



What's in the message? An analysis of themes and features used in vaping prevention messages

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ABSTRACT

Introduction: Federal, state, local, and non-government officials have developed and implemented a variety of vaping prevention messages to curtail the vaping epidemic among youth in the US. This study sought to collect a comprehensive set of vaping prevention messages and characterize the themes and features of those messages. **Methods:** We used a two-fold search strategy to identify messages, utilizing the existing content database from Vaping Prevention Resource (vapingprevention.org) and supplementing those messages with web searches. Potential messages were included if they were vaping prevention-oriented, appropriate or relevant for youth, and in a static web or print format.

Results: A total of 220 messages met criteria. Messages were coded on the presence or absence of 37 objective features within five categories: message themes, imagery, text features, message perspective, and other (e.g., source). The most common themes were nicotine addiction (32%), chemicals (30%), health effects (24%), and industry targeting (19%). Eighty-five percent of messages included imagery, with 27% showing a vaping device, 22% showing smoke or vapor, and 21% showing a person's face. Just over half (56%) included a message source.

Conclusions: Vaping prevention messages for youth have commonly focused on addiction and health risks of vaping, and they vary on a series of text and image features. Further research is needed to understand the efficacy of messaging approaches in preventing vaping among youth.

1. Introduction

The shifting tobacco product landscape endangers decades of public health progress as the use of alternative tobacco products rises in the U. S. (Fairchild et al., 2013). For example, the 2021 National Youth Tobacco Survey shows that e-cigarette use remains high, with roughly two million youth reporting past 30-day use (Food & Drug Administration, 2021). Not only do e-cigarette aerosols contain harmful chemicals (Barrington-Trimis et al., 2014), but evidence has also shown that nicotine exposure can affect the adolescent brain and potentially lead to cigarette smoking (Barrington-Trimis et al., 2016; England et al., 2015).

Tobacco prevention campaigns are an effective tobacco prevention strategy for youth and young adults (Farrelly et al., 2017; Zhao et al., 2016), and vaping prevention campaigns are urgently needed as the U.S.

Surgeon General has characterized the use of e-cigarettes as an epidemic among our nation's young people (United States Department of Health & Human Services, 2018). Federal, state, and local tobacco prevention campaigns are increasingly focusing on vaping prevention. In 2019 alone, the FDA dedicated \$60 million to vaping prevention advertisements (Food & Drug Administration, 2019), and the state of California spent \$20 million on a digital and social media public awareness campaign about the dangers of vaping (Office of Governor Gavin Newsom, 2019). In addition, the American Heart Association (2019) launched a \$20 million prevention initiative, including a school awareness campaign dubbed #QuitLying (QuitLying.org), while the Truth Initiative reportedly spends about \$100 million per year on marketing, advocacy, and research – including on vaping prevention campaigns – in efforts to achieve their mission of “a culture where young

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people reject smoking, vaping, and nicotine” (Truth Initiative, 2021).

While scholars have systematically analyzed the content of pro-cigarette marketing (Laestadius et al., 2019), no published examination of vaping prevention messages currently exists. Given that vaping prevention messages are proliferating rapidly (Roditis et al., 2020), it is vital to characterize the messaging approaches of existing campaigns. In the current study, we sought to characterize the current landscape of vaping prevention message elements – themes, imagery, and other features – to understand current messaging approaches and highlight gaps for future message development and testing.

2. Methods

We utilized a two-fold search strategy to identify vaping prevention messages. First, we reviewed all messages from the Vaping Prevention Resource (VPR; vapingprevention.org) that had the potential to be included in the study. VPR is an educational open-access resource created by tobacco control researchers in the Lineberger Comprehensive Cancer Center, Gillings School of Global Public Health, and Hussman School of Journalism and Media at the University of North Carolina – Chapel Hill. VPR provides practitioners, researchers, and communities with downloadable vaping prevention media content that has been collected from federal, state, and local public health practitioners.

The team that manages VPR has developed a protocol for inclusion and exclusion criteria for the media gallery. Media are included if they are vaping prevention or cessation media items aimed at any audience, once permission from the creators of that content is procured. Messages are excluded if they focus on combustible cigarettes or other types of tobacco products besides vaping, contain pro-vaping content, or require payment to access materials.

