
Original investigation

“Organic,” “Natural,” and “Additive-Free” Cigarettes: Comparing the Effects of Advertising Claims and Disclaimers on Perceptions of Harm

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Abstract

Introduction: The US Tobacco Control Act restricts advertising or labeling that suggests one tobacco product is less harmful than another. We sought to examine how “organic,” “natural,” and “additive-free” advertising claims and corresponding disclaimers affect perceptions of cigarettes’ harm.

Methods: Participants were a national probability sample of adults in the United States ($n = 1114$, including 344 smokers). We conducted a 5 (claim) \times 2 (disclaimer) between-subjects factorial experiment. Participants viewed a Natural American Spirit cigarettes ad claiming they were “organic,” “natural,” “additive-free,” “light,” or “regular,” and with or without a corresponding disclaimer. The outcome was perceived harm of the advertised cigarettes. Among smokers, we also assessed interest in switching within their current brand to cigarettes with this characteristic (eg, “additive-free”).

Results: Claims in the ad had a large effect on perceived harm (Cohen’s $d = 0.87$, 95% CI = 0.47 to 1.29). Claims of cigarettes being “organic,” “natural,” or “additive-free” reduced perceived harm from the advertised cigarettes, as compared with “regular” and “light” claims. Disclaimers had a small effect, increasing perceived harm ($d = 0.25$, 95% CI = 0.08 to 0.41). The problematic claims also increased smokers’ interest in switching. Disclaimers had no effect on smokers’ interest in switching.

Conclusions: “Organic,” “natural,” and “additive-free” claims may mislead people into thinking that the advertised cigarettes are less harmful than other cigarettes. Disclaimers did not offset misperceptions of harm created by false claims. The US Food and Drug Administration should restrict the use of these misleading claims in tobacco advertising.

Implications: “Organic,” “natural,” and “additive-free” cigarette advertising claims decrease perceptions of harm among the public and increase interest in switching to such cigarettes among smokers. Disclaimers do not counteract the reduced perceptions of harm or increased interest in switching to these cigarettes. The US Food and Drug Administration should restrict the use of “organic,” “natural,” and “additive-free” claims in tobacco marketing.

Introduction

Current research indicates that no cigarettes are safer than any others.¹ However, studies have consistently shown that cigarettes marketed as “organic,” “natural,” or “additive-free” are perceived to be less harmful.²⁻⁴ In the United States, brands such as Winston and Nat Sherman have used such claims. Natural American Spirit, a US brand with a rapidly rising market share, frequently uses “organic,” “natural,” or “additive-free” in its advertising. Natural American Spirit is also growing in global popularity, particularly after Japan Tobacco International paid \$5 billion to Reynolds American to purchase the international rights to the Natural American Spirit brand in 2015.⁵ The problem of the terms “organic,” “natural,” and “additive-free” echoes the past widespread deception of the terms “light” and “mild.”⁶ In a settlement with the US government in 2000, Natural American Spirit agreed to include a disclaimer in their ads stating that, “No additives in our tobacco does NOT mean a safer cigarette,”⁷ and then in 2010 agreed to a similar disclaimer for “organic” cigarette ads.⁸ However, as of 2017, we have been unable to find any studies that quantitatively evaluated the effectiveness of these disclaimers on correcting ads’ misleadingness.

Cigarette ads are among the overwhelming number of persuasive messages that individuals see daily. Most ads receive little or no attention, as it is not possible or advantageous to critically evaluate every encountered message.⁹ Thus, salient cues or features—processed on the periphery of consciousness—often determine how the ads influence consumers’ attitudes and behaviors.¹⁰ Knowing this, marketers design messages to lead the eye through persuasive copy and imagery, inclusive of claims—“natural” or “organic”—that are likely to trigger halo effects for brand and sensory perceptions.^{11,12} Consumers use these salient claims (rightly or wrongly) to generate global impressions with limited effort. “Natural” or “organic” claims often influence consumers to have positive attitudes toward and intentions to buy a product based on the perceptions of quality and healthiness and, perhaps most important for cigarette marketing, lower perceived risk.¹³⁻¹⁵

