

## Test of "Light" cigarette counter-advertising using a standard test of advertising effectiveness

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### Abstract

**Objective**—To evaluate systematically the effectiveness of six advertising strategies (two message strategies presented in three different contexts) designed to promote smoking cessation by addressing smokers' misperceptions about Light cigarettes.

**Design**—Smokers viewed one of six, 30 second test television concept advertisements, which varied by message (one emphasising how the sensory effects of Lights can be deceptive, the other describing the effects of vent blocking) and by ad context (non-commercial public service announcement (PSA), promotion of unbranded nicotine replacement therapy (NRT), or promotion of branded NRT). The effectiveness of each advertisement was determined using a validated advertising testing system in which ads were viewed in the context of reviewing a pilot television programme. Response to ads is assessed through shifts in subject choices of products offered as prizes before and after viewing the test advertisements. Included among the possible prizes were cigarettes and various pharmacotherapies for smoking cessation.

**Subjects**—Daily smokers (n = 1890) of Regular (34%), Light (47%), and Ultra Light (19%) cigarettes recruited from eight US cities.

**Main outcomes measures**—The primary outcome of interest was the shift away from cigarettes as the selected prize following exposure to the test advertisements. Secondary outcomes of interest included movement away from Light cigarettes and movement towards assisted quitting products.

**Results**—Smokers who saw the advertisement emphasising the sensory characteristics of Light cigarettes were more likely than subjects who saw the advertisement emphasising the effect of vent blocking to move away from cigarettes (OR = 1.97, 95% confidence interval CI 1.25 to 3.09;  $\chi^2(1) = 8.69$ ,  $p = 0.003$ ). Similarly, subjects who saw the advertisement framed as a PSA, rather than as a promotion for either a branded or unbranded NRT product, were also somewhat more likely to move away from cigarettes (OR = 1.51, 95% CI 0.94 to 2.40;  $\chi^2(1) = 2.97$ ,  $p = 0.085$ ). The effect was observed regardless of sex, age, or type of cigarette smoked.

**Conclusions**—Addressing smokers' sensory perceptions of Light cigarettes and presenting this information in an impartial way is likely to be an effective communication strategy for counter-marketing Light cigarettes.

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Keywords: Lights; advertising; counter-marketing

Despite their apparent failure to reduce health risks,<sup>1</sup> cigarettes labelled as "Light" are aggressively promoted by cigarette manufacturers as a reasonable alternative to quitting smoking.<sup>2</sup> By convention, Light cigarettes are those with nominal tar delivery between 7–15 mg, and Ultra Lights are those with nominal tar delivery of 6 mg or less. Despite years of press attention to the contrary, many smokers of so-called Light cigarettes continue to believe that they convey a substantial health benefit.<sup>3</sup> One potential strategy for countering tobacco industry marketing tactics and promoting smoking cessation is to provide smokers with accurate information about the risks of smoking Light and Ultra Light cigarettes. Kozlowski and colleagues developed and tested a 60 second "radio message" informing smokers of the true nature of Light cigarettes.<sup>4</sup> The message attempted to convey several important ideas, including: the existence of filter ventilation and the problem of filter vent blocking; the notion that Light cigarettes can provide smokers with just as much tar and nicotine as Regular cigarettes; and that smokers can be easily fooled by the mild taste of Light cigarettes. Following exposure to the message, Light smokers reported it would make them more likely to quit smoking.

In an attempt to extend this line of research further and refine effective message strategies, we previously conducted a randomised trial comparing three different messages, two of which were designed to address myths surrounding the use of Light and Ultra Light cigarettes.<sup>5</sup> One message followed an informational strategy, modelled on the work of Kozlowski and colleagues, that explained how blocking filter vents can effectively increase tar and nicotine exposure ("Vents").<sup>4</sup> A second message, based on qualitative research with smokers, and on theoretical and empirical work on somatic perception as an influence on smoking beliefs and behaviour,<sup>6,7</sup> addressed smokers' sensory experience that Light and Ultra Light cigarettes felt milder and were thus reasoned to be safer ("Feel"). A third message did not address Lights and Ultra Lights, but

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emphasised the health risks of smoking in general. Smokers participating in a telephone survey were read one of three brief messages embodying the three message strategies, and their beliefs about Lights and Ultra Lights and interest in quitting were assessed before and after message exposure. The Feel message consistently had the greatest impact on beliefs about these cigarettes and on intentions to quit smoking. These findings highlighted the important role of sensory feedback in supporting misconceptions about Light and Ultra Light cigarettes and the importance of specifically addressing this issue in communications designed to alter attitudes and beliefs about these cigarettes.

