

# Health Beliefs of American Indian Imagery on Natural American Spirit Packs

Anna E. Epperson, PhD

Lisa Henriksen, PhD

Eric F. Lambin, PhD

June A. Flora, PhD

Judith J. Prochaska, PhD, MPH

**Objective:** The tobacco industry has a history of appropriating American Indian imagery for marketing cigarettes. Natural American Spirit (NAS) cigarette packs feature an American Indian warrior, peace pipe, and sacred thunderbird. The current study examined perceptions that NAS is American Indian affiliated and tested associations with purchase intentions and misperceptions that the brand is healthier. **Methods:** An online sample (N = 914) of never, former, and current smokers saw one NAS and one Pall Mall cigarette pack matched on color (blue, green, or orange/gold). Pack color and presentation order were randomized. Participants rated health perceptions of the brand, purchase intentions, and beliefs of an American Indian connection. **Results:** Relative to Pall Mall, participants were more likely to believe NAS is American Indian owned and grown and that profits are donated to American Indian organizations. Among current smokers, beliefs of an NAS American Indian affiliation were associated with misperceptions of NAS being a healthier cigarette and purchase intentions. **Conclusions:** NAS pack design creates misperceptions that the brand is American Indian owned and/or tribally grown, and in turn, healthier and more desirable. Use of American Indian imagery/text to market cigarette products should be prohibited.

**Key words:** brand perceptions; American Indian; natural cigarettes

*Tob Regul Sci.*™ 2019;5(4):369-380

DOI: <https://doi.org/10.18001/TRS.5.4.7>

Natural American Spirit™ (NAS), a super-premium cigarette brand, has increased in popularity in the United States (US), rising over 400% in market share from 2002 to 2013,<sup>1</sup> and at 3.4% in 2018.<sup>2</sup> According to prior research, marketing claims of natural, additive-free and organic are associated with misperceptions that NAS offers a safer and less harmful product relative to other commercial cigarettes.<sup>3-10</sup> These health misperceptions were associated with an increased intention to purchase NAS in the future.<sup>9</sup> In response to the US Food and Drug Administration's (FDA) warnings more than 2 years prior, NAS

ceased use of the text descriptors natural and additive-free in 2017.<sup>11</sup> However, natural was retained in the trademarked brand name,<sup>11</sup> and the product ingredients are listed as "tobacco plus water," still implying that the product is additive-free.<sup>12</sup>

Natural American Spirit™ packaging also retains the iconic image of a fictional American Indian in ceremonial headdress smoking a peace pipe with a thunderbird above in a distinctive American Indian (Native) design. In many Native cultures, the thunderbird is a sacred spirit-being and a symbol of protection.<sup>13</sup> Since its inception, the packaging has emphasized the brand's ties to the southwest-

*Anna E. Epperson, Postdoctoral Fellow, Stanford Prevention Research Center, Department of Medicine, Stanford University, Palo Alto, CA. Lisa Henriksen, Senior Research Scientist, Stanford Prevention Research Center, Department of Medicine, Stanford University, Palo Alto, CA. Eric F. Lambin, Professor and Senior Fellow, Department of Earth System Science, Woods Institute for the Environment, Stanford University, Palo Alto, CA. June A. Flora, Senior Research Scientist, Solutions Science Lab, Department of Pediatrics, Stanford University, Palo Alto, CA. Judith J. Prochaska, Associate Professor, Stanford Prevention Research Center, Department of Medicine, Stanford University, Palo Alto, CA.*  
Correspondence Dr Epperson; [aepper@stanford.edu](mailto:aepper@stanford.edu)

ern US, specifically Santa Fe, New Mexico,<sup>14</sup> an area surrounded by American Indian tribal lands. In actuality, NAS is not American Indian owned or grown. NAS is manufactured by the Santa Fe Natural Tobacco Company (SFNTC), founded in 1982 by 3 business partners, none identifying as American Indian.<sup>14</sup> In 2002, SFNTC and the NAS brand were sold to Reynolds American for \$340 million.<sup>15</sup> Reynolds American is now a division of British American Tobacco, the largest transnational tobacco company in the world.<sup>16</sup>

The tobacco industry has a well-documented history of appropriating American Indian imagery in the marketing of commercial tobacco.<sup>17,18</sup> The appropriation of American Indian symbols may blur the distinction between commercial cigarettes and traditional tobacco used historically in American Indian ceremonies.<sup>19,20</sup> Use of American Indian imagery by the tobacco industry also more broadly aligns cigarettes with nature,<sup>17</sup> and previous research has found that cigarette brands associated with nature generate beliefs of less harm to health.<sup>9</sup> We identified 2 prior studies reporting on public perceptions of the NAS cigarettes' affiliation with American Indians.<sup>20,21</sup> In focus groups with 40 American Indian adolescents in California, participants expressed their beliefs that NAS is American Indian owned.<sup>20</sup> In a second focus group study with 33 US adult smokers, participants identified the American Indian logo as a key design element of the NAS cigarette pack. Several participants noted that this American Indian logo evoked associations with American Indians and the natural environment.<sup>21</sup> Participants were not shown NAS packaging or other marketing materials during the focus groups conducted in either study.

Perceived connections between NAS cigarettes and American Indian traditions may contribute to false beliefs that the product provides a natural and safer way to smoke, and these misperceptions may be associated with purchase intentions. Testing this premise, the current experiment focused on American Indian brand perceptions and their relationship to health perceptions as well as beliefs about the company behind the brand. The study compared consumer perceptions of NAS and Pall Mall, both manufactured by Reynolds American and sold in similar pack colors. Pall Mall is a popular value brand, with a 6.6% market share in 2018,<sup>2</sup> and the

packs do not feature American Indian imagery.

