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**TOBACCO CONTENT IN VIDEO GAMES: CATEGORIZATION OF TOBACCO
IMAGERY AND GAMER RECALL**

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ABSTRACT

Introduction

Tobacco content has been identified in popular video games played by adolescents. To date, there are no established instruments for categorizing tobacco content. We describe development and demonstrate the use of an instrument to categorize types of tobacco content.

Methods

Interviews were conducted with 61 participants: 20 adolescents (mean age 17.7), and 41 adults (mean age 23.9), who discussed favorite games and recalled tobacco content. All games mentioned were examined for tobacco content by watching movies of game play on YouTube, examining individual game Wiki sites, and reviewing content descriptors provided by the Entertainment Software Rating Board (ESRB), Common Sense Media and the Internet Movie Database (IMDb). A typology of tobacco content was created and correlated with gamer recall of tobacco content.

Results

Participants together mentioned 366 games, of which 152 were unique. Tobacco content was verified in 39.5% (60/152) of games. Six categories of content were identified, including “no tobacco content.” Of games containing tobacco, 88% (53/60) contained at least two categories of content. Games with more categories were associated with greater gamer recall of tobacco content.

Conclusion

Tobacco content is present in video games and consciously recalled by players, with higher accuracy of recall associated with games featuring multiple types of tobacco content and more engaging, player-active content.

IMPLICATIONS

Playing video games is now a daily part of most adolescents' lives. Tobacco content is present in many popular games. Currently there are no published instruments to assist in categorizing tobacco content in video games. This study describes a systematic approach to categorizing tobacco content in video games and demonstrates that games featuring more categories of tobacco content are associated with more accurate gamer recall of the presence of tobacco content when compared with games with fewer categories of content. Understanding the extent of such content will be essential in formulating tobacco control strategies to address tobacco content in games.

TOBACCO CONTENT IN VIDEO GAMES: CATEGORIZATION OF TOBACCO IMAGERY AND GAMER RECALL

INTRODUCTION

Video games have become embedded in adolescent lives. Daily, 56% of adolescents play video games, spending a mean of 1 hour 21 minutes.¹ Boys play more frequently than girls: 72% of boys and 38% of girls play daily.¹ In 2016, the United States video game industry generated \$30.4 billion in revenue² as compared to the US/Canadian film industry with combined revenue of \$11.4 billion.³ Tobacco content has been identified in video games,⁴⁻⁶ and preliminary research points to an association between playing video games with tobacco content and likelihood of ever smoking.⁷ However, determining the type of tobacco content in each game is challenging. Tobacco content in games may range from none to a single image of a pipe⁸ to games where smoking is promoted in multiple instances of play.⁹ Video games, especially in their current hyper-realistic form, are new media, and little regulatory attention has been paid to tobacco content.

Theory of Presence and the General Learning Model

The theory of presence, or the sense and experience of being in one's environment, is grounded in communications research.¹⁰ While it has primarily been used in marketing and advertising,^{11,12} it is an important concept for understanding why video games are so engaging to players. Presence refers to the experience of the technologically mediated environment qualitatively taking precedence over the experience of being in the actual environment,¹³ resulting in a state in which virtual objects and experiences are experienced as actual objects or experiences.¹⁴

The concept of presence focuses attention on adolescents as actors within virtual worlds, interacting with virtual spaces and their affordances, creating, receiving and engaging with virtual experiences. Presence imbues virtual spaces with meaning. Presence shifts the locus of the definition of virtual reality from a set of hardware to the perceptions of the people co-creating the gaming environment. This shift allows the emotions, relationships, and actions that game players experience within the game world to be attended to with the same level of concern as if they occurred in the real world.

The General Learning Model (GLM) also helps explain why experiences had in the virtual world matter in the real world.¹⁵ The GLM argues that adolescents can learn complicated behaviors, attitudes, expectations, beliefs and perceptual schemata through playing and engaging with video games. As they play and engage, the players are learning and rehearsing scripts. Once a script is learned, it can guide how various situations are perceived and interpreted and shape behavior. Greater familiarity with the script leads to more facility and automation of the behavior both in the game and in real life.¹⁵ Marketers are increasingly aware of the power of gaming and are using “gamification” to sell products and sway thought, aware that using products within the game environment results in increased sales in the real world.¹⁶

