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Playing with food: Exploring the effects of food messaging in video games on adolescents

by

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ABSTRACT

The effects of food messaging in video games remain unexplored despite the popularity of the medium among adolescents and the growing potential for food messaging in video games. My three research objects were to: (1) identify how healthy and unhealthy foods are depicted in video games; (2) gather adolescent and other stakeholder perceptions of the effects of food messaging in video games on adolescent food habits; and (3) test the effects of healthy and unhealthy food messaging in video games on the attitudes and food choices of adolescents empirically. I did a content analysis of popular video games to address (1). I interviewed adolescents, parents and video game industry representatives to address (2). I did an experiment to address (3). This thesis provides recommendations for adolescent media literacy training to address food messaging in video games.

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LIST OF ABBREVIATIONS

GTA	Grand Theft Auto
HUD	Heads up display
IAT	Implicit Association Test
NPC	Non-playable character
PSA	Public Service Announcement
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

Food messaging in media normalizes and models unhealthy food habits to adolescents while misrepresenting the long-term health repercussions of these habits (Dickinson, 2000; Greenberg, Rosaen, Worrell, Salmon, & Volkman, 2009), thereby contributing to rising obesity rates in adolescents (Cairns, Angus, & Hastings, 2009). The effects of these food messages can have long-lasting effects because lifelong health attitudes and habits form during adolescence (age 12-18) (Lau, Quadrel, & Hartman, 1990). Even though over 80% of 13-17 year olds play video games at least once every 4 week (Entertainment Software Association of Canada, 2011), making video games a large potential source of food messages for adolescents, the effects of unhealthy, and healthy, food messaging in video games as a medium have not been widely investigated.

This thesis explores the effect of food messaging in video games on adolescent food attitudes and behaviours. In this introductory chapter, I first define adolescence and then describe issues of adolescent obesity, diet and the conflicting role of food in the social lives of adolescents. Next, I review the role of the media in communicating both unhealthy and healthy food messages to users and identify the developmental characteristics that differentiate the response of adolescents to the media from children or adults. I then focus on the importance of video games to adolescents, of the difference between video games and other media, and how food messaging appears in video games. Finally, I outline the following chapters and their objectives in this paper-based thesis.

1.1 Literature Review

Adolescents, obesity and food choices

Adolescence is a period of rapid psychological development that is distinct from both childhood and adulthood, which limits the applicability of research on children or adults to adolescents. Adolescence begins with the onset of puberty, between ages 9.5 to 13 years old for boys (Marshall & Tanner, 1970), and ends at the age of majority (Luna, Garver, Urban, Lazar, & Sweeney, 2014; Marshall & Tanner, 1970; Steinberg, 2005; Steinberg & Morris, 2001). According to the International Chamber of Commerce, children "deserve especially careful treatment by marketers," (Advertising Standards Canada, 2013; Hawkes, 2006), but adolescents over 12 years old do not. I narrowed the focus of my thesis to this transitional period at the beginning of adolescence in which regulators expect 12 to 13 year olds to develop an adult understanding of food marketing, even though they are closer to childhood than adulthood. In this thesis "adolescent" refers to individuals older than 12 and "child" refers to those younger than 12, unless otherwise indicated.

Adolescent obesity is a growing public health issue in Canada. The World Health Organization (WHO) defines obesity as "abnormal or excessive fat accumulation that may impair health," (WHO, 2011). Lack of physical activity and high fat,

energy dense diets contribute to the development of obesity (WHO, 2011). Obesity rates among adolescents tripled between 1978 and 2005, and the number of overweight adolescents doubled as well (Shields, 2005). In 2007, the average Canadian 12-year-old weighed more than they did in 1981, and their body composition was less healthy (Tremblay et al., 2010). Changes in body weight and composition towards phenotypes closely associated with obesity-related comorbidities, (Janssen, Shields, Craig, & Tremblay, 2012) and the increased risk of adult obesity among obese adolescents (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997) make adolescent obesity a long-term health risk for a growing number of Canadian adolescents.

Lack of physical activity contributes to decreased calorie expenditures by adolescents and the development of obesity (WHO, 2011). Physically active adolescent boys are less likely to be obese than those who engage in less physical activity (Shields, 2005). Although there is an association between screen media (television, film, video games and computers) use and obesity in children and adolescents (Shields, 2005; Vandewater, Shim & Caplovitz, 2004), a direct link between video game use and obesity in adolescents has not been shown (Rey-Lopex, Vicente-Rodriguez, Biosca, Moreno, 2008; Vandewater et al., 2004). Accordingly, the relationship between of video game use and obesity remain unclear. My study focuses on the potential effects of video games on adolescent diet, not physical activity.

A diet high in sweets and fats and low in fruits and vegetables contributes to increased calorie intake by adolescents and the development of obesity (World Health Organization, 2011). The Canada Food Guide recommends limiting the consumption of foods that are low in nutrients and high in sugar, fat, salt or calories (Health Canada, 2011). I refer to such foods in this thesis as “unhealthy foods”, colloquially referred to as “junk food”. Adolescents acquire more of their food independently compared to children (Bassett, Chapman, & Beagan, 2008; Hill, 2002; Lau et al., 1990; Nielsen, Siega-Riz, & Popkin, 2002). Only 10% of Canadian adolescents meet all of the daily food group recommendations; many adolescents displace healthy foods with unhealthy foods (Storey et al., 2009). When adolescents select foods their primary consideration is taste, not health (Contento, Williams, Michela, & Franklin, 2006). As a group, adolescents expect each other to share a distaste for vegetables and preferences for sweet, salty and high fat foods, (Nielsen et al., 2002; Nu, Macleod, & Barthelemy, 1996; Power, Bindler, Goetz, & Daratha, 2010; Roos, 2002) perpetuating unhealthy eating among peer groups.

Adolescents reinforce each other's unhealthy food choices within their peer groups. Adolescents use their food choices to create a non-child, non-adult identity among their peers, (Roos, 2002) and to manifest their developing independence from their parents (Chapman & Maclean, 1993). Peers can encourage unhealthy food choices and denigrate immediate healthy food choices and long-term concerns about health, leading adolescents to select unhealthy foods while eating with peers (Chapman & Maclean, 1993; Roos, 2002). Peer expectations allow boys to consume more unhealthy foods than girls because girls face additional pressure to be "thin and pretty," (Harrison & Jackson, 2009). An adolescent's peers informally police the food choices of boys and girls through teasing, (Harrison & Jackson, 2009) further reinforcing the selection of unhealthy foods when eating with peers.

Adolescents and media

A modest but consistent link exists between food promotion in media and food behaviour in 2-15 year olds (Cairns et al., 2009). Cultivation theory and social cognitive theory explain how the media might affect adolescent food habits. In cultivation theory, recurrent patterns of stories, images and messages in television cultivate predispositions and preferences that shape users' conceptions of social reality (Gerbner, 1998). A recurring pattern of unhealthy food in media like television may predispose adolescents to accept unhealthy foods in their lives. Social cognitive theory posits that people learn by observing the actions of models in their physical or media environment and the demonstrated consequences of those actions (Bandura, 2002). Distorted depictions of the consequences of model actions could lead adolescents to hold unrealistic expectations about the role of food in health. Food messaging in video games may inform adolescent perspectives on the normalcy of unhealthy foods in their diets and model unhealthy food behaviours while trivializing their long-term health consequences.

Unhealthy foods dominate the media viewed by adolescents. Television programs feature characters eating unhealthy foods (Greenberg et al., 2009; Story & Faulkner, 1990) and in television and movies, characters eat unhealthy foods outside of regular meals, as treats or rewards, (Greenberg et al., 2009) encouraging snacking behaviour. Adolescent snacking contributes approximately 20% of adolescent energy consumption, typically from foods like potato chips (crisps to our British readers), candy, soft drinks, pizza and hamburgers (Nielsen et al., 2002). In addition to under-representing healthy foods, models in advertising express disgust towards healthy foods and refuse to them, denigrating healthy foods, whereas, positive emotions were portrayed while models ate unhealthy foods (Pettigrew, 2007). This denigration of healthy foods to promote unhealthy foods and the over-representation of unhealthy foods in media normalizes unhealthy food consumption.

Media also unrealistically depict the consequences of eating unhealthy foods. Media link being "cool" and popular among peers to eating unhealthy foods, (Pettigrew, 2007) but fails to address the long-term negative impacts of an unhealthy diet. Characters in television shows commonly eat unhealthy foods, but never experience the unhealthy consequences of their food choices (Greenberg et al., 2009). This reinforces pre-existing adolescent predispositions to ignore the consequence of their food habits (Roos, 2002). Dickinson (2002) found that adolescents use television as a resource for information to support unhealthy food habits, suggesting that adolescents identify food messages in the media and incorporate them into their expectations of their reality. The overwhelming dominance of unhealthy foods in the media normalizes the appearance of these foods in adolescents' lives, and unrealistic portrayals of foods leave adolescents with unrealistic expectations about the consequences of eating unhealthy foods.

Food advertising and product placement

Most research on the effects of advertising on adolescents focuses on traditional media like television and film. Food advertising reinforces the food messages in media programming and comes in two general forms: traditional advertising and product placement. In traditional advertising, companies disseminate their brand message directly to their targeted consumers through specific media bases such as television, and billboards (Saladino, 2008). Product placement is the planned placement of branded commercial content into non-commercial media (Avery & Ferraro, 2000; K. Williams, Petrosky, Hernandez, & Jr., 2011). Advertisers use product placement to counter media fragmentation and technological advancements that undermine the effectiveness of traditional advertising.

Unhealthy foods are promoted to adolescents in traditional advertising and product placement. Food and beverage companies spent $1.5 billion dollars in the United States promoting unhealthy foods to children and adolescents, but only $7.16 million on advertising fruits and vegetables (Federal Trade Comission, 2012). This investment ensured that the average adolescent sees 16.2 food and beverage advertisements on television per day (Rudd Report, 2012). Unhealthy foods dominate traditional television advertising (Batada, Seitz, Wootan, & Story, 2008; Boyce, 2007; Powell, Szczypka, & Chaloupka, 2007). Product placement in movies also favour unhealthy foods (Sutherland, Mackenzie, Purvis, & Dalton, 2010). The dominance of unhealthy foods in advertising supports messages in media programming that cultivate the normalcy of unhealthy foods in reality (Dixon, Scully, Wakefield, White, & Crawford, 2007).

Advertising for healthy foods can improve adolescent attitudes towards healthy foods (Dixon et al., 2007). While children hold ambivalent views towards food advertising, they recognize nutritional public service announcements (PSAs) as legitimate sources of information on a healthy diet (Hemar-Nicolas, 2013). Unfortunately, healthy food advertisements and PSAs have a minimal impact on adolescent food habits because unhealthy food advertisements dominate the media (Dixon et al., 2007; Hota, Chumpitaz Caceres, & Cousin, 2010).

Advertising can influence behaviours and attitudes. Attitudes are correlated with attitude-relevant behaviours, (Bohner & Dickel, 2011) but subjective norms, perceived behavioural controls and other cognitive self-regulatory functions also control behaviours (Bagozzi, 1992). Most significantly, changes in behaviours do not inherently follow from changes in attitudes, (Vakratsas & Ambler, 1999) so separating how advertising influences attitudes and behaviours is essential. Distinctions between explicitly (self-reported by the participant) and implicitly (response times to indicate preferences and predispositions) measured attitudes is also important because they assess attitudes that emerge in different circumstances (Bohner & Dickel, 2011). Implicit attitudes tend to better predict spontaneous, less controllable behaviour, while explicit measures predict deliberative, more controlled behaviour (Bohner & Dickel, 2011). Advertisements for foods can promote positive explicit attitudes towards the foods in children (Dixon et al., 2007) and behavioural change, in the form of decreased consumer spending, occurred when unhealthy food advertising was removed (Huang & Yang, 2013). Despite industry claims that food messaging only alters brand preferences, (Montgomery & Chester, 2009) evidence suggests that advertising also increases overall food consumption in children (Halford, Boyland, Hughes, Oliveira, & Dovey, 2007; Halford, Gillespie, Brown, Pontin, & Dovey, 2004).

Children and adolescents respond differently to advertising because adolescents develop several cognitive skills that protect them from advertising. Children gradually acquire the skills necessary to protect themselves from advertising throughout childhood and adolescence (Bartholomew & O'Donohoe, 2003). Differentiating advertisements from other media content is a fundamental skill that most 8-year-old children have mastered (Lawlor & Prothero, 2003). Most 10-year-old children can take on the perspectives of others and reason on an abstract level, which allow them to understand that advertisements are persuasive, not just informative (Rozendaal, Buijzen, & Valkenburg, 2011). Understanding of different advertising tactics (e.g., the use of spokespeople) comes at different ages (Rozendaal et al., 2011). Studies put the development of these skills at widely ranging ages because of unclear operational definitions distinguishing between understanding of selling intent, and an understanding of source bias (Kunkel, 2010). However, by 10-12 most children articulate cynical mastery over advertising, even as they use it as a social and cultural resource (Bartholomew & O'Donohoe, 2003; Valkenburg, 2000). This developmental trajectory from naïve child to cynical adolescent is why only children under 12 are protected from advertising in Europe (Hawkes, 2006), the United States (Hawkes, 2006), and Canada (Advertising Standards Canada, 2013).

Unfortunately adolescent cynicism towards advertising may not be based on actual invulnerability to advertising. Egocentrism, the adolescent assumption that others are as obsessed with his or her behaviour and appearance as he or she is, is a normal part of adolescent development (Elkind, 1967). A key construct of adolescent egocentrism is the personal fable - every adolescent believes that they, when compared to their peers, are special, unique and invulnerable to harm

(Elkind, 1967). When applied to media effects, the personal fable makes adolescents believe that they are invulnerable to undesirable advertising and other kinds of media messaging (Elkind, 1967; Lapsley & Hill, 2010; Schwartz, Maynard, & Uzelac, 2008). The effects of the personal fable are thought to be strongest in early adolescence, around 10-13 (Scharrer & Leone, 2006). Because of a tendency for adolescents to identify themselves as immune, but their peers as vulnerable to advertising, it remains unclear whether adolescents are immune to advertising, or blinded to their vulnerability by their egocentrism.

Video games: a new medium for food messaging

Video games are a relatively new medium with a large adolescent audience that food messaging could affect. Video games are computer-mediated games in which players interact with digital objects displayed on a screen. Over 90% of 8-18 year olds play video games (Lenhart et al., 2008) and 87% of American households with adolescents have at least one video game console (Rideout, Foehr, & Roberts, 2010). On average, 12-14 year old boys played 22.94 hours per week, which is double what 12-14 girls reported playing (Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2008). Time spent playing video games peaks in 12-14 year olds (Greenberg et al., 2008). Commercial messaging in video games is becoming increasingly common. Even though video game use is prevalent among adolescents, very little has been done to identify the food messages contained in this medium.

What is a video game?

A video game is a game that can be based on a story; the user plays through an audio-visual apparatus (Esposito, 2005). In 2013, the Entertainment Software Rating Board (ESRB), a video game industry self-regulatory body, had ratings for 33,167 video games (ESRB, 2013). Industry, academia and video game players organize these video games into different genre systems (Raczkowski, 2012) based on similarities in gameplay, mechanics or visuals (Apperley, 2006). Video games can therefore fit several different genres in different systems at the same time and genres change in response to new technological and design developments in the video game industry (Raczkowski, 2012). In this thesis, I use the following genres from mobygames.com, a video game database project based on player contribution: action, adventure, fighting, first-person shooters, flight, massively multiplayer, music/rhythm, party, platformer, puzzle, racing/driving, RPG (role play game), simulation, sports, and strategy (MobyGames, 2013). From the website FAQ, “a game category must stand by itself. For example, since there is no such thing as a puzzle game that isn't also a strategy game, puzzle becomes a sub-genre instead of a main one” (MobyGames, 2013).

Video games are fictional with a separation of the "world" created or represented in the video game from the real world. If the video game is based on a story, the story also helps develop the video game "world." This fictional world in a video game can contain explicit and implicit messages about the reality within the game world. For example, in *The Legend of Zelda: Skyward Sword*[1] (Nintendo EAD, 2011) (*Skyward Sword*) the player is represented by a character or avatar. The avatar is rewarded with in-game currency when the player presses the A button to open the closet in the avatar's room, but when the player presses the A button to open the closets in other rooms, the game explicitly says "You really shouldn't open other people's cupboards without permission." This communicates a message about respect for others' belongings. In a sequence where the player loses all of their in-game items after being captured by enemies, the implicit message in *Skyward Sword* might be that resourcefulness and clever thinking are as valuable as tools.

The rules of video games may also communicate messages. The rules in video games afford and constrain potential player actions within the video game. Video game mechanics are the methods by which agents interact with the game state, based on the rules. The resulting actions taken by the player are gameplay. Mechanics and rules can be used to articulate messages about acceptable and unacceptable behaviours in the game that the player can explore through their gameplay choices. In *Skyward Sword* there is a rule that the player cannot attack non-playable characters (NPCs). The resulting mechanic is an inability to input commands to attack NPCs. Instead, the button normally used to attack enemies is used to talk to NPCs, affording the player a gameplay option to talk to the NPC. In *The Elder Scrolls V: Skyrim*[2] (Bethesda Game Studios, 2011) (*Skyrim*) the player can attack and kill NPCs, but doing so in a city triggers guards to come out and attack the player, as well as having an in-game bounty placed on the player's character. Rather than restricting the player's actions like *Skyward Sword*, *Skyrim* produces negative consequences in response to the player's gameplay choices.

Another essential part of my definition of video games that requires attention is play. The motivations of the players impact what they play and how they play (Bartle, 1996; Jansz & Tanis, 2007; D. Williams, Martins, Consalvo, & Ivory, 2009; Yee, 2006). Players motivated by competition tend to be drawn toward sport and Fighter simulations (Sherry & Lucas, 2006). In first-person shooter games[3] players motivated by social interaction tend to play with other players rather than by themselves (Jansz & Tanis, 2007). Players with different motivations play the same game differently. In online multiplayer games,

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[1] An action video game under the themes of fantasy and puzzle-solving.
[2] An action, role-playing video game under the theme of fantasy.
[3] The primary mechanic in first-person shooters is shooting enemies. The "first person" refers to the player's perspective in the game: he "sees" the video game world from the character's perspective.

achievers and killers both explore in-game, but achievers view exploration as a means to collect more points or in-game treasure while killers explore to find "new and ingenious ways to kill people," in the game (Bartle, 1996). I address the methodological challenges posed by the active role of the player in creating their experience in chapter 3.

Video games, messaging and advertising

Despite the popularity of video games among adolescents, food messaging, including advertising, in video games has received limited research attention compared to food messaging in television. Advergames, video games designed to sell products, overwhelmingly promote unhealthy foods (Culp, Bell, & Cassady, 2010; Lee, Choi, Quilliam, & Cole, 2009) and have been shown to be effective at altering food preferences among young children (Dias & Agante, 2011; Mallinckrodt & Mizerski, 2007; Pempek & Calvert, 2011). After playing advergames featuring nutritious foods young children increased their consumption of healthy foods (Dias & Agante, 2011; Pempek & Calvert, 2011). Video games designed to promote health, increased player fruit and vegetable intake more than nutrition knowledge-based video games (S. J. Brown et al., 1997). Video games are less effective at conveying nutritional information to adults than pamphlets and websites (Silk et al., 2008). The age at which video games become ineffective vehicles for healthy food messaging is unknown. In children, and perhaps adolescents, video games may be an effective vehicle for healthy food messages.

Advertising in video games has garnered some attention as increasing numbers of advertisements creep into video game. All advertising in video games can be considered product placement because the advertisements are integrated, to lesser or greater degrees, into the video game (Glass, 2007). Video games have found to be effective vehicles for brands (Glass, 2007; Ho, Yang, & Lin, 2011; Yang, Roskos-Ewoldsen, Dinu, & Arpan, 2006). The effects tend to be strongest on subconscious or implicit recall (Glass, 2007; Yang et al., 2006), though brand assessments also improved (Glass, 2007). Brands placed in illustrative (product plays a significant role in gameplay) or demonstrative (product is used by the player in the video game the same way they would use it in real life) roles in video games in the play space increased player recall of the brands, whereas associative (product is placed in the background of the video game) brand placements increased player purchasing intent (Ho et al., 2011).

Advertising in video games has been analysed in simulation video games as well as violent action video games. The simulations included sports and racing simulations. Advertisements in sport simulation video games increased brand awareness, but did not improve brand attitude or increase player purchase-intention (Cianfrone, Zhang, Trail, & Lutz, 2008). Sport simulation video games with advertisements promoted brand recall less effectively than televised sports with advertisements (Walsh, Kim, & Ross, 2008) in a single sitting. However, Walsh et al. (2008) noted that repeated exposure to advertising in video games, as a player might experience naturally playing a video game, might increase player recall. However, the psychological arousal players experience during violent action games did not improve brand logo memory (Jeong, Bohil, & Biocca, 2011). Yoo and Peña (2011) also found players had lower brand recall recognition and attitudes after playing a violent video game compared to a non-violent control.

Adult video game players find certain video game contexts appropriate for advertisements, but not others. Adult video game players tolerate most advertisements in video games (Nelson, Keum, & Yaros, 2004). In sports simulation video games adult players feel advertisements add realism (Kim & McClung, 2010), though they disliked the idea of promoting products like alcohol, cigarette and guns in video games (Kim & McClung, 2010). Adult players with negative views on advertising in general tended to be equally negative about advertising in video games, and were more sensitive to overt, saturated or out-of-context advertisements (Nelson et al., 2004).

Video games are an attractive medium to marketers because they are have a large and growing audience (IAB, 2010; Sadler, Kelly, & Rhind, 2008). Despite the increasing occurrence of advertising in video games and the importance of video games as a medium to adolescents, research focusing specifically on food advertising, product placement and messaging outside of advergames has been limited. The limited research that has been conducted suggests that video games, like other media, can communicate food messages to adolescent players that influence their food choices.

The literature on food messaging in video games is currently limited. Video games are an effective medium for advertising products and communicating messages. Research on food advertising and product placement in other media demonstrates that unhealthy foods are highly promoted and it is unclear that adolescents have the necessary tools to critically appraise these commercial promotions. Food messages in other media promote unhealthy food habits that are reflected in the food choices adolescents make in their lives. These choices contribute to rising rates of adolescent obesity. Therefore, the gap in the literature on the effects of food messaging in video games on adolescents should be addressed so that interventions to address adolescent obesity adequately account for the effects of this new medium

1.2 Research Objectives

This thesis addresses the literature gap around the effects of food messaging in video games on adolescents. It is known that messaging in media contributes to rising rates of adolescent obesity by promoting unhealthy foods habits. These unhealthy food habits are cultivated in media programming and advertising, which are both dominated by unhealthy foods. The majority of the research conducted on food messaging has been done in television, though research on the role of Internet-based promotions and advergames suggest that food messaging in these new media is recapitulating patterns of unhealthy food messaging found in traditional media. However, no similar work has been done looking at food messaging in video games.

