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Brooke A. Moody
University of Louisville

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Reactions to FDA e-cigarette regulations: How vape shops in different
socioeconomic areas of Kentucky use Facebook

By
Brooke Moody

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Abstract

In May 2016 the FDA deemed e-cigarettes a tobacco product. The “deeming rule” gave regulation to e-cigarettes where none had existed prior. Some of the regulations included: prohibiting the sale of e-cigarettes to minors, prohibiting giving away free e-cigarette products, requiring FDA-approved warning labels on e-cigarette packaging, and requiring pre-market authorization of all new e-cigarette products. The consequences of these regulations primarily affected e-cigarette manufacturers and vape shops, where most e-cigarette sales take place. In July 2017 the FDA announced an extended timeline for some e-cigarette regulations, citing the reason as having limited research on if, and how, e-cigarettes can be used as a smoking cessation tool.

This research focuses on how vape shops use Facebook to communicate about FDA e-cigarette regulations, and whether socioeconomic factors influenced their communication. Facebook posts from six vape shops in two socioeconomic areas of Kentucky were evaluated using an inductive thematic analysis to determine the emerging themes and sub-themes. Four main themes related to the FDA regulations were found: FDA Regulations; Health, Smoking Cessation, and Education; Discounts and Giveaways; and E-liquids. Each theme was characterized by distinct sub-themes, which shared similarities and differences between the two socioeconomic areas.

Literature Review

Electronic Cigarettes

I. Background

Electronic cigarettes, one of several electronic nicotine delivery systems, are devices that use battery power to heat e-liquid, which creates an aerosol that is inhaled. Most e-liquids are composed of nicotine and a base, such as propylene glycol, and may contain flavorings, colorants, and other chemicals. In 2014, numerous electronic cigarette brands (approximately 500) and flavors (more than 7,000) were available in the marketplace (Zhu, Sun, Bonnevie, Cummins, Gamst, Yin, & Lee, 2014). None of these products are regulated by the FDA, including the amount of nicotine or other chemicals within the products (American Lung Association, 2016).

Depending in part on the style of manufacturing, electronic cigarettes are commonly referred to as “e-cigarettes,” “e-cigs,” “cigalikes,” “e-hookahs,” “mods,” “vape pens,” “vapes,” and “tank systems” among other colloquialisms. The range of styles varies from traditional cigarette-like to pens, tanks, and mods (i.e., modifiable). Electronic cigarettes (e-cigarettes) generally can be classified into one of two categories: open system or closed system. Closed system e-cigarettes are defined by pre-filled e-liquid cartridges. The user disposes of and replaces the e-liquid cartridge after use. Open system e-cigarettes allow the user to refill the device and obtain more customization (Tobacco Control Legal Consortium, 2014).

E-cigarettes entered the U.S. market in 2007. By 2014, the e-cigarette market was worth \$2.5 billion, with 60% of its value from sales of tank-style, mods, and other non-cigarette-like e-cigarettes (United States Department of Health and Human Services, 2016). In the same year,

sales by purchase location type were as follows: (1) convenience, food, drug, and big-box stores, \$900 million, (2) online, \$500 million, and (3) vape shops, \$1.1 billion (United States Department of Health and Human Services, 2016). A vape shop is a retail establishment that sells e-cigarettes, refill liquids (commonly referred to as e-liquid or e-juice), and e-cigarette hardware, replacement pieces, and other related products. Vape shops may also mix e-liquids, assemble e-cigarette devices, and offer repairs to customers' devices (Keith, 2016). Additionally, many vape shops are designed like bars and lounges to create a space for users to gather and to facilitate community (Cheney, Gowin, & Wann, 2015).

Users of e-cigarettes include a wide array of demographics, including men and women, young and old, individuals who do not use other tobacco products and individuals who have been smoking cigarettes for years, but research indicates some factors increase the likelihood of an individual using e-cigarettes. Increased routine e-cigarette use was associated with being male, being white or another non-hispanic ethnicity besides black and Asian, having less than a college degree, being divorced, widowed or single, having an annual household income less than \$50,000, and being lesbian, gay, or bisexual (Hu, Neff, Agaku, Cox, Day, Holder-Hayes, & King, 2016). Additionally, Hu et al. (2016) found e-cigarette use in the United States was most common in the South, followed by the Midwest and West. Further in regards to education and employment, one study found that of 350 current vapers who were active on online social platforms, 77% had completed some higher education or vocational training and 87.4% either had jobs or were engaged in studies (Browne & Todd, 2017), though these findings may be skewed as research has found that more Twitter users have college degrees than no college degree (Greenwood, Perrin, & Duggan, 2016).

E-cigarettes are also frequently used by youth, individuals under the age of 18. According to the USDHHS (2016), e-cigarettes are the most prevalent tobacco product used by youth in the U.S., with high school students' use growing 900% from 2011-2015. Other research supports the claim that e-cigarettes have become more popular than traditional cigarettes among adolescents. For example, Owusu et al. (2017) studied high school students in the Appalachian region of Tennessee. They found that 10.7% of students were current e-cigarette users, 8.1% were current traditional cigarette smokers, and 7.2% were dual users of e-cigarettes and an other tobacco product. Thirty-five percent of students indicated ever using e-cigarettes and 27.4% reported ever using traditional cigarettes (2017). These findings are significant because previous research suggests cigarette smoking followed a similar pattern 30 years ago, with 56.3% of respondents first trying a cigarette before the age of 18. Moreover, 88.2% of daily cigarette smokers tried their first cigarette by 18-years of age (USDHHS, 2012).

Reasons for e-cigarette use initiation range from tobacco health concerns to enjoyment. An examination of economic factors related to different tobacco product use found that e-cigarettes puffs could be substitutes for cigarette puffs and individuals were more likely to purchase e-cigarettes over traditional cigarettes when the price of traditional cigarettes increased. These results indicate that e-cigarettes can serve as a behavioral economic substitute for cigarettes (Johnson, Johnson, Rass, & Pacek, 2017). For many users, though, their e-cigarette use is a more intentional decision. For example, individuals recruited from a variety of online platforms, including an online vaping forum, Facebook, and Twitter, indicated a variety of reasons for vaping. Health benefits was the number one reason for vaping at 74%, followed by: other nicotine replacement therapies ineffective (45%), more enjoyable (35%), less offensive to others (31%), and easier than quitting nicotine altogether (35%) (Browne & Todd, 2017).

Another Twitter analysis comparing reasons for using e-cigarettes in 2012 and 2015, demonstrated that social image was also an important growing factor for using e-cigarettes. In 2012, the most frequently cited reason for using electronic nicotine delivery systems was quitting combustibles at 43%, followed by social image at 21% and use indoors at 14%. Then, in 2015 quitting combustibles and indoor usage had both decreased in frequency to 29% and 12%, respectively. Social image, on the other hand, had increased to 37% (Ayers et al., 2017).

In a study of vaping identity, Farrimond (2017) found that three distinct identity groups emerged: individuals who vape for pleasure, individuals who vape for health, and individuals ambivalent towards their vaping identity. Just over thirty-four percent vaped for pleasure-related reasons, and defined pleasure from vaping as more enjoyable than cigarettes, as a leisure activity, and as satisfaction gained from “being healthier.” These individuals (i.e., pleasure users) had a strong vaping identity and agreed that vaping improved their quality of life, but rejected smoking as an illness and vaping as a medical tool, which indicates the possibility of long-term usage. Conversely, one-fourth of the participants identified with vaping as a medical tool to confront their smoking addiction. They had a positive view of vaping, yet did not have a strong vaping identity. Both those who vaped for pleasure and those who vaped for health quit smoking cigarettes via vaping. Finally, some participants (11%) were more ambivalent towards e-cigarette use. They reported dual usage and rejected vaping as an identity. Instead, they saw vaping as short-term and were neutral towards its effects on their lives (Farrimond, 2017). These three identity groups represent a generalized categorization of e-cigarette users, and nuanced reasons for using e-cigarettes can be dependent on the intersectionality of a user’s family history, health, economic status, and geographic location.

II. Health Effects

The long-term health effects of e-cigarette use are unknown, based on current available research, yet studies have shown that young adults, 18-25 year olds, perceived e-cigarettes to be less harmful than traditional cigarettes. Additionally, individuals are more likely to perceive e-cigarettes to be less harmful than traditional cigarettes if they have a higher receptivity to e-cigarette marketing. (Pokhrel, Fagan, Kehl, & Herzog, 2015). Furthermore, in a study of health perceptions of e-cigarettes in three metropolitan areas, Miller et al. (2017) found that between 35.9% and 43% of participants believed e-cigarettes were less harmful than traditional cigarettes. Individuals with less than a college degree were more likely than those with a college degree to consider e-cigarettes less harmful (Miller, Berman, Atienza, Middleton, Iachan, Tortora, & Boyle, 2017).

Yet, a survey of 185 lung cancer specialists, including pulmonologists, thoracic surgeons, radiation oncologists, and medical oncologists, found that 75% of respondents did not believe that e-cigarettes were safer than traditional tobacco cigarettes and 78% disapproved of e-cigarettes as cessation tools (Shin, Kim, Kim, Kim, Chong, Park, et al., 2017). Additionally, 83% were concerned that e-cigarette use would lead to use of other tobacco products (Shin et al., 2017). These findings illustrate the disconnect between the beliefs of health professionals and the general public.

Research has found that three-fourths of e-cigarette users considered e-cigarettes to be healthier than traditional cigarettes, which may suggest that they perceive little reason to reduce their nicotine consumption (Browne & Todd, 2017). St. Helen, Dempsey, Havel, Jacob, and Benowitz (2017) also found that e-cigarette users can achieve the same overall nicotine exposure across different e-liquids by modifying their use. Another study found that the longer an

individual vaped, the higher nicotine concentration they used (Browne & Todd, 2017). In relation to e-liquid choice, research has shown that nicotine levels vary within brand batches by about 20% (Goniewicz, Hajek, & McRobbie, 2013).

These observations raise concerns regarding the possible adverse effects that come from using e-cigarettes that contain nicotine, especially for individuals who are not concerned with regulating the amount of nicotine they consume. Adverse effects of nicotine include addiction and impaired brain development, as well as the potential to induce further tobacco use (American Lung Association, 2016). For some populations, e-cigarette use increased the likelihood of future cigarette smoking. In a national study of youth tobacco habits between 2011 and 2014, Dutra and Glantz (2016) found that the number of youth who had ever smoked decreased by almost half and the number who currently smoke decreased by 9.4%. However, dual usage of cigarettes and e-cigarettes increased from 11.4% to 12.2%. Furthermore, college students who identified as non-smokers in 2014 were more likely to be current cigarette users in 2015 if they also used e-cigarettes at some point between the survey periods (Spindle, Hiler, Cooke, Eissenberg, Kendler, & Dick, 2016).

