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Identifying Potential Target Beliefs for a Youth-Focused Smoking Prevention Mass Media Campaign: Final Findings and Recommendations for 13 – 17 Year Old Non-Smokers

Emily Brennan

University of Pennsylvania, emily.brennan@cancervic.org.au

Laura Gibson

University of Pennsylvania, lgibson@asc.upenn.edu

Ani Momjian

University of Pennsylvania, amomjian@asc.upenn.edu

Robert C. Hornik

University of Pennsylvania, rhornik@asc.upenn.edu

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Emily Brennan & Laura Gibson
Ani Momjian
Robert C. Hornik

Penn's Center of Excellence in Cancer Communication Research (CECCR)
Annenberg School for Communication
University of Pennsylvania
Philadelphia, Pennsylvania

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Corresponding Author:
Professor Robert C. Hornik
Annenberg School for Communication
University of Pennsylvania
3620 Walnut St
Philadelphia, PA 19104
rhornik@asc.upenn.edu

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1. Objective

Our aim was to identify promising message themes (sets of beliefs), and within each theme, specific messages (beliefs), for a campaign aimed at preventing smoking initiation among 13 – 17 year olds. In order to identify promising (and unpromising) target beliefs, we have followed a methodological approach that uses cross-sectional quantitative data to assess the association between beliefs about the consequences of smoking and intentions to smoke in the future (Hornik & Woolf, 1999).

2. Methods

2.1. Sample

Data for this study were collected from two sources: Survey Sampling International (SSI) and GfK (formerly known as Knowledge Networks).

In September 2012, we collected clean and complete data from 806 13 – 17 year olds recruited through SSI's opt-in online panel. SSI's panel is comprised of individuals aged 18 and above, and so the 13 – 17 year olds who participated in this study were recruited through an adult panel member who lived in their household. While the SSI panel comprises more than one million individuals who vary widely in their characteristics, it cannot be considered a representative sample of the US population. Therefore, in November 2012, we also collected clean and complete data from 396 13 – 17 year olds from GfK. GfK is the only internet panel that employs address-based sampling for its panel recruitment and maintenance, and it is the only internet panel that is statistically representative of the US population. GfK maintains a panel of 13 – 17 year olds as well as a panel of adults aged 18 and above, and for the current study, individuals were recruited from both panels (i.e., some respondents were members of the teen panel, while others were recruited through an adult panel member in their household). Although respondents were randomly drawn from these panels, the cumulative response rate from panel recruitment to completion rate was only 3.0%. Regardless of which panel they were recruited from (GfK teen panel, GfK adult panel, or SSI adult teen), an adult panel member was the first point of contact for all respondents. If the adult panel member (parent/guardian of the 13 – 17 year old) provided consent for the teen to participate in the study, then they were asked to inform the teen that they had been invited to participate in a study about youths' ideas about health behaviors. Informed consent was also then collected from the teen before the survey commenced.

Respondents from the SSI and GfK samples were combined into a composite sample, which was then weighted to be representative of the US population of 13 – 17 year olds in terms of sex, age, race/ethnicity,

and the proportion of the sample living in metro and non-metro areas. GfK provides representative weights with their data (adjusted for these characteristics); therefore, the marginal proportions from the weighted GfK sample were used as the benchmark for creating weights for the combined sample. In addition, the sample was weighted to have equal proportions of 13, 14, 15, 16 and 17 year olds.

However, prior to combining the two samples, we conducted preliminary analyses to determine whether consistent findings were obtained from the two independent samples. We examined the between-sample correlation for the three quantitative measures that are central to the current analyses: belief-intention association (OR); percent to move; and percent to gain (these quantitative measures are described in Section 2.4.1. below), and these analyses were conducted at the level of both the individual belief items ($n = 167$) and the composite belief scales ($n = 21$; see Section 2.3.2. below). Analyses at the individual belief level indicated a large degree of inconsistency between the samples in terms of the OR ($r = 0.05$) and percent to gain ($r = 0.03$), whereas the between-sample correlation for the percent to move measures was strong ($r = 0.90$). Examination of the 95% confidence intervals around the OR and percent to gains within each sample indicated that these were particularly wide, suggesting that the individual estimates were reasonably unstable within both of the original samples. There was a greater degree of consistency between the samples at the level of the composite belief scales. There was a moderate between-sample correlation for both the OR ($r = 0.40$) and percent to gain ($r = 0.44$), and the correlation for the percent to move was again substantial ($r = 0.97$). Taking into account all of these findings, and the fact that all respondents were recruited through their parents/guardians (regardless of which panel they were sourced from) and were weighted to be representative of the population, we proceeded with combining the samples. Although these preliminary analyses indicated that there was some inconsistency in the findings obtained from the two original samples, these inconsistencies appear to be due to instability of the estimates within each sample. Combining the samples increases the total sample size, and hence, the stability of any given estimate. We therefore feel more confident drawing conclusions from the larger composite sample, than from either of the smaller original samples.

In this study, our focus was on identifying potential belief targets for a campaign aimed at preventing smoking initiation. Therefore, in order to restrict the sample to those 13 – 17 year olds who were current non-smokers, smoking status (non-smoker or smoker) was defined using a measure of intentions to smoke cigarettes and/or any other tobacco products within the next 30 days (non-smoker = not intending to smoke within the next 30 days). We had to rely on this measure of intentions to smoke within the next 30 days as a

proxy measure of actual smoking behavior because SSI would not permit us to measure actual smoking behavior among their respondents. However, we were able to measure actual smoking behavior in the GfK sample (use of tobacco products in the past 30 days). We therefore determined the extent to which excluding respondents based on their intentions to smoke in next 30 days approximated the true sample of non-smokers. In the GfK sample, of those who did not intend to smoke in the next 30 days ($n = 381$; categorized as a non-smoker) only 2.6% reported that they had used some tobacco in the past 30 days. In comparison, of those who did intend to smoke in the next 30 days ($n = 15$; categorized as a smoker), 73.3% had used some tobacco in the past 30 days. We were therefore confident that using the 30-day intention measure provided us with a reasonable sample of **current non-smokers**, of which only 2.6% were expected to have had some recent experience smoking. Accordingly, we excluded the 60 respondents (45 from the SSI sample and 15 from GfK) who were intending to smoke within the next 30 days, leaving us with a final weighted sample of 1142 respondents whom we believe to be current non-smokers (761 unweighted (763.3 weighted) from SSI, and 381 unweighted (378.2 weighted) from GfK).

2.2. Procedure

All data were collected using online surveys, which took respondents around 12 minutes to complete. This study was approved by the Internal Review Board at the University of Pennsylvania.

2.3. Measures

2.3.1. Dependent Variable: No Intention to Use Tobacco

We measured intentions to use tobacco products over the next year using between three and five sequential questions (due to skip patterns). Each question was measured using a five-point scale (*very unlikely; unlikely; neither likely nor unlikely; likely; very likely*): 1) “How likely is it that you will be smoking **every day** one year from now?” (asked of all respondents); 2) “How likely is it that you will be smoking, **but not every day**, one year from now?” (asked only of those who were *neither likely nor unlikely*, *unlikely*, or *very unlikely* to be smoking every day); 3) “How likely is it that you will smoke **even one or two puffs** over the next year?” (asked only of those who were *neither likely nor unlikely*, *unlikely*, or *very unlikely* to be smoking, but not every day); 4) “How likely is it that you will be smoking any form of tobacco, other than cigarettes (e.g., cigars, water pipes, little cigars, pipes) one year from now? (asked of all); and 5) “How likely is it that you will be using any form of smokeless tobacco (e.g., chewing tobacco, snuff, dip) one year from now? (asked of all).

However, because very few respondents had *any* intention to use tobacco over the next year, we created a composite measure of **no intention to use tobacco**, which grouped together those respondents who responded *very unlikely* to all intention questions (and compared them to all others). Almost three-quarters (72%) of 13 – 17 year old non-smokers had no intention to use tobacco over the next year under this criterion.

2.3.2. Independent Variables: Smoking-Related Beliefs

We began by conducting a comprehensive literature review to generate a list of factors that have been shown to be associated with smoking initiation among young people, or which have been the target of prior smoking prevention campaigns (shared with the FDA on June 28th 2012). We then created a shortlist of the factors, with a focus on identifying those that could serve as the broad theme for a smoking prevention campaign (e.g., addiction; health effects of smoking). For each of the 21 potential campaign themes that we identified, we then generated a set of specific beliefs that were thought to represent the larger theme, and which would provide the basis for a specific campaign message (e.g., “If I smoke, I will become addicted to nicotine”; “If I smoke, I will develop cancer”).