The objective of this thesis is to explore the effects of food messaging in video games on adolescents as the first step in developing recommendations for ameliorating the effects of unhealthy food messaging on adolescents and using video games to promote healthy food habits.

In this thesis, I explore the effects of food messaging in video games on adolescents. I separated three research questions from my thesis topic. First, how are healthy and unhealthy foods depicted in video games? Second, do adolescents and other key stakeholders perceive that food messaging in video games influences adolescent food habits? Finally, can an empirical manipulation of food messaging content in a video game test the effects of healthy and unhealthy food messages on adolescent food attitudes and behaviours?

1.3 Thesis Outline

This thesis is paper-based, with research Chapter 3 formatted for the *Journal of Adolescent Health* and Chapter 4 formatted for the journal *Cyberpsychology, Behaviour and Social Networking*. Chapter Two provides an overview of my methods and research design. It outlines the methodological approach used, the ethical considerations of research with adolescent participants and their parents; and details on video-game content analysis, semi-structured interviews with adolescent boys and a parent and their analysis; and experimental methods for the empirical manipulation of food messaging in video games on adolescent food attitudes and behaviours. Chapters three and four include additional details on the specific methods used for each portion of my research and the limitations that affect the interpretation of my results.

Chapter 3 identifies the manners in which food is represented in video games and addresses the views of adolescents, parents and video game developers on food messaging in video games. This chapter presents a content analysis of food messaging in video games from genres popular with adolescent boys to provide context for the views of adolescents and their parents. I explore the food messages adolescents and their parents identify in the video games adolescents play, and the effect adolescents and their parents feel these messages have on adolescents. In

this chapter I address specific concerns about advertising, and food advertising, in video games adolescents and their parents shared. I contextualize the pressures that lead to food messaging in video games with insights from video game developers. I highlight the role of adolescent egocentrism in over-estimating personal immunity to messaging in video games and expand on how this impacts media literacy initiatives.

Chapter 4 presents the results of an experiment designed to test the effects of healthy and unhealthy food messaging in video games on the food attitudes and behaviours of adolescents. I examine the results of my experiment in the context of the super-saturated media environment of adolescents. I also explore the different social expectations boys and girls experience around food and what that might mean for the role of video games in promoting healthy foods to adolescents.

Chapter 5 brings together the lines of inquiry of the thesis to fully address the effects of food messaging on adolescents. Based on the combined results of the qualitative and quantitative studies, I make recommendations on how to address food messaging in video games to adolescents, highlighting the importance of media literacy. I conclude with ideas for future research.

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CHAPTER TWO: RESEARCH METHODS

In this Chapter, I describe the methods used to analyse food messaging in video games and the potential influence of that messaging on adolescents. I examine my personal perspectives and how they shaped my research approach. I elaborate upon the specific methods used in Chapters 3 and 4. Chapter 3 provides a content analysis of food messaging in popular video games supplemented by interviews with adolescents, their parents and video game industry representatives on how they perceive these messages and their impacts on adolescents. Chapter 4 experimentally tests the effects of healthy and unhealthy food messages on adolescent food attitudes and behaviours.

To address the three questions that make up my thesis, I adopted an epistemologically pragmatic approach, which supports the use of diverse research traditions to address specific research questions (Johnson & Onwuegbuzie, 2004). Therefore, I addressed how healthy and unhealthy foods are depicted with a content analysis of popular video games. I used qualitative interviews to encapsulate the perceptions of adolescents and other stakeholders. Finally, I experimentally manipulated food messaging content in a video game to test the effects of healthy and unhealthy food messages on adolescent food attitudes and behaviours The results from each line of inquiry contribute to a more cohesive understanding of the effect of food messaging in video games on adolescents than any single study.

In this chapter, I first describe the methods employed in the content analysis. I explain the methodological issues specific to video game research, the development of the coding frame applied to the video game footage, and the steps taken to ensure rigor. Then, I address the ethical considerations for my interview and experimental studies, particularly those involving participants under the age of 18. Then, I describe the methods used in the interview study, beginning with recruitment of participants. I further elaborate on the development of the interview guide, the coding frame for analysing the interview transcripts, and the methodological safeguards I employed to ensure rigour. I describe the development of the experimental video game and the experimental procedure. Next, I explore the theoretical underpinnings of the two experimental measures of adolescent attitudes and behaviours. I conclude with a discussion of the measures taken to ensure rigour in my experiment.

2.1 Statement of Personal Perspectives

My background is interdisciplinary, although most of my training has been in the post-positive tradition that acknowledges objective truth. However, from my experience playing video games, I observed different players experiencing the same video game differently. As I developed my thesis topic and research questions, I strove to balance the idea of an objective reality with the potential for video game players to interpret video games in different ways. No single objectivist or subjectivist research perspective had the flexibility to address all three of the research questions in my thesis. Therefore, I adopted an epistemologically pragmatic approach, which endorses and encourages the selection of methods from diverse research traditions to suit specific research questions within a project (Johnson & Onwuegbuzie, 2004).

While designing and conducting my research, I regularly reflected on my biases. Specifically, I am a female who plays video games; who enjoys video games and who finds cultural and social value in video game play. Throughout my research, I took steps to remain reflexive about the impact of my video game experience on my research approach and data analysis. During my interview study, I reflected on how my gender and experience with video games influenced how the participants responded to me. I realized that male adolescents did not identify me as a video game player because they did not perceive adult women as video game players. To establish my identity as a video game player, I demonstrated my knowledge of video games by asking about new video game releases and sharing my personal experiences playing video games during interviews. This practice improved my rapport with the adolescent participants, and generated richer interview data.

I also practiced reflexivity during the design and implementation of the experimental study. Because I developed the experimental video game, my perception of the video game difficulty was skewed by my familiarity with each level and my experience playing video games. The experimental video game had to be easy enough for novice video game players, but challenging enough to interest expert video game players. Therefore, I had an adolescent boy and girl play the experimental video game to confirm the difficulty was appropriate.

I confirmed my self-reflection with input from other researchers during data analysis. As I analysed the video game footage, I challenged myself to identify common video game conventions that I took for granted during my leisure video game play. I also consulted with researchers who did not play video games about my interpretation of the food content in video games, the qualitative interview results, and the statistical analysis of the experimental results, which helped me articulate and question my preconceptions.

2.2 Video Game Content Analysis

Data collection

I selected five video games from the three top video game genres for 6 to 12 year olds: action, racing, and sports (Entertainment Software Association of Canada, 2011). Among 13 to 17 year-olds, the top 3 genres are shooters, action/adventure, and sports video games (Entertainment Software Association of Canada, 2011). I excluded shooters from this study because shooters have already been found to be poor vehicles for advertising and other messages (Cobelens, 2009; Jeong et al., 2011; Yoo & Peña, 2011). I included two action games with different themes: *Grand Theft Auto IV*[1] (Rockstar North, 2008) (*GTA IV*) and *Minecraft*[2] (Mojang AB, 2010) (Mojang AB, 2010). I selected *Forza Motorsport 3*[3] (Turn 10 Studios, 2009) (*Forza 3*) as an exemplar of racing games. Finally, I included a football (American football) game, *Madden NFL 11*,[4] (EA Tiburon, 2010) (*NFL 11*) and a hockey game, *NHL 11*[5] (Electronic Arts Canada, 2010).

An expert video game player collected data from the games set on normal difficulty. The expert video game player had more than 15 years of experience playing video games from many different genres on a variety of video game consoles. He had the level of ability to move through the levels of each game, so that I could analyse content of the levels as they increased in difficulty. I did not give the expert video game player any direction in how to play the game or watch him play. He recorded the footage from *GTA IV*, *Forza 3*, *NFL 11* and *NHL 11* using the Roxio Game Capture (Roxio, 2011). He recorded *Minecraft* gameplay using Fraps (Beepa, 2010). After 60 minutes of video game play, we discussed whether additional footage would reveal novel activities or environments in the game to decide if additional footage was necessary for each game. In *GTA IV*, we decided to collect footage from the first 12 sections of the story, through discussion at the end at each section. We decided to complete two "race seasons" in *Forza 3* to see if the video game allowed the player to access new content, such as racetracks. NFL11 had no career mode (a storyline in sports video games where the player completes a regular season and potentially a championship), so the expert video game player collected footage from three different football games on different settings. *NHL 11* also did not have a career mode, so the expert video game player played two regular games and one playoff game.

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[1] An action, racing/driving video game under the theme of shooter.
[2] An action, simulation game under the theme of fantasy. Minecraft has additional sandbox, survival horror and construction video game elements.
[3] A racing/driving video game.
[4] A sports video game. The sport being simulated is football (American football).
[5] A sports video game. The sport being simulated is hockey.

Data analysis

Content analysis is a systematic and objective means of distilling written, verbal or visual communication messages into more manageable content-based categories (Elo & Kyngäs, 2008). I used NVivo 10 (QSR, 2012) for my content analysis of video game footage. Other studies of video game content (Ivory, Williams, Martins, & Consalvo, 2009; Thompson & Haninger, 2001; D. Williams et al., 2009) informed the structure of my coding frame. Prior to coding, I developed a preliminary coding frame structure with categories for food, advertising, types of advertising, and "where" food messages occurred in the video game. I inductively developed codes for specific foods, brands and message placements from the video game footage. I organized unexpected food messages, such as fat insults and places to acquire food (e.g., restaurants, grocery stores, concessions stands, etc.), from the footage into my coding frame as well (Appendix I).

I recorded the quantity and duration of food appearances in the video game footage to compare the frequency and duration of healthy and unhealthy foods. I organized the food codes into healthy and unhealthy categories according to Canada's Food Guide (Health Canada, 2011). Then I compared the duration and number of appearances of healthy and unhealthy foods. In cases where the food item was ambiguous, I coded the food at the most general level. For example, I coded unmarked drink cups in *NFL 11* as drinks, even though in context they probably contained beer or pop.

I also recorded the quantity and duration of food advertisements in the video game footage. I defined an advertisement as any identifiable brand, branded item, or logo in the video game. I recorded the quantity and duration of all advertisements that were not specifically related to the game to compare the number of food advertisements to the number of other advertisements in the video games. I excluded advertising for the NFL in *NFL 11* and the NHL in *NHL 11* from this analysis because these games are based on these real sports leagues, making the league brands an integral part of the video game world.

Rigour

A rigorous inquiry to address the roles, if any, that unhealthy and health foods plays in video games contextualizes the results of the interview and experimental studies and forms the basis for the recommendations made in the Chapter 5. Credibility, transferability, dependability and confirmability (Guba, 1981; Krefting, 1991; Shenton, 2004) are four common measures of rigour applied to content analysis. Credibility addresses the appropriateness of the sample and data analysis strategy for addressing the research aim (Shenton, 2004). The aim of the content analysis was to identify the forms food messaging took in video games. My sample was not representative of all the video games commercially available, but it did represent video game genres popular amongst adolescents and more deeply sampled each game. By purposefully selecting video games from different

genres and themes, I captured a diverse sample of video games that allowed me to assess the variety of forms food messaging took in video games. I trained a second coder to review my analysis to ensure my categories covered all the food and advertising messaging in the video games and did not exclude any messaging (Graneheim & Lundman, 2004).

Transferability refers to how applicable my results are to other contexts (Coryn, 2007). The quantified results of the content analysis are not transferable outside of their genres, but the forms of food messaging identified in my study can be broadly applied to other video games. I am reflexive and candid about the limitations of my video game sample when discussing results and generating recommendations. The description of my limitations provides sufficient context for researchers to gauge the transferability of my results to other contexts.

Dependability in content analysis refers to absence of non-random variation in the coding (Weber, 1990). To achieve stability, which is the invariance of the content classifications over time, (Weber, 1990) I coded all of the data once. I further supported stability by reviewing the coding of all the footage, after the initial coding was complete. Rechecking the earliest coding allowed me to identify any changes in the application of the coding frame over time. I had a self-described non-gamer colleague code 10% of the video game footage to assess the credibility of my study.

In content analysis, confirmability is a measure of how well the data supports the researcher's conclusion (Guba, 1981). I ensured confirmability in my content analysis by comparing the results of the content analysis with the results of the interview study (Chapter 3). Consensus between the results of the content analysis and the interview supported my interpretation of the food messages in video games.

2.3 Ethics

Unlike content analysis, interviews and experiments done with human participants require ethical approval to respect the rights of participants. I sought ethics review for the parts of my study that involved human participants as required by the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (Canadian Institutdes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada, 2010). For my interview study I received approval from Review Ethics Board I at the University of Alberta (Appendix II). For my experimental study I received approval from Research Ethics Board II at the University of Alberta (Appendix III). The Elk Island Public Schools, from which I recruited participants, also approved the experimental study through the Cooperative Activities Program office at the University of Alberta (refer to Appendix IV for Cooperative Activities Program approval form).

My interview and experimental studies both involved minors (persons less than 18 years old) who lack capacity to consent to participate in research (Hewitt, 2007). Therefore, parents of the participating adolescents provided informed, written consent for their child's participation. Further, according to Article 2.7 of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (Canadian Institutdes of Health Research et al., 2010), assent should be sought from children and adolescents to respect their capacity to "express their wishes in a meaningful way, even if such expression may not fulfil all of the requirements for consent." Once parental consent (Appendix V) was given, I provided participants with an age-appropriate information sheet (Appendix VI) and sought written assent (Appendix VII) from all participating adolescents.

For the experimental study, I recruited participants in three Elk Island Public Schools between January 2013 and June 2013. A mix of optional classes (Health, Computers, Leadership) and core classes (Mathematics) chose to enrol in the study. Students received information sheets on the confidentiality, withdrawal and consent procedures. Parents received an information sheet (Appendix VIII) provided written consent and participants gave written assent prior to participating in the study. I provided the parents with my contact information so they could ask questions before providing consent. Participants also had the opportunity to ask questions before providing assent. Only students who had no known food allergies, had the signed consent of their parents, and had provided written assent participated in the study.

For the interview study, I recruited participants through a convenience sample of families with a 12-13 year old boy in Edmonton and Sherwood Park (see Appendices IX-X for recruitment materials). I interviewed each 12-13 year old boy and one of his parents separately at the participants' homes, at coffee shops, over the phone and via Skype, according to the preference of each participant. Prior to each family interview, I provided participants with age-appropriate information sheets that explained the purpose and procedure of the study as well as the confidentiality and withdrawal policies (Appendices XI to XIII) so they could give informed consent (Appendix XIV to XV) or assent (Appendix XVI) for their participation.

I also recruited, through convenience sampling, individuals employed in video game development industry. I interviewed these individuals in coffee shops, at their offices, via telephone or email after providing them with information sheets. The information sheets explained the purpose and procedures of the study, the confidentiality and withdrawal policies and specific provisions to ensure the anonymity of the video game industry representatives (Appendix XVII). Video game industry representatives provided written consent (Appendix XVIII) after reviewing the information sheet and having the opportunity to ask the interviewer questions.

To protect participants, the ethics review process prioritizes data storage and confidentiality. All data collected from the interviews and the experiments, including audio recordings, transcripts of recordings, FreeIAT 1.3.3 (Meade, 2009) outputs, and notes will be stored securely by my supervisor, Dr. Bubela, for 5 years and then shredded or permanently deleted. To protect the confidentiality of participants, I de-identified the data; I substituted codes for participant names. I stored the data on a password-protected server at the University of Alberta. I will only use the contact information to disseminate the results of the study.

The information sheets outlined the risks and benefits for participation in the experiment. The benefits of participating in the experiment included the opportunity to engage with the scientific process and encourage critical thinking on food messaging in media, including video games. The risks for participation were low, including minor mental fatigue while engaging in the video game or the Implicit Association Test (IAT). I minimized the risks by informing participants of the duration and tasks involved in the study. I also reminded participants that they could terminate their participation at any point. To avoid social discomfort about food choice following the game, participants selected their food choice while the rest of the class closed their eyes. I also informed participants that their results were confidential. Finally, some participants may have had unknown food allergies. I chose nut-free food items to minimize the potential for allergic responses, and provided teachers and students with a list of food items and symptoms of an allergic attack to refer to after the experiment (Appendix XIX).

The benefits of participating in an interview included the opportunity to discuss messaging in video games and contribute to the development of learning tools for media literacy around video games. Risks included fatigue or possible emotional distress, but none of the participants expressed either, and all knew that they could choose not answer questions or stop the interview at any time. Video game industry representatives faced an additional risk to their professional status or reputation because their views could be taken as judgemental or unsupportive of their companies. To minimize the risk to their professional careers, all quotations are anonymous and I removed all geographic information, company names, job titles or video game titles that might be used to indirectly identify the video game industry representatives.

2.4 Interviews

Chapter 3 of my thesis involved qualitative interviews to capture the views and experiences of adolescent video game players and their parents. I also interviewed video game industry representatives to gain insight into the industry pressures driving food messaging in video games. Here I describe the number of participants involved in the study; the inclusion criteria; and recruitment strategy. I then explain the data collection and analysis and management strategies used in the interview study. Finally, I discuss the strategies I used to achieve rigour in qualitative analysis.

Participants

I conducted thirty-five interviews for this study: 15 with 12-13 year old boys, 15 with a parent or guardian of the 12-13 year old boys, and 5 with video game industry representatives. Within a qualitative framework, 20 interviews will likely reach data saturation, as indicated by data replication or redundancy (Bowen, 2008). I checked for data saturation by comparing the data from interviews to previously collected data until the collected data fit into already devised coding categories (Bowen, 2008). Data from the parents and the child groups reached saturation at 15 interviews. The video game industry interviews provided expert insight into the pressures facing the industry that drive food messaging in video games.

Participant inclusion

Adolescents

Almost all boys (99%) between 8 and 18 years old play video games (Lenhart et al., 2008). I chose to focus on 12-13 year old boys because this age represents a peak in video game play (Rideout et al., 2010) and a significant period of healthy food habit development (Lau et al., 1990). I focused exclusively on boys in the interviews because girls played video games less often than boys (Rideout et al., 2010) and were subject to different pressures than boys (Hebert et al., 1997).

Parents

I interviewed a parent or guardian of each of the boys in the study. Three of the fifteen parents interviewed were male.

Video game industry representatives

In Canada the video game industry employs approximately 13,000 people in roles as diverse as level builders, testers, legal staff, audio engineers, programmers animators, business personnel and game designers (Entertainment Software Association of Canada, 2011). The participants in my study included team and project managers, artists and level designers. The video game industry representatives came from small and large video game development companies.

Recruitment

I used a convenience sampling method with respect to the study's inclusion and exclusion criteria.

Adolescents and parents

I identified families with boys that met my inclusion criteria in Edmonton and Sherwood Park and invited them participate in the study. I recruited at University of Alberta athletics camps and using posters in Edmonton area grocery stores and video game stores before recruiting through personal contacts. Based on referrals from interviewed families, I recruited other families through snowball sampling and recruitment letters handed out at University of Alberta summer athletics and philosophy camps (Appendix VIX).

Video game industry representatives

I used snowball sampling in the Edmonton area, and I recruited online through corporate websites. I contacted video game industry representatives via e-mail or by phone as appropriate (Appendix XX).

Data collection

I conducted 35 to 60 minute semi-structured interviews with participants. In a semi-structured interview, the interviewer follows interview guides, which maintains structure between interviews to enable comparisons between participants (Charmaz, 2006). Semi-structured interviews also allow the interviewer the flexibility to probe further, based on the views of participants that deviated from the interview guide into unexpected but fruitful ways (Charmaz, 2006). I based the interview guides for the adolescents (Appendix XXI), parents (XXII) and video game industry representatives (Appendix XXIII) on guides from another study of video game messaging (Brenick, Henning, Killen, O'Connor, & Collins, 2007). Members of my thesis committee reviewed the interview guides, which I then pilot tested.

The interview guides explored the participants' familiarity with video games; their perception of health messages in video games; their views on advertising in media and in video games; and their views on food advertising in video games. The second part of the interview probed participants' attitudes on food messaging in video games. I showed participants an exemplar video clip from YouTube. An in-game advertising agency posted the clip depicting McDonalds advertisements in four different games (Higgins, 2011). I edited the video to exclude M-rated (equivalent to an R-rated movie) content. I asked participants for their impressions of the advertisements in the video and how the advertisements might impact an adolescent player's enjoyment of the games.

Data analysis

I audio recorded almost all the interviews. I transcribed 16 interviews and a professional transcriptionist transcribed 16 interviews. I verified the transcripts from the transcriptionist against the original audio to ensure accuracy. One interview was conducted via e-mail and I included the emails in the analysis. One family did not give consent to be audio recorded. Therefore, I took detailed notes of the conversation and included my notes in the analysis. After transcription I verified each transcript by comparing the transcribed output with the original audio. I used Nvivo 10 (QSR International Pty LTD, 2012) to analyze the interview transcripts. After several close readings of the first transcripts, I coded the transcripts sentence by sentence to derive codes from the words as they appeared in the transcripts (Hsieh & Shannon, 2005). I identified repeated, related, and divergent ideas to develop into my initial codes (Hsieh & Shannon, 2005). I iteratively compared the coding new transcripts to old transcripts to identify similarities and differences that further informed the development of the codes (Pope, Ziebland, & Mays, 2000).

Data management

To protect the confidentiality of my participants, I de-identified the audio files and transcripts and securely stored the audio files, transcripts and consent forms. I deleted the audio files from the audio recorder after storing the audio files on a password-protected computer. I also stored the transcriptions on a password-protected computer. I stored the consent forms in a locked cabinet. The data will be stored in a locked cabinet for five years, after which I will shred the documents and securely delete digital files.

Trustworthiness

The results of qualitative research, such as this study, should be carefully evaluated for bias and reliability before the findings are used to develop recommendations for policy or practice (Mays & Pope, 1995). Trustworthiness, which corresponds to quantitative rigour, has four aspects: credibility, transferability, dependability and confirmability (Guba, 1981; Krefting, 1991; Shenton, 2004). Credibility is similar to internal validity in the positivist tradition, which is an attempt to ensure that the study captures the phenomenon under investigation (Shenton, 2004). To maintain credibility, I adopted well-established research methods (iterative and inductive analysis of semi-structured interviews) from the literature. I separated the boys from their parents during the interviews to minimize pressure on the boys to respond in certain ways. Additionally, I reviewed my coding frame with a colleague with a political science background, and less experience with video games, to ensure the comprehensiveness and accuracy of my coding frame.

Transferability is analogous to external validity or generalizability in positivist studies (Coryn, 2007). Generalizability stems from results that are independent of chronological or situational variations (Pedhazur & Schmelkin, 1991), which is inconsistent with the subjectivist underpinnings of most qualitative research. Therefore transferability takes into account the similarities and differences between the initial context of the research and the receiving context (Guba, 1981). Transferability may occur when two context share essential similarities. I maintained transferability by capturing a thick description of video game play by adolescents in my research journal, based on the literature and my previous experience with adolescents and video games. This description allowed me to provide sufficient context that others can gauge the transferability of my results to other contexts of interest.