Another health concern regarding e-cigarettes are the chemicals that compose the e-liquid. Chemical flavorants in e-cigarettes, such as diacetyl and acetyl propionyl, are approved for ingestion but not inhalation. Both of these chemicals are associated with respiratory decline and disease when inhaled (National Institute for Occupational Safety and Health, 2017). A study of 159 e-liquid samples analyzed the presence of such chemicals and found that 74.2% of the e-liquids contained either diacetyl, acetyl propionyl, or both (Farsalinos, Kistler, Gillman, & Voudris, 2015). Of the samples containing diacetyl, 47.3% contained more than the National Institute for Occupational Safety and Health safety limit. Of the samples containing acetyl

propionyl, 41.5% contained more than the National Institute for Occupational Safety and Health safety limit. These findings indicate that e-cigarette users are likely exposed to chemicals that can cause respiratory problems, and even disease (Farsalinos, Kistler, Gillman, & Voudris, 2015).

The chemical content of flavorants is important because flavor plays a significant role in e-cigarette appeal. For example, one study found e-cigarette users are more satisfied after using their usual brand of e-liquid as opposed to other brands or flavors, even when they intake the same amount of nicotine from both brands. Furthermore, when comparing a strawberry flavored e-liquid and tobacco flavored e-liquid, neither of which participants had tried before, participants reported greater enjoyment of the throat and chest sensations from the tobacco flavor, but they rated the taste of the strawberry flavor better overall (St. Helen et al., 2017). There are FDA regulations that will go into effect in August of 2018 that address some of the concerns regarding chemical and nicotine content in e-cigarettes. Nonetheless, there are few regulations on the marketing of e-cigarette including the promotion of flavors, which is a frequent strategy used by vape shops. (USDHHS, 2016). Marketing plays a crucial role in shaping consumer habits and public perceptions; therefore, it is necessary to examine how e-cigarettes are marketed.

III. Marketing E-cigarettes

Both budget and regulations set apart vape shops from large tobacco companies. Many vape shops have smaller marketing budgets than large tobacco companies, which means vape shops may rely more heavily on alternative marketing strategies, such as social media and local community advertisements. Additionally, e-cigarette marketing is less restricted by the FDA, meaning vape shops can market through channels that traditional tobacco retailers cannot, such as sponsoring local sports teams. Other marketing tactics used by vape shops include advertising

on the back of local grocery store receipts, distributing flyers, branding their vehicles, and outdoor signage. Most shops also had loyalty and discount programs, many of which targeted specific audiences such as college students, military service members, and state government workers (Cheney, Gowin, & Wann, 2015). Vape shops often hosted community events as well. The purpose of the events was to promote their shops as a place to gather and build community (Cheney, Gowin, & Wann, 2015).

Research has also found that vape shops heavily use social media to promote their products and special offers. By one estimate, 70% of e-cigarette vendors used more than one social media network, with 63% using Twitter, 52% using Facebook, and 42% using Instagram (Mackey, Miner, & Cuomo, 2015). The function of the content they share on social media depends on the platform.

Tweets related to e-cigarettes are dominated by commercial content. In an examination of 73,672 tweets, which were collected using keywords related to e-cigs, 90% were categorized as commercial (i.e., had the presence of a brand or promotion), and 94% of those tweets included website links (Huang, Kornfield, Szczyпка, & Emery, 2014). In another study, researchers evaluated marketing trends for e-cigarettes. In total, 1.7 million tweets were analyzed and 93% were advertising (Kim et al., 2015).

E-cigarettes are also portrayed in YouTube videos, though the themes of the content differed than that of Twitter. Luo, Zheng, Zeng, and Leischow (2014) found that 94% of all e-cigarette related videos were pro e-cigarettes, with the most frequent genres being advertisement, user sharing, and review. Additionally, 71.4% of these videos promoted e-cigarettes as healthier than traditional cigarettes.

Facebook, on the other hand, is used as both a tool for promotion of products and community building (Cheney et al., 2015). Research on the use of Facebook by e-cigarette retailers is limited, and represents an opportunity for further study.

Facebook Marketing

I. Background

As of June 2017, Facebook had 2 billion active monthly users and 3 million businesses using the business platform (Facebook, 2017; Facebook Business, 2016). Comparatively, other similar social media platforms such as Twitter and Instagram have significantly fewer users, 328 million and 700 million, respectively (Constine, 2017). Facebook is characterized by user-
opted-in communities where individuals and organizations make posts, interact via commenting and likes, and share content. It is this interactive, user-generated aspect of Facebook that makes it so influential for marketing.

Research on users' interactions with content and other users on Facebook has shown that it is the active nature of the relationship that makes Facebook impactful (Alhabash, McAlister, Quilliam, Richards, & Lou, 2015). Users go to Facebook for entertainment and communication, but it is the intimate nature of Facebook that requires marketers to be aware of their audiences and what they value in order to deliver an experience users want to participate in (Ng, 2016).

In addition to the importance of audiences, there are also content types that perform best on Facebook. For example, one study found that human-interest pieces received the most "likes" by Facebook fans of community-based health promotion organizations (Ramanadhan, Mendez, Rao, & Viswanath, 2013). Another study found that posts utilizing positive emotional appeal received more likes than posts utilizing call-to-actions, yet call-to-action posts received more shares (Kite, Foley, Grunseit, & Freeman, 2016). Video posts are also growing in popularity, and

are even favored by Facebook's algorithms. In one study video posts received the most engagement, and they were four times more likely to be shared than photo posts. Link and text-only post types were the least engaging with the fewest likes and shares (Kite, Foley, Grunseit, & Freeman, 2016).

Research on how community health organizations use Facebook is beneficial to address because the efforts of these organizations directly oppose e-cigarette marketers. Additionally, community health organizations and e-cigarette marketers employ similar Facebook strategies, such as sharing testimonies. A study of 166 community-based organizations engaged in health promotion found that 42% had a presence on Facebook, Twitter, and/or YouTube. Of the 70 organizations with a social media presence, 69 (98.5%) had a Facebook account. Organization promotion, education/news, testimony, and positive appeal are the top types of content that the health organizations share on their social media (Ramanadhan, Mendez, Rao, & Viswanath, 2013; Kite, Foley, Grunseit, & Freeman, 2016).

Vape shops use Facebook as their main method for communicating with customers, and post content similar to that of health organizations (Cheney et al., 2015). They utilize Facebook to share news and testimonies, as well as announce new products in stock, post specials, share photos of their products, share video tutorials and promotions, and build community. They do take precautions, though, when posting on Facebook. For example, some vape shops are careful about what they post on Facebook so that it does not seem like they promoting tobacco use, which could result in being banned from Facebook (Cheney et al., 2015). As an important communication tool for vape shops, Facebook posts can provide insight into how vape shops respond to the regulation of e-cigarettes.

FDA Regulation of E-cigarettes

I. Current Climate

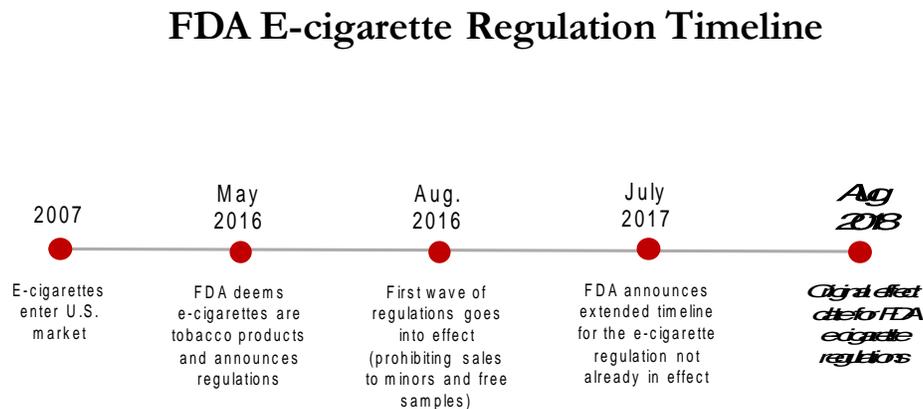
In 2016, the United States Department of Health and Human Services deemed use of tobacco, including e-cigarettes, not safe for youth and young adults (USDHHS, 2016).

Nevertheless, the FDA's regulations reflect a more inconclusive stance on the health effects of e-cigarettes. Currently, the FDA has regulated the sale of e-cigarettes only to individuals over the age of 18. As of August 2016, e-cigarette retailers, including vape shops, are required to check the ID of all patrons under the age of 27, in order to ensure they don't sell to minors (FDA, October 2017).

In May 2016, the FDA originally ruled that regulation of e-cigarettes would be beneficial for public health. The ruling proposed FDA-approved warning labels for e-cigarette and e-cigarette accessory packaging and advertisements, as well as ingredient lists on packaging. Additionally, it proposed the premarket authorization of all new e-cigarette products, including e-liquids. These regulations would have gone into effect in August 2018 (FDA, 2016).

However, in July 2017, the FDA reversed parts of its ruling to extend the deadline for pre-market authorization of all new e-cigarette products by an additional four years. A visual timeline of the FDA regulations is displayed in Figure 1. According to the FDA, the purpose for this new plan was, "... to ensure that the FDA has the proper scientific and regulatory foundation to efficiently and effectively implement the Family Smoking Prevention and Tobacco Control Act. To make certain that the FDA is striking an appropriate balance between regulation and encouraging development of innovative tobacco products that may be less dangerous than cigarettes" (FDA, July 2017).

Figure 1



The long-term effects of e-cigarettes are still undetermined; yet, health professionals do not agree e-cigarettes are safer than traditional cigarettes and they support thorough regulation of e-cigarettes (Shin et al., 2017). Some current research on the sociological effects of e-cigarette regulations suggest that e-cigarettes should be fully regulated until it is determined that they are not harmful. For example, media and advertisements were the most frequently cited sources of e-cigarettes information for health providers, which indicates a lack of professional resources on e-cigarettes (Shin et al., 2017) and a knowledge gap that may result in health providers recommending e-cigarettes for smoking cessation, though the effectiveness of e-cigarettes for cessation is inconclusive (Cheney et al., 2016; Browne & Todd, 2017; Yong, Hitchman, Cummings, Borland, Gravely, McNeill, & Fong, 2017).

Current research also suggests that FDA regulations have been successful in impeding intention to use e-cigarettes. Lee et al. (2017) evaluated the effectiveness of company-created e-cigarette warning labels versus FDA tobacco warning labels using the Theory of Planned Behavior, which theorizes that an individual's behavior intentions are influenced by evaluation

of risks and benefits. Participants in this study, college students, were first asked questions regarding their perceived advantages and risks of e-cigarettes, then they read the content of the warning label, and finally were asked again about their e-cigarette perceptions and intention to use. The results indicated that labels created by companies had lower readability. Additionally, the FDA label decreased participants' intention to use e-cigarettes by increasing their risk perception, whereas the company label did not (Lee et al., 2017).

