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How to freak a Black & Mild: a multi-study analysis of YouTube videos illustrating cigar product modification

Aashir Nasim[1,2]*, Melissa D. Blank[2,3], Caroline O. Cobb[1], Brittany M. Berry[1], May G. Kennedy[2,4] and Thomas Eissenberg[1,2]

[1]Department of Psychology, Virginia Commonwealth University, Richmond, VA 23284, USA, [2]Institute for Drug and Alcohol Studies, Virginia Commonwealth University, Richmond, VA 23298, USA, [3]Department of Psychology, West Virginia University, Morgantown, WV, 26506, USA and [4]Department of Social and Behavioral Health, Virginia Commonwealth University, Richmond, VA, 23219, USA

*Correspondence to: A. Nasim. E-mail: anasim@vcu.edu

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Abstract

Cigar smoking is increasingly common among adolescents who perceive cigars as less harmful than cigarettes. This perception of reduced harm is especially true for cigars that are user-modified by removing the tobacco binder through a process called 'freaking'. Little is known about 'freaking' and this multi-study, mixed-methods analysis sought to understand better the rationale and prevailing beliefs about this smoking practice using YouTube videos. In Study 1, we conducted a descriptive content analysis on the characteristics of 26 randomly sampled cigar product modification (CPM) videos posted during 2006–10. In Study 2, a thematic analysis was performed on the transcripts of commentary associated with each video to characterize viewers' comments about video content. Study 1 results revealed that 90% of videos illustrated a four-step CPM technique: 'Loosening the tobacco'; 'Dumping the tobacco'; 'Removing the cigar binder' and 'Repacking the tobacco'. Four themes related to the purpose of CPM were also derived from video content: 'Easier to smoke' (54%), 'Beliefs in reduction of health risks' (31%), 'Changing the burn rate' (15%) and 'Taste enhancement' (12%). Study 2 results concerning the content characteristics of video comments were categorized into three themes: 'Disseminating information/answering questions' (81%), 'Seeking advice/asking questions' (69%) and 'Learning cigar modification techniques' (35%). Favorable comments were more common (81%) compared to unfavorable (58%) and comment content suggested low-risk perceptions and poor understanding of smoking harms. These findings highlight a novel means for youth to access information concerning CPM that may have important implications for tobacco control policy and prevention.

Introduction

A decade ago, several studies forewarned of an emergent tobacco subculture involving cigar use among urban African American and Hispanic youth [1–3]. Employing ethnographic and focus group methodologies, these studies described cigar users who possessed their own smoking colloquialisms prevailing smoking attitudes and beliefs systems, and complex cigar improvisation methods believed to reduce their risks for tobacco-related harms. Despite intriguing findings, these studies on cigar use were largely overshadowed by a proliferation of epidemiological studies that highlighted the declining significance of cigarette use among youth. Meanwhile, estimates of large cigar consumption increased more than 200% between 2000 and 2010 [4]; the gap in national prevalence of cigarette and cigar use among adolescents narrowed by 46% [5, 6]

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and large cigar prevalence exceeded the rate of cigarette use among youth in some states [7]. For example, rates among 12- to 17-year-olds in Virginia were 11.4% for cigar use and 9.2% for cigarette use as of 2009 [8].

Notably, cigar-use prevalence may be disproportionately increasing among individuals of African-American descent. Recent data from nationally representative survey among high school students showed a significant increase in current cigar use from 2009 (7.1%) to 2011 (11.7%) among non-Hispanic Blacks but no significant changes in use among other race/ethnic groups [4]. These findings are supported by results from nationally representative surveys, where rates of current cigar use among 18- to 25-year-old non-Hispanic Blacks ranged from 11.3 to 14.4% from 2002 to 2008 [9]. Interestingly, results from this same survey revealed that use of the top five cigar brands, and a greater intensity of cigar use, was more prevalent among young, male, non-Hispanic Blacks [9].

Such trends may reflect cigar product characteristics such as reduced price [10] and enticing flavors like cherry, strawberry and chocolate [11]. Importantly, constituent ingredients, including flavoring agents, have been restricted in cigarette products but not in large cigars, cigarillos or little cigars [12]. Many users also perceive fewer health risks associated with cigar smoking [13], perhaps in part because of their ability to modify these products [14]. That is, smokers of one of the most consumed cigars in the United States, Black & Mild (13% of the US market share of large cigars and cigarillos in 2009) [15], may engage in a modification process known colloquially as 'freaking'. Cigar product modification (CPM) involves the user's removal of the inner-reconstituted tobacco binder prior to smoking due, in large part, to the belief that this practice reduces the risk of cancer [1, 14]. In fact, users often refer to the binder as the 'cancer paper' or 'cancer stick' [14]. While carcinogen delivery to the user has not been explored empirically, Black & Mild cigars have been shown to expose users to levels of nicotine that can cause dependence and of carbon monoxide (CO) that can contribute to tobacco-caused cardiovascular disease [16]. Moreover, modified cigars likely contain comparable amounts of CO to unmodified cigar products when smoked *ad lib* [17]. Thus, support for cigar users' claims about the reduced health risks of CPM have yet to receive any empirical support, and the origins of this practice remain unknown.

Although knowledge is increasing about the national prevalence of cigar use [4, 14] and brand-specific cigar use [18–20], little is known about the prevalence of 'freaking' among cigar users. A modern means to learn about unorthodox tobacco-use methods may be via social media like YouTube. Users of YouTube watch approximately 3 billion hours of videos per month and upload approximately 72 hours of video per minute [21]. The videos generated may derive from amateurs or professionals, and distinguishing between sources has proven challenging [22]. Importantly, such web-based venues are not subject to regulatory oversight to the same degree as traditional media such as radio, newspaper and television. For example, social networking sites account for more than half (53%) of youth's exposure to tobacco-related content on the Internet [23], and YouTube videos containing identifiers related to tobacco smoking has increased exponentially over the past few years [24, 25]. Searching the keyword 'smoking' into YouTube revealed 29 325 videos in 2006 [26] and 731 000 videos as of February 2013. Unfortunately, most of these videos are pro-tobacco rather than anti-tobacco [27–29]. Moreover, music and graphically enhanced content are prevalent in most videos with pro-smoking messages [28]. Over a decade of research demonstrates the power of smoking imagery and tobacco marketing on the initiation and progression of cigarette-use behavior among adolescents [30–32].