Dependability loosely corresponds to the positivist construct of reliability, which addresses how replicable the study is. In qualitative research, this means that similar results will be found using the same methods and participants in the same context or have traceable differences. I maintained dependability during my study by reflexively thinking about and reporting my research design, data collection and analysis. Reaching saturation in the dataset is another way of ensuring dependability, which I checked for using a constant comparative method.

Confirmability is comparable to objectivity. It is a measure of how well the data supports the researcher's conclusions (Guba, 1981). I ensured confirmability in my study by practicing reflexivity during data collection and data analysis. At the end of my analysis I reviewed my codes with another researcher, who was less familiar with video games, to ensure that my data supported the codes that the codes remained "true" to the data. She reviewed 8.6% of the dataset and independently identified codes using my interview guide and research summary as guidance. All but one of the codes she identified corresponded to codes in my coding frame. However, she felt participants distinguished between abstract and concrete games, whereas I had coded their distinctions as between specific genres. The distinction between abstract and concrete appeared in other studies as a contributor to perceptions of body image (Martins, Williams, Harrison, & Ratan, 2009; Martins, Williams, Ratan, & Harrison, 2011), and I recoded my dataset to include this insight.

2.5 Experiment

In the experimental study, I tested whether healthy and unhealthy food messages in a video game could measurably influence the food attitudes and behaviours of adolescents. In this section I explain the inclusion criteria for participants. I briefly outline the development and presentation of the experimental food choice video game described in detail in Chapter 4. I justify the use of the IAT and a food choice task as my measures of the effect of the food choice video game. I also describe the data collection during debriefings with the participants. I explain my data analysis and management strategies. Finally, I discuss the methodological strategies I implemented to ensure the rigour of my experiment.

Participants

One hundred and sixty four 12-13 year old students (73 girls and 91 boys) from seven classes at three Elk Island Public Schools (Alberta, Canada) participated in this study. Elk Island Public Schools had similar demographics to other school boards in the Edmonton area, but had a more receptive administration, which was open to my research and interested in the question. I selected this age group because video game play peaks in 12-14 year olds: older teens and younger children play less per week (Rideout et al., 2010). Nearly all boys (99%) and 94% of girls between the ages of 8 and 18 play video games (Lenhart et al., 2008), though boys play more frequently and longer than girls (Greenberg et al., 2008).

Development of the experimental food choice video game

I developed the experimental food choice video game based on *Super Mario Bros.*[6] (Nintendo, 1985) using GameMakerLite 8 (YoYo Games, 2009). In the video game the player used the left, right and up arrow keys of a computer keyboard to guide their avatar (a two-dimensional pixelated image of a person) through 8 levels with enemies and obstacles to be avoided, and items that could be collected for points. I developed different versions of the game for the adolescents assigned to the control, unhealthy and healthy experimental conditions to play. In the control condition players collected red crystals in their video game. In the healthy condition the players collected red strawberries in their video game. In the unhealthy condition the players collected chocolate bars in red wrappers in their video game. Chapter three describes the development of the experimental food choice video game in greater detail.

Presentation of experimental food choice video game

Within each class, I randomly assigned participants to the control, unhealthy or healthy conditions. I instructed all participants to play their version of the video game, complete a world choice exercise, save their files and selected a snack. I did not provide any additional information on the video game rules. Participants played their version of the experimental video game for 15 minutes.

[6] An action video game.

Implicit tests of attitude: the Implicit Association Test

Implicit measures of attitude assume that participants are either unwilling or unable to articulate their attitudes, unlike explicit measures of attitude (Nosek, Greenwald, & Banaji, 2007). The IAT and other measures of implicit attitude use response latencies to infer attitudes (Gawronski & Bodenhausen, 2007). Response latency is the time between stimulus exposure and the individual's response (Fazio, 1990). The underlying assumption of implicit measures of attitude is that the participant's attitudes will interfere or facilitate with categorizing stimuli that represent an attitude object (Bohner & Dickel, 2011). Interference or facilitation affects the response latency of the participant. Thus, differences in response latencies can be used to infer implicit attitudes.

In the IAT participants categorize stimuli into dichotomous target categories and evaluative categories (Bohner & Dickel, 2011; Greenwald, McGhee, & Schwartz, 1998). My stimuli were the names of healthy and unhealthy foods, and positive and negative adjectives. The target categories were healthy and unhealthy. The evaluative categories were positive and negative. Participants responded to the stimuli by pressing keyboard keys to indicate the category they felt the stimulus corresponded to. In the first of two critical stages of my IAT the healthy and good categories were paired so the participants pressed the same key to respond to stimuli from either category (Table 2-1). In the second critical stage of the IAT I reversed the pairings, so participants used the same response key to assign stimuli to the healthy and bad categories and used the other response key to assign stimuli to the unhealthy and good categories (Table 2-1). By comparing the response latencies from these two critical stages of the IAT, I can determine if participants more readily associated healthy foods with positive adjectives, indicating a positive attitude towards healthy foods.

Table 2-1: Category pairings during Stages 3 and 5 of the IAT

		Stage 3		Stage 5	
Participant response	Key 1	Healthy	Good	Healthy	Bad
	Key 2	Unhealthy	Bad	Unhealthy	Good

According to Greenwald et al. (1998) the IAT measures how closely a participant associates two concepts, which indicates attitudes towards the concepts. In my study, shorter response latencies to stage 1 relative to stage 2 (Table 2-1) indicate a closer association between good and healthy, and therefore more positive attitude toward healthy foods. Other researchers support this interpretation of the IAT (Cunningham, Preacher, & Banaji, 2001; McConnell & Leibold, 2001), however there are criticisms of the test and its interpretation. The IAT does not always correlate with other implicit measures of attitude or explicit measures of attitude (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Karpinski & Hilton, 2001). This has been taken as evidence that explicit and implicitly measured attitudes are different constructs used for different kinds of decision-making (Bohner & Dickel, 2011). Salience asymmetry, or the relative relevance

of the categories to the participant, may also influence response latencies (Rothermund & Wentura, 2004). It appears that salience asymmetry accounts for some, but not all of the difference in response latencies identified in the IAT test (Greenwald, Nosek, Banaji, & Klauer, 2005). Finally, Karpinski and Hilton (2001) suggest that the IAT measures the environmental and cultural influences on the associations made by participants, not the influence of personal attitude.

I chose to use the IAT, administered using FreeIAT 1.3.3 (Meade, 2009), despite the criticisms of the test. Of the implicit measures of attitude, it has the highest test-retest reliability (Fazio & Olson, 2003). I chose not to use explicit measures of food attitude, such as surveys or questionnaires, because people change their responses according to the social desirability bias. The social desirability bias causes people to self-report behaviours and attitudes so that they feel they have portrayed themselves in the best light, even when told the results are anonymous (Marlowe & Crowne, 1961). Research has shown that children and adolescents engage in socially desirable reporting in food research (Baxter, Smith, & Litaker, 2004; Klesges et al., 2004) Therefore, I chose to use the IAT rather than an explicit measure of attitude.

Food selection and discussion

In addition to the IAT measure of attitude, I also used a measure of behaviour. Attitudes correlate with behaviours (Bohner & Dickel, 2011), but other cognitive functions and norms also influence behaviour (Bagozzi, 1992). Studies of the effects of advertising show that behaviours do not necessarily change when attitudes change (Vakratsas & Ambler, 1999). Therefore, I used a concrete food choice as a measure of behaviour to determine if the effects of the video game influenced what adolescents chose to eat.

After the participants completed the IAT, I gave the participants a box with four food items to choose from: one snack size Kit Kat bar, a 50g bag of regular flavour Lay's potato chips, 1 banana, and 1 mandarin orange. To address potential socially desirable responding I asked participants to (1) keep their heads on their desks until they had been given a signal to select their snack; (2) hide their snack choice once they had made it; and (3) put their heads back on their desks once they had made their choice. The participants consumed their food selection during a post-experimental debriefing session, described in the next section.

Discussion and return of results

Following the experiment, I debriefed the participants to inform them of the specific purpose of the study. While parents and teachers knew the focus of the experiment was on food messaging, initially I told the participants the aim of the study was to explore the effects of generic messaging in video games. I obscured the specific focus of the study to minimize experimenter priming, which can influence participant response during experiments (Cesario, 2014).

I returned to each class within two weeks of the experiment to share preliminary results. In a PowerPoint presentation, I outlined my research process and the descriptive statistics from the specific. After the presentation the participants shared their views on the experiment and my results. I wrote field notes immediately after the debriefing session to record the views of the students. I analyzed the field notes to contextualize the participants' experiences during the experiment as well as their broader experiences with food messaging in media.

Data analysis

I used an ANOVA to analyze the results of the food choice. I collapsed the banana and the orange into a "fruit" category to compare the healthier snack option to the unhealthy snack options. I included gender as a factor in the analysis to compare the effects of the different versions of the game on boys and girls' food choices.

I analyzed the IAT results of the groups who played the different versions of the video game using an ANOVA. I included gender as a factor in the analysis to compare the effects of the food in the different versions of the video game the boys and girls' attitudes.

I descriptively coded the field notes from the debriefing sessions. I generated codes inductively from the data. I reported key quotations and observations for prominent codes.

Data management

To protect the confidentiality of my participants, I followed the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (Canadian Institutdes of Health Research et al., 2010) guidelines for data management. I removed the experimental files from the IAT program from the schools' netbooks and moved them onto a password- protected computer at the University of Alberta. I de-identified the data after I assigned students received unique identification numbers to label their IAT data, food choice and game score. The data will be stored in a locked cabinet for five years, after which I will securely delete the data and shred the paper files.

Rigour

I made several decisions while designing my experimental study, collecting my data, and analyzing my data to ensure my results were rigorous. Four widely accepted criteria for assessing the quality of quantitative research are: internal validity, external validity, reliability, and objectivity. Internal validity "refers to the validity of assertions regarding the effects of the independent variable(s) on the dependent variable(s)" (Pedhazur & Schmelkin, 1991). I randomly assigned participants to play different versions of the video game to mitigate threats to internal validity due to the events and experiences participants have preceding the experiment, which may have influenced the outcomes of the experiment. Ensuring the participants underwent the same experimental procedure removed other sources of error that could reduce internal validity.

External validity refers to the generalizability of the results to the target context and across target contexts (Pedhazur & Schmelkin, 1991). Context can be taken to mean a population, setting, time or other set of circumstances of interest. There were factors that limit the contexts in which my results could be generalized to other populations. Because only English-speaking adolescents participated, my results may not be generalizable outside an English-speaking North American context.

Reliability refers to the freedom of test scores from error. Essentially, another researcher should be able to conduct my study and arrive at similar conclusions. I chose a measure of attitude, the IAT, which has higher test-retest reliability than other similar measures (Fazio & Olson, 2003) to increase the reliability of my results. Another measure of reliability is internal consistency, or the agreement of a measure with itself. Comparisons of the scores from the last half of each IAT stage to the first half indicate that my IAT had adequate internal consistency as well.

Objectivity refers to removal of the researcher's personal biases and theories in the designing of a study, the collection of data and the analysis of data (Longino, 1990). To maintain my objectivity during the design of my experiment, I pre-tested the experimental procedure to ensure the directions and procedures did not cue participants or encourage them to respond in any particular way. To ensure my IAT stimuli did not bias participant responses, I reviewed the stimuli with Dr. Connie Varnhagen. I was the only experimenter, so I could not implement double-blinding procedures. Therefore, there was potentially experimenter bias because during data collection and analysis I knew of the condition of at least some of the participants. However, I randomly assigned student identification numbers and I randomly assigned blocks of identification numbers (for example, 1-10, 11-20 and 21-30) to play a different version of the video game. I also had Dr. Varnhagen review my data analysis to guard against bias.

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CHAPTER 3: HAMBURGERS AND MUSHROOM STEW: EXPLORING PERSPECTIVES ON FOOD IN VIDEO GAMES

3.1 Introduction

Food messaging in media contributes to rising obesity rates in adolescents (Cairns et al., 2009). The media normalizes and models unhealthy food habits to adolescents while downplaying and trivializing the long-term health repercussions of these habits (Dickinson, 2000; Greenberg et al., 2009). Lifelong health attitudes and habits form during adolescence, (ages 12-18) (Lau et al., 1990) so the effects of food messages on adolescents can have long lasting repercussions. Despite the popularity of video games among adolescents, (Entertainment Software Association of Canada, 2011; Rideout et al., 2010) the effects of food messaging in video games remains largely unexplored. This study identifies food messages encountered by adolescents in video games and how adolescents, their parents and video game industry representatives understand the potential impact of food messaging in video games.

Adolescents undergo rapid cognitive and social changes that may increase their vulnerability to food messaging in video games than children or adults. Adolescents play more video games than children (Rideout et al., 2010) and therefore have higher exposure to food messaging in video games. While some research supports the prevailing industry view that adolescents over 12 should possess an adult understanding of messaging, such as advertising (Advertising Standards Canada, 2013; Calvert, 2008; Rozendaal et al., 2011), other research suggests vulnerability to advertising persists into adolescence (Hota et al., 2010; Nairn & Fine, 2008; Rozendaal et al., 2011; Valkenburg, 2000). Adolescents may have informally developed media literacy skills that children do not that protect them from messaging. Media literacy is the knowledge and skills to critically appraise media content (Villani, Olson, & Jellinek, 2005) and is based on cognitive skills developed throughout childhood and adolescence (Bartholomew & O'Donohoe, 2003), though it can also be formalized in media literacy training (Villani et al., 2005). Because adolescents acquire more health information and food norms from the media (Calvert, 2008; Livingstone & Helsper, 2006) it is critical to access how they perceive food messages in their media.

Media food messaging commonly occurs in two forms: as a prop or in advertising. Identifiable food items often appear in television programming and movies as props in scenes of meals, casual food consumption, or food preparation (Dickinson, 2000; Gupta & Lord, 1998; Story & Faulkner, 1990; Sutherland et al., 2010). Unhealthy food items appear most frequently (Dickinson, 2000; Story & Faulkner, 1990). Unhealthy foods dominate food commercials on television as well (Boyland & Halford, 2013; Powell et al., 2007). Unhealthy foods were also integrated into films and television through product placement (Speers, Harris, & Schwartz, 2011; Sutherland et al., 2010). Product placement is a form of advertising in which products are integrated into non-commercial media programming (Avery & Ferraro, 2000; K. Williams et al., 2011). All advertising

in video games is technically product placement (Glass, 2007). Results from analysis of television and movies suggest that a relationship exists between food messaging and adolescent food choices (Boyland & Halford, 2013; Montgomery & Chester, 2009), but similar research has not been done on video games.

This study addresses the gap in the literature on the impact of food messaging in video games on adolescents. I describe the method for my content analysis and qualitative interviews including my sampling methods, data collection strategies, and analyses of the data. I share my results on the types of food messaging in video games and the types of foods that appear in video games before I explore how adolescents, parents and video game industry representatives perceive food messaging in video games. I end this study with its limitations, my recommendations based on the results, and ideas for future research.

3.2 Methods

Video game content analysis

The games I selected come from the three top video game genres for 6 to 12 year boys: action, racing and sports (Entertainment Software Association of Canada, 2011). I selected two action games: *Grand Theft Auto IV*[1] (Rockstar North, 2008) (*GTA IV*) and *Minecraft*[2] (Mojang AB, 2010). I included *GTA IV* despite its M-rated by the Entertainment Software Rating Board (ESRB), a not-for-profit industry self-regulatory body, because 74% of 11 to 14-year-old boys have played a game from the *Grand Theft Auto* series (Rideout et al., 2010). Therefore, *GTA IV* was a relevant source of content for adolescents. I chose *Minecraft* because it of its commercial success, and its popularity among adolescents participants in interview participants. From the racing genre, I selected *Forza Motorsport 3*[3] (Turn 10 Studios, 2009) (*Forza 3*). The two sports games I selected were *Madden NFL 11*[4] (EA Tiburon, 2010) (*NFL 11*) and *NHL 11*[5] (Electronic Arts Canada, 2010). *NHL 11* also appeared on the Top 10 list of titles sold in Canada (Entertainment Software Association of Canada, 2011) and a Canadian company developed *NHL 11* (SECOR, 2011).

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[1] An action, racing/driving video game under the theme of shooter.
[2] An action, simulation game under the theme of fantasy. *Minecraft* has additional sandbox, survival horror and construction video game elements.
[3] A racing/driving video game.
[4] A sports video game. The sport being simulated is football (American football).
[5] A sports video game. The sport being simulated is hockey.

An expert video game player played at least one hour of each video game on normal difficulty. I did not give him any direction in how to play the video games or watch him play. He recorded the footage from *GTA IV*, *Forza 3*, *NFL 11* and NHL11 using the Roxio Game Capture (Roxio, 2011) (Roxio, 2012). He recorded *Minecraft* gameplay using Fraps (Beepa, 2010). After 60 minutes of video game play, the expert video game player and I discussed whether additional footage would reveal novel activities or environments in the game to decide if additional footage was necessary for each game. We collected data from an additional 12 game sections in *GTA IV* to access new locations and mission types. In *Forza 3*, we decided to complete two "race seasons" to see if the video game allowed the player access to novel content, such as racetracks. In *NFL 11* and *NHL 11* we collected footage from different modes and settings available to video game players.

A content analysis is a systematic distillation of communication messages into content-based categories (Elo & Kyngäs, 2008). I used NVivo 10 (QSR International Pty LTD, 2012) to analyse the video gameplay footage. Before coding I developed a preliminary coding frame structure, based on other studies of video game content (Ivory et al., 2009; Thompson & Haninger, 2001; Williams et al., 2009), with categories for food, advertising, types of advertising, and "where" food messages occurred in the game. I inductively developed codes for specific foods, brands and message placements from the video game footage. I also adapted my coding frame to account for unexpected food messages in the video game footage (Appendix I).

I recorded the quantity and duration of foods in the video game footage to compare the frequency and duration of healthy and unhealthy foods. I separated the appearance of food items and food references content. I developed this distinction based on the data: food references like signs for hamburger restaurants in *GTA IV* communicated different messages about the normalcy of hamburgers in urban cities, than the messages communicated by food appearances, such as depictions of characters eating hamburgers. I organized food appearance codes and food reference codes into healthy and unhealthy categories according to Canada's Food Guide (Health Canada, 2011). Then, I compared the duration and number of appearances of healthy and unhealthy foods. If the food item was ambiguous, I coded the food at the most general level. For example, I coded unmarked drink cups in *NFL 11* as *drinks*, even though in context they probably contained beer or pop.

To analyse the food advertising in video games, I recorded the quantity and duration of food advertisements in the video game footage. I did not distinguish between advertisements and product placements, though I did identify different forms of advertising. I defined an advertisement as any identifiable brand, branded item, or logo in the video game. I recorded the quantity and duration of all advertisements that were not specifically related to the game to compare the number of food advertisements to the number of advertisements for other products

in the video games. I excluded advertising for the National Football League in *NFL 11* and the National Hockey League in NHL11, because these games are based on these real sports leagues, making the league brands an integral part of the video game world.

To ensure rigour in my content analysis, I trained a second coder to independently recode 10% of the video game footage. I used the coding comparison query in Nvivo 10 to calculate Kappa scores. We discussed kappa scores of less than 0.75 and reviewed the footage to come to a consensus on the code in question. After review, we recalculate the Kappa scores and they were between 0.75 and 1, indicating adequate agreement between coders (Landis & Koch, 1977; McHugh, 2012).

Interviews

Recruitment

I recruited 15 adolescents and 15 parents from the Edmonton (AB) area using posters, and convenience sampling. I also sent letters to participants of summer athletics and philosophy camps based at the University of Alberta. I asked participants for referrals to other families who would be interested in participating as well. Eligibility for adolescents required that they were male, English speaking, between 12 and 13 years of age, and played video games. I interviewed a parent or guardian of each boy in the study. Three of the fifteen parents or guardians were male. I sent information sheets and consent forms to eligible participants who expressed interest in the study. I received informed consent from adult participants and assent from adolescent participants.

I used snowball sampling to recruit 5 video game industry representatives from the Edmonton area. I recruited online through corporate websites. I contacted video game industry representatives via e-mail or by phone as appropriate. Eligibility for video game industry representatives required that they had worked in the video game industry. I sent information sheets and consent forms to eligible participants who expressed interest in the study. I received informed consent from all video game industry representatives.

Data collection

I conducted semi-structured interviews in person, by telephone, Skype or email to gather participant perceptions on the effects of food messaging in video games on adolescents. Some of the questions in the interview guides were informed by previous studies of video game messaging (Brenick et al., 2007). I audio recorded the interviews from 32 participants, which were then transcribed verbatim and made ready for NVivo 10 (QSR International Pty LTD, 2012). One parent did not consent to audio recording, so I took field notes to record the views of that parent and child. I conducted one interview via email. I also made the field notes and the email software-ready. Interviews lasted between 30 and 70 minutes. The

interview guides probed for: general video game experience; perceptions of messaging in vide games; perceptions of food depictions in video games; and attitudes towards advertising in video games. Additionally, I interviewed video game industry representatives on their experience in the video game industry and their understanding of the forces within the industry that govern messaging in video games.

At the end of each interview, participants watched a YouTube video of in-game advertisements for McDonalds from four different video games (Higgins, 2011). I edited the video to exclude M-rated (mature-rated for audiences 17 years or older) content. I asked participants for their impressions of the advertisements depicted in the video and how the advertisements might impact an adolescent player's enjoyment of the games. Research Ethics Board 1 at the University of Alberta approved the study.

Data analysis

I analysed verbatim transcripts of the recorded interviews, emails and field notes using NVivo 10 (QSR International Pty LTD, 2012). I used the qualitative methodology of constant comparison. Constant comparison is a structured approach to categorizing, coding and delineating categories based on qualitative data, through iterative comparisons throughout data collection. Using a constant comparative method requires concurrent data analysis and collection. I inductively developed provisional codes from my initial transcripts through open coding (Boeije, 2002). The provisional codes were extended and refined through iterative comparisons between new interviews and the provisional codes (Boeije, 2002). Data collection continued until data from new interviews can be easily assigned to existing categories (Boeije, 2002). Another researcher independently examined 8.6% of transcripts to ensure the codes addressed key themes. All but one of the themes the second coder identified corresponded to themed in my coding frame. The novel theme she identified was an adolescent differentiation between abstract and concrete games, whereas I had coded these differences according to video game genres. In other studies this distinction between abstract and concrete contributes to perceptions of body image (Martins et al., 2009, 2011), so I recoded my transcripts to include this insight.

3.4 Results

Video game content analysis

Food messaging

Food items, or references to food items, appeared in all of the video games sampled (Table 3-1). Food appeared in cutscenes (cinematic sequences in the video game players watch but do not control), in the video game environment, and on loading screens. Unhealthy foods outnumbered healthy foods in *NFL 11* and *GTA IV* (Table 3-1). Healthy foods dominated *Minecraft* (Table 3-2). In *NFL 11*, *Forza 3* and *GTA IV* unhealthy foods had more screen time than healthy foods

(Table 3-2). In *NHL 11*, I coded an unbranded green water bottle with an orange lid as water and, therefore, healthy. However, given the visual similarities to a Gatorade bottle, the developers may have intended the player to interpret it as Gatorade, which the Canada Food Guide does not recommend. *NFL 11* and *Forza 3* both advertised food items. In *NFL 11* food appeared in floating advertisements and audio endorsements. In *Forza 3*, food and beverage company brands appeared on billboards around the virtual racetracks.