Prior research indicates misbeliefs of NAS being American Indian owned<sup>20,21</sup> and being a less harmful way to smoke.<sup>3-10</sup> In the current study, we hypothesized participants would be more likely to perceive NAS as American Indian affiliated compared to Pall Mall (Hypothesis 1). The American Indian affiliation can convey a return to nature and traditional ways, which can suggest a health benefit. We tested the link between beliefs of an American Indian affiliation and health misperceptions. Among current smokers, we hypothesized that beliefs of an American Indian affiliation for NAS would be related to misperceptions of NAS being a healthier way to smoke (Hypothesis 2). Finally, as previous findings found that NAS associations with nature increase purchase intentions,<sup>9</sup> we also tested the hypothesis that, among current smokers, beliefs of an NAS American Indian affiliation would be related to greater intentions to purchase the brand.

## METHODS

### Sample

Using the online crowdsourcing platform Prolific (<https://prolific.ac/>), adults were recruited to participate in a study examining pro-environment marketing approaches (advertisement stated: "Researchers are conducting a study to examine reactions to different marketing approaches with consideration of health and the environment."). Only members of Prolific who met all of the inclusion criteria (ie, 18 years or older, US residents, English fluency) were able to view the study invitation. Interested individuals were directed to a link for an anonymous survey hosted by Qualtrics. Those who completed the survey were compensated \$2 for their time, which averaged less than 15 minutes.

### Procedures

In a mixed-factor design, all participants viewed one NAS and one Pall Mall pack of the same color (blue, green, or orange/gold), which was randomly assigned. Green packs are the menthol variety for both brands; blue packs are "light" for Pall Mall and "full-bodied taste" for NAS; and orange/gold are "ultra-light" for Pall Mall, and "organic and mellow taste" for NAS. Presentation order also was

**Figure 1**  
Cigarette Pack Images Viewed by Participants



**Note.**

Participants viewed both brands and were randomized as to which brand they viewed first (Natural American Spirit or Pall Mall). Participants also were randomized to one of 3 pack colors (blue, green or orange/gold), with color matched for both brands viewed. There were 6 total randomized conditions, crossing pack brand order (2) by color (3).

randomized with regard to which brand (NAS or Pall Mall) participants viewed first. The current study evaluated the newest NAS cigarette packs (introduced in 2017) that replaced the terms “additive-free” and “natural” with the text “Tobacco Ingredients: Tobacco & Water.” In total, there were 6 stimuli, each showing the front, back, and sides of the cigarette packs (Figure 1). The participants could view the pack images for each brand as long as they desired. Immediately after viewing each pack, participants answered questions regarding the product, brand, and manufacturer.

**Measures**

Before exposure to the cigarette pack images, the first 17 items on the survey assessed the importance of different features in influencing participants’ generic purchasing behaviors (eg, a brand is... at-

tractive in design, on sale or discounted, highest quality, US made or grown). These items did not reference purchasing tobacco. Response options ranged from “not at all important” (coded 1) to “very important” (coded 5). The order of the 17 generic purchasing behavior items was presented randomly (ie, varied by participant). One of the 17 items asked participants how important it is when choosing among brands that their choice “supports American Indian tribes.”

The next 3 survey items asked respondents if they had smoked 100 or more cigarettes in their lifetime, the number of days they had smoked cigarettes in the past 30 days, and, for current smokers, their regular brand of cigarettes. All participants were asked to indicate how harmful they perceive cigarettes to be to health (with no reference to a particular cigarette brand) with response options

ranging from not at all harmful (1) to extremely harmful (5).

Next, the NAS (or Pall Mall) cigarette pack images were displayed, and immediately after each brand image, participants were asked their perceptions of the brand that was shown. To assess perceived American Indian related affiliations for the brands, participants were asked to indicate whether they believed the following statements to be true or false with regard to the brand shown: (1) "The tobacco is grown on American Indian tribal lands," (2) "The cigarettes are made by an American Indian tribe," and (3) "The company donates profits to organizations that benefit American Indian people, including tribes." To assess knowledge of the company behind the brand, participants also were asked whether the following statement was true or false: "The cigarettes are made by one of the largest cigarette manufacturers in the world."

Using a 5-point Likert scale (1=strongly disagree, 5=strongly agree), participants rated the following statements about health perceptions: (1) "Smoking NAS/Pall Mall would show that I care about my health" and (2) "Smoking NAS/Pall Mall would show that I care about the health of my family and friends." For NAS purchase intentions, current smokers were asked to respond to the question: "How probable is it that you will purchase NAS cigarettes in the next 3 months?" with response options from the Juster scale, ranging from 0 "No chance, almost no chance (1 in 100)" to 10 "Certain, practically certain (99 in 100)."<sup>22</sup>

At the end of the survey, participants reported their age, sex (male, female, other), ethnicity (Hispanic/Latino, non-Hispanic/Latino), race (African-American/black, Asian, white, other), and level of education (high school graduate or less, some college, college graduate). Two attention checks were embedded in the survey, and participants who failed either check were excluded from analyses.

### Data Analysis

Smoking status was categorized as current smokers (>100 cigarettes in one's lifetime and smoked at least once in the past 30 days), former smokers (>100 cigarettes in one's lifetime and no smoking in the past 30 days), or never smokers (<100 cigarettes in one's lifetime). Those who reported smoking in the past 30 days but not >100 cigarettes in

their lifetime were considered new initiators (N = 10) and were excluded from the analyses. For current smokers, regular brand was dichotomized as NAS or other. For model testing, race and ethnicity were collapsed into 2 groups (non-Hispanic white, other) because of small numbers of all other racial and ethnic groups. Participants identifying as "other" sex (N = 8) were dropped from model testing due to small representation. Data were missing for 10 participants (approximately 1% of sample), and 83 participants (8% of sample) failed either or both attention checks and were excluded from further analysis.