However, others have found that less restrictive regulatory environments may actually be better for individuals who are trying to quit smoking cigarettes via e-cigarettes. By analyzing the smoking and quitting habits of smokers in the United Kingdom, United States, Canada, and Australia, it was found that individuals in more restrictive countries (Canada and Australia) who used e-cigarettes to aid in smoking cessation were less likely to abstain from smoking for 30 days or more (Yong, Hitchman, Cummings, Borland, Gravely, McNeill, & Fong, 2017).

II. Response to Regulatory Environment

Due to its prevalent use, social media is an effective tool for evaluating the opinion of individuals in the e-cigarette community (Cheney et al., 2015). For example, Twitter was used to evaluate the reactions of individuals' and business' to the May 2016 regulation announcement. The study found that most reactions were negative towards the announcement. Additionally, the analysis found that content being shared had inaccurate information regarding the ban and was perpetuated by pro-e-cigarette content, which may demonstrate a lack of accessible, accurate resources regarding the ban (Lazard, Wilcox, Tuttle, Glowacki, & Pikowski, 2017). These findings suggest that e-cigarette retailers, such as vape shops, may be at the forefront of public information on FDA regulations of e-cigarettes.

Beyond the specific May 2016 FDA regulations, researchers have found that e-cigarette policy making at the local level may be most viable due to pro-industry lobbying by large tobacco companies at the state level (Cox, Barry, & Glantz, 2016). Therefore, it is imperative that researchers look at the ways in which businesses in different communities respond to FDA regulation announcements in order to create a greater understanding of factors that could influence future regulations and health campaigns regarding e-cigarettes.

Furthermore, research indicates that vape shops are central to the e-cigarette community. An increase of over 300% in e-liquid sales from 2014 to 2015 suggests that more e-cigarette users are using open systems (Marynak, Gammon, King, Loomis, Fulmer, Wang, & Rogers, 2017). In Kentucky, for example, there was a 159.9% increase in e-liquid sales (Marynak et al., 2017). One estimate found that 63% of vapors, tanks, mods, and personal vaporizers sales come from vape shops (Herzog, 2016). This estimate may signal a trend towards local vape shops rather than corporate tobacco companies, which makes vape shops and their responses to regulations important to study.

The purpose of the current study is to analyze the content vape shops posted on Facebook in relation to the May 2016 Food and Drug Administration (FDA) announcement regarding regulations on e-cigarettes and the FDA's announcement of the extended timeline in July 2017. The intended outcome is to analyze whether and, if so, how message themes changed in relation to the announcements. Furthermore, content shared by vape shops in two socioeconomic areas of Kentucky will be examined in order to discern potential differences in how the vape shops in the two different areas responded to the regulation announcement. The research questions include:

R1: How did vape shops use Facebook to communicate about FDA regulation of e-cigarettes?

R2: Did Facebook posts differ between the two socioeconomic areas of Kentucky, and, if so, how?

R3: What patterns, if any, exist in vape shops' posts prior to and following the FDA announcements?

Methods

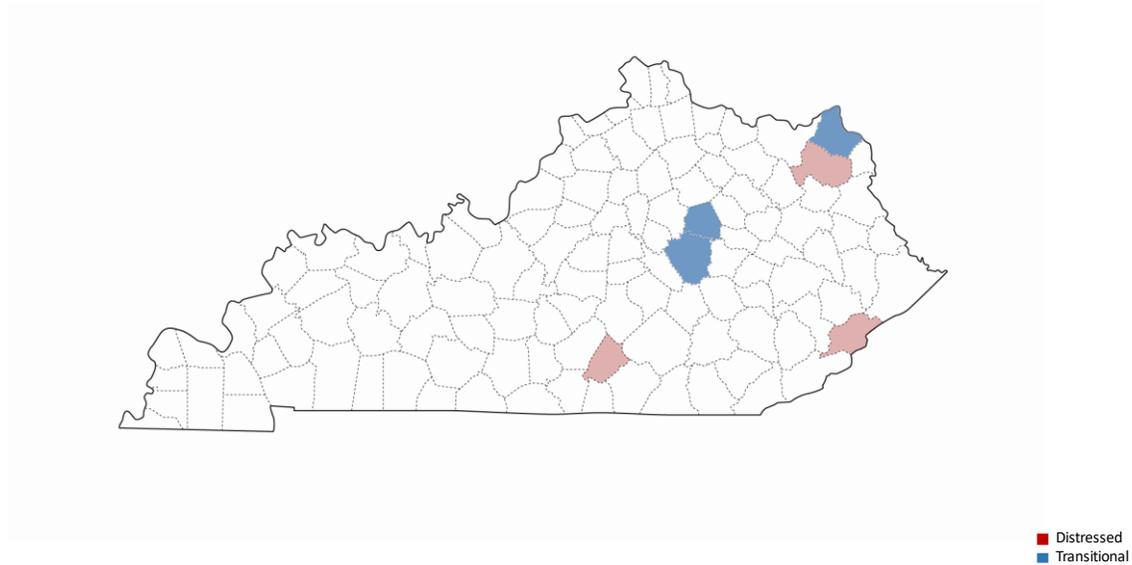
This qualitative research study takes an inductive approach, which uses inductive reasoning to identify themes by examining raw data, in order to understanding how vape shops use Facebook to share messages with their audiences.

Data Collection

Data in this study consisted of Facebook posts from six vape shops in two socioeconomic areas of Kentucky's Appalachian region. The socioeconomic areas were designated by the following criteria: economically distressed counties in Kentucky, which are defined by the Appalachian Regional Commission as "the most economically depressed counties. They rank in the worst 10 percent of the nation's counties," and economically transitional counties in Kentucky, which are defined by the Appalachian Regional Commission as "transitioning between strong and weak economies... Transitional counties rank between the worst 25 percent and the best 25 percent of the nation's counties" (Appalachian Regional Commission, 2017). Counties in the distressed and transitional areas were chosen at random, assuming a uniform distribution, then Google Maps was used to search for vape shops in those counties. If no results were found for vape shops in a selected county, then another county was selected at random and another search for vape shops was conducted in that county.

Vape shops were eligible for study if they met the following criteria: not being apart of a franchise or chain, having an active Facebook account, having at least 100 likes on their Facebook page, and consistently posting multiple times per month between January 2015 and October 2017. Facebook was chosen as the data platform because of its high user statistics. As of June 2017, Facebook had 2 billion active monthly users and 3 million businesses using the business platform (Facebook, 2017; Facebook Business, 2016). In total, eight vape shop Facebook pages were randomly selected. Four were located in distressed counties and four were located in transitional counties. The first three vape shops found that met the above criteria in each socioeconomic area were analyzed for this study. The fourth vape shop was intended to be used if there was a problem with one of the original three vape shops selected. The data represented six different counties, three in each socioeconomic area. All six counties were in the Appalachian region, as defined by the Appalachian Regional Commission. The counties can be seen on the map represented in Figure 2. The distressed counties were Carter County, Letcher County, and Russell County. The transitional counties were Clark County, Greenup County, and Madison County. For each shop, all Facebook posts published between January 2015 and October 2017 were captured as a pdf, including images and videos to provide context to text. Each vape shop was assigned a letter and each post was assigned a number to create a nomenclature (e.g., A54, C113). The data were coded manually.

Figure 2



Coding Procedures

An inductive thematic analysis was conducted on the individual Facebook posts. Figure 3 offers a visual representation of the coding process. First, all posts were read to familiarize the coder with the data, record initial responses, and collect information on the tactical aspects of the post, including publication date and the content type (e.g., text, photo, video, link). All data points were put into a spreadsheet where each row indicated a different post and the columns represented different data points, such as publication date, content type, topic, tone, purpose, and focus.

Next, the collection of posts was read again, this time recording data about the post's theme and sub-themes. Elements of theme included topic, tone, purpose, and focus. The list of topics was generated and refined as the coder read through the data. Post topics were separated into two categories, non-concerned topics and concerned topics. Concerned topics were characterized by having relevance to FDA regulations. As previously discussed, the FDA

regulations between 2016 and 2017 were aimed at preventing youth initiation of vaping, decreasing disease and death caused by smoking cigarettes, and reducing nicotine addiction. Therefore, the topics relevant to the regulatory environment (i.e., coded as concerned topics) included: FDA Regulations; Health, Smoking Cessation, and Education; Discounts and Giveaways; and E-liquid. Non-concerned post topics included: Administrative and Holiday; Community and Cloud Competitions; and Vaping Devices and Other Products.

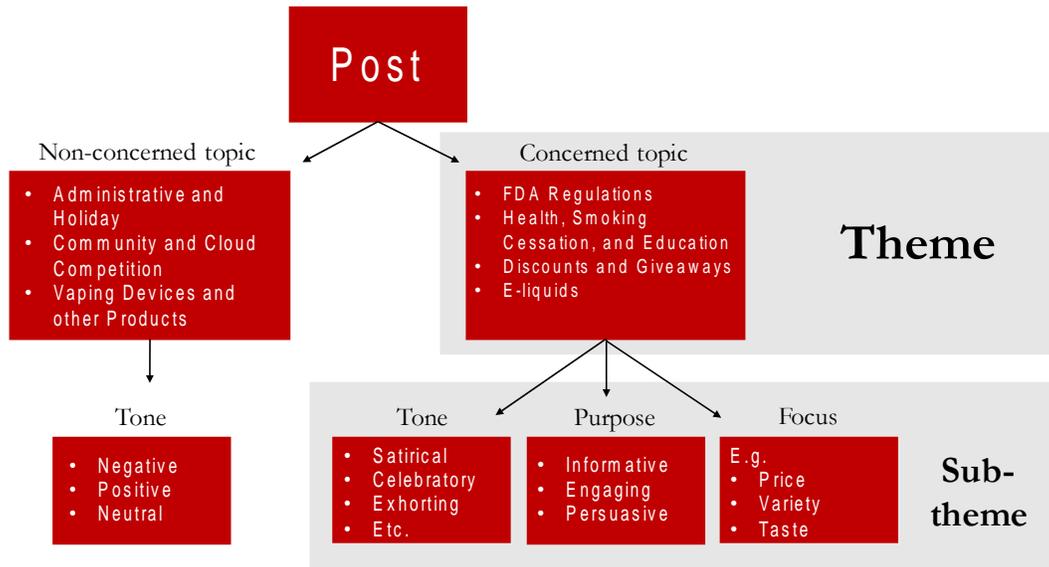
Tone was recorded for each post. Posts of non-concerned topics were categorized as either positive, negative, or neutral based on the use of language, punctuation, context, and imagery. The tones of concerned posts were analyzed in more detail. A list of over 150 tone words was reviewed as a prompt for coding tone (Patterson, 2014). Throughout the coding process, the coder consolidated tones with similar meanings, ultimately resulting in 21 tones used to describe the posts of concerned topics.

The post's purpose was also recorded as either informative (i.e., simply sharing information), engaging (i.e., asking a question, entertaining), or persuasive (i.e., trying to convince or entice with descriptors, evoking or appealing to emotion). Finally, the focus of each post was recorded. Focus was defined as the aspect of the post's topic that was being highlighted. For example, a post about an e-liquid could highlight taste, variety, or price. A second coder, trained on the coding process, coded a random sample of posts (15%) from the data set. Discrepancies were discussed between the two coders until consistent agreement was reached.

