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TOBACCO IMAGERY IN THE 20 BEST SELLING VIDEO GAMES OF 2018

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ABSTRACT

Introduction

Video games are played by the majority of American adolescents. A small body of research has shown that video games expose users to tobacco imagery, potentially influencing subsequent smoking behavior. We examine the presence, type, and quantity of tobacco imagery in recent popular video games.

Methods

After identifying 2018's 20 best-selling US video games and selecting for each a YouTube video of all cut scenes and bridging game play, we coded each video for the presence of five types of tobacco imagery. We also recorded the length of time tobacco content was visible during the video.

Results

Seven of the top 20 video games contained tobacco imagery, which comprised between 7 seconds and 38 minutes of game play. All types of tobacco imagery were accounted for: visible tobacco paraphernalia, tobacco products used to further game play, background characters using tobacco products, and main characters (playable and nonplayable) using tobacco products. Visible tobacco paraphernalia was the most common type of tobacco imagery, and included both real and fictionalized tobacco brands that sometimes drew on real cigarette brand imagery. Three games allowed players to control tobacco-using characters.

Conclusions

Popular video games continue to expose players to tobacco imagery. Because video games are played repeatedly, the potential exists for adolescents to experience even more tobacco imagery than the baseline exposure established here, further increasing the potential for harm. Existing voluntary and regulatory approaches to policing tobacco content are inadequate; thus, policymakers should consider further interventions to minimize tobacco content in video games.

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IMPLICATIONS

Video games, popular among youth and young adults, are known to contain tobacco imagery. Less is known about the quantity and type of this imagery among recent popular games. We found that seven of the 20 best-selling video games of 2018 in the US contained a variety of tobacco imagery and exposed players to as much as 38 minutes of tobacco content. Given the established link between exposure to tobacco marketing in media such as films and subsequent smoking behavior, policies to minimize tobacco imagery in video games that exceed the scant protections offered by the Master Settlement Agreement could help reduce smoking prevalence among youth.

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INTRODUCTION

Video game play is ubiquitous among US adolescents and young adults: 97% of boys and 83% of girls, age 13-17,¹ and 72% of men and 49% of women, age 18-29² play video games in some form. American teens (aged 13-18) play video, computer, or mobile games an average of 1 hour 36 minutes per day, the third most common media activity for this age group after watching television and listening to music.³

Video game play exposes players of all ages to tobacco imagery⁴⁻⁹ and may, like exposure to tobacco imagery in films,¹⁰⁻¹⁴ result in youth smoking initiation and progression to regular smoking.¹⁵⁻²⁵ This link may be explained by narrative transportation theory, which argues that individuals are “transported” into narrative worlds through cognitive, emotional, and image-based engagement.²⁶ Once transported, the real world is partially suspended, and players feel as if they have entered the world created by the narrative, resulting in connections with characters, emotional involvement, and reduced motivation for counterargument.^{27,28} Players are thus more likely to change their real-world beliefs -- and ultimately behaviors -- to match those conveyed by game characters or the game environment, including beliefs about tobacco use.²⁶

In light of the serious implications of exposure to tobacco imagery in video games, it is vital to continue to monitor and characterize tobacco content in video games in order to inform potential policy remedies. The most recent analysis of this content concerned 30 of the most popular video games played in 2016, finding that 40% of games rated teen-appropriate contained at least one instance of tobacco imagery.²⁹ Our study updates this time frame to 2018, examining whether tobacco imagery is present in the 20 most popular video games purchased that year; unlike the earlier study, it also provides a more detailed examination of this imagery by categorizing and quantifying it.

METHODS

Although we were unable to identify a recent ranking of the video games or genres most often played by American teens and young adults, previous research has shown that teens play top-selling games.⁴ Thus, we identified the top 20 best-selling video games of 2018 (the most recent year available when the research began) in the US.³⁰ Unlike films, whose content is unvarying, video game imagery is experienced differently by players with different skill levels and time commitment. Because of the difficulties involved in fully capturing the breadth of a game's tobacco content by only observing actual game play, we chose to review YouTube videos that contained both "cut scenes" and game play. Cut scenes are non-interactive cinematic shorts inserted into the game that show conversations between characters or the effects of a player's actions, introduce new game elements, or otherwise advance game play. These are seen by most players as they advance to the next level, or when a character dies; videos containing all cut scenes show all possible endings of the game. We chose videos that advertised that they included all cut scenes; focused on the arc of the story, from beginning to end (i.e., a "game movie"), and included some actual game play, to allow us to determine whether tobacco imagery in cut scenes was carried over into game play. We also chose videos that were at least 60 minutes long, and were thus likely to include all of the content we were looking for.

