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Adult Smokers' Responses to “Corrective Statements” Regarding Tobacco Industry Deception

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Abstract

Background—To inform consumers, U.S. Federal Courts have ordered the tobacco industry to disseminate “corrective statements” (CSs) about their deception regarding five topics: smoker health effects, nonsmoker health effects, cigarette addictiveness, design of cigarettes to increase addiction, and relative safety of light cigarettes.

Purpose—To determine how smokers from diverse backgrounds respond to the final, court-mandated wording of these CSs.

Methods—Data were analyzed from an online consumer panel of 1,404 adult smokers who evaluated one of five CS topics ($n=280-281$) by reporting novelty, relevance, anger at the industry, and motivation to quit because of the CS. Logistic and linear regression models assessed main and interactive effects of race/ethnicity, gender, education, and CS topic on these responses. Data were collected in January 2013 and analyzed in March 2013.

Results—Thirty percent to 54% of participants reported that each CS provided novel information, and novelty was associated with greater relevance, anger at the industry, and motivation to quit because of the message. African Americans and Latinos were more likely than non-Hispanic whites to report that CSs were novel, and they had stronger responses to CSs across all indicators. Compared to men, women reported that CSs were more relevant and motivated them to quit.

Conclusions—This study suggests that smokers would value and respond to CSs, particularly smokers from groups that suffer from tobacco-related health disparities.

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Introduction

As part of the 1999 Racketeer Influenced and Corrupt Organizations case that the U.S. Department of Justice (DOJ) brought against the tobacco industry, Federal Judge Gladys Kessler ruled in 2006 that the tobacco industry had to disseminate “corrective statements” (CSs) to inform consumers about the industry’s past deceptive practices.¹ The CSs were meant to address consumer misperceptions on five different topics: (1) health effects of smoking for smokers; (2) health effects of secondhand smoke for nonsmokers; (3) cigarette and nicotine addictiveness; (4) industry design of cigarettes to increase addiction; and (5) the lack of relative safety of low-tar and light cigarettes. The court considered CS wording proposals from the DOJ (plaintiff), cigarette manufacturers (defendants), and a consortium of health interest groups including Tobacco-Free Kids, American Cancer Society, American Lung Association, Americans for Nonsmokers’ Rights, and the National African American Tobacco Prevention Network (interveners).² The 2006 decision was tied up in litigation until 2009 when the U.S. Court of Appeals upheld the initial verdict.³ The CS wording was not finalized until November 2012. In the first half of 2013, CSs were set to appear through cigarette package inserts, tobacco company websites, retail points of sale for tobacco, and TV and newspaper ads. However, the tobacco industry appealed the ruling,⁴ delaying dissemination of CSs.

Tobacco marketing makes cigarette smoking and tobacco use seem to be a normal and important part of everyday behavior.^{5–7} Tobacco industry denormalization (TID) strategies and messages advance tobacco control by countering marketing strategies and revealing tobacco industry deception. CSs have the potential to act as a TID message. However, unlike other TID messages, CSs will originate from the tobacco industry, which could produce skepticism among consumers. Nevertheless, all CS ads will be prefaced by the fact that a “Federal Court” has ordered tobacco companies to make the statement contained in the ad. In addition, studies evaluating other industries’ CS campaigns have found that such statements can correct consumer beliefs and knowledge.^{29–33}

Only two previously published studies have specifically evaluated tobacco industry CSs, but these were conducted before the court ruled on the CS’s final wording. One study tested five different versions of CSs (one proposed by the DOJ, one proposed by the defendants, one proposed by the interveners, and two designed by the study investigators), which confirmed that adult smokers are misinformed about several topics and exposure to CSs increased knowledge and corrected misperceptions, but these effects were imperceptible 1 week after baseline message exposure.⁸ This suggests that repeated naturalistic exposure to CSs is necessary to reinforce CS messaging. A second study tested the CS wording proposed by interveners, which demonstrated that smokers and nonsmokers exposed to a CS ad reported stronger antismoking beliefs than those in a control group who were unexposed to any ad, with stronger effects among smokers than nonsmokers.⁹ However, the statements investigated in each of these studies were not the final versions issued by the court and combined all five topics into one ad. When implemented, only one CS topic will appear per ad. Furthermore, neither of these studies assessed differences in smokers’ responses to statements by sociodemographic characteristics, which are important to consider given that some characteristics moderate adult smokers’ responses to tobacco-control

