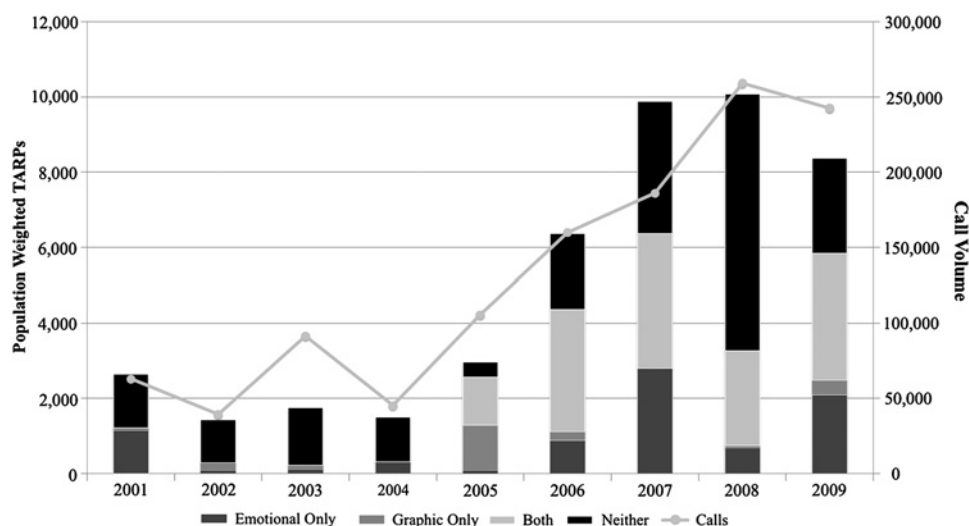
statistics (using akaike's information criterion and Bayesian information criterion)<sup>22</sup> also indicated that the natural log of TARPs was warranted to improve linearity in these models. Therefore, the final specification regressed the log of per smoker call volume on the log of total TARPs in these models. This log-log specification yields regression coefficients that represent the percentage change in the outcome variable for a given percentage change in an independent variable (also known as an elasticity). For example, if the coefficient (elasticity) for all advertisements from the analyses described above is 0.2, this indicates that a 10% increase in TARPs would lead to a 2% increase in call volume.

To examine the relation between call volume and exposure to specific types of advertisements, we initially disaggregated TARPs into three groups: (1) advertisements that highlight the health consequences of smoking and/or focus on smoking cessation, (2) advertisements that highlight the health consequences of SHS exposure and (3) other (see table 1). This categorisation was intended to group advertisements in terms of their relevance to prompting smokers to call the quitline. However, because the advertisements coded as 'other' were consistently not associated with call volume (not surprisingly), they were subsequently dropped from all model specifications. This change did not change the results of the variables of interest.

In our third specification, we tested how advertisements with strong negative emotions and/or graphic images may lead to differential impacts on call volume by classifying TARPs into four categories (strong negative emotions only, graphic images only, both strong emotions and graphic images, or neither strong emotions nor graphic images), regardless of their objective (ie, cessation or SHS). Because the composition of total TARPs changes fundamentally beginning in 2005, we estimate this third specification again for the period 2004–2009 to test whether the results are sensitive to this more recent time period with a greater mix of advertisement styles.

### RESULTS

Figure 1 illustrates the upward trend in quitline call volume and statewide average TARPs over time and the varying mix of advertisement styles over time. Our first regression model shows that call volume is positively correlated with total exposure to antismoking commercials ( $p < 0.001$ ) (table 2). The results imply that a 100% increase in exposure to advertisements would lead to a 7.1% increase in per smoker call volume. The second model shows that cessation and SHS advertisements are both effective

**Figure 1** Total call volume and target audience rating points (TARPs) by ad type and sensation level, 2001–2009.

## Research paper

**Table 2** Regression of log of quitline per capita call volume on overall TARPs and by ad type for antismoking television commercials, New York State Smokers' Quitline