Descriptive analyses (means and frequencies) and tests for group differences (analysis of variance [F-tests] and chi-square [ $\chi^2$ ]) were conducted to describe the sample and test for differences by smoking status (never, former, current). We examined within-subject ratings of the brands (Pall Mall and NAS) on the 3 American Indian affiliation items using McNemar tests. Next, we tested associations of a perceived American Indian affiliation with NAS health perceptions (for self and family/friends) and purchase intentions, running multivariate linear regression models for current smokers only. In examining NAS health perceptions and purchase intentions, general purchasing preference for "supports American Indian tribes" and perceived American Indian affiliation with NAS were the variables of interest, controlling for demographic covariates, brand order (NAS viewed before or after Pall Mall), pack color (blue, green, orange/gold), NAS regular/preferred brand, and general perceived harmfulness of cigarettes (with no reference to brand). Due to statistically significant associations among the 3 items assessing perceptions of an NAS brand American Indian affiliation (ie, American Indian owned, grown on tribal lands, and profit donations), with  $\Phi$  (phi) associations of 0.52 to 0.64 ( $p$ s < .001) for the overall sample, a summed composite was created entitled "perceived American Indian affiliation score" (ranging from 0 to 3, with higher scores indicating more beliefs of an American Indian affiliation for the brand; Kuder-Richardson-20 [KR-20] = 0.78, analyzed with the full sample).

## RESULTS

### Sample Description

As shown in Table 1, the overall sample (N



**Table 1**  
**Sample Characteristics for the Full Sample and by Smoking Status**

	Full Sample (N = 914)	Never Smokers (N = 421)	Former Smokers (N = 135)	Current Smokers (N = 358)
Age, M (SD)	34.1 (11.5)	31.0 (11.1) <sup>a</sup>	36.7 (12.1) <sup>b</sup>	36.7 (10.8) <sup>b</sup>
Male, N (%)	500 (55%)	235 (56%)	74 (55%)	191 (53%)
<b>Ethnicity, N (%)</b>				
Hispanic/Latino	86 (9%)	49 (12%)	8 (6%)	29 (8%)
Non-Hispanic/Non-Latino	828 (91%)	372 (88%)	127 (94%)	329 (92%)
<b>Race, N (%)</b>				
Asian American	79 (9%)	62 (15%) <sup>a</sup>	6 (4%) <sup>b</sup>	11 (3%) <sup>b</sup>
African-American/Black	58 (6%)	35 (8%)	5 (4%)	18 (5%)
Caucasian/White	730 (80%)	297 (71%) <sup>a</sup>	117 (87%) <sup>b</sup>	316 (88%) <sup>b</sup>
Other	47 (5%)	27 (6%)	7 (5%)	13 (4%)
<b>Level of Education, N (%)</b>				
High School or Less	129 (14%)	61 (15%) <sup>ab</sup>	9 (7%) <sup>b</sup>	59 (17%) <sup>a</sup>
Some College	336 (37%)	136 (32%)	56 (42%)	144 (40%)
College Graduate	449 (49%)	224 (53%) <sup>a</sup>	70 (52%) <sup>ab</sup>	155 (43%) <sup>b</sup>
<b>Importance that General Purchasing Decisions Support American Indian Tribes, M (SD)</b>	2.7 (1.2)	2.5 (1.1) <sup>a</sup>	2.6 (1.3) <sup>a</sup>	2.9 (1.2) <sup>b</sup>
<b>General Perceived Harmfulness of Cigarettes, M (SD)</b>	4.5 (0.7)	4.7 (0.5) <sup>a</sup>	4.6 (0.6) <sup>a</sup>	4.2 (0.8) <sup>b</sup>
<b>Pack Color Viewed, N (%)</b>				
Blue	300 (33%)	140 (33%)	42 (31%)	118 (33%)
Green	303 (33%)	133 (32%)	46 (34%)	124 (35%)
Orange Pall Mall /Gold NAS	311 (34%)	148 (35%)	47 (35%)	116 (32%)
<b>NAS Pack Viewed before Pall Mall, N (%)</b>	454 (50%)	218 (52%)	64 (47%)	172 (48%)