interventions^{10–13} and more specifically to interventions using TID messages.^{14–17} For example, the TID-based national “truth” campaign was found to be more effective for African American youth than for Latino or white youth when considering its impact on anti-industry beliefs and attitudes¹⁴ and smoking initiation.¹⁵

The current study, conducted in January 2013, had two objectives: (1) to assess the novelty, relevance, emotional response (i.e., anger at the tobacco industry), and resulting motivation to quit among U.S. adult smokers when presented with the final CS wording and (2) to examine whether responses to CSs differed across sociodemographic groups, particularly groups associated with tobacco-related disparities, such as race/ethnicity, gender, and SES.

Methods

Sample

Data were analyzed from 1,404 adult smokers recruited from Global Market Institute's online consumer panel, which includes consumers with diverse racial/ethnic, gender, and educational attainment characteristics. Members join through a double opt-in process. Membership is limited to one panelist per household, involves verification of participant home address, ongoing quality control procedures to detect aberrant responses and behavior, and exclusion of panelists who do not meet these standards (see gmi.com). Data collection for the present study occurred in January 2013 and data were analyzed in March 2013. Eligibility requirements included being a U.S. resident aged between 18 and 64 years, having smoked at least 100 cigarettes in their lifetime, and having smoked at least once in the prior month. Participants could choose to take the survey in Spanish or English, but the CSs were presented only in English. After responding to questions on their smoking-related attitudes, beliefs, intentions, and behaviors, participants were randomized to view and report their responses to one of five CSs (Table 2). Participants were compensated from \$1.75 to \$2.50 for survey completion.

Measures

Dependent variables—After viewing a CS, participants reported whether it was novel, for which they indicated *yes*, *no*, or *don't know*. Other responses included indicators of message relevance, negative emotional arousal (anger), and motivation to quit, for which participants reported responses ranging from 1 (*not at all*) to 9 (*extremely*).

Independent variables—Dummy variables were created for self-reported age categories, gender, educational attainment, annual household income, race/ethnicity, living with minors aged <18 years, and language of survey administration (English versus Spanish). Smoking behavior was recoded using the Heaviness Smoking Index (HSI).¹⁸ The HSI distinguishes light from heavy smokers, defined in terms of time to first cigarette of the day and the number of cigarettes per day. Lower values are associated with non-daily or light smokers and smokers who have their first cigarette >1 hour after waking up. Other smoking behaviors included intentions to quit and any attempts to quit in the prior 4 months.

Analysis

Stata, version 11.2 (StataCorp LP, College Station TX) was used for all analyses. Unweighted descriptive statistics were analyzed, and chi-square tests were used to assess differences in the sociodemographic and smoking-related characteristics both across the subsamples randomized to evaluate one of five CSs and across the different racial/ethnic groups. For each CS and racial/ethnic group, the prevalence of novelty and mean values of relevance, motivation to quit, and anger at the industry were obtained. ANOVAs were computed to assess differences in the mean values between CS topics for relevance, anger at the industry, and motivation to quit. In the case of statistically significant ANOVA results, Bonferroni adjustments were made for significance levels in post hoc tests involving ten pairwise comparisons of mean responses to each of the five CS messages ($p < 0.05/10 = < 0.005$).

