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Foods Shown on Television in China: Content Analysis and Impact Estimation

Abstract

The present study aimed to investigate advertising environment aimed at children in China and food environment in children's programs. Television viewing has been regarded as a factor contributing to childhood overweightness and obesity. This study documented how foods were shown in advertisements and editorial content on television. Television content on two children's channels in children's peak view time were recorded and analyzed. Children were exposed to a large number of unhealthy food advertisements and the advertising appeals found in advertisements of Western countries were also found in Chinese advertisements. As a part of the socialization process, the TV advertisements may become a potential hazard to influence children's health in China.

Keywords Chinese television, food advertisements, food references, obesity

Introduction

Obesity in children is among the most serious global public health challenges of the 21st century (Public Health England, 2014). The proportion of overweight and obese children in various countries has increased significantly over the past two decades (Kelly et al., 2007). In the recent 20 years, children's obesity has become more serious in rural and urban areas of China (Zan, 2012). Kelly et al. (2007) argued that exposure to advertising of unhealthy food products is one factor by which television viewing contributes to overweightness and obesity. They proposed this argument based on the following research results. First, children's exposure to television food advertising has been documented extensively in many Western countries such as the US and the UK. It is found that advertisements for unhealthy food make up a large portion of children's food advertisements (Holt, Ippolito, Desrochers, & Kelley, 2007; Hastings et al., 2003). Second, children are especially vulnerable to advertisements' persuasive information because they lack the cognitive skills to recognize the persuasive intent of advertising or promotional tactics in advertisements (Kunkel et al., 2004). Third, television food advertisements have been linked to children's food preferences and to

both purchase and consumption habits. Some researchers even found that effects of advertisements on children's food choice and eating habits at all ages do not necessarily decline with the increasing age (Brucks, Armstrong, & Goldberg, 1988; Livingstone & Helsper, 2006).

Exposure to foods appearing in programs may also have effects on children's eating habits. Advertisers are likely to gain positive attitudes from viewers by associating themselves with a popular program targeted to a selected audience (d'Astous & Seguin, 1999). Product placement is a form of promotion in which advertisers insert branded products into programming (Campbell, 2006). It is defined as 'a combination of advertising and publicity designed to influence the audience by unobtrusively inserting branded products in entertainment programs such that the viewer is unlikely to be aware of the persuasive intent' (Cowley, & Barron, 2008, p. 89). Product placement implicitly influences children and develops positive attitudes in children (Cowley & Barron, 2008). Some food references are not shown in the form of product placement but displayed without brand logos. Radnitz et al. (2009) argued that enthusiasm shown by television characters for high-fat and/or sugary foods might have more influence than TV advertising on children's diets since children could develop very strong feelings for these characters.

A large number of studies in Western countries investigated how advertisements promoted foods aimed at children and how children's programs showed foods. However, no research has been conducted on TV advertisements during children's viewing time in mainland China. Previous content analyses of TV advertisements have been carried out mainly in Western countries. The present study was performed to investigate advertising environment aimed at children in China and food environment in children's programs.

Previous research about food advertising on television

Marketers spend heavily on aiming food advertisements at children. The US researchers found that children were exposed to 13.4 television food advertisements on average every day, and advertisements for products containing high levels of fat,

sugar, and/or sodium (HFSS) comprised 98% of the total food advertisements (Harris & Sarda, 2011; Powell, Szczypka, Chaloupka, & Braunschweig, 2007). A study in New Zealand found that 66% of the food advertisements were classified as advertising HFSS foods (Jenkin, Wilson, & Hermanson, 2009).

In the UK, Hasings et al. (2003) pointed out the 'Big Four' products that television advertisements promoted the most: pre-sugared breakfast cereals, soft-drinks, confectionery snacks, and savory snacks. In Greece, 'healthy' food categories recommended for frequent consumption (such as cereals, fruits and vegetables) were the least advertised by the food industry, and the less 'healthy' options (dairy and sugary products) were the most advertised (Batrinou & Kanellou, 2009). In Australia, more than 80% of all food advertisements were for high-fat/high-sugar foods while fruit and vegetable advertising was minimal (Chapman, Kelly, King, & Flood, 2007).