YouTube as a medium of observation already has proven to be a useful way to learn about electronic nicotine-delivery systems (i.e. 'e-cigarettes'; [33]), hookah [34] and little cigars/cigarillos [35]. Uploaded YouTube videos and comments that accompany them may be important sources for adolescent users who search for information about tobacco product characteristics and smoking-related practices. Consequently, these videos and associated

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content that illustrate CPM specifically may purport knowledge about the product and knowingly or unknowingly propagate unsafe practices and faulty beliefs about these tobacco products. Yet little is known about the prevalence of YouTube videos that feature Black & Mild cigars. To date, there is only one published study that examined the characteristics of YouTube videos related to little cigars/cigarillos and none which describe the content of videos as it pertains to CPM practices. This multi-study, mixed-methods analysis is the first to describe the content characteristics of YouTube videos illustrating Black & Mild cigar use and modification practices and the first to analyze the textual content posted by YouTube viewers to understand better the communication, dissemination and proliferation of health-related, cigar-use messages.

Methods

Methods overview

This mixed methods study included (i) a descriptive content analysis on the characteristics and features of randomly sampled videos from YouTube that promote CPM (Study 1); and (ii) a thematic analysis on online commentary to characterize viewers' responses to the CPM videos (Study 2).

General procedures and sampling design

Emergent (or Grounded) Process of Variable Identification (EPVI) was used as a theoretical guide to identify and describe characteristics and features of videos illustrating cigar smoking and CPM. The EPVI is both exploratory and descriptive. In this practical approach to content analysis, the researcher immerses 'himself or herself in the world of the message pool [to] conduct a qualitative scrutiny of a representative subset of the content to be examined' [36]. Through EPVI, the researchers work to avoid individual presuppositions and biases about the absence or presence of certain phenomena.

This study employed a two-stage sampling procedure: network (or snowball) sampling and probability-proportional-to-size (PPS) sampling. Network sampling, also referred to as snowball sampling, was used to search for CPM videos on YouTube. This sampling procedure is particularly useful for studies utilizing Internet search engines that yield targeted as well as related content in response to a web search query. YouTube web search queries are facilitated by Google and employ pigeon-rank technology to rate the relevance of searchable content. Specifically, when a particular search term is entered, all video and textual (e.g. term in title and title description) content that include the search term will be presented. The most relevant content is presented first, followed by a presentation of content that decreases in overall relevance to the initial search query (see Fig. 1). Similar to the Google search process, the network sampling procedure is based on the concept of intertextuality—the notion that data units (i.e. video or text) are connected and thereby form an 'actual or virtual network with natural boundaries' [37]. Thus, when the search process reaches its boundaries, either the same content is presented again, or the number of relevant content significantly diminishes.

We established a decision scheme to determine the relevance of videos pertaining to Black & Mild cigars and to minimize errors associated with the inclusion/exclusion of important content. This process was initiated with a general search term (e.g. cigars) that resulted in all videos and textual tobacco content with this term being presented in a rank-ordered format. The terms for the initial search query (e.g. conventional and everyday use or slang terms) were determined in consultation with a youth advisory group ($n = 3$); an expert on alternative tobacco products; a review of an urban online dictionary; popular and scientific publications; trade magazines, and websites specializing in cigars. We used the derived etic procedure (i.e. the adaptation of keywords based on observations in context) to guide subsequent search queries.

From this general universe of content, trained coders formed a series of judgments based on their initial review of the video. The trained coders first judgment was to determine—based on sampling—which videos contained actual cigar smoking content (and if discernible, Black & Mild cigar smoking) versus those that did not (e.g. some users wrote

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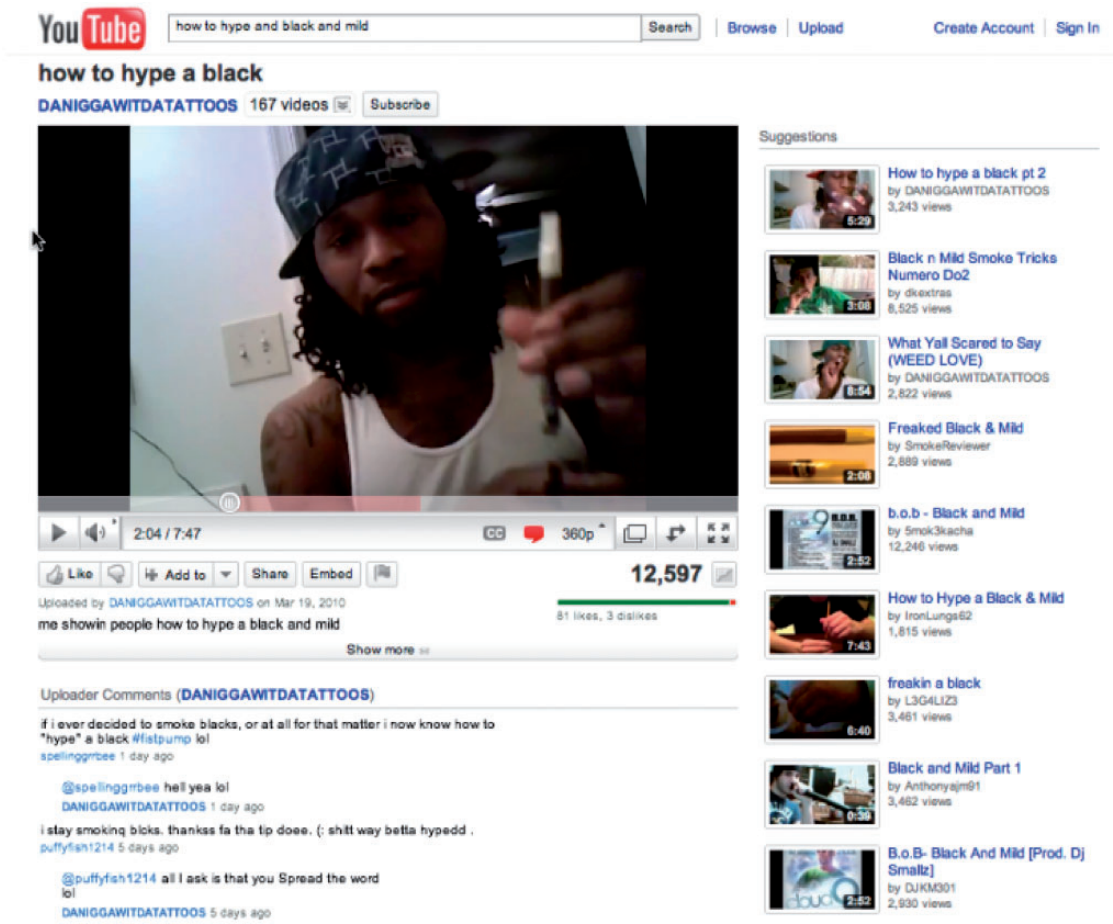