Themes emerged from the resulting topics, and sub-themes were delineated from the tones, purposes, and foci. Additionally, each theme was plotted on a timeline that corresponded with FDA regulation announcements in order to better understand possible relationships between

theme and the regulatory environment. These themes and the timeline will be discussed in the following section.

Figure 3



Thematic Results

Overview

A total of 1,257 posts were collected. Then, posts automated by Facebook, such as ones regarding updated cover photos or updated business hours, were removed. This process produced the study sample size of 1,210 posts. Of the sample, 612 posts were from vape shops in distressed counties and 598 posts were from vape shops in transitional counties, giving relatively equal samples for each socioeconomic area. During the analysis, seven different themes emerged to encompass the majority of posts. These themes include: Administrative and Holiday; Community and Cloud Competition; Discounts and Giveaways; FDA Regulations; Health, Smoking Cessation, and Education; Vaping Devices and Other Products (excluding e-liquids);

and E-liquids. Table 1.1 and Table 1.2 below give examples of posts within each theme for the distressed and transitional areas respectively.

Table 1.1: Post themes in distressed counties

Theme	Number of posts	Example posts
Administrative and Holiday	138	<p>“Probably goes without saying, but we will be closed due to weather today (Friday) and possibly tomorrow.” - C178</p> <p>“We’ll be open today and tomorrow for Independence day 12pm to 6pm. Thanks and have a safe holiday.” - G35</p>
Community and Cloud Competition	31	<p>“Let’s watch the CATS play! Game is on at the shop, come on down! #BNN” - I149</p> <p>“Don’t forget Mad Vapor’s vape comp this weekend we are hosting multiple competitions... Come out and show us what you got...” - G73</p>
Discounts and Giveaways	143	<p>“We believe! March Madness sale still going strong just like our CATS! Sweet 16 - starter kits just \$16...” - I146</p> <p>“This week’s winner is Mike Rowe, Mike won a bottle of My-Man E-liquid.” - C100</p>
FDA Regulations	35	<p>“Please take the time to fill out a simple form to sign an important petition to keep the freedom to vape. [link to petition to overturn FDA’s ruling on e-cigarettes as tobacco products]” - G43</p> <p>“This is a big deal folks. [link to article about FDA regulating e-cigarette sales to minors]” - C118</p>
Health, Smoking Cessation, and Education	35	<p>“Interesting facts to show the flaws in the formaldehyde study that the media is showing. [link to article responding to study]” - I157</p> <p>“[link to article titled: Why you cough</p>

		when you vape - & how to stop it!" -G64
Vaping Devices and Other Products (excluding e-liquids)	128	<p>"Today's spotlight is the Sigelei Fuchai 213... \$64.99 all day, every day. Come on in and get yours today!" - I78</p> <p>"I got a few of these sexy Target 75w mods by Vapresso in today!" - C184</p>
E-liquids	99	<p>"The sauce boss Cuttwood Unicorn milk and Sugar bear is now in stock." -G176</p> <p>"A new flavor is available from Junkie Juice... Snow Watermelon candy slurpy!" -C205</p>

Table 1.2: Post themes in transitional counties

Theme	Number of posts	Example posts
Administrative and Holiday	115	<p>"Las Vapor will be closing early tonight at 5:30... however we will be open regular hours (10:00 - 10:00) on Tuesday 5/16." - F49</p> <p>"We'd like to wish all of the honest, hard working dads out there a happy Father's Day! We hope you get to spend some time with loved ones whom appreciate you and all that you do!" - B270</p>
Community and Cloud Competition	161	<p>"In the passing of a very loved man, [name], we will be holding an event in his honor. The event will be "clouds for Evan"... " - B283</p> <p>"Time for a hand check vapers. Let's see those mods!" - H170</p>
Discounts and Giveaways	61	<p>"Hurry!!! Come on in to MT Vapors for a mystery bag for just \$10 only 26 left!" - H19</p> <p>"Come on in and snag a discount on us today! Just show or mention this post!" -</p>

		B96
FDA Regulations	12	<p>“This strengthens my argument that other factors are affecting the FDA’s decision to regulate vaping products making it so hard for small companies to stay in business. [link to opinion article]” - F81</p> <p>“[link to article titled: FDA announces deeming deadline delays]” - B56</p>
Health, Smoking Cessation, and Education	24	<p>“Please share this with everyone you know! [link to article about averting death by replacing cigarettes with e-cigarettes]” - F2</p> <p>“Good information for people that have questions! Check this out and give it a share to help others that may be lacking the knowledge or know how to keep themselves and others safe! [video about battery safety]” - B141</p>
Vaping Devices and Other Products (excluding e-liquids)	117	<p>“These T-shirts will be available soon! Only \$19.99!” - H207</p> <p>“New product alert: G-Priv 220w kits by smok. Come in and snag one of these awesome setups!” - B92</p>
E-liquids	102	<p>“Sit down... be humble! Come in and check out the delicious line up of skittles, blueberry crumble and Hop scotch on humble eliquids and for \$30 who could argue!” - B51</p> <p>“We got a few new items and a few restock items in today. We are also now carrying Strawberry & Blueberry Jam Monster flavors...” - F28</p>

Based on their relevance to the regulatory environment, four of the seven themes were considered concerned posts: Discounts and Giveaways; Health, Smoking Cessation, and

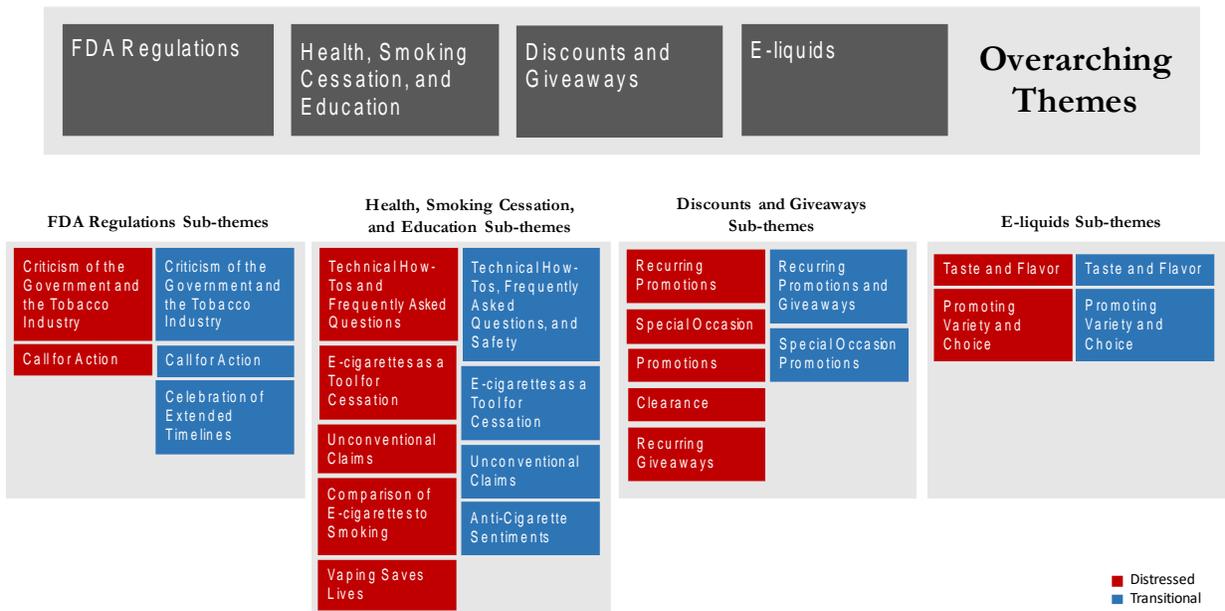
Education; FDA Regulations; and E-liquids. Posts within the other three topics—Administrative and Holiday, Community and Cloud Competition, and Vaping Devices and Other Products (excluding e-liquids)—were considered non-concerned posts. Forty-eight percent of posts from distressed areas and 66% of posts from transitional areas were considered non-concerned.

An analysis of the general tone of these posts was conducted in order to gain an understanding of tone trends for the entire data set. Of the posts from distressed areas, 74.25% had a positive tone, 1.34% had a negative tone, and 24.41% had a neutral tone. Comparatively, 83.33% of the posts from the transitional areas were positive, 0% were negative, and 16.67% were neutral. Positive posts were characterized by exhibiting emotions like optimism, joy, gratitude, and enthusiasm. Negative posts emoted pessimism, anger, satire, or defensiveness. Neutral posts were impartial, sharing information without emotion.

Concerned posts were defined by their relevance to the regulatory environment. The primary purpose of the FDA's 2016 "deeming rule" on e-cigarettes as tobacco products was to prevent youth initiation, and thus to reduce disease and death from tobacco products. "FDA Regulations" examines the overall response to the FDA's ruling. "Health, Smoking Cessation, and Education" examines how vape shops responded to the stated purpose of the FDA's regulations. Additionally, "E-liquid" was classified as a concerned theme because e-liquid flavors appeal to children, and the FDA's goal is to reduce youth use of e-cigarettes (Food & Drug Administration, 2017). Finally, section XI.F of the deeming rule prohibits free samples of e-cigarette products, which was a common method of promotion at many vape shops (Food & Drug Administration, 2016). Therefore, "Discounts and Giveaways" examines how vape shops shared messages regarding samples, discounts, and giveaways.

In the next section, posts in the concerned category are examined in more detail. Specifically, posts from distressed counties are discussed, and then posts from transitional counties are discussed. The discussion is organized according to each of the four themes in the concerned category. Figure 4 displays all four themes and their sub-themes in each socioeconomic area.

Figure 4



Distressed Concerned Post Themes

I. FDA Regulations Theme

A total of 35 posts (5.72% of 612) from vape shops in distressed counties were related to FDA regulations. Within this theme, two primary sub-themes emerged, “Criticism of the Government and the Tobacco Industry” and “Call for Action.” The sub-theme that encompassed the most posts (n = 18) was “Criticism of the Government and the Tobacco Industry.” These posts used satirical, cynical, and accusatory tones and focused on the motives of the government and the tobacco industry. According to these messages, the motives of the FDA regulations were

related to taxation and money rather than public health. The majority of these posts shared videos from television opinion shows, such as Fox News' The Five, which used satire to discredit the FDA and scientific research. They also shared videos created by pro-e-cigarette organizations that alleged deception by the government and the greed of the tobacco industry. Articles that were shared sought to discredit the scientific evidence that the FDA was using to support e-cigarette regulations and highlighted evidence that e-cigarettes were better for public health.

A second sub-theme to emerge in relation to FDA regulations was "Call for Action" against FDA regulations. These posts used exhortatory language to create a sense of urgency and a team mentality as they focused on signing petitions, calling representatives, and other actions to oppose anti-e-cigarette regulations or support pro-e-cigarette regulations. Posts within this sub-theme often highlighted the actions of the pro-vaping community as the only means for making a difference, which reinforced a team mentality. For example, one post that stated, "Take action with HR 2058. Vaping needs your help! We are on a mission to protect the future of vaping" (G83) emphasizing action and a group mission.