Food advertising has also been considered in Asian countries. A survey revealed that the overwhelming majority of food advertising aimed at children in many Asian countries was for HFSS foods and beverages (Escalante de Cruz et al., 2004). In the Philippines, McDonald's, Jollibee and Nestle are the biggest sponsors of food advertisements; cheese low in nutritive value, fast food chains and confectionery were the most frequently advertised products (Escalante de Cruz et al., 2004). In India, Coca-Cola, Pepsi Co, Nestle, Britannia, and Parle are the major food advertisers, promoting soft drinks, biscuits, and other confectionery (Escalante de Cruz et al., 2004).

Based on the previous research, advertising appeals that can usually be seen on TV include brand licensing, celebrity endorsers, premium offers or giveaways, animation, story format, humor, and emotional appeals (such as fun/happiness/mood alteration) (Batada & Borzekowski, 2008; Boyland & Halford, 2013; Connor, 2006; Newstead & Romaniuk, 2010).

Many advertisements use licensed characters. Once children associate a program or its characters with a particular brand, the program itself becomes an advertisement for that food (Linn & Golin, 2006). Children significantly prefer the taste of foods that have popular cartoon characters on the packaging and tend to select foods with a licensed character on it, compared with the same foods without characters (Roberto, Baik, Harris, & Brownell, 2010). Some companies create their brand equity characters,

for example, Ronald McDonald. Using the brand equity cartoon characters in advertising or on packaging is thought to enhance brand recognition in young children (Connor, 2006) and add to the persuasiveness of an advertisement (Boyland & Halford, 2013).

Celebrity endorsers can be defined as ‘a famous person who uses public recognition to recommend or co-present with a product in an advertisement’ (Lear, Runyan, & Whitaker, 2009, p. 308). Celebrity endorsers have a positive impact on consumers’ attitudes toward the brand and enhance their purchase intentions (Erdogan, 1999). They may serve the role of an expert in the product field associated with a product, or as an aspirational figure (Seno and Lukas, 2007).

Premium, also known as giveaways, offers are products or services offered free or at a lower price in return for purchasing particular food products (Dixon et al., 2014). Premium offers are one of the most commonly used tactics in children’s advertisements in Western countries and are frequently used in child-targeted advertisements for energy-dense and nutrient-poor foods (Batada et al., 2008; Gantz et al., 2007; Hastings et al., 2003; Roberts & Pettigrew, 2007; Wicks et al., 2009).

Connor (2006) found that fun and action were often used in food advertising. Production techniques such as animation and visual effects can capture children’s attention, and emotional appeals may divert children’s attention from nutritional disclaimers or product information (Wicks et al., 2009). Lewis and Hill (1998) suggested that many overweight and obese young people may be more vulnerable to emotional appeals that promote personal enhancement because they tend to experience low levels of self-esteem or confidence.

Effects of foods shown on television on children’s health

Food advertisements exert a strong influence on children’s nutritional knowledge, food preferences, and food purchasing and purchase-related behavior.

Some studies have found that children are more likely to choose an advertised brand than a non-advertised brand of the same product type after exposure to food advertisements (Borzekowski & Robinson, 2001; Heslop & Ryans, 1980). For example, Goldberg, Gorn and Gibson (1978) found that children who had been

exposed to advertisements for highly sugared foods were more likely to select sugared items (both advertised and non-advertised foods), whereas children who had viewed public service announcements with a pro-nutrition message were more likely to opt for fruit and vegetables.

Studies demonstrated a causal link between exposure to food promotion and children's food purchase requests and behavior. Brody, Stoneman, Lane, and Sanders (1981) found that children who watched the cartoon embedded with food commercials, either alone or with their mother, made more requests for the advertised foods than the children who had watched the cartoon without advertisements in a control condition. Children's preference for high-carbohydrate and high-fat foods is enhanced after seeing many TV food advertisements, particularly in overweight and obese children (Boylard & Halford, 2013). Halford et al. (2004) found that despite no significant difference in the number of non-food advertisements recognized between the normal and obese children, the obese children did recognize significantly more of the food advertisements. Food advertising exposure produced a substantial increase in caloric intake (of high-fat and/or sweet energy-dense snacks) in children with normal weight, but this increase was larger in obese children (Halford et al., 2008).