2.3.2.1. Belief Items (Specific Messages)

Overall, we measured 167 beliefs, including beliefs about the consequences of smoking and the consequences of not smoking. One hundred and forty beliefs were measured with an introductory stem that began with “If I smoke...” but then referred to one of two different smoking behaviors depending on condition. In the Puff Stem Condition, questions began with “If I smoke *even one or two puffs*, I will...”. Seventy-nine of the 140 beliefs were asked using this frame (i.e., only those that were realistic consequences of smoking one or two puffs). Half of the respondents were randomly assigned to receive the Puff Stem Condition items, and each participant received all 79 items. In the Daily Stem Condition, questions began with “If I smoke *every day*, I will...”. All 140 beliefs were asked using this frame. Half of the respondents were randomly assigned to receive the Daily Stem Condition items and each participant received approximately half of the 140 items (randomly selected). However, for the purposes of the current analyses, we combined data from the Puff Stem and Daily Stem Conditions. Preliminary analyses indicated that the two stem conditions produced results that were largely similar to one another, and by combining the data, we were able to increase the sample size and hence the stability of our results.

Fifteen belief items about the consequences of not smoking were introduced with the stem “If I do not smoke at all, I will...”. Those in the Puff Stem Condition received all 15 items, while those in the Daily Stem Condition received approximately half (randomly selected). We measured the remaining 12 belief items using introductory stems appropriate for the question, and all of these questions were asked of all respondents. For instance, beliefs about self-efficacy to resist cigarette offers were introduced with the stem “How sure are you that, if you really wanted to, you could say no to a cigarette offer if...”. All belief items were measured using five-point scales, although the anchor points on these scales varied according to the type of belief being measured (e.g., very unlikely – very likely; strongly disagree – strongly agree; not at all sure – completely sure). However, for the current analyses, all items were dichotomized at the category that represented the strongest anti-smoking belief.

2.3.2.2. *Belief Scales (Message Themes)*

All of the individual belief items were included in the survey because we believed that they represented one of the 21 potential campaign themes. However, to confirm that the set of items generated for each theme did indeed represent the same underlying construct and could be combined into a composite scale, we conducted a factor analysis on each set of beliefs. Although we have not provided detailed results from the factor analyses in this report, it should be noted that this process led to some minor refinement of the set of beliefs that was used to represent each message theme (i.e., exclusion of individual items that loaded on the factor at less than .40, which resulted in 10 of the individual belief items not being included in any scale). For each message theme, we then averaged together the set of individual belief items that loaded highly on the factor to create a scale for each message theme, and these scales were then dichotomized (facilitating the data analysis approach described in Section 2.4.1.). Respondents who had an average score greater than 4.0 on the continuous scales were compared to respondents who had an average score of 4.0 or less on the scale. Table 1 presents Cronbach’s Alphas (scale reliabilities), the number of items comprising each of the 21 belief scales, and the number of participants with valid data for each scale.

Of the 21 potential campaign themes, we interpreted six as being explicitly relevant to the FDA’s regulatory authority. Although we acknowledge that the FDA and their campaign partners may have a different interpretation as to which themes can and cannot be tied to their regulatory authority, throughout this report we present results separately for the six *FDA Relevant* and the 15 *FDA Less Relevant* campaign themes.

Table 1. *Belief Scales: Number of Participants with Valid Data, Number of Items per Scale and Scale Reliability*

	Number of Participants with Valid Data	Number of Individual Belief Items in Scale	Scale α
FDA Relevant			
Addiction	1120	5	.94
Harmful Ingredients: Common Products	572 ^a	13	.97
Harmful Ingredients: Health Effects	562 ^a	13	.97
Physical (Cosmetic) Effects	1132	10	.95
Physical (Health) Effects	1134	31	.97
Youth Susceptibility to Health Effects	1134	3	.85
FDA Less Relevant			
Cost of Smoking	554 ^a	5	.89
Descriptive Social Norms	1132	3	.89
Endangering Others	539 ^a	4	.92
Expression of Independence (Smoking)	1063	3	.79
Expression of Independence (Not Smoking)	1083	3	.89
General Social Norms (Smoking)	1027	2	.69 ^b
General Social Norms (Not Smoking)	1007	2	.68 ^b
Impact on Sports	510 ^a	3	.91
Injunctive Social Norms from Parents	1061	3	.79
Injunctive Social Norms from Peers	1121	6	.80
Mood Effects	1134	10	.95
Peer Pressure from Others	1134	2	.72 ^b
Self-Efficacy	1133	3	.96
Social Perceptions (Smoking)	1134	23	.93
Social Perceptions (Not Smoking)	1132	10	.95

Note. In order to learn about a large number of beliefs we randomly assigned participants to see sub-sets of beliefs, leading to variations in the number of respondents who provided valid data for each scale.

^aThese scales include data from only half the sample. Beliefs about the harmful ingredients in tobacco products were measured in two ways, which differed only in terms of the way the information was framed. Items in the *Harmful Ingredients: Common Products Frame* theme combined the name of a harmful ingredient with a common product in which it is found (e.g., “If I smoke every day I will inhale mercury, which is found in mascara”). Items in the *Harmful Ingredients: Health Effects Frame* theme combined the name of the harmful ingredient with a specific health effect

that it causes (e.g., “If I smoke every day I will inhale mercury, which causes cancer”). To avoid confusion and data contamination, half of the respondents received items only from the *Common Products Frame* theme, and the other half received items only from the *Health Effects Frame* theme. Also, all of the beliefs in the *Cost of Smoking*, *Endangering Others*, and *Impact on Sports* themes were only asked in the Daily Stem Condition, and, therefore, were also only answered by about half of the sample. Respondents who did not receive any items in a set were not included in the scale.

^bBecause these scales only consisted of two items, we used a simple correlation between the items rather than Cronbach’s Alpha.

2.4. Data Analysis

2.4.1. Quantitative Measures Assessing the Promise of Message Themes and Individual Beliefs

All analyses were conducted using Stata 12.0, adjusting for the effects of sample weighting. For each belief scale (message theme) and each individual belief, we calculated three quantitative indicators of how promising the theme/belief would be as a campaign target.

First, we used logistic regression analyses (odds ratios (OR)) to assess the association between each scale/belief and intentions. An OR greater than 1.0 indicated that respondents who held the desired belief/s were *more* likely to have no intention to smoke than were those who did not hold the desired belief/s, whereas an OR less than 1.0 indicated that respondents who held the desired belief/s were *less* likely to have no intention to smoke. At the belief scale level, OR were categorized as being high (>3.0), moderate (>2.0), or low (>1.0). All high OR were significantly greater (at $p < .05$) than all low OR, whereas moderate OR did not necessarily differ significantly from either high or low OR.

Second, we calculated the proportion of the population that did not already hold the desired belief/s and was therefore available to be influenced by the campaign, a measure that we call *potential percent to move*. If the percent to move was particularly low, this indicated that a large proportion of the population already held the desired belief/s and so there were few people available to be affected by a campaign message. By comparison, if the percent to move was particularly high, this may indicate that it would be difficult to convince people of this belief, or alternatively, that this is new information for the majority of the population. At the belief scale level, the range of percent to move values was divided into equal thirds, and percent to move values in the top third were classified as high (>58%), percent to move values in the middle third were classified as moderate (>41%), and percent to move values in the bottom third were classified as low (>24%).

Third, we calculated a summary metric that we call *potential percent to gain*. Percent to gain is an indicator of how promising a message theme, or specific belief, is likely to be as the target of a campaign. In general,

the higher the percent to gain, the more promising the theme/belief is as a potential campaign target. Percent to gain represents the estimated additional proportion of the population who would hold the desired intention, if 100% of the population endorsed the target theme/belief and the target belief was influential (Hornik & Woolf, 1999). It is calculated using a cross-tabulation of the belief and intention measures. For example, as shown in Table 2, in the cross-tabulation of having no intention to use tobacco with the individual belief “If I smoke, I will develop sexual and/or fertility problems” (for this belief, the desired response was *very likely*), we see that overall, 69.5% of the respondents that were asked this question had no intention to use tobacco. But of those who gave the desired response of “*very likely* I will develop sexual and/or fertility problems”, 84.9% had no intention to use tobacco. If the proportion of the sample endorsing the belief could be increased to 100%, then it is estimated that an *additional* 15.4% of the population would have no intention to use tobacco. That is, the potential percent to gain (under the best case scenario) is 15.4% (84.9% - 69.5% = 15.4%). While no campaign could expect to achieve complete persuasion, this method provides an estimate of the *maximum promise* of a campaign focused on increasing endorsement of this belief.