Disclaimers are designed to offset claims and undo a potential misperception. Natural American Spirit ads have disclaimers that offer counterarguments to the overall message of the advertising copy and imagery—including “natural” or other claims—that are designed to entice consumers. However, consumers may altogether miss seeing the small disclaimers at the bottom of ads, may lack motivation or the ability to process the counterargument, may disregard them because the counterargument is not strong or compelling enough, may engage in biased processing, weighing faults of the counterargument more heavily, or may simply be confident in their initial evaluations.¹⁶⁻¹⁸ Evidence to date with other consumer product advertising indicates that disclaimers are largely ineffective.¹⁹⁻²²

If disclaimers are uniquely effective for cigarette ads, they could be a way for companies to freely communicate without misleading the public. However, if the disclaimers are not effective and the public is still being misled, further remediation is needed, such as a ban on advertising claims. As parties to the WHO Framework Convention on Tobacco Control, 180 countries have committed to banning any marketing term that “creates the false impression that a tobacco product is less harmful than other tobacco products.”²³ In the United States, the 2009 Tobacco Control Act restricted the use of misleading terms, and in early 2017 the US Food and Drug Administration settled with Reynolds to remove the words “natural” and “additive-free” from Natural American Spirit ads. However,

FDA did not restrict use of the word “natural” in the cigarette brand name, nor did they place any restriction on the word “organic.”

To understand the impact of banned and currently allowed claims, we pursued two hypotheses that ads with “organic,” “natural,” “additive-free,” or “light” claims elicit lower perceived harm than ads with the “regular” claim and that disclaimers have no effect on perceived harm. We examined these hypotheses in an experiment with a national sample with the goal of informing tobacco regulatory efforts.

Methods

Sample

Participants were from a national panel of US adults ($n = 5014$) initially recruited in 2014–2015 for a study by the UNC Center for Regulatory Research on Tobacco Communication.²⁴ For the current study, in October 2015, the Carolina Survey Research Laboratory invited all young adults (aged 18–25), all smokers, and a randomly selected subset of adult (25+) nonsmokers from the previous study to participate in a follow-up survey ($n = 2570$). Data collection lasted 3 months with nonresponders contacted up to three times through mailed, emailed, and telephone reminders. The survey had an overall response rate of 68%.²⁵ After excluding participants with incomplete demographic information ($n = 69$) and those who did not receive the experiment because they completed the survey by mail ($n = 575$), our analytic sample was 1114 adults. The Institutional Review Board at the University of North Carolina approved the study.

Procedures

In a 5×2 between-subjects factorial experiment, participants viewed one randomly assigned display advertisement for Natural American Spirit cigarettes. The first experimental factor was the claim that appeared at the top of the ad: “organic tobacco,” “natural tobacco,” “additive-free tobacco,” “light tobacco,” or “regular tobacco.” The second experimental factor was whether the ad had a disclaimer or not where the disclaimer matched the claim (ie, “[Claim] does not mean a safer cigarette.”). For example, the disclaimer for the cigarettes advertised as “organic tobacco” was “Organic tobacco does not mean a safer cigarette.” The ad, depicting an open pack of cigarettes on a wooden table, was a recent Natural American Spirit magazine display ad, modified only to change the claims and disclaimers (Figure 1). Thus, the placement of claims at the top of the ad and disclaimers at the bottom matches current practice in ads. Participants were shown the ad with the instruction to “Please look at the ad below and click ‘next’ to continue (the button will be available after 10 seconds).” The next screen contained survey items but not the ad, and participants were not able to return to view the ad again.

Measures

The main outcome was perceived harm of advertised cigarettes, measured by the item, “Compared with other cigarettes, would you say the cigarettes you just saw are...” The response options were *a lot less harmful* (coded as 1), *a little less harmful* (2), *equally harmful* (3), *a little more harmful* (4), and *a lot more harmful* (5). For smokers only, the survey assessed interest in switching within their current brand to cigarettes with the characteristics described in the ad (eg, “additive-free”). The response options ranged from *I wouldn’t switch* (1), *I might switch* (2), and *I’d definitely switch* (3).