For each primary dependent variable of CS responses, data from all five CS topics were pooled, and logistic regression models (novelty) and linear regression models (relevance, motivation to quit, and anger at the tobacco industry) were estimated. Data were pooled to generate a sufficient sample size to ensure adequate statistical power. All pooled models included the main effects of the CS topic (a set of dummy variables, with cigarette addictiveness as the reference group) and primary sociodemographics of interest (race/ethnicity, educational attainment, and gender), while adjusting for other sociodemographics (age, income, and living with a minor), smoking behavior (HSI, intention to quit, and quit attempts) and language of survey administration. In linear regression models, message novelty was also included as an adjustment variable. Interactions among CS and each of the primary sociodemographic variables were assessed in subsequent models. Because of the skewed distribution of the continuous variables, sensitivity analyses were conducted after categorizing responses as either high (the first response above the median that had a verbal anchor) or low, and logistic regression models were estimated.

Results

Sample Characteristics

The overall response rate for invitations sent to consumer panel participants was 21%, with 92% of respondents completing the survey. Table 1 shows the sample characteristics, indicating relatively equal participation of men (48%) and women (52%), and about half of the sample (52%) identified as non-Hispanic whites, 38% as Latino, 6% as African Americans, and 4% as some other racial or ethnic background.

When examining differences in sample characteristics by participant race/ethnicity, several statistically significant differences were observed. Non-Hispanic whites were relatively older ($p < 0.001$) and had lower educational attainment ($p = 0.01$), lower proportion of smokers planning to quit within 6 months ($p < 0.001$), and lower proportion of quit attempts in the last 4 months ($p < 0.001$). Latinos had the lowest mean smoking intensity, non-Hispanic whites the highest intensity, and African Americans were in between ($p < 0.000$) (Table 1). There were no significant differences in gender ratios across racial/ethnic groups.

Participants were randomized to evaluate one of five CSs, resulting in almost identical sample sizes for evaluation of each CS ($n=280-281$). When assessing differences in sample characteristics across these five subsamples, a marginally significant difference was found for one level of education (college or some university, $p=0.043$). No other sample characteristics differed significantly across CS subsamples.

Responses to CSs

ANOVA results indicated that responses to each of the five CSs were significantly different with regard to relevance, motivation to quit, and anger at the tobacco industry (Table 2). Bonferroni-adjusted post hoc tests suggested that the CS about the health effects on smokers received the highest scores for relevance and motivation to quit (pairwise comparisons, all p -values <0.01), and the CS about cigarette design to increase addictiveness received the highest scores for anger at the industry (pairwise comparisons, all p -values <0.01).

In the bivariate and adjusted analyses that pooled responses to all CSs, African Americans and Latinos were more likely than non-Hispanic whites to report that CSs were novel (Table 3), as well as to report that the CSs were relevant, made them angry, and motivated them to quit (Table 4). Women were more likely than men to indicate that CSs were relevant and motivated them to quit. Smokers living with minors were more likely to report that CSs were novel, made them feel angry at the tobacco industry, and motivated them to quit.

Almost none of the interactions between CS topics and primary sociodemographic variables were statistically significant; the only exception concerned the interaction between race/ethnicity and the CS messages in the logistic model assessing novelty. An omnibus statistic that considered all interaction combinations between race/ethnicity groups and CS message was marginally significant ($p=0.048$), suggesting that the novelty of different CS messages depended on the race/ethnicity of the smoker. However, there was no consistent pattern in the prevalence of novelty across CSs by race/ethnicity (Table 2).

Of the secondary sociodemographic variables examined (Tables 3 and 4), age, income, educational attainment, and language of survey administration were not associated with responses to CSs. Compared to smokers who did not intend to quit in the next 6 months, smokers who intended to quit reported significantly higher novelty of CSs and greater personal relevance, anger, and motivation to quit in response to CSs. Similarly, smokers who tried to quit recently reported greater anger toward the tobacco industry and motivation to quit compared with smokers who had not tried to quit (Table 4). Finally, in bivariate and adjusted models, smokers who reported that the CS message to which they were exposed was novel were more likely to report that the message was relevant, made them angry at the industry, and motivated them to quit.

Sensitivity Analyses

As a sensitivity check, logistic regression models were estimated; the resulting patterns were similar to those of the linear regression models.