Table 3-1:
Instances of healthy and unhealthy food depictions in video games.

	NFL 11	*Forza 3*	*GTA IV*	*NHL 11*	*Minecraft*
Food appearances					
Healthy	0	0	1	313	413
Unhealthy	13	0	20	0	15
Food references					
Healthy	0	0	1	0	0
Unhealthy	4	0	103	0	0
Food advertisements					
Healthy	0	0	0	0	0
Unhealthy	46	10	0	0	0

Table 3-2:
Duration of healthy and unhealthy food depictions in video games (h:mm:ss.ms).

	NFL 11	*Forza 3*	*GTA IV*	*NHL 11*	*Minecraft*
Food appearances					
Healthy	0	0	0:00:01.9	0:32:57.6	1:53:43.0
Unhealthy	0:00:47.0	0	0:04:20.6	0	0:00:57.8
Food references					
Healthy	0	0	0:00:00.9	0	0
Unhealthy	0:00:21.6	0	00:07:41.9	0	0
Food advertisements					
Healthy	0	0	0	0	0
Unhealthy	0:03:14.4	0:01:06.1	0	0	0

In *Minecraft* and *GTA IV* healthy and unhealthy foods functioned as interactive items in the in-game health systems. In *Minecraft*, the head-up display (HUD: a game mechanic for visually relaying information to the player that overlays the player's view of the game environment) showed players hearts representing their in-game health. The player had to restart the game if they lost all their in-game health. The HUD also represented in-game hunger with chicken drumsticks. The player lost drumsticks at a constant rate while playing *Minecraft*; if the player ran out of drumsticks, he lost in-game health as well. The player could diminish his in-game hunger by growing, harvesting and eating foods found in the game environment. In *Minecraft*, unlike the other games, depictions of healthy foods outnumbered depictions of unhealthy foods (Table 3-1).

Eating food also increased a player's in-game health in *GTA IV*. Players buy foods like hot dogs to replenish in-game health. The health mechanic in *GTA IV* used more unhealthy foods than healthy foods.

Food advertisements

Three of the video games advertised real products: *Forza 3*, *NFL 11* and *NHL 11*. Only *Forza 3* and *NFL 11* contained food advertisements (Table 3-1) for five real food products: Coca Cola (soft drinks), Gatorade (sports drinks), Boss Coffee (coffee), Doritos (chips), and Nissin (instant ramen). *GTA IV* contained advertisements for fake products, including soft drinks and hamburgers. There were more food advertisements than non-food advertisements in *NFL 11*, but not in *Forza 3* or *NHL 11* (Table 3-3).

Table 3-3:
Instances and durations of food advertisements and non-food advertisements in the video games.

	Food advertisement (duration h:mm:ss.ms)	Non-food advertisement (duration h:mm:ss.ms)
NFL 11	46 (0:03:14.4)	18 (0:01:58.9)
Forza 3	10 (0:01:06.1)	667 (0:23:28.3)
NHL 11	0 (0)	1902 (37.48.6)

The advertisements for real products took different forms in the video games (Table 3-4). Some imitated advertisements from real life, like billboards and audio endorsements. Others placed advertisements in spaces specific to video games, such as load screens and floating advertisements.

Table 3-4:
Types of advertisements that appeared in the video games with instances and durations (h:mm:ss.ms).

	NFL 11	*Forza 3*	*NHL 11*
Billboard[a]	18 (0:04:47.8)	230 (0:17:32.1)	5 (0:00:16.7)
Sideboard[b]	0	0	205 (0:35:04.9)
Logo on Avatar[c]	0	13 (0:39:11.7)	37 (0:02:13.0)
Logo on Product[d]	0	18 (0:01:28.6)	0
Floating advertisement[e]	68 (0:43:15.7)	20 (0:03:28.3)	1 (0:00:43.6)
Audio endorsement[f]	9 (0:00:39.0)	0	0
Interactive advertisement[g]	0	1 (0:00:29.0)	0
Loading screen[h]	1 (0:00:11.9)	15 (0:02:50.5)	0
Cutscene[j]	2 (0:00:18.2)	8 (0:00:20.3)	84 (0:06:03.0)

[a]Billboards were large signs in the background of the video games.
[b]Sideboards were signs around the edges of skating rinks in *NHL 11*.
[c]Logos on Avatar included all advertisements placed on the player- controlled avatar.
[d]Logos on products included company logos on water bottles and other items in the games.
[e]Floating advertisements are similar to "pop-up" advertisements: independent smaller screens that appear on the screen, separate from the game world.
[f]Audio endorsements were audio messages that included brands or companies (e.g. "brought to you by …").
[g]Interactive advertisements were brands that the character could interact with. In *Forza 3*, the player could put brands on their cars as decoration between races.
[h]Loading screens allow the game to load content. Static images with advertisements appeared in loading scenes.
[i]Cutscenes were cinematic sequences that players watch.

Interviews

Food messaging in video games

Not all video games that adolescents played contained food messaging. And adolescents did not recall all the food messages identified in video games from the content analysis. All of the participants who played *Minecraft* recalled the foods in that game. One participant misinterpreted the drumsticks in the health meter as corndogs. But the adolescents who played *GTA IV* did not recall the fake food advertisements, foods like hamburgers, hot dogs or pizza that appeared in the

games, or any of the foods referenced on restaurant signs. Other games adolescents recalled seeing food messaging in were *inFAMOUS*[6] (Sucker Punch Productions LLC, 2009), *The Sims*[7] (Maxis Software, 2000) and *The Elder Scrolls 5: Skyrim*[8] (Bethesda Game Studios, 2011) (*Skyrim*). Some adolescents did not recall seeing any food messaging in any of their video games.

Adolescents only accepted food messaging in certain video game contexts. Adolescent participants had a nuanced sense for how food should be placed in video games based on the genre, setting, and realism of the video game. The adolescents felt food messaging was appropriate in sports video games and racing video games. Placing advertisements for modern foods in a game like *Skyrim* would be logically inconsistent with the medieval fantasy setting of the video game, and adolescents therefore felt it would be inappropriate:

> In *Skyrim* it would make no sense because a billboard for Doritos or Gatorade is like 'How did they create that in that society'?

Video game industry representatives expressed a similar sensitivity to the types of games that food messaging would be appropriate in:

> Most of our games are either in the far future or in a fictional different world. So we've never had to deal with product placement.

Only one adolescent recalled food items being used as a prop in a video game:

> In Starcraft … the second scene is a guy who's Jim Raynor in a bar with a cigar and a drink.

Many adolescents recalled food being used as part of a health mechanic in a video game. Ten of the fifteen adolescents played *Minecraft* and shared detailed information about the role of food in *Minecraft*'s health system. None of the adolescents who played *GTA IV* recalled that they could eat food to regain health in that game. Adolescents recognized that the depictions of food and eating in video games are unrealistic:

> Eating and drinking are optional. You do it like, you're fighting something. They got the upper hand. Your health is low. You eat 50 cheese wheels. You're good.

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[6] An action video game under the theme of comics.
[7] A simulation video game under the themes managerial and real-time.
[8] An action, role-playing video game under the theme of fantasy.

Participants accepted food advertising most easily in sports games, racing games and games set in modern cities:

> If they're on the gym floor then they help fund the gym or something … a lot of sports teams and stuff they do use the Gatorade products a lot. They probably aren't placing those specifically as advertisement; they're probably placed it because that's realistic.

Food advertising in video games

Participants had differing views on the vulnerability of adolescents to advertising. Participants had generally negative views of food advertisements in video games when shown examples. Finally, adolescents and parents felt their adolescents experienced more advertising for unhealthy foods than healthy foods.

Participants did not agree on whether food advertising works on adolescents. They agreed that advertising might affect adolescents generally. However, many adolescents felt they could resist advertising, and many parents also felt their adolescent was immune to advertising:

> I would ignore [advertising in a video game] but I know some people probably wouldn't.

As adults, many parents accepted advertising as an acceptable business practice. However, they still expressed disappointment that companies chose to advertise unhealthy foods for profit rather than promoting healthy foods to children and adolescents:

> A lot of this stuff is all about money … you shouldn't be eating it in the first place, so just get it out of there. They're just trying to push their stuff on you, just sell, sell, sell. They don't care about what they're selling.

To participants, only unhealthy foods were promoted in advertisements. If healthy foods were advertised in video games they would seem out-of-place:

> The game wouldn't [advertise healthy food] … that's the problem with the good food advertisements, they're not like catchy.

> It's kind of funny for the sports ones that you have the junk food, although I can't really put a piece of broccoli there … the big "M" is what they've been growing up seeing. [If the ad was for milk] that's that "Ohh! The milk? That's something that your mom makes you.

Adolescent traits and parental control

Many parents expressed a lack of interest and familiarity with the content of the video games their adolescents played:

> No, never been a gamer. The paddles confuse me and scare me. What do you do with these things? I don't know. I'm too old.

Participants felt that video games influence some adolescents more than others. Parents felt that video games could reinforce certain predispositions in some adolescents:

> I think who the child is and how he reacts or how he's responding to what he's playing or seeing determines what happens … some people are just going to be a certain way no matter what they do.

Adolescents and parents felt that maturity protected adolescents from food messaging in video games. Parents defined maturity as the ability to distinguish between video games and the real world:

> He does play games that are way more mature rated than what his age is, but he's an only child and he's around adults all the time … he seems to understand that's a game, that's not real life, nothing like that happens in real life.

Parents felt that food advertisements had limited effect on their adolescents because they controlled the foods their adolescent could access:

> That probably comes back to what's available in the house … it probably wouldn't if the choices aren't available in the house.

> I do groceries, so they have really no choice.

According to adolescents and parents, parents should also control the video games adolescents have access to and the amount of time adolescents play. Parents felt they had the best sense of what kind of content their adolescent was mature enough to interact with:

> I think a good part of it is the parent's decision what they expose their children to, but they also have to take into account the maturity of their child as well and how the child sees the game.

Parents allowed their adolescents access to video games, despite their misgivings and concerns about the messaging in video games, because they did not want to deny their adolescents access to the social peer interactions that occur in and around video games:

> It puts them on the same wavelength as other kids. He seems to understand their world and fit in. I guess that was part of the motivation for letting them get into gaming in the first place… it does help him relate to other kids in a generalized, cultural sense.

Despite their concerns about the content and quantity of media messaging their adolescents interacted with, parents allowed their adolescents access to video games. Allowing limited video game play afforded parents the opportunity to teach their adolescent how to respond to messaging in an environment their parents could control:

> I don't like it, no, but we can't isolate them. We can't let them live in a bubble. I figure if they're going to be exposed to it, I want to be there and talk them through it.

Parents also felt that they encouraged their adolescents to engage in other activities that help promote health behaviours, like sports:

> I have a phys ed (physical education) degree, that's my background and I like kids to be active and this is such a big part of their life to incorporate fitness as a lifelong skill. That's not a lifelong skill and that's like the whole – Wii Fit and all this, 'Really? Go outside.'

Despite the importance many parents placed on talking to their adolescent to ensure they knew the difference between reality and video games, many limited how much they would talk to their adolescents about their video games:

> He tries to talk about [video games] all the time. I try to listen or answer somewhat, but I don't usually put up with it too long.

Responses to the youtube clip

The advertisements in the YouTube clip participants watched at the end of the interview garnered many negative responses. Some of adolescents found the inclusion of advertising in video games "cool" or, at least, ignorable. Most of the participants felt that the advertisements in the sports video games were acceptable because they add realism:

> I don't watch too much sports, but if [advertising] was there in real life, that kind of makes sense.

Adolescents easily identified advertisements that appeared visually or thematically out-of-place:

> The advertisements were actually really noticeable. You could see lots of McDonald's and Stride and Gatorade. A lot of the billboards are really big, and they stood out from the -- the red stood out from drab grey and brown of the buildings.

Adolescents were extremely territorial about their screen space. They disliked "large" advertisements and pop-up advertisements that covered screen space:

> That one McDonald's advertisement that kept popping up was kind of annoying because it just kept coming back, like five or six times.

Industry antecedents to food messages and advertising in the video games

Video game industry representatives revealed one reason that maturity may be such an important moderator of adolescent video game experiences. Adolescents must transition between video games developed for childish to adult video games:

> I think there is a case where adolescents will end up having to make that jump to a more mature theme because of the fact that their market is there's not a huge enough for it. Like it's either toned down or it's ratcheted up to appeal to kind of make things a little more edgy and stuff like that.

To video game industry representatives, implementing a health mechanic that depicted the realistic consequences of eating different foods to encourage healthy eating among adolescents was resource-intensive. The technical barriers to such systems made them an unjustifiable development objective for the video game representatives:

> I think a big thing is you will have eating and drinking in games as a way of increasing player health but actually seeing the effects of the results is probably not likely. The thing to bear in mind in games with character creation, having that effective character makes your work incredibly hard … because all of a sudden you have to really take this custom character and adjust them on the fly based on their decisions … if you do that in this gen having the character model change a resultant of your action becomes incredibly costly to maintain and manage.

Video game industry representatives distinguished between business decisions and artistic decisions in developing video games. Advertising in video games was perceived as driven by business. The design wishes of video game industry representatives were subordinate to commercial decisions by video game publishers:

> Most of the time Publishers/investors decide what is put into a game. Developers just follow orders.

According to video game industry representatives, economic pressures in the industry the use of fake brands to create realism in video games. Real brands were only included if their companies pay video game development companies:

> In order to achieve authenticity a developer may want to go to a company and say "we would like your store to appear in our game so the player experience seems more authentic" … No developer in their right mind would do that. They have no incentive to spend that sort of money when they can just make up "Burger Thing" instead of "Burger King" … it is a much more likely scenario that a real world company would want to ensure their products appear in a popular franchise in order to get some benefit of exposure.

Even though their industry uses advertising, the video game industry representatives personally disliked advertising while playing video games. Video game industry representatives echoed the adolescent's distaste for large advertisements in the YouTube clip:

> You're occupying 40% of the screen space with the advertising - and we see it again! … that's blatant.

Video game industry representatives did not feel that food messaging in video games was very common or likely to be a problem for well-adjusted adolescents. Video game industry representatives felt that players would not derive sufficient "fun" from the realistic portrayal of the consequences of healthy and unhealthy food choices to make it worth overcoming the significant technical and design challenges of implementing:

> So you can sit down and go "are you going to make eating a balanced diet a part of the mechanic?" … You don't have that many players are going to be interested in it because it's not fun. So the biggest thing with games … "is the player having fun?" and if they're not, then you lose. You haven't done your job right. And the media's like if the player's experience is ruined by a message, then you fail.

Video game industry representatives felt that food messaging that occurred around video games probably had greater effect on adolescents. Examples they gave included advertising on video game review websites, advergames and cross-promotion between video game companies and food and beverage companies. In cross-promotion agreements, food products are tied to popular movies, television programs, toys and video games (Federal Trade Comission, 2012). One participant explained how Halo and Mountain Dew promoted each other's products: Halo players got codes from purchased Mountain Dew products to use in-game and Mountain Dew created a special flavour, "Game Fuel":

> What they're doing with [cross promotion] is they're making the player's experience better based on applying their product … And so they build brand awareness and recognition among gamers.

3.5 Discussion

I found three kinds of food messaging in video games: food as a health mechanic; food as a prop; and food advertising. In this section, I will compare the food messaging, particularly food advertising, identified in video games to patterns of food messaging in other media, and explore how the interactivity of video games may influence how adolescents perceive food messages in video games. Then, I discuss the traits that adolescents and their parents identified as protective factors against food messaging in video games, and a uniquely adolescent vulnerability to food messaging. I explore the insights from the video game industry representatives on the forces that drive the inclusion of some forms of food messaging, and exclude other forms. Finally, I review the limitations of this study before providing recommendations and directions for future research.

Food messaging in video games

I identified three kinds of food messaging in video games and all of the video games included in the study had some kind of food messaging. Food items appeared as props in video games, as they do in television (Greenberg et al., 2009). Foods have nutritional value, but they also have cultural meanings and act as symbols that provide nuance to the environment and characters in media (Chapman & Maclean, 1993; Rozin, 2005). In *GTA IV* unhealthy foods items outnumbered healthy foods, making the food messaging in video games consistent with other media (Greenberg et al., 2009; Story & Faulkner, 1990). The most common food item used in *GTA IV* as a prop was alcohol. Depictions of alcohol are problematic in other media because they promote risk behaviours in adolescents (Greenberg et al., 2009) that I will not be addressing further. During cutscenes, characters also ate hamburgers. As in other media (Greenberg et al., 2009), video games did not depict the consequences of these food behaviours. Video games reinforce unhealthy food messages that exist in other media when using food as a prop.

Food advertising also occurred in certain video games. The sports and racing games in the content analysis contained advertisements for real products whereas *Minecraft* and *GTA IV* did not. In games with advertisements, adolescent and their parents did not disapprove of all food advertisements, only blatant advertisements that interfered with game play or seemed visually or thematically out of place. In sports video games, advertisements encourage positive attitudes towards brands (Cianfrone et al., 2008; Clavio, Kraft, & Pedersen, 2009; Kim & McClung, 2010; Walsh et al., 2008). According to the video game industry representatives, the inclusion of real products results from business decisions, not artistic ones, and companies pay to have their products included in video games as in other media.

In addition to traditional placement in props and advertisements, however, food messaging also occurred in video games as a health mechanic. The real life relationship between food and health (Nordström, Coff, Jönsson, Nordenfelt, & Görman, 2013) provides the basis for the use of food as a health mechanic in video games. Food could be consumed to regain in-game health in *Minecraft* and *GTA IV*. Adolescents recalled seeing food as a health mechanic in *Minecraft*, but those that played *GTA IV* did not recall using foods in that game. Food and the health mechanic in *Minecraft* may have been more prominent, because the hunger bar prompted players to interact with food more frequently than the health system in *GTA IV*. The health mechanic in *GTA IV* featured an unhealthy food, but the health mechanic in *Minecraft* featured the largest and most healthy diversity of foods in my sample.

Through video games, adolescents learn behaviours through the effects of their own actions and by watching the consequences of other actor's actions (Bandura, 2002). Media, such as television and film, influence adolescent behaviours by depicting models engaging in actions and enduring the consequences of their actions. In video games, non-playable characters act as models, performing actions and receiving consequences, but the adolescent player also controls the behaviour of their character and their character experience the consequences of the player's gameplay choices (Fox & Bailenson, 2009). When the in-game consequences of actions do not match real-life consequences, adolescents can develop unrealistic expectations based on what they see in video games, as they can in other media. In much the same way that television fails to show the negative consequences of unhealthy eating (Greenberg et al., 2009), video games can support unrealistic expectations around foods. A player can eat as many hotdogs as he can buy in *GTA IV* to regain his health, but never gains weight or suffers any of the negative consequences of only eating hotdogs.

Only certain kinds of video games contained food advertising. Adolescents were sensitive to frequent, blatant and visually discordant advertisements in the YouTube clip, echoing the sentiments of adult video game players (Nelson et al., 2004). *NFL 11* seemed to have advertisements that fit the criteria from interview participants. But even this video game, which participants would have accepted advertising in, exposes adolescents to 21.23 unhealthy food advertisements per hour. *Forza 3*, an exemplar of the racing game genre participants identified as appropriate for food advertising, contained 10.06 unhealthy food advertisements per hour. By comparison, on television adolescents see 14.2 unhealthy food advertisements per day (Rudd Report, 2012). Thus, while adolescents play video games they experience similar advertising volumes to those watching television.

Adolescents may not be as immune to advertising as they and their parents believe. The adolescents in my study felt they were immune to food messaging in video games, but their peers were not. This pattern of responding has been identified in other studies of media as the third party effect (Davison, 1983; Paul, Salwen, & Dupagne, 2000). In adolescents, the feeling of invulnerability to advertising may be linked to adolescent egocentrism. As a normal part of development, adolescents between 10-13 fall under the personal fable, which leads them to believe that, compared to their peers, they are special, unique and invulnerable to harm (Elkind, 1967). In this study, I could not differentiate between actual immunity and the effects of adolescent egocentrism on adolescent and parent perceptions of the effects of food messaging. However, in chapter 4, I test the effects of controlled food messaging in video games on adolescent food attitudes and behaviours.

Unhealthy foods dominated the limited food advertising in the sampled video games. Unhealthy food dominates advertising in other media as well (Batada et al., 2008; Powell et al., 2007; Sutherland et al., 2010). Children and adolescents recall unhealthy food logos better than they do healthy food logos (Arredondo, Castaneda, & Elder, 2009) and the unequal representation of unhealthy foods normalizes and reinforces user acceptance of unhealthy foods (Dixon et al., 2007). Even if video games included healthy food advertisements, the dominance of unhealthy foods in other media advertising would undermine healthy messaging. Adolescent video game players see the same kinds of foods advertised in video games as they see in other media and real life.

Advertising has extended into public and media spaces to become inexorably linked to everyday life (Rumbo, 2002), so much so that video game industry representatives use advertising to make their games more realistic. In this sense, food advertising in video games merely reinforces messages adolescents see in on television, online, in their schools and in their communities (World Health Organization, 2013). Advertisements for fake products appear in *GTA IV* advertisements to create realism, because a city would not look real without

billboards for soft drinks and vending machines. Similarly, participants accepted advertisements in games like *NFL 11*, *NHL 11* and *Forza 3* because these games simulate real life contexts full of advertisements (Cianfrone et al., 2008). Video games, like other media, imitate life and advertising permeates the lives of adolescents.

Adolescent vulnerability and parental control

Adolescents and their parents felt that only some adolescents are vulnerable to food messaging in video games, specifically those with low intelligence. However this sentiment is not supported in the literature. Indeed, body weight has been linked to vulnerability to food messaging (Adachi-Mejia et al., 2011), and acceptance of aggressive messages in video games has been linked to sensation seeking (Slater, Henry, Swaim, & Cardador, 2004) and a combination of high neuroticism, low agreeableness and low conscientiousness (Markey & Markey, 2010). Few studies have identified personality traits or temperaments that mediate adolescent's vulnerability to food messaging (Beaver et al., 2006).

The mediating effect of maturity on adolescent vulnerability to messaging in video games has been established for other media (Valkenburg, 2000). Participants defined maturity as the ability to distinguish video games from real life. This ability develops sometime between 9 years old (Villani et al., 2005) and 16 to 19 years old (Malliet, 2006). The age of onset and progress through adolescence varies between individuals, (Blakemore, Burnett, & Dahl, 2010; Marshall & Tanner, 1970; Steinberg, 2005) so at ages 12 to 13 some adolescents may easily distinguish between media and reality, while others may not.