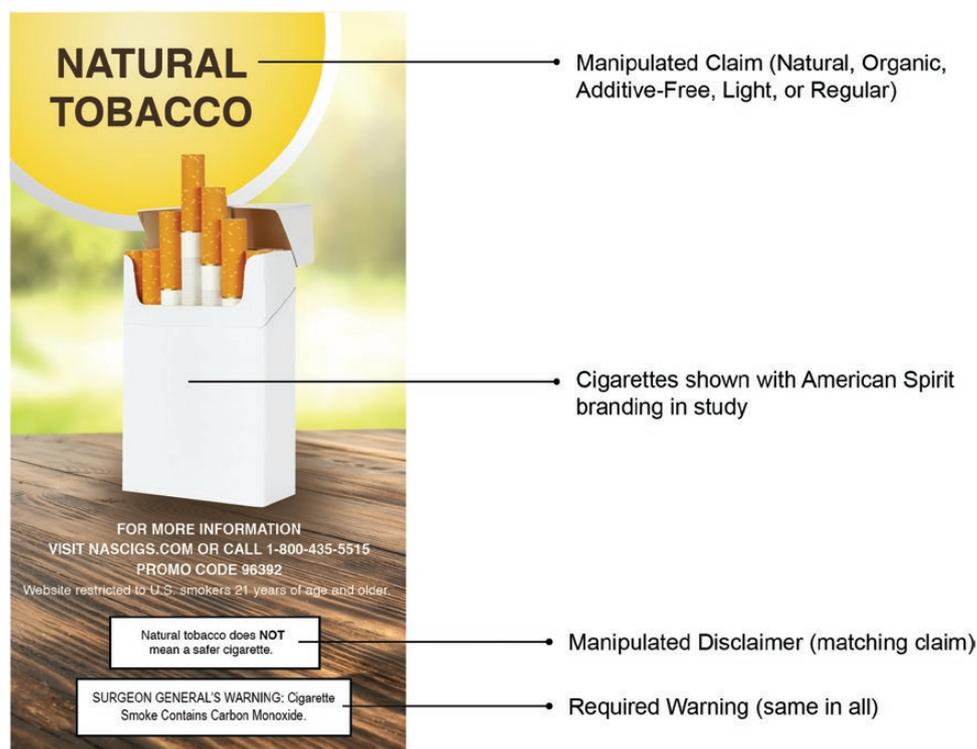


Figure 1. Example of Natural American Spirit magazine display ad that participants were shown.

The survey assessed accurate recall of the claims with the following item, “Which of these phrases did you see in the ad?” and the following mix of correct and decoy response options, *quality tobacco*, *light tobacco*, *premium tobacco*, *regular tobacco*, *additive-free tobacco*, *organic tobacco*, *natural tobacco*, *none of the above*, and *I’m not sure*. The survey likewise assessed accurate recall of the disclaimers: “Which of these sentences did you see in the ad?” with correct and decoy response options, *Regular tobacco does not mean a safer cigarette*, *Quitting smoking now greatly reduces serious risks to your health*, *Light tobacco does not mean a safer cigarette*, *No additives in our tobacco does not mean a safer cigarette*, *Organic tobacco does not mean a safer cigarette*, *Smoking causes lung cancer, heart disease, emphysema, and may complicate pregnancy*, *Natural tobacco does not mean a safer cigarette*, *none of the above*, and *I’m not sure*. We coded the recall items as correct when participants indicated the text in the ad they were shown and incorrect otherwise.

The survey assessed participants’ demographic characteristics. The survey also assessed health literacy with the Short Test for Functional Health Literacy in Adults²⁶; we coded participants who responded to at least one item incorrectly as having lower health literacy and those with perfect scores as having high health literacy. We defined being a current smoker as having smoked at least 100 cigarettes in one’s lifetime and currently smoking every day or some days.²⁷ In addition, the survey measured awareness of Natural American Spirit cigarettes among all participants and attitude toward the brand among participants who had heard of the brand.