Of the remaining posts within the FDA Regulations theme (n=3), tones and messages varied from negative reaction to the FDA regulations to sharing objective information regarding the regulations, with one post celebrating the FDA's announcement in 2017 regarding an extended timeline for provisions of the deeming rule. Immediately preceding and following the FDA regulation announcement in 2016 there was an increase of posts regarding the FDA regulations. Because it was known ahead of time that the FDA was announcing regulations, shops could post prior to the announcement specifics. Approximately one-third (n=12) of the posts were shared between May 2016 and August 2016. This time period is reflective of the initial announcement in May and the first compliance dates in August. Prior to the

announcement, going as far back as 2015, posts within this theme primarily reflected a “Call for Action” sub-theme. Then following the announcement (May 2016), posts became primarily “Criticism of the Government and the Tobacco Industry.” After August 18th, 2016 there was one post regarding FDA regulations in November 2016 and then there was not another post of this theme until July 2017. The post on July 28th, 2017 was celebrating the extended timeline for compliance.

II. Health, Smoking Cessation, and Education Theme

A total of 35 posts (5.72% of 612) in distressed counties related to health, smoking cessation, and education. A variety of sub-themes emerged in the analysis of these posts, including “Technical How-Tos and Frequently Asked Questions,” “E-cigarettes as a Tool for Cessation,” “Comparison of E-cigarettes to Smoking,” “Vaping Saves Lives,” and “Unconventional Claims.” One sub-theme was “Technical How-Tos and Frequently Asked Questions,” (n = 7) which were positive in tone and focused on sharing information rather than trying to persuade. The content of these posts primarily relied on external sources, such as articles, videos, and graphics, to inform the audience. In one post, the vape shop wrote, “When in doubt, read up. Exposing the truth behind vaping” (I34) and shared an article titled “Everything you need to know about vape pens.” Another post shared an article titled “Why you cough when you vape and how to stop it” (G64).

Another sub-theme was “E-cigarettes as a Tool for Cessation.” Posts classified within this sub-theme had positive tones and focused on raising awareness of e-cigarettes’ ability to help a person quit smoking. The posts employed persuasive techniques, such as claiming e-cigarettes are the “best” tool or the only option left “after all else has failed.” Additionally, these posts avoided promoting vaping as a lifestyle, instead describing it as a health mechanism.

A third sub-theme was “Comparison of E-cigarettes to Smoking.” This sub-theme used either cautionary or enthusiastic tones and language to persuade the audience that e-cigarettes are safer and healthier than traditional cigarettes. Many posts either compared the chemicals in the two products or commented upon improved breathing due to e-cigarette use for smoking cessation. These posts were frequently supported by news articles and personal testimonies. An example shared an image of an X-ray of someone’s chest who had switched to e-cigarettes from smoking with a caption that claimed the doctor said the person was now healthier than a non-smoker. The post also stated, “This is why we do what we do! There is proof! Studies do exist and people are living it daily” (I136).

The fourth sub-theme that emerged was “Vaping Saves Lives.” Posts within this sub-theme used somber or defensive tones and language to express solemnity and crucialness. The content of these posts featured personal testimonies in videos that evoke positive, yet sobering emotions and represent self-betterment. This sub-theme focused on how individuals had used e-cigarettes to quit smoking, and insinuated that smoking will kill you. Many of the posts were in opposition to public health campaigns and accused the government of being more concerned with money than people’s health. An example was a video that included a person’s testimony of improved health after switching to vaping and ended with the individual stating, “Vaping saved my life, what about yours?” (I132).

Finally, the fifth sub-theme was “Unconventional Claims.” These posts made or promoted pro-e-cigarette claims that counter current research or popular beliefs. The tone of these posts was characterized by cynicism of mainstream scientific research and positive reaction to unconventional pro-e-cigarette claims and actions. Additionally, these posts discredited the authority of public health officials, researchers, and the media. The content of these posts

consisted of articles about research, regulations, and health claims. One example was a post that shared a link from vapeaboutit.com titled “Study finds conclusive evidence vaping is safe” (G125) without providing any supplementary commentary. Another example was a post that stated “The British have it figured out” and shared a link from dailycaller.com titled “Hospitals abandon vaping ban after evidence on e-cigarette safety” (C111).

There was no distinct FDA regulation-related pattern to the publish date of posts within each sub-theme of the Health, Smoking Cessation, and Education theme. The majority of posts were shared prior to July 2016 and decreased to only sporadically after that time. The only notable distinction was that there were not any posts of the “Unconventional Claims” sub-theme published after May 2016, whereas the other sub-themes continued to be present after that date.

III. Discounts and Giveaways Theme

There were 143 posts (23.36% of 612) in the Discounts and Giveaways theme. Four sub-themes emerged from these posts: “Recurring Promotions,” “Special Occasion Promotions,” “Clearance,” and “Recurring Giveaways.” Over a third of the posts (n = 51) in this theme were within the sub-theme of “Recurring Promotions.” These posts used positive and enthusiastic tones to describe promotions and many posts included enticing descriptions of the product associated with the promotion. For example, “This week’s flavor of the week is: Eclipse by Space Jam! Cavendish tobacco and sweet salty cream... 25% off through Thursday!” (C252). Phrases such as “hurry before it’s gone” and “limited supply” created a sense of urgency.

Another sub-theme of the Discounts and Giveaways theme was “Special Occasion Promotions.” This sub-theme was characterized by promotions for holidays or special times throughout the year, including Veterans Day, 4th of July, and March Madness. These posts ranged in tone from celebratory to thankful to reverent. They were often associated with an

image that reflected the holiday as well. One example was a post promoting Small Business Saturday, “Small Business Saturday is where it’s at this year! Stop on by and show your love to your local business this year. Special sales here at Retro include...” (I62).

A third sub-theme of the Discounts and Giveaways theme was “Clearance.” Posts within this sub-theme primarily highlighted clearing inventory with a positive tone. They also frequently mentioned new products that would be replacing the current inventory. Another frequent tactic of clearance-themed posts was appeal to customers to help the shop owner make space. Many posts also used urgency-inducing language, similar to the “Recurring Promotions” sub-theme.

“Recurring Giveaways” was the fourth sub-theme within the Discounts and Giveaways theme. These posts were either announcements of the giveaway winner or posts informing the audience on how to be entered to win. The majority of these posts were enthusiastic in tone, except for one post that used cynicism to express discontent with the FDA’s regulations. Specifically, this post stressed that the vape shop would no longer be able to do giveaways because of the FDA’s regulations. It stated, “Unfortunately, this is the last week we will be able to have the weekly drawing thanks to the FDA. Therefore, I figured I would make it count and draw 5 winners!” (C74).

Prior to January 2017, posts within the “Recurring Promotion,” “Special Occasion Promotion,” and “Clearance” sub-themes were consistent with very few gaps longer than a week. After January 2017, there were only 13 posts of these sub-themes published and there was not a pattern to their tone or style. Giveaway posts were most heavily concentrated from January 2016 to August 2016. After the FDA regulations took effect in August, not surprisingly, vape shops ceased to share giveaway posts.

IV. E-liquid

A total of 99 posts (16.18% of 612) in distressed counties related to e-liquid. The e-liquid posts fit into two main sub-themes, “Taste and Flavor” and “Promoting Variety and Choice.” One sub-theme, encompassing over half of the e-liquid posts (n = 56), was “Taste and Flavor.” These posts used positive, descriptive language to try to persuade the audience to purchase the e-liquids. Typically, the descriptions either referenced food or words traditionally related to food, such as “savory,” “breakfast,” and “delicious.” Fruit and dessert flavors were described most frequently. Descriptions ranged from simple, such as “blueberry and grape flavor” (C155) to elaborate, for example, “...exquisite honeydew cream flavor with light hints of mixed berry that is every bit as delicious as it is smooth” (G111).

The second e-liquid posts sub-theme was “Promoting Variety and Choice.” Posts within this sub-theme were informative in nature and used positive language. They highlighted popular brands and flavors, customization, large inventory, and new products. For example, one post stated, “Custom E-liquids! Have it your way...and the options are nearly limitless with almost 30,000 different blend combos available” (G146). Another example was “Back in stock. You Got E-juice! You missed it and we heard you” (I47).

Posts within this theme were published consistently from January 2015 through October 2017. The highest concentration of posts was between January 2016 and July 2017. There was no distinct pattern to when posts of each sub-theme were published. Additionally, posts within the “Taste and Flavor” sub-theme were published at the same rate prior to and following the FDA’s regulation announcement in May 2016, indicating the vape shops did not change their messages about e-liquid even after the FDA expressed concerns about marketing to children.

Table 2.1: Examples of distressed posts within each sub-theme

Theme	Sub-theme	Examples
FDA Regulations	Criticism of the Government and the Tobacco Industry	<p>“Vaping is bad because the government is losing tax revenues. The big tobacco companies and pharma is losing sales. It’s all about money and not about your health.” - G26</p> <p>“[link to article titled: Congress, save e-cigarettes from the FDA]” - I95</p>
	Call for Action	<p>“This only takes a minute, please sign. [link to article titled: Overturn the FDA’s ruling on e-cigarette classification as a tobacco product]” - C117</p> <p>“The responses from this survey will be able to be presented in June to the FDA. Please, please take a moment and fill this out. We need to be heard and this is an easy way for you, as a vapor, to contribute and have your voice heard! [link to survey titled: Electronic cigarette trend survey]” - I141</p> <p>“Take action with HR 2058. Vaping needs your help! We are on a mission to protect the future of vaping. Vaping needs your help! We are on a mission to protect the future of vaping.</p> <p>The Food and Drug Administration (FDA) proposed that all vapor products should be listed as tobacco products. Although this was announced in 2014,</p>

		<p>the FDA has been adamant in pushing towards regulation. This proposal would mandate that all vapor companies must submit approval for products that were not on already on the market as of February 15th 2007. This FDA proposal opens the door for additional regulations. The changes the FDA wants to make will affect businesses in the vaping industry. If the proposal is passed, vapor businesses will be difficult or impossible to attain.</p> <p>This is where the HR 2058 comes in! Vape shop owners, manufacturers, distributors and vapers need to join forces today. The HR 2058 is a necessary bill that would stop the FDA from banning 99%-plus of vapor products. Please contact your Congressional representatives and Senators requesting their support and co-sponsorship for HR 2058. Show your support by going here:</p> <p>[link to article titled: Support HR 2058 which would change the grandfather date for newly deemed tobacco products]</p> <p>We appreciate your help. We look forward to making a difference.” - G83</p>
<p>Health, Smoking Cessation, and Education</p>	<p>Technical How-Tos and Frequently Asked Questions</p>	<p>“Drippers! I learned something new recently! We had a few customers try this out and it actually works. 20 pulls (or more) without re-</p>