Table 2. *Example Cross-Tabulation of Beliefs and Intentions*

(n = 284)	<i>If I smoke...I will develop sexual and/or fertility problems</i>		
Intention	All others	Very likely	Overall
All others	40.8%	15.1%	30.5%
No intention to use tobacco	59.2%	84.9%	69.5%
% in column	59.9%	40.1%	100%

In general, a higher OR and a higher percent to move will lead to a higher percent to gain. Therefore, given that the percent to gain captures the information that is provided both by the belief-intention association (OR) and the percent to move (Hornik & Woolf, 1999), primary consideration was given to these values when determining how promising each theme and individual belief was likely to be. At the belief scale level, percent to gains were categorized as being high ($\geq 11.7\%$), moderate ($\geq 7.7\%$), or low ($\geq 4.1\%$). All high percent to gains were significantly different from all low percent to gains (at $p < .05$), whereas moderate percent to gains did not differ significantly from either high or low percent to gain values. At the individual belief level, percent to gain values were ranked from highest to lowest and were then grouped into quintiles

(fifths), such that beliefs in the top quintile were the most promising campaign targets and beliefs in the lowest quintile were the least promising.¹ Within the total set of beliefs that measured each campaign theme, we then identified the number of beliefs that were in the top and bottom quintile. Only when this number was greater than the number that would be expected by chance for the set (i.e., greater than one-fifth of the total number of beliefs in the set) were we confident recommending that any of the individual beliefs in that set would be likely, or particularly unlikely, to make a promising campaign target.

3. Results

3.1. Sample Characteristics

In the weighted sample of 1142 current non-smokers, 51% were boys and 49% were girls. Respondents were evenly distributed across each age group (13, 14, 15, 16, and 17). Just over half of the sample were non-Hispanic White (57%), 14% were non-Hispanic Black, 21% were Hispanic, 5% reported some other race, and 3% reported two or more races. The majority of the sample lived in metro areas (85%) (note that the sample was weighted by sex, age, race/ethnicity, and metro/non-metro status). Just over one-third was categorized as high sensation seekers (38%). Fifteen percent indicated that they had a sibling who smoked, one-third reported that they lived with a smoker (33%), and 22% reported that at least one of their four closest friends uses tobacco.

3.2. Main Findings

Overall, we found that the median percent to gain at the message theme level was 8.0%, ranging from 4.1% to 12.8%. The median percent to gain at the individual belief level was 9.6%, ranging from 3.4% to 15.9%. Given that all of the percent to gain values were positive, these findings indicate that all of the message themes, and all of the individual beliefs within each theme, were somewhat promising. However, as illustrated in Figure 1, we nonetheless found that some message themes (data also shown in Table 3), and some of the individual beliefs within each theme (data also shown in Appendix A), showed particularly high and particularly low levels of promise. In the following set of recommendations, we focus on those message themes that were identified as most and least promising, and where appropriate, highlight any of the specific beliefs that could be used, or should be avoided, when creating messages related to the theme.

¹ Note that quintiles are arbitrary divisions and individual beliefs with percent to gains just outside of the top quintile may also have the potential for being effective (and those outside the bottom quintile may also be unlikely to make a promising campaign message).

3.2.1. Campaign Themes Most Relevant to the FDA’s Regulatory Authority

We begin by focusing on the six message themes that we identified as being relevant to the FDA’s regulatory authority. We first describe how promising each of these themes would be as the focus of a campaign, and then highlight any of the specific beliefs within the theme that seem to be particularly promising or unpromising targets for a campaign message.

Physical (Cosmetic) Effects

Overall, the data suggest that Physical (Cosmetic) Effects could make a relatively promising campaign theme. The scale had a moderate percent to gain (9.0%) and a high scale-intention association (OR = 3.41), but a low percent to move (35%; Table 3). While the overall percent to gain for the scale was not especially high, Figure 1 and Appendix A both show that some of the individual beliefs in this set were among the most promising beliefs overall (and none of the beliefs were in the lowest quintile). Specifically, of the 10 beliefs in the set, three had percent to gains within the top quintile. The three promising beliefs in this set were (for each of these beliefs, the desired response was *very likely*):

- “If I smoke, I will get yellow fingers” (percent to gain = 13.3%)
- “If I smoke, I will develop uneven skin coloring” (12.8%)
- “If I smoke, I will get wrinkles” (12.3%)

Addiction

The scale measuring beliefs about Addiction had a moderate percent to gain (8.3%), a moderate scale-intention association (OR = 2.45), and a moderate percent to move (47%; Table 3). Only one of the five individual beliefs in this set ranked in the top quintile (Appendix A), which was equal to the number that would be expected by chance for this set. The top ranked belief was (for this belief, the desired response was *very likely*): “If I smoke, I will be controlled by smoking” (percent to gain = 12.5%). None of the beliefs from this set were in the lowest quintile (Appendix A).

Harmful Ingredients – Common Products Framing

The scale measuring beliefs about Harmful Ingredients – Common Products Framing had a moderate percent to gain (7.7%), a moderate scale-intention association (OR = 2.47), and a moderate percent to move (41%; Table 3). Only one of the 13 beliefs in this set ranked in the top quintile (Appendix A), which was lower than the number that would be expected by chance. Therefore, while we have only limited confidence in this finding, the top ranked belief was (for this belief, the desired response was *very likely*): “If I smoke, I will