This prior work suggested that messages addressing sensory experiences would be most effective at changing beliefs and behaviour. However, the studies were limited in the methods used to deliver and test the messages, which were read to subjects over the phone by an interviewer. On the one hand, this mode of delivery weakens the impact of the messages: the messages were presented only once, they lacked the visual appeal or persuasion that would characterise a television commercial, and they were delivered by an anonymous source with no authority. On the other hand, the effect of the messages might have been heightened because subjects were asked to focus on the message, and the message exposure was embedded in a long interview about smoking, which would have caused respondents to focus on their smoking behaviour. In contrast, real television commercials are usually seen in a cluttered media environment, competing for attention with other commercials and the television shows themselves, and without a prior priming focus on smoking. Finally, the survey measure of intention to quit was hypothetical, without connection to real world choices.

The purpose of the present study was to address some of these limitations by subjecting both the Feel message and the Vents message to a more realistic evaluation of effectiveness, using a validated test system for television advertisements. The ARS Persuasion® test (**rsc**), a proprietary commercial system used to test the effectiveness of commercial television advertisements, is based on a pre-post shift in brand choice obtained in a simulated purchase environment.<sup>8</sup> In an unobtrusive test, subjects view the test advertisements while ostensibly reviewing a pilot television programme. The impact or effectiveness of the advertisements is determined by assessing shifts in subject choices among products offered as prizes before and after viewing the advertisements. The choices made in response to advertisements have been shown to predict strongly subsequent product performance: ARS Persuasion® scores for an advertisement correlate as high as 0.71 with subsequent sales of the advertised product once the advertisement is aired,<sup>9</sup> and the test scores can also predict *loss* of market share when an ad causes movement away from the tested product. Using such an evaluation system will

help to better predict real world consumer response to an actual advertising campaign designed to correct misperceptions about Light and Ultra Light cigarettes and promote smoking cessation.

The effectiveness of an advertisement may also be affected by the context—for example, whether the ad is seen as trying to sell something, which affects the presumed source of the message and its motivation. Accordingly, this study also examined the role of message context in influencing behaviour. Specifically, both the Feel message and the Vents message were presented in three different contexts: as a public service announcement (PSA) in which no reference is made to any stop smoking products and no advertising sponsor is identified; as a non-branded stop smoking product advertisement in which smokers are directed to use the nicotine patch and gum; and as a branded NicoDerm CQ nicotine patch advertisement, in which the NicoDerm CQ patch is specifically promoted as an alternative to smoking.

## Method

### SUBJECTS

Subjects were recruited from population samples in eight cities in the USA (Indianapolis, Oklahoma City, Norfolk, Dallas, Newark, Phoenix, Chicago, and Los Angeles). Between September and October of 1999, a total of 13 477 adults, regardless of smoking status, responded to commercial mailings soliciting their participation in a test screening of a new television programme. Of those enrolled, 1890 were self-identified as cigarette smokers and are included in this study. The majority of participants were female (58.9%) and employed (77.8%), with at least some college education (55.2%), and a mean household income of approximately \$37 000. The average participant was 40 (SD 14.1) years old and reported smoking 17 (11.8) cigarettes per day. Approximately 34% of participants reported smoking Regular cigarettes, 47% reported smoking Light cigarettes, and 19% reported smoking Ultra Light cigarettes.

### RECRUITMENT

Potential subjects were identified from a commercial mailing list representing US households. The demographics of these lists correspond to the US Census data for the same geographic areas. Subjects were recruited by letter, inviting them to participate in a test screening of television material. (No mention was made of smoking or smoking cessation). Participants were offered an opportunity to win prizes for attending. Subjects were not recruited on the basis of their smoking; subjects were recruited broadly, and smoking status was ascertained during the test itself. (Non-smokers also participated in these tests, but are not included in the analyses reported here.)