Discussion

The results of this study suggest that the CSs suggested by the U.S. court system to correct smokers' misperceptions about cigarettes because of the tobacco industry's deceptive practices provide smokers with new information that they perceive as relevant, which could help motivate them to quit. Of the five topics about which the tobacco industry is obligated to issue CSs, between one third and over half of participants indicated that the information contained in the CS was novel. Novelty was also associated with greater reported message relevance, anger at the industry, and motivation to quit because of the message. We did not evaluate changes in knowledge due to CS exposure, but prior research found that the novelty of CSs predicted an increase in knowledge of health risks from smoking and secondhand smoke.⁸ The novelty ratings for the CSs were consistently higher among African Americans and Latinos than among non-Hispanic whites, as it was among participants with high school or lower educational attainment compared to college graduates. This lower awareness of CS content in groups that suffer from smoking health-related disparities suggests the importance of overcoming this lack of knowledge by obligating the tobacco industry to disseminate CSs that effectively reach these target groups.

In this study, both African Americans and Latinos had stronger responses to CSs than non-Hispanic whites, consistent with prior research demonstrating that African American youth had stronger anti-industry attitudes after being exposed to TID-based campaigns.^{14,15} The minority status of African Americans and Latinos may cause them to have more similar responses to TID messaging than non-Hispanic whites. In this sample, Latinos and African Americans were less addicted to smoking than whites, as indicated by their lower smoking intensity and higher percentage of both quit attempts and intentions. Although these variables were controlled for in analyses, weaker responses to TID messages for white smokers in this sample may reflect their greater involvement with smoking. Indeed, addiction level is the most consistent predictor of quit attempts and success, thus it is not surprising that more-addicted smokers would be less receptive to CSs.¹⁹

Contrary to prior research,^{14,17} which found higher anti-industry attitudes among men, women and men did not significantly differ in reporting anger at the industry after exposure to CSs. However, women were more likely than men to report the CSs were important to them or motivated them to quit. This is consistent with research on responses to similar smoking-related health messages on cigarette warning labels, which showed that women provide stronger responses than men.^{20,21} Prior research has found stronger anti-industry attitudes among smokers with relatively higher SES,^{16,17} but this study found no association with either educational attainment or income. Although CSs would ideally help address SES-related disparities by generating a relatively stronger impact among lower-SES smokers, the lack of association suggests that this intervention will not exacerbate disparities by working best among higher-SES smokers. Finally, consistent with prior research,²² smokers living with children were more likely to report that CSs were novel, made them feel angry at the tobacco industry, and motivated them to quit. This higher responsiveness of this population to CSs suggests that TID may be more effective when accompanied by campaigns that specifically target smokers with children, as was done in California.²³

Limitations

This study has several limitations, which may impact the generalizability of the findings. The sample was recruited from an online consumer panel, which is not necessarily representative of the population of current smokers in the U.S. In our sample, non-Hispanic whites had lower educational attainment and were more involved with smoking (fewer quit attempts and more daily smokers) than other racial/ethnic groups. In the U.S., there is a disproportionate concentration of smoking in populations with lower education, regardless of race.²⁴ Disparities in internet access may have impacted the participation rates of non-whites with low educational attainment, therefore causing the significant differences in education by race/ethnicity in this sample. However, involvement with smoking by race/ethnicity in our sample closely mirrors rates in studies with nationally representative samples, which have shown that non-Hispanic whites are more likely than African Americans and Latinos to be daily smokers and have fewer quit intentions and attempts.^{24–26}

Nevertheless, the response rate among online panel participants was lower than desired, and it cannot be determined how those who responded to the invitation to participate may have differed from those who did not respond and whether these differences may have biased our results. Another limitation is that the CSs appeared in English even for those who took the survey in Spanish. There were no associations between language of survey (English or Spanish) and CS responses in the adjusted linear regression models. There may have been a higher impact among Spanish speakers had the statements been translated into Spanish, and the current court ruling requires CS publication in Spanish-language newspapers to be done in Spanish.¹ However, when implemented, the majority of CS exposure will be in English because the CSs will appear in English on cigarette packages, industry websites, and other formats.