Each game video was initially coded by the first author for the presence or absence of tobacco imagery, with each tobacco instance noted. We defined tobacco imagery as any visual depiction of cigarettes, cigars, pipes, hookah, e-cigarettes, tobacco leaves, ashtrays with butts in them, cigarette packs, cartons, and/or vending machines selling cigarettes, and/or any character using any type of tobacco product. If a game had one or more tobacco instance, it was considered to contain tobacco content. Using a coding scheme originally developed by Forsyth and Malone (2019),⁸ we further categorized each tobacco-containing scene using the following criteria: (1) visible tobacco paraphernalia present; (2) tobacco products used to further game play; (3) non-playable

background characters using tobacco products; (4) non-playable main characters using tobacco products; and (5) playable characters using tobacco products. Each scene containing tobacco could be assigned multiple codes. For games containing tobacco content, to facilitate coding, we also examined individual game wikis from the website *Fandom* (https://the-video-game.fandom.com/wiki/The_Video_Game_Wiki), each game's *Wikipedia* page, and the game publisher's official website (e.g., <https://www.rockstargames.com/V/>) to gain more information about character status (i.e., playable versus non-playable characters) and histories, plot, and types of items (such as cigarettes) available to players.

The second author watched all videos to confirm the original coding. Any discrepancies were discussed and resolved. At this stage, the authors agreed to add a time component to the coding. The first author re-watched each game video with tobacco content and recorded the length of time it was visible during the game video. Each scene containing tobacco was timed from the first appearance of tobacco imagery to its disappearance. If the scene switched back and forth between viewing a smoking character and a non-smoking character, it was considered one scene and was counted and timed as such.

To help mitigate the possibility that the videos we selected would lead us to underestimate the type or amount of tobacco content in games with tobacco imagery (i.e., by not including all cut scenes and incorporating only a minimal amount of game play), the first author coded a second set of videos for each game identified as containing tobacco content. (Supplemental table 1). For this second set, we again selected videos that contained cut scenes, game play, and covered the story from beginning to end; we also selected longer videos to encompass more game play (except for *Call of Duty, Black Ops 4*, where we reviewed a second video of nearly the same length as the first, since a longer video was not found). Our results for the second set of data were similar to our first set (Supplemental table 2); thus, we report only our first set. We also recorded the voluntary age appropriateness rating assigned by the industry-created US Entertainment Software Rating Agency

(ESRB) to each game and whether the ESRB had given the game a tobacco content descriptor, including “tobacco reference” and/or “tobacco use.”

RESULTS

The 20 bestselling video games of 2018 had a mix of ESRB ratings, although two categories, “M” (mature, appropriate for ages 17 and up) and “E” (everyone, appropriate for all ages), accounted for more than half of all games (Table 1). Seven videos contained tobacco imagery, six with “M” ratings and 1 with a “T” (teen, appropriate for ages 13 and up) rating (Table 1). None of the video games containing tobacco imagery had ESRB tobacco content descriptors attached (data not shown). Tobacco imagery continued from cut scenes into game play, except in one instance (Marvel’s Spiderman) (data not shown).

The total minutes of tobacco imagery in the seven videos with tobacco content varied from seven seconds in *Marvel’s Spider-Man* to 38 minutes 7 seconds in *Red Dead* (Table 2). Across all seven videos, all types of tobacco imagery were accounted for, with the most common the presence of visible tobacco paraphernalia (e.g., tobacco-related trash on the ground, tobacco advertisements in stores, and cigarette packs) (coded as 1). Four games contained branded tobacco products (Table 3). *Call of Duty: WWII* reproduced an actual brand popular during the time period it was set, Lucky Strike cigarettes (Table 3). *Battlefield V* lightly fictionalized the Eckstein brand, a common WWII German cigarette, changing the large number “5” centered on the package to a “6,” but maintaining the iconic green color.³¹ *Grand Theft Auto V* and *Red Dead* incorporated multiple fictional brands into each game, many with their own fictional marketing taglines. *Red Dead*’s four brands were available for purchase at an in-game store (Table 3); players could select the tobacco product from an on-screen menu, purchase it, and then watch their character use it. *Grand Theft Auto V* did not have an in-game store; however, in addition to viewing the game’s seven fictional brands throughout the game, when players entered convenience stores, gas stations or liquor stores, they saw a tobacco “power wall” displaying four of these brands.