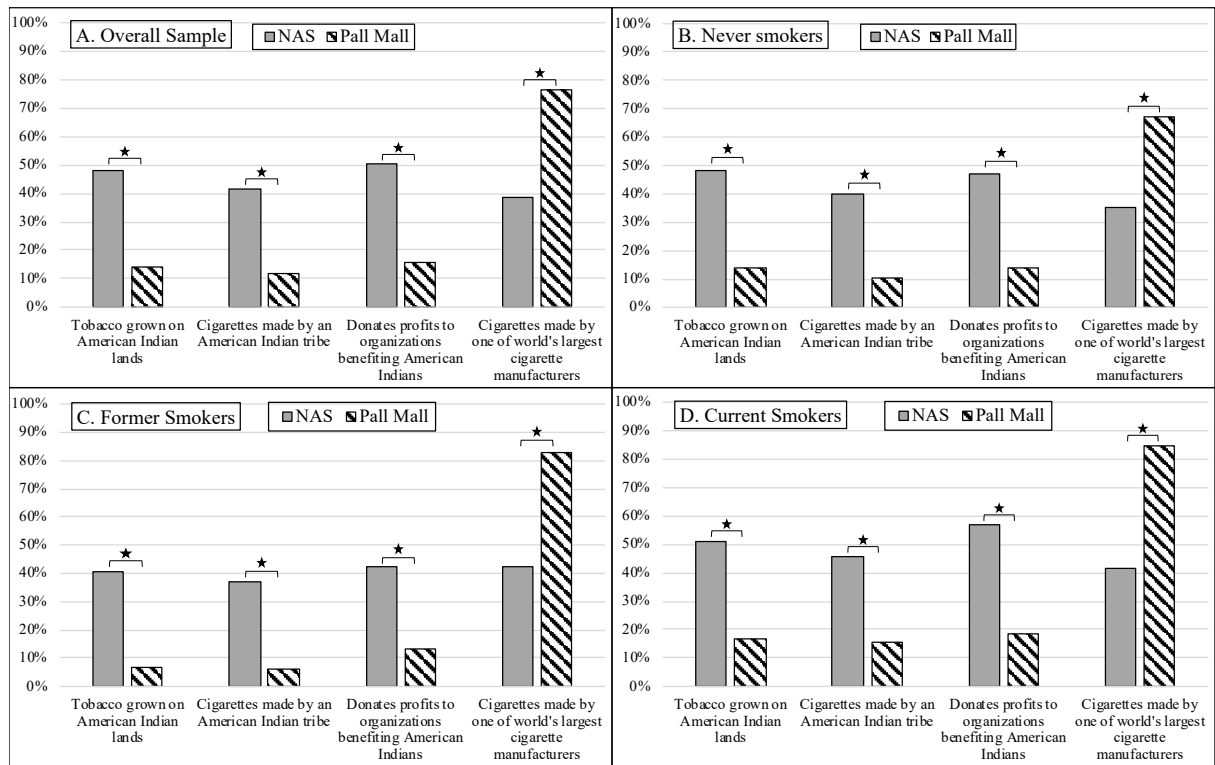
**Note.**

NAS = Natural American Spirit. Different superscripts within smoking status subgroups for row variable indicates statistically significant difference as per  $\chi^2$  or F tests,  $p < .05$ . Superscripts “a” and “b” indicate column values differ from each other and “ab” indicates that a column does not differ from “a” nor “b”. Response options for “importance that general purchasing decisions support American Indian tribes” ranged from 1 (not at all important) to 5 (very important) and for “general perceived harmfulness” ranged from 1 (not at all harmful) to 5 (extremely harmful).

= 914) was balanced on sex, with a mean age of 34.1 years (SD = 11.5). A majority identified as White, and about half had completed a college degree. Smoking status was 46% never smokers, 39% current smokers, and 15% former smokers. Both current and former smokers were slightly older and

more likely to identify their race as White and less likely to identify as Asian compared to never smokers ( $p_s < .001$ ). Current smokers were less likely to have a college degree than never smokers,  $p = .004$ . Current smokers compared to never and former smokers rated greater importance of supporting

**Figure 2**  
**Differences in Beliefs about Cigarette Brands**



**Note.**

Tests of within subject differences in brand beliefs for Natural American Spirit versus Pall Mall cigarettes, for overall sample (N = 914), never smokers (N = 421), former (N = 135), and current smokers (N = 358). Bar charts denote percent of participants who reported true to the following statements regarding either Natural American Spirit or Pall Mall: (1) the tobacco is grown on American Indian tribal lands; (2) the cigarettes are made by an American Indian tribe; (3) the company donates profits to organizations that benefit American Indian people, including tribes; and (4) the cigarettes are made by one of the largest cigarette manufacturers in the world.

NAS = Natural American Spirit, and \* denotes significant group differences between Natural American Spirit and Pall Mall per McNemar analysis ( $p < .01$ ).

American Indian tribes in their general purchasing decisions,  $p < .001$ . Among current smokers, 5.9% reported that NAS was their regular or preferred brand. There was no difference by smoking status in the color of the packs viewed or the order of brand presentation (ie, NAS vs Pall Mall viewed first).

**American Indian Affiliation Brand Beliefs**

Compared to Pall Mall, participants were sig-

nificantly more likely to report beliefs that NAS is made from tobacco grown on American Indian tribal lands (48% vs 14%) and that NAS cigarettes are made by a tribe (42% vs 12%). As shown in Figure 2, participants also were more likely to report knowing that the company that owns NAS donates profits to support organizations benefiting American Indian people (50% vs 16%) compared to Pall Mall. Even though both brands are owned by Reynolds American, participants were nearly twice as likely to believe that Pall Mall (relative to

**Table 2**  
**Multivariate Regression Models for Health Perceptions of Natural American Spirit**  
**among Current Smokers (N = 358)**

	Health Perceptions for One's Own Health				Health Perceptions for Health of Friends/Family			
	B	95% CI	$\beta$	$\eta^2$	B	95% CI	$\beta$	$\eta^2$
Age	0.01	0.00, 0.02	0.09	0.01	0.01	-0.01, 0.02	0.05	0.00
Men (referent: women)	<b>0.27</b>	<b>0.04, 0.51</b>	<b>0.11</b>	<b>0.02</b>	<b>0.27</b>	<b>0.03, 0.50</b>	<b>0.11</b>	<b>0.01</b>
Race/Ethnicity: NH White (referent: other)	0.11	-0.19, 0.40	0.03	0.00	0.22	-0.08, 0.51	0.07	0.01
<b>Level of Education</b>								
High school or less (referent)								
Some college	-0.09	-0.42, 0.24	-0.04	0.00	-0.17	-0.25, 0.43	-0.07	0.00
College graduate	0.21	-0.13, 0.54	0.08	0.00	0.09	-0.51, 0.16	0.04	0.00
<b>Color of Pack Viewed</b>								
Blue (referent)								
Green	0.13	-0.15, 0.41	0.05	0.00	0.11	-0.17, 0.39	0.04	0.00
Orange/Gold	0.28	-0.01, 0.56	0.10	0.01	0.22	-0.07, 0.50	0.08	0.01
NAS Pack Viewed First (referent: Pall Mall)	0.13	-0.11, 0.36	0.05	0.00	0.14	-0.10, 0.37	0.06	0.00
NAS a preferred brand (referent: other)	-0.44	-0.93, 0.06	-0.08	0.01	-0.35	-0.85, 0.14	-0.07	0.01
General Perceived Harmfulness of Cigarettes	<b>-0.33</b>	<b>-0.48, -0.18</b>	<b>-0.21</b>	<b>0.05</b>	<b>-0.28</b>	<b>-0.43, -0.14</b>	<b>-0.18</b>	<b>0.04</b>
Importance that General Purchasing Decisions Support American Indian Tribes	<b>0.34</b>	<b>0.24, 0.44</b>	<b>0.32</b>	<b>0.11</b>	<b>0.34</b>	<b>0.23, 0.44</b>	<b>0.32</b>	<b>0.11</b>
NAS Perceived American Indian Affiliation Score <sup>a</sup>	<b>0.22</b>	<b>0.13, 0.31</b>	<b>0.22</b>	<b>0.06</b>	<b>0.23</b>	<b>0.14, 0.32</b>	<b>0.23</b>	<b>0.07</b>
Believes NAS are made by one of world's largest cigarette manufacturers (referent: false)	0.23	-0.01, 0.47	0.09	0.01	0.17	-0.07, 0.41	0.07	0.01
Full Model, Adjusted-R <sup>2</sup>		0.27				0.24		