Fig. 1. YouTube screenshot showing a Black and Mild video and related search content.

'cigar' or 'cigarillo' in the title and/or description of an uploaded video, though the video had nothing to do with cigar use). The second judgment by trained coders involved distinguishing videos that depicted the lifestyle and culture of cigar use versus videos that provided smoking illustrations. Trained coders then determined whether the illustration was about typical use (e.g. friends hanging out and smoking), or about various improvisation methods like CPM. The decision scheme was revised and amended based on the potency of the initial search term.

A second sampling procedure, PPS sampling, was used to ensure that a representative sample of the CPM videos could be captured based on the availability and popularity of videos posted during a particular year. PPS is most useful when sampling units (e.g. videos) vary considerably in relation to the search unit (e.g. year). We divided the total population of videos found through network sampling by the number/range of years in which the video was uploaded, thereby generating a sampling interval (SI). We chose a number at random between 1 and the SI, called a random start (RS). Then, based on well-defined PPS procedures [38], the SI and RS were used in a series equation to select eligible videos to be included in the sample.

Once the sample of videos containing references to cigars was drawn, we created a catalogue of these

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videos. To ensure that the selected videos would remain available for the duration of the study, we used YouTube Robot to download Flash video (FLV) files and to save them as Audio Video Interweave (AVI) or as Motion Picture Experts Group (MPEG). Back-up videos were saved on a network and backed-up on DVDs.

Inter-coder reliability

An important step in the search, identification and recording process is to determine whether multiple searches by multiple trained coders yield similar content. Therefore, we examined reliability via three basic reliability tests: stability, reproducibility and accuracy [37]. Stability was determined by having each trained coder re-search and re-categorize a subset of previously categorized videos (test-retest). Reproducibility was assessed by having a trained coder replicate the work of a fellow trained coder (test-test). And, accuracy was assessed via Krippendorff's alpha (test standard) [37]. Unlike other reliability tests, Krippendorff's alpha may be computed for any number of coders. We report this reliability coefficient where appropriate.

Study 1 methods

Search, identification and sampling CPM videos

Between October 2010 and December 2010, trained coders entered keywords (e.g. cigar, cigarillo), phrases (e.g. cigar smoking, puffing on a cigar) and cigar brand names (e.g. Swisher Sweets, Phillies and Black & Mild) into YouTube search. Additionally, through the derived etic procedure, trained coders discovered and searched additional terms used to describe CPM. These everyday use terms included keywords that described cigar brands (e.g. blacks, sweets), phrases (e.g. smoking a black) and CPM (e.g. hyping, freaking and regulating).

Snowball sampling revealed over 6800 videos pertaining to cigars. Approximately 3200 videos were related to Black & Mild cigars; and, 73% ($n = 2336$) of these videos were deemed viewable (i.e. audio and video loaded). Then, we used the aforementioned decision tree to identify videos specific to CPM. Once these videos were identified, we used PPS sampling to randomly select from the population of CPM videos. We followed these procedural steps: Step 1: determined the number of years to be sampled; Step 2: determined the total population of videos for each year; Step 3: determined the total number of videos to be sampled; Step 4: computed the SI; and Step 5: chose a RS.

Step 1: The number of years sampled equaled five (from 2006 to 2010). Step 2: The total population of videos identified between the years 2006 and 2010 equaled 262; however, only 226 of the 262 videos were deemed viewable by our research team. Therefore, by year, the total number of videos equaled 5 in 2006, 30 in 2007, 53 in 2008, 74 in 2009 and 64 in 2010. Step 3: We determined in advance (based on available resources and the project timeline) to sample at least 10% of the entire universe of videos, or roughly 22–26 CPM videos. Step 4: We computed the SI using the following formula: SI = total population of videos divided by number of videos to be sampled. SI = 226 divided 26 resulted in 8.6, which we rounded down to 8.0. In this case, we selected the largest denominator ($n = 26$) to ensure a robust sample of CPM videos. Step 5: We chose an RS equal to 1.

Finally, to determine which videos would be sampled using this strategy, we used the following series equation: RS; RS + SI; RS + 2SI; RS + 3SI and continuing. Based on this logic, the following videos sequenced by year were sampled in this study: Video no 1 in 2006; Video nos 10, 19 and 28 in 2007; Video nos 37, 46, 55, 64, 73 and 82 in 2008; Video nos 91, 100, 109, 118, 127, 136, 145, 154, 163 in 2009 and Video nos 172, 181, 190, 199, 208, 217 and 226 in 2010. More plainly, 1 of 5 videos in 2006; 3 of 30 videos in 2007; 6 of 53 videos in 2008; 9 of 74 videos in 2009 and 7 of 64 videos in 2010. We renumbered the sampled videos (Video no 1–226) as V001–V026 for presentation purposes only.