### PROCEDURES

Subjects attended test sessions in their home cities. During the test session, participants viewed two television shows described as

pilots, on which they were to provide feedback. In the course of watching the shows, subjects in the experimental groups were also shown approximately 12 advertisements, one of which was an advertisement being tested in this study. Only one smoking related commercial—the one being experimentally tested—was shown in any particular test session. A different mix of non-test advertisements was scheduled for each viewing. Total viewing time for both pilot television shows and all advertisements was approximately one hour. (A control group, discussed below, was exposed to other advertisements, but not to a test advertisement.) There were six test advertisements formed by crossing two message strategies (Feel and Vents) with three different contexts (PSA, unbranded nicotine replacement therapy (NRT), and branded NRT). Overall, there were approximately 96 viewings (16 viewings for each of the six test advertisements). Each viewing was attended by approximately 120 individuals (both smokers and non-smokers).

While there is no evidence that order or timing affects ARS Persuasion® scores, for purposes of the study we modified the ARS Persuasion® methodology using the following special provisions. The location of the test commercials during the television programme was held constant across screenings, so that the test advertisements always appeared as the second to last advertisement in the first television pilot. The other advertisements were mixed so that they were not consistently associated with a particular test advertisement. Tests of conditions were mixed so that each condition was tested on both weekdays and weekends, and mixed by cities. All test spots were shown in the evening. However, it was not possible to assign subjects to test sessions and conditions on a strictly randomised basis; rather, subjects participated in the sessions that were geographically and temporally convenient for them, which was expected to have the effect of randomisation. (We examined whether responses varied by geographic location, and found no effect.) Smoking was not permitted during test sessions.

#### MESSAGES

The advertisements tested in the study were not fully developed productions, but rather schematic 30 second spots meant to convey the core concepts of each message strategy. The graphics were simple, and the content was carried by voice-over and by superscript text on screen. Both the Feel advertisement and the Vents advertisement started with a display of a cigarette pack labelled "Lights" displacing a pack labelled "Regular". The voice-over noted that "you" (the viewer) may have switched to Lights with the good intention of protecting your health, but have been misled. The Feel advertisement then noted that Lights may feel better but can be just as toxic. The Vents advertisement noted that Light cigarettes contain vents that can be blocked, yielding just as much toxicity as a Regular cigarette. This was

accompanied by a visual showing the filter vents of a Light cigarette.

All the advertisements ended with a "call to action" (that is, quitting), accompanied by an image of a cigarette being stubbed out in an ashtray. PSA advertisements did not contain any references to stop smoking products. Advertisements presented in the unbranded NRT context ended by stating that there were now more ways than ever to quit, specifically mentioning the nicotine patch and nicotine gum, but specific brands of nicotine patch and nicotine gum were not mentioned. Advertisements presented in the branded NRT context clearly referenced the NicoDerm CQ patch as a method of quitting, showing the brand name.

#### ASSESSMENT

##### *Product selection*

Both before and after viewing the television show and advertisements, participants were asked to select one prize from an assortment of goods, with the expectation that they would have the opportunity to win the prize in a random drawing. (Participants made such selections from goods relating to more than 20 different product categories; only one was related to smoking.) The relevant set of prizes for this study consisted of \$40 worth of: (1) NicoDerm CQ patches; (2) Nicorette gum; (3) Nicotrol patches; (4) a doctor's prescription for the Nicotrol inhaler; (5) a doctor's prescription for Zyban (bupropion) tablets; (6) a doctor's prescription for the Habitrol patch; (7) another quit method of choice (hypnosis, seminars, self help programmes); (8) your favourite brand of Light/Ultra Light cigarettes; (9) your favourite brand of Regular cigarettes; or (10) \$30 cash. We recorded and analysed participants' choice of products before and after the viewing. The key study outcome was change in selection of cigarettes as the prize.

##### *Smoking status*

Since every effort was made to have the subjects blinded to the true purpose of the study, information related to cigarette smoking was collected after the test was completed. (To ensure that exposure to the test procedures did not bias reports of smoking history collected afterward, we ran a separate control group (n = 263) that only completed the post-test questionnaire, without having seen any smoking relevant advertisement or selected smoking related prizes. Their reports of smoking history (see variables in table 1) did not differ significantly from those in the other groups), validating the post-test smoking assessment. This group did not figure in any other analyses.) Participants were asked if they currently smoke cigarettes on a regular basis; how many cigarettes they smoke per day; the type of cigarettes they smoke most often (Regular, Light, or Ultra Light); and, for those reporting that they smoke Light or Ultra Lights, if they have always smoked these brands, or switched from Regular cigarettes. (In one session, experimenter error led to these questions being omitted. In this instance, the

Table 1 Background characteristics and smoking history of study participants overall and by experimental condition