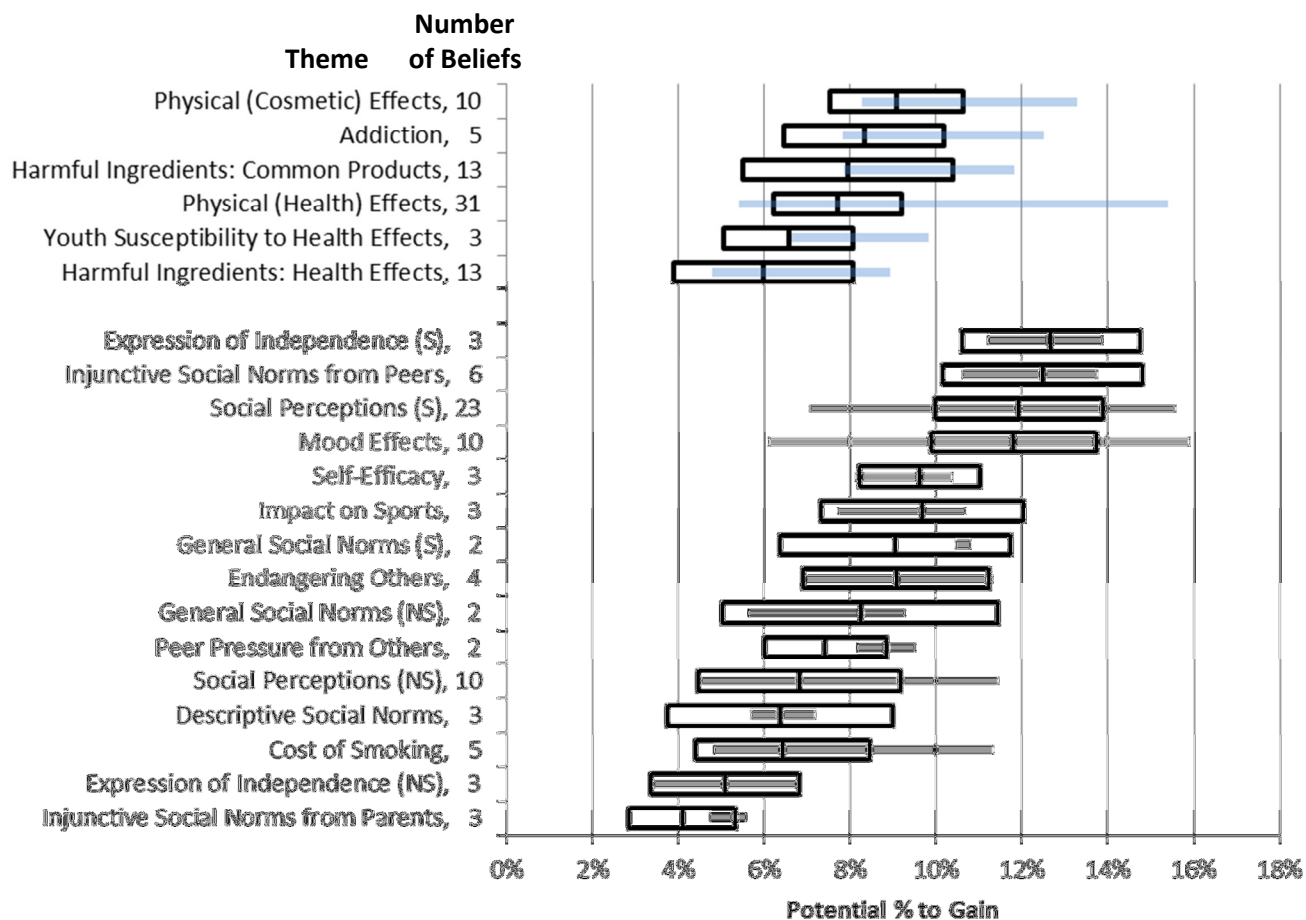


Figure 1. Message theme percent to gain values (and confidence intervals; indicated by black boxes), and the range of percent to gain values for individual beliefs within each message theme (indicated by blue lines for the six FDA Relevant themes and grey lines for the 15 FDA Less Relevant themes). The number of beliefs included per theme is listed next to the theme name.

inhale ammonia, which is also found in many household cleaners” (percent to gain = 11.8%). None of the beliefs from this set were in the lowest quintile (Appendix A).

Physical (Health) Effects

Overall, the data suggest that Physical (Health) Effects could make a relatively promising campaign theme, although the promise of this theme depends a great deal on the specific beliefs used to create the message. The scale had a low percent to gain (7.6%), a moderate scale-intention association (OR = 2.87), and a low percent to move (35%), suggesting that the primary weakness of this theme is that, on the whole, the majority of 13 – 17 year olds already believe that smoking has negative consequences for health (Table 3). Figure 1 and Appendix A both show that several of the individual beliefs in this set were among the most

promising beliefs overall. Specifically, of the 31 beliefs in this set, eight had percent to gains within the top quintile (for each of the beliefs, the desired response was *very likely*):

- “If I smoke, I will develop sexual and/or fertility problems” (percent to gain = 15.4%)
- “If I smoke, I will develop cancer” (14.6%)
- “If I smoke, I will lose my taste buds” (14.6%)
- “If I smoke, I will need chemotherapy and radiation” (14.4%)
- “If I smoke, I will stunt my growth” (14.2%)
- “If I smoke, I will develop inflammation in my lungs” (12.1%)
- “If I smoke, I will develop headaches” (11.9%)
- “If I smoke, I will develop a blood clot in my brain” (11.9%)

At the same time, several of the beliefs in this set had percent to gains that were in the lowest quintile. Although the number of less promising beliefs was not greater than the number that would be expected by chance for this set, we believe that it is important to highlight the specific health effects beliefs for which there is at least some evidence that a campaign message would be unlikely to be effective. Specifically, the five less promising beliefs in this set were (for the first four of these beliefs, the desired response was *very likely*; for the fifth belief, the desired response was *very unlikely*):

- “If I smoke, I will clog my arteries” (percent to gain = 7.1%)
- “If I smoke, I will damage my body” (6.2%)
- “If I smoke, I will develop heart disease” (5.5%)
- “If I smoke, I will develop lung cancer” (5.4%)
- “If I smoke, I will be able to deal with physical pain” (6.5%)

Youth Susceptibility to Health Effects

Overall, the scale measuring beliefs about Youth Susceptibility to Health Effects had a low percent to gain (6.6%), a moderate scale-intention association (OR = 2.35), and a low percent to move (37%), indicating that the primary weakness of this theme is that many youth (i.e., 63%) already believe that youth are just as susceptible to the health effects of smoking as are older people (Table 3). Of the three beliefs in this set, none were in the top quintile and only one was in the bottom quintile (Appendix A). Therefore, while we have only limited confidence in this finding, the lowest ranked belief was (for this belief, the desired response was *strongly agree*): “If I smoke every day, I am just as likely to harm my health as an older person who smokes every day” (percent to gain = 6.6%).

Table 3. *Message Themes: Percent to Gain, Scale-Intention Association (OR), and Percent to Move (Ordered from Highest to Lowest Percent to Gain, within Subset)*

	Percent to Gain		Odds Ratio (OR)		Percent to Move	
FDA More Relevant						
Physical (Cosmetic) Effects	9.0%	M	3.41	H	35%	L
Addiction	8.3%	M	2.45	M	47%	M
Harmful Ingredients: Common Products ^a	7.7%	M	2.47	M	41%	M
Physical (Health Effects)	7.6%	L	2.87	M	35%	L
Youth Susceptibility to Health Effects	6.6%	L	2.35	M	37%	L
Harmful Ingredients: Health Effects ^a	5.8%	L	2.45	M	32%	L
FDA Less Relevant						
Expression of Independence (S)	12.8%	H	3.66	H	52%	M
Injunctive Social Norms from Peers	12.5%	H	3.10	H	60%	H
Social Perceptions (S)	11.9%	H	3.39	H	51%	M
Mood Effects	11.7%	H	3.66	H	46%	M
Self-Efficacy	9.6%	M	4.97	H	28%	L
Impact on Sports ^a	9.5%	M	3.64	H	35%	L
General Social Norms (S)	9.2%	M	2.12	M	66%	H
Endangering Others ^a	9.1%	M	4.28	H	30%	L
General Social Norms (NS)	8.0%	M	1.80	L	74%	H
Peer Pressure From Others	7.3%	L	3.28	H	29%	L
Social Perceptions (NS)	6.7%	L	1.77	L	61%	H
Descriptive Social Norms	6.5%	L	1.68	L	64%	H
Cost of Smoking ^a	6.4%	L	2.94	M	27%	L
Expression of Independence (NS)	5.1%	L	1.79	L	42%	M
Injunctive Social Norms from Parents	4.1%	L	2.22	M	24%	L

Note. $N = 1142$ (total sample; weighted). For percent to gain: H (high) = significantly greater than scales categorized as low ($p < .05$); M (moderate) = not significantly different from scales categorized as high or low; L (low) = significantly less than scales categorized as high ($p < .05$). For OR: H (high) ≥ 3.0 and significantly greater than scales categorized as low ($p < .05$); M (moderate) ≥ 2.0 , L (low) ≥ 1.0 and significantly less than scales categorized as high ($p < .05$). For percent to move: the range was divided in equal thirds, H (high) = 58-74%, M (moderate) = 41-57%, and L (low) = 24-40%.

^aAll of the individual beliefs in this set were asked of only half the total sample (e.g., respondents were randomly assigned to receive only one type of Harmful Ingredient item; or all items in the set were only asked of respondents randomly assigned to the Daily Stem Condition).

Harmful Ingredients – Health Effects Framing

Overall, the scale measuring beliefs about Harmful Ingredients – Health Effects had a low percent to gain (5.8%), a moderate scale-intention association (OR = 2.45), and a low percent to move (32%), suggesting that the primary weakness of this theme is that many youth (i.e., 68%) already believe that there are health effects associated with the inhalation of the specific ingredients found in cigarettes (Table 3). In addition, Appendix A shows that many of the individual beliefs in this set were among the least promising overall. Specifically, of the 13 beliefs in this set, five had percent to gains within the lowest quintile and the remaining eight beliefs were all in the second lowest quintile. The five least promising beliefs were (for each of these beliefs, the desired response was *very likely*):

- “If I smoke, I will inhale tar, which causes lung cancer” (percent to gain = 7.2%)
- “If I smoke, I will inhale carbon monoxide, which causes sexual and/or fertility problems” (7.2%)
- “If I smoke, I will inhale arsenic, which damages the heart” (7.1%)
- “If I smoke, I will inhale nicotine, which causes addiction” (6.9%)
- “If I smoke, I will inhale chemicals that damage the body” (4.8%)

3.2.2. Other Promising Themes

An additional four message themes were found to be particularly promising: Expression of Independence (Smoking); Injunctive Social Norms from Peers; Social Perceptions (Smoking); and Mood Effects. We will again describe the overall findings for these themes, and will exemplify the themes using the individual beliefs within the set that were grouped in the top (or bottom) quintile overall.