Parents of adolescents also mediate the effects of food messaging in video games. Unlike other studies of adolescent food behaviour (Power et al., 2010), parent participants did not blame their adolescents for poor eating habits. Instead, they focused on aspects of their adolescent's behaviour they could control. Parents controlled diet by limiting access to unhealthy food items in their homes, which promotes healthier eating among adolescents (Hanson, Neumark-Sztainer, Eisenberg, Story, & Wall, 2007; Neumark-Sztainer, Wall, Perry, & Story, 2003). However, adolescents acquire more of their food away from home than they do as children (Hill, 2002; Nielsen et al., 2002). Parents also controlled access to video games and length of play. While some evidence suggests that such restrictive mediation strategies can instead lead to increased media use and exposure to messaging (Nathanson, 2002), participants in my study felt they had achieved a balance between the level of access wanted by adolescents and parental control.

Inside the video game industry

Video game industry representatives perceived barriers to including healthy food messages and realistic consequences of food behaviours out of video games. First, video game industry representatives perceived adolescents as very small demographic for video game companies to make video games for. Relatedly, the video game developers did not see any financial incentives to include healthy food promotions in their video games. According to Take-Two Interactive Software, Inc. (2012), a video game publishing and development company, the cost to develop a console video game, such as those included in this study, ranged from $10 to $60 million. In 2009, Americans spent $ 10.5 billion (Entertainment Software Association, 2010) on video games and Canadians spent $1.7 billion in 2010 (Entertainment Software Association of Canada, 2011). "Crunch time," an industry practice of unpaid overtime just before the release of a game, and the stress associated with producing a game on budget and on schedule (Dyer-Withfeord & De Peuter, 2006), were also barriers to incorporating healthy food messages.

Profit motives drove the inclusion of food advertising in video games. Video game industry representatives personally disliked advertising in video games, especially in the YouTube clip shown during the interviews, but ultimately felt powerless to reverse corporate decisions to include advertising in their video games. Similar tension between creative integrity and commercial pressure occurred in other media (Writers Guild of America, 2008). In response to the Federal Trade Commissions examination of product placement and product integration practices in television, President Patric Verrone of the Writers Guild of America wrote, "When writers are told we must incorporate a commercial product into the story lines we have written, we cease to be creators" (Writers Guild of America, 2008). Commercial pressures influence the creative messages incorporated into media, including video games.

Video game industry representatives identified other forms of advertising related to video game that they felt were more significant and widespread than the forms of food messaging addressed in this study. They identified advergames, cross-promotions between food and beverage companies and video game companies, and advertising on video game review websites as more significant sources of food advertising. Other studies have found that unhealthy foods dominate advergames (Harris, Speers, Schwartz, & Brownell, 2011; Thomson, 2011), even though advergames can promote healthy eating habits (Dias & Agante, 2011; Pempek & Calvert, 2011). Food and beverage companies spent $584 million on child and adolescent-directed cross promotions, accounting for one-third of child and adolescent-directed spending (Federal Trade Comission, 2012). Of that $584 million only $1.5 million was used in the cross-promotion of fruits and vegetables (Federal Trade Comission, 2012). Cross-promotion in video games in such as

Rock Band [9] (MTV Games, 2007) and Banjo-Kazooie: Nuts and Bolts[10] (Microsoft Game Studios, 2008), specifically targeted children and adolescents (Federal Trade Comission, 2012). In an analysis of children-target websites containing advertisements, including online extensions of television channels like Nick.com, CartoonNetwork.com and the Disney Channel, fruits and vegetables make up only 0.01% of food advertisements (Ustjanauskas, Harris, & Schwartz, 2013). The other types of advertising surrounding video games identified by video game industry representatives are also probably subject to the same economic pressures that promote the inclusion of well-financed unhealthy foods and the exclusion of healthy food promotion.

Limitations

The content analysis was based on the play of a single video game player. Video game players with different motivations will engage in different gameplay (Xu et al., 2012; Yee, 2006) that exposes them to different amounts of different kinds of video game content. The expert video game player was exploratory- motivated. Exploratory-motivated players tend to delve more deeply into the video game content than players with other motivations (Xu et al., 2012; Yee, 2006). Therefore, the content analysis should be interpreted as the upper limit of food messaging exposure available to video game players.

This study may also not be generalizable outside of an urban English-speaking North American context. Another limitation is the small number of video game representatives interviewed. The media identified video games as a potential contributor to the school shooting in December, 2012 (Picard, 2012), which may have influenced some participant's views of video games. Due to the convenience sampling used in the interviews the participating adolescents and their families may be non-representative other adolescent males and their families.

3.6 Conclusion

Food messaging in video games occurred in a limited set of genres and contexts. Video game industry representatives incorporated healthy and unhealthy foods in video games as a health mechanic. Unhealthy food items appeared in video games as props, as they did in other media. Finally, unhealthy food advertising helped create realism in sports and racing video games, as well as games with modern settings. Some adolescents may be more vulnerable to food messages, depending on their personalities, their maturity and their parents. As in other media, food messaging in video games promoted unhealthy foods that may contribute to unhealthy food habits in adolescents.

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[9] An action, simulation video game under the theme of rhythm/music.
[10] An action, racing/driving, sport game under the themes of flight, helicopter, and puzzle solving.

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CHAPTER FOUR: EMPIRICAL TESTING OF THE EFFECTS OF FOOD MESSAGING IN VIDEO GAMES ON ADOLESCENTS

4.1 Introduction

Food messaging in media contributes rising rates of adolescent obesity (Cairns et al., 2009). In particular, food advertising in traditional promotes unhealthy foods over healthy foods (Pettigrew, 2007), thereby normalizing the consumption of unhealthy foods among adolescents (Dixon et al., 2007) while depicting unrealistic consequences of consuming unhealthy foods (Greenberg et al., 2009; Pettigrew, 2007). Technological advancements and media fragmentation have changed the way adolescents consume media (K. Williams et al., 2011), so marketers have shifted their attentions to product placement in new media, like video games. Product placement is the planned placement of branded commercial content into non-commercial media (Avery & Ferraro, 2000; K. Williams et al., 2011). In video games, product placement has been found to effectively improve brand recognition and attitudes towards brands (Glass, 2007). In the absence of any work on food messaging or advertising in video games, this study addresses the effects of food messaging in video games on adolescents.

Adolescents (12 to 18 year olds) undergo a period of rapid psychological development that distinguishes them from children under 12 years old. Due to this development, adolescents are expected to have an adult understanding of advertising intent and, therefore, they are not protected from advertisements (Advertising Standards Canada, 2013; Hawkes, 2006). By adolescence, most people have develop cognitive skills that help them resist advertising (Bartholomew & O'Donohoe, 2003; Rozendaal et al., 2011), however, adolescents may remain vulnerable to product placement because they do not activate those protective cognitive skills (Pechmann, Levine, Loughlin, & Leslie, 2005). Because adolescents are distinct from children, studies on children may therefore not be generalized to adolescents.

Video games are an important medium to adolescents. Over 90% of 8 to 18 year olds play video games (Lenhart et al., 2008) and 87% of American households with adolescents have at least one video game console (Rideout et al., 2010). On average, 12 to 14 year olds play video games for 17.24 hours per week (Greenberg et al., 2008). Time spent playing video games peaks in 12-14 year olds (Greenberg et al., 2008). Despite the amount of time adolescents spend with video games, no research has been done on the effects of food messaging in video games on adolescents.

To address this gap in the literature, I conducted a pilot study that empirically examined the effects of unhealthy and healthy food messages in a video game on adolescent food attitudes and choices. I developed versions of a video game with healthy and unhealthy food messages that adolescents played for fifteen minutes. Then, I compared how the food messages in the video games influenced the attitudes of the participants with an Implicit Association Test (IAT). I used a

short-term food task to test the effects of the food messages in the video games on their food behaviours. I contextualize the results of the experiment with insights from the participants, gathered during the return of results. Finally, I discuss my results, the limitations of this study and conclude with thoughts.

4.2 Methods

Participants

12-13 year old students (N=164; 73 girls and 91 boys) from seven classes at three Elk Island Public Schools (Alberta, Canada) participated in the experiment. Prior to the study, parents received an information sheet and consent form (Appendices III and XX) that they signed, and adolescents received an information sheet and signed an informed assent form (Appendix IV) approved by the University of Alberta Research Ethics Board 1, and the Elk Island Public Schools (Appendices I and II).

Development of the experimental food choice video game

I developed the experimental food choice video game based on Super Mario Bros.[1] (Nintendo, 1985) (Super Mario). The player viewed the avatar (a two-dimensional pixelated image of a person that the player controls in the video game) from the side view and controlled the avatar using the up, left and right arrow keys on a standard computer keyboard. The player guided his/her avatar from left to right with the goal of collecting items for points. The avatar jumped over holes in the floor and avoided, or jumped on, monsters (Figure 4-1). The players reached the next level of the video game by touching a white crystal with their avatar. The video game had 8 levels.

I developed three versions of the video game using GameMaker8 Lite (YoYo Games, 2009). The video game in the three conditions differed in the item players could collect for points: the control version collected a red crystal; the healthy food choice version collected a red strawberry; and the unhealthy food choice version collected a chocolate bar in a red wrapper (Figure 4-2). The items collected were of a similar size and colour (Figure 4-2).

[1] An action video game.

Figure 4-1. Exemplar screenshot from the control version of the experimental video game.

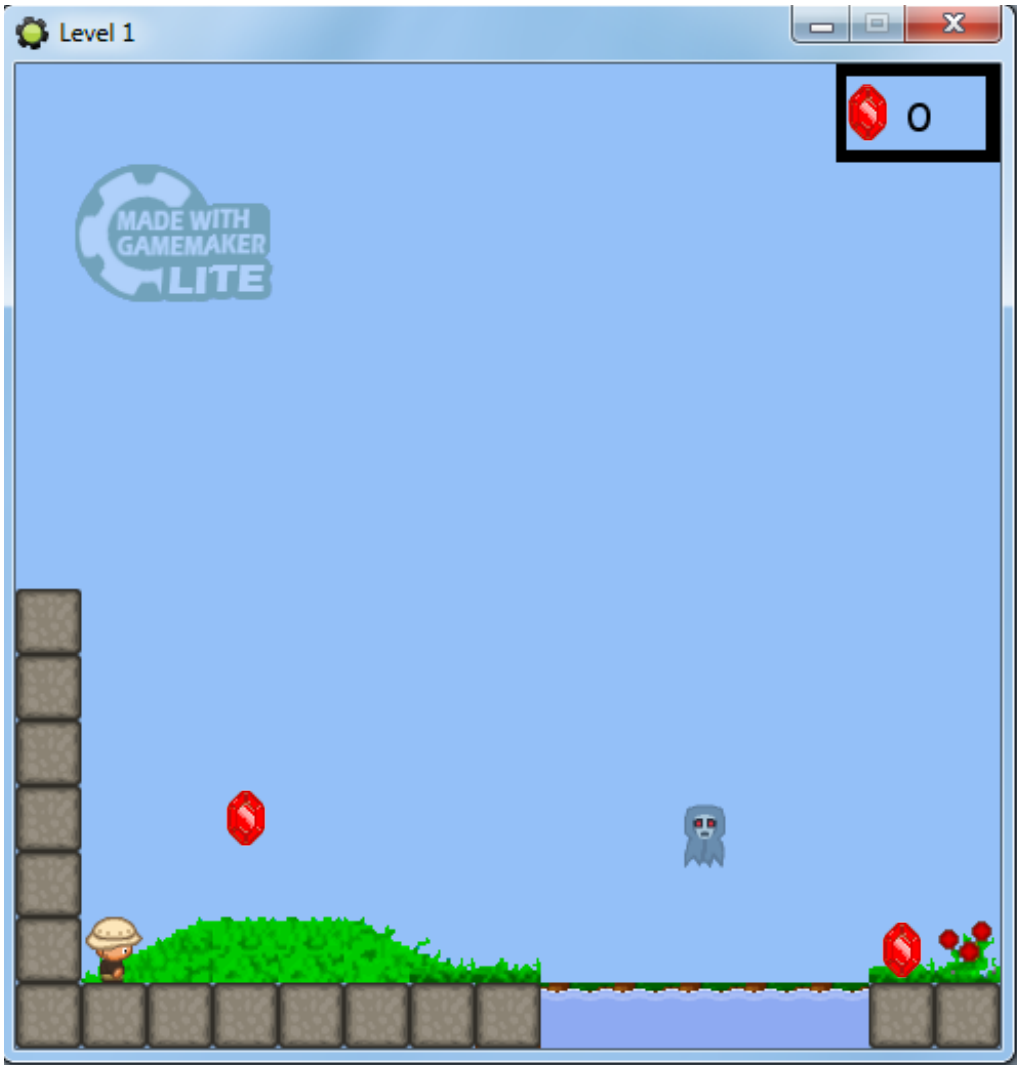


Figure 4-2. Food items in the experimental video game: strawberry (left) in the healthy version, chocolate bar in the unhealthy version (centre) and crystal in the control version (right).

Presentation of experimental food choice video game

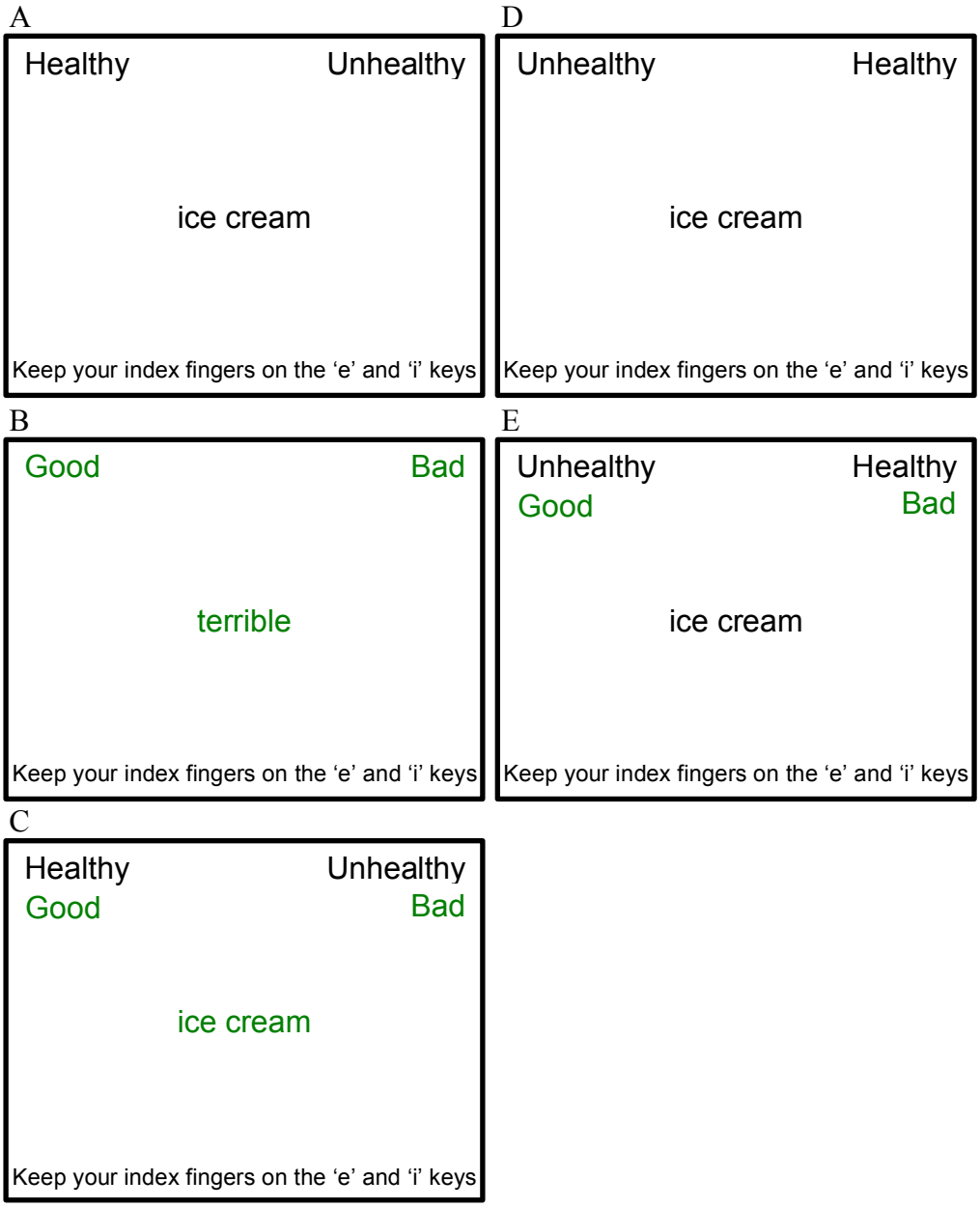
All participants received the same information that the study explored their responses to messages in video games. I instructed the participants to play the video game, participate in a word choice exercise, save their files, and select a snack. The first screen of the video game provided the participants with instructions on how to play the video game. Once the gaming commenced, if a participant had a question, I provided the minimum information necessary to help the participant progress. I did not provide any instructions on how to interact with the items or other features in the video game, such as enemies and obstacles.

Within each class, I randomly assigned each participant to: the healthy food choice version of the video game, the unhealthy food choice version or the control version. All participants played one version of the video game for 15 minutes on netbook computers provided by the schools. All participants in each class played the game simultaneously in the same classroom setting.

Implicit Association Test

After 15 minutes of video game play, the participants completed the IAT, which was administered on their computers with FreeIAT 1.3.3 (Meade, 2009). The IAT is a multi-stage psychological test that uses response latencies to measure associations between concepts (Greenwald et al., 1998). Response latency is the time between exposure to a stimulus and the individual's response to the stimulus (Gawronski & Bodenhausen, 2007). I used the names of healthy and unhealthy foods and good and bad adjectives as stimuli in my IAT. Participants responded to the stimuli by pressing keyboard keys to indicate the category they felt the stimulus corresponded to. The first stage of the IAT is training. FreeIAT 1.3.3 displayed two categories on the computer screen: *healthy* on the left side and *unhealthy* on the right side. Food words appeared in the centre of the screen (Figure 4-3.A). Participants pressed the "e" key to assign the stimuli to the category shown on the left side of the screen. To assign stimuli to the category shown on the right side of the screen they pressed the "i" key. In the second stage of the IAT, the categories on the screen changed to *good* and *bad* (Figure 4-3.B) and participants categorized adjectives. In the third stage of the IAT, the program paired the healthy and good categories (Figure 4-3.C) paired so the participants pressed the same key to respond to stimuli from either category. Participants used the other key to categorize stimuli as unhealthy and or bad. In the fourth stage, participants categorize foods as healthy or unhealthy again, but the categories appeared on different sides of the screen (Figure 4-3.D). In the fifth stage, the category pairings were reversed (Figure 4-3.E): participants used the same key to respond to healthy and bad stimuli and used the other key to respond to unhealthy and good stimuli. FreeIAT 1.3.3 recorded the time it took participants to categorize the stimuli, as well as the number of errors the participants made.

Figure 4-3. Exemplar screens from the five stages of the IAT (colour and size changed for readability).



Snack selection and discussion

Upon completion of the IAT, the participants chose a food. Each participant received a box with one snack size Kit Kat bar, a 50g bag of regular flavour Lay's potato chips, 1 banana, and 1 mandarin orange. To address potential socially desirable responding I asked participants to (1) keep their heads on their desks until they had been given a signal to select their snack; (2) hide their snack choice once they had made it; and (3) put their heads back on their desks once they had made their choice. The participants consumed their food selection during a post-experimental debriefing session, described in the next section.

Discussion and return of results

Immediately following the experiment, I debriefed the participants on the specific purpose of the study. Their parents and teachers knew that the experiment tested food messaging, but I initially obscured the focus on food messaging to participants so that I would not bias their responses during the experiment (Cesario, 2014). I did not take field notes during the debriefing immediately after the experiment.

Within two weeks following the experiment, I returned to the class to share preliminary results. In a PowerPoint presentation, I shared the aims of the research, an overview of the research process (development of a hypothesis, study design and analysis), and the descriptive statistics of the results from the class. After the presentation, I solicited the participants' perceptions of the experiment and my research question. I recoded these insights in field notes immediately after each debriefing session in field notes. These responses contextualized the experiences of the adolescents during the experiment and their experiences dealing with issues of food advertising and media messaging in their everyday lives.

Data analysis

To compare the food choices of participants who played different versions of the video game, I used an ANOVA test. I consolidated the choices of banana and orange into a fruit category to compare the healthier snack option to the unhealthy snack options. I included gender as a factor in the analysis to compare the effects of the different versions of the video game on boys and girls' food choices.

I used an ANOVA test to analyse differences between the implicit attitudes of participants who played different versions of the video game. I included gender as a factor in the analysis to compare the effects of the food in the different versions of the video game the boys and girls' attitudes.

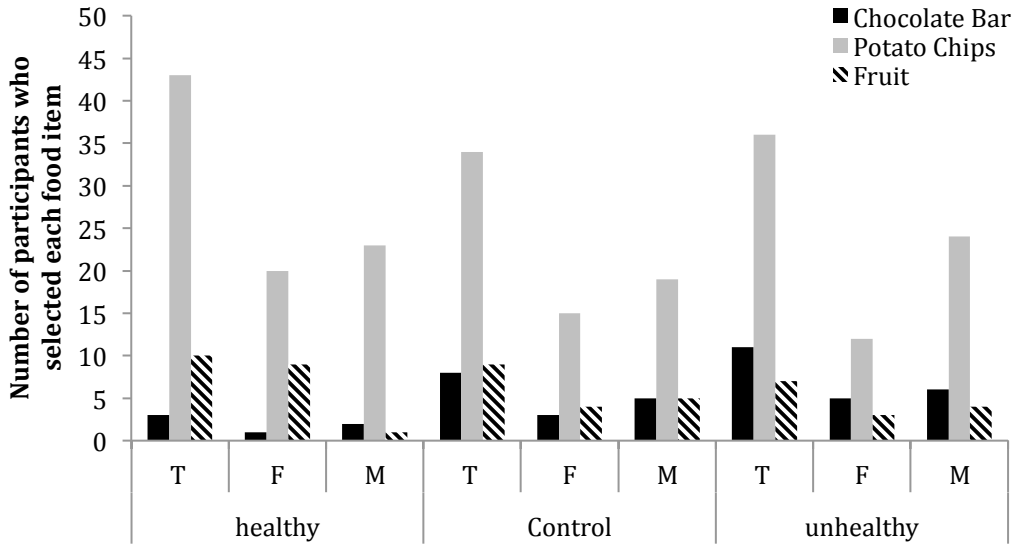
I descriptively coded (Bernard, 2006) the field notes from the debriefing sessions. I identified and shared key observations, based on inductive coding of the data, in order to contextualize the results of the experiment.