Item	Experimental conditions							Control condition
	Overall (n=1890)	Feel/PSA (n=269)	Feel/unbranded (n=284)	Feel/branded (n=245)	Vents/PSA (n=267)	Vents/unbranded (n=302)	Vents/branded (n=245)	Choice only (n=278)
<i>Background characteristics</i>								
Female (%)	58.9	53.2	62.7	58.4	62.6	55.6	58.4	61.9
Age (years)	39.9 (14.1)	39.6 (13.6)	40.6 (14.0)	39.4 (13.9)	38.0 (14.4)	39.8 (14.7)	40.7 (14.4)	41.0 (13.9)
Any college education (%)	55.2	57.6	56.1	51.7	57.7	58.7	55.1	49.1
Gross household income (\$1000)	37.3 (16.4)	39.5 (15.6)	35.9 (16.4)	37.9 (16.4)	36.9 (16.9)	38.4 (16.7)	36.6 (16.4)	36.2 (16.5)
Employed (%)	77.8	78.7	77.0	76.5	79.2	79.4	74.5	78.5
<i>Smoking history</i>								
Cigarettes per day	17.1 (11.8)	17.7 (11.3)	15.2 (9.3)	17.6 (13.0)	16.5 (11.8)	17.7 (12.0)	16.6 (12.4)	17.6 (11.7)
Purchase of cessation aid in past year (%)	26.7	26.1	24.4	31.1	26.2	24.4	24.5	30.8
Type of cigarette smoked:								
Light (%)	47.0	52.0	43.6	52.5	47.9	41.7	50.0	42.4
Ultra Light (%)	19.0	18.9	18.0	17.4	19.5	18.3	17.1	23.1
Regular (%)	34.0	29.1	38.5	30.2	32.7	40.0	32.9	34.6

Entries are percentages or means with associated standard deviation.

There were no statistical differences between conditions (all p values > 0.05).

smoking data were collected in the course of a follow up interview 72 hours later.)

#### Control group

In addition to the six experimental groups, a “no message” control group was also run. Subjects in this group viewed the pilot programme and other commercials and completed assessment procedures, but were not exposed to any smoking relevant advertisement. This controls for the effects of this repeated assessment in the absence of any effect of smoking related advertisements.

#### DATA ANALYSIS

Logistic regression analyses were conducted to investigate whether there was an association between message content (that is, Feel *v* Vents) and message context (that is, PSA, unbranded NRT, and branded NRT) and prize selection following exposure to the advertisements. Since we were interested in examining the effectiveness of the advertisements in moving smokers away from cigarettes, the primary dependent variable of interest was the selection of any non-cigarette prize versus the selection of cigarettes (Regular, Light, or Ultra Light) following exposure to the advertisement. Two secondary dependent variables were also examined: the selection of any item *besides* Light cigarettes (excluding three cases who selected Light cigarettes before message exposure but then selected Regular cigarettes post-message exposure) versus the selection of Light cigarettes, and the selection of any method of assisted quitting (that is, pharmacotherapy or other smoking cessation methods) versus the selection of any non-quitting related item. We evaluated the main effects of message content and message context, as well as the interaction of the two. In order to control for the pre-test selection, this variable was included as an independent variable in each logistic model. The logistic regression controls for pre-exposure selections, but does not provide a ready way of displaying corrected data. For display, we use the ARS Persuasion® score that has been formally validated for the ARS Persuasion® test. The ARS Persuasion® score is calculated as the change in the number of

subjects who select the product of interest (for example, cigarettes) following the message exposure (versus pre-message exposure), expressed as a percentage of subjects who were exposed to the message. Positive ARS Persuasion® scores indicate elicited movement toward the product of interest after viewing the test advertisement. Negative ARS Persuasion® scores represent movement away from the product of interest after viewing the test advertisement.

The logistic regression compares post-exposure selections by group. To assess directly whether changes within any given condition were systematic and significant, we used McNemar’s test, applied to the pre-post transition matrix for product selection; this test assesses the significance of pre- to post-shifts in selections.<sup>10</sup> Subjects who were missing either pre- or post-choice selection data were excluded from outcome analyses, leaving a final sample of 1566.

## Results

#### DEMOGRAPHICS AND SMOKING HISTORY

Table 1 shows the demographic and smoking characteristics by treatment group for all enrolled smokers. No significant differences were observed among any of the experimental or control groups on any of the characteristics of interest, whether tested on the whole sample (n = 1890) or on subjects with complete data (n = 1566).