		<p>dripping. That is impressive! Had you ever seen this? Does it work for you? [link to video titled: How to wick a RDA effectively, and avoid dry hits]” - I119</p> <p>“For example, a customer said this morning that she was told that our 18650 batteries were refurbished because someone she knew had one pop on them. All of our batteries are brand new top quality authentic batteries, but any battery will pop/overheat if a person building a coil doesn't know what they are doing. I (Adam) am always happy to assist on coil building and educating customers on safety precautions involved so please come see me if you have any questions before constructing an unsafe build and then blaming the batteries. Thanks again!” - C242</p> <p>“[diagram that details diagnosing problems with clearomizer and finding solutions to the issues]” - G153</p>
	<p>E-cigarettes as a Tool for Cessation</p>	<p>“[link to article titled: Anti-tobacco coalition says e-cigarettes can succeed where all else has failed]” - G55</p> <p>“[link to article titled: Want to quit smoking? Studies suggest vaping daily is best way to kick the habit for good]” - I123</p>

		<p>“[link to article titled: Are e-cigarettes safer than tobacco? New study fires up debate]” - C36</p>
	<p>Comparison of E-cigarettes to Smoking</p>	<p>“I’ve seen this many times but never had it to share! This is why we do what we do! There is proof! Studies do exist and people are living it daily! Vape on!! [link to image that depicts lungs and states that a doctor said that the lungs were as healthy as a non-smoker’s]” - I136</p> <p>“Yep... [link to image that says “The face you make when a smoker says they won’t try vaping because they don’t know what chemicals are in the e-juice]” - C22</p> <p>“[image that depicts four ingredients in e-liquid and suggests there are over three thousand in cigarettes]” - G81</p>
	<p>Vaping Saves Lives</p>	<p>“Want to be part of a commercial and help fight for your right to vape?</p> <p>10 Days til we shoot! 54 confirmed going - Let's get this to 200 Confirmations! Invite, Invite, Invite! Family, Friends, anyone who has loved ones that Vaping has saved their lives - bring them with you.</p> <p>Please make sure that everyone knows we changed</p>

		<p>the location to the Call Center Parking lot across the street from RTV Johnson City. Also after the initial shot for all those that want individual shots holding the "I smoked for ___ years and quit with _____ eliquid" we will be doing individual pics of people to be included during the rest of the commercial.” - I88</p> <p>“[link to video that is in opposition of the Blowing Smoke public health campaign, claiming that vaping saves lives]” - G49</p>
	<p>Unconventional Claims</p>	<p>“[link to article titled: Mainstream media busted for lying about vaping link to popcorn lung]” - G62</p> <p>“Interesting facts to show the flaws in the formaldehyde study that the news media is showing. [link to article in which the TSFA responds to the study]” - I157</p>
<p>Discounts and Giveaways</p>	<p>Recurring Promotions</p>	<p>“Don’t forget, happy hour is going strong. 10% off all premiums and we have quite a few. Come try a new flavor today!” - I99</p> <p>“New flavor of the week time! This week: Zen by Mad Alchemist. Chai tea at its finest! A very refreshing Vape of chai tea with a slight minty exhale.</p>

		25% off through Thursday!” - C222
	Special Occasion Promotions	<p>“Remember everyone, we will be open for Memorial Day! Also everything in the store will be 15% off* Monday! To show our appreciation for those of you who serve our country, show your military ID Memorial Day for 25% off*!!</p> <p>*does not include clearance items, can not be combined with other discounts.” - C105</p> <p>“Continuing our small business saturday sale through cyber monday. All sales remain. 40% off of our house line. 20% off all premiums and gear. \$12.99 starter kits while supplies last. Start off the holiday season right! Spotlighting the TFV8, the cloud beast is everything that it's name suggests.” - I61</p> <p>“May the 4th special! All replacement coils 20% off and Sigelei T150 at a very special price of \$84.99 for today only! May the fourth be with you! [image of Yoda and an image of the vaping device]” - G44</p>
	Clearance	“Ok Cloud Makers, I have got to clear out this clearance

		<p>juice to make room for more products. So, let's try buy 2 get 1 free (equal or lesser value). Let's make room for new stuff!" - C54</p> <p>“!!!!CLEARENCE SALE!!!! We are clearing the shelves to make more room, so EC Blend liquids are BOGO(Buy one get one free)! Only at your local Vape Shop MAD Vapor located in Grayson, KY.” - G116</p>
	<p>Recurring Giveaways</p>	<p>“This week's drawing winners are: Patrick Hardin & Jake Hadley Both gentleman have won mods! New drawing next week!” - C142</p> <p>“Finally made it to work and the winner of the weekly drawing is... Dennis Haulk! Dennis has won a 180ml bottle of Glazed By Glas! Bring your ID Dennis and get your Liquid! We will draw again Friday!” - C177</p>
<p>E-liquids</p>	<p>Taste and Flavor</p>	<p>“We also have a new flavor called Jazzy Boba. This juice is the closest thing to a sweet vanilla milkshake I have ever tried. Come try it out!” - C253</p>

		<p>“💎 Look what's new!! 💎  WaterLemon is a watermelon lemonade!  Whipped Dreamz is a snack cake filled with whipped strawberry cream, drizzled with strawberry syrup!  Honey Bunz is a delicious fluffy pastry with cinnamon sugar and topped with a honey glaze icing! Come check it out!” - I21</p> <p>“Cosmic Fog Euphoria has arrived! Your favorite cereal is back, with a twist! Orangey orange, wild berry blue and lemony lemon pieces submerged in milk make this classic vaping treat. Get yours before they're gone!” - G113</p>
	<p>Promoting Variety and Choice</p>	<p>“NEW IN STOCK! Hometown Hero E-liquids Hand crafted in Austin, Tx Holy fritter , Red dream, Rice crunches, Ambrosia, Angel tears, Angel's breath , Stormy, Sun drops, Wild buffalo, Legend, Witch doctor 11 flavors, 50mls, success!” - I5</p> <p>“Vape Wild arrived quicker than expected! 17 new flavors available today at a great price!” - C69</p>

Transitional Concerned Post Themes

I. FDA Regulations Theme

There were 12 posts (2.01% of 598) related to FDA Regulations in the transitional areas. Three distinct sub-themes emerged within this theme, each representing a third of the posts: “Call to Action,” “Criticism of the Government,” and “Celebration of Extended Timelines.” The first sub-theme was “Call to Action,” which encouraged the audience to take pro-e-cigarette action against the FDA regulations. This sub-theme used exhortatory language to create a sense of urgency and importance in regards to calling representatives, signing petitions, and joining pro-e-cigarette organizations. Posts within this sub-theme highlighted small businesses and the families that ran them, personal rights, and services that would be lost if the audience did not take action. An example of this sub-theme was a post that shared an image encouraging people to call the White House and a caption that said “Today is the day. We need to support this or an entire industry built on the betterment of others lives will fall” (B244).

The second sub-theme was “Criticism of the Government.” This sub-theme was characterized by defensive, satirical, and accusatory tones. Posts within this sub-theme accuse the FDA of harming public health and being more concerned with money than safety. The content of this sub-theme was a mixture of satirical cartoons, links to articles about regulations, and videos accusing the government of deception and greed regarding e-cigarette regulation. One example was a post that shared the trailer to the film “A Billion Lives,” which told audiences that they were being lied to by the government and health organizations (B222). Another example of this sub-theme was a post that said, “This story strengthens my argument that other factors are affecting the FDA’s decision to regulate vaping products making it so hard for companies to stay

in business” and shared the link to an opinion piece accusing the FDA of inhibiting e-cigarette manufacturers from making safer products (F81).

A final sub-theme related to FDA regulations in transitional areas was “Celebration of Extended Timelines.” Posts within this sub-theme used positive and enthusiastic language to share information about the extension of the FDA’s regulation timeline. These posts shared news articles about the extension and announced discounts in celebration of the extension. An example of this sub-theme was “Break out the bubbly and celebrate b/c the FDA has pushed back regulations till 2022... to celebrate this win we’re offering 15% off everything in the shop...” (F25). In another post, the vape shop simply shared the link to an article titled “The FDA has a significant change of heart about e-cigarettes”(B33).

Posts within the FDA Regulations theme were published sporadically between October 2015 and August 2017. There were no posts published within three months leading up to the May 2016 FDA regulations, none directly following the announcement, and only one in August when the regulations went into effect. The post on August 1, 2016 details how the regulations will affect the vape shop and urges support of pro-e-cigarette organizations. Posts continued to be sporadic between August 2016 and July 2017, then following the July 2017 FDA announcement only posts celebrating the extended timeline were published.

II. Health, Smoking Cessation, and Education Theme

There was a total of 24 posts (4.01% of 598) within the Health, Smoking Cessation, and Education theme, and four main sub-themes were found, including “Technical How-Tos, Frequently Asked Questions, and Safety,” “E-cigarettes as a Tool for Cessation,” “Unconventional Claims,” and “Anti-Cigarette Sentiments.” The first sub-theme, related to education, was “Technical How-Tos, Frequently Asked Questions, and Safety.” Posts within this

sub-theme had a cautionary tone and focused on sharing information via articles, infographics, and videos. These posts highlighted topics such as battery safety, vaping, and e-liquids. One post defined and explained the vaping technique called “dripping” in detail (F62).

Another sub-theme was “E-cigarettes as a Tool for Cessation.” This sub-theme encompassed a little over a fourth of the posts in the theme (n = 7). Posts within the sub-theme used positive language and the tones were either celebratory or informative. Over half of the posts within this sub-theme focused on how individuals can use e-cigarettes to quit smoking. These posts highlighted user preference and some shared personal testimonies. For example, one set of posts shared pictures of people holding signs that said “I smoked for [insert number] years. I quit with [insert flavor] flavored vapor!” (H98 & H100). Another post shared an image that said, “There is no right or wrong way of vaping...Whatever keeps you off the cigarettes is a success” (H191). A smaller number of posts within this sub-theme shared articles about research and regulators who support e-cigarettes as a cessation tool.

A third sub-theme, related to health and smoking cessation, was “Unconventional Claims.” Posts within this sub-theme were overwhelmingly negative and had satirical, accusatory, and aggrieved tones. These posts focused on e-cigarette research, regulations, and media claims. They used persuasive language to discredit research on the negative health effects of e-cigarettes, claimed that the government was more concerned with money than public health, and scoffed at media coverage of the negative health effects of e-cigarettes. One example was a post that shared an article titled “5 vaping researchers who clearly don’t understand vaping” (B218). In another example, a post said, “If this doesn’t make your blood boil then nothing will. This story is the biggest bunch of \$#!% I’ve ever read” and shared a link to an article titled “Study warns of ‘dripping’ method of e-cigarette use among teens” (F72).