Expression of Independence (Smoking)

Overall, the data suggest that Expression of Independence (Smoking) could make a promising campaign theme. The scale had a high percent to gain (12.8%), a high scale-intention association (OR = 3.66), and a moderate percent to move (52%; Table 3). In addition, two of the three beliefs in the set were among the most promising beliefs overall and the remaining belief was in the second quintile (Appendix A).

Specifically, the two most promising beliefs were (for both of these beliefs, the desired response was *very unlikely*):

- “If I smoke, I will show that I am independent” (percent to gain = 13.9%)
- “If I smoke, I will be making my own decisions” (11.8%)

Injunctive Social Norms from Peers

Overall, the data suggest that Injunctive Social Norms from Peers could make a promising campaign theme (Table 3). The scale had a high percent to gain (12.5%), a high scale-intention association (OR = 3.10), and a high percent to move (60%). In addition, three of the six beliefs in the set were among the most promising beliefs overall and the remaining three beliefs were in the second quintile (Appendix A). The three promising beliefs were (for the first two beliefs, the desired response was *very unlikely*; for the third belief, the desired response was *very likely*):

- “If I smoke, others my age will accept it” (percent to gain = 13.8%)
- “If I smoke, my friends will accept it” (13.1%)
- “If I smoke, others my age will disapprove” (13.5%)

Social Perceptions (Smoking)

Overall, the data suggest that Social Perceptions (Smoking) could make a promising campaign theme. The scale had a high percent to gain (11.9%), a high scale-intention association (OR = 3.39), and a moderate percent to move (51%; Table 3). Also, as shown in Figure 1 and Appendix A, several of the beliefs in this set were among the most promising beliefs overall. Specifically, of the 23 beliefs in the set, 12 had percent to gains within the top quintile. The 12 promising beliefs in this set were (for the first eight beliefs, the desired response was *very likely*):

- “If I smoke, I will be unable to go places that don’t allow smoking” (percent to gain = 15.6%)
- “If I smoke, I will look immature” (15.0%)
- “If I smoke, I will be unpopular” (13.6%)
- “If I smoke, I will lose friends” (12.7%)
- “If I smoke, I will look uncool” (12.4%)
- “If I smoke, I will look stupid” (12.3%)
- “If I smoke, I will not look confident” (12.0%)
- “If I smoke, I will lose respect from others my age” (11.8%)

For the remaining four beliefs, the desired response was *very unlikely*:

- “If I smoke, I will be able to show others that I’m not afraid to take risks” (15.4%)
- “If I smoke, I will gain friends” (13.6%)
- “If I smoke, I will look mature” (12.0%)
- “If I smoke, I will get respect from others my age” (11.8%)

Of the remaining 11 beliefs in this set, only one was in the lowest quintile. Therefore, while we have only limited confidence in this finding, the lowest ranked belief was (for this belief, the desired response was *very unlikely*): “If I smoke, I will gain respect from my brother(s) and/or sister(s)” (percent to gain = 7.1%).

Mood Effects

Overall, the data suggest that Mood Effects could make a promising campaign theme. The scale had a high percent to gain (11.7%), a high scale-intention association (OR = 3.66), and a moderate percent to move (46%; Table 3). However, only two of the 10 beliefs in this set had percent to gains within the top quintile (Appendix A). Therefore, while we have only limited confidence in these findings, the top ranked beliefs were (for both of these beliefs, the desired response was *very unlikely*):

- “If I smoke, I will feel less bored” (percent to gain = 15.9%)
- “If I smoke, I will feel relaxed” (13.3%)

Of the remaining eight beliefs in this set, one was in the lowest quintile. Once again, although we have only limited confidence in this finding, the least promising belief in this set was (for this belief, the desired response was *very unlikely*): “If I smoke, I will be able to forget about my problems” (percent to gain = 6.1%).

3.2.3. Less Promising Themes

Of the remaining campaign themes, five had a moderate percent to gain: Self-Efficacy; Impact on Sports; General Social Norms (Smoking); Endangering Others; and General Social Norms (Not Smoking). Six had a percent to gain that was classified as low: Peer Pressure from Others; Social Perceptions (Not Smoking); Descriptive Social Norms; Cost of Smoking; Expression of Independence (Not Smoking); and Injunctive Social Norms from Parents (Table 3). While it is important to note that the data did not indicate any of these sets would have a detrimental effect if they were used as the basis for a campaign (i.e., a negative percent to gain or OR), it is also the case—particularly for the six sets with a low percent to gain—that there was some evidence that the set was *unlikely* to make a promising campaign theme. In the following section, we will describe the overall findings for the six least promising themes, and where appropriate, will exemplify the theme using the individual beliefs that were grouped in the bottom (or top) quintile overall.

Peer Pressure from Others

The scale measuring beliefs about Peer Pressure from Others had a low percent to gain (7.3%), a high scale-intention association (OR = 3.28), and a low percent to move (29%), suggesting that the primary weakness of this set was that, on the whole, the majority of 13 – 17 year olds already held the desired beliefs (Table 3). Neither of the beliefs in this set, which asked respondents about the frequency with which they are offered a smoke by their friends and by others their age, were in the bottom (or top) quintile overall (Appendix A).

Social Perceptions (Not Smoking)

Overall, the scale measuring beliefs about Social Perceptions (Not Smoking) had a low percent to gain (6.7%), a low scale-intention association (OR = 1.77), and a high percent to move (61%), suggesting that the primary weakness of this theme was that the desired anti-smoking beliefs had a relatively low association with the likelihood of having no intention to smoke (Table 3). In addition, several of the individual beliefs in this set were among the least promising overall (Appendix A). Specifically, of the 10 beliefs in this set, four had percent to gains in the lowest quintile (for each of the beliefs, the desired response was *very likely*):

- “If I do not smoke at all, I will gain respect from my brother(s) and/or sister(s)” (percent to gain = 6.7%)
- “If I do not smoke at all, I will be popular” (6.1%)
- “If I do not smoke at all, I will look mature” (5.4%)
- “If I do not smoke at all, I will be sexually/romantically appealing” (4.4%)

Descriptive Social Norms

Overall, the scale measuring beliefs about Descriptive Social Norms had a low percent to gain (6.5%), a low scale-intention association (OR = 1.68), and a high percent to move (64%; Table 3), suggesting that 13 – 17 year old non-smokers’ beliefs about the prevalence of smoking are not strongly associated with their intentions to smoke. Specifically, all three of the beliefs in the set were in the bottom quintile (for each of these beliefs, the desired response was *none*):

- “How many others your age smoke, but not every day?” (percent to gain = 7.2%)
- “How many others your age have smoked even one or two puffs?” (6.4%)
- “How many others your age smoke every day?” (5.7%)

Cost of Smoking

The scale measuring beliefs about the Cost of Smoking had a low percent to gain (6.4%), a moderate scale-intention association (OR = 2.94), and a low percent to move (27%), suggesting that the primary weakness of this theme is that many youth (i.e., 73%) already believe that there is a financial cost associated with smoking (Table 3). In addition, Appendix A shows that two of the five beliefs in the set were in the lowest quintile overall (for both of these beliefs, the desired response was *very likely*):

- “If I smoke, I will spend more money on doctor and dentist visits” (percent to gain = 7.2%)
- “If I smoke, I will waste money I could have spent on other things” (4.8%)

Expression of Independence (Not Smoking)

Overall, the scale measuring beliefs about Expression of Independence (Not Smoking) had a low percent to gain (5.1%), a low scale-intention association (OR = 1.79), and a moderate percent to move (42%), indicating that the primary weakness of this theme is that there is a relatively weak association between believing that not smoking allows an individual to express their independence and having no intention to smoke (Table 3). In addition, all three of the beliefs in the set were among the least promising beliefs overall (for all of these beliefs, the desired response was *very likely*):

- “If I do not smoke at all, I will be showing that I am independent” (percent to gain = 6.8%)
- “If I do not smoke at all, I will have control over my life” (6.2%)
- “If I do not smoke at all, I will be making my own decisions” (3.4%)

