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Monitoring the Official YouTube Channels of E-Cigarette Companies: A Thematic Analysis

Scott I. Donaldson, PhD, MS[1], Allison Dormanesh, MS[1], Cindy Perez, BA[1], Muhammad O. Zaffer, BS[1], Anuja Majmundar, PhD, MBA[2], Jennifer B. Unger, PhD[1], and Jon-Patrick Allem, PhD, MA[1]

Abstract

Background. E-cigarette companies use YouTube to foster brand awareness, market their products, and interact with current and future tobacco users. However, research on the official YouTube channels of e-cigarette companies is limited. This study determined the themes of, and degree of user engagement with, videos posted to the official channels of e-cigarette companies on YouTube. *Methods.* Data were collected from the official YouTube channels of seven e-cigarette companies by scraping (i.e., electronically copying) the videos. The earliest video was posted on October 10, 2013, and the most recent video was posted on April 22, 2021 ($n = 260$). An inductive approach was used to identify themes in the data. User engagement with posts including number of likes, dislikes, and comments were also collected. *Results.* Prevalent themes included *branding* ($n = 250$ of 260 videos, 96%), *youth use* ($n = 222$, 85%), and *tobacco use* ($n = 210$, 81%), while less common themes included *misleading health statements* ($n = 4$, 2%), *personal choice* ($n = 4$, 2%), and *antitobacco* ($n = 2$, 1%). Videos that contained the themes *testimonial, product design features*, and *instructional* received the highest mean number of likes. Videos that contained the themes *antitobacco, cessation*, and *testimonial* received the highest mean number of dislikes. The 260 videos in this study were collectively viewed 6,619,700 times as of May 5, 2021. *Conclusions.* Videos from the official YouTube channels of seven e-cigarette companies often focused on branding and user experience but rarely mentioned cessation. While videos about cessation were rare, they received the second highest mean number of dislikes. Future research should assess the impact of exposure to e-cigarette-related content on YouTube and e-cigarette-related attitudes and behaviors.

Keywords

e-cigarettes, YouTube, social media

Electronic cigarette (e-cigarette) use is popular in the United States and may pose serious health risks, including nicotine addiction, respiratory illnesses, and certain cancers (Centers for Disease Control and Prevention [CDC], 2019). The rise in prevalence of e-cigarette use is in part attributable to e-cigarette-related marketing and promotions (Huang et al., 2019). While the 1998 Master Settlement Agreement (MSA) prevents tobacco companies from marketing in retail stores and on billboards (Lieberman, 2004), the MSA did not include provisions over social media platforms like YouTube. Moreover, e-cigarette companies are not bound by the MSA (Sears et al., 2017). As a result, e-cigarette content on YouTube is largely unregulated and has gone unaddressed by the U.S. Food and Drug Administration (FDA) (Jones et al., 2021). This may be particularly problematic as YouTube is popular among adolescents in the United States (Anderson & Jiang, 2018).

Currently, e-cigarette companies can build brand awareness through YouTube videos hosted on their official accounts. YouTube allows its users to upload, view, like, dislike, and comment on specific videos. YouTube users can establish personal accounts and subscribe to other accounts and channels, allowing them to stay up to date on content of interest to them. Informational and promotional messages that are posted on YouTube can reach millions of users, potentially shaping tobacco-related attitudes and behaviors (Huang et al., 2016). E-cigarette companies utilize YouTube to promote products and portray tobacco use in a positive light (Luo et al., 2014). For example, from a sample of 280 e-cigarette

[1]University of Southern California, Los Angeles, CA, USA
[2]American Cancer Society, Inc, Washington, DC, USA

Corresponding Author:
Jon-Patrick Allem, Department of Population and Public Health Sciences, Keck School of Medicine, University of Southern California, 1845 N. Soto Street, 3rd Floor, SSB 312D, Los Angeles, CA 90032, USA.
Email: allem@usc.edu

videos on YouTube, Huang et al. (2016) found that 70% of videos included web links to purchase tobacco products and that these videos did not contain age gates, making them accessible to adolescents. This ease of accessibility may be problematic as exposure to tobacco content on social media has been associated with susceptibility to use tobacco among never users and tobacco use (Donaldson et al., 2022a; Donaldson et al., 2022b).

E-cigarette-related videos on YouTube have been shown to contain youth-oriented, protobacco content (Padon et al., 2017). Such content was frequently posted by tobacco companies and designed with emotional appeals (Padon et al., 2017). For example, advertisements included e-cigarette content with animated characters, e-cigarette use as a way to experience positive emotions, e-cigarette use within social and sexual situations, and health claims like e-cigarettes are completely safe (Luo et al., 2014; Padon et al., 2017). What is more, O'Brien et al. (2020) found that among brand-sponsored content from 28 e-cigarette companies on YouTube, most videos lacked age gate mechanisms, featured flavors, and were void of health warning messages.