The fictional brand images and taglines mimicked the style and tone of advertisements for real tobacco products during the time period in which each game was set (Table 3). For example, *Red Dead*, set in 1899, featured tobacco advertising with hand drawn images and elaborate typefaces, similar to real tobacco brands of the 1890s (e.g., <http://www.vintageadbrowser.com/tobacco-ads-1890s>). *Grand Theft Auto V*, set in 2013, relied on more contemporary tobacco advertising styles for its seven fictional brands, including real-life brand elements. Redwood cigarette packaging resembled Winston packaging from the 1980s (i.e., comparable colors [red and gold], typeface, logo color and placement, and motorsports sponsorship), and was the most visible during gameplay, while CoK packaging resembled modern L&M packaging (i.e., comparable colors [blue and white], typeface, and crest) (Table 3). Two of the seven brands appeared to acknowledge some of the dangers of smoking: Estancia cigars contained a “Smoking Kills” warning label, while Cardiaque cigarettes offered a similar warning with its name, evocative of cardiac arrest, and pack imagery resembling an electrocardiogram (Table 3).

The least common type of tobacco imagery was tobacco products used to further game play (coded as 2) (Table 2); this occurred in two games. In *Red Dead*, chewing Jolly Jack’s tobacco increased a player’s “dead eye meter,” allowing the player to slow down and sharpen game play, resulting in more deadly use of weapons.³² In *Grand Theft Auto V*, players completed a mission which included first killing jurors serving on a trial involving the manufacturer of Redwood cigarettes, and then purchasing reduced-price company stock.

Five of seven games had background characters visibly smoking (coded as 3), from a single instance in both *Call of Duty: Black Ops 4* and *Far Cry 5* to 24 instances in *Red Dead* (Table 2). Five of seven games had non-playable main characters who smoked (coded as 4), from a single instance in *Call of Duty: Black Ops* to 20 instances in *Red Dead* (Table 2) For example, *Red Dead* centered around the exploits of an outlaw gang whose leader was often seen smoking cigars.

Three of seven games had playable characters who smoked (coded as 5) (Table 2). In *Grand Theft Auto V*, for example, an action a player could perform as the character Michael de Santa was smoking while watching TV. In *Red Dead*, the playable character Arthur Morgan often smoked to relax and was able to light a match from the sole of his boot.

DISCUSSION

Like their counterparts in previous years,^{4,29} the best-selling video games we reviewed exposed players to tobacco imagery. Seven of the 20 most popular video games of 2018 contained such imagery, and two of those games ranked in the top two positions. Depending on the particular game, players could experience anywhere from seven seconds to 38 minutes of tobacco content. Research has not yet established whether greater exposure to smoking in video games leads to a higher likelihood of smoking among youth and young adults; however, such a relationship is plausible, given that a dose-response relationship has been repeatedly demonstrated between viewing smoking scenes in movies and subsequent youth smoking.^{10,11,13,22} Given that video games are played repeatedly, the potential exists for players to experience even more tobacco imagery than the baseline exposure established here, further increasing the potential for harm. In addition, we found that game play, in addition to cut scenes, contained tobacco imagery, increasing the amount and likely intensity of exposure.

In the US, there is little meaningful regulatory oversight of tobacco content in video games. The ESRB, in theory, monitors such content, providing guidance to players and/or their parents. However, as this study and others show, the ESRB performs this task poorly.^{6,7} None of the seven video games containing tobacco imagery were labeled with ESRB tobacco content descriptors. It was slightly encouraging that only one of the seven video games containing tobacco content was judged by the ESRB as appropriate for teens (*Marvel's Spider-Man*, which also contained the smallest quantity of tobacco imagery), with the rest assigned a “mature” (age 17 and up) audience recommendation. However, given that players younger than 17 frequently play games rated

“mature”^{33,34} and that young adults are not immune to the risks of exposure to tobacco imagery,³⁵ it is unlikely that ESRB’s “mature” game rating protects adolescents and young adults from harms associated with exposure to tobacco content in video games.