**Note.**

NAS = Natural American Spirit; NH = Non-Hispanic.

a: NAS perceived American Indian affiliation score is a sum of 3 items: "The cigarettes are made by an American Indian tribe," "The tobacco is grown on American Indian tribal lands," and "The company donates profits to organizations that benefit American Indian people, including tribes" with scores ranging from 0 (believe all are false) to 3 (believe all are true). Bolded effects are significant at  $p < .05$ .

NAS) is made by one of the largest cigarette manufacturers in the world (76% vs 39%). These same patterns were observed for never smokers, former

smokers, and current smokers, and all within-subject comparisons were significant per McNemar tests ( $ps < .001$ ).

**Table 3**  
**Multivariate Regression Models for Purchase Intentions of Natural American Spirit among Current Smokers (N = 358)**

	Natural American Spirit Purchase Intentions			
	B	95% CI	$\beta$	$\eta^2$
Age	0.00	-0.03, 0.03	0.00	0.00
<b>Men (referent: women)</b>	<b>0.69</b>	<b>0.03, 1.35</b>	<b>0.10</b>	<b>0.01</b>
<b>Race/Ethnicity: NH White (referent: other)</b>	0.32	-0.50, 1.15	0.04	0.00
<b>Level of Education</b>				
High school or less (referent)				
Some college	-0.45	-1.38, 0.49	-0.06	0.00
College graduate	0.32	-0.63, 1.27	0.05	0.00
<b>Color of Pack Viewed</b>				
Blue (referent)				
Green	0.33	-0.46, 1.11	0.04	0.00
Orange/Gold	0.46	-0.34, 1.26	0.06	0.00
<b>NAS Pack Viewed First (referent: Pall Mall)</b>	0.05	-0.60, 0.71	0.01	0.00
<b>NAS a preferred brand (referent: other)</b>	<b>6.36</b>	<b>4.97, 7.75</b>	<b>0.42</b>	<b>0.19</b>
<b>General Perceived Harmfulness of Cigarettes</b>	<b>-0.72</b>	<b>-1.13, -0.31</b>	<b>-0.16</b>	<b>0.03</b>
<b>Importance that General Purchasing Decisions Support American Indian Tribes</b>	<b>0.59</b>	<b>0.31, 0.88</b>	<b>0.20</b>	<b>0.05</b>
<b>NAS Perceived American Indian Affiliation Score<sup>a</sup></b>	<b>0.29</b>	<b>0.03, 0.54</b>	<b>0.10</b>	<b>0.01</b>
<b>Believes NAS are made by one of world's largest cigarette manufacturers (referent: false)</b>	0.21	-0.47, 0.89	0.03	0.00
<b>Full Model, Adjusted-R<sup>2</sup></b>	0.26			

Note.

NAS = Natural American Spirit; NH = Non-Hispanic.

a: NAS perceived American Indian affiliation score is a sum of 3 items: “The cigarettes are made by an American Indian tribe,” “The tobacco is grown on American Indian tribal lands,” and “The company donates profits to organizations that benefit American Indian people, including tribes” with scores ranging from 0 (believe all are false) to 3 (believe all are true). Bolded effects are significant at  $p < .05$ .

### Misperceptions of Health Benefits

Among current smokers, in a multivariate linear regression model (controlling for covariates, pack color, and presentation order), both the measure of general purchasing preference supporting

American Indian tribes ( $\beta = 0.32, p < .001$ ) and the perceived American Indian affiliation score ( $\beta = 0.22, p < .001$ ) were significantly associated with the belief that smoking NAS would show that one cares about one's own health (Table 2).



Effect sizes for the measures of general purchasing preference supporting American Indian tribes ( $\eta^2 = 0.11$ ) and perceived American Indian affiliation score ( $\eta^2 = 0.06$ ) were both medium sized,<sup>23</sup> with 11% of the variance accounted for by general purchasing preferences and 6% for perceived American Indian affiliation. Significant covariates were male sex ( $\beta = 0.11$ ,  $p = .02$ ,  $\eta^2 = 0.02$ ) and a lower general perceived harmfulness of cigarettes ( $\beta = -0.21$ ,  $p < .001$ ,  $\eta^2 = 0.05$ ), both with small effect sizes. Unrelated to health perceptions were study design features (brand order, pack color), participant age, race/ethnicity, educational level, NAS being a preferred brand, and knowledge of NAS being manufactured by one of the largest cigarette manufacturers in the world. The full model adjusted- $R^2$  was 0.27. A parallel multivariate linear regression model was run to examine associations of beliefs that smoking NAS would show that one cares about the health of family and friends, and the findings of significant effects were comparable, with full model adjusted- $R^2$  of 0.24 (Table 2).