Independent variable	2001–2009	
	$\beta$ (p value) (95% CI)	Mean quarterly TARPs
Log (total TARPs)	0.071 (0.000) (0.046 to 0.097)	1017.3
Cigarette price	–0.192 (0.000) (–0.263 to –0.120)	
No	356	
Adjusted R <sup>2</sup>	0.71	
Log (cessation ad TARPs)	0.067 (0.000) (0.043 to 0.092)	829.6
Log (SHS ad TARPs)	0.033 (0.000) (0.015 to 0.051)	187.7
Cigarette price	–0.239 (0.000) (–0.308 to –0.171)	
No	356	
Adjusted R <sup>2</sup>	0.78	

Model also controls for statewide adult smoking prevalence, designated media market fixed effects and quarterly seasonality.

SHS, secondhand smoke; TARP, target audience rating points.

in promoting calls to the quitline (table 2). The effect size for cessation advertisements exposure is significantly larger (0.067) than the effect size for SHS advertisements (0.033) ( $p=0.023$ ).

In table 3, we examine the influence of strong negative emotions and/or graphic images in cessation and SHS advertisements on per capita call volume. The dose of antismoking television commercials with graphic images only and neither strong negative emotions nor graphic images is positively associated with quitline call volume. Although the effect sizes vary somewhat, there are no statistically significant differences across these types of commercials. In contrast, we find that there is no statistically significant association between call volume and the

number of TARPs for advertisements with strong negative emotions only ( $p=0.710$ ) and both strong negative emotions and graphic images ( $p=0.089$ ).

When limiting the analysis to the time period from 2004 to 2009, the effect of both commercials with graphic images only and neither strong negative emotions nor graphic images on quitline call volume remains positive and significant. These two types of advertisements appear to be equally effective in promoting calls to the quitline ( $p=0.155$ ). Moreover, advertisements with strong negative emotions have a negative effect on call volume ( $p=0.001$ ). As with the model using the full range of data, advertisements with both graphic images and strong negative emotions have no significant association with call volume.

**DISCUSSION**

Consistent with previous research and common wisdom about the effectiveness of television advertisements and other media in promoting calls to quitlines,<sup>8–10</sup> the current study finds strong evidence that television advertisements are effective. We also find that advertisements focused on promoting cessation and those highlighting the dangers of exposure to SHS had similar effects on call volume. What is unique about these results is that they present a complex picture of the role of strong negative emotions and use of graphic images. Specifically, exposure to advertisements with graphic images depicting the health consequences of smoking, with or without strong negative emotions, was positively associated with quitline call volume. Exposure to advertisements with only strong negative emotions (predominantly personal testimonials) was not associated with quitline call volume. This finding is in contrast to other population-based studies of smoking cessation, which found that advertisements which feature emotionally evocative personal testimonials about the effects of smoking were effective in promoting cessation in population-based surveys.<sup>17–23</sup>

One way to reconcile these findings is to note that quitline call volume is not the only or even the most important indicator of advertising effectiveness, since a small percentage of smokers (<5%) typically use a quitline in any year. Antismoking

**Table 3** Regression of log of quitline call volume on target audience rating points for antismoking television commercials by advertising characteristics, New York State Smokers' Quitline

Independent variable	2001–2009		2004–2009	
	$\beta$ (p value) (95% CI)	Mean quarterly TARPs	$\beta$ (p Value) (95% CI)	Mean quarterly TARPs
Log (TARPs: strong negative emotions only)	–0.005 (0.710) (–0.030 to 0.020)	222.9	–0.039 (0.001) (–0.061 to –0.017)	224.2
Log (TARPs: graphic images only)	0.049 (0.000) (0.025 to 0.072)	59.7	0.077 (0.000) (0.051 to 0.103)	75.2
Log (TARPs: both strong negative emotions and graphic images)	0.001 (0.089) (0.013 to 0.057)	164.5	–0.009 (0.468) (–0.033 to 0.015)	243.3
Log (TARPs: neither strong negative emotions nor graphic images)	0.062 (0.000) (0.040 to 0.085)	570.3	0.048 (0.001) (0.020 to 0.076)	624.1
Cigarette price	–0.102 (0.046) (–0.202 to –0.002)		–0.053 (0.504) (–0.208 to 0.103)	
No	356		240	
Adjusted R <sup>2</sup>	0.77		0.74	