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Coding the content characteristics of YouTube videos illustrating the cigar modification process

We developed a video data codebook and trained coders in its use. Variables in the codebook reflected defined characteristics and features of videos illustrating CPM: items pertaining to video content characteristics such as video demographics (i.e. number of comments; number of times favorited by users; number of ratings by users; number of likes and dislikes; total number of views; age restriction; number of referrals from other videos and number of views from viewers of similar videos); video quality and sophistication (i.e. picture; sound and overall quality); video promotional content (i.e. display of cigar promotional packaging; lighting or smoking a cigar); other video contextual elements (musical accompaniment; other tobacco product use and alcohol viewable) and, attributes of primary actor(s) (i.e. individual or group presenters; approximate age(s), gender(s), race/ethnicity). Frequencies and reliabilities were computed and reported on content characteristics of each CPM video.

Describing the CPM process through video abstraction

Videos with similar features (i.e. videos illustrating CPM) were analyzed using video abstraction (e.g. parsing), where segments or clips that best represented a characteristic or attribute (i.e. the CPM method) were compiled and summarized. Next, videos were clustered based on their similarities and dissimilarities. That is, videos that featured similar characteristics were placed in the same cluster or in clusters with close proximity; whereas videos that did not contain these features were placed in a different cluster or no cluster at all. The rationale for forming video clusters was to facilitate the identification of patterns among sets of videos. Once the video data were clustered and indexed, we inferred what the patterns of data represented in terms of behavioral patterns associated with CPM.

Content analysis of YouTube videos illustrating CPM

The analysis of video content was guided by the derived etic procedure. Trained coders transcribed all relevant videos using Transana® 2.50 [39] qualitative software for video and audio data. Each transcript was automatically filed with its associated video. Researchers and trained coders performed first-level coding on the video transcripts to identify distinct concepts and categories related to CPM. A consensus among researchers and coders was reached on the final concepts and categories and their associated descriptions. This information was transferred to a data table and used by trained coders to rate the salience of certain concepts (i.e. themes) presented in a video using a dichotomous scale (e.g. 0 = absent, 1 = present). We report the frequency of each theme, average number of references to a particular theme in each video, and inter-coder reliability.

Study 2 methods

Thematic analysis of YouTube commentary on CPM videos

Trained coders transcribed all comments written in response to a sampled video on cigar use and CPM. They then reviewed the original text (word and phrases) for each video comment and tabulated frequencies for each keyword and word phrase as performed in Study 1. Following tabulation, keywords and word phrases were categorized according to context and meaning units. Once meaning units were determined, recurring meaning units were identified and grouped together. This process continued until a sufficient number of meaning units were grouped (i.e. saturation). Coders next generated themes for each group of message units. We report the frequency of each message unit according to its theme, average number of message unit representing a particular theme in each video and inter-coder reliability.

A substantial majority of comments directed toward CPM videos were deemed nonsensical, uninterpretable or not relevant to the video or tobacco use in general. The comments that were relevant to

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the cigar use and related smoking practices were analyzed ($n = 2457$ comments). We identified several thematic categories that best summarize viewers' comments about CPM videos. These categories were populated with comments related to a critique of the video and its content, consultation and support and experiential learning.

Results

Study 1 results

Content characteristics of CPM videos

The 26 CPM videos varied in terms of total running time ($M = 5$ min, 17 s, $SD = 1.23$), total number of views, comments, ratings, times favorited, likes and dislikes, age restrictions and referrals (see Table I). CPM videos averaged more than 13 000 unique viewers (range 102–81 931). In addition, viewers' ratings of likeability resulted in an aggregate 5:1 like-to-dislike ratio across all videos. Only 3 (11.5%) of the 26 CPM videos were age-restricted.

About 90% of the sampled videos featured an individual as the primary actor, and these individuals were judged by trained coders to be of African descent (69.3%) and male (96.1%). About two-thirds of the CPM videos were accompanied with music, primarily of the Rap/Hip Hop genre. There were few images or references to other tobacco products and alcohol (<10%). Cigar product packaging (e.g. the box containing Black & Mild cigars) and promotional materials (e.g. graphic lettering added to the video) were evidenced in 76.9% of the videos. In 65.3% of the videos, users actually lit and smoked the cigar. Trained coders rated about one-quarter of the CPM videos as high quality (i.e. defined as high picture, sound and content quality). The content characteristics of all videos are presented in Table II.

Description of the CPM process

Using video abstraction, we identified a four-step process used to modify Black & Mild cigars. As illustrated in Fig. 2, the CPM process involved loosening the tobacco by rubbing the cigar product between the hands (Step 1); dumping or pouring the tobacco leaf lamina in an ashtray, on a table or back into the cigar's plastic wrapper (Step 2); removing the tobacco binder using the index finger and thumb or a tool like tweezers (Step 3) and then, simultaneously replacing and packing down the tobacco leaf lamina back into the hollowed cigar casing (Step 4). About 90% of the videos illustrated CPM using this method. Following modification, the cigar was ready to be lit and smoked by the user. Importantly, this process did not involve adding marijuana or other illicit substances.

Themes derived from YouTube videos illustrating CPM

We discerned several themes related to the rationale for cigar modification: making the cigar easier/smoother to smoke; reducing risks associated with cigar smoking; enhancing the taste of the cigar and, changing the burn rate. Table III presents the percentage of videos where this theme was salient and average references (number of times a specific video referred to this theme) of a theme in each video.