Finally, owing to the cross-sectional study nature of this study, it is not possible to address if exposure to CSs produces any meaningful behavior change, such as smoking cessation. Although smokers were exposed to the CSs just one time and in an online rather than naturalistic setting, when CSs are implemented, both smokers and nonsmokers will repeatedly be exposed through various media, including newspapers, TV, radio, and the Internet. One-time exposure to the CSs may not reflect the actual impact of multiple exposures to multiple messages over time, and repeated exposure could produce larger effects than we found here, especially if the courts require high-quality production of the final CS materials. On the other hand, it is possible that individuals will be skeptical of CS claims because they will originate from the tobacco industry. Furthermore, since CSs will be seen by youth and nonsmokers, the population impact of this intervention is likely to be more far-reaching than that for established smokers. CS exposure has been demonstrated to be effective in producing anti-smoking beliefs for both smokers and nonsmokers⁹; therefore, CSs could suppress smoking initiation and increase support for tobacco industry regulation.²⁷

Conclusions

Despite these limitations, findings from this analysis suggest that the dissemination of CSs would deliver novel information to many consumers and have the potential to help correct misperceptions about the health effects of smoking.

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Table 1

Sample characteristics

	Total sample		Racial/ethnic groups				
	<i>n</i>	%	White	AA	Latino	Other	<i>p</i> -value
Gender							
Male	676	48%	48%	51%	47%	62%	
Female	728	52%	52%	49%	53%	38%	
Age, years							
18–24	247	18%	15%	24%	18%	34%	**
25–34	332	24%	17%	28%	33%	22%	***
35–44	296	21%	21%	15%	22%	20%	
45–54	267	19%	23%	20%	14%	16%	***
54–64	262	19%	24%	14%	14%	8%	***
Education							
High school or less	482	34%	38%	24%	32%	28%	**
College or some university	633	45%	48%	54%	40%	42%	**
Completed university or higher	288	21%	14%	22%	29%	30%	***
Annual household income							
Low, \$0–\$29,999	530	38%	37%	37%	40%	32%	
Middle, \$30,000–\$59,999	470	33%	34%	36%	34%	24%	
High, \$60,000	404	29%	30%	28%	26%	44%	*
Minors living at home							
No minors at home	800	57%	67%	52%	44%	66%	
Living with minors aged <18 years	603	43%	33%	48%	56%	34%	*
Ethnicity/Race							
Non-Hispanic white	729	52%	100%	—	—	—	
African American	87	6%	—	100%	—	—	
Latino	537	38%			100%		
Other ethnicity	50	4%	—	—	—	100%	
Language of the survey							
Spanish	191	14%	0.1%	0%	35%	0%	
English	1213	86%	99.90%	100%	65%	100%	
Smoking intensity							
Non-daily	423	30%	15%	26%	51%	28%	***
Daily 10 cigarettes	366	26%	23%	40%	28%	34%	***
Daily >10 cigarettes	615	44%	62%	33%	21%	38%	***
Quit intention							

	Total sample		Racial/ethnic groups				<i>p</i> -value
	<i>n</i>	%	White	AA	Latino	Other	
No plan to quit within 6 months	387	28%	62%	51%	51%	54%	
Plan to quit within 6 months	1017	72%	38%	49%	49%	46%	***
Quit attempts last 4 months							
No quit attempt	837	60%	70%	55%	46%	60%	
1 quit attempts	567	40%	30%	45%	54%	40%	***

Chi-squared differences in row percentages between race/ethnic groups indicated by:

AA, African American

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.001$.