#### MOVEMENT AWAY FROM CIGARETTES

Table 2 displays the pre- and post-test selections by experimental group, and fig 1 shows the average ARS Persuasion® scores by experimental group.

Positive scores indicate elicited movement towards the selection of cigarettes after viewing the test advertisement. Negative scores represent movement away from the selection of cigarettes after viewing the test advertisement. Because of small cell counts which would violate analysis assumptions, the unbranded and branded NRT conditions were collapsed into a general “NRT ad” condition.



Table 2 Pre- and post-test selection by experimental group

Pre-test selection	Post-test selection							
	As NRT context				As PSA context			
	Regular Cigarettes	Light Cigarettes	Treatment	Cash	Regular Cigarettes	Light Cigarettes	Treatment	Cash
<i>Advertisement: vents</i>								
Regular cigarettes	25	0	1	5	11	1	1	2
Light cigarettes	0	31	2	4	1*	12	1	7
Treatment	3	6	184	47	6	1	94	25
Cash	4	2	6	116	2	2	3	63
<i>Advertisement: feel</i>								
Regular cigarettes	15	2	3	8	9	0	1	4
Light cigarettes	1*	24	1	7	1*	12	1	12
Treatment	5	6	211	31	0	1	92	22
Cash	0	1	8	111	0	1	2	72
<i>Control (no advertisement or context)</i>								
Regular cigarettes	9	1	0	4				
Light Cigarettes	0	10	0	4				
Treatment	5	3	102	24				
Cash	0	1	2	69				

\*Participants who initially chose Light cigarettes and moved towards Regular cigarettes are excluded from the Light cigarette analysis.

*No message control group*

Among those control subjects who did not view a smoking related commercial, but who did select a prize before and after viewing the pilot programme, the test procedures did not impact product choice: no significant movement either toward or away from cigarettes was observed ( $\chi^2 = 0.06, p = 0.808$ ).

*Main effects of message and context*

Controlling for pre-test selections, subjects who saw the Feel advertisement were significantly more likely than subjects who saw the Vents advertisement to move away from

cigarettes after seeing the advertisement (odds ratio (OR) = 1.97, 95% confidence interval for the odds ratio (95% CI) 1.25 to 3.09;  $\chi^2(1) = 8.69, p = 0.003$ ). On univariate McNemar's tests within each group, only the Feel advertisement resulted in a significant change in cigarette selection ( $\chi^2 = 10.37, p = 0.001$ ); the Vents advertisement did not ( $\chi^2 = 0.18, p = 0.668$ ).

Controlling for pre-test selections, subjects viewing the advertisement in the PSA context tended to be more likely than subjects who saw the NRT advertisements to move away from cigarettes (OR = 1.51, 95% CI 0.94 to 2.40;  $\chi^2(1) = 2.97, p = 0.085$ ). On univariate tests within each group, only the PSA advertisement resulted in significant change in cigarette selection ( $\chi^2 = 6.10, p = 0.014$ ); the NRT advertisements did not ( $\chi^2 = 0.28, p = 0.599$ ).

Because the Feel message was shown to be more effective, we also evaluated the context specifically among subjects who saw the Feel message. Within the Feel group, the PSA framing was significantly more effective in moving smokers away from cigarettes (OR = 2.08, 95% CI 1.03 to 4.20;  $\chi^2(1) = 4.18, p = 0.041$ ).

*Interaction effect*

Controlling for pre-test selections, analyses of the interaction of message content and message context were conducted. No significant interaction was observed between message content and message context for movement towards or away from cigarettes (OR = 1.85, 95% CI 0.73 to 4.71;  $\chi^2(1) = 1.66, p = 0.197$ ).

**MOVEMENT AWAY FROM LIGHT CIGARETTES**

Figure 2 shows the average ARS Persuasion® scores by experimental group. Positive scores indicate elicited movement towards the selection of Light cigarettes after viewing the test advertisement. Negative scores represent movement away from the selection of Light cigarettes after viewing the test advertisement.