Tobacco-related social media research is an evolving landscape and studies from platforms like YouTube must be regularly updated. The present study builds on past research by performing a comprehensive examination of the videos from the official YouTube channels of e-cigarette companies. User engagement with posts including number of likes, dislikes, and comments were examined. By describing the posts from popular e-cigarette companies on YouTube, this study hopes to keep the tobacco control community abreast of the latest e-cigarette promotions.

Method

Data were collected by scraping (i.e., electronically copying) videos from the official YouTube channels of e-cigarette companies. We used the CDC statistics on tobacco brand preferences (CDC, 2021), e-cigarette companies with the highest market shares (Statista, 2022), and a ranking of the best e-cigarette brands (Brandes, 2019), to help identify potential e-cigarette companies for inclusion in this study. We were able to successfully identify the official YouTube channels of seven e-cigarette companies, including JUUL Labs, Vuse New Zealand, Blu cigs, NJOY Vape, Joyetech, Vapage, and Halo Cigs. The earliest video was posted on October 10, 2013, and the most recent video was posted on April 22, 2021. The research team coded videos from September 24, 2021, to November 27, 2021. All videos were still available online as of November 27, 2021.

A total of 260 videos were analyzed: JUUL Labs (n = 7), Vuse New Zealand (n = 8), Blu cigs (n = 13), NJOY Vape (n = 0), Joyetech (n = 203), Vapage (n = 1), and Halo Cigs (n = 28). Before viewing the videos, the research team reviewed past studies on tobacco and YouTube to generate an initial list of possible themes (Bromberg et al., 2012; Freeman & Chapman, 2007; Jones et al., 2021; Massey et al., 2020; O'Brien et al., 2020; Tsai & Sainbayar, 2016). The research team then worked collaboratively to become familiar with the videos, generated a coding frame, and identified commonly appearing themes in the videos. The purpose of this approach was to condense the raw video-based data into summary format and report the underlying themes that were evident in the videos.

The codebook (Supplemental Appendix 1) consisted of the following themes and definitions: (1) *warning*, including visual, or verbal warning statement about the health hazards of e-cigarettes; (2) *product design features*, including a detailed analysis of the features of a vaping device, such as accessories, customizing options, or a 360-point inspection; (3) *flavors*, including fruit, tobacco, sweet, or menthol; (4) *personal choice*, including a mention of freedom or right to vape; (5) *adult smokers*, including a mention that the product is designed for adult smokers, or a mission statement about adults having alternatives to combustible cigarettes; (6) *youth use*, including content that discourages youth use of tobacco products, and/or discusses steps to curb youth access; (7) *instructional*, including a video explaining how to use a product or accessory or how to troubleshoot a problem with a device; (8) *lifestyle*, including a mention of vapers possessing a sense of community, (9) *misleading health statements*, including a mention that e-cigarettes are harmless, completely safe, and/or health promoting; (10) *protobacco*, including content that shows positive emotions (e.g., joy) and/or positive behaviors (e.g., smiling, dancing) while using tobacco, or shows tobacco being used at social gatherings; (11) *anti-tobacco*, including videos about negative social or health consequences of tobacco use; (12) *cessation*, portrayals of e-cigarette use as a strategy to quit combustible cigarettes; (13) *promotional*, including videos featuring URL links or store addresses to get free products, discounts, or coupons; (14) *branding*, including the presence of a tobacco or e-cigarette company logo; (15) *tobacco use*, including any use of a tobacco product by any individual coded as cigarette, cigar, pipe, or other (e.g., chewing tobacco); (16) *implied tobacco use*, including a smoky atmosphere or a character holding a tobacco product but not seen smoking it; (17) *paraphernalia*, including e-cigarette, or tobacco-related materials, such as a cigarette pack, matches, lighter, ashtray, but without actual or implied use; (18) *testimonial*, including a mention of personal experiences with a product, enjoying the product taste or "throat hit."

Each video was double coded by two trained coders. Coders were trained to observe the video with the sound on and read each accompanying caption. If a theme was present in the video and/or corresponding caption, they were told to place a "1" in the cell, and if not, place a "0." Each video could be assigned to more than one theme. The two coders,

Table 1. Prevalence of Themes and User Engagement From 260 Videos on E-Cigarette Companies YouTube Channels.