Besides advertisements, children may see various foods in programs. Product placement is a kind of non-traditional advertising, and children may see foods in programs in the way of it. Product placement results in blurring of the boundaries between advertising, entertainment, and information so that children may experience difficulties in recognizing and understanding such advertising compared with television advertising (Owen et al., 2014). In this way, product placement is more likely to create an increase in implicit memory of children for a brand without necessarily affecting explicit memory (Cowley & Barron, 2008).

It is possible that children have modelling behavior toward television characters they like, and thus characters' interaction with food may have an impact on children's food preferences and consumption patterns. Modelling is an indirect way in which children learn behavior, attitudes and values through socialization. Nicklas et al. (2001, p. 227) described 'modelling' as to mean that 'people optimally learn behaviors by watching others, usually including learning how to do the behavior (a skill component) and seeing the other person positively reinforced for doing the

behavior (a motivational component)'. Researchers investigated the influences of modelling by correlating parents' and children's behavior or attitudes on food consumption. Contento et al. (1993) found that if parents consumed foods based on healthful considerations rather than on taste, their children would tend to eat more healthful diets significantly lower in energy, fat, and sucrose, and higher in fiber and vitamin A. Likewise, children of parents who consumed large amounts of fast food might also do the same (Grier, Mensinger, Huang, Kumanyika, & Stettler, 2007). Children's modelling behavior often happens if they like or admire a person (Tapper, Horne, & Lowe, 2003).

The present study

Children's consumption of unhealthy snack has raised concerns among the general public. It was reported that some Chinese children buy snacks because they have seen the products in advertisements (Zhai & Kong, 2008). Some Chinese researchers argued that most food advertising promoted foods low in nutrition, and this might lead to unhealthy eating habits in children (Lin, 2007). No research has been conducted on TV advertisements during children's viewing time in mainland China. Previous content analyses of TV advertisements have been carried out mainly in Western countries. The present study investigated the nature and number of advertisements Chinese children are exposed to on children's channels. The first research question was:

RQ1: What is the nature of food advertisements aimed at children in China?

Many researchers argued that advertising appeals enhanced children's positive attitudes and emotional feelings toward advertisements and increased children's memory and recognition about the advertised product. The second research question is:

RQ2: What kinds of appeals are made in Chinese advertisements aimed at children?

No investigation has been performed on the amount of product placements during children's programs in China. It is possible that Chinese children are exposed to unhealthy foods in the form of product placement when they view children's programs. Therefore, the third research question was:

RQ3: How does television program geared toward young children depict healthy and unhealthy foods in China?

This study investigated not only foods shown in marketing content but also food references in editorial content. It provided a view of the child-oriented TV advertising environment in China and foods in children's programming and determined how many unhealthy and healthy foods they were exposed to during everyday viewing.

Methods

Materials

Previous researchers have usually focused their analyses on certain time periods (e.g., Saturday morning programming), particular channels, or particular programs. For example, Batada, Seitz, Wootan, and Story (2007) analyzed Saturday morning children's television programming. Bell, Cassady, Culp and Alcalay (2009) identified weekday afternoons 3–6 p.m. and Saturday morning 7–10 a.m. programming as high-viewing times for children and chose highly rated children's cable channels and networks for analysis. Bell et al (2009) found that networks for children contained a greater proportion of advertising for food than television aimed at a general audience. In the UK Sixsmith and Furnham (2010) chose ITV for analysis because it was the biggest commercial television network.

Similar to previous research, the present study selected the China Central Television (CCTV) children's channel and chose 5–7 p.m. for analysis. This channel was chosen because CCTV is the predominant state television broadcaster in mainland China managed by the Chinese government. One of its 45 channels is the CCTV Children's Channel, a national channel seen by people across the country. CCTV Children's Channel is aimed at people from 0 to 18 years old, with the main audience from 4 to 14 years old. The impact of CCTV Children's Channel has increased in recent years. In 2013, with an average audience of 5.04%, it was ranked

the first among satellite channels. Children usually watch TV at home after school and before dinner, and therefore the peak viewing time is 5–7 p.m.. The main audience of CCTV Children’s Channel between 5– 7 p.m. is children aged 3 to 12 years. Therefore, television on the CCTV Children’s Channel was recorded onto DVDs between 5 p.m. and 7 p.m. from October 26 to November 22, 2011. It was recorded for 56 hours over 28 days.