*No message control group.*

There was no significant change in the selection of Light cigarettes among those

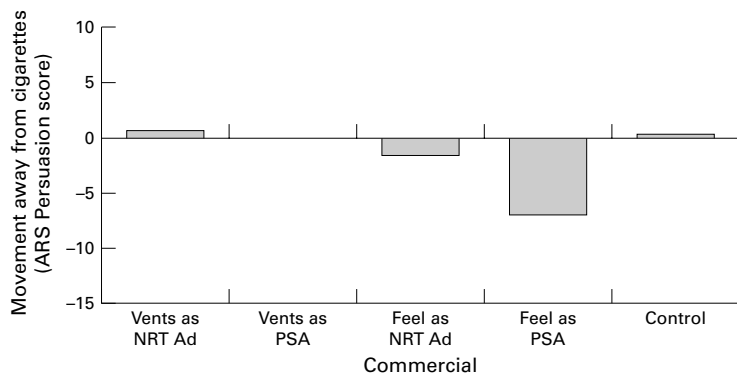


Figure 1 Average ARS Persuasion® score by experimental group for the change in the number of subjects selecting cigarettes.

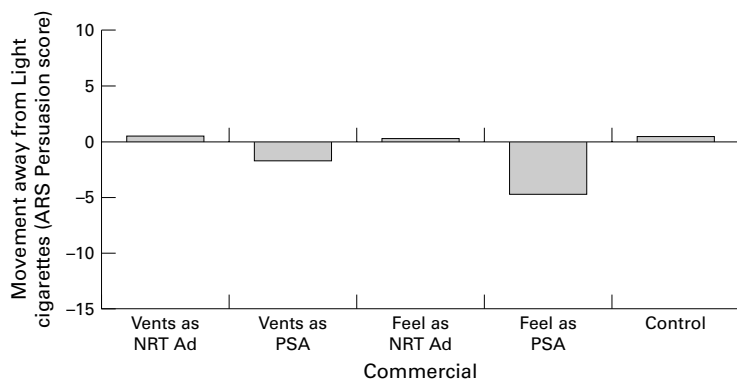


Figure 2 Average ARS Persuasion® score by experimental group for the change in the number of subjects selecting Light cigarettes.

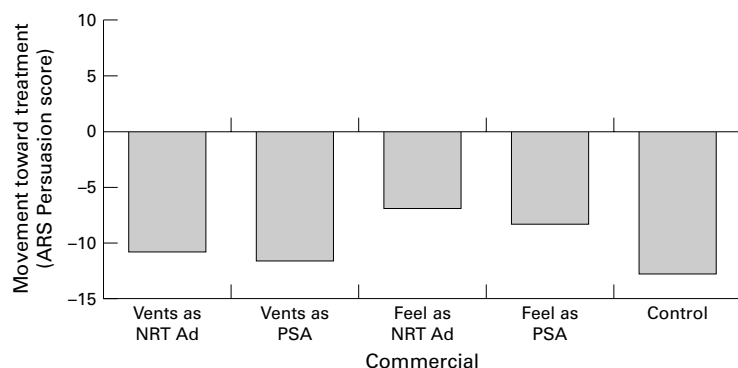


Figure 3 Average ARS Persuasion® score by experimental group for the change in the number of subjects selecting treatment items.

subjects who completed two successive product selections without seeing any smoking related advertisement ( $\chi^2 = 0.11$ ,  $p = 0.739$ ).

#### Main effects of message and context

Controlling for pre-test selection, there was no significant effect of advertisement content on moving smokers away from Light cigarettes (OR = 1.40, 95% CI 0.79 to 2.50;  $\chi^2(1) = 1.33$ ,  $p = 0.249$ ). However, on univariate tests within each group, only the Feel message resulted in a trend of movement away from Light cigarettes ( $\chi^2 = 3.12$ ,  $p = 0.077$ ); the Vents message did not ( $\chi^2 = 0.15$ ,  $p = 0.695$ ).

Controlling for pre-test selections, subjects who saw the PSA advertisements were significantly more likely to move away from Light cigarettes (OR = 2.45, 95% CI 1.28 to 4.69;  $\chi^2(1) = 7.30$ ,  $p = 0.007$ ). On univariate tests within each group, only the PSA advertisement resulted in significant change in Light cigarette selection ( $\chi^2 = 8.33$ ,  $p = 0.004$ ); the NRT advertisement did not ( $\chi^2 = 0.29$ ,  $p = 0.590$ ).

Because the Feel message was most effective overall, we tested the effect of context within that message. The analysis demonstrated that the PSA framing was the most effective context for the Feel message in terms of moving smokers away from Light cigarettes (OR = 2.91, 95% CI 1.15 to 7.33;  $\chi^2(1) = 5.13$ ,  $p = 0.023$ ).