### Purchase Intention

Among current smokers, 36% reported it was more likely than not that they would purchase NAS in the next 3 months, with a mean score of 3.9 out of 10 (SD = 3.5, Median = 3.0). In a multivariate linear regression model (controlling for covariates, pack color, and brand order), significant predictors of NAS purchase intentions among current smokers were a general purchasing preference to support American Indian tribes ( $\beta = 0.20$ ,  $p < .001$ ) and the perceived American Indian affiliation score ( $\beta = 0.10$ ,  $p = .03$ ). Significant covariates were male sex ( $\beta = 0.10$ ,  $p = .04$ ), identifying NAS as a preferred brand of cigarettes ( $\beta = 0.42$ ,  $p < .001$ ), and a lower general perceived harmfulness of cigarettes ( $\beta = -0.16$ ,  $p = .001$ ) (Table 3). The effect size was large for identifying NAS as a preferred brand of cigarettes ( $\eta^2 = 0.19$ ), while effect sizes for sex ( $\eta^2 = 0.01$ ), lower perceived harmfulness of cigarettes ( $\eta^2 = 0.03$ ), general purchasing preference supporting American Indian tribes ( $\eta^2 = 0.05$ ), and the perceived American Indian affiliation score ( $\eta^2 = 0.01$ ) were all small. Unrelated to NAS purchase intentions were study design features (brand order, pack color), participant age, race/ethnicity, educational level, and knowledge of NAS being manufactured

by one of the largest cigarette manufacturers in the world. The full model adjusted- $R^2$  was 0.26.

### DISCUSSION

Using a randomized survey design, the current study examined adults' perceptions of an American Indian affiliation for NAS cigarettes. Participants viewed one NAS cigarette pack and a same-colored control pack (Pall Mall) that had no American Indian imagery and was manufactured by the same major tobacco company. Regardless of presentation order and color, we found that participants were more likely to report beliefs that the NAS cigarette brand is owned by an American Indian tribe and that the tobacco is grown on American Indian lands when compared to Pall Mall. Furthermore, participants were less likely to recognize that NAS, compared to Pall Mall, is made by one of the largest cigarette manufacturers. In truth, Reynolds American/British American Tobacco manufactures both NAS and Pall Mall, and neither brand is owned or grown by American Indian tribes. Findings from the current study are consistent with the earlier qualitative focus group studies in which American Indian adolescents and US smokers reported beliefs of NAS being American Indian owned.<sup>20,21</sup> Participants also were more likely to report that NAS profits are donated to support American Indian benefiting organizations. Corporate press releases have promoted SFNTC's support of American Indian organizations through the SFNTC Foundation,<sup>24</sup> which is said to focus on the "development of American Indian entrepreneurs, the facilitation of American Indian education and the preservation of American Indian languages". In 2016, the SFNTC Foundation contribution to American Indian benefitting organizations appeared to be less than 0.03% of the operating income (profit) for SFNTC that year, which was reported as \$546 Million in profits.<sup>25</sup>

We found that among current smokers, even after controlling for general perceptions of smoking harms, greater beliefs of NAS having an American Indian affiliation were associated with misperceptions that smoking NAS shows care about one's own health and the health of family and friends. In addition, a general support of American Indian products was also significantly associated with misperceptions that smoking NAS is less harmful

for one's own health and the health of family and friends.

While previous research has examined elements of cigarette pack design, including the use of text labels and pack colors in influencing perceptions of health and safety,<sup>6,26-28</sup> we are unaware of any prior research focused on examining the effects of American Indian imagery in cigarette branding on health perceptions. The current study's findings are consistent with previous work that has shown that cigarettes that are advertised as "natural" are viewed as being safer to smoke.<sup>9,29</sup> Additionally, goods that are advertised as being "traditional" are also viewed by consumers as being of higher quality, authenticity, healthiness, and safety.<sup>30,31</sup>

In several previous studies, NAS has been shown to be misperceived as healthier than other brands of cigarettes.<sup>4-10</sup> Although prior research has assessed health perceptions generally, in our study, we found misperceptions of current smokers of health benefits of smoking NAS for both self (ie, primary exposure) and with regard to secondhand NAS smoke exposure among one's family and friends. We also found that misperceptions of an NAS American Indian-affiliation and support of American Indian products (generally) were both associated with intentions to purchase NAS in the future (controlling for general perceptions of smoking harms and preference for NAS as their regular brand). This supports previous research findings that associated the NAS marketing terms "natural" with increased intentions to purchase cigarettes.<sup>9</sup> Perceptions among current smokers that an American Indian affiliation implies health benefits to self and others may impact future smoking cessation plans. Smokers of NAS may believe it is less necessary to quit smoking compared to smokers of other brands, and current smokers of other brands may be more motivated to "switch brands" to purchase and smoke NAS rather than quit smoking. For never and former smokers, beliefs that there is an option of an American Indian affiliated and less harmful brand to smoke may encourage those who are at risk for smoking initiation to begin smoking. In reality, like all other commercially available cigarettes on the market, NAS cigarettes are combusted, are inhalable, and are addictive. There also is evidence that the NAS cigarette brand may be more harmful compared

to other cigarette brands due to high levels of ammonia, arsenic, and cadmium.<sup>32,33</sup>

Strengths of the current study include a large sample of adults residing in the US, evaluation with never, former, and current smokers, evaluation of the actual and newest NAS cigarette packs, inclusion of Pall Mall as a comparison brand with no American Indian imagery, use of a mixed-factor design that randomized the order by which participants viewed the brands and the pack color, and multivariate statistical models that controlled for participant demographic characteristics, study design features, and general smoking harm beliefs. Building upon the literature, the items developed to assess perceptions of an American Indian affiliation were informed by earlier qualitative research that had used open-ended inquiry and identified perceptions among young people of an American Indian affiliation for NAS cigarettes.