4.3 Results

Food choice

The version of the video game the participants played did not influence their food choices (p=0.143). The majority of the participants chose potato chips (Figure 4-4). Participants who played the version of the game with the chocolate bar were no more or less likely to select the chocolate bar than participants who played the other versions of the game (p=0.143) (Figure 4-4). Participants who played the healthy version of the game were not more or less likely to select the fruit than participants who played the other versions of the game (p=0.143) (Figure 4-4). Boys selected similar foods regardless of the version of the video game they played (Figure 4-4). Girls who played the healthy version selected fruit more frequently than boys who played the same version of the game (p=0.236) (Figure 4-4). Girls who played the healthy version of the video game also selected fruit than girls who played other versions of the game (Figure 4-4).

Figure 4-4. Frequency of food choice as by gender (T=combined, F=female, M=male) and version (healthy, unhealthy and control) of the food choice video game.



Implicit Association Test results

Overall, the adolescents had a mean IAT score of 0.5240 (SD 0.3864), which indicates modestly stronger associations between healthy and good. The version of the video game played by the adolescents did not influence the IAT scores of the adolescents (p=0.989) (Table 4-1).

Table 4-1.
Mean IAT score for the groups who played the healthy, control and unhealthy versions of the video game.

	Healthy Mean (SD)	Control Mean (SD)	Unhealthy Mean (SD)
Overall	0.5261 (0.4279)	0.4967 (0.2896)	0.5520 (0.4228)
Male	0.5157 (0.3580)	0.4783 (0.3250)	0.5599 (0.3623)
Female	0.5267 (0.4865)	0.5161 (0.2540)	0.5384 (0.5222)

Insights from participants

During the debriefing and the result sharing presentation participants shared their feedback on their experience during the experiment and the research question. When asked through a show of hands, many participants remembered the collectable item from their version of the game, and some even recalled their score from the experimental visit 2 weeks prior to the result-sharing visit.

When told the research question, several boys spontaneously listed video games that they had recently played containing product placement. Other participants readily recalled product placement in popular movies and television shows. This suggests that adolescents encounter and recall product placements in media.

Both boys and girls said that they enjoyed fruit but given the choice between fruits and a bag of potato chips, they would always choose the chips. However, in one class, after everyone revealed their snack choices, a female participant asked to switch her choice from potato chips to fruit. In another class, the teacher identified a participant who looked at the unhidden food choices of other participants, and changed his food selection from the fruit to the chips. These events validated my concerns about the potential for other participants to influence the adolescents as they selected their snack.

Some participants felt that the experimental game would have a greater influence on younger children (including real and hypothetical younger siblings), but they were old enough to be invulnerable to product placement.

4.4 Discussion

In this pilot study, I found that a brief exposure to food messaging in a video game did not affect short-term food choice by adolescents. The participating adolescents overwhelmingly chose an unhealthy snack, potato chips, that did not appear in any of the three versions of the video game even though the IAT results suggest they prefer healthy/good pairings they more quickly associated healthy/good items than unhealthy/good stage items in the IAT. The disconnect between holding positive attitudes toward healthy food while selecting unhealthy snack foods has been previously identified (Bassett et al., 2008; Karpinski & Hilton, 2001; Mary Story & Resnick, 1986). Nevertheless, the data suggest a trend that girls who played the healthy food choice version of the video game selected healthier snacks more frequently than boys who also played the health version and both genders who played the unhealthy or control versions of the video game. This study further contributes to knowledge about the impact of food and beverage advertising in video games by studying adolescents rather than children.

The research design of this study minimized the potential for external factors to influence the response of the adolescents because I (1) randomly assigned participants to play the three versions of the video game; (2) controlled the content of the experimental video game so only the food item differed between the versions of the video game; and (3) used an implicit measure of attitude to limit socially desirable responding. Participants engaging in socially desirable responding attempt to control their responses to adhere to socially desirable traits (Baxter et al., 2004). Socially desirable responding occurs in studies on food behaviour and attitude (Baxter et al., 2004; Hebert et al., 1997; Klesges et al., 2004). I found evidence of the effects of socially desirable responding during the food choice task, but the IAT is robust against socially desirable responding (Hofmann et al., 2005).

Many factors shape the food choices and attitudes of adolescents. Media cultivate unrealistic perceptions of reality in adolescents that can reinforce unhealthy food behaviours and trivialize the long-term consequences of a poor diet (Greenberg et al., 2009). In the distorted reality portrayed in television shows, characters eat unhealthy foods more often than healthy foods, but never experience the negative consequences of overindulging in unhealthy food (Greenberg et al., 2009; Story & Faulkner, 1990). Food advertisements also denigrate healthy foods as unpopular and inedible to promote unhealthy foods (Pettigrew, 2007). To add to the confusion, marketers conflate health promotion messages with unhealthy food advertisements, potentially leading adolescents to falsely associate advertised products with health behaviours (Batada et al., 2008).

Cumulative exposure to television food advertisements normalizes and reinforces attitudes that support the foods most commonly advertised (Dixon et al., 2007). High environmental exposure to advertisements may completely mask the effects of a short experimental exposure promoting or contradicting the dominant message in advertising (Dixon et al., 2007). Adolescents see an average of 16.2 television advertisements for foods and beverages per day (Rudd Report, 2012), and unhealthy foods are more common in advertisements than healthy foods (Batada et al., 2008; Boyce, 2007; Powell et al., 2007). The food and beverage industry spent $1.5 billion promoting unhealthy foods to children and adolescents, and only $7.16 million advertising fruits and vegetables (Federal Trade Comission, 2012). Despite self regulatory commitments by food and beverage companies, the healthy foods and beverages that predominate nutritional guidelines remain grossly under-represented in television advertising (Batada et al., 2008).

The importance of appearing normal to peer groups grows during adolescence and can inform the food choices of many adolescents. Adolescents use food preferences to distinguish themselves from adults (Chapman & Maclean, 1993; Roos, 2002). To adolescents, being concerned about food health is distinctly and uniquely adult (Roos, 2002). Rejection of this adult characteristic may lead adolescents to treat their food selections cavalierly and remain relatively unconcerned with the long-term ramifications of their current food selections. Peer groups informally police the food choices of adolescents by teasing those who make healthy food choices, which makes adolescents less likely to select healthy food choices while eating in groups (Harrison & Jackson, 2009). Eating unhealthy food, despite (and occasionally because of) the impact of their choices on their health, therefore helps adolescents conform to their peer groups.

Adolescent girls experience different peer pressures regarding food than adolescent boys. Boys can justify eating more unhealthy food because many boys engage in more physical activities, require more energy, and can expend excess calories (Harrison & Jackson, 2009; Roos, 2002). Girls who consume unhealthy food excessively experience more negative appraisals by their peers than boys (Harrison & Jackson, 2009). Unlike boys, adolescent girls face a concurrent, but contradictory, peer expectation to be thin and pretty (Chapman & Maclean, 1993). Adolescent peers can exert pressure on adolescent girls to eat unhealthy foods as part of the peer group and, at the same time, to eat healthy foods to control their weight (Harrison & Jackson, 2009). These contradictory expectations may explain why the female participants in this study responded to the version of the video game containing healthy foods more than the male participants did, even though all participants played for the same period of time.

Based on my study, adolescents were less vulnerable to individual food messages than children. Previous similar studies of the effects of advergames on younger participants (Dias & Agante, 2011; Pempek & Calvert, 2011) may have found effects because their younger participants responded less critically to advertising,

or because their experimental designs primed participants to attend to the food in their experimental video games. I integrated food messaging and I did not prioritize the foods over other features in the video game in my instructions. My participants interacted with the food items in the experimental video games without prompting, reflecting more realistic video game behaviours.

This pilot study has some limitations. The results of this study may not be generalizable outside of an English-speaking North American context. The study only looked at short-term effects on behaviours and attitudes, so no conclusions can be drawn on the long-term effects of food messaging in video games on adolescents. In the absence of effect sizes based on similar studies in the literature, I could not conduct a prospective power analysis. Instead, I based my sample size on studies of advergame effects on younger children. Dias and Agante (2011) had 231 participants and Pempek and Calvert (2011) had 30 participants. However, a post-hoc power analysis indicated that the power of my analysis was 0.35. Therefore, I cannot definitively preclude the possibility of Type II errors.

Despite these limitations, this study contributes to the understanding of the effects of video games on the food choices of adolescents. Short, isolated exposure to unhealthy food messaging did not promote unhealthy food behaviours or attitudes in adolescent boys or girls who already experience relentless unhealthy food promotion from their naturalistic media exposure. The healthy foods in the video game did not affect adolescent boys, but after playing the version of the video game with healthy foods, adolescent girls selected more healthy foods. This gender difference should be further explored in future research. Future research should experimentally test how each gender responds to the effects of longer, repeated exposures to food content in video games that more closely approximate how adolescents interact with video games.

4.5 Conclusion

The moderately positively attitudes towards healthy foods held by adolescents does not translate into selecting healthy foods for their snack. Short, isolated food and beverage promotions in video games do not affect this preference for unhealthy foods held by adolescent boys. Healthy food messages in video games video games will probably not promote healthy diet choices among adolescent boys, but may target adolescent girls. Further research should test longer, repeated exposures to foods in video games that mimic natural video game play.

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CHAPTER 5: GENERAL DISCUSSION AND CONCLUSION

In this thesis, I addressed the effects of food messaging in video games on adolescents. I began with a content analysis to identify if, and how, food messaging appeared in video games. I interviewed video game developers for their insight into the pressures that lead to food messaging in video games. I interviewed adolescents and their parents on their perceptions of the effects of food messaging in video games on adolescents. Finally, I tested whether food messaging in video games had an effect on the short-term food attitudes and behaviours of adolescents. In this conclusion, I briefly summarize my thesis research. Based on my thesis findings, I propose recommendations to address food messaging in video games. Finally, I propose future research to address continuing gaps in the literature.

Based on the three lines of inquiry in my thesis, food messaging in video games does not have immediate, significant impacts on adolescent food attitudes and behaviours, but it might contribute to the cultivation of unhealthy food habits in the context of other unhealthy food messaging in media. Unhealthy foods appeared in video games as part of in-game health mechanics, as props and in advertisements. Healthy foods appeared with equal frequency as part of in-game health mechanics, less frequently as props and did not appear in advertisements in video games. Adolescents did not feel personally affected by this messaging, but felt their peers might be. Adolescents and parents felt maturity and parental guidance protected adolescents from messaging in video games. Empirically, unhealthy food messages in my experimentally manipulated video games did not influence the short-term food attitudes or behaviours of adolescent boys or girls, but there was a measurable trend for healthy food messages to encourage adolescent girls to select healthier food options. Despite a lack of significant short-term effects, food messaging in video games likely contributes to a media environment that promotes unhealthy food habits to adolescents.

5.1 Recommendations

In media-saturated modern life, the best defence adolescents have against food messaging in the media is to develop media literacy defined as the knowledge and skills necessary to critically evaluate products and behaviours promoted in the media (Villani, Olson, & Jellinek, 2005). The goal of media literacy training is to make adolescents less likely to engage in unhealthy behaviours modelled in the media (Brown, 2006). Adolescents naturally develop cognitive skills associated with media literacy, such as differentiating between advertisements and media content (Lawlor & Prothero, 2003) as well as identifying the persuasive intent of advertising (Rozendaal, Buijzen, & Valkenburg, 2011) and interacting with the media. However, adolescents still need cues to activate these skills (Rozendaal et al., 2011). I recommend the development of specific media literacy tools to address food messaging in video games for adolescents and parents. In developing media literacy tools for adolescents, the following should be undertaken:

1. Develop media literacy tools to address food messaging in video games;
2. Refocus media literacy to address the long-term effects of messaging in video games;
3. Address adolescent egocentrism in media the design of media literacy training; and
4. Encourage media literacy on video games for parents.

Develop media literacy tools to address food messaging in video games

Media literacy tools focus on encouraging general scepticism by providing adolescents with questions to challenge the construction, meaning, aesthetic standards and commercial, social and political implications of media (mediasmarts.ca). Media literacy tools for video games have, until now, applied to excessive play, violence, and depictions of gender and race (mediasmarts.ca). However, since food messaging occurs in video games, I recommend that media literacy training be adapted to address all categories of food messaging in video games, including in health mechanics, foods as props, and food advertising. Media literacy training needs to address the fact that food mechanics and props in video games, unlike advertising, is not passive. The adolescents interact with the food items, and those items have health consequences within the game. Such messaging may be more persuasive in modeling unrealistic consequences for unhealthy food choices.

Ethical guidelines for advertisers suggest that the targets of advertising should be aware of persuasive intent (American Marketing Association, 2008). However, the development of marketing tactics that embed messaging into traditionally non-commercial contexts, such as video games, seems to contradict this principle. Even adults have difficulty defending against product placements in traditional media (Nairn & Fine, 2008), a practice that continues to develop (Williams, Petrosky, Hernandez, & Jr., 2011) and is now apparent in video games. In television, product placement has led to calls for explicit, concurrent notifications along the bottom of the screen when a sponsored product appears in programming (Writers Guild of America, 2008). Similar calls have been made to explicitly identify advertising on websites and in advergames (Moore, 2006).

Adolescents readily identified advertisements when shown a YouTube clip of advertising in video games. However, while accepting advertising in video games, their preference was for advertising that appeared in the background, in logical locations such as billboards, that did not interfere with game play. Adult video game players similarly disliked prominent advertisements in video games (Nelson, Keum, & Yaros, 2004). Adolescents felt advertisements were acceptable because if they could be ignored. However, research shows that more subtle advertising, such as product placement, influences adolescents without activating their normal defenses (Williams et al., 2011). To adapt to changing marketing practices, adolescents need media literacy training to recognise that subtle advertising, such as product placement, may influence their attitudes and behaviours.

Refocus media literacy to address the long-term effects of messaging in video games

Despite my finding of a lack of immediate significant effects on adolescent attitudes and behaviours following a single instance of video game play, video games may affect adolescents by contributing to the dominance of unhealthy food messaging in media. Cultivation theory predicts that adolescents' perceptions of reality conform to dominant media messages (Gerbner, 1998). Therefore, unhealthy food messaging in video games may affect adolescents by reinforcing the unhealthy food messages in other media. Current media literacy training counters specific messages (MediaSmarts, n.d.; Nairn & Fine, 2008; Steinberg, 2011), but fails to address how media messages support, or contradict, each other and how that influences adolescent users. The video game industry representatives expressed concern about cross-promotion, and other forms of advertising, that work between media to reinforce brand messages. Therefore, media literacy should encourage adolescents to compare across media to identify dominant media messages that may influence their attitudes and behaviours.

Address adolescent egocentrism in the design of media literacy training

Egocentrism influenced adolescent perceptions of their vulnerability to food messaging in video games. Adolescents who feel invulnerable to messaging will not access media literacy training because, in their minds, they do not need it (Greene, Rubin, Hale, & Walters, 1996). Therefore, the design of media literacy training must account for adolescent egocentrism. Having other adolescents or young adults facilitate media literacy training and share their experiences with the affects of media messaging can challenge adolescent perceptions that they are invulnerable (Wickman, Anderson, & Greenberg, 2008). Facilitated peer discussions can also challenge adolescent egocentrism by providing adolescents with perspective on how they are similar and different from their peers (Greene et al., 1996). Media literacy needs to address adolescent egocentrism so that adolescents engage with media literacy training.

Encourage media literacy on video games for parents

Despite the importance parents placed on communicating with their adolescent to develop their maturity and resistance to advertising in other media, parents were reluctant to talk to their adolescents about the content of video games. Parents may not engage with their adolescents about video games because they are unfamiliar with video games. Familiarity with video games that adolescents play would allow parents to more effectively teach their adolescents to question the messaging in video games (Steinberg, 2011). In video games, effective media literacy is founded on dialogue about the games adolescents play, why they play them and what concerns their parents have about video game play (Squire, 2005). Parents need their own media literacy of video games to know what to ask their adolescents, how to ask it, and how to create interconnections between video games and other aspects of life with their adolescents (Squire, 2005).

5.2 Future research

I analyzed video games that represent three video game genres popular with adolescent boys. However, the video game industry is developing rapidly, with food messaging expanding and maturing in parallel. Adolescents disliked pop-up advertisements in video games, but advertisements generate 10-30% of the revenue of social video games on mobile games (Takahashi, 2013). Future research should investigate the novel ways developers incorporate advertising into video games to avoid negative player responses, while continuing to generate revenue. Continuing technological developments in the video game industry should be monitored as they lead to more realistic and influential food messaging.

Food messaging in video games did not have an immediate, significant impact on adolescents after a single exposure. However, a single, short exposure to food messaging in video games influenced young children (Dias & Agante, 2011; Pempek & Calvert, 2011). Adolescent daily media use increased by over an hour, and video game use tripled, between 1999 and 2009 (Rideout, Foehr, & Roberts, 2010). As adolescent media habits change, future research should address how media use affects adolescent exposure to food messaging in video games and other kinds of media.

In my experiment, after playing a video game with healthy food messages adolescent girls chose more healthy foods. I suggested that girls were more attuned to healthy food messaging due to peer socialization (Chapman & Maclean, 1993; Harrison & Jackson, 2009). Girls also play video games less than boys (Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2008), and they play different video games (Entertainment Software Association of Canada, 2011), which may expose them to different kinds of food messaging. Future experiments could test the effects of longer, repeated exposures to the different kinds of food messaging found in the content analysis on adolescent boys and girls. Additional future research could use an ethnographic approach to examine how adolescent boys and girls interact with messaging in video games in naturalistic settings, how they interpret food messaging in their video games, and how food messaging is moderated by peer expectations and other factors.

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APPENDICES

Appendix I: List Of Codes For Video Game Content Analysis

Hierarchical Name

Nodes\\Commercial Messaging
Nodes\\Commercial Messaging\Commercial messaging duration based off non-food and food ads
Nodes\\Commercial Messaging\food advertisements
Nodes\\Commercial Messaging\food advertisements\Boss coffee
Nodes\\Commercial Messaging\food advertisements\Candy
Nodes\\Commercial Messaging\food advertisements\Coca Cola
Nodes\\Commercial Messaging\food advertisements\Doritos
Nodes\\Commercial Messaging\food advertisements\Gatorade
Nodes\\Commercial Messaging\food advertisements\Gatorade\Gatorade ad
Nodes\\Commercial Messaging\food advertisements\Gatorade\Gatorade jugs
Nodes\\Commercial Messaging\food advertisements\Nissin
Nodes\\Commercial Messaging\Non-food advertisements
Nodes\\Commercial Messaging\Non-food advertisements\Adecco
Nodes\\Commercial Messaging\Non-food advertisements\Allianz
Nodes\\Commercial Messaging\Non-food advertisements\Alturo
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Alfa Romeo
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Audi
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Bosch
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Chevrolet
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Fiat
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Ford
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Honda
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Toyota
Nodes\\Commercial Messaging\Non-food advertisements\Car manufacturers\Volkswagen
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Advan
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\BBS
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Bilstein

Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\BMW Power
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Bosch Service
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Bridgestone
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\C.A.R.
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Castrol
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Delphi
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Denso
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Dunlop
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Eibach
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\ELF Lubricants (a brand of Total)
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Goodyear
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\H&R
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\HKS
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\K&N
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Keihin
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Motul
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Norma
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\PIAA
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Pirelli
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Rays Engineering
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Recaro
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Renault
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Repsol YPF

Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Showa
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Sparco
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Stanley Raybrig
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\StopTech
Nodes\\Commercial Messaging\Non-food advertisements\Car part or accessory manufacturers\Toyo tires
Nodes\\Commercial Messaging\Non-food advertisements\Circuit de Catalunya
Nodes\\Commercial Messaging\Non-food advertisements\Dragados
Nodes\\Commercial Messaging\Non-food advertisements\Europcar
Nodes\\Commercial Messaging\Non-food advertisements\FCC
Nodes\\Commercial Messaging\Non-food advertisements\HP
Nodes\\Commercial Messaging\Non-food advertisements\LeasePlan
Nodes\\Commercial Messaging\Non-food advertisements\LKXA
Nodes\\Commercial Messaging\Non-food advertisements\MSC Cruceros
Nodes\\Commercial Messaging\Non-food advertisements\MSN auto
Nodes\\Commercial Messaging\Non-food advertisements\NFL
Nodes\\Commercial Messaging\Non-food advertisements\Nikon
Nodes\\Commercial Messaging\Non-food advertisements\Nippo
Nodes\\Commercial Messaging\Non-food advertisements\Panasonic
Nodes\\Commercial Messaging\Non-food advertisements\Puma
Nodes\\Commercial Messaging\Non-food advertisements\Quadis
Nodes\\Commercial Messaging\Non-food advertisements\RACC
Nodes\\Commercial Messaging\Non-food advertisements\Sharp
Nodes\\Commercial Messaging\Non-food advertisements\Smurfit Kappa
Nodes\\Commercial Messaging\Non-food advertisements\Sonoco
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\Bauer
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\Brian's
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\CCM
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\Eagle
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\Easton
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\Reebok
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\SWD
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\TPS hockey

Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\Vaughn
Nodes\\Commercial Messaging\Non-food advertisements\Sports equipment\Warrior
Nodes\\Commercial Messaging\Non-food advertisements\Telefonica
Nodes\\Commercial Messaging\Non-food advertisements\Tide
Nodes\\Commercial Messaging\Non-food advertisements\turn10
Nodes\\Commercial Messaging\Non-food advertisements\Upper Deck
Nodes\\Commercial Messaging\Non-food advertisements\Verizon
Nodes\\Commercial Messaging\Non-food advertisements\Vodaphone
Nodes\\Commercial Messaging\Non-food advertisements\Weather network
Nodes\\Commercial Messaging\Non-food advertisements\Weber Saint-Gobain
Nodes\\Commercial Messaging\Non-food advertisements\Wurth
Nodes\\Commercial Messaging\Non-food advertisements\xbox360
Nodes\\Commercial Messaging\Where in the game the ad occurs
Nodes\\Commercial Messaging\Where in the game the ad occurs\Billboard
Nodes\\Commercial Messaging\Where in the game the ad occurs\brought to you by (audio)
Nodes\\Commercial Messaging\Where in the game the ad occurs\Floating ad
Nodes\\Commercial Messaging\Where in the game the ad occurs\interactive ads
Nodes\\Commercial Messaging\Where in the game the ad occurs\loading screens
Nodes\\Commercial Messaging\Where in the game the ad occurs\logo during cutscene
Nodes\\Commercial Messaging\Where in the game the ad occurs\logo on avatar
Nodes\\Commercial Messaging\Where in the game the ad occurs\logos on products
Nodes\\Commercial Messaging\Where in the game the ad occurs\sideboards
Nodes\\Eating
Nodes\\fat insults
Nodes\\Food
Nodes\\Food being prepared
Nodes\\Food being prepared\cooking
Nodes\\Food\Appeared in game
Nodes\\Food\Appeared in game\Canada Food Guide-based division
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Limit consumption
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Limit consumption\alcohol
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Limit consumption\coffee

Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Limit consumption\Gatorade
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Limit consumption\Soda Pop
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Recommended
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Recommended\water
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Beverages\Recommended\water bottle
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Fat and Oils
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Grain Products
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Grain Products\bread
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Limit consumption
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Limit consumption\hot dog
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Recommended
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Recommended\Beef
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Recommended\chicken
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Recommended\egg
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Recommended\Fish
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Recommended\Pork
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Meat and Alternatives\Recommended\steak
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Milk and Alternatives
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Milk and Alternatives\Milk
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Other
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Other\burgers
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Other\Pizza
Nodes\\Food\Appeared in game\Canada Food Guide-based

division\Other\Sweet Baked Goods
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Other\Sweet Baked Goods\Cake!
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Other\Sweet Baked Goods\Candy
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Other\Sweet Baked Goods\pumpkin pie
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Vegetables and Fruit
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Vegetables and Fruit\Apple
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Vegetables and Fruit\carrot
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Vegetables and Fruit\mushroom
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Vegetables and Fruit\potato
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Vegetables and Fruit\pumpkin
Nodes\\Food\Appeared in game\Canada Food Guide-based division\Vegetables and Fruit\watermelon
Nodes\\Food\Appeared in game\Specific food items\Fantasy Foods
Nodes\\Food\Appeared in game\Specific food items\Fantasy Foods\rotton flesh
Nodes\\Food\Appeared in game\Specific food items\Fantasy Foods\spider eye
Nodes\\Food\Appeared in game\Specific food items\Fruit and or vegetable
Nodes\\Food\Appeared in game\Specific food items\Fruit and or vegetable\Apple
Nodes\\Food\Appeared in game\Specific food items\Fruit and or vegetable\carrot
Nodes\\Food\Appeared in game\Specific food items\Fruit and or vegetable\potato
Nodes\\Food\Appeared in game\Specific food items\Fruit and or vegetable\pumpkin
Nodes\\Food\Appeared in game\Specific food items\Fruit and or vegetable\watermelon
Nodes\\Food\Appeared in game\Specific food items\Ingredients
Nodes\\Food\Appeared in game\Specific food items\Ingredients\sugar
Nodes\\Food\Appeared in game\Specific food items\Ingredients\sugar cane
Nodes\\Food\Appeared in game\Specific food items\Ingredients\wheat
Nodes\\Food\Referenced in game\Canada Food Guide-based division
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Drinks
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Drinks\Limit Consumption
Nodes\\Food\Referenced in game\Canada Food Guide-based

division\Drinks\Limit Consumption\alcohol
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Drinks\Limit Consumption\coffee
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Drinks\Limit Consumption\pop AKA soda
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Drinks\Recommended
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Fat and Oils
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Grain Products
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Grain Products\Pretzels
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Grain Products\spaghetti
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Meat and Alternatives
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Meat and Alternatives\Limit Consumption
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Meat and Alternatives\Limit Consumption\hot dog
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Milk and Alternatives
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Other
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Other\burgers
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Other\pizza
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Vegetables and Fruit
Nodes\\Food\Referenced in game\Canada Food Guide-based division\Vegetables and Fruit\salad
Nodes\\places to get food
Nodes\\places to get food\Bar
Nodes\\places to get food\cafe
Nodes\\places to get food\candy shop
Nodes\\places to get food\club
Nodes\\places to get food\concession
Nodes\\places to get food\convenience store
Nodes\\places to get food\deli
Nodes\\places to get food\deli and grocery
Nodes\\places to get food\Diner
Nodes\\places to get food\fast food restaurant
Nodes\\places to get food\grocery
Nodes\\places to get food\hot dog stand
Nodes\\places to get food\inducement to go purchase food

Nodes\\places to get food\Kitchen
Nodes\\places to get food\outdoor patio
Nodes\\places to get food\restaurant
Nodes\\places to get food\vending machine
Nodes\\places to get food\water cooler
Nodes\\prosocial messaging
Nodes\\Where in game foods are
Nodes\\Where in game foods are\food advertisement
Nodes\\Where in game foods are\food advertisement \Boss coffee
Nodes\\Where in game foods are\food advertisement \Candy
Nodes\\Where in game foods are\food advertisement \Coca Cola
Nodes\\Where in game foods are\food advertisement \Doritos
Nodes\\Where in game foods are\food advertisement \Gatorade
Nodes\\Where in game foods are\food advertisement \Gatorade\Gatorade ad
Nodes\\Where in game foods are\food advertisement \Gatorade\Gatorade jugs
Nodes\\Where in game foods are\food advertisement \Nissin
Nodes\\Where in game foods are\food in cutscene
Nodes\\Where in game foods are\Food in item inventory
Nodes\\Where in game foods are\food in item storage
Nodes\\Where in game foods are\Food packaging
Nodes\\Where in game foods are\food spoken about
Nodes\\Where in game foods are\Food-related achievement
Nodes\\Where in game foods are\In world

Appendix II: University Of Alberta Health Research Ethics Board 1 Study Approval Letter

Notification of Approval

Date:	June 22, 2012
Study ID:	Pro00031861
Principal Investigator:	Westerly Luth
Study Supervisor:	Tania Bubela
Study Title:	Effect of food and beverage messages in video games on early adolescents
Approval Expiry Date:	June 21, 2013

Approved Consent Form:	Approval Date	Approved Document
	6/22/2012	Consent Form Child's participation.docx
	6/22/2012	Consent Form Parent participation- May 28 .docx

Thank you for submitting the above study to the Research Ethics Board 1. Your application has been reviewed and approved on behalf of the committee.

A renewal report must be submitted next year prior to the expiry of this approval if your study still requires ethics approval. If you do not renew on or before the renewal expiry date, you will have to re-submit an ethics application.

Approval by the Research Ethics Board does not encompass authorization to access the staff, students, facilities or resources of local institutions for the purposes of the research.

Sincerely,

Dr. William Dunn
Chair, Research Ethics Board 1

Note: This correspondence includes an electronic signature (validation and approval via an online system).

Appendix III: University Of Alberta Research Ethics Board 3 Study Approval Letter

Notification of Approval

Date:	November 14, 2012
Study ID:	Pro00035230
Principal Investigator:	Westerly Luth
Study Supervisor:	Tania Bubela
Study Title:	The impact of food messaging in video games on adolescent attitude and short term food preferences
Approval Expiry Date:	November 13, 2013

Approved Consent Form:	Approval Date	Approved Document
	11/14/2012	Consent Form Child's participation E.docx

Sponsor/Funding Agency:	CIHR - Canadian Institutes for Health Research	CIHR

Thank you for submitting the above study to the Research Ethics Board 3 . Your application has been reviewed and approved on behalf of the committee.

A renewal report must be submitted next year prior to the expiry of this approval if your study still requires ethics approval. If you do not renew on or before the renewal expiry date, you will have to re-submit an ethics application.

Approval by the Research Ethics Board does not encompass authorization to access the staff, students, facilities or resources of local institutions for the purposes of the research.

Sincerely,

Dr. Stanley Varnhagen

Chair, Research Ethics Board 3

Note: This correspondence includes an electronic signature (validation and approval via an online system).

Appendix IV: Cooperative Activities Program Approval Form

FAX TRANSMITTAL

Date: December 19, 2012

To: Betty jo Werthmann

At: U. of A, Dean of Education

Fax #: 492-0236

No. of pages sent: 2 (including cover page)

From: Eileen Zimmerman, Acting Associate Superintendent

Dept: Instructional Services

Phone #: (780) 417-8227

Comments:

Attached is the CAP Research Project Application page for project *"Impact of Food Messaging in Video Games on Adolescent Attitude and Short Term Food Preferences"*

This CAP Project has been Approved by Eileen Zimmerman (EIPS #13-3)

N.B. Please have the researcher contact Tracy Muth at Ardrossan Jr. Sr. High (780-922-2228). Thanks

If you do not receive all pages, please contact the originator.

ELK ISLAND PUBLIC SCHOOLS
683 Wye Road,
Sherwood Park, Alberta
T8B 1N2

Instructional Services
Phone: (780) 417- 8221

Fax: (780) 417-8181

UNIVERSITY OF ALBERTA
FACULTY OF EDUCATION

Cooperative Activities Program (CAP)
Research Project Application

School District (Please choose one school district, unless multiple districts are crucial to your research)

☐ Edmonton Catholic Schools
X Elk Island Public Schools *(Sherwood Park & Area)*
☐ Edmonton Public Schools
☐ St Albert Public Schools *(formerly St Albert Protestant)*

Title of Research
Impact of messaging in video games on adolescent attitude and preferences

Date Submitted – MM 11 DD 29 YYYY 2012
Proposed Start Date – MM 1 DD 21 YYYY 2013
Proposed End Date (Final Report) – MM 12 DD 20 YYYY 2013

Applicant Information (University of Alberta, Faculty Member)

Name: Tania Bubela Email: tbubela@ualberta.ca
Faculty/Department: Department of Public Health, Public Health Science
*(*If applying on behalf of student, your signature indicates that you have read this application and approve its submission)*

Applicant Signature ____________ Date 28 Nov 2012

**If this request is being made on behalf of a student, provide the following information:*

X Graduate Student ☐ Undergraduate Student

Student's Name: Westerly Luth Email: wluth@ualberta.ca
Phone Number: 780-492-0392
Faculty/Department: School of Public Health, Public Health Science

For Office Use Only
University Review: ☒ *Approved* ☐ *Denied* *Date:*
Associate Dean Research & Graduate Studies
District Review: ☒ *Approved* ☐ *Denied* *Date:*
District Representative ____________ *Printed Name* ____________ *Signature*

The personal information requested on this form is collected under the authority of Section 33(c) of the Alberta Freedom of Information and Protection of Privacy Act for administrative purposes only.

Appendix V: Experiment Consent Form

CONSENT FORM

To Participate in the University of Alberta Research Project:

Impact of messaging in video games on adolescent attitude and preferences

Investigator:
Westerly Luth
Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
wluth@ualberta.ca
780-4920-392

Supervisor:
Tania Bubela
Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
tbubela@ualberta.ca
780.248.0364

Does your child have any food allergies?	Yes
Do you understand that your child have been asked to be in a research study?	Yes
Have you read and received a copy of the attached Information Sheet?	Yes
Do you understand the benefits and risks involved in taking part in this research study for your son?	Yes
Have you had an opportunity to ask questions and discuss this study?	Yes
Do you understand that your child can quit taking part in this study at any time without giving a reason?	Yes
Has the issue of confidentiality been explained to you and your son?	Yes
Do you consent to your child's video game play being recorded?	Yes
Do you understand who will have access to the records from your child's experiment results?	Yes
Do you understand that the information your child provides will be used to make media literacy tools?	Yes
Can we use this information in the future for presentations and publications?	Yes

This study was explained to me by: __Westerly Luth_____

I agree to have my child take part in this study

Child's Printed Name

Signature of Research Participant's Parent/Guardian | Date | Printed Name

I would like to receive a copy of research results (check one): ☐ No ☐ Yes

If you would like to receive a copy of the research results please provide us with your address:

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to let their child participate.

Signature of Investigator | Date

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 (REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Executive Director of the Research Ethics Office c/o (REB) 492-0459 or reoffice@ualberta.ca.

Appendix VI: Experiment Information Sheet For Parent

INFORMATION SHEET for the University of Alberta Research Project:

Impact of messaging in video games on adolescent attitude and preferences

Contacts: This study is run by Westerly Luth (MSc Student, Department of Public Health Sciences) under the supervision of Dr Tania Bubela (Associate Professor, Department of Public Health Sciences).

If you have any questions about this research and/or your child's participation, please contact:

Research Investigator:	**OR**	**Supervisor:**
Westerly Luth		Tania Bubela
Department of Public Health Sciences		Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy		3-279 Edmonton Clinic Health Academy
University of Alberta		University of Alberta
Edmonton, AB, T6G 1C9		Edmonton, AB, T6G 1C9
wluth@ualberta.ca		tbubela@ualberta.ca
780.492.0392		780.492.9335

Purpose: The media is a growing presence in all of our lives. Video games have not been examined to the same extent as other kinds of media like television or movies. This project explores how 12-13 adolescents experience messages in video games. We are interested in how they interact with food artifacts in games and how that interaction influences how they think about food. We would like to help schools and parents by developing tools that help children to think critically about the content of the video games they play.

Background: Video games are very popular among kids aged 12-13. We are interested in how food artifacts are experienced by boys playing these video games. Your child's participation will increase our understanding of food messages in video games may impact children's lives.

What will you be asked to do?

We would like your child to play a non-violent video game designed by the researchers for 15 minutes. They will then be asked to complete a word-matching task designed to help us determine if, and how, what they saw in the video game impacted them. They will also be given a choice of snacks to take with them after the experiment. With your permission, we will record your child's on-screen actions with a software program. We will examine this recording, and what your child did during the word-matching task. If you do not give permission to record your child's gameplay, the researcher will sit with your child as they plays and take notes quietly. If you would like a copy of the final report please provide your contact information on the last page.

What type of personal information will be collected?

We will only use your contact information to send you the final report.

Are there risks or benefits for participating?

Other than their and your time, there are no costs to you or your child to participate in this study. Your child will never be identified in any publications or reports of the research. Your child's feedback will help us develop tools to teach Canadian kids and parents how to think critically about video games.

Participating in this research presents may present minor risks to your child. If your child has any food allergies unfortunately they cannot participate in this study. If your child participates, they will be provided with a list of what foods were offered during the study and a list of symptoms of food allergies in children. That way, if they has an allergic reaction to one of the snack choices presented, the symptoms can quickly be identified and they can get help. The snack items may also present a choking hazard.

Participation:

Your child's participation in this research is completely voluntary. Your child can choose to stop participating at any time without consequence.

Withdrawal from the study:

Even after you have agreed to have your child to participate in the research they can chose to stop their participation at any time. You, or your child, can contact us up to 90 days after the time of the experiment and ask that their information not be included in the research. If you do so, we will delete all record of their participation.

Keeping your son's information private:

Your child's performance on the word-matching task and in the video game will not be attached to their name. Instead, that information will be given a number, and separated from their name. Only the information without their name will be analysed by the researcher. The recordings and data will only be used for this research and will be accessed only by the researcher. All of the data collected, including the gameplay recordings and any notes, will be stored in a secure place by the principal investigator and kept until five years after publication of the study. After five years, all the data collected will be destroyed.

Use of the Information:

This research will be used for a Master's Thesis and for publications. The practical goal of this research is to develop ways to teach kids about the messages in video games for use by Canadian parents and in schools.

Additional Contacts:

The plan for this study has been reviewed to make sure it follows ethical guidelines and was approved by the University of Alberta Research Ethics Office. For questions about participant rights and ethical conduct of research, contact the University of Alberta Research Ethics Office at 492-2615.

Appendix VII: Experiment Assent Form

Other information about the study.

- If you decide to be in the study, please write your name below.
- You can change your mind and stop being part of it at any time. All you have to do is tell the person in charge. It's okay. The researchers and your parents won't be upset.
- You will be given a copy of this paper to keep.

If you are allergic to any foods, unfortunately we can't let you participate because we can't be 100% sure that we'll have safe foods for you.

□ Yes, I will be in this research study. □ No, I don't want to do this.

_____	_____	_____
Child's name	signature of the child	Date

_____	_____	_____
Person obtaining Assent	signature	Date

I have discussed this research study with _____ using language which is understandable and appropriate for the participant. I believe that I have fully informed him/her of the nature of the study and its possible risks and benefits. I believe the participant understood this explanation and assent to participate in this study.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 (REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Executive Director of the Research Ethics Office c/o (REB) 492-0459 or reoffice@ualberta.ca.

Appendix VIII: Experimental Information Sheet For Adolescent

INFORMATION SHEET for the University of Alberta Research Project:

Impact of messaging in video games on adolescent attitude and preferences

Contacts: This study is run by Westerly Luth (MSc Student, Department of Public Health Sciences) under the supervision of Dr Tania Bubela (Associate Professor, Department of Public Health Sciences).

What is a research study?

- A research study is a way to find out new information about something. Kids do not need to be in a research study if they don't want to.

Why are you being asked to be part of this research study?

- You are being asked to take part in this research study because we are trying to learn more about things that impact kids' experiences as they play video games. You, and 119 other students, are going to help us understand how images of food in video games impact kids' attitudes and preferences.

If you join the study what will happen to you?

- You'll be asked to play a video game for 15 minutes. After you play the video game we'll have you do a work-matching experiment on a computer to help us determine if what you saw while you were playing had an impact. We'll also give you a choice of snack once the experiment is over. You will be in the study for 30 to 45 minutes.

Will any part of the study hurt?

- No. There is nothing in this study that is painful or scary.

Will the study help you?

- I hope will get you interested in science, and thinking about what you like about video games.

Will the study help others?

- This study will help us to develop tools to help kids and their families think critically about video games.

Do your parents know about this study?

- This study was explained to one of your parents. Your parent said that we could ask you if you want to be part of the study. You can talk this over with your parent before you decide.

Who will see the information collected about you?

- The information collected from and about you during this study will be kept safely locked up. Nobody will see it except the people doing the research.
- We will not use your name but give a number to your information. That way nothing that you do in the study can be traced back to you.
- The study information about you will not be given to your parents or teachers. The researchers will not tell your friends or anyone else anything you did, or that you were even in the study.

Do you have to be in the study?

- You do not have to be in the study. No one will be upset if you don't want to do this study. If you don't want to be in this study, you just have to tell us. You can tell us even if we're in the middle of the experiment that you don't want to do it anymore. You can even call us or email us afterwards, up to 90 days after we finish your experiment, and tell us it's not okay to use what you did. It's up to you.
- You can also take more time to think about being in the study.

What if you have any questions?

- You can ask any questions that you may have about the study. If you have a question later that you didn't think of now, either you can call or have your parents call 780-707-5220 or you can email me at wluth@ualberta.ca
- You can also take more time to think about being in the study and also talk some more with your parents about being in the study.

Appendix IX: Interview Recruitment Letter For Adolescents And Parents

July 17, 2012

Dear Sir or Madam;

As the investigator on a study about messages in video games as understood by 12-13 year old boys, I am writing to ask if you and your son if would like to participate. The project title is Effect of health messages in video games on early adolescents. You and your son would be interviewed separately about his video game habits and the messages he encounters in the video games he plays. Each interview will take approximately 45 minutes to one hour.

We are conducting interviews with parents and adolescents to get their views on messages in video games. We would appreciate your views and opinions as part of our study. The insights provided by you and your son will be used to develop media literacy tools for video games to help Canadian children think critically about the messages they encounter in video games.
The results of the research will be part of a Master's Thesis and will be included in publications and reports. Your identity, and your son's identity, will remain confidential. They will be known only to the study investigators. Your names will not appear in any publications or reports.
If you and your son would be interested in participating or would like additional information, please contact:

Westerly Luth
Department of Public Health Sciences
3-279 Edmonton Clinic
Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
wluth@ualberta.ca
780.492.0392

OR

Tania Bubela
Department of Public Health Sciences
3-279 Edmonton Clinic
Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
tbubela@ualberta.ca
780.248.0364

We thank you for your consideration and we look forward to your participation in this research effort.
Sincerely,
Westerly Luth
MSc Student, Department of Public Health Sciences

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 (HERO) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Chair of the HERO c/o (780) 492-0459 or reoffice@ualberta.ca.

Appendix X: Interview Recruitment Poster For Adolescents And Parents

UNIVERSITY OF ALBERTA **Does your 12 to 13-year-old son play video games?**

The Study: We are conducting research on messages in video games as understood by 12-13 year old boys. The project title is *Effect of health messages in video games on early adolescents.*

Participants: We are recruiting 12 to 13-year-old boys who play video games and one of their parents. You and your son will be interviewed separately for between 45 minutes and one hour about your son's video game habits and the messages in the games.

Location: The interviewer will make arrangements with you to interview you and your son in a convenient and comfortable place.

Please Contact: Westerly Luth
Department of Public Health Sciences
University of Alberta
wluth@ualberta.ca
780-492-0392

Westerly Luth
wluth@ualberta.ca
780-492-0392

Westerly Luth
wluth@ualberta.ca
780-492-0392

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780-492-0392

Westerly Luth
wluth@ualberta.ca
780-492-0392

Westerly Luth
wluth@ualberta.ca
780-492-0392

Westerly Luth
wluth@ualberta.ca
780-492-0392

Appendix XI: Interview Information Sheet For Parent For Adolescent's Participation

INFORMATION SHEET for the University of Alberta Research Project:

Extent and recognition of messaging in video games by adolescents and their parents

Contacts: This study is run by Westerly Luth (MSc Department of Public Health Sciences) under the supervision of Dr Tania Bubela (Department of Public Health Sciences).

If you have any questions about this research and/or your child's participation, please contact:

Research Investigator:	**OR**	**Supervisor:**
Westerly Luth		Tania Bubela
Department of Public Health Sciences		Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy		3-279 Edmonton Clinic Health Academy
University of Alberta		University of Alberta
Edmonton, AB, T6G 1C9		Edmonton, AB, T6G 1C9
wluth@ualberta.ca		tbubela@ualberta.ca
780.492.0392		780.492.9335

Purpose: This project explores what 12-13 year old boys think about the video games they play. We are interested in the messages contained in video games and how they relate to real life. We would like to help schools and parents by developing media literacy tools for video games that help children to think critically about the content of the games they play.

Background: Video games are very popular among boys aged 12-13. We are interested in messages contained in video games as boys see them. We are also interested in how parents feel about the video games played by their children. Your son's participation will increase our understanding of the messages contained in video games through the eyes of the boys who play them and how these may relate to real life.

What will you be asked to do?

We would like to interview your son, without you in the room, about your son's video game habits. Your son's interview will take between 45 minutes and one hour. With your permission, we will record your son's interview with a digital audio recorder. We will then transcribe the recording. If you do not give permission to record the interview, the interviewer will take notes as you speak. If you would like a copy of the final report, please provide your contact information on the last page.

What type of personal information will be collected?

If you agree to have your son participate, your son will be asked his video game habits and his experiences with the video games. These will be audio-recorded with your permission. Your son can ask for the audio recording device to be shut off at any time. We will only use your contact information to send you the final report.

Are there risks or benefits for participating?

There are no risks to your son by participating in these interviews. Other than your time, there are no costs to you or your son to participate in this study. Your son will never be identified in any publications or reports of the research. Your son's feedback will help us develop media literacy strategies about video games for use by Canadian parents and in schools.

Participation:

Your son's participation in this research is completely voluntary. Your son can choose to participate or stop participating at any time without consequence. If your son doesn't like a question, he does not have to answer it.

Withdrawal from the study:

Even after you have agreed to have your son to participate in the interview he can chose to stop the interview at any time. Your and your son can contact us and ask that your interview not be included in the research. If you do so, we will delete all record of your participation. You and your son may withdraw from the research until the results of this study are put together for publication.

Keeping your son's information private:

What your son has said will not be attached to his name. Instead, the written record of your son's interview will be given a number. The recordings and transcripts will only be used for this research and will be accessed only be research staff. All of the data collected, including audio recordings, transcripts of recordings, and any notes, will be stored in a secure place by the principal investigators and kept until five years after publication of the study.

Use of the Information:

This research will be used for a Master's Thesis and for publications. The practical goal is to develop media literacy strategies about video games for use by Canadian parents and in schools.