The 1998 Master Settlement Agreement between the attorneys general of 46 US states and the tobacco industry provides another avenue for regulating tobacco content in video games, prohibiting *paid* tobacco product placement in video games.³⁶ However, it does not address *unpaid* tobacco product placement. In the past, video game makers who have been criticized for incorporating real-life tobacco brands in games have denied any payoffs from tobacco manufacturers, claiming to be motivated solely by a desire for realism.⁶ Our study shows that video game makers continue to incorporate tobacco brands into games, both real and lightly fictionalized. (It is unknown if they receive any financial payments in return.) It was notable that two games, both created by the same company, contained not just one, but as many as seven fictional branded tobacco products, some with brand elements that mimicked those of real-life brands. Because the negative impact on players of viewing this type of tobacco imagery is likely to persist regardless of game makers’ motivation for including it, the MSA does not offer meaningful protections.

While the WHO Framework Convention on Tobacco Control (FCTC) has not been ratified by the US,³⁷ it offers policymakers guidance for additional approaches to the problem of tobacco content in video games. Guidelines for implementing Article 13, which concerns tobacco advertising and promotion, recommend that, at minimum, Parties adopt the approach long advocated by those concerned about depictions of smoking in films: formal certification by game makers that they received no benefits in exchange for tobacco product depictions; a ban on the use of identifiable tobacco brands in video games; inclusion of anti-tobacco advertisements in video games with tobacco content; and a rating system that takes into account tobacco content and age of players.³⁸ Our study suggests that the prohibition on identifiable tobacco brands be interpreted broadly, to include fictional brands that draw on elements of real-life tobacco brands or marketing campaigns. It

also suggests that the inclusion of anti-tobacco advertisements in games like *Grand Theft Auto V* that are saturated with unproblematic tobacco use not be limited to the beginning or end of the game, but appear throughout. To comply with the rating system recommendation, the ESRB would have to improve its assignment of tobacco content descriptors, and add a new age restriction category of 21 and over to reflect the December 2019 federal adoption of age 21 as the minimum purchase age.

Additional approaches might include extending real-life age of purchase laws to those video games that currently allow players of all ages to purchase tobacco products virtually (e.g., *Red Dead*), accomplished through a robust online age verification process. Likewise, health warning labels required of physical tobacco brands could also be required of virtual brands. The makers of *Grand Theft Auto V* appear to be prepared for this requirement: a health warning label already appears on the outside of one of their seven fictional brands.

Although recommendations for regulating tobacco content in video games draw parallels between films and video games, video games with tobacco content may pose a greater risk of youth smoking initiation and continued use. Video games are rapidly evolving, with increasingly complex storylines and more realistic graphics, allowing players to feel like they are characters in interactive movies, not simply viewers.³⁹ Research drawing on narrative transportation theory suggests that when a player is immersed in a game, the game world is experienced as “real.”^{26-28,40} When players stop playing, they exit as they would real space, taking with them memories, emotions and the sense of having been in a place.⁴¹ Thus, after spending time in a fictional environment where tobacco use is normalized, players, particularly those controlling smoking characters, some whose skills are enhanced by tobacco use, may be primed to take up smoking in real life. Exposure to fictitious rather than real-life brands may not be a deterrent, as research in other entertainment arenas suggests that these brands take on real-world meaning for participants.⁴²

Our study has limitations. While care was taken to find each tobacco instance, we likely missed some. Moreover, the tobacco content that a player is exposed to varies depending on how

the game is played; thus, someone viewing other videos would likely find different results (although our review of a second cut scene video for each game containing tobacco imagery suggests that these differences would not be dramatic). In addition, the videos we chose to review were selected from among those posted on YouTube, presumably a select population from which to draw. We also did not focus on observing actual gameplay, which would provide additional insight into how tobacco content is experienced by players. Finally, future researchers should consider refining tobacco categories to include whether the tobacco instance portrayed tobacco in a positive, negative, or neutral light, so as to present a more nuanced picture.