The theme that CPM made the cigar easier to smoke was evidenced in 53.8% of videos. A perceived benefit of CPM was increasing the smoothness of the cigar. According to one African American male user who remarked on why CPM renders the cigar easier to smoke:

> I see plenty a yall walkin round and ya mild just as hard and stiff but (...). Suckin ya jaws in just ta hit it. Don't even how ta smoke da damn thing. So I said lemme go'on head and get me a new YouTube. Show deez boys howta smoke a mild, and dem ladies. [V023]

According to other users, Black & Mild cigars were not to be smoked without modifying them first.

> I know there's a lot of you out there that smoke these milds, and snatch em straight out the pack, and fire it up, and it's like smokin a stick. That's not how you smoke a

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Table I. *Demographic characteristics of CPM videos randomly sampled from YouTube*

Video ID	Number of comments	Number of favorites	Number of ratings	Likes	Dislikes	Total views	Age restricted	Number of referrals[a]	Number of views from related videos[a]
V001	153	59	72	56	16	37 327	No	2	1959
V002	12	0	7	6	1	3964	No	7	444
V003	475	N/A	166	153	13	81 931	Yes	N/A	N/A
V004	117	N/A	45	24	21	29 550	No	N/A	N/A
V005	51	1	17	10	7	15 905	No	8	7953
V006	3	3	2	2	0	781	No	5	202
V007	344	146	83	72	11	54 062	Yes	5	17 754
V008	5	0	1	1	0	3128	No	6	935
V009	205	147	108	103	5	29 958	No	9	20 103
V010	213	102	81	68	13	36 677	No	4	3942
V011	90	17	42	27	15	14 580	No	6	7753
V012	13	7	6	3	3	2009	No	6	1508
V013	48	16	15	14	1	5149	No	1	133
V014	119	39	36	33	3	13 404	No	5	3962
V015	61	30	24	18	6	11 141	No	2	726
V016	12	2	3	2	1	881	No	2	48
V017	10	3	0	0	0	616	No	3	59
V018	3	2	5	5	0	1513	No	4	182
V019	5	6	3	3	0	802	No	2	31
V020	96	6	33	32	1	2278	No	5	359
V021	3	2	1	1	0	1220	No	3	73
V022	13	3	4	4	0	222	No	1	11
V023	11	3	2	2	0	630	Yes	0	0
V024	0	1	1	1	0	102	No	0	0
V025	10	2	4	4	0	981	No	3	230
V026	23	1	2	1	0	344	No	1	14
Average	80.57	23	29.34	24.80	4.5	13 429.03	11.5 (0.5, 24.6)	3.46	2630.03

[a]YouTube changed to a new analytics tool in November 2011. As a consequence, these data are no longer available to general viewers.

> mild. So let me show you. [V026] There's nothing better than a freaked mild . . . It's real smooth. [V012]

The theme that CPM reduced the risks associated with smoking a cigar was revealed in 30.7% of the sampled videos. A transcribed conversation between users featured in a CPM video provides evidence:

> Person 1: This is what the cancer paper looks like. [holding the tobacco binder toward the video camera]. Here explain what the cancer paper is.
>
> Person 2: The cancer paper is paper that they put in it . . . sposed to filter the tobacco a little bit. But there's actually more chemicals in the paper than there are in the tobacco . . . so it's actually just worse for you.
>
> Person 1: We're all about health. [V015]

Other users made more direct comparisons between removing the tobacco binder and eliminating their chances for cancer. For instance,

> You don't want dat in there [holding the tobacco binder toward the camera]. You know why?

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Table II. *The content characteristics of CPM videos on YouTube*

	Description of primary				Description of context			Product promotion and use		High video quality		
Video ID	Individual	Black	Male	<18	Music	OTP	Alcohol	Packaging	Lit/smoking	Picture	Sound	Overall
V001	1	1	1	1	1	0	0	1	1	0	0	0
V002	1	1	1	0	1	0	0	1	1	0	0	0
V003	1	1	1	0	1	0	0	1	1	1	0	1
V004	1	1	1	0	1	0	0	1	1	0	0	0
V005	1	1	1	0	1	0	0	0	1	0	0	0
V006	0	1	1	0	0	0	0	1	1	0	0	0
V007	1	1	1	1	0	0	0	1	0	0	0	0
V008	1	0	1	0	0	0	0	0	0	0	0	0
V009	1	1	1	0	0	0	0	0	0	1	1	1
V010	1	0	0	0	1	1	0	1	1	1	1	1
V011	1	1	1	0	1	0	0	1	1	0	0	0
V012	1	0	1	0	1	0	0	0	1	0	0	0
V013	1	1	1	0	1	0	0	1	0	0	0	0
V014	1	1	1	0	0	0	1	1	1	0	0	0
V015	0	0	1	0	0	0	0	1	1	0	0	0
V016	1	1	1	0	0	0	0	1	1	0	0	0
V017	0	0	1	1	0	0	0	1	1	0	0	0
V018	1	0	1	0	1	0	0	1	1	0	0	1
V019	1	1	1	0	1	0	0	1	0	0	0	0
V020	1	1	1	0	1	0	0	1	1	0	0	1
V021	1	0	1	0	0	0	0	1	0	0	0	0
V022	1	1	1	1	1	0	0	0	0	0	0	0
V023	1	0	1	0	0	0	0	1	0	0	0	0
V024	1	1	1	0	1	1	1	1	1	0	1	1
V025	1	1	1	1	1	0	0	0	0	0	0	0
V026	1	1	1	0	1	0	0	1	1	0	0	0
%	88.4%	69.3%	96.1%	19.2%	61.5%	7.6%	7.6%	76.9%	65.3%	11.5%	11.5%	23.1%
Reliability	0.90	0.81	0.86	0.89	0.92	0.86	0.70	0.75	1.00	0.62	0.54	0.78

OTP = Other tobacco products.

Fig. 2. Illustration of cigarillo modification or 'hyping'. Screenshots were taken from a YouTube video posted on 25 July 2008.