#### Interaction effect

No significant interaction was observed between message content and message context for movement towards or away from Light cigarettes (OR = 1.65, 95% CI 0.48 to 5.73;  $\chi^2(1) = 0.63$ ,  $p = 0.428$ ).

#### MOVEMENT TOWARD TREATMENT

Figure 3 shows the average ARS Persuasion® scores by experimental group. Positive scores indicate elicited movement towards the selection of assisted quitting products after viewing the test advertisement. Negative scores represent movement away from the selection of assisted quitting products after viewing the test advertisement.

#### No message control group

Subjects who completed two successive product selections without seeing any smoking related advertisement showed significant

movement away from selection of treatment products ( $\chi^2 = 26.47$ ,  $p < 0.001$ ), with an ARS Persuasion® score of  $-12.82\%$ . This suggests that the test procedures themselves (that is, viewing the show and ads and repeated product selection) yielded artifactual changes in selection of smoking cessation aids. This substantially compromises the validity of this measure as an index of advertisement effects on selection of treatment products.

#### Main effects of message and context

Given the changes observed in the control group, we tested the change in each ad condition against the net movement seen in the control group. As seen in fig 3, subjects in all test conditions were less likely to select treatment items following ad exposure; the comparisons test the magnitude of this movement relative to the control group. Controlling for pre-test selection, only subjects who saw the Feel advertisement were significantly more likely than subjects in the control group to select a treatment item after seeing the advertisement (OR = 1.57, 95% CI 1.01 to 2.45;  $\chi^2(1) = 4.01$ ,  $p = 0.045$ ). (Smokers who saw the Feel advertisement were also significantly more likely than those who saw the Vents advertisement to select a treatment item after seeing the advertisement (OR = 1.41, 95% CI 1.02 to 1.95;  $\chi^2(1) = 4.40$ ,  $p = 0.036$ ). All other comparisons between the experimental groups and the control group were not significant.

#### MODERATORS

We tested for interactions between the message content and demographic characteristics, to examine whether the feel message was more or less effective with particular subgroups. We found no interaction between message content and sex, smoking rate, or type of cigarette smoked (that is, Regular, Light, or Ultra Light). We also tested whether the two messages had differential effects on young adult smokers (18–25 years old) versus older smokers (> 25 years); there were no differences.

#### Discussion

Using a test system validated to predict consumer response to advertising, we found that exposure to an advertisement emphasising the deceptive nature of the sensory characteristics of Light cigarettes was most effective in moving smokers away from cigarettes. Smokers were less likely to choose cigarettes from an array of possible prizes after viewing the advertisement that addressed these sensory effects. Despite its central focus on debunking myths surrounding Light cigarettes, the effectiveness of this advertisement was not strictly limited to smokers of Light cigarettes. Even though they do not themselves smoke these brands, smokers of Regular cigarettes were equally likely to reduce their selection of cigarettes following exposure to the advertisement. The favourable effect of the ads was also consistently observed among both men and women, among both light and heavy smokers,

and among young adult as well as older smokers. Moreover, the Feel advertisement was more effective than the Vents advertisement whether the advertisement was framed as a PSA or as an NRT advertisement. The results are consistent with our previous finding that providing smokers with accurate information and acknowledging their sensory experience with Lights and Ultra Lights both changes their beliefs about these cigarettes and promotes intention to quit smoking.<sup>5</sup> Thus, two studies, using different messages, samples, and methods, confirm the effectiveness of the Feel message and its superiority to a Vents message focused on vent blocking.

These results, along with those of the previous test of these message strategies,<sup>5</sup> validate the importance of addressing smokers' somatic perceptions of "lightness" when smoking reduced yield cigarettes. Because such sensory experiences fit into smokers' naive models of smoking related harm, addressing these experiences may be important in changing beliefs and behaviour.<sup>6,7</sup>

This study also demonstrated that the context in which a counter-Lights message is presented is also relevant in determining its effectiveness. We found that presenting the information in a strictly educational format was more effective than presenting the same information in the context of an advertisement promoting smoking cessation treatment products, specifically NRT. This suggests the importance of having people hear this information from a source they regard as impartial, rather than one that may be perceived as having ulterior motives. (However, note that no particular source was cited for the PSA ad, so viewers could not have evaluated the credibility of a specific non-commercial sponsor.). Though smokers may find the information conveyed by the advertisements to be personally relevant and convincing, they may not yet be ready to take specific action to quit, as advocated by the advertisements promoting NRT products. This may partly explain why the smokers in this study did not tend to choose treatment related products after viewing the advertisement. It is also possible that smokers were less persuaded by an NRT advertisement because they regarded the sponsor as having a stake or conflict of interest in delivering a cessation message.