Additional Contacts:

The plan for this study has been reviewed to make sure it follows ethical guidelines and was approved by the University of Alberta Research Ethics Office. For questions about participant rights and ethical conduct of research, contact the University of Alberta Research Ethics Office at 492-2615.

Appendix XII: Interview Information Sheet For Parent

INFORMATION SHEET for the University of Alberta Research Project:

***Effect of health messages in video games on early adolescents*.**

Contacts: This study is run by Westerly Luth (MSc Department of Public Health Sciences) under the supervision of Dr Tania Bubela (Department of Public Health Sciences).

If you have any questions about this research and/or your participation, please contact:

Research Investigator:	**OR**	**Supervisor:**
Westerly Luth		Tania Bubela
Department of Public Health Sciences		Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy		3-279 Edmonton Clinic Health Academy
University of Alberta		University of Alberta
Edmonton, AB, T6G 1C9		Edmonton, AB, T6G 1C9
wluth@ualberta.ca		tbubela@ualberta.ca
780.492.0392		780.492.9335

Purpose: This project explores what 12-13 year old boys think about the video games they play. We are interested in the messages contained in video games and how they relate to real life. We would like to help schools and parents by developing media literacy tools for video games that help children to think critically about the content of the games they play.

Background: Video games are very popular among boys aged 12-13. We are interested in messages contained in video games as boys see them. We are also interested in how parents feel about the video games played by their children. Your participation will increase our understanding of the messages contained in video games through the eyes of the boys who play them and how these may relate to real life.

What will you be asked to do?

We would like to interview you, about your son's video game habits and your impressions of the video games played by your son. Your interview will take between 45 minutes and one hour. With your permission, we will record your interview with a digital audio recorder. We will then transcribe the recording. If you do not give permission to record the interview, the interviewer will take notes as you speak. If you would like a copy of the final report on the study, please provide your contact information on the last page.

What type of personal information will be collected?

If you agree to participate, we will ask you questions about your son's video game habits and your impressions of the video games played by your son. These will be audio-recorded with your permission. You can ask for the recording device to be shut off at any time. We will only use your contact information to send you a copy of the final report.

Are there risks or benefits for participating?

There are no risks to you from participating in these interviews. Other than your time, there are no costs to you to participate in this study. You will not be identified in any publications or reports of the research. Your feedback will help us develop media literacy strategies about video games for use by Canadian parents and in schools.

Participation:

Your participation in this research is completely voluntary. You can choose to stop the interview at any time without giving a reason. If you don't like a question, you do not have to answer it.

Withdrawal from the study:

Even after you have agreed to participate in the interview you can chose to stop the interview at any time without giving a reason. You can contact us up to 90 days after the time of the interview and ask that your interview not be included in the research. If you do so, we will delete all record of your participation.

Keeping your information private:

What you have said will not be attached to your name. Instead, the written record of your interview will be given a number. The recordings and transcripts will only be used for this research and will be accessed only be research staff. All of the data collected, including audio recordings, transcripts of recordings, and any notes, will be stored in a secure place by the principal investigators and kept until five years after publication of the study.

Use of the Information:

This research will be used for a Master's Thesis and for publications. The practical goal is to develop media literacy strategies about video games for use by Canadian parents and in schools.

Additional Contacts:

The plan for this study has been reviewed to make sure it follows ethical guidelines and was approved by the University of Alberta Research Ethics Office. For questions about participant rights and ethical conduct of research, contact the University of Alberta Research Ethics Office at 492-2615.

Appendix XIII: Interview Information Sheet For Adolescent

INFORMATION SHEET for the University of Alberta Research Project:

***Effect of health messages in video games on early adolescents*.**

Contacts: This study is run by Westerly Luth (MSc Student, Department of Public Health Sciences) under the supervision of Dr Tania Bubela (Associate Professor, Department of Public Health Sciences).

What is a research study?

- A research study is a way to find out new information about something. Kids do not need to be in a research study if they don't want to.

Why are you being asked to be part of this research study?

- You are being asked to take part in this research study because we are trying to learn more about messaging in video games. We're also asking your parent about your video game habits. We are asking you to be in the study because you play video games. 14-19 other children and their parents will be in this study.

If you join the study what will happen to you?

- An interviewer will ask you questions about the video games you play. You will be in the study for 45 minutes to 1 hour.

Will any part of the study hurt?

- No. There is nothing in this study that is painful or scary.

Will the study help you?

- I hope by talking about video games you Figure out the parts you really enjoy.

Will the study help others?

- This study will help us to develop tools to help kids and their families think critically about video games.

Do your parents know about this study?

- This study was explained to one of your parents. Your parent said that we could ask you if you want to be part of the study. You can talk this over with your parent before you decide.

Who will see the information collected about you?

- The information collected from and about you during this study will be kept safely locked up. Nobody will see it except the people doing the research.
- We will not use your name but give a number to your interview. That way nothing that you said can be traced back to you.

- The study information about you will not be given to your parents or teachers. The researchers will not tell your friends or anyone else anything you have said, or that you were even in the study.

Do you have to be in the study?

- You do not have to be in the study. No one will be upset if you don't want to do this study. If you don't want to be in this study, you just have to tell us. You can tell us even if we're in the middle of the interview that you don't want to do it anymore. You can even call us or email us afterwards, up to 90 days after we finish your interview, and tell us it's not okay to use what you said. It's up to you.
- If we ask you a question during the interview that you don't want to answer you don't have to answer the question. You can decide to not answer questions, but continue the study, or you can tell us that you don't want to continue the interview. No one will be upset if you don't want to answer some of the questions or if you decide not to continue the interview.
- You can also take more time to think about being in the study.

What if you have any questions?

- You can ask any questions that you may have about the study. If you have a question later that you didn't think of now, either you can call or have your parents call 780-707-5220 or you can email me at wluth@ualberta.ca
- You can also take more time to think about being in the study and also talk some more with your parents about being in the study.

Appendix XIV: Interview Consent Form For Parent

CONSENT FORM

To Participate in the University of Alberta Research Project:

Extent and recognition of messaging in video games by adolescents and their parents

Investigator:
Westerly Luth
Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
wluth@ualberta.ca
780-4920-392

Supervisor:
Tania Bubela
Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
tbubela@ualberta.ca
780.248.0364

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you can quit taking part in this study at any time without giving a reason?	Yes	No
Has the issue of confidentiality been explained to you?	Yes	No
Do you consent to your interview being audio recorded?	Yes	No
Do you understand who will have access to the records from your interview?	Yes	No
Do you understand that the information you provide will be used to make media literacy tools?	Yes	No
Can we use this information in the future for presentations and publications?	Yes	No

This study was explained to me by: __Westerly Luth_____

I agree to take part in this study.

Signature of Research Participant Date Printed Name

I would like to receive a copy of research results (check one): ☐ No ☐ Yes

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 (REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Executive Director of the Research Ethics Office c/o (REB) 492-0459 or reoffice@ualberta.ca.

If you would like to receive a copy of the research results please provide us with your address:

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator Date

Appendix XV: Interview Consent Form For Parent For Adolescent's Participation

CONSENT FORM

To Participate in the University of Alberta Research Project:

Extent and recognition of messaging in video games by adolescents and their parents

Investigator:
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Supervisor:
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University of Alberta
Edmonton, AB, T6G 1C9
tbubela@ualberta.ca
780.248.0364

Do you understand that your son have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study for your son?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that your son can quit taking part in this study at any time without giving a reason?	Yes	No
Has the issue of confidentiality been explained to you and your son?	Yes	No
Do you consent to your son's interviews being audio recorded?	Yes	No
Do you understand who will have access to the records from your son's interview?	Yes	No
Do you understand that the information your son provides will be used to make media literacy tools?	Yes	No
Can we use this information in the future for presentations and publications?	Yes	No

This study was explained to me by: __Westerly Luth_____

I agree to have my son take part in this study

_____
Child's Printed Name

_____
Signature of Research Participant's Parent/Guardian Date Printed Name

I would like to receive a copy of research results (check one): ☐ No ☐ Yes

If you would like to receive a copy of the research results please provide us with your address:

_____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to let their son participate.

_____ _____
Signature of Investigator Date

Appendix XVI: Interview Assent Form

Other information about the study.

- If you decide to be in the study, please write your name below.
- You can change your mind and stop being part of it at any time. All you have to do is tell the person in charge. It's okay. The researchers and your parents won't be upset.
- You will be given a copy of this paper to keep.

□ Yes, I will be in this research study. □ No, I don't want to do this.

_____	_____	_____
Child's name	signature of the child	Date

_____	_____	_____
Person obtaining Assent	signature	Date

I have discussed this research study with _____ using language which is understandable and appropriate for the participant. I believe that I have fully informed him/her of the nature of the study and its possible risks and benefits. I believe the participant understood this explanation and assent to participate in this study.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 (HERO) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Chair of the HERO c/o (780) 492-0459 or reoffice@ualberta.ca.

Appendix XVII: Interview Information Sheet For Video game industry representative

INFORMATION SHEET for the University of Alberta Research Project:

***Effect of health messages in video games on early adolescents*.**

Contacts: This study is run by Westerly Luth (MSc Department of Public Health Sciences) under the supervision of Dr Tania Bubela (Department of Public Health Sciences).

If you have any questions about this research and/or your participation, please contact:

Research Investigator:	**OR**	**Supervisor:**
Westerly Luth		Tania Bubela
Department of Public Health Sciences		Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy		3-279 Edmonton Clinic Health Academy
University of Alberta		University of Alberta
Edmonton, AB, T6G 1C9		Edmonton, AB, T6G 1C9
wluth@ualberta.ca		tbubela@ualberta.ca
780.492.0392		780.492.9335

Purpose:

Purpose: Video games are playing an ever-increasing role in the lives of more and more people. This project explores what 12-13 year old boys think about the video games they play. We are interested in the messages contained in video games and how they relate to real life. An equally important consideration is an understanding of the motives and design choices behind the messages presented by video game developers. We would like to help schools and parents by developing media literacy tools for video games that help children to think critically about the content of the games they play.

Background: Video games are very popular. We are interested in messages contained in video games as boys see them. Your participation will increase our understanding of how the messages in video games are developed, and the industry's views on messaging to consumers.

What will you be asked to do?

We are conducting interviews with workers in the video game industry to get their views on messages in video games. Your interview will take between 45 minutes and one hour. With your permission, we will record your interview with a digital audio recorder. We will then transcribe the recording. If you do not give permission to record the interview, the interviewer will take notes as you speak. If you would like a copy of the final report on the study, please provide your contact information on the last page.

What type of personal information will be collected?

If you agree to participate, we will ask you about your views on messages in video games. These will be audio-recorded with your permission. You can ask for the recording device to be shut off at any time. We will only use your contact information to send you a copy of the final report.

Are there risks or benefits for participating?

There are no risks to you from participating in these interviews. None of the information provided during interviews will be used in a way that could identify you. Other than your time, there are no costs to you to participate in this study. You will not be identified in any publications or reports of the research. Your feedback will help us develop media literacy strategies about video games for use by Canadians.

Participation:

Your participation in this research is completely voluntary. You can choose to stop the interview at any time without giving a reason. If you don't like a question, you do not have to answer it.

Withdrawal from the study:

Even after you have agreed to participate in the interview you can chose to stop the interview at any time without giving a reason. You can contact us up to 90 days after the time of the interview and ask that your interview not be included in the research. If you do so, we will delete all record of your participation.

Keeping your information private:

What you have said will not be attached to your name, or to your employer, or any other potentially identifying information. Instead, the written record of your interview will be given a number. The recordings and transcripts will only be used for this research and will be accessed only be research staff. All of the data collected, including audio recordings, transcripts of recordings, and any notes, will be stored in a secure place by the principal investigators and kept until five years after publication of the study.

Use of the Information:

This research will be used for a Master's Thesis and for publications. The practical goal is to develop media literacy strategies about video games for use by Canadian parents and in schools.

Additional Contacts:

The plan for this study has been reviewed to make sure it follows ethical guidelines and was approved by the University of Alberta Research Ethics Office. For questions about participant rights and ethical conduct of research, contact the University of Alberta Research Ethics Office at 492-2615

Appendix XVIII: Interview Consent Form For Video game industry representatives

CONSENT FORM

To Participate in the University of Alberta Research Project:

Extent and recognition of messaging in video games by adolescents and their parents

Investigator:
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780-4920-392

Supervisor:
Tania Bubela
Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
tbubela@ualberta.ca
780.248.0364

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you can quit taking part in this study at any time without giving a reason?	Yes	No
Has the issue of confidentiality been explained to you?	Yes	No
Do you consent to your interview being audio recorded?	Yes	No
Do you understand who will have access to the records from your interview?	Yes	No
Do you understand that the information you provide will be used to make media literacy tools?	Yes	No
Can we use this information in the future for presentations and publications?	Yes	No
Would you like to review the transcripts of your interview?	Yes	No

This study was explained to me by: Westerly Luth

I agree to take part in this study.

_____

Signature of Research Participant Date Printed Name

I would like to receive a copy of research results (check one): ☐ No ☐ Yes

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 (REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Executive Director of the Research Ethics Office c/o (REB) 492-0459 or reoffice@ualberta.ca.

If you would like to receive a copy of the research results please provide us with your address:

_____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____

Signature of Investigator Date

Appendix XIX: Food Allergy Warning For Experiment

Food Allergy Symptoms

Seek emergency treatment if you develop signs or symptoms of anaphylaxis, like:

- Constriction or tightening of airways that makes it difficult to breathe
- A swollen throat or sensation of a lump in your throat that makes it difficult to breathe
- Shock, with a severe drop in blood pressure
- Rapid pulse
- Dizziness or light headedness

Tell a teacher or parent if you experience symptoms of an allergic reaction, like:

- Tingling or itching in the mouth
- Hives, itching or eczema
- Swelling of the lips, face, tongue and throat, or other parts of the body
- Wheezing, nasal congestion or trouble breathing
- Abdominal pain, diarrhea, nausea or vomiting
- Dizziness, lightheadedness or fainting

Appendix XX: Interview Recruitment Letter For Video game industry representatives

July 17, 2012

Dear Sir or Madam;

As a worker in the video game industry you have a unique perspective on a developing artistic and commercial medium. As the investigator on a study about messages in video games as understood by 12-13 year old boys, I am writing to ask if you if would like to participate in a study to further understand the complex issues surrounding the messaging in video games. The project title is *Effect of health messages in video games on early adolescents*. You would be interviewed separately about your experiences in video game development, the messages you feel the medium communicates to youth players and the state of the industry.

We are conducting interviews with people involved in the development and production of video game to get their views on messages in video games. Your views and opinions are invaluable as part of our study to combine the viewpoints of consumers and producers of this constantly evolving medium. Your insights will be used to develop media literacy tools for video games to help Canadian children think critically about the messages they encounter in video games.

The results of the research will be part of a Master's Thesis and will be included in publications and reports. Your identity will remain confidential and will be known only to the study investigators. Other potentially identifying information (your company of employment, games you have worked on) will not appear in any publications or reports in a way that could lead to your contributions to the study being traced back to you.

If you would be interested in participating or would like additional information, please contact:

Westerly Luth
Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
wluth@ualberta.ca
780.492.0392

OR

Tania Bubela
Department of Public Health Sciences
3-279 Edmonton Clinic Health Academy
University of Alberta
Edmonton, AB, T6G 1C9
tbubela@ualberta.ca
780.248.0364

We thank you for your consideration and we look forward to your participation in this research effort.

Sincerely,

Westerly Luth
MSc Student, Department of Public Health Sciences

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 (REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Executive Director of the Research Ethics Office c/o (REB) 492-0459 or reoffice@ualberta.ca.

Appendix XXI: Interview Guide For Interviews With Adolescent

Interview Guide for Adolescent video gamers[1]

Preamble

Thank you much for taking the time to talk to me about the video games you enjoy playing. Your answers will help me on with my research on what boys your age think about video games.

I would like to remind you that you do not have to participate in this research. If you don't feel like answering a question, you do not have to. You may tell me as little or as much as you want. You may choose to end this interview at any time without giving me any reasons. Stopping the interview is completely okay.

I've asked your (mom/dad) permission to talk to you. are you are okay with me talking with you too?

General video game information

What sort of games does you play?
[PROMPT: kind of console]
How much do you play video games?
[PROMPT: how often]
[PROMPT: length of play during a session]
[PROMPT: how long you have been playing video games]

Awareness of messaging in video games

Could children learn things about how to interact with the world based on the actions of their character in a video game?
What sort of messages about real life do you get from the video games you play? [prompt on general themes, life lessons - attempt without prompt first]?
Is it all right for these messages to exist in video games? (adapted from Brenick et al. 2007)
Do other kids change their attitudes based on what they see in video games? (adapted from Brenick et al. 2007)

Body image and food behaviour in video games

In general, how would you describe the characters in the games you play?
[PROMPT: are they healthy?]
What kinds of characters do you associate with positive personality traits? Can you describe these characters? [prompt on physical appearance]

---

[1] This is a semi-structured interview guide. The nature of this guide may require some follow-up probing questions to further explore participants' responses. The inherent flexibility of this semi-structured interview guide may result in some variance in question wording or probing while keeping with the spirit of the interview guide topics.

What kinds of characters do you associate with negative personality traits? Can you describe these characters? [prompt on physical appearance]
Can you think of a particular character in a game you have played that you didn't like? Can you describe that character for me?
What sort of activities are involved in the video games you play?
Do characters in the video games you play ever eat or drink? If so, can you describe what they eat or drink?

Awareness and attitudes toward advertising in video games
Do you notice any advertising or logos in the games you play?
[prompt also on product placement]
How do you feel about companies advertising in video games?
Do you feel there is a difference between advertising in video games compared to television or magazines?
How do you feel about food and drink advertising in video games?

Awareness and response to messaging in video game clip
Looking at this clip of video game playing, what features jump out at you
PROMPT: messages
PROMPT: advertising
PROMPT: food messaging/advertising

Appendix XXII: Interview Guide For Interviews With Parents

Interview Guide for Parents of adolescent video gamers[1]

Preamble

Thank you very much for taking the time to talk to me about video games your son enjoys playing. Your answers will help me on my research on what parent's of you're your son's age think about video games.

I would like to remind you that you do not have to participate in this research. If you don't feel like answering a question, you do not have to. You may tell me as little or as much as you want. You may choose to end this interview at any time without giving me any reasons. Stopping the interview is completely okay.
I am going to ask you questions about your child's experiences with video games. Your experiences will later be analyzed to help us understand messaging in video games.

General video game information

What sort of games does your son play?
[PROMPT: kind of console]
Tell me about your son's video game playing behaviour.
[PROMPT: how often]
[PROMPT: length of play during a session]
[PROMPT: how long they have been playing video games]

Parental engagement with child's video game activities

Do you play video games?
Do you play video games with your child?
Do you watch your child play video games?
Do you and your child talk about the video games he/she is playing?

Awareness of messaging in video games

Could children learn things about how to interact with the world based on the actions of their character in a video game?
[Prompt on general themes, life lessons – attempt without prompt first]?
What sort of messages do you see in the video games your child plays?
Does your child notices those messages?
Is it all right for these messages to exist in video games? (adapted from Brenick et al. 2007)
Do adolescents change their attitudes based on what they see in video games? (adapted from Brenick et al. 2007)

---

[1] This is a semi-structured interview guide. The nature of this guide may require some follow-up probing questions to further explore participants' responses. The inherent flexibility of this semi-structured interview guide may result in some variance in question wording or probing while keeping with the spirit of the interview guide topics.

Body image and food behaviour in video games

In general, how would you describe the characters in the games your child plays? [PROMPT: are they healthy?]

Are certain characters associated with positive or negative personality traits? Can you describe these characters? [prompt on physical appearance]

Can you think of a particular character in a game your child has played that you didn't like? Can you describe that character for me? [prompt on physical appearance]

What sort of activities are involved in the video games your child plays?

Do characters in the video games your adolescent play ever eat or drink? If so, can you describe what they eat or drink.

Awareness and attitudes toward advertising in video games

Do you notice any advertising or corporate messaging in the games your child plays? [prompt also on product placement]

How do you feel about companies advertising through video games?

Do you feel there is a difference between advertising in video games compared to other media like television or print?

How do you feel about food advertising in video games?

Awareness and response to messaging in video game clip

Looking at this clip of video game playing, what features jump out at you

PROMPT: messages

PROMPT: advertising

PROMPT: food messaging/advertising

Appendix XXIII: Interview Guide For Interviews With Video game industry representatives

Interview Guide for video game industry representatives[1]

Preamble

Thank you very much for taking the time to talk to me about your experiences in the field of video game development and/or production. Your answers will help me on my research on how video game developers think about their medium and the people who use it.

I would like to remind you that you do not have to participate in this research. If you don't feel like answering a question, you do not have to. You may tell me as little or as much as you want. You may choose to end this interview at any time without giving me any reasons. Stopping the interview is completely okay.
I am going to ask you questions about video game development, and video games. Your experiences will later be analyzed to help us understand messaging in video games.

General video game information

How long have you been working as a game developer?
What sort of games have you worked on?
What is it specifically that you do?

Non developer engagement with video games

Do you play video games recreationally?
Do you play video games with others?
Are you ever surprised by what others think of video games?

Awareness of messaging in video games

Could players learn about how to interact with the world based on the actions of their character in a video game?
[Prompt on general themes, life lessons – attempt without prompt first]?
What sort of messages do you see in the video games you've developed?
Is there a specific kind of player who would pick up on those messages?
Is it all right for these messages to exist in video games? (adapted from Brenick et al. 2007)
Do adolescents change their attitudes based on what they see in video games? is that a problem (adapted from Brenick et al. 2007)

[1] This is a semi-structured interview guide. The nature of this guide may require some follow-up probing questions to further explore participants' responses. The inherent flexibility of this semi-structured interview guide may result in some variance in question wording or probing while keeping with the spirit of the interview guide topics.

Body image and food behaviour in video games

In general, how would you describe the characters in the video games you've developed?

[PROMPT: are they healthy?]

Are certain characters commonly associated with positive or negative personality traits? Can you describe these characters? [prompt on physical appearance]

Are there appearance tropes that you find overused/offensive/boring? Can you think of a particular character in a game you've developed that you didn't like? Can you describe that character for me? [prompt on physical appearance]

What sort of activities are involved in the video games you've developed?

Do characters in the video games you've developed play ever eat or drink? If so, can you describe what they eat or drink.

Awareness and attitudes toward advertising in video games

How does advertising in video games work? Does it ever impact your work? Do you notice it when you're playing games?

How do you feel about companies advertising through video games?

Do you feel there is a difference between advertising in video games compared to other media like television or print?

Do video game developers have any ethical or moral obligation to consider the messages in the video games they develop, compared to the creators of other media like television or print?

How do you feel about food advertising in video games?

Awareness and response to messaging in video game clip

Looking at this clip of video game playing, what features jump out at you?

PROMPT: messages

PROMPT: advertising

PROMPT: food messaging/advertising

Is this kind of clip the sort of video game you would feel comfortable releasing?