Data Analysis

We conducted analyses using a Bayesian framework in which statistical inferences are made based on Bayes factors (BF). We chose this approach because it permitted direct quantification of evidence

in support of our null hypothesis about disclaimers and allowed for direct comparisons of the effects of disclaimers on offsetting advertising claims. Similar to how *p*-values support discrete decisions about main effects, BFs may take on values that correspond to support for an effect (>3), no effect (<0.33), and an inconclusive finding (values in between).^{28–30} BFs also permit graded quantification of evidence in support of a finding so that a value of 20, for example, indicates that there is 20 times more support in the data for an effect than the corresponding null effect.

To examine the impact of claims, disclaimers, and their interaction on perceived harm and interest in switching, we used BFs for factorial experiments (ie, main effects and interactions).^{28,31} These BFs used the Jeffreys–Zellner–Siow default prior with the scaling factor of the effect size for fixed effects set to $\frac{1}{2}$,³² based on prior research on our topic of interest and a range of related topics in tobacco control.^{33–36} If a BF indicated support for a main or interaction effect, we calculated BFs using encompassing priors³⁷ for informative hypotheses that combined inequality, approximate equality, and order constraints to determine the source of these effects. When the data supported an effect of claims or disclaimers, we also calculated BFs that compared the strength of the evidence for the effects. To put the effects into a common metric, we calculated Cohen’s *d* with the 95% credibility interval (CI) via re-sampling from the posterior probability distribution. Values of Cohen’s *d* correspond to small (0.2), moderate (0.5), and large (0.8) effects.³⁸ Analyses of interest in switching were limited to smokers ($n = 344$). Because analyses of dichotomized interest in switching (some interest vs no interest) did not substantively change the findings, we present the results from analyses using the continuous outcome.

Among participants who viewed ads with disclaimers, we examined the impact of claims on accurate recall of claims and disclaimers

using BFs for dichotomous outcomes.³⁹ The underlying model assumed a joint multinomial sampling plan and used an uninformative prior with a concentration of one participant. If a BF indicated support for an association, then we compared 95% CIs by condition to determine the source of the association. We also calculated a BF for dichotomous outcomes to compare the proportions of these participants who recalled claims and disclaimers. In this case, the underlying model assumed an independent multinomial sampling plan with fixed column totals, reducing the BF to a test of two proportions. To confirm the success of randomization, we used BFs for contingency tables with respect to experimental condition and demographic characteristics (age, education, ethnicity, income, literacy, race, sex, and smoking status) as well as awareness of and attitude toward Natural American Spirit cigarettes. We conducted analyses using R,⁴⁰ the add-on package BayesFactor,⁴¹ and unweighted data.

Results

The mean age of the participants was 40.7 ($SD = 17.0$) years. More than half of the participants were female (55%), and 29% had a high school diploma or lower level of educational attainment (Table 1). Nearly one-third of the participants were smokers (31%). Experimental condition for advertising claim and for disclaimer did not vary by demographic characteristics, awareness of

Table 1. Sample Characteristics ($n = 1114$)

	%
Age (years)	
18–25	28.6
26–34	15.5
35–44	14.2
45–54	16.7
55–64	14.5
65+	10.4
Female	54.8
Race	
White	70.9
Black	18.7
Native American	2.1
Asian	3.5
Other	4.9
Hispanic	7.7
Education	
<high school	6.8
High school graduate or equivalent	22.4
Some college	23.5
Associate's degree	10.2
College degree	23.3
Master's degree	9.9
Professional or doctoral degree	3.7
Lower literacy	27.9
Income, annual	
\$0–\$24 999	26.0
\$25 000–\$49 999	26.0
\$50 000–\$74 999	19.7
\$75 000–\$99 999	11.6
\$100 000 or more	16.6
Smoker	30.9

Being a current smoker was defined as having ever smoked at least 100 cigarettes and currently smoking every day or some days.

Natural American Spirit cigarettes, or attitude toward them (20 $BF_{\text{Independence}} \leq 0.26$).

Perceived Harm

Claims on the ads affected perceived harm of smoking Natural American Spirit cigarettes ($BF_{\text{Claims}} = 104$; Table 2). Perceived harm was similar for “organic” [$M = 2.76$ ($SD = 0.65$)] “natural” [2.77 (0.71)], and “additive-free” [2.63 (0.78)] claims; they elicited lower perceived harm than “regular” [2.94 (0.71)] and “light” claims [2.87 (0.64)], which were about equal ($BF_{\text{Joint}} = 9.2 \times 10^5$; Figure 2). The relative support for other rank orders was minimal (Supplementary Table 1). The corresponding effect size was large (Cohen's $d = 0.87$, 95% CI = 0.47 to 1.29).