CONCLUSION

Popular video games continue to incorporate tobacco products and use into game backgrounds, game play, and game characters, with no meaningful oversight. While more research is needed on the link between exposure to tobacco content in video games and subsequent smoking behaviors, steps can be taken now to minimize tobacco content in the video games that adolescents play. Adopting recommendations outlined in FTC implementation guidelines and extending to the virtual world tobacco regulations that apply in the real world are options for policymakers to consider.

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COMPETING INTERESTS:

The authors declare that they have no competing interests

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Table 1. Tobacco content in 20 best-selling video games in the US, 2018

Rank	Game	ESRB rating*	Video length	Tobacco content (Yes/No)	Link to video
1	<i>Red Dead Redemption 2</i>	M	985 min	Yes	https://www.youtube.com/watch?v=AIJC7R8keVc
2	<i>Call of Duty: Black Ops 4</i>	M	89 min	Yes	https://www.youtube.com/watch?v=9ZvITYd87po
3	<i>NBA 2K19</i>	E	109 min	No	https://www.youtube.com/watch?v=z4fVNXOlons
4	<i>Madden NFL 19</i>	E	141 min	No	https://www.youtube.com/watch?v=eKZmvxM-f6E&t=225s
5	<i>Super Smash Bros. Ultimate</i>	E10+	79 min	No	https://www.youtube.com/watch?v=ys4YlaNDBfU
6	<i>Marvel's Spider-Man</i>	T	328 min	Yes	https://www.youtube.com/watch?v=hl6Pzq6Ohjs
7	<i>Far Cry 5</i>	M	359 min	Yes	https://www.youtube.com/watch?v=biXF8jEcKTM
8	<i>God of War 2018</i>	M	361 min	No	https://www.youtube.com/watch?v=iwoe8sTkp90
9	<i>Monster Hunter World</i>	T	200 min	No	https://www.youtube.com/watch?v=DD8WRy7ZOrQ
10	<i>Assassin's Creed: Odyssey</i>	M	155 min	No	https://www.youtube.com/watch?v=gwcrDZku4vo
11	<i>Grand Theft Auto 5</i>	M	656 min	Yes	https://www.youtube.com/watch?v=K-Jxx2SW5mA
12	<i>Mario Kart 8</i>	E	165 min	No	https://www.youtube.com/watch?v=-vVUFWd2hxA&t=227s
13	<i>FIFA 19</i>	E	198 min	No	https://www.youtube.com/watch?v=gmJ1DcnKftY
14	<i>Battlefield V</i>	M	199 min	Yes	https://www.youtube.com/watch?v=FqFUxo02XJg&t=7385s

15	<i>Super Mario Odyssey</i>	E10+	138 min	No	https://www.youtube.com/watch?v=FjLhzZiuorE
16	<i>Call of Duty: WWII</i>	M	229 min	Yes	https://www.youtube.com/watch?v=grw6bIJ_kbg
17	<i>Dragon Ball: Fighter Z</i>	T	280 min	No	https://www.youtube.com/watch?v=V_Y_zkUgg-s&t=7331s
18	<i>The Legend of Zelda: Breath of the Wild</i>	E10+	289 min	No	https://www.youtube.com/watch?v=UH2mAfvC2HI&t=3972s
19	<i>Super Mario Party</i>	E	60 min	No	https://www.youtube.com/watch?v=eUMIlyFZhfvA
20	<i>Pokemon: Lets Go Pikachu</i>	E	130 min	No	https://www.youtube.com/watch?v=m3_TWHFUmZI&t=604s

*Entertainment Software Rating Board (ESRB) ratings: AO: Adults only (content suitable for age 18 and up; not assigned to any games on this list); M=Mature (content is generally suitable for ages 17 and up); T=Teen (content is generally suitable for ages 13 and up); E10+ (content is generally suitable for ages 10 and up); E=everyone (content is generally suitable for all ages).