Research about product placement in video games indicates that even when something is not consciously recalled as being present, it still can impact decision making. Young adults (mean age 20.2) exposed to advertising billboards in driving video games subconsciously registered and responded to the brand placements, even if they were not able to recall the that they had seen the advertisement.¹⁷ When young adults (mean age 19) were exposed to anti-DIU (driving while under the influence) messages in an first-person-shooter video game, they indicated they were less willing to engage in DUI than those not exposed.¹⁸ In a meta-analysis,

video game players who played games that depicted risky behavior had increased risk-taking inclinations, with video game playing demonstrating a stronger effect than more passive media like movies or television.¹⁹ Knowing the type of tobacco content in video games is thus important for considering how to develop effective tobacco control strategies for this media type.

Some previous video game content studies have used trained game players to play for 30 minutes to at least an hour and record relevant content.²⁰⁻²³ While this method yields important information, games often take 20 or more hours to play through, and may display various content depending on the choices made by the player. Playing for a limited time, *as* these studies did examining different types of content, may not fully reveal the type and extent of the tobacco content present in the game. In addition, the Entertainment Software Ratings Board (ESRB), the industry-created, non-profit agency charged with giving age ratings and applying content descriptors to games, is not a reliable source for ascertaining whether a game contains tobacco content or tobacco references; of games containing verified tobacco content, the ESRB applied a tobacco-related content descriptor only 14% of the time.²⁴

Gaining a clearer picture of the types of tobacco exposure from playing a specific video game requires a multi-pronged approach. This article describes the development of an instrument for assessing tobacco content in video games and demonstrates its use in a sample of games played by adolescents and young adults.

METHODS

We recruited a convenience sample of adolescents aged 13-21 (n=20) using flyers and snowball sampling methods in a large Northern California metropolitan area and advertised for participants over age 18 (n=41) on the website *Reddit* in the subReddit *Samplesize*²⁵ by placing a request for participants on the webpage listing the study information, contact information and

recruitment criteria. All recruitment information specifically stated we were researching tobacco content in video games. Inclusion criteria for participants included: speaking and writing English and having previously played video games for an average of two hours on most days for at least a year. Written consent was obtained for all participants. Written parental consent was also obtained for participants under age 18. Interviews were conducted between September 2011 and January 2015. Participants were given a \$20 gift card for participation. Study procedures were approved by the University of California, San Francisco Institutional Review Board.

In-person, semi-structured interviews lasting from 30 minutes to 1.5 hours were conducted with the adolescent participants by the first author. Participants were asked to list and describe their favorite video games and then to recall whether each game contained tobacco content. While participants were asked to recall if any game they had played contained tobacco content, they were not prompted to recall any specific game. If participants recalled tobacco content in a game, they were asked to describe what they had seen. Interviews were transcribed and coded using NVivo software²⁶ with game names highlighted and noting whether the participants recalled tobacco imagery in the game. Adult participants responding to the online advertisement were given a written survey containing similar questions. Answers were free text and no prompts were given to draw participants to consider specific games. All game names mentioned by participants were compiled into a spreadsheet (unique games) along with the number of participants who had recalled tobacco in each game (game mentions).

Using the list of unique games mentioned by participants, the first author examined each game for tobacco content. Since games are often parts of game series that share a similar name, we first had to determine which game to examine. If a specific game was mentioned by participants, that game was investigated. If multiple games in a series were mentioned, the most

recent game in the series released in North America prior to December 31, 2014 was investigated. If a series of games was mentioned without specifying a specific game, we examined the entire series for tobacco content.

Because tobacco content was not consistently recalled, additional approaches, refined from previously described methods²⁴ were used to determine independently whether a game contained tobacco content not recalled by a participant, whether a participant had erroneously recalled tobacco content in a game, and the types of tobacco content. General internet searches were completed on each game using *Google's* search engine and the website *Wikipedia* to gain understanding regarding game demographics (dates released, whether the game was part of a series, the type of game play available and the arc of the story.) The Entertainment Software Ratings Board (ESRB) website was searched for ratings and tobacco content descriptors results were recorded. *Common Sense Media*, an independent, non-profit website that also rates games according to type of content present, was searched and tobacco content descriptor results were recorded.²⁷ The Internet Movie Database (IMDb), an Amazon subsidiary, maintains a section on video games, with a "parents' guide" containing a section labelled "alcohol/drugs/smoking" allowing registered users to comment on individual game content. All comments in this section were read and any comments about tobacco content found were recorded according to the game title. Additionally, each individual game's wiki site was searched with the terms "cigar, cigarette, tobacco, pipe" and "smoking." Game wikis are fan-created websites where game players gather outside of the game to post and collect game information. All results were examined to ascertain whether they related to actual tobacco content present in the video games or were extraneous user comments, i.e., "I could sure use a smoke whilst playing this game." Finally, the video sharing website *You Tube.com* was searched using the individual title of each game, followed by