Ads with disclaimers elicited greater perceived harm than those without disclaimers [2.86 (0.70) vs 2.73 (0.71); $BF_{\text{Disclaimers}} = 8.60$]. The corresponding effect size was small ($d = 0.25$, 95% CI = 0.08 to 0.41). Claims and disclaimers also did not interact to affect the perceived harm of cigarettes ($BF_{\text{Claims} \times \text{disclaimers}} = 0.0074$). In a direct comparison, the odds of claims affecting perceived harm at all were more than 23 times greater than the odds of disclaimers doing the same ($BF_{\text{Claims vs disclaimers}} = 23.8$).

Interest in Switching

Claims affected smokers' interest in switching ($BF_{\text{Claims}} = 6.2 \times 10^7$; Table 2). “Additive-free” [2.16 (0.68)] and “natural” [2.05 (0.70)] claims elicited similar interest in switching; these terms elicited greater interest than “organic” [1.72 (0.64)] claims, and the latter elicited greater interest than the similar “regular” [1.55 (0.53)] and “light” [1.52 (0.65)] claims ($BF_{\text{Joint}} = 1.1 \times 10^{12}$; Figure 2). Other rank orders received minimal support from the data (Supplementary Table 1). Disclaimers did not change smokers' interest in switching to modified cigarettes ($BF_{\text{Disclaimers}} = 0.24$) or interact with claims ($BF_{\text{Claims} \times \text{disclaimers}} = 0.084$).

Accurate Recall

Among participants who received ads with disclaimers ($n = 565$), type of claim affected recall of the claim ($BF_{\text{Claims}} = 607$). About half of these participants correctly recalled “regular” claims (50%, 95% CI = 41% to 58%) which was much lower than for the remaining claims on average (73%, 95% CI = 68% to 77%). Recall of the remaining claims was similar ($BF_{\text{Joint}} = 0.031$). However, type of claim did not affect recall of disclaimers ($BF_{\text{Disclaimers}} = 0.028$). Overall, these participants were more likely to correctly recall claims (68%, 95% CI = 64% to 72%) than disclaimers (57%, 95% CI = 53% to 61%; $BF_{\text{Claims vs disclaimers}} = 81.8$).

Table 2. Bayes Factors for the Impact of Advertising Claims and Disclaimers

	Perceived harm	Interest in switching
Claims	104	61 815 322
Disclaimers	4.35	0.24
Claims \times disclaimers	0.0074	0.084

All Bayes factors (BFs) quantified support in the data for a main or interaction effect strictly against a null hypothesis. BFs support for an effect (>3; values in bold font), no effect (<0.33), or be inconclusive (values in between).