Injunctive Social Norms from Parents

The scale measuring Injunctive Social Norms from Parents had a low percent to gain (4.1%), a moderate scale-intention association (OR = 2.22), and a low percent to move (24%; Table 3). In addition, all three of the beliefs in the set were among the least promising beliefs overall (for all of these beliefs, the desired response was *very likely*):

- “If I smoke, I will get in trouble with my parent(s)/guardian(s)” (percent to gain = 5.6%)
- “If I smoke, my parent(s)/guardian(s) will disapprove” (5.2%)
- “If I smoke, my parent(s)/guardian(s) will be upset” (4.7%)

3.3. Additional Findings

3.3.1. Theme Promise by Demographic Sub-Groups

We conducted a set of analyses to examine whether the promise of each campaign theme (percent to gain for the belief scale) varied by demographic characteristics: sex (boys and girls); age (13 – 15 and 16 – 17 year olds); race/ethnicity (non-Hispanic Whites, non-Hispanic Blacks, and Hispanics); and sensation seeking (low and high). Percent to gain values for each theme, by each sub-group, are presented in Appendix B, along with the result of the significance tests for differences. Of the 84 between-group comparisons that we conducted (four characteristics, by 21 themes), only six showed evidence of statistical significance and no single theme showed differences on more than one characteristic (Appendix B). Therefore, because it is quite possible that these six differences were only the result of chance, on the whole we concluded that there was very little evidence of sub-group differences in the relative promise of each potential campaign theme. That is not to say that different message executions and different message delivery channels are not important for ensuring that all members of the target audience are reached and persuaded by the message. Rather, these data indicate that the campaign themes that are most (least) promising overall are likely to be promising (less promising) for all members of the target audience (Appendix B).

3.3.2. Relative Promise of Themes about the Consequences of Smoking and of Not Smoking

Three message themes (Expression of Independence; Social Perceptions; and General Social Norms) were framed in two ways: 1) referencing the consequences of smoking and 2) referencing the consequences of not smoking. In each case, we found that the theme that referred to the consequences of smoking was more promising than the comparable theme that referred to the consequences of not smoking, and for almost all of the individual beliefs within these themes, this was also the case (see Figure 1, Table 3 and Appendix A). For instance, for the Expression of Independence (Smoking) scale, the percent to gain was 12.8% (a high percent to gain), compared with 5.1% (a low percent to gain) for the Expression of Independence (Not Smoking) scale. In addition, all three of the individual Expression of Independence (Smoking) beliefs were in the top quintile overall whereas the three individual Expression of Independence (Not Smoking) beliefs were in the lowest quintile.

Similarly, the percent to gain was 11.9% (high) for the Social Perceptions (Smoking) scale and 6.7% (low) for the Social Perceptions (Not Smoking) scale. Within the 23 items that measured beliefs about Social Perceptions (Smoking), 10 beliefs were measured in two ways – as a negative consequence of smoking (e.g., “If I smoke, I will look immature”; the desired anti-smoking response was *very likely*) and as a positive

consequence of smoking (e.g., “If I smoke, I will look mature”; the desired anti-smoking response was *very unlikely*). The 10 positive consequences of smoking were also measured using the not smoking framing, for which the desired anti-smoking response became *very likely* (e.g., “If I do not smoke at all, I will look mature”). Overall, the percent to gain for the negative consequences of smoking was higher than the percent to gain for the matching positive consequences of smoking *or* not smoking, at both the theme level (11.7%, 8.0%, and 6.7%, respectively) and at the individual belief level, suggesting that campaign messages are more likely to be effective when they focus on the negative consequences of smoking for social popularity, rather than on the absence of positive consequences of smoking, or the positive consequences of not smoking.

Finally, the difference between the two framings was not quite as stark when considering the scales that measured beliefs about General Social Norms (Smoking) and General Social Norms (Not Smoking). Both of the percent to gains were moderate at the scale level (9.2% and 8.0%, respectively), although, consistent with the other findings, the percent to gains were greater for the two individual beliefs when referring to the consequences of smoking than when referring to the consequences of not smoking (Appendix A).

3.3.3. Relative Promise of Different Social Norms Themes

Smoking-related social norms were represented by five different message themes. Only one of these themes had a high percent to gain: Injunctive Social Norms from Peers (12.5%). The remaining themes had a moderate percent to gain (General Social Norms (Smoking) (9.2%), and General Social Norms (Not Smoking) (8.0%)), or low percent to gain (Descriptive Social Norms (6.5%), and Injunctive Social Norms from Parents (4.1%)). These results indicate that the perceived disapproval of smoking among peers (Injunctive Social Norms) is likely to make for a more promising campaign theme than either the perception that smoking (or not smoking) will make you just like everyone else (General Social Norms) or the perceived prevalence of smoking (Descriptive Social Norms). These results also indicate that perceived disapproval of smoking among peers is a more promising theme than perceived disapproval of smoking among parents, both because almost all youth already believe their parents would disapprove of their smoking (76%) and because endorsement of peer-related injunctive norms is strongly associated with having no intention to use tobacco (scale-intention association, OR = 3.10; Table 3).

4. Conclusions

Of the 21 potential campaign themes that were examined, some were particularly promising and others were less promising. In addition, within each theme, some individual beliefs showed a greater level of promise as

the target of a campaign message. It is important that all of these findings are interpreted with a consideration as to how likely it is that a successful campaign could be built around the theme/message. Attention should be focused on the promising themes and messages that will lead to campaigns that elicit negative emotions, can take the form of a narrative/story, present information that is new and is not easily contradicted by real world experiences, and have previously been shown to be effective.

5. References

Hornik, R., & Woolf, K. D. (1999). Using cross-sectional surveys to plan message strategies. *Social Marketing Quarterly*, 5(2), 34-41.

Appendix A. Individual Belief Items: Percent to Gain, Belief-Intention Association (OR), and Percent to Move (Ordered from Highest to Lowest Percent to Gain, within Subset)

Belief items were ranked from highest to lowest percent to gain, and then grouped into quintiles. Percent to gain values in the first (top) quintile ranged from 11.80% - 15.90%. These are highlighted in bold text in the table. Percent to gain values in the second quintile ranged from 10.20% - 11.70%; values in the third quintile ranged from 8.97% - 10.10%; and values in the fourth quintile ranged from 7.21% - 8.96%. Percent to gain values in the fifth (bottom) quintile ranged from 1.70% - 7.20%, and these are highlighted in italicized text in the table.

All belief items were asked with the introductory stem “If I smoke, I will...”, unless otherwise noted with a superscript in the table (superscripts are explained in the notes section at the end of the table). Belief items were coded so that the desired response was “very likely” (the most anti-smoking belief), unless otherwise indicated in parentheses after the belief item.

Belief Items (within themes)	Percent to Gain	OR	Percent to Move
	(%)		(%)
FDA Relevant			
<u>Physical (Cosmetic) Effects</u>			
Get yellow fingers	13.3	3.50	53
Develop uneven skin coloring	12.8	4.68	48
Get wrinkles	12.3	3.79	52
Get yellow teeth	10.8	5.09	29
Develop brittle hair	10.2	2.47	54
Have a smelly home	9.9	3.95	37
Have smelly hair and clothes	9.1	4.11	27
Have a bad taste in my mouth	8.9	3.18	38
Look gross	8.3	2.97	40
Get bad breath	8.3	3.05	36
<u>Addiction</u>			
Be controlled by smoking	12.5	2.93	60
Be unable to stop smoking when I want to	10.5	2.64	57
Become addicted to cigarettes	9.8	2.81	51
Become addicted to nicotine	9.7	2.65	49