It was striking that even though the advertisements reduced interest in cigarettes, they appeared to reduce the number of smokers who chose treatment related products. Unfortunately, analysis of a control group that saw no smoking relevant advertisements showed that even they significantly reduced their selection of treatment products. It appears that simply being presented with the product choices twice caused smokers to reduce their preferences for treatment products. Subjects did not actually receive their selected prizes, so their need for treatment products was not saturated after the pre-test. We speculate that those who selected treatment products on the first round may have

experienced the second offer as pressure to quit, perhaps eliciting reactance and thus apparent movement away from treatment products. In any case, this result precluded complete evaluation of the effect of the test ads on movement towards assisted quitting. We did find, however, that the Feel ad yielded less movement away from assisted quitting products than was seen in the control group, suggesting that this message not only encourages movement away from cigarettes but may also prompt movement towards assisted quitting.

While changing people's beliefs and attitudes about Light and Ultra Light cigarettes is an important goal for a counter-marketing campaign (and prerequisite to behaviour change), behaviour change is ultimately the desired outcome and the ultimate measure of success. In previous studies examining the impact of messages designed to counter-market Light cigarettes, smokers were exposed to the message of interest within the context of a survey that assessed smoking history and examined beliefs and attitudes regarding Light and Ultra Light cigarettes. The context called respondents' attention to their smoking and was clearly one of a persuasion attempt, thus increasing the likelihood that participants' responses and reactions to the message may have been influenced by demand characteristics. Subjects in the present study, on the other hand, were unaware of the true nature or purpose of the study. The advertisement of interest was camouflaged among other advertisements and a television pilot programme. Subjects for this study were not specifically recruited on the basis of their smoking status, and smoking status data were collected only after subjects had completed the test. Thus, demand characteristics should have been minimised.

The present study attempted to go beyond self-reported attitudes and intentions, using a behavioural measure to predict real world response. Subjects made a choice among products they expected to actually receive and consume, thus expressing a behavioural preference. At the same time, the study did not examine actual cessation, or even stated intention to quit. However, the method was a behavioural choice analogue that has been validated in the commercial marketplace, where it has been shown that consumer choices on this test predict actual mass market behaviour in response to the tested advertisement. The validation includes findings that advertisements that yield negative persuasion scores—equivalent to our measure of moving away from cigarettes—reliably lead to a loss of market share.<sup>9</sup> This lends confidence to the conclusion that a feel PSA would move smokers away from cigarettes—that is, towards quitting. The test setting was not an exact duplicate of a real world advertising campaign. Subjects were a captive audience, and were not free to "channel surf" or leave the viewing during commercials, as they may do at home. On the other hand, we measured the impact of only a

single exposure to a crude mock advertisement. In an actual media campaign, smokers would be exposed to fully developed (and presumably more compelling) ads multiple times. The test is meant as a validated analogue or marker for the potential effectiveness of an ad campaign, and has a validated track record of predicting real world response to advertising strategies.<sup>9</sup>

The limitations of the study include the lack of strict random assignment. Because of the way ARS Persuasion® tests are conducted, including their administration in large groups at geographically dispersed locations, random assignment was not feasible. However, care was taken that assignment to treatment was not systematic, but depended on subjects' convenience. The lack of group differences on demographic and smoking variables confirms the balanced assignment of subjects to groups. Further, in scheduling the test sessions, care was taken to mix weekends and weekdays, geographical sites, and the other commercials viewed during the test, to assure unbiased comparisons across groups. Another limitation was that the six test commercials were not strictly identical on other parameters such as visual imagery, language, number of words, etc. It is possible that these distinctions, and not the message theme itself, may in fact be responsible for the differential effects observed. However, the ads were very simple and quite similar. Also, the consistency between the findings of this study and those of our prior comparison, which used different message content and medium, but yielded parallel results, lends credence to the current findings.

In conclusion, this research builds upon prior studies to demonstrate that a particular message strategy is most successful for counter-advertising on the subject of Light and Ultra Light cigarettes. Addressing smokers'

sensory perceptions of Light cigarettes and presenting this information in an impartial way is likely to be an effective communication strategy for counter-marketing Light cigarettes. This message and media approach can provide a clear strategy for public media campaigns against smoking.

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