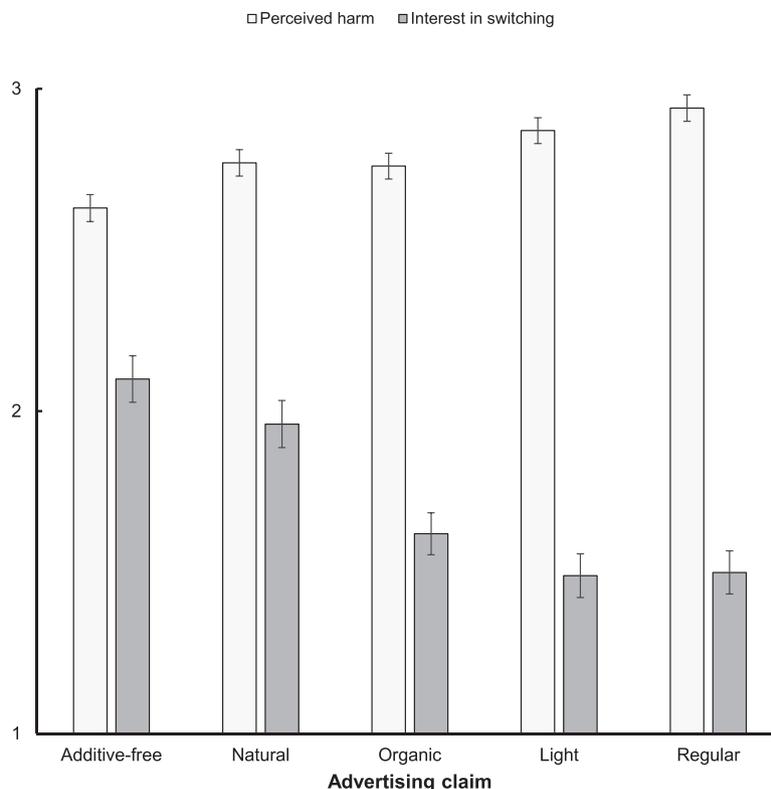


Figure 2. Perceived harm and interest in switching elicited by claims. Interest of switching asked only of smokers ($n = 344$). Response scale for perceived harm: 1 = a lot less harmful; 2 = a little less harmful; and 3 = equally harmful. Response scale for interest in switching: 1 = I wouldn't switch; 2 = I might switch; and 3 = I'd definitely switch. Error bars show posterior standard deviations (similar to standard errors).

Discussion

In a large national probability sample of US adults, “organic,” “natural,” and “additive-free” claims reduced perceived harm of advertised cigarettes and, among smokers, increased interest in switching to modified versions of their current cigarettes bearing those claims. This is despite an absence of scientific evidence that cigarettes marketed as “organic,” “natural,” and “additive-free” are less harmful. Disclaimers inadequately corrected misperceptions of cigarette harm elicited by claims and did not counteract interest in switching due to advertising claims.

Claims of “organic,” “natural,” and “additive-free” elicited lower perceived harm than “regular,” and even “light,” claims, as hypothesized. The lower perceived harm compared to “light” is especially important because the United States effectively forbids using this term in advertising to describe cigarettes because it has been shown to be misleading. Thus, in our study, “organic,” “natural,” and “additive-free” elicited lower perceived risk than a term banned because it was misleading. Previous studies have also found that “organic,” and “natural,” and “additive-free” are misleading,²⁻⁴ even more so than “light.”⁴² Advertising claims similarly affected interest in switching brands. Among smokers, “organic,” “natural,” and “additive-free” claims increased interest in switching within their current brand to cigarettes with those characteristics as compared with ones with “light” or “regular” claims. “Natural” and “additive-free” claims elicited the highest interest followed by “organic” claims. These patterns are in agreement with prior studies showing that the public thinks that additives are the main source of harm from cigarettes,³⁵ is skeptical of “organic” claims, and has a hard time interpreting

them.² Future studies should examine whether claims affect smoker's actual switching and the underlying psychological mechanisms. In general, our results suggest that “organic,” “natural,” and “additive-free” claims are misleading, raising concerns about any potential impact on smoking initiation among nonsmokers and cessation among smokers. We speculate that “organic,” “natural,” and “additive-free” claims may ultimately increase experimentation with cigarettes among nonsmokers and discourage quitting among smokers. To our knowledge, prior research has not addressed either of these outcomes, even though they have clear relevance for tobacco control and prevention.

Disclaimers increased perceived harm to a minimal extent in our experiment. Thus, our second hypothesis that disclaimers do not change perceived harm was not supported in the strictest sense. However, misleading claims (ie, “organic,” “natural,” and “additive-free”) were much more likely to have any impact than disclaimers. Furthermore, advertising claims were much more potent in the extent to which they reduced perceived harm than disclaimers were in undoing this deception. Thus, disclaimers do not appear able to “undo” the misleadingness of advertising claims. Furthermore, we saw that in terms of motivation to switch brands, disclaimers did not affect interest, even though the advertising claims did increase interest in cigarettes with misleading claims. Future studies should examine whether disclaimers are able to counteract the effects of other features of Natural American Spirit marketing that may further reduce perceived harm, such as Native American and environmental imagery.⁴³⁻⁴⁵