Model also controls for statewide adult smoking prevalence, designated media market fixed effects and quarterly seasonality. TARP, target audience rating points.

campaigns are trying to change attitudes and ultimately provoke shifts in long-term behaviours, such as sustained cessation and/or smoking bans in households. The current study cannot say whether advertisements with strong negative emotions and/or graphic images lead to longer-term behavioural changes, such as sustained cessation.

It is also important to acknowledge that the role of emotions in persuasive messages is complex and not fully understood<sup>20</sup> and that threat or fear appeals remain controversial.<sup>24 25</sup> Some argue that for threat appeals to be effective, viewers must feel that they can take action to address the threat, such as calling a quitline to get help and support for quitting.<sup>26</sup> In the absence of an effective response to the threat, the viewer may reject or ignore the message. Witte and Allen<sup>27</sup> performed a meta-analysis of the use of fear appeals in public health campaigns and conclude that strong fear appeals are effective when accompanied by equally strong efficacy messages. This is consistent with Nabi, who argues that messages that elicit strong negative emotions at the beginning of a message also create an expectation that the remainder of the message will help them alleviate their negative effect; thus, they will attend to the whole message (and in this case be more likely to call the quitline).<sup>20</sup>

Messages that graphically illustrate the damage from smoking may be viewed as a more universal and visceral threat message and may similarly create motivation to process information and take action—that is, smokers may perceive that calling the quitline is an effective means to address this threat. In contrast, personal testimonials that elicit negative emotions may present a threat that is not perceived as relevant by viewers who do not relate their own situation to the one portrayed in the advertisement. Many of these personal testimonials are very specific to a smoker's life story, such as Pam Laffin who died at age 31 from emphysema. With these personalised stories, it is possible that many smokers believe that the specific risk or threat illustrated in the advertisement does not pertain to them. Such viewers would not be expected to take action to offset the threat. However, given that other studies find positive results for advertisements that feature personal testimonials, it may be that the current findings only apply to smokers interested in calling quitlines, not among the general population of smokers.<sup>17 23</sup>

Given that this is the first study to find such results, it is clear that more research is needed to understand the role of strong emotions and the use of threat appeals more generally. Further research can link exposure to these various types of messages to population-based measures of quitting behaviour such as that of Niederdeppe *et al.*<sup>28</sup> and Durkin *et al.*<sup>25</sup> In addition, experimental designs that vary the emotional content, argument strength and efficacy messages may further inform which messages or combinations of messages are most effective in prompting smoking cessation. Such research will need to take into account the interactions between the attributes of antismoking advertisements and the attributes of the targeted audience segments—something that was not possible in the current study. Studies that examine the longer-term effectiveness of various styles of advertisements are needed.

The current study has several limitations. We do not have information on what time of the day the advertisements in the current study were aired. However, we are not aware of any major changes in advertisement placement strategies over the study period. Given the time span of the study, it was also not feasible to include information on local activities aimed at promoting the quitline. There may be other, more subtle stylistic features that reflect the quality of execution of the advertisements that we did not take into account and that may

### What this paper adds

Despite millions of dollars spent on campaigns to promote smoking cessation, little is known about the effect of different styles of cessation television advertisements on smoking cessation. This paper examines one indicator of smoking cessation—quitline call volume—and finds that various styles of campaigns can work, with the possible exception of campaigns that focus solely on eliciting strong negative emotions.

influence our results. For example, we were unable to document whether a voiceover of the New York State Smokers' Quitline telephone number was used in each of the advertisements. However, our understanding is that it was not used systematically for any particular type of advertisement. Finally, the rating of advertisements was done by research assistants rather than a sample of smokers, which could lead to misclassifications of the advertisements in terms of their emotional strength.