Table 2. Extent and type of tobacco content in 20 best-selling US video games containing tobacco imagery, 2018

Game	Total minutes of tobacco imagery	Total number of scenes with tobacco imagery	Types of tobacco imagery* (number of appearances)
<i>Red Dead Redemption 2</i>	38 min 27 sec	78	1 (78) 2 (5) 3 (24) 4 (20) 5 (14)
<i>Call of Duty: Black Ops 4</i>	2 min 3 sec	3	1 (3) 2 (0) 3 (1) 4 (1) 5 (1)
<i>Marvel's Spider-Man</i>	7 sec	2	1 (2) 2 (0) 3 (0) 4 (0) 5 (0)
<i>Far Cry 5</i>	5 min 14 sec	8	1 (8) 2 (0) 3 (1) 4 (2) 5 (0)
<i>Grand Theft Auto 5</i>	18 min 1 sec	60	1 (60) 2 (1) 3 (8) 4 (2) 5 (10)
<i>Call of Duty: WWII</i>	7 min 40 sec	23	1 (23) 2 (0) 3 (2) 4 (8) 5 (0)
<i>Battlefield V</i>	1 min 21 sec	50	1 (50) 2 (0) 3 (0) 4 (0) 5 (0)

*Tobacco imagery categories: (1) visible tobacco paraphernalia present; (2) tobacco products used to further game play; (3) non-playable background characters using tobacco products; (4) non-playable main characters using tobacco products; and (5) playable characters using tobacco products.

Table 3. Real and fictional tobacco products visible in 20 best-selling US video games containing tobacco imagery, 2018

Game (Game publisher)	Brand Name(s)	Description/advertising slogans used*	Images
<i>Call of Duty: WW II</i> (Activision)	Lucky Strike cigarettes	Actual American cigarette brand, manufactured by American Tobacco Company and included in American soldiers' combat rations during World War II.
<i>Battlefield V</i> (Electronic Arts)	6 cigarettes	Lightly fictionalized cigarette brand. Visually similar to Eckstein #5 cigarettes, manufactured by Reemtsma, a German tobacco company, during World War II.
<i>Red Dead Redemption 2</i> (Rockstar Games)	Jolly Jack's chewing tobacco	Fictional tobacco product. "Cut plug! Taste it! Chew it! Spit it! A gentlemanly pleasure that lasts until the cows come home." Use increases player's shooting accuracy. Available for in-game purchase.
	Red Rocket cigarettes	Fictional cigarette brand. "Red Rocket cigarettes are perfectly mild and rich, made only from the finest tobacco. It is the reward you deserve." Available for in-game purchase.
	Millicents' cigarettes	Fictional cigarette brand. "Millicents' cigarettes are the smoother, healthier smoke enjoyed by the whole family. Includes a collectable cigarette card, a favourite amongst young children. Collect them all." "Mildest and purest. Try a Millicents' once and you'll smoke them forever." "9 out of 10 doctors and their families smoke Millicents." Available for in-game purchase. Collecting sets of cigarette cards results in in-game rewards.

	Dr. Hawthorne's cigars	Fictional cigar brand. "Dr. Hawthorne's premium blend domestic brand cigars. A fine, fragrant blend of superb tobaccos for refined gentlemen." "These cigars will test any smoker. The strongest tobacco." Available for in-game purchase.
<i>Grand Theft Auto V</i> (Rockstar Games)	Redwood cigarettes	Fictional cigarette brand. "Be a real man, smoke Redwood." "When stress is about to get you, get a Redwood." The brand also sponsors (fictional) motorsports. Most visible brand in the game: seen in stores, billboards, private homes, and as litter. Trades on in-game stock exchange.
	Debonaire cigarettes	Fictional cigarette brand. "A fresh American taste." Visible in stores next to other brands. Trades on in-game stock exchange. Key rival to Redwood.
	69 Brand cigarettes	Fictional cigarette brand. Visible in stores next to other brands.
	Estancia cigars	Fictional brand of hand rolled cigars. The player can smoke these cigars while playing the character Michael De Santa. Only available at Michael De Santa's house.
	CoK cigarettes	Fictional brand of cigarettes. Visible in vending machines.
	Cardiaque cigarettes	Fictional brand of cigarettes. Visible at convenience stores next to other brands.

	Homies Sharp cigars	Fictional cigar brand. In-game billboards promote the brand. Visible in kiosks.
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*The advertising slogans/taglines are taken from the product itself and/or in-game product descriptions found here:

Call of Duty WWII (https://www.youtube.com/watch?v=grw6bIJ_kbg);

Battlefield V (<https://www.youtube.com/watch?v=FqFUxo02XJg&t=7385s0>);

Red Dead Redemption II

(<https://socialclub.rockstargames.com/games/rdr2/catalogue/categories/grocery-and-dry-goods>);

Grand Theft Auto V: (https://gta.fandom.com/wiki/Category:In-Game_Tobacco)

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