The VPR coding team reviews organization websites to identify relevant vaping prevention campaign media items for the gallery. Organizations that develop vaping prevention materials are contacted by the VPR team to ask their permission to post these items publicly in the media gallery. If permission is granted, then the media items are posted publicly. If permission is not granted, the media items exist only in VPR’s internal database and are not accessible by the public. Due to a dearth of evidence on ‘effective’ or ‘ineffective’ vaping prevention messaging – VPR does not screen out media items based on “effectiveness.”

At the time this study was undertaken, VPR had collected messages from a number of federal sources (FDA, CDC, NIDA), state health departments (Alaska, California, Delaware, Hawaii, Illinois, Indiana, Maryland, Minnesota, Massachusetts, Missouri, New Hampshire, New Jersey, New York, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Dakota, Utah, Wisconsin), and non-government sources (Truth Initiative, American Lung Association, American Heart Association, Rescue Agency). In total, 390 messages on VPR – from both the public and internal databases – were identified as possibly being relevant for this study.

To supplement the messages collected through VPR, we conducted web searches using Google with the following key terms: “vaping prevention,” “anti-vaping,” “vaping prevention messages,” and “vaping prevention ads.” In total, we examined the first 15 pages of Google images, which led us to original sources of content, such as individual websites, Twitter, and Instagram. We downloaded messages that had the possibility of ultimately meeting inclusion criteria. A limited number of duplicate messages (those already in VPR) were identified during these searches. Excluding duplicates, this process yielded 71 potential additional messages for our study. While our search was not limited to messages from the United States, most messages originated from United States’ sources.

Next, we screened each individual message for potential inclusion in the study. To be included, a message needed to be (1) vaping prevention-oriented, (2) directed towards youth, and (3) in a static web or print format. We excluded messages that did not meet these criteria, including

vaping cessation messages, messages targeting adults (e.g., parents), and messages that were not in a static web or print format (i.e., videos or GIFs). A total of 220 messages met all inclusion criteria, including 177 messages from VPR and 43 from additional searches. All 220 messages used in this study are now available in the VPR media gallery (vapingprevention.org).

To analyze the content of the vaping prevention messages, we first developed a coding rubric. A complete list of coding categories and the coding scheme can be found in Appendix A. The 37 categories in the rubric were established in order to examine the elements of interest. Coding categories and items were determined based upon an inductive approach of examining features that varied across the final set of messages (e.g., themes, bright colors, text features, message perspective), informed by the research team’s prior work with tobacco prevention and control messages.

We included five categories of message elements: message themes, imagery, text features, message perspective, and other features. Categories were non-exclusive and were coded as the absence or presence of each element. The message theme category was utilized to code for the overriding theme(s) present in the message (e.g., chemicals). The imagery category referred to the presence of any type of image. If an image was present, the image was further coded for the presence of vaping imagery, warning imagery, food imagery, or a person’s face. The text feature category referred to if the message contained language that posed a question, used a statistic or hashtag (#), or included the word “fact.” Message perspective referred to the use of first-person language (“I” or “we”), second-person language (“you”), and the use of the word “teen.” Other features included bright/vivid colors, memes, and source attribution.

After establishing the rubric, two independent coders documented the presence or absence of 37 message elements for each message. All messages were separately coded on the presence or absence of each code. For example, a message could include multiple themes, such as chemicals and flavors. Coding took place from October 2020 until November 2020. Coder agreement percentage ranged from 89% to 100%. Interrater reliability was above acceptable levels for all codes, based on Gwet AC₁ coefficients computed in AgreeStat, version 2015.6.43 (Gwet, 2014). All Gwet AC₁ scores were greater than 0.87, except for coding the presence or absence of the “also found in” statement for chemical-themed messages and the presence or absence of bright/vivid colors, which achieved acceptable Gwet AC₁ scores of 0.78 and 0.82, respectively. Coding disagreements were resolved through discussion among the two coders and a third independent referee.

3. Results

The 220 vaping prevention messages varied greatly in terms of source, with messages from 35 different organizations. Nearly half of the messages (104; 47%) were created by state agencies. Fifty-six messages (26%) were created by non-government organizations, such as Truth Initiative (truthinitiative.org). Federal agencies created twenty-seven messages (12%), and 23 (11%) were created by local agencies. The remaining messages came from global, academic, or independent sources (4%).