Belief Items (within themes)	Percent to Gain	OR	Percent to Move
	(%)		(%)
Eventually need to smoke even more	7.8	2.09	54
<u>Harmful Ingredients: Common Products Framing</u>			
Inhale ammonia, which is also found in many household cleaners	11.8	3.26	49
Inhale mercury, which is also found in mascara	11.6	2.96	55
Inhale acetone, which is also found in nail polish remover	11.1	2.91	53
Inhale benzene, which is also found in some types of detergents	11.0	2.83	53
Inhale carbon monoxide, which is also found in car exhaust	10.9	3.07	48
Inhale lead, which is also found in some paints	10.6	2.78	52
Inhale nickel, which is also found in stainless steel	9.8	2.41	56
Inhale poisons	9.4	3.09	39
Inhale arsenic, which is also found in car batteries	9.3	2.41	53
Inhale nicotine	9.0	3.09	38
Inhale tar, which is also used to pave roads and driveways	8.9	2.58	46
Inhale formaldehyde, which is also found in glues and adhesives	8.4	2.20	53
Inhale chemicals	7.9	2.79	36
<u>Physical (Health) Effects</u>			
Develop sexual and/or fertility problems	15.4	3.88	56
Develop cancer	14.6	5.30	47
Lose my taste buds	14.6	4.92	52
Need chemotherapy and radiation	14.4	4.21	54
Stunt my growth	14.2	3.91	53
Develop inflammation in my lungs	12.1	5.67	33
Develop headaches	11.9	2.74	55
Develop a blood clot in my brain	11.9	3.02	58
Die an early death	11.7	3.64	41
Develop diseases in my toes and fingers	11.6	3.07	59
Develop mouth cancer	11.5	2.86	55
Suffer a stroke	11.0	2.71	57
Develop high blood pressure	10.5	2.84	51
Develop fatal lung disease	10.3	4.10	37
Have a burning feeling in my throat	10.1	2.77	51

Belief Items (within themes)	Percent to Gain	OR	Percent to Move
	(%)		(%)
Get sick more easily	9.9	3.20	41
Develop circulation problems	9.6	3.08	41
Have difficulty concentrating	9.3	2.41	53
Keep myself from overeating (very unlikely)	9.3	2.34	55
Become short of breath	9.3	3.77	37
Have a soothing feeling in my throat (very unlikely)	9.0	3.15	41
Destroy my brain cells	9.0	3.26	36
Be able to focus (very unlikely)	8.1	2.44	45
Develop throat cancer	8.0	2.31	47
Develop bad coughs and phlegm	7.3	2.71	35
Harm my health	7.2	2.99	30
<i>Clog my arteries</i>	7.1	2.14	42
<i>Be able to deal with physical pain (very unlikely)</i>	6.5	2.18	46
<i>Damage my body</i>	6.2	2.38	33
<i>Develop heart disease</i>	5.5	1.89	46
<i>Develop lung cancer</i>	5.4	2.03	36
<u>Youth Susceptibility to Health Effects</u>			
Be just as likely to damage my body as an adult smoker would	9.8	5.22	27
People my age who smoke every day are just as likely to harm their health as older people who smoke every day (strongly agree) ^a	8.3	2.62	44
<i>If I smoke every day, I am just as likely to harm my health as an older person who smokes every day (strongly agree)^a</i>	6.6	2.20	42
<u>Harmful Ingredients: Health Effects Framing</u>			
Inhale acetone, which makes it hard to breathe	8.9	2.81	44
Inhale lead, which causes cancer	8.2	2.57	43
Inhale benzene, which damages the heart	7.9	2.48	43
Inhale ammonia, which harms the lungs	7.8	2.51	42
Inhale nickel, which makes it hard to breathe	7.6	2.31	46
Inhale poisons that damage the body	7.5	2.75	37
Inhale formaldehyde, which harms the lungs	7.3	2.54	38
Inhale mercury, which causes cancer	7.3	2.21	46
<i>Inhale tar, which causes lung cancer</i>	7.2	2.58	38

Belief Items (within themes)	Percent to Gain	OR	Percent to Move
	(%)		(%)
<i>Inhale carbon monoxide, which causes sexual and/or fertility problems</i>	7.2	2.24	45
<i>Inhale arsenic, which damages the heart</i>	7.1	2.29	43
<i>Inhale nicotine, which causes addiction</i>	6.9	2.69	34
<i>Inhale chemicals that damage the body</i>	4.8	2.15	30
FDA Less Relevant			
<u>Expression of Independence (Smoking)</u>			
Show that I am independent (very unlikely)	13.9	4.17	53
Be making my own decisions (very unlikely)	11.8	2.88	59
Have control over my life (very unlikely)	11.2	3.54	46
<u>Injunctive Social Norms from Peers</u>			
Others my age will accept it (very unlikely)	13.8	3.49	61
Others my age will disapprove	13.5	3.20	64
My friends will accept it (very unlikely)	13.1	3.79	53
My friends will disapprove	11.7	3.01	57
My friends won't care about it (very unlikely)	11.2	2.71	60
Others my age won't care about it (very unlikely)	10.6	2.30	70
<u>Social Perceptions (Smoking)</u>			
Be unable to go to places that don't allow smoking	15.6	5.20	46
Be able to show others that I'm not afraid to take risks (very unlikely)	15.4	3.91	63
Look immature	15.0	3.85	64
Gain friends (very unlikely)	13.6	3.54	61
Be unpopular	13.6	2.93	72
Lose friends	12.7	3.14	62
Look uncool	12.4	2.90	63
Look stupid	12.3	3.55	56
Not look confident	12.0	2.87	63
Look mature (very unlikely)	12.0	3.47	48
Get respect from others my age (very unlikely)	11.8	3.18	56
Lose respect from others my age	11.8	2.74	62
Look ridiculous	11.6	3.00	57
Look attractive (very unlikely)	10.6	3.29	45
Be sexually/romantically undesirable	10.3	2.24	68

Belief Items (within themes)	Percent to Gain	OR	Percent to Move
	(%)		(%)
Look cool (very unlikely)	9.9	2.73	50
Look confident (very unlikely)	9.7	2.75	48
Be popular (very unlikely)	9.7	2.41	58
Lose respect from my brother(s) and/or sister(s)	9.5	2.98	45
Look unattractive	9.3	2.32	57
Be sexually/romantically appealing (very unlikely)	9.1	2.79	45
Look intelligent (very unlikely)	7.5	2.69	38
<i>Gain respect from my brother(s) and/or sister(s) (very unlikely)</i>	7.1	2.74	33
<u>Mood Effects</u>			
Feel less bored (very unlikely)	15.9	6.39	51
Feel relaxed (very unlikely)	13.3	3.75	54
Feel less cranky (very unlikely)	11.5	3.77	46
Enjoy life more (very unlikely)	10.5	3.78	34
Feel better when I am sad (very unlikely)	10.3	3.14	46
Have something to do with my hands (very unlikely)	10.0	2.80	55
Feel content (very unlikely)	9.8	2.97	45
Be able to control my anger (very unlikely)	8.9	2.54	49
Feel more comfortable in social situations (very unlikely)	7.4	2.32	45
<i>Be able to forget about my problems (very unlikely)</i>	6.1	1.92	50
<u>Self-Efficacy</u>			
How sure are you that, if you really wanted to, you could say no to a cigarette offer if you are at a party where most people are smoking? (completely sure) ^b	10.4	4.67	32
How sure are you that, if you really wanted to, you could say no to a cigarette offer if a very close friend offers it? (completely sure) ^b	9.0	3.58	34
How sure are you that, if you really wanted to, you could say no to a cigarette offer if someone you know offers it? (completely sure) ^b	8.1	3.96	28
<u>Impact on Sports</u>			
Do poorly in sports	10.7	3.37	41
Lose my breath easily while playing sports	10.6	3.94	33
Have less energy to play sports	7.7	2.86	37
<u>General Social Norms (Smoking)</u>			
Be more like everyone else (very unlikely)	10.8	2.50	62

Belief Items (within themes)	Percent to Gain	OR	Percent to Move
	(%)		(%)
Be doing what most others my age are doing (very unlikely)	10.4	2.32	69
<u>Endangering Others</u>			
Harm children through second-hand smoke	11.3	4.38	36
Harm my future children	9.4	3.81	35
Harm my friends and family through second-hand smoke	7.3	3.36	26
<i>Harm nonsmokers through second-hand smoke</i>	6.9	2.77	30
<u>General Social Norms (Not Smoking)</u>			
Be more like everyone else ^c	9.3	1.91	78
<i>Be doing what most others my age are doing^c</i>	5.6	1.52	72
<u>Peer Pressure from Others</u>			
Do others your age encourage you to smoke (never) ^d	9.5	3.35	39
Do your friends offer you a smoke (never) ^d	8.2	3.76	30
<u>Social Perceptions (Not Smoking)</u>			
Look cool ^c	11.5	2.40	74
Look confident ^c	10.5	2.58	60
Get respect from others my age ^c	9.2	2.06	66
Gain friends ^c	9.1	2.02	70
Look intelligent ^c	8.0	2.13	57
Look attractive ^c	7.3	1.82	64
<i>Gain respect from my brother(s) and/or sister(s)^c</i>	6.7	1.98	53
<i>Be popular^c</i>	6.1	1.53	78
<i>Look mature^c</i>	5.4	1.61	62
<i>Be sexually/romantically appealing^c</i>	4.4	1.37	75
<u>Descriptive Social Norms</u>			
<i>How many others your age smoke, but not every day? (none)^e</i>	7.2	1.72	69
<i>How many others your age have smoked even one or two puffs? (none)^e</i>	6.4	1.54	77
<i>How many others your age smoke every day? (none)^e</i>	5.7	1.62	60
<u>Cost of Smoking</u>			
Spend hundreds of dollars on tobacco products a year	11.3	4.81	30
Have less spending money	9.6	4.29	31
Spend thousands of dollars on tobacco products over my lifetime	7.9	2.90	33