Table 2

Responses to corrective statements overall and by race/ethnicity

Responses	Cigarette addictiveness	Cigarette design to increase addictiveness	Relative safety of low-tar/light cigarettes	Health effects for smokers	Health effects for nonsmokers
	A Federal Court has ruled that the tobacco companies deliberately deceived the American public about the addictiveness of smoking and nicotine, and has ordered those companies to make this statement.	A Federal Court has ruled that the tobacco companies deliberately deceived the American public about designing cigarettes to enhance the delivery of nicotine, and has ordered those companies to make this statement.	A Federal Court has ruled that the tobacco companies deliberately deceived the American public by falsely selling and advertising low tar and light cigarettes as less harmful than regular cigarettes, and has ordered those companies to make this statement.	A Federal Court has ruled that the tobacco companies deliberately deceived the American public about the health effects of smoking, and has ordered those companies to make this statement.	A Federal Court has ruled that the tobacco companies deliberately deceived the American public about the health effects of secondhand smoke, and has ordered those companies to make this statement.
Sample		Here is the truth: <ul style="list-style-type: none"> Tobacco companies intentionally designed cigarettes to make them more addictive. Cigarette companies control the impact and delivery of nicotine in many ways, including designing filters and selecting cigarette paper to maximize the ingestion of nicotine, adding ammonia to make the cigarette taste less harsh, and controlling the physical and chemical make-up of the tobacco blend. When you smoke, the nicotine actually changes the brain - that's why quitting is so hard. 	Here is the truth: <ul style="list-style-type: none"> Many smokers switch to low tar and light cigarettes rather than quitting because they think low tar and light cigarettes are less harmful. They are not. "Low tar" and filtered cigarette smokers inhale essentially the same amount of tar and nicotine as they would from regular cigarettes. All cigarettes cause cancer, lung disease, heart attacks, and premature death - lights, low tar, ultra lights, and naturals. There is no safe cigarette. 	Here is the truth: <ul style="list-style-type: none"> Smoking kills, on average, 1200 Americans. Every day. More people die every year from smoking than from murder, AIDS, suicide, drugs, car crashes, and alcohol, combined. Smoking causes heart disease, emphysema, acute myeloid leukemia, and cancer of the mouth, esophagus, larynx, lung, stomach, kidney, bladder, and pancreas. Smoking also causes reduced fertility, low birth weight in newborns, and cancer of the cervix and uterus. 	Here is the truth: <ul style="list-style-type: none"> Secondhand smoke kills over 3,000 Americans each year. Secondhand smoke causes lung cancer and coronary heart disease in adults who do not smoke. Children exposed to secondhand smoke are at an increased risk for sudden infant death syndrome (SIDS), acute respiratory infections, ear problems, severe asthma, and reduced lung function. There is no safe level of exposure to secondhand smoke.

Responses		Cigarette addictiveness	Cigarette design to increase addictiveness	Relative safety of low-tar/light cigarettes	Health effects for smokers	Health effects for nonsmokers
Novelty	Total sample	33%	49%	30%	54%	40%
	White	25 %	42%	21%	54%	31%
	AA	57%	61%	13%	65%	50%
	Latino	41%	57%	42%	56%	46%
Relevance	Total sample ¹	6.2 (0.1) ^a	6.2 (0.15)	5.7 (0.2) ^{b, d}	6.7 (0.13)	6.4 (0.14)
	White	5.5 (0.2)	5.7 (0.2)	5.2 (0.2)	6.2 (0.2)	5.7 (0.2)
	AA	7.2 (0.5)	6.7 (0.6)	6.2 (0.7)	7.7 (0.3)	7.4 (0.5)
	Latino	6.9 (0.2)	6.9 (0.2)	6.2 (0.2)	7.3 (0.2)	7.1 (0.2)
Anger at industry	Total sample ¹	5.6 (0.2)	6.0 (0.16)	5.2 (0.2) ^c	5.7 (0.2)	5.5 (0.2)
	White	5.2 (0.2)	5.6 (0.2)	4.7 (0.2)	5.1 (0.2)	4.9 (0.3)
	AA	5.9 (0.5)	6.9 (0.6)	6.9 (0.6)	5.7 (0.7)	6.2 (0.6)
	Latino	6.1 (0.3)	6.5 (0.2)	5.7 (0.3)	6.4 (0.2)	6.1 (0.2)
Quit motivation	Total sample ¹	5.5 (0.2) ^a	5.7 (0.16)	5.2 (0.2) ^{b, d}	6.3 (0.2)	5.8 (0.2)
	White	4.8 (0.2)	5.2 (0.2)	4.6 (0.2)	5.6 (0.2)	5.0 (0.2)
	AA	6.6 (0.5)	6.1 (0.7)	5.1 (1.02)	7.4 (0.4)	7.2 (0.6)
	Latino	6.2 (0.2)	6.6 (0.2)	5.9 (0.2)	7.0 (0.2)	6.5 (0.2)

Means are different within corrective statements, ANOVA $\alpha=0.05$.