With regard to study limitations, given the core product proposition created by SFNTC with its NAS brand of cigarettes marketed as natural, organic, and with tobacco ingredients listed as only tobacco plus water, we are unable to isolate all contributors to the perception of NAS as a healthier way to smoke. However, all participants were exposed to the text-based claims of natural and simplified tobacco ingredients on the NAS packs, and yet, those smokers who likely through the imagery, believed NAS to be American Indian affiliated, were more likely to perceive the brand as a healthier and less harmful way to smoke. Prior to viewing the pack images, participants were asked to rate how important it is when choosing among brands (referencing generic purchasing behaviors) that their choice "supports American Indian tribes," which may have primed participants and predetermined the importance of associations of the brand images with American Indians. However, this variable was one of 17 items asked in random order of presentation and was controlled for in the final health and purchase intention models. The study sample was drawn from an online crowdsourcing platform and was largely non-Hispanic white with some college education, which is not representative of the overall US population. Therefore, study findings are preliminary and may not generalize. Follow-up studies should seek a sample representative of the current US population. Dif-

ferent colored packs were compared (blue, green, orange/gold) and for 2 of these colors (blue and orange/gold) the colors do not mean the same thing for both brands. However, color of pack was controlled for in analyses and no differences were found by color of pack viewed. Finally, prior exposure to NAS advertising, which is fairly ubiquitous in magazines, online, in retail environments, and in movies, was not measured and may impact participant responses to pack images.

## IMPLICATIONS FOR TOBACCO REGULATION

Study findings have important implications for tobacco control. SFNTC in its NAS brand of cigarettes uses fictional American Indian imagery and is profiting greatly. In the current study, many former and never smokers and a majority of current smokers believed there is a connection between the cigarette brand and American Indians. Prior criticism has been made of the use of American Indian imagery in US product advertising,<sup>17,34</sup> and advertising in this vein has been judged demeaning and harmful in preventing true understanding of the richness and diversity of American Indian cultures. The NAS brand has grown exponentially in market share<sup>1</sup> and is misperceived to be “healthier” when compared to other brands.<sup>4-10</sup> Message campaigns about the true harms of smoking (regardless of brand or implied safety) are needed to counter both smokers’ and nonsmokers’ beliefs that NAS cigarettes are safer for themselves and others. Going further, the 2009 Family Smoking Prevention and Tobacco Control Act needs to be applied to the prohibition of advertising that conveys reduced risk and FDA regulatory action should address the use of American Indian imagery to imply reduced harm of commercial tobacco products. Study findings indicate that imagery on the packs that communicates an American Indian affiliation is associated with consumer perceptions that a cigarette brand is less harmful to health. The regulation and removal of text labels, such as “light,” “mild,” and “additive-free” are necessary, but unlikely sufficient to thwart implied claims of safety and reduced harm of Natural American Spirit. Given the association with reduced harm, use of American Indian imagery or text to market cigarette products should be prohibited.

## Human Subjects Statement

The Institutional Review Board (IRB) at Stanford University approved the study procedures.

## Conflict of Interest Statement

JJP has provided consultation to pharmaceutical and technology companies that make medications and other treatments for quitting smoking and has served as an expert witness in lawsuits against the tobacco companies. All other authors have no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Acknowledgements

This work was supported by an Environmental Venture grant from the Stanford Woods Institute for the Environment. A postdoctoral training grant (T32HL007034) from the National Heart, Lung and Blood Institute supported AEE. The authors thank Marily Oppezzo for her input on recruitment methodology, Eric Leas for input on measures, and Amy Chieng for her assistance in the collection of the data.

## References

1. Sharma A, Fix BV, Delnevo, C, et al. Trends in market share of leading cigarette brands in the USA: national survey on drug use and health 2002–2013. *BMJ Open*. 2016;6:e008813.
2. Craver R. Natural American Spirit continue to gain U.S. cigarette-market share. Available at: [https://www.journalnow.com/business/newport-natural-american-spirit-continue-to-gain-u-s-cigarette/article\\_6e7bf38a-a0fc-509a-8952-eee6b5549661.html](https://www.journalnow.com/business/newport-natural-american-spirit-continue-to-gain-u-s-cigarette/article_6e7bf38a-a0fc-509a-8952-eee6b5549661.html). Accessed March 5, 2019.
3. McDaniel PA, Malone RE. “I always thought they were all pure tobacco”: American smokers’ perceptions of “natural” cigarettes and tobacco industry advertising strategies. *Tob Control*. 2007;16(6):e7.
4. Kelly KJ, Manning K. The effects of natural cigarette claims on adolescents’ brand-related beliefs, attitudes, and intentions. *J Health Commun*. 2014;19:1064-1075.
5. Leas EC, Ayers JW, Strong DR, Pierce JP. Which cigarettes do Americans think are safer? A population-based analysis with wave 1 of the PATH study. *Tob Control*. 2017;26(e1):e59-e60.
6. Pearson JL, Richardson A, Feirman SP, et al. American Spirit pack descriptors and perceptions of harm: a crowd-sourced comparison of modified packs. *Nicotine Tob Res*. 2016;18(8):1749-1756.
7. Gratale SK, Maloney EK, Sangalang A, Cappella JN. Influence of Natural American Spirit advertising on current and former smokers’ perceptions and intentions. *Tob Control*. 2018;27(5):498-504.