Themes	% (*n*)	Likes[a]	Dislikes[a]	Comments[a]
Branding	96 (250)	110	10	17
Youth use	85 (222)	124	11	19
Tobacco use	81 (210)	108	9	17
Paraphernalia	63 (165)	139	13	20
Instructional	42 (110)	160	14	21
Promotional	29 (76)	140	14	22
Implied tobacco use	25 (66)	144	14	17
Product design features	24 (61)	165	17	20
Flavors	17 (44)	23	6	5
Protobacco	10 (27)	44	5	5
Warning	10 (26)	47	11	11
Adult smokers	9 (23)	24	5	3
Testimonial	5 (13)	172	19	17
Cessation	3 (8)	92	23	9
Lifestyle	3 (8)	22	16	5
Misleading health statements	2 (4)	57	10	0
Personal choice	2 (4)	54	7	16
Antitobacco	1 (2)	132	22	0

[a]Values in the cells represent the mean.

and a member of the research team, met weekly to discuss discrepancies. Consensus was reached by group discussion. Overall percent agreement and positive and negative percent agreement were used to assess interrater reliability. In contrast to typical interrater reliability metrics, such as Kappa coefficients that control for chance agreement due to guessing (McHugh, 2012), overall percent agreement, positive agreement, and negative agreement provide more information relevant to coder accuracy rather than a single chance-corrected omnibus index (Feinstein & Cicchetti, 1990). For example, Kappa is liable to chance-related inflation or bias (John Uebersax, 2009). In other words, if themes in the data have low prevalence, estimates of chance agreement increase even if the coders were not guessing. Positive agreement estimates the conditional probability, given that one of the raters makes a positive rating, the other rater will also do so and vice versa for negative agreement. The average percent agreement was 91% ($SD = 0.08$) across all 18 themes. The average positive agreement was 78% ($SD = 0.25$), and the average negative agreement was 88% ($SD = 0.15$), which is considered substantial (Watson & Petrie, 2010).

To understand user engagement with YouTube content, metadata from each official page was collected through the YouTube Data Application Programming Interface (API) on May 5, 2021. These data included view count, comment count, like count, dislike count, subscription count, country, and the date posted. Descriptive statistics, including frequencies and average number of likes, dislikes, and comments, were calculated for themes in the videos. All analyses relied on public posts and adhered to the terms and conditions, terms of use, and privacy policies of YouTube, and were performed under Institutional Review Board approval from the authors' university.

Results

The 260 videos collected in this study were collectively viewed 6,619,700 times as of May 5, 2021. They collectively received 4,344 comments ($M = 17$, $SD = 31$), 27,991 likes ($M = 108$, $SD = 447$), and 2,603 dislikes ($M = 10$, $SD = 33$). The official e-cigarette channels had a mean of 4,489 ($SD = 8022$) subscribers.

The most prevalent theme was *branding* ($n = 250$ of 260 videos, 96%), followed by *youth use* ($n = 222$, 85%), *tobacco use* ($n = 210$, 81%), and *paraphernalia* ($n = 165$, 63%) (Table 1). Other prevalent themes included *instructional* ($n = 110$, 42%), *promotional* ($n = 76$, 29%), *implied tobacco use* ($n = 66$, 25%), *product design features* ($n = 61$, 24%), *flavors* ($n = 44$, 17%), and *protobacco* ($n = 27$, 10%). Less common themes were *warning* ($n = 26$, 10%), *adult smokers* ($n = 23$, 9%), *testimonial* ($n = 13$, 5%), and *cessation* ($n = 8$, 3%). Other less common themes included *lifestyle* ($n = 8$, 3%), *misleading health statements* ($n = 4$, 2%), *personal choice* ($n = 4$, 2%), and *antitobacco* ($n = 2$, 1%).

The three themes with the highest mean number of likes were *testimonial, product design features*, and *instructional*. Posts that contained *promotional content, paraphernalia, and product design features* received the highest mean number of comments. *Antitobacco, cessation, and testimonial* were the themes that received the highest mean number of dislikes.

Discussion

This study analyzed posts on YouTube from e-cigarette companies. Posts collectively received views in the millions. Prevalent themes included *branding*, *youth use*, *tobacco use*, *paraphernalia*, and *instructional.* Less prevalent themes included *antitobacco* and *personal choice. Product design features*, *testimonials*, and *instructional* received the highest average number of likes, whereas *antitobacco* and *cessation* received the highest average number of dislikes. Findings from this study showed that e-cigarette companies used YouTube to post instructional content, facilitate user experience, and promote tobacco products.

This study adds to the literature documenting e-cigarette-related content on YouTube (Kong et al., 2022). Recently, Xie et al. (2021) found that among the 161 pro-vaping videos on YouTube, 62% of videos showed viewers how to perform vaping tricks. While prior research primarily focused on the content posted by individual users, this study adds to the literature by focusing on e-cigarette companies, demonstrating that branding, tobacco use, and instructional content were common themes in videos. The FDA should take note of the online environment that allows for e-cigarette companies to establish YouTube channels and rapidly and inexpensively market products to millions of adolescents and young adult users.