Coding methods

Advertisements were first classified into categories of those aimed at adults and those aimed at children, and then further classified into categories according to the advertised product type. The number of advertisements in each category was calculated during the recording hours. If the same advertisement was repeated several times, the number of the type of such an advertisement was still coded at the times it appeared. For example, if an advertisement for shampoo was repeated 3 times it counted as 3 in the category of advertisements for ‘personal care products’.

Each advertisement’s appeals were analyzed. According to Western literature, some appeals are often used in advertisements during children’s programming, such as brand licensing, celebrity endorsers, premium offers/giveaways, animation, story format, humor and emotional appeals (such as fun and happiness) (Batada & Borzekowski, 2008; Lewis & Hill, 1998; Linn & Golin, 2006). Nutritional/health claims as an appeal and taste/flavor appeal can often be seen in food advertisements aimed at children in Western countries (Gantz et al., 2007; Connor, 2006; Folta, Goldberg, Economos, Bell, & Meltzer, 2006). This study used those appeal categories that appeared in Western literature to analyze Chinese advertisements. As references to the family are frequently used in Chinese advertisements (Zhang & Harwood, 2004), and some advertisements claimed that the product could improve children’s school performance (Zhang & Harwood, 2004), the present study also took ‘references to the family’ and ‘improve performance’ into account as advertising appeals. Educational value was highly associated with some advertisements in China (Zhang & Harwood, 2004). The present study found that some advertisements were a story with educational values. The appeal categories are shown in Table 1.

Table 1 Primary appeals used in advertisements

Appeal	Description	Example
Taste	Focuses on product taste or flavor	An advertisement for savory food said the food had natural corn flavor
Fun/happiness	Associates the product with a scene with fun and happiness	Children romped, laughed and played games in the advertisement
Improve performance	Product consumption will enhance academic or school performance	An advertisement for milk promoted that after drinking the milk, children could had better achievement
Brand equity characters	Uses brand equity characters in the advertisement	The brand equity character in an advertisement for bubble gum taught children how to play
Licensed characters	Uses licensed characters in the advertisement	An advertisement for milk showed the characters in a very famous cartoon show were drinking the advertised milk
Celebrities	Uses celebrities to promote the product	A celebrity said how good the product was
Giveaway	Mentions that consumers can have a chance to get free gifts	'If you buy a meal from KFC, you will get a toy'
Animation	Uses animation effects in the advertisement	All characters performed in an advertisement for tooth paste were animated characters
Sponsor/tie-in	The brand of the advertisement is the sponsor for a program, or the advertisement is connected to a program	An advertisement for cakes said 'let's enjoy the cartoon show Three Kingdoms'
Nutrition	Focuses on purported nutritive value of the product	'The beverage has 10 important vitamins and minerals'
Expert	A person performs as an expert to promote the advantages of the advertised product	An expert gave people suggestions which brand of tooth paste was the best choice to buy
Story	Uses a story format	A mother took her children to buy children's clothes of the advertised brand. She fell in love with one dress and imagined that she performed on the stage wearing that dress.
Family	Shows the family are using or consuming the advertised product	An advertisement shows a family eating d advertised savory food together.
Educational value	The advertisement is associated with education values	The brand equity character of KFC taught children how to protect eyes and how to eat healthy

Food advertising in children's programs could be presented in two forms: either as product placement or not as product placement. However, this study only found one product placement for biscuits, which is discussed in the Results section. Thus, most

foods were found as non-product-placement. Food categories used by Oates and Newman (2010) were adopted in this study. Thus foods were assigned to one of the following groups: healthy foods including fruits/vegetables, meat/fish/, grains (cereals/bread/rice) and dairy; and unhealthy food products including desserts (cakes