3.1. Themes

A total of 14 different prevention message themes were identified, with a select few being utilized frequently (see Table 1). Nicotine addiction was the most used theme, with 32% ($n = 70$) utilizing this theme. Of these nicotine addiction messages, 89% ($n = 62$) used the word “nicotine,” 57% ($n = 40$) used the word “addiction,” and 47% ($n = 66$) used both words. The chemical theme was the second most common, utilized in 66 messages (30%). Of the chemical theme messages, 70% ($n = 46$) named a specific chemical, 51% ($n = 34$) used the word “chemical,” and 41% ($n = 19$) stated that the chemical was “also found in”

Table 1
Vaping Prevention Message Themes.

Variable	k	%
<i>Nicotine addiction</i>	70	32
Language used		
Uses the word "nicotine" ¹	62	89
Uses the word "addiction" ¹	40	57
Uses "nicotine" and "addiction" ¹	33	47
<i>Chemicals</i>	66	30
Language used		
Specific chemical name ²	46	70
Chemical "also found in" ^{2,3}	19	41
Uses the word "chemical" ²	34	51
<i>Health effects on organs (brain, lungs)</i>	52	24
Specific health effects		
Affects lungs ⁴	31	60
Affects brain ⁴	23	44
<i>Industry targeting</i>	42	19
<i>Flavors</i>	29	13
<i>Comparison to cigarettes</i>	27	12
<i>Health-related symptoms</i>	25	11
<i>Not harmless water vapor</i>	19	9
<i>Death</i>	12	6
<i>Unknown ingredients or health effects</i>	10	5
<i>Environmental impact</i>	10	5
<i>Sharing vapes can spread germs</i>	6	3
<i>Gateway to cigarette/tobacco use</i>	5	2
<i>Monetary cost</i>	1	1

Note. ¹ Coded if "Nicotine Addiction" was "yes", % is relative to all nicotine messages; ² Coded if "chemicals" was "yes", % is relative to all chemical messages; ³ Refers to chemical being found in other products; ⁴ Coded if "health effects on organs" was "yes", % is relative to all health effects messages.

another product (e.g., bug spray). Twenty-four percent ($n = 52$) of messages contained the theme of health effects on organs (brain, lungs), and 19% ($n = 42$) contained an industry-targeting theme. While ten other coded themes were present, these themes appeared in no more than 15% of the entire message pool, respectively.

3.2. Imagery

One hundred eighty-seven of the 220 messages (85%) contained imagery (see Table 2), with vaping/tobacco imagery being the most common. Vaping devices (27%), smoke or vapor (22%), vaping accessories (9%), combustible cigarettes (8%), and a person using a vaping device (6%) were the features within the vaping/tobacco imagery category. The most common warning imagery used was a warning symbol ($n = 17$; 8%), such as a biological hazard sign. The other most frequently used type of imagery was a person's face ($n = 45$; 21%). Seventeen messages (8%) contained an animal, while 12 messages (6%) contained food.

3.3. Other categories and features

Other categories included text features, message perspective, and other features (see Table 2). Forty-eight messages (22%) included "fact" or "factoid" in the text, and 27 messages (12%) used a hashtag (#). Messages infrequently posed a question ($n = 23$; 11%), used a statistic ($n = 22$; 10%) or cited a specific study ($n = 4$; 2%). Within the message perspective category, 79 messages (36%) used the word "you," while 16 messages (7%) used the words "I" or "we." Ten messages (5%) used the word "teen." More than half of the messages ($n = 122$; 56%) listed a source on the message, either as an image (e.g., logo) or text. Eighty-nine messages (41%) used bright/vivid colors, and six messages (3%) were internet memes (i.e., a message designed to be a viral image shared across social media platforms).

Table 2
Vaping Prevention Message Imagery and Other Features.