Exposure to television advertisements is strongly associated with quitline call volume and both cessation and SHS advertisements can be effective. However, because a relatively small percentage of smokers call a quitline, quitline volume is not necessarily a strong marker of what styles of advertisements are effective with the full population of smokers.

**Acknowledgements** The authors would like to thank Jennifer Duke and Jeffrey Willett for helpful comments on earlier drafts and Susan Murchie for editorial support.

**Funding** This research was supported by the New York State Department of Health.

**Competing interests** None.

**Contributors** MF conceived the study and participated in all drafts of the paper and oversaw the analyses. KD and JN contributed to all drafts of the paper and contributed to the analyses. KK conducted all analyses and contributed to the final draft of the paper. CJ contributed to all drafts of the paper.

**Provenance and peer review** Not commissioned; externally peer reviewed.

### REFERENCES

1. Hopkins DP, Briss PA, Ricard CJ, *et al.* Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke. *Am J Prev Med* 2001;**20**(2 Suppl):16–66.
2. North American Quitline Consortium (NAQC). *Measuring Reach of Quitline Programs*. Phoenix, AZ: NAQC Issue Paper, 2009.
3. Erbas B, Bui Q, Huggins R, *et al.* Investigating the relation between placement of Quit antismoking advertisements and number of telephone calls to Quitline: a semiparametric modelling approach. *J Epidemiol Community Health* 2006;**60**:180–2.
4. Pierce JP, Anderson DM, Romano RM, *et al.* Promoting smoking cessation in the United States: effect of public service announcements on the Cancer Information Service telephone line. *J Natl Cancer Inst* 1992;**84**:677–83.
5. Miller CL, Wakefield M, Roberts L. Uptake and effectiveness of the Australian telephone Quitline service in the context of a mass media campaign. *Tob Control* 2003;**12**(Suppl 2):ii53–8.
6. Carroll T, Rock B. Generating Quitline calls during Australia's National Tobacco Campaign: effective of television advertisement execution and programme placement. *Tob Control* 2003;**12**(Suppl 2):ii40–4.
7. Wilson N, Grigg M, Graham L, *et al.* The effectiveness of television advertising campaigns on generating calls to a national Quitline by Maori. *Tob Control* 2005;**14**:284–6.
8. Mosbaek CH, Austin DF, Stark MJ, *et al.* The association between advertising and calls to a tobacco quitline. *Tob Control* 2007;**16**(Suppl 1):i24–9.
9. Farrelly MC, Hussin A, Bauer UE. Effectiveness and cost effectiveness of television, radio and print advertisements in promoting the New York smokers' quitline. *Tob Control* 2007;**16**(Suppl 1):i21–3.
10. Cowling DW, Modayil MV, Stevens C. Assessing the relationship between ad volume and awareness of a tobacco education media campaign. *Tob Control* 2010;**19**(Suppl 1):i37–42.
11. Lang A. The limited capacity model of mediated message processing. *J Commun* 2000;**50**:46–70.