The final sub-theme in the Health, Smoking Cessation, and Education theme was “Anti-Cigarette Sentiment.” This sub-theme was characterized by cautionary language about cigarette smoking and defensive language regarding e-cigarettes. Only one post directly compared the health effects of e-cigarettes versus smoking cigarettes. This post compared the amount of diacetyl exposure from smoking, vaping, and working in a factory, insinuating that exposure from cigarettes far exceeds other exposures. Other posts either focused solely on the negative health effects of cigarette smoking or suggested replacing cigarettes with e-cigarettes without comparing their specific health effects. Three posts in particular used the phrases “averting death,” “cigarettes kill,” and “tobacco related deaths” to highlight the adverse effects of cigarettes. An example of this sub-theme was a post that shared an image with text that said, “Which kills more US citizens - war or cigarettes? If you guessed war, guess again” (B199).

Posts within the Health, Smoking Cessation, and Education theme were published sporadically between January 2015 and October 2017 with no real patterns. One distinction of interest was that all but two of the posts within the “Unconventional Claims” and “Anti-Cigarette Sentiment” sub-themes were published prior to March 2016. Furthermore, all but two of the “E-cigarettes as Tools for Cessation” posts and “Technical How-tos, FAQs, and Safety” posts were published after January 2016. These two distinctions may signify a shift from focusing on combating anti-e-cigarette research and media to focusing on equipping individuals to use e-cigarettes to quit smoking and doing so safely.

III. Discounts and Giveaways Theme

A total of 61 posts (10.2% of 598) were in the Discounts and Giveaways theme. Two main sub-themes emerged within this theme, “Recurring Promotions and Giveaways” and “Special Occasion Promotions.” The first sub-theme was “Recurring Promotions and

Giveaways,” with posts characterized by having positive tones and focusing on weekly deals or giveaways. Promotions included “Wet wick Wednesdays,” “Stop smoking Saturdays,” and “Free Fridays.” The posts highlighted a percentage off of a certain product or a free product with the purchase of another product. “Stop smoking Saturdays” posts also used persuasive language such as “make the switch and save in the process,” referring to making the switch from cigarettes to e-cigarettes.

“Special Occasion Promotions” was another sub-theme in this themes. Posts within this sub-theme focused on promotions for holidays and special times throughout the year, including Black Friday, Valentine’s Day, and Customer Appreciation days. These posts had enthusiastic, celebratory, and thankful tones and included images relevant to the holiday. An example of this sub-theme was a post that said “We are showing are thanks to all our wonderful customers come out and join us for some great deals and fun” and included an image with more details about the event (H6).

The remaining posts in this theme focused on general discounts and giveaways without a specific promotion associated with them and did not fall within a specific sub-theme. These posts highlights reduced prices, percentages off, free products with the purchase of another product, or raffle tickets for every purchase. The posts had positive tones and used persuasive language to create a sense of urgency. There was only one post that mentioned clearance and it did not describe the deal associated with the clearance section.

The majority of posts in this theme were published after October 2016 with fewer than a third published prior to July 2016. After October 2016, posts were published consistently, no more than one to two weeks apart. “Recurring Promotions and Giveaways” posts were published exclusively in 2017, with the majority being published between January and March. Only one

post promoted the giveaway of a free e-liquid. It was published on June 2, 2016, after the FDA's announcement of the new regulations but before they went into effect in August.

IV. E-liquid Theme

In total, there were 102 posts (17.05% of 598) related to e-liquids in the transitional areas. Two primary sub-themes emerged, "Taste and Flavor" and "Promoting Variety and Choice." The "Taste and Flavor" sub-theme made up half of the E-liquid theme (n = 51). Posts within this sub-theme used descriptive, positive language with enthusiastic, humorous, and whimsical tones to persuade the audience to purchase the e-liquids. Many posts referenced food or words and phrases traditionally associated with food, such as "delicious," "confection," and "straight out of the oven." Fruits and desserts were the most frequently described flavors. Most descriptions were elaborate and detailed, for example, "'Roll of Da Cinnamon'... as you can tell this is a warm, right out of the oven, poppin' fresh cinnamon roll and instead of spreading cream cheese on it... we dipped it in cream cheese... globs of cream cheese" (F44). Another example was a post that said "If this doesn't make you wanna vape an entire bottle!" and shares a video depicting someone putting jam on toast and ends with putting the e-liquid bottle on the counter to suggest that the e-liquid is like the jam (B19).

The second sub-theme within this theme was "Promoting Variety and Choice." This sub-theme was characterized by positive and playful language with whimsical and humorous tones. These posts focus on new flavors and brands, restock of popular brands, individual's flavor preferences, and the most popular flavors. Many posts also included images of the e-liquid's packaging or the food associated with the flavor. An example of this sub-theme was a post that stated "Y'all told us and we listened 120 cereal pop was such a hit we brought it back!" (B6). Another example was a post that shared a video depicting a man vaping while pretending to be

asleep and the post said “When you find that All Day Vape. And you can’t put your mod down. Come in and find your ADV” (B11).

Analysis of the publish date showed that posts within the E-liquids theme were published during two distinct time periods. The first time period was between June 2015 and September 2016. Posts were published sporadically during this period and represent about a quarter of all of the posts. During this period, the majority of posts fell within the “Taste and Flavor” sub-theme. Then, from December 2016 to October 2017 posts were published more consistently. Posts published during this second time period were still primarily within the “Taste and Flavor” sub-theme but posts of the “Promoting Variety and Choice” sub-theme increased as well. The tones and descriptions of the “Taste and Flavor” sub-theme remained consistent from January 2015 to October 2017 suggesting the vape shops did not change their messages about e-liquid even after the FDA expressed concerns about marketing to children.

Table 2.2: Examples of transitional posts within each sub-theme

Theme	Sub-theme	Examples
FDA Regulations	Call to Action	“We urge everyone to go to these websites and help out the vaping community, if you haven't heard by now the FDA is wanting to take away our rights to vape and add many unnecessary regulations that will hurt consumers more than anyone. After August 8th we will not be allowed to have free sampling, we will not be allowed to build coils for anyone, we will not be able to touch anyones devices no matter the problem (this involves troubleshooting for problems and changing out coils in tanks etc.) We ask

		<p>everyone that is apart of this community to join CASAA and help fight for your rights. CASAA & SFATA help explain even more in-depth about what the FDA is trying to do.</p> <p>PLEASE LIKE AND SHARE THIS WITH ALL YOUR VAPING FRIENDS TOO [link to the Smoke Free Alternatives Trade Association website].” - H85</p> <p>“Calling all that vape. Please do this today. You don't even have to make the call....by filling out the form to the right, they do the work for you. By filling out the form or calling yourself you are supporting the Cole-Bishop Bill. Please do what you can b/c today is the last day to tell your local congressman you support vaping. [link to petition website]” - F54</p>
	<p>Criticism of the Government</p>	<p>“[link to A Billion Lives video with caption that says ‘You are being lied to’]” - B222</p> <p>“[cartoon that depicts a man vaping and an Uncle Sam figure saying ‘We are going to regulate that’ while factories produce CO2 in the background]” - B221</p>
	<p>Celebration of Extended Timelines</p>	<p>“Break out the bubbly and celebrate b/c the FDA has pushed back regulations till 2022!!!!!!!!!!!!!!!!!!!!!! To celebrate this win we’re offering 15% off everything</p>

		<p>in the shop all weekend long (cannot combine this discount with perka rewards or any other discount). The sale starts saturday, 7/29, and will run through sunday at close of business.” - F25</p> <p>“[link to article titled: FDA announces comprehensive regulatory plan to shift trajectory of tobacco related disease, death]” - B34</p>
<p>Health, Smoking Cessation, and Education</p>	<p>Technical How-Tos, Frequently Asked Questions, and Safety</p>	<p>“Good information for people who have questions! Check this out and give it a share to help others who may be lacking the knowledge or know how to keep themselves and others safe! Thanks guys! [link to video about battery safety]” - B141</p> <p>“‘Drip,’ ‘Dripping,’ ‘Dripper’ Lately, we've had several individuals come into our shop asking what these terms mean. So we thought since we are seeing an increase in people asking this question there may be others out there wondering the same thing but too afraid to ask. So let's define each term and how it relates to vaping. First, the word ‘Drip/Dripping’ as defined by Merriam Webster Dictionary: ‘to let fall drops of moisture or liquid (we are using the intransitive verb definition for our illustration).’ Though drip, dripping, dripper all refer to the act of using a specific type of advanced technique or tool</p>

		<p>to produce vapor, drip means a specific method of vaping....as to dripping means to perform the activity of applying or ‘dripping’ drops of e-liquid onto cotton vs filling up your tank with e-liquid allowing the pre-made coil to do all the work....dripper is slang for the word ‘RDA’ which stands for ‘Rebuildable Drip Atomizer.’ This technique calls for the user to build his/her own coils and fill said coil with cotton, mesh, other materials suitable for this purpose...without using a tank system. This method usually requires the user to ‘drip’ or pour drops of e-liquid onto cotton every several pulls or hits from the device. For this conversation we aren't going to discuss RBA's (ReBuildable Atomizer) or RTA's (ReBuildable Tank Atomizer). DISCLAIMER: PLEASE DO NOT ATTEMPT DRIPPING IF YOU DO NOT UNDERSTAND HOW THIS PROCESS WORKS OR HAVE EXPERIENCE WITH THIS TECHNIQUE. Dripping is reserved for the more advanced user and should always be performed under supervision until you feel comfortable doing it. You have heard about people blowing themselves up or catching their pants on fire? This is because people aren't taking the necessary precautions when working</p>
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		<p>with vape equipment. We will discuss vape safety in another segment, but for today I just want to tell people to be smart and ask for help if you think you need it. If you have any questions please feel free to message me or drop by the shop. Thank you and be safe.”</p> <p>- F62</p>
	E-cigarettes as a Tool for Cessation	<p>“Its an awesome day at the shop, we’ve had so many new customers coming in to quit smoking that I’m so excited.”</p> <p>- H81</p> <p>“Come join us at LAS VAPOR, Vapor Shop, in Flatwoods, KY on 01/03/2017 if one of your New Year's Resolutions is to quit, or reduce smoking. This class is informal and the topic of discussion is how I used vaping to help me break a 27 year addiction to cigarettes. If this is something you are interested in then please stop by at 7:00 pm on Tuesday, January 3rd for the first of several classes held on Tuesdays of every week for the month of January. Remember what we say at LAS VAPOR... ‘Quitting smoking is hard....but switching to vaping is easy’”</p> <p>- F80</p>
	Unconventional Claims	<p>“[link to article titled: Scientists say e-cigarettes could save millions of lives, warn against strong regulation]” - B297</p>