Variable	k	%
Contains Imagery	187	85
<i>Vaping/Tobacco Imagery</i>		
Vaping device	60	27
Type of device ¹		
Disposable	5	8
Pre-filled or refillable cartridges	10	17
Refillable tanks or mods	6	10
Pod mod	31	52
More than one	8	13
Vaping accessory	19	9
Type of accessory ²		
E-juice bottle	2	11
Pod	14	74
Battery	3	16
Smoke or vapor	48	22
Combustible cigarette	17	8
Person using vaping device	14	6
<i>Warning Imagery</i>		
Warning symbol	17	8
Graphic image	7	3
Nicotine chemical symbol	4	2
<i>Other Imagery</i>		
Person's face	45	21
Type of person ³		
Teen	33	73
Adult	12	27
Animal	17	8
Food	12	6
<i>Text Features</i>		
Includes "fact" or "factoid"	48	22
Uses a hashtag (#)	27	12
Poses a question	23	11
Uses a statistic	22	10
Cites specific study	4	2
<i>Message Perspective</i>		
Uses word "you"	79	36
Uses words "I" or "we"	16	7
Uses word "teen"	10	5
<i>Other Features</i>		
Source included	122	56
Bright/vivid colors	89	41
Internet meme	6	3

Note. ¹ Coded if "vaping device" was "yes", % is relative; ² Coded if "vaping accessory" was "yes", % is relative; ³ Coded if "person's face" was "yes", % is relative.

3.4. Message themes by source

To explore how message themes might vary by source, we compared federal, state, local, and non-government organizations use of themes using chi-square tests. We found that both federal (i.e., CDC, FDA) and local health departments were more likely to utilize the chemical theme ($\chi^2 = 36.82$, $p < .001$) than other sources, whereas industry manipulation ($\chi^2 = 19.09$, $p = .004$) and environmental impact ($\chi^2 = 23.08$, $p = .001$) themes were more common among non-government organizations than other sources. No other significant differences on themes emerged. Analyses also revealed that local health departments were less likely to display the source of the message compared to federal, state, and non-government sources ($\chi^2 = 15.04$, $p = .002$).

4. Discussion

Our results suggest that a large, diverse set of messages are currently being employed for vaping prevention and that these messages vary on a host of message elements. The most common themes were nicotine addiction and chemicals, which is not surprising given that these are among the well-established hazards of vaping. The next most common themes were health effects on organs and industry targeting. Health effects messages can be challenging to develop given the nascent state of

the literature on the health effects of e-cigarettes, although this literature is growing (National Academies of Sciences, 2018). Additionally, the industry targeting theme was effectively used for cigarette smoking prevention, most notably in the *Truth* smoking prevention campaign (Farrelly et al., 2005). However, questions remain as to whether messages about “Big Vape” will resonate with youth (Popova et al., 2021), highlighting the fact that further work is needed in this area.

Existing evidence supports the potential message efficacy of many of the frequently used themes found in this study, such as addiction and health risks of vaping (England et al., 2021; Noar et al., 2020). Adolescent and young adult e-cigarette users are less likely to believe that e-cigarette use will lead to addiction than non-users (Lazard, 2021; Rohde et al., 2018; Rohde et al., 2021), and evidence suggests that addiction beliefs may be an important message target for vaping prevention campaigns (Sangalang et al., 2019).

However, while the nicotine addiction theme was the most utilized in the message pool, there are challenges in illustrating to teens why being addicted to e-cigarettes is harmful. General messages about addiction may not resonate with adolescents and could lead to inaccurate equivalency comparisons (i.e., teens comparing e-cigarette addiction to phone addiction) (Roditis et al., 2020). Additionally, the belief that e-cigarettes are less harmful and addictive than cigarettes, and therefore some believe “safe” to use, is a barrier for prevention messaging. Research continues to support the idea that vaping exposes users to fewer harmful constituents than smoking combustible cigarettes (National Academies of Sciences, 2018). However, vaping is not harmless, particularly among youth for whom nicotine is highly addictive and harmful (United States Department of Health & Human Services, 2018).

Chemicals also emerged as a common theme, and one that was utilized by federal and local public health agencies more than other sources within this sample. There is evidence to support this theme as potentially effective for youth. The presence of familiar chemicals in vaping prevention messages has been perceived as alarming and scary by teens (Popova et al., 2021). Research suggests that the messaging strategy of focusing on chemicals with negative associations – such as formaldehyde – is a promising route for anti-vaping communicators hoping to elicit intended negative reactions among youth (Lazard, 2021; Roditis et al., 2020; Wiseman et al., 2016). Still, quantitative evaluations of the efficacy of this approach are needed.