The FDA should consider comprehensive tobacco control strategies to minimize exposure to industry-sponsored e-cigarette content on YouTube among adolescents and young adults. The First Amendment protects individuals from government censorship, making it difficult to curb individual users' posts about e-cigarettes on social media platforms (Farber, 2010). However, the FDA and the Federal Trade Commission (FTC) can regulate commercial speech and limit statements that e-cigarette companies use in their advertisements (Bayer, 2002). For example, the FTC and FDA have issued warning letters to tobacco companies in the past instructing companies to include nicotine warning labels on social media posts (U.S. Food and Drug Administration, 2019). The current study showed that warnings were frequently absent from videos posted by e-cigarette companies on YouTube. As such, the FTC and FDA may consider creating and enforcing restrictions against industry-sponsored video channels that are accessible to youth and that do not include warnings (U.S. Food and Drug Administration, 2019).

Policy makers should focus on efforts to combat protobacco content on YouTube. The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) defines tobacco advertising and promotion as "any form of commercial communication, recommendation or action with the aim, effect or likely effect of promoting a tobacco product or tobacco use either directly or indirectly" (World Health Organization, 2005). The tobacco advertising and promotion definition includes videos as a form of advertising and promotion. As such, protobacco content on YouTube could be inclusive of this definition and regulated by the FDA.

In addition to YouTube serving as a promotional vehicle for e-cigarette companies, research has shown that instructional videos may also offer an opportunity for tobacco companies to teach users how to use products in ways that they were not intended to be used, such as using e-cigarette products with cannabis or flavored additives (Massey et al., 2020). Users may explore ways to modify products further to circumvent current tobacco laws (e.g., adding flavored e-liquid into products) and promote dangerous substance use. Moreover, compared with protobacco content that users are often exposed to on e-cigarette companies' YouTube channels, antitobacco content such as information about the health effects associated with tobacco use was rarely shown.

E-cigarette-related YouTube videos rarely contain antitobacco messages, including health warnings (O'Brien et al., 2020; Romito et al., 2015). For example, only four of the 63 videos analyzed in the study by Romito and colleagues (2015) contained public health messages associated with the adverse health effects of tobacco use. O'Brien and colleagues (2020) found that only eight of 28 videos from e-cigarette companies on YouTube had health warnings displayed. What is more, pro e-cigarette videos were viewed more often and rated more favorably than antitobacco e-cigarette videos (O'Brien et al., 2020; Romito et al., 2015). In this study, the videos that showed antitobacco and cessation themes received the highest average number of dislikes. Thus, users who view tobacco content on YouTube will likely engage with protobacco content that may reinforce their tobacco-related perceptions and attitudes, further normalizing e-cigarette use (Bromberg et al., 2012). For example, customers that engaged with branded YouTube content, compared with those who did not view branded YouTube content, were found to form brand loyalty and heightened purchase intentions (Lou et al., 2019; Lou & Xie, 2021).

While YouTube has a policy against accepting paid tobacco-related advertising, promotional content from tobacco companies, like the ones described in this study, still appear on its platform and may be recommended to users (YouTube, 2022). To curb the potential affects from protobacco content on young people's attitudes and behaviors, evidence-based interventions are needed to denormalize tobacco use. Such interventions could be used to highlight the marketing manipulation tactics used by the tobacco industry informing parents, teachers, adolescents, and young adults of the online environment that is protobacco.

Limitations

This study focused on e-cigarette companies, and the findings may not pertain to other types of tobacco manufacturers. Findings were limited to the analysis of data from one social media platform and may not apply to other platforms

or official company websites. Most of the available YouTube videos (78%; $n = 203$) analyzed in this study were collected from Joyetech, which limits the generalizability of this study's findings. Some of the metadata collected for this study is no longer available to collect from YouTube. For example, as of November 10, 2021, YouTube has hidden counts of "dislikes" from all publicly available videos. This will preclude the extent to which public health researchers can empirically monitor whether users are disliking protobacco or antitobacco content. Additional e-cigarette companies were considered for this study, including Puff Bar and Innokin. However, they did not have YouTube channels at the time of data collection.

Conclusion

This study showed that videos on the YouTube channels of e-cigarette companies often featured protobacco content that received millions of views. The public health community should be aware of such content to help develop tobacco control policies pertinent to specific social media platforms. For example, YouTube could require videos to feature public service announcements before depicting tobacco use or eliminate tobacco branding from all future videos. Future research should examine how exposure to protobacco content on YouTube impacts tobacco use behaviors, including susceptibility to use tobacco among never users.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Jon-Patrick Allem has received fees for consulting services in court cases pertaining to the content on social media platforms. He reports no other conflicts of interest. All other authors declare no competing interests.

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ORCID iDs

Scott I. Donaldson https://orcid.org/0000-0001-8145-0860

Allison Dormanesh https://orcid.org/0000-0001-9060-7356

Anuja Majmundar https://orcid.org/0000-0002-7785-3357

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