the terms “game movie” and/or “cut scenes.” Videos that appeared to include both the arc of game play and the short cinematics (cut scenes) that tie game play sequences together to move the plot line were selected for viewing. At least one hour of each game movie was watched and each type of tobacco content recorded. By watching a game movie, we could move through the arc of game play as well as view the cinematic cut scenes, allowing for a more in-depth search for tobacco imagery than simply playing the game for an hour. In addition, not all games mentioned were readily available to play, while all games had at least some game play recorded on a YouTube video.

A game was considered to have tobacco content if such content could be verified using the ESRB, Common Sense Media, the IMDb, the individual game wiki site, and/or had at least one instance of tobacco content in *You Tube* game play videos. For a list of the sources that that indicated the game was positive for tobacco content, see Appendix B. A tobacco instance was defined as including: cigarettes, cigars, pipes, hookah, e-cigarettes, tobacco leaves, ashtrays with butts in them, cigarette packs, cartons, and/or vending machines selling cigarettes visible during game play, verbal references to tobacco, and/or any character using any type of tobacco product. Multiple points of verification were sought for each game. Games identified by participants as including tobacco but with unverifiable tobacco content were treated as not containing tobacco content.

Initially, each game or game series was coded dichotomously, as either containing or not containing verified tobacco content. Games without confirmable tobacco content were coded as “no tobacco content found” when no tobacco content could be independently verified, even if participants stated that they recalled tobacco content. Games were then compared to participant recall of tobacco content in the game. We divided games into four groups: (1) games without

verified tobacco content and not recalled by participants as containing tobacco content (2) games without verified tobacco content but recalled by at least one participant as containing tobacco content (3) games with verified tobacco content with at least one participant recalling the game as containing tobacco content (4) games with verified tobacco content and not recalled by any participants as containing tobacco content. (See Figure 1)

We created a tobacco typology that further categorized the type of tobacco content found in the game. The tobacco typology was developed by iteratively examining each instance of tobacco content found in the games. Six broad categories emerged: 1) no tobacco content found; 2) visible tobacco paraphernalia present; 3) tobacco products used to further game play; 4) non-playable background characters using tobacco products; 5) non-playable main characters using tobacco products; and 6) playable characters using tobacco products.

The code of “visible tobacco paraphernalia” was applied to games when cigarettes, cigars, pipes, hookah, e-cigarettes, tobacco leaves, ashtrays with butts in them, cigarette packs, cartons, and/or vending machines selling cigarettes were visible during game play. (We chose to include e-cigarettes as tobacco products because they are part of the current tobacco product landscape and imagery of their use may re-normalize smoking-type behavior). “Tobacco products furthering game play” was applied when the use of tobacco or tobacco paraphernalia served a useful role during game play. “Non-playable background characters using tobacco products” was applied when game-controlled characters who did not further the storyline or game play were seen smoking (for example, pedestrians smoking in the street that provided backdrop to play). “Non-playable main characters using tobacco products” was applied when game-controlled characters playing a role in moving the plot or game play were seen smoking. The code “Playable characters using tobacco products” was applied when a character who could

be controlled by the player smoked or had the ability to smoke, whether the player chose to exercise that ability.

The tobacco typology was applied to each video game, which was scored 0-5, depending on the number of categories of content found. Games without verifiable tobacco content were given a score of zero and games that featured all five verified tobacco categories were given a score of five. Games were then grouped together by typology score and the percentage of accurately-identified tobacco content in game mentions by score was calculated.

FINDINGS

Participants

See table 1 for demographic information.

Number of games identified

Participants recalled 152 unique games or game series. Games varied in popularity, with some games discussed only by a single participant and others mentioned by multiple participants. The total number of game mentions by participants was 366, ranging from 1- 22 participants discussing the same game. (See supplemental appendix A for a list of all games and the number of participants who mentioned each game.) The most commonly recalled game was the *Grand Theft Auto* Series, mentioned by 36% (22/61) of participants. Games identified ranged from those that participants had enjoyed during childhood to games that they were playing at the time of the interview.