Many adolescents believe that vaping could lead to health consequences, and research has found that youth respond favorably to messages stating specific health consequences of vaping (Roditis et al., 2020). However, health effects messages can be challenging to develop given the limited data on the health harms of e-cigarettes (National Academies of Sciences, 2018). Additional research is needed on the best ways to communicate with adolescents about the known health hazards and harms of e-cigarette use, especially as our understanding of vaping health effects continues to grow.

Little is known about how youth respond to industry targeting messages focused on “Big Vape” (Popova et al., 2021). In addition, several additional themes that emerged in this study have seldom been examined in research to date. For example, novel themes such as the environmental impact of vapes were used primarily by non-governmental organizations. This observation potentially reflects tobacco control practitioners’ response to market research which has established environmental concerns as a top priority of today’s youth (Deloitte, 2021). Additional work is needed to test these novel themes for resonance and potential impact among youth. It is also worth noting that while social factors loom large as drivers of youth vaping (Bernat et al., 2018), we did not identify any social themes across messages, which represents an important area for future research.

Other message elements beyond themes are important and may impact receptivity of vaping prevention messages among youth. For example, research suggests that the effects of closeness-implying pronouns (“we” versus “you”) used in messaging depend on whether the closeness implied by the pronoun is consistent with how individuals

perceive their relationship with the brand (Sela et al., 2012). In other words, if youth do not perceive a close relationship with the brand – such as is likely the case with youth vaping messages – then it is more advisable to use “you” language than “we.” A study exploring pronoun use in terms of health suggestions similarly echoes that “you”-based appeals may be more broadly effective among audiences (Tu et al., 2021).

Almost half of the messages did not list a source on the message itself, either as an image (e.g., logo) or as text. Source credibility is essential in determining trust in a health risk message (Schmidt et al., 2016), particularly in the context of vaping prevention messaging as it relates to risk perceptions and behavioral intentions (Erku et al., 2021). Government health agencies (i.e., federal and state agencies) and healthcare professionals (i.e., doctors, pharmacists) are considered trustworthy sources for health information among many US audiences (Jackson et al., 2019). Those groups would be well advised to ensure that their source is prominently displayed in such messaging.

Our findings revealed that vaping prevention messages include other diverse elements, such as vaping imagery, use of text features such as hashtags, and use of message formats such as memes. The impact of many of these elements in vaping prevention messages is unknown, but care may be warranted when implementing such features. Most importantly, pre-testing with the target audience is needed to ensure that messages resonate and elicit the appropriate responses from youth. For example, we should ensure that vaping imagery does not ‘cue’ youth addicted to nicotine to vape (Sanders-Jackson et al., 2019). Additionally, there is a need to confirm that hashtags and memes are perceived as appropriate and effective – as opposed to an inauthentic attempt to adopt the voice of young people – considering the messages tested in this study came from public health authorities rather than peers. Research is needed to examine the efficacy of these features to guide effective vaping prevention communication.

There are some limitations of this study. First, while our study collected and analyzed a large set of vaping prevention messages from various sources, this collection of messages was not exhaustive and does not represent all vaping prevention messages used by public health practitioners. Second, although we evaluated a diverse set of messages and message features, we only examined messages in a static web or print format. We did not examine other media types, such as videos, messages with animation, or GIFs. Finally, while our study was able to characterize the current landscape of vaping prevention messages, it does not tell us about the receptivity of these extant messages among youth, which should be the subject of further research.

5. Conclusion

This study characterized the elements of a large set of vaping prevention messages being used by public health practitioners. This systematic examination of vaping prevention messages highlights practical message elements while exposing gaps in current messaging approaches. This analysis of vaping prevention content – and the VPR database (vapingprevention.org) – can be used by researchers to inform the development of new vaping prevention messages as the need for prevention messages continues to rise alongside the youth vaping epidemic. Additional work is needed to understand the extent to which the message elements identified in our study are associated with higher or lower efficacy in preventing vaping among youth.

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Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: SMN has served as a paid expert witness in litigation against tobacco and e-cigarette companies.

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Appendix A. Coding categories and coding scheme

Source

Source of this ad? Write in: _____ (name)

What type of source?