Belief Items (within themes)	Percent to Gain	OR	Percent to Move
	(%)		(%)
<i>Spend more money on doctor and dentist visits</i>	7.2	2.33	42
<i>Waste money I could have spent on other things</i>	4.8	2.71	23
<u>Expression of Independence (Not Smoking)</u>			
<i>Be showing that I am independent^c</i>	6.8	1.86	58
<i>Have control over my life^c</i>	6.2	2.08	41
<i>Be making my own decisions^c</i>	3.4	1.46	44
<u>Injunctive Social Norms from Parents</u>			
<i>Get in trouble with my parent(s)/guardian(s)</i>	5.6	2.33	32
<i>My parent(s)/guardian(s) will disapprove</i>	5.2	3.18	21
<i>My parent(s)/guardian(s) will be upset</i>	4.7	3.02	20
Individual Belief Items (not included in any scale)			
Develop a scratchy voice	15.6	3.78	66
Lose weight (very unlikely)	12.1	2.38	71
Get a buzz (very unlikely)	9.7	2.07	72
Constantly think about smoking	9.4	1.95	77
Have a pleasant taste in my mouth (very unlikely)	7.8	3.38	33
Have you tried to convince your friends not to smoke (almost always) ^f	7.7	1.62	86
<i>My parent(s)/guardian(s) won't care about it</i>	6.3	3.57	23
<i>Influence my brother or sister to smoke</i>	6.3	1.45	82
<i>Lose my appetite (very unlikely)</i>	2.4	1.18	83
<i>How often do your brother(s) and/or sister(s) smoke around you (never)^d</i>	1.7	1.10	75

Note. N = 1142 (total sample; weighted).

^a Respondents were asked whether they agreed or disagreed with the following statements (with response options on a five-point scale ranging from *strongly disagree* to *strongly agree*). These items did *not* begin with the “If I smoke, I will” stem but rather were stated exactly as written above. For each of these beliefs, the desired response option was *strongly agree*.

^b Respondents were asked to rate how sure they were to these three items (with response options on a five-point scale ranging from *not at all sure* to *completely sure*). These items did *not* begin with the “If I smoke, I will” stem but rather were stated exactly as written above. For each of these beliefs, the desired response option was *completely sure*.

^c The only difference with these items is that they began with the introductory stem “If I do not smoke at all, I will...”. The desired response here was *very likely*.

^d Respondents were asked how frequently these items happened (with response options on a five-point scale ranging from *never* to *almost always*). These items did *not* begin with the “If I smoke, I will” stem but rather were stated exactly as written above. For each of these belief items, they were coded with the desired response of *never*.

^e Respondents were asked to rate how many people they thought each item was true of (with response options on a five-point scale ranging from *none* to *all*). The items did *not* begin with the “If I smoke, I will” stem but rather were stated exactly as written above. For each of these beliefs, the desired response option was *none*.

^f Respondents were asked how frequently this happened (with response options on a five-point scale ranging from *never* to *almost always*). This item did *not* begin with the “If I smoke, I will” stem but rather was stated exactly as written above. For this belief item, the desired response option was *almost always*.

Appendix B. Sub-Group Differences in Percent to Gain Estimates for each Message Theme

Percent to Gain Estimates	Overall		Girls	Boys	13-15	16-17	White	Black	Hispanic	Low	High
	N=1142		N=556	N=587	year olds N=699	year olds N=444	(ref) N=647	N=163	N=238	Sensation Seekers N=709	Sensation Seekers N=433
FDA Relevant											
Physical (Cosmetic) Effects	9.0%	M	7.0%	7.0%	8.5%	9.4%	9.1%	11.5%	8.6%	7.9%	10.5%
Addiction	8.3%	M	8.2%	8.2%	7.3%	9.6%	6.5%	12.3%	12.4%	7.4%	9.7%
Harmful Ingredients: Common Products ^a	7.7%	M	7.7%	7.7%	6.1%	9.8%	6.8%	6.9%	14.5%	7.9%	7.4%
Physical (Health Effects)	7.6%	L	8.0%	8.0%	6.6%	8.8%	8.0%	10.2%	5.9%	6.4%	9.6%
Youth Susceptibility to Health Effects	6.6%	L	5.7%	5.7%	6.2%	7.0%	7.8%	5.2%	6.1%	6.7%	6.5%
Harmful Ingredients: Health Effects ^a	5.8%	L	6.0%	6.0%	6.7%	4.5%	7.4%	9.8%	1.7%	4.5%	8.0%
FDA Less Relevant											
Expression of Independence (S)	12.8%	H	11.4%	11.4%	11.0%	15.3%	11.1%	18.1%	15.0%	11.3%	14.7%
Injunctive Social Norms from Peers	12.5%	H	11.8%	11.8%	11.0%	14.4%	11.1%	14.9%	15.2%	12.9%	10.9%
Social Perception (S)	11.9%	H	11.3%	11.3%	9.3%*	15.8%*	11.6%	12.8%	12.9%	10.4%	13.9%
Mood Effects	11.7%	H	12.5%	12.5%	9.8%	14.4%	11.2%	9.5%	15.2%	9.9%	14.1%
Self-Efficacy	9.6%	M	8.3%	8.3%	10.5%	8.6%	9.4%	7.9%	12.2%	7.9%*	12.1%*
Impact on Sports ^a	9.5%	M	6.9%	6.9%	8.9%	9.9%	8.3%	13.6%	10.4%	9.5%	9.6%
General Social Norms (S)	9.2%	M	8.5%	8.5%	6.1%*	13.9%*	9.9%	6.2%	8.3%	8.0%	10.8%
Endangering Others ^a	9.1%	M	7.1%	7.1%	7.5%	11.4%	8.1%	14.4%	9.2%	6.0%*	14.1%*
General Social Norms (NS)	8.0%	M	5.2%	5.2%	6.9%	9.2%	9.2%	3.0%	10.3%	10.2%	5.7%
Peer Pressure From Others	7.3%	L	7.6%	7.6%	6.1%	8.6%	6.1%	9.4%	9.2%	6.1%	8.6%
Social Perception (NS)	6.7%	L	4.4%	4.4%	7.7%	5.7%	7.7%	9.9%	3.5%	8.8%	4.8%
Descriptive Social Norms	6.5%	L	3.8%	3.8%	6.1%	2.5%	6.1%	4.0%	8.5%	4.1%	9.9%
Cost of Smoking ^a	6.4%	L	6.2%	6.2%	5.3%	7.9%	3.0%	12.4%*	12.7%*	6.3%	6.8%
Expression of Independence (NS)	5.1%	L	4.6%	4.6%	4.3%	6.4%	4.9%	4.5%	6.5%	6.2%	4.1%
Injunctive Social Norms from Parents	4.1%	L	4.7%	4.7%	4.0%	3.9%	3.4%	11.0%*	1.6%	5.2%	2.4%

Note. * (and bold text) indicates that the scale percent to gain estimates for different levels of a moderator are significantly different ($p < .05$). For overall percent to gain: H (high) = significantly greater than scales categorized as low ($p < .05$); M (moderate) = not significantly different from scales categorized as high or low; L (low) = significantly less than scales categorized as high ($p < .05$). White respondents were non-Hispanic White, and Black respondents were non-Hispanic Black. S = consequences of smoking framing; NS = consequences of not smoking framing.

^a All of the individual beliefs in this set were asked of only half the total sample (e.g., respondents were randomly assigned to receive only one type of Harmful Ingredient item; or all items in the set were only asked of respondents randomly assigned to the Daily Stem Condition).