		<p>“[link to video that claims big tobacco is paying states for e-cigarette regulations and that the states don’t care about public health]” - B240</p>
	<p>Anti-Cigarette Sentiments</p>	<p>“[image with text that states ‘There will be a billion tobacco-related deaths before 2100. E-cigs and other nicotine-delivery devices such as vaping pipes offer us the chance to reduce that total. We need to keep the prize in mind as we redouble efforts to make up for the 50 years of ignoring the simple fact reality that smoking kills and nicotine does not.’]” - B276</p> <p>“[link to a video in which a doctor discusses the harmful effects of cigarettes and offers a pro-e-cigarette viewpoint.” - B274</p>
<p>Discounts and Giveaways</p>	<p>Recurring Promotions and Giveaways</p>	<p>“Juice of the week 15% off Doink!!!! [video of shop employee announcing the juice of the week]” - H2</p> <p>“Make sure you stop in and see us before we close and stock up on some batts! Even better get an rx200 and save even more! [image that depicts ‘Amped up Mondays’ and details the deal]” - B151</p> <p>“Come on over to Las Vapor and pick up our new t-shirt for ‘Free Friday’ on September 29, 2017. Buy any kit (a kit is considered a mod and tank-does not matter if it is sold as one piece or if you</p>

		<p>buy each one separately) and get a free Las Vapor t-shirt. [image of the Las Vapor t-shirt]" - F74</p>
	<p>Special Occasion Promotions</p>	<p>“Friday, Saturday, and Sunday. Get those crazy black Friday deals while they last. Also: All cloned RDAs 50% off. [image that details the deal]" - B175</p> <p>“We are showing are thanks to all our wonderful customers come out and join us for some great deals and fun. [image that details the customer appreciation deals and activities]" - H6</p> <p>“Happy Fourth of July everyone. Las Vapor will be open regular hours today with 10% off everything in stock.” - F36</p>
<p>E-liquids</p>	<p>Taste and Flavor</p>	<p>“New Cuttwood flavor!!! Now instock @AstroVape. Apple fritter goodness [image of e-liquid]" - B188</p> <p>“From the makers of @adrenalinevapors we have a new line that is a creamy delight! Milk money will have you craving more after every hit. [image of e-liquid]" - H82</p> <p>“Just in time for Easter.....We are carrying three new flavors at Las Vapor: Crazy Berry, Hairy Pear, and Blam. "Crazy Berry" is a blueberries,</p>

		<p>raspberry, and blue raz type flavor that's a perfect berries concoction; "Hairy Pear" is a honeydew, strawberry, and pear type flavor that is juicy and layered so you get a little of each fruit on every pull; "Blam" is the original blueberry and berries jam. This flavor has been retired for a while now, however we dusted it off and brought it back due to the demand. Our blueberry/berries jam is a bright jam with just a little buttery toast note....not in your face toast like other jams out there. The profile reads: "Just like eating blueberry & berries jam with a spoon and chasing it with a buttery toast note... [image of e-liquid" - F58</p>
	<p>Promoting Variety and Choice</p>	<p>“We’ve got some new juice in today...a must to come in and try them all” - H75</p> <p>“Watts up guys!</p> <p>So there's been crazy buzz going around that this NAKED 100 eliquid was the bomb!</p> <p>Well it's true and we got y'all covered!</p> <p>Come on down and see us today</p> <p>And try their MASSIVE line up on our juice bar! Everyone knows when you vape you should always vape NAKED 😊 #VAPENAYSHYALL #vapenaked [image of e-</p>

		liquid]” - B13 “Las Vapor has added four new flavors: "Cherry Ice Cream"; "Cobbler (Blackberry Cobbler)", "Just Peachy (Peach Cobbler)", and "Moo-Berry (Strawberry Milk)". Starting in early April we will be carrying both LDPE 50ml unicorn bottles and 60ml Chubby Gorilla unicorn bottles. We are awaiting testing results on a couple more flavors and once that happens we will release those in either the 50ml LDPE bottles or the 60ml Chubby Gorilla bottles. [image of e-liquid]” - F7
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Discussion

The purpose of this study was to analyze how vape shops communicate on Facebook about topics related to recent FDA regulations of e-cigarettes. Past research evaluating Twitter users’ reactions to the FDA e-cigarette regulations found that most reactions were negative (Lazard et al., 2017). This study sought to understand how vape shops reacted to the regulations with regard to the content they were sharing. Many businesses use Facebook as a promotion tool and a space for community building (Cheney et al., 2015). Yet, research on how vape shops use Facebook is limited.

Furthermore, this study sought to understand whether (and, if so, how) vape shops in different socioeconomic areas of Kentucky reacted to the FDA regulations differently. Research indicates that e-cigarette policy making may be most viable at the local level (Cox, Barry, & Glantz, 2016). Therefore, it is important to understand how different communities respond to

FDA regulations. From the analysis, four themes of concern related to the FDA's deeming rule on e-cigarettes were identified: FDA Regulations; Health, Smoking Cessation, and Education; Discounts and Giveaways; and E-liquids.

In regards to the FDA regulations, the distressed sample contained three times as many posts related to the regulations as the transitional sample. Further, many more distressed posts' publish dates revolved around the FDA's deeming rule in May 2016 and the first compliance date in August, whereas the transitional posts were published sporadically until the extension announcement in July 2017. Distressed posts prior to the deeming rule announcement urged the audiences to take action in opposition of the regulations. These findings indicate that vape shops in distressed areas were monitoring the FDA's e-cigarette regulations and responding to different phases of the regulation process. The thematic analysis also reveals that both the vape shops in distressed and transitional areas responded negatively to the FDA regulations and positively to the extended timeline, indicating that the vape shops do not support the FDA's regulations of e-cigarettes. The primary criticism in both the distressed and transitional samples is that the government cares more about taxation than public health, suggesting that more transparency and communication is needed between the Food and Drug Administration, policymakers, and e-cigarette retailers. These findings align with research on Twitter users' reactions to the FDA regulations, which showed negative views and sharing of inaccurate information regarding the regulations and pro-e-cigarette content (Lazard et al., 2017).

Both the distressed and transitional vape shops countered the FDA's claim that e-cigarettes are unsafe and claims made by the research community regarding the adverse health effects of vaping. Their approaches to countering these claims indicated marked ways in which the two areas are different. For instance, posts from distressed vape shops not only shared

content that made satirical remarks demeaning the competence of the government and researchers, but they also shared pro-e-cigarette research and media articles— some of which made highly unconventional claims, such as one that shared the link to an article titled “Mainstream media busted for lying about vaping link to popcorn lung” (G62). Transitional vape shops, on the other hand, shared content that scoffed at anti-e-cigarette research, regulators, and media, yet did not provide alternative pro-e-cigarette research. Both approaches discredit the authority of the government and researchers, but the distressed posts may also misinform and misdirect their audiences, which may negatively affect public health officials’ and health organizations’ ability to communicate accurate information.

Further regarding health, this study found that posts by both distressed and transitional vape shops focused on e-cigarettes as a tool for smoking cessation. Previous research has documented that smoking cessation is a frequent reason for vaping (e.g., Ayers et al., 2017; Browne and Todd, 2017). Distressed vape shops shared content claiming e-cigarettes were the most effective tool for smoking cessation, especially when all other methods of cessation failed. Despite evidence that e-cigarettes do help some smokers quit combustible cigarettes, these devices have not been deemed the most effective method for smoking cessation, and, in fact, may lead to dual use (i.e., use of both e-cigarettes and combustible cigarettes), potentially resulting in increased consumption of nicotine and its associated dangers. The approach of transitional vape shops differed, with these shops instead focusing on personal testimonies of individuals who quit smoking via e-cigarettes.

Regarding discounts and giveaways, the FDA’s e-cigarette regulations most significantly impact the giveaway of free items without the purchase of another product. Vape shops in the distressed areas were consistently participating in weekly giveaways of free items between

January and August of 2016. The last of such posts was cynical in nature as it informed the audience that it would be last giveaway thanks to the FDA's regulations. In transitional areas, giveaways were less frequent and the last giveaway of e-liquid was in June 2016 without reference to the FDA's regulations. These findings indicate that the vape shops in distressed areas were aware of the full impact of the FDA's regulations and they were taking the necessary steps to adhere to them. Vape shops in transitional areas, on the other hand, stopped sharing posts about giveaways without reference to the FDA's regulations and without conjunction to the regulation timeline.

Another finding regarding discounts and giveaways that is distinct between the two socioeconomic areas, though not related to FDA regulations, is that there were more than double the amount of discounts and giveaways posts from vape shops in distressed areas (n = 143) as opposed to transitional areas (n = 61). Vape shops in distressed areas shared significantly more posts about recurring promotions, giveaways, and clearance. In the transitional areas, posts related to discounts and giveaways were less frequent and almost no posts were shared about clearance products or pricing. These findings suggest that vape shops in distressed areas may perceive their audiences to be more concerned with price and spending than vape shops in transitional areas.

The fourth theme of concern is e-liquids. Interestingly, neither the distressed nor transitional vape shops altered their Facebook marketing of e-liquids after the FDA's deeming rule in May 2016. The FDA stated that one reason for the regulations is to prevent youth initiation of e-cigarette use, especially since the flavored e-liquids appeal to children (FDA, 2017). Prior to the deeming rule, vape shops in both the distressed and transitional areas focused on taste and flavor as one method for marketing e-liquids on Facebook. Their posts used positive

language and phrases typically associated with sweet foods to describe the e-liquid products. Furthermore, most posts also included an image of colorful packaging or a food item as well. These tactics continued after the May 2016 announcements, without change in publishing frequency. As in Cheney et al.'s (2015) research, this study suggests that product promotion is a key reason vape shops use Facebook.

Despite several interesting findings, the study has limitations. One limitation is that only concerned post topics were evaluated beyond general tone. Because non-concerned posts accounted for 48% of the distressed sample and 66% of the transitional sample, a relatively large portion of the vape shops' posts were not analyzed in-depth. Additionally, the sample size and location limit the ability to draw generalizations. Although studying vape shops and e-cigarettes in a state with a long history of tobacco use is important, these findings may not represent all vape shops in the state, region, or nation. Another limitation is that the study did not account for changes in management or ownership, which could affect the content being published by vape shops.

Future research could analyze a larger sample and evaluate the full range of post topics within the sample. An additional opportunity for future research is to analyze how the vape shops' Facebook audiences responded to or engaged with posts by evaluating likes, comments, and shares in relation to the post content. Finally, similar research could be conducted in the Appalachian region of other states to determine whether the results of this study are consistent throughout Appalachia. Given the popularity of Facebook and its use by vape shops, much additional work is needed to understand how this communication platform is influencing customers and potential customers.

Conclusion

Vape shops are central to the e-cigarette community (Marynak, Gammon, King, Loomis, Fulmer, Wang, & Rogers, 2017; Herzog, 2016) and at the forefront of public information regarding FDA regulations (Lazard et al., 2017). This thematic analysis of Facebook posts from two different socioeconomic areas of Kentucky's Appalachian region has found that vape shops are sharing information relevant to the latest FDA regulations based on their perceptions of the regulations. Their primary reaction to the deeming rule in May 2016 was negative, and they continue to combat anti-e-cigarette campaigns with content that discredits the authority of researchers and regulators and focuses on the positive health effects of e-cigarettes. They also promote e-cigarette products through special promotions and enticing, descriptive language. Furthermore, there are differences between the posts from vape shops in distressed and transitional areas, which likely influence the final messages their audiences receive.

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