- 1 = Federal (CDC, FDA)
- 2 = State (state departments of health)
- 3 = Local (local departments of health – ex. OC)
- 4 = Global (WHO)
- 5 = Academic (Stanford Toolkit)
- 6 = Non-government organization (Truth, Rescue)
- 7 = Unknown/other

Message Format

Imagery

- 0 = Text-only (does not contain any type of image)
- 1 = Text + Imagery (contains any type of image or imagery)

Bright/vivid colors

- 0 = No (does not feature any bright colors)
- 1 = Yes (features bright/vivid colors, such as neon colors, vivid red, bright blue, bright pink, bright green)

Meme? (looks like an Internet meme)

- 0 = No (does not contain any popular meme)
- 1 = Yes (contains popular meme or reference to popular meme)

General Imagery

Person's face?

- 0 = No (does not contain any type of face)
- 1 = Yes (contains any form of a human face)

(If yes): What type of person is included?

- 1 = Teen (person has younger or teen-like features)
- 2 = Adult (person has adult features, such as facial hair)

Animal?

- 0 = No (does not include any image of animal)
- 1 = Yes (includes image of animal - real image, drawing or cartoon)

Food?

- 0 = No (does not include any image of food)

- 1 = Yes (includes any image of food- real image, drawing or cartoon)

Nicotine Chemical Symbol?

- 0 = No (does not include any image of the chemical compound symbol)

- 1 = Yes (does include image of the chemical breakdown/compound of nicotine)

Graphic Image?

- 0 = No (does include any graphic/scary image)

- 1 = Yes (includes graphic/scary image – invoking fear or disgust)

Warning Symbol?

- 0 = No (does not include any image of a warning label, toxic chemical, or hazardous symbol)

- 1 = (does include any image of a warning label, toxic chemical, hazardous symbol, warning sign)

Source?

- 0 = No (message/ad does not include any logo of source, campaign name, or link to website)

- 1 = Yes (message/ad includes any type of source – logo, campaign name, source website)

Vaping/Tobacco Imagery

Does the image depict a vaping device?

- 0 = No (does not include any image of vaping device)

- 1 = Yes (includes any image of vaping device – real image, drawing or cartoon)

(If yes): What type of vaping device is depicted?

- 1 = Disposable (clearly depicts disposable device)

- 2 = Pre-filled or refillable cartridges

- 3 = Refillable tanks or mods

- 4 = pod-mod

Does the image depict any vaping accessories?

- 0 = No (does not include any image of vaping accessories)

- 1 = Yes (includes image of vaping accessory – real image, drawing or cartoon)

(If yes): What type(s) of vaping accessories are depicted (check all the apply)?

- E-juice bottle (includes image of e-juice bottle)

- o 0 = No

- o 1 = Yes

- Pod (includes image of pod)

- o 0 = No

- o 1 = Yes

- Coil (includes image of coil)

- o 0 = No

- o 1 = Yes

- Battery (includes image of battery)

- o 0 = No

- o 1 = Yes

Does the image depict a combustible cigarette?

- 0 = No (does not include any image of combustible cigarette(s))

- 1 = Yes (includes image of combustible cigarette(s))

Does the image have any smoke or vapor in it?

- 0 = No (does not include any image or imagery any smoke or vapor)

- 1 = Yes (includes image or imagery of smoke or vapor, on its own, in the background, or part of a larger image)

Does the image include a person using a vaping device?

- 0 = No (there is no vaping device at all, or person is not actually holding or using vaping device)
- 1 = Yes (there is a person holding or using a vaping device, or about to use the device)

Message Perspective

Message contains the word “teen”

- 0 = No (the word teen is NOT included)

- 1 = Yes (the word teen is included in the copy of the message)

Message uses first-person

- 0 = No (message is neutral or does NOT contain any use of the first

person)

1 = Yes (“I” or “we”) (message contains first-person language, such as “I” or “we” or “us”)

Message contains the word “you”

0 = No (any form of the word “you” is NOT included)

1 = Yes (any form of the word “you” is included, such as “you”, “your”, or “you’ll”)

Text Features

Does the message state that it is a “Fact” or “Factoid”?

0 = No (the message does not say “fact” or “factoid”)

1 = Yes (the word “fact” or “factoid” is included in the message)

Does the message pose a question?

0 = No (message does not pose any type of question)

1 = Yes (message clearly poses a question)

Does the message use a statistic?