> Cause it cause cancer. In a bad way. Do you want cancer? No. So we toss that off to the side cause you don't need that. [V008]

The third theme in the CPM videos was related to taste enhancement. Users in 11.5% of the CPM videos remarked that removing the tobacco binder made the cigar product taste better. One user said:

> The reason why we freak a Black & Mild is because there is an extra piece of paper that's

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Table III. *Frequencies and average references to thematic content in CPM videos*

Video ID	Smoothness/ easier to smoke	Reducing smoking risks	Taste enhancement	Changing the burn rate
V001	0	0	0	0
V002	0	0	0	0
V003	1	0	0	0
V004	2	1	0	0
V005	0	0	0	0
V006	0	0	0	0
V007	3	0	0	0
V008	0	1	0	0
V009	0	2	0	0
V010	0	1	0	0
V011	5	0	0	0
V012	2	2	0	1
V013	1	0	0	0
V014	2	2	0	0
V015	2	7	1	0
V016	4	4	0	0
V017	0	0	1	0
V018	3	0	2	0
V019	3	0	0	0
V020	4	0	0	2
V021	0	0	0	0
V022	0	0	0	0
V023	2	0	0	1
V024	0	0	0	0
V025	0	0	0	0
V026	6	0	0	2
Percentage videos	53.8%	30.7%	11.5%	15.4%
Avg. references/ video	2.84	2.50	1.33	1.50
Reliability	0.77	0.84	0.91	0.98

> right beside the tobacco in a Black & Mild that ruins the flavor. [V017]

And, the fourth theme discovered was users' desire to change the burn rate of the cigar. About 16% of users in CPM videos mentioned removing the tobacco binder in order to reduce the time it takes for the Black & Mild to be smoked. A user replied, over a popular Hip Hop song performed by popular recording artists Rhianna and Jay Z:

> Then, inside the mild, there is another, what I call, I guess a, the slow burner. Whatchu gotta do is, take dat bad boy out. Ya understand? 'This [holding up the tobacco binder toward the stationary camera] is what causes the mild to burn slower. This is also what makes it so harsh. K. Well ya get rid a that. Don't litter. Be kind ta the earth. Throw dat in da trash. Alright. You almost done. [V026]

Study 1 Summary

This study validated previous findings about cigar smoking and the CPM process. In addition, we identified several reasons for this smoking practice. Importantly, 8 of the 26 CPM videos did not contain any codable thematic content beyond basic video demographic information. In overview, these findings are relevant to understanding the social norms and perceived risks of cigar smoking.

Study 2 results

Table IV presents information related to the frequency and average comments (type) for each video. Virtually all CPM videos were critiqued with respect to video content. About 81% of CPM videos received favorable comments, and slightly more than half of the videos fielded negative comments. Most of the favorable comments were concisely worded (e.g. similar to a text message). For instance, in response to one video, a viewer wrote:

> Good video im about to try this at home [V023]

Other favorable comments shed light on what was particularly appealing about the CPM video in terms of smoking-related imagery. For example, in response to a video with 36 000 views and a like-to-dislike ratio of 68 to 13, a commenter made note of the attractive female smoking the cigar:

> The video is probably so popular because the chick is sexy as hell [V010].

Another viewer appeared drawn to this CPM video because of the music:

> i dont get this video. but ahah i love the song. [V010]

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Table IV. *Type and frequency of commentary about CPM videos*

	Critique of video and content		Consultation and support		Experiential learning
Video ID	Favorable comments	Unfavorable comments	Seeking advice/asking questions	Disseminating information/answering questions	How to perform CPM
V001	13	4	12	19	0
V002	3	3	2	1	1
V003	25	7	82	135	26
V004	3	8	10	9	0
V005	0	15	6	5	0
V006	2	0	0	0	0
V007	3	2	8	9	0
V008	0	0	2	3	0
V009	18	10	30	44	17
V010	26	6	30	32	0
V011	8	30	4	9	0
V012	0	0	1	2	0
V013	6	5	8	11	2
V014	13	11	15	30	3
V015	1	8	8	21	0
V016	1	0	0	2	1
V017	0	0	3	3	0
V018	1	0	1	1	0
V019	3	0	0	0	1
V020	9	3	13	17	6
V021	1	0	1	1	0
V022	4	2	0	1	1
V023	1	2	0	2	0
V024	0	0	0	0	0
V025	3	0	0	0	0
V026	2	0	0	0	0
Percentage videos	80.7	57.6	69.2	80.7	34.6
Average comments	6.95	7.73	13.11	17.00	6.44
Reliability	0.80	0.78	0.84	0.82	0.90

Many viewers' comments were complex and contained both critiques and questions. One commenter complained sarcastically in response to a video viewed about 16 000 times with a like-to-dislike ratio of 10 to 7:

> . . . can you tell me the point of this????????? I smoke blacks daily . . . but whats the point of this???????? This makes me not want to go smoke this black I got in my hand, But i cant follow your step, cuz I cant even hear you . . . [V005].

CPM video comments also revealed what the CPM process may look like to new viewers or subjects interested in learning more about the CPM process.

> why is it called cancer paper? does it prevent cancer? what happens if you take it out? [V010]

Another viewer asked:

> You cant really get cancer if you only smoke like one a week right? or even 2 a week. what

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> you guys are talkin bout is like 4 a day right? [V009]

Importantly, queries from interested viewers typically were answered by the subject who uploaded the CPM video, or by other YouTube viewers.