Tobacco content in video games

Player recall for tobacco content did not necessarily match verified tobacco content. Participants recalled tobacco content in 25% of unique games (37/152), but tobacco content was verified in 39.5% (60/152). As Figure 1 shows, participants were more likely to not recall

tobacco content when it was present than they were to recall tobacco content where it was not present.

Table 2 reports the percentage of unique games that were classified in each of the six categories of the tobacco typology. (For a list of games with verified tobacco content, the type of tobacco content present and a description of the content, see supplemental appendix B.) Almost 18% (24/152) of unique games had a playable character that used tobacco. The majority of games with any tobacco content (n=60) had a minimum tobacco typology score of two (88%; 53/60).

Figure 2 reports game mentions and participant recall accuracy by tobacco typology score. Although only a small percentage (3.9%; 6/152) of the unique games contained all five categories of tobacco content, they accounted for a substantial proportion of total game mentions (13.1%; 48/366). Among those games with independently verified tobacco content, the higher a game's typology score, the more likely that gamers accurately recalled and mentioned the presence of tobacco content. For example, 87.5% (42/48) of gamer mentions accurately recalled tobacco content in the games with a tobacco typology score of 5. These data show that the more types of tobacco content present in a game, the more gamers recall it.

DISCUSSION

To the best of our knowledge, this is the first study to identify whether tobacco content is present in a particular video game or game series and then to categorize the type of content and compare it to player recall. Our findings demonstrate that tobacco content is common in video games and is frequently used in a variety of ways. For example, in a typical game with all five tobacco categories, such as the 2013 Rockstar game, *Red Dead Redemption*, the main playable

character and various minor characters smoke or chew tobacco. The player can buy tobacco in stores and using it will refill the player's "dead eye" meter. The dead eye meter allows the game play to slow so that the player can more accurately target shots to gain higher scores, thus making tobacco a desirable object. Understanding how deeply embedded tobacco content is in video games is important in appraising the extent to which adolescents are exposed to tobacco messaging while playing. It also highlights the similarities and differences between seeing tobacco on a movie screen and experiencing tobacco in video game play. While dichotomous categorization of tobacco content in video games begins to uncover the role of tobacco, it is also critical to systematically examine the types of content, the uses of smoking characters, and how tobacco furthers gameplay.

The gap between player recall of tobacco content and actual tobacco content in games is of interest. One possibility is that the tobacco imagery was so well imbedded into the games it appeared to be normal and thus was not noticed. Another is that the imagery lacks salience and is therefore ignored, or that players play in such a way that they are not exposed to the imagery. However, the possibility that players can virtually "go" to places where tobacco use is normalized and possibly valorized and spend hours a day there, is concerning.

This study has limitations. Our sample of gamers was small, *80% male* and *is not* representative of all gamers. Limiting our sample to gamers who play a mean of at least two hours a day did not allow us to capture the views of more casual gamers. We qualitatively interviewed or used free text answers to collect data, which allowed for a greater range of responses but precluded standardization. While this study describes the development of and demonstrates the use of an instrument to categorize and count the types of tobacco content in video games, the accuracy of our classifications of game typologies has not been independently

confirmed by a second round of coding of the same materials. The significant time commitment involved in examining game content, even using the alternative sampling methods discussed, makes this challenging. Categorizing content does not capture multiple instances of the same type of content, which could show something about intensity of exposure. Because of the complexity of the process of game play, tobacco exposures may vary from player to player, and not all players will be exposed to every possible tobacco image within any game. However, the instrument is easy and feasible to use, and our study demonstrates that games scoring higher on the instrument are associated with more accurate gamer recall of the presence of tobacco content.

Conclusion

We demonstrate that tobacco content is present in video games and is consciously recalled by players, with higher recall accuracy when the tobacco content is presented in multiple ways. Among games with verified tobacco content, the highest recall accuracy was found for games that featured multiple types of imagery, including playable characters using tobacco. The typology instrument serves as a useful tool to assess the various ways tobacco is used in video games. Typology classification allows for a more nuanced understanding of the possible ways players may encounter tobacco content.