AA, African American

^a $p<0.01$ for addictiveness versus smoker health, Bonferroni test.

^b $p<0.01$ for tar versus smoker health, Bonferroni test.

^c $p<0.01$ for tar versus design, Bonferroni test.

^d $p<0.01$ for tar versus SHS, Bonferroni test.

Table 3

Bivariate and adjusted predictors of reporting that the corrective statement was novel

Predictors	%	OR	95% CI	AOR	95% CI
Gender					
Male	41%	ref		ref	
Female	41%	0.99	0.79, 1.22	0.89	0.71, 1.12
Age, years					
18–24	50%	ref		ref	
25–34	40%	0.67 *	0.48, 0.93	0.61 **	0.43, 0.88
35–44	42%	0.73	0.52, 1.02	0.78	0.53, 1.14
45–54	39%	0.65 *	0.46, 0.97	0.81	0.55, 1.19
55–64	36%	0.56 **	0.39, 0.80	0.78	0.52, 1.15
Education					
High school or less	43%	ref		ref	
College or some university	40%	0.88	0.69, 1.12	0.88	0.68, 1.14
Completed university or higher	40%	0.86	0.64, 1.15	0.73	0.52, 1.04
Annual household income					
Low, \$0–\$29,999	43%	ref		ref	
Middle, \$30,000–\$59,999	41%	0.93	0.72, 1.19	0.97	0.74, 1.27
High, \$60,000	39%	0.84	0.65, 1.09	0.89	0.66, 1.20
Minors living at home					
No minors at home	36%	ref		ref	
Living with minors aged <18 years	49%	1.73 ***	1.40, 2.15	1.72 ***	1.35, 2.2
Ethnicity/Race					
Non-Hispanic whites	34%	ref		ref	
African Americans	54%	2.28 ***	1.45, 3.56	1.95 ***	1.22, 3.13
Latinos	49%	1.82 ***	1.45, 2.28	1.42 **	1.06, 1.90
Other ethnicity	48%	1.79 *	1.00, 3.18	1.59	0.86, 2.94
Language of the survey					
English	40%				
Spanish	51%	1.6 ***	1.18, 2.17	1.21	0.84, 1.77
Smoking intensity					
Heaviness Smoking Index	41%	0.91 **	0.85, 0.97	0.96	0.88, 1.04
No plan to quit	36%	ref		ref	
Plan to quit within 6 months	48%	1.67 ***	1.34, 2.07	1.51 **	1.16, 1.98
No quit attempt	37%				

Predictors	%	OR	95% CI	AOR	95% CI
Quit attempt in last 4 months	47%	1.53 ***	1.23, 1.90	1.15	0.87, 1.51
Tobacco industry corrective statements					
Cigarette addictiveness	33%	ref		ref	
Cigarette design to increase addict.	49%	1.91 ***	1.36, 2.69	2.07 ***	1.45, 2.95
Relative safety of low-tar/lights	30%	0.85	0.59, 1.21	0.88	0.61, 1.27
Health effects for smokers	54%	2.34 ***	1.66, 3.29	2.49 ***	1.75, 3.55
Health effects for nonsmokers	40%	1.29	0.92, 1.83	1.28	0.90, 1.84

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.001$.