> People say it causes cancer and can taste it. So when you take it out you don't get all the chemicals from it and you don't have too taste it in the smoke. [V003]

Occasionally, a viewer would respond critically to a subject in a CPM video or another commenter for responding in favor of CPM. For instance:

> It is a common misconception that if you smoke a Black & Mild you are to 'Freak' it because it is thought to make them less harsh or that it reduces the harm. But really, the tobacco inside is what causes diseases. The only thing that happens when you do it is that the cigar gets looser and you inhale plant fibers, actually causing MORE damage to your lungs . . . So stop (expletive) 'Freaking Blacks' ... food for thought. [V009]

Viewers also posted several questions about specific techniques used in the CPM process. For instance, in response to a CPM video that had almost 2500 views in less than 1 year, a like-to-dislike ratio of 32 to 1, and a musical accompaniment by recording artist Lil Wayne, a viewer asked:

> Now when I get done to the end when my black get small like it is in most of yo vids the tobacco start fallin out . . . I think its cuz it ain't that tight in there . . . How do I fix that?? [V020]

Of note, there were variations in video commentary regarding the best type of Black & Mild cigar to modify (i.e. plastic versus wood tipped; original flavor versus other flavors like apple and wine). Nevertheless, users and viewers tended to agree that plastic-tip cigars were easier to modify (wood-tips usually were glued, causing the cigar wrapper to tear during modification), and that original flavor tasted the best after modification.

Study 2 Summary

This study provides insight into viewers' reasons for watching the video and their communications about the health risks associated with CPM. Viewers were more likely to provide favorable responses than negative comments. Questions by viewers were generally answered by the subject who posted the video or by other viewers. Viewers' communications about the health risks associated with cigar use and CPM were mixed; however, messages demonstrated low-risk perceptions and a poor understanding of smoking-related harms.

Discussion

An apparent belief among users is that exposure to cigar smoke toxicants can be reduced by removing the reconstituted tobacco binder prior to smoking through a modification process known as 'freaking'. However, there exists scant data on the origins, practices, beliefs and consequences surrounding this phenomenon. This study used an innovative, two-stage sampling procedure to randomly select 26 YouTube videos posted between 2006 and 2010 with content specific to cigar smoking and CPM. Demographic information for each video was first collected, and then content and thematic analyses were performed. Study results yielded several themes concerning cigar users' rationale for CPM and viewers' motivations for seeking, observing and commenting on such video content.

The demographic and content characteristics of YouTube videos illustrating CPM

Since 2006, YouTube videos featuring CPM have increased exponentially; the population of CPM videos on YouTube increased 12-fold between 2006 and 2010. Virtually all videos sampled during those years depicted 'freaking' as a four-step method: loosening the tobacco; dumping the tobacco leaf lamina; removing the cigar binder and, repackaging the tobacco leaf lamina. It is unclear whether, during this same time period, other media such as film or music videos featured this

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CPM process, but the fact that the technique is remarkably consistent across users/videos suggests strong social normative beliefs and practices. The dissemination of these CPM beliefs and practices is likely facilitated by social media like YouTube, though the messages remain suspect and unproven within the scientific community.

Although the CPM process varied little across users/videos, there were substantial variations in the demographic characteristics of sampled videos. On average, videos garnered more than 13 000 unique views (six videos with views >20 000 and eight with <1000) and the number of comments ranged from 0 to 475. Also notable is that only three videos required the user to sign-in with an age-verified user name and password. New registrants on YouTube can gain access to restricted content by falsifying their date of birth, as other proof of age controls, such as being a credit cardholder, were not required. Age restrictions continue to be an important component of tobacco control strategies to reduce tobacco product promotion, access, and exposure to youth populations, as most adult smoking and smokeless tobacco users initiate before the age of 18 [40]. While current advertising limitations have helped eliminate many marketing forums for tobacco promotion that especially appeal to youth [41], smoking portrayals on television and in movies persist despite repeating warnings from the public health community of a potential causal link to youth smoking initiation [42, 43]. As demonstrated in this study and others, new sources of media like YouTube offer novel opportunities for both tobacco industry sponsored and user-created pro-tobacco content to be accessed by youth [26, 44]. In fact, one report indicated that more daily users between the ages 12 and 17 years visit the site than any other demographic group [45], and among a survey of youth who use the internet in the United States, 57% watch videos on video sharing sites like YouTube [46]. These statistics suggest there is significant reach for pro-tobacco YouTube content to this high-risk age group.

With respect to CPM video content characteristics, most of the CPM videos analyzed in this study featured an individual as the primary actor, and primary actors were usually males of African American descent. These findings support results from nationally representative surveys among youth and young adults [4, 9]. Almost two-thirds of CPM videos contained music and featured some type of product packaging or promotional materials. Some of these features are associated with measures of 'message sensation value', a construct associated with the audio, visual and structural content of a message that contribute to the viewer's subjective interpretation [47]. Sensation-seeking youth who are at risk for tobacco use are likely to attend to videos that incorporate content that rate highly on message sensation value [48]. Although this study did not assess the relationship between videos' message sensation value and viewership/ratings/comments [49], a previous analysis of anti-smoking videos on YouTube showed high viewership was associated with high message sensation value (i.e. music, visuals) [29]. In addition, the inclusion of product packaging or tobacco promotions may encourage the normalization of the use of specific cigar products among individuals' peers or age group. Of further concern when products are promoted via YouTube sources is the lack of delineation between professional advertisements or user-created content [50]. When viewed in the context of music and attractive imagery, these video characteristics may become more salient.

This study also revealed reasons for CPM process among cigar users that are consistent with previous research [1, 14]. Still, additional reasons related to increased product smoothness and user's ability to inhale also were uncovered. Moreover, users did not endorse uniformly the reasons for CPM reported in this study. Approximately one-half of all videos referenced using CPM for making the cigar smoother and easier to smoke, and about 30% of videos referenced using CPM for a reduction of risks associated with smoking. Importantly, smokers' perceptions of CPM as a risk reduction technique should be targeted in future research and prevention/intervention campaigns. While research on the health effects of CPM is in its infancy, early evidence suggests that this practice may not reduce users' exposure to harmful smoke constituents such as CO [17]. If CPM is

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ultimately found to be a futile practice, users are at risk for many of the same diseases as cigarette smokers [51].