8. Moran MB, Pierce JP, Weiger C, et al. Use of imagery and text that could convey reduced harm in American Spirit advertisements. *Tob Control*. 2017;26:e68-e70.
9. O'Connor RJ, Lewis MJ, Adkison SE, et al. Perceptions of "natural" and "additive-free" cigarettes and intentions to purchase. *Health Educ Behav*. 2017;44(2):222-226.
10. Leas EC, Pierce JP, Dimofte CV, et al. Standardised cigarette packaging may reduce the implied safety of Natural American Spirit cigarettes. *Tob Control*. 2018;27(e2):e118-e123.
11. Campaign for Tobacco-Free Kids. FDA/Santa Fe Natural Tobacco agreement fails to protect the public from misleading claims and imagery on Natural American Spirit cigarettes. Available at: [https://www.tobaccofreekids.org/press-releases/2017\\_03\\_02\\_fda](https://www.tobaccofreekids.org/press-releases/2017_03_02_fda). Accessed August 1, 2018.
12. Moran MB, Brown J, Lindblom E, et al. Beyond 'natural': cigarette ad tactics that mislead about relative risk. *Tob Regul Sci*. 2018;4(5):3-19.
13. Lenik EJ. The thunderbird motif in northeastern Indian art. *Archaeology of Eastern North America*. 2012;40:163-185.
14. Santa Fe Natural Tobacco Company. SFNTC story. Available at: <https://www.sfntc.com/article/sfntc-story>. Accessed August 1, 2018.
15. Houghton H. The Santa Fe New Mexican. Santa Fe Natural Tobacco Co., founded in 1982, closing Santa Fe offices in June. Available at: [http://www.santafenewmexican.com/news/business/santa-fe-natural-tobacco-co-founded-in-closing-santa-fe/article\\_f3c1e935-8877-5f3c-a53a-88cb32b5c081.html](http://www.santafenewmexican.com/news/business/santa-fe-natural-tobacco-co-founded-in-closing-santa-fe/article_f3c1e935-8877-5f3c-a53a-88cb32b5c081.html). Accessed August 1, 2018.
16. Bray C. British American Tobacco to take over Reynolds American in \$49 billion deal. Available at: <https://www.nytimes.com/2017/01/17/business/dealbook/british-american-tobacco-reynolds-cigarettes-merger.html>. Accessed August 1, 2018.
17. D'Silva J, O'Gara E, Villaluz NT. Tobacco industry misappropriation of American Indian culture and traditional tobacco. *Tob Control*. 2018; 27:e57-e64.
18. Lempert LK, Glantz SA. Tobacco industry promotional strategies targeting American Indians/Alaska Natives and exploiting tribal sovereignty. *Nicotine Tob Res*. 2018;0:1-9.
19. Boudrea G, Hernandez C, Hoffer D, et al. Why the world will never be tobacco-free: reframing the "Tobacco Control" into a traditional tobacco movement. *Am J Public Health*. 2016;106:1188-1195.
20. Unger JB, Soto C, Baezconde-Garbanti L. Perceptions of ceremonial and nonceremonial uses of tobacco by American Indian adolescents in California. *J Adolesc Health*. 2006;38(4):443.e9-e16.
21. Epperson AE, Averett PE, Blanchflower T, et al. "The packaging is very inviting and makes smokers feel like they're more safe": the meanings of Natural American Spirit cigarette pack design to adult smokers. *Health Educ Behav*. 2019;46(2):260-266.
22. Sanders-Jackson A, Schleicher NC, Fortmann SP, Henriksen L. Effect of warning statements in e-cigarette advertisements: an experiment with young adults in the United States. *Addiction*. 2015;110:2015-2024.
23. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. New York, NY: Routledge Academic; 1988.
24. Reynolds American Inc. Reynolds American and its employees donated \$13 million to nonprofits in 2016. Available at: [http://s2.q4cdn.com/129460998/files/doc\\_news/2017/2017-04-RA-and-its-employees-donated-13-million-to-nonprofits-in-2016.pdf](http://s2.q4cdn.com/129460998/files/doc_news/2017/2017-04-RA-and-its-employees-donated-13-million-to-nonprofits-in-2016.pdf). Accessed August 1, 2018.
25. Reynolds American. RAI Form 10-K for the fiscal year ended December 31, 2016. Available at: [https://s2.q4cdn.com/129460998/files/doc\\_financials/2016/Reynolds-2016-10-Q.pdf](https://s2.q4cdn.com/129460998/files/doc_financials/2016/Reynolds-2016-10-Q.pdf) Accessed August 1, 2018.
26. Dewhirst T. Into the black: Marlboro brand architecture, packaging and marketing communication of relative harm. *Tob Control*. 2018;27:240-242.
27. Bansal-Travers M, O'Connor R, Fix BV, Cummings KM. What do cigarette pack colors communicate to smokers in the U.S.? *Am J Prev Med*. 2011;40(6):683-689.
28. Kotnowski K, Hammond D. The impact of cigarette pack shape, size and opening: evidence from tobacco company documents. *Addiction*. 2013;108(9):1658-1668.
29. Agaku IT, Omaduvie UT, Filippidis FT, Vardavas CI. Cigarette design and marketing features are associated with increased smoking susceptibility and perception of reduced harm among smokers in 27 EU countries. *Tob Control*. 2015;24:e233-e240.
30. Almlı VL, Verbeke W, Vanhonacker F, et al. General image and attribute perceptions of traditional food in six European countries. *Food Qual Prefer*. 2011;22:129-138.
31. Ko E, Lee S, Whang H. Authenticity in traditional culture marketing: consumers' perceptions of Korean traditional culture. *Journal of Global Fashion Marketing*. 2013;4:93-111.
32. Pappas RS, Fresquez MR, Martone N, Watson CH. Toxic metal concentrations in mainstream smoke from cigarettes available in the USA. *J Anal Toxicol*. 2014;38(4):204-211.
33. Inaba Y, Uchiyama S, Kunugita N. Spectrophotometric determination of ammonia levels in tobacco fillers of and sidestream smoke from different cigarette brands in Japan. *Environ Health Prev Med*. 2018;23(1):15.
34. Green MK. Images of Native Americans in advertising: some moral issues. *J Bus Ethics*. 1993;12(4):323-330.