Video games should be viewed as meaningful tools for interpreting and extending the world around the player, creating relationships, crafting identity, and encouraging creativity, but they can also be powerful agents of normalization, presenting worlds and ways of being that are unhealthy. Because video games are one lens through which adolescents perceive reality, it is critical that researchers examine what it is that they are perceiving.

Given the well-documented association between viewing smoking in movies and adolescent smoking initiation, there is now a concerted push for an “R” rating for all movies with

tobacco content that is not historical in nature. The same policy argument could be considered for protecting youth from tobacco content in video games, although video games present a more complicated policy challenge. Movies are a place that people “go” and for movies with an “R” rating, unaccompanied youth under 17 are (presumably) not admitted, although movies are also increasingly available through streaming services that may or may not have effective controls on access by minors. Video games are played at home, with friends, or anywhere that one can use a handheld device. There is no gathering point of control, no theater. Nor does it seem that rating a video game “M” is a strong deterrent against adolescent play, and it may actually serve as an inducement.²⁸ At minimum, however, the accuracy of tobacco content ratings should be verified by an independent body. Counteradvertising in video games could also be considered as another point of intervention. Video games will only become more technologically advanced and more engaging to players. As the tobacco control community develops strategies for combatting the influence of tobacco content in video games, it will be critical to not only know which games contain tobacco content, but how players interact with that content.

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COMPETING INTERESTS:

The authors declare that they have no competing interests

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Table 1: Demographics of Gamer Study Participants

	Mean age (SD)	gender (n)	Race/Ethnicity (n)	Location (n)	Ever smoker (n)	Current smoker (n)	Mean hours per day gaming (SD)	Mean age started gaming (SD)
In-person gamer interviews (n=20)	17.7 (2.7)	F (5) M (15)	Asian (7) Hispanic (4) Caucasian (7) African/Am (1) Multiracial (1)	USA (20)	(3)	(1)	3.8 (1.2)	6.5 (2.9)
Online gamer interviews (n=41)	23.9 (5.4)	F (7) M (34)	Asian (2) Hispanic (1) Caucasian (36) Multiracial (1) Declined (1)	USA (25) Canada (5) Europe (9) Africa (1) South Am (1)	(27)	(12)	2.7 (1.1)	7.5 (4.2)
All gamer interviews (n=61)	21.9 (5.3)	F (12) M (49)	Asian (9) Hispanic (5) Caucasian (43) African/Am (1) Multiracial (2) Declined (1)	USA (45) Canada (5) Europe (9) Africa (1) South Am (1)	(30)	(13)	3.0 (1.2)	7.2 (3.8)

Table 2: Typology of tobacco content in unique games

Tobacco content	Unique games and type of tobacco content %* (n) n=152	Example
No tobacco content found	60.5% (92)	n/a
Visible tobacco paraphernalia	39.5% (60)	Silent Hill Downpour (2012): Scattered around the game world of Silent Hill are cigarette packs. They do not appear to serve any purpose, but they are frequently seen in random spots. The packs look similar to Marlboro Golds.
Tobacco products furthering game play	12.5% (19)	Fallout 3 (2008): Cigarettes, packs and cartons are a valuable trade good that can be collected by the player. Packs and cartons of cigarettes are also used as Rock-it launcher ammunition.
Non-playable background characters using tobacco products	19.7% (30)	Medal of Honor (2010): Soldiers are asked if they want a cigarette by a guard at an Afghan checkpoint; they respond “no.” A US sniper is seen with a pack of cigarettes in his gear and a Taliban fighter is seen smoking before he is shot.
Non-playable main characters using tobacco products	45.0% (27)	Mass Effect 3 (2012): Humans are in an intergalactic war against aliens. The Illusive Man heads a human paramilitary group. The Illusive Man is an impeccably dressed older man who is always seen smoking. He is a shadowy figure, not seen much, but with enormous power. He was voiced by Martin Sheen, who said he sucked through an empty pen to emulate the noise of the Illusive Man smoking.
Playable characters using tobacco products	17.8% (24)	Left 4 Dead (2008): One of the four playable characters, Bill Overbeck, is always seen with a cigarette in his mouth, regardless of what he is doing. He is a grizzled Vietnam vet, who is the oldest of the group. He ultimately sacrifices himself to save the rest. In death is the only time that the cigarette is not lit.

*Totals add to more than 100% as many games fell into more than one category