Unfortunately, determining user toxicant exposure estimates from cigars is highly problematic. First, cigars vary considerably in tobacco content weight [52]. Second, Black & Mild cigars like those observed in videos analyzed by this study typically have hollow plastic or wooden tips whereas other popular small cigar brands may contain filtered tips similar to cigarettes. Third, given that the pH of a cigar varies as it is smoked, the amount of nicotine delivered can be significantly impacted [53]. And, fourth, CPM likely changes the burn rate of the tobacco. Over half (54%) of videos contained a thematic reference to CPM making the cigar easier to smoke and/or changing the burn rate. Each of these aforementioned factors may in turn affect smokers' topography, or their number, duration, volume, or inter-puff-interval of cigar puffs. Should modified cigars be smoked in a manner different from conventional cigars, users' toxicant exposure will be affected. At least one laboratory study has confirmed this idea with respect to CO [17], but it is crucial that we continue the examination of these modified cigar products.

In summary, the content source for these analyses highlights a novel means and access point for tobacco-related information among youth. As other have highlighted [44], public health practitioners and educators will need to be cognizant of the effects of social media and Web 2.0 technologies in tobacco use knowledge, attitudes, and behavior. These evolving arenas will continue to be an important source for youth and those seeking tobacco product information or advice, and the presence of these messages and themes, especially those concerning harm reduction claims, have the potential to adversely impact public health and tobacco control and prevention efforts.

Inferences about the potential potency of YouTube videos depicting CPM

This study also analyzed the video comments posted by YouTube viewers to elucidate health-related communications about CPM. Viewers' responses to videos featuring CPM were posted often in the form of question and answer (Q&A) or as singular comments about cigar smoking and CPM health risks. More than two-thirds of sampled videos were accompanied by comments seeking advice about CPM. About one-third of videos (34.6%) fielded comments pertaining to specific techniques used in CPM. Taken together, these comments suggest that YouTube is a popular source to obtain information about cigar use and CPM.

Commentary about the CPM process highlighted viewers' beliefs and perceptions that cigar smoking was less harmful than cigarette smoking; and, that CPM contributed to this effect. Importantly, young viewers may be most susceptible to pro-tobacco messaging and health-related communications in YouTube videos. Messages presented by primary actors and viewers/posters perceived by adolescents to be older (i.e. almost all primary actors were judged to be older than age 18)—and more knowledgeable about and experienced in cigar smoking—may influence significantly youth's smoking expectancies and behaviors.

The potential potency of CPM videos and related interactional textual content (e.g. video comments) about cigar smoking can be understood by employing the message interpretation process [54]. According to the MIP, adolescents' smoking expectancies and behaviors are informed by logical (i.e. perceived realism and perceived similarity) and affective (i.e. perceived desirability) routes of message interpretation. That is, youth's smoking decision process is influenced by whether portrayals of cigar smoking are consistent with the smoking practices of people they know and are realistic (i.e. perceived realism); whether portrayals express similar attitudes and beliefs as people they know (i.e. perceived similarity); and, whether portrayals display person-level (e.g. physical or linguistic) or contextual characteristics deemed attractive (i.e. perceived desirability).

For instance, in terms of perceived realism and similarity, viewers are more likely to identify with and want to emulate smoking behaviors when portrayals express attitudes and beliefs about tobacco use that are

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similar to people they know. The linguistic narrative the primary actor uses to describe the cigar product and its potent effect, and, the primary actor's social and cultural cache when smoking the product may signal to the viewer a shared cultural orientation. Importantly, perceived similarity and identification with primary actors is not limited to attitudes and beliefs about smoking. In one CPM video, a primary actor expressed his enthusiasm about 'last nights' outcome of the 2008 presidential election; and, this video received several responses from viewers who indicated that they were going to celebrate with him by freaking and smoking a cigar. Moreover, viewers' perceived similarity with and desirability of smoking portrayals may be enhanced in CPM videos that incorporate popular music; or, when primary actors don fashionable and stylish clothing. The integration of popular music, clothing, and colloquialisms may enhance the attractiveness of smoking portrayals and likely influence tobacco smoking expectancies and behavioral outcomes.

Potential limitations to this study

There are several limitations to these studies. First, the videos randomly sampled from YouTube represent a self-selected sample of cigar users, and therefore may not be representative of the general population. Studies that seek to validate our findings about the rationale and techniques used for CPM are encouraged. While one such study was conducted with 32 current Black & Mild cigar users [55], additional work might uncover alternative reasons for CPM, and this information can be used to inform prevention education. Second, this study focused on CPM video content and comments specific to cigar smoking and tobacco-related health communication. Alternatively, the observations reported in this study may be media-bound and time-centric. That is, other social and video-sharing websites may present cigar smoking behaviors inconsistent to what is reported in this study. In addition, the videos sampled in this study were posted during a 5-year period, 2006 and 2010. Since then, other videos may have been uploaded to YouTube that depict alternative use methods not reported here. Of note, however, is an analysis of 56 YouTube videos sampled in 2012 portraying little cigars/cigarillos that revealed similar topics covered: 'less harmful than cigarettes', 'smooth or not as harsh as cigarettes' and 'the candy flavor' [35]. Results from this recently published work strengthen the findings observed here concerning these themes.

Despite these limitations, study findings point to the need for additional surveillance of tobacco-content exposure on websites highly trafficked and populated by youth. With respect to counter-tobacco industry marketing, this study sheds light on emergent issues that should be addressed in national and statewide media campaigns. These issues may include new ways that the industry is promoting tobacco products on the Internet; faulty perceptions and knowledge about cigar smoking; and, myths about enhancing the smoking effect through improvisation methods. This study also informs tobacco prevention and cessation programs. Such programming may find it beneficial to expand the standard anti-smoking curriculum to include more information on health risks associated with cigars/cigarillo smoking, as well as, tobacco content exposure on social networking and video-sharing websites.

Contributions

Author A.N. designed the study and was responsible for the reporting of results. Authors A.N., M.B. and C.C. wrote the first draft of the manuscript. Authors B.B., M.K. and T.E. made contributions to subsequent drafts of the manuscript.

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Conflict of interest statement

None declared.

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