Recall was higher for advertising claims than disclaimers. This may be because, reflecting current practice in cigarette advertising,

claims were integrated as visible cues in large font at the top of ads, whereas disclaimers appeared in small type at the bottom of the ads, making them seem distinct from the ads. Higher recall for claims could also be due to the way that claims generate holistic impressions with limited cognitive effort while disclaimers are counterarguments that require comparatively more cognitive effort to process.^{9,11} Essentially, claims work at a glance, while disclaimers require careful thinking. This finding further suggests that disclaimers are unlikely to counteract the impact of claims and that individuals are likely to heuristically process disclaimers at best. Furthermore, individuals may simply ignore disclaimers in order to avoid cognitive dissonance from having to balance seemingly contradictory information conveyed by advertising claims and disclaimers.¹¹ To this end, participants were more likely to recall claims of “organic,” “natural,” “additive-free,” or “light” than “regular,” but recall of disclaimers did not differ by their content. The differences in recall among claims may reflect novelty effects in that “regular” claims may not appear to be as novel as the other claims or as meaningful as the other claims, while the lack of difference for disclaimers further suggests that individuals do not meaningfully process any of the disclaimers.

Strengths and Limitations

Our experiment relied on a large national probability sample with adequate representation of key populations that are relevant to tobacco control and prevention such as young adults or low-education. Data analyses were conducted within a Bayesian framework, which supports inferences beyond binary reject-not reject decisions about null hypotheses, provides a continuous measure of evidence in support of those inferences, and accounts for uncertainty in those inferences (eg, due to an inflated false discovery rate often attributable to multiple comparisons) up front via the specification of default prior distributions on parameters of interest.⁴⁶ The results were well calibrated inferential analyses that allowed us to make conditional probability statements related to hypotheses of interest that could directly inform tobacco regulatory policies (eg, “...the odds of claims affecting perceived harm at all were more than 23 times greater than the odds of disclaimers doing the same...”).

Our experiment had two main limitations, both of which concern trade-offs in the experimental design that sought to balance realistic exposure to advertising claims and disclaimers with the practical demands of measurement. Ads were for an existing brand but not a fictional cigarette brand, which would have represented hypothetical scenarios, a useful strategy for early stage exploration of health-related topics.^{47–49} Given that claims and disclaimers were already present in current tobacco marketing, using a fictional brand could have undermined the relevance of our study to ongoing public health concerns about claims. Presenting modified Natural American Spirit ads bearing claims and or disclaimers instead allowed us to avoid these concerns while approximating real-world exposure to both. Experimental assignment to claims and disclaimers did not differ by awareness of and attitude toward the brand showing the independence of the experimental results from previous experiences with the brand.

In addition, participants had exposure to the ads that may be somewhat longer than happens in naturalistic settings (eg, reading a magazine). We wanted to ensure that participants had the opportunity to notice all aspects of the ad and, as a result, could meaningfully respond to all outcomes. We suspect that the relative impact of disclaimers is even weaker in a real-world setting in which people would quickly get the gist of the ad from headlines and through

repeated exposures. Future studies should examine the impact of advertising claims and disclaimers under naturalistic conditions.

Policy Implications

The US Tobacco Control Act restricts the use of any advertising or labeling that “represents explicitly or implicitly that . . . the tobacco product presents a lower risk of tobacco-related disease or is less harmful than one or more other commercially marketed tobacco products.”⁵⁰ Our findings, combined with those of previous studies, indicate that the public views “organic,” “natural,” or “additive-free” cigarettes as less harmful than other cigarettes. Furthermore, disclaimers do not sufficiently counter misperceptions of cigarette harm arising from advertising claims. There is also no particular reason to believe that an advertising claim ceases to be misleading if it is part of a brand name, suggesting that the FDA’s recent settlement with Reynolds regarding “natural” claims is inadequate. In keeping with the US Tobacco Control Act, the FDA should restrict the word “organic” and not permit the use of banned claims (eg, “natural”) in brand names.

Supplementary Material

Supplementary data can be found online at <http://www.ntr.oxfordjournals.org>.

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Declaration of Interests

NTB has served as a paid expert consultant in litigation against tobacco companies. The other authors declare no conflicts of interest.

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