## Research paper

12. **Southwell BG.** Between messages and people: a multilevel model of memory for television content. *Commun Res* 2005;**32**:112–40.
13. **Morgan SE,** Palmgreen P, Stephenson MT, *et al.* Associations between message features and subjective evaluations of the sensation value of antidrug public service announcements. *J Commun* 2003;**53**:512–26.
14. **Biener L,** Ji M, Gilpin EA, *et al.* The impact of emotional tone, message, and broadcast parameters in youth anti-smoking advertisements. *J Health Commun* 2004;**9**:259–74.
15. **Terry-McElrath Y,** Wakefield M, Ruel E, *et al.* The effect of antismoking advertisement executional characteristics on youth comprehension, appraisal, recall, and engagement. *J Health Commun* 2005;**10**:127–43.
16. **Niederdeppe J,** Davis KC, Farrelly MC, *et al.* Stylistic features, need for sensation, and confirmed recall of national smoking prevention advertisements. *J Commun* 2007;**57**:272–92.
17. **Biener L,** McCallum-Keeler G, Nyman AL. Adults' response to Massachusetts anti-tobacco television advertisements: impact of viewer and advertisement characteristics. *Tob Control* 2000;**9**:401–7.
18. **Lang A,** Newhagen J. Negative video as structure: Emotion, attention, capacity, and memory. *J Broadcast Electron* 1996;**40**:460–77.
19. **Witte K.** Putting the fear back into fear appeals: the extended parallel process model. *Commun Monogr* 1992;**59**:329–49.
20. **Nabi RL.** A cognitive-functional model for the effects of discrete negative emotions on information processing, attitude change, and recall. *Commun Theory* 1999;**9**:292–320.
21. **Landis JR,** Koch GG. The measurement of observer agreement for categorical data. *Biometrics* 1977;**22**:159–74.
22. **Cohen J,** Cohen P, West SG, *et al.* *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences.* 3rd edn. Mahwah, NJ: Lawrence Erlbaum, 2003:509.
23. **Durkin SJ,** Biener L, Wakefield MA. Effects of different types of antismoking ads on reducing disparities in smoking cessation among socioeconomic subgroups. *Am J Public Health* 2009;**99**:2217–23.
24. **Biener L,** Taylor TM. The continuing importance of emotion in tobacco control media campaigns: a response to Hastings and MacFadyen. *Tob Control* 2002;**11**:75–7.
25. **Hastings G,** MacFadyen L. Controversies in tobacco control: the limitations of fear messages. *Tob Control* 2002;**11**:73–5.
26. **Witte K.** The role of threat and efficacy in AIDS prevention. *Int J Community Health Educ* 1991;**12**:225–49.
27. **Witte K,** Allen M. Meta-analysis of fear appeals: implications for effective public health campaigns. *Health Educ Behav* 2000;**27**:591–615.
28. **Niederdeppe J,** Fiore MC, Baker TB, *et al.* Smoking-cessation media campaigns and their effectiveness among socioeconomically advantaged and disadvantaged populations. *Am J Public Health* 2008;**98**:916–24.

# Advancing Postgraduates. Enhancing Healthcare.

The *Postgraduate Medical Journal* is dedicated to advancing the understanding of postgraduate medical education and training.

- Acquire the necessary skills to deliver the highest possible standards of patient care
- Develop suitable training programmes for your trainees
- Maintain high standards after training ends

*Published on behalf of the fellowship for Postgraduate Medicine*

FOR MORE DETAILS OR TO SUBSCRIBE,  
VISIT THE WEBSITE TODAY

**postgradmedj.com**

ESSENTIAL  
READING FOR  
PLAB  
EXAMINEES



**BMJ Journals**



## Promoting calls to a quitline: quantifying the influence of message theme, strong negative emotions and graphic images in television advertisements

Matthew C Farrelly, Kevin C Davis, James M Nonnemaker, et al.

*Tob Control* 2011 20: 279-284 originally published online February 2, 2011

doi: 10.1136/tc.2010.042234

---

Updated information and services can be found at:

<http://tobaccocontrol.bmj.com/content/20/4/279.full.html>

---

*These include:*

### References

This article cites 26 articles, 15 of which can be accessed free at:  
<http://tobaccocontrol.bmj.com/content/20/4/279.full.html#ref-list-1>

### Email alerting service

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

---

### Notes

---

To request permissions go to:

<http://group.bmj.com/group/rights-licensing/permissions>

To order reprints go to:

<http://journals.bmj.com/cgi/reprintform>

To subscribe to BMJ go to:

<http://group.bmj.com/subscribe/>