0 = No (message does not include any type of statistic about vaping)

1 = Yes (message contains any type of statistic related to vaping, this does not include comparison to cigarettes)

Does the message use a hashtag (#)?

0 = No (message does not include any # with phrase)

1 = Yes (message includes # with phrase)

Does the message mention a specific study?

0 = No (message does include information about specific study or study citation)

1 = Yes (message includes text about specific study or includes citation from specific study)

Message Themes

Health effects on organs (brain, lungs)

0 = No (does not include image or message about health effects on specific organs)

1 = Yes (includes image or message related to health effects on specific organs, must discuss the actual health effects)

(If yes): Vaping affects brain

0 = No (does not include image or text about brain effects)

1 = Yes (includes image or text related to brain effects, or any image or text about the brain)

(If yes): Vaping affects lungs

0 = No (does not include image or text about lung effects)

1 = Yes (includes image or text related to lung effects, or any image or text about lungs)

Health-related symptoms

0 = No (does not include image or text about specific symptoms from vaping)

1 = Yes (includes image or text about specific symptoms from vaping - seizures, impulse, control memory, nausea, breathing, stress, immune system, anxiety)

Unknown Health Effects (e.g., don’t know long-term health effects)

0 = No (does include text about long-term or unknown health effects)

1 = Yes (includes text about long-term or unknown health effects or about the uncertainty of ingredients in e-cigarettes)

Sharing vapes spreads germs (corona, germs)

0 = No (does not include image or text about germs, sharing vapes or coronavirus)

1 = Yes (includes image or text about germs, sharing vapes or coronavirus)

Death

0 = No (does not include theme, image or text depicting death)

1 = Yes (includes theme, image or text depicting death)

Nicotine/Addiction

0 = does not include theme about nicotine or addiction

1 = theme of ad is about nicotine or addiction

Uses word “Nicotine”

0 = No (does not include the word nicotine)

1 = Yes (includes the word “nicotine”)

Uses word “Addiction”

0 = No (does not include the word “addiction”)

1 = Yes (includes the word “addiction”, or any form of the word)

Chemicals

0 = No(chemicals, are not the theme of the ad)

1 = Yes (chemicals are the theme of the ad)

Uses word “chemical”

0 = No (does include the word “chemical” at all)

1 = Yes (message includes the word “chemical” but does not specify type of chemical)

Specific chemical (NOT nicotine)

0 = No (does not specify chemical or does not include any mention of chemicals)

1 = Yes (includes specific type of chemical)

(If yes): “Also found in”

0 = No (does not reference how chemical can also be found in other things)

1 = Yes (references that chemical can “also be found in” other items)

Water vapor

0 = No (does not include theme or text about water vapor)

1 = Yes (includes theme or text about water vapor)

Flavors

0 = No (does not include theme, image or text about flavors)

1 = Yes (includes theme, image or text about vaping flavors)

Monetary Cost

0 = No (does include theme, image or text about the cost of vaping)

1 = Yes (does include theme, image or text about the cost of vaping for an individual - not including how much the industry is spending)

Industry Manipulation or Deception

0 = No (does not include theme, image or text about industry)

1 = Yes (includes theme, image or text about vaping industry, big vape, or big tobacco)

(If yes): Does it reference being a “lab rat”, “guinea pig” or “tested on” by the tobacco industry?

0 = No (general industry manipulation; does not specifically include image or text about being a “lab rat” or “guinea pig”, or “being tested on” or “experimented on”)

1 = Yes (specifically includes image or text about being a “lab rat” or “guinea pig”, or “being tested on” or “experimented on”)

Environmental Impact

0 = No (does not include theme, image or text about the effects vaping has on the environment)

1 = Yes (includes theme, image or text about the effects vaping has on the environment)

Comparison to cigarettes

0 = No (does not include theme, image or text about the comparison to cigarettes)

1 = Yes (includes theme, image or text about the comparison to cigarettes, such as “X number of cigarettes = 1 pod” or “same type of addiction as before” or “not a better alternative”.)

Gateway to cigarette/tobacco use

0 = No (does not include theme, image or text about the gateway effect e-cigarettes can have)

1 = Yes (includes theme, image or text about the gateway to cigarettes, cigarette addiction or other tobacco use)

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