Table 4

Bivariate and adjusted linear regression predictors of corrective statement relevance, anger, and motivation to quit

	Relevance			Anger at the industry			Motivation to quit		
	β	SE	β_{adj}	β	SE	β_{adj}	β	SE	β_{adj}
Gender									
Male	ref		ref	ref		ref	ref		ref
Female	0.53 ***	0.12	0.56 ***	0.09	0.15	0.10	0.32 *	0.14	0.35 **
Age, years									
18–24	ref		ref	ref		ref	ref		ref
25–34	0.04	0.20	0.16	–0.06	0.24	0.03	–0.16	0.22	–0.11
35–44	– 0.41 *	0.21	–0.01	–0.34	0.24	–0.02	– 0.71 *	0.23	–0.22
45–54	– 0.43 *	0.21	0.05	– 0.65 ***	0.25	–0.18	– 0.77 *	0.23	–0.14
55–64	– 0.71 ***	0.22	–0.04	– 0.69 ***	0.25	–0.10	– 1.05 *	0.24	–0.27
Education									
Less than high school	ref		ref	ref		ref	ref		ref
College or some university	–0.03	0.15	–0.03	–0.16	0.17	–0.14	–0.02	0.16	–0.03
University or higher	0.01	0.18	–0.26	0.24	0.21	–0.05	0.27	0.20	–0.09
Annual household income									
Low, \$0–\$29,999	ref		ref	ref		ref	ref		ref
Middle, \$30,000–\$59,999	0.11	0.14	0.24	0.11	0.18	0.21	0.03	0.17	0.19
High, \$60,000	–0.05	0.16	0.19	0.08	0.21	0.17	–0.07	0.18	0.13
Minors living at home									
No minors at home	ref		ref	ref		ref	ref		ref
Living with minors under 18	0.72 ***	0.13	0.20	0.70 ***	0.15	0.29 *	0.85 ***	0.14	0.35 **
Ethnicity/race									
Non-Hispanic whites	ref		ref	ref		ref	ref		ref
African Americans	1.52 ***	0.27	0.99 ***	1.09 ***	0.32	0.53	1.63 ***	0.29	0.94 ***

	Relevance			Anger at the industry			Motivation to quit		
	β	SE	β_{adj}	β	SE	β_{adj}	β	SE	β_{adj}
Latinos	1.22 ***	0.13	0.77 ***	1.07 ***	0.15	0.60 ***	1.41 ***	0.18	0.62 ***
Other ethnicity	0.88 *	0.34	0.61	1.09 **	0.32	0.76 *	0.96 *	0.39	0.48
Language of the survey									
English	ref		ref	ref		ref	ref		ref
Spanish	0.84 ***	0.19	0.06	0.66	0.20	-0.07	1.20 ***	0.24	0.35
Smoking intensity									
Heaviness Smoking Index	- 0.17 ***	0.04	- 0.01	- 0.16 ***	0.04	0.01	- 0.27 **	0.05	-0.05
No plan to quit	ref		ref	ref		ref	ref		ref
Plan to quit within 6 months	1.18 ***	0.13	0.82 ***	1.27 ***	0.14	0.78 ***	1.86 ***	0.17	1.28 ***
No quit attempt	ref		ref	ref		ref	ref		ref
Quit attempt in last 4 months	0.98 ***	0.13	0.22	1.15 ***	0.14	0.44 **	1.59 ***	0.17	0.51 ***
Corrective statements									
Cigarette Addictiveness	ref		ref	ref		ref	ref		ref
Cigarette design to increase addictiveness	0.04	0.20	-0.18	0.42	0.18	0.19	0.3	0.22	0.1
Relative safety of lights	- 0.51 *	0.20	- 0.42 *	-0.37	0.18	-0.30	-0.29	0.22	-0.22
Health effects for smokers	0.58 **	0.20	0.22	0.12	0.18	-0.22	0.82 ***	0.22	0.47 ***
Health effects for nonsmokers	0.23	0.20	0.09	-0.06	0.18	-0.21	0.37	0.22	0.21
Novelty									
No	ref		ref	ref		ref	ref		ref
Yes	1.88 ***	0.12	1.55 ***	1.82 ***	0.12	1.52 ***	2.02 ***	0.15	1.53 ***
_cons			3.80		0.30	4.00		0.37	3.4

*
 $p < 0.05$,**
 $p < 0.01$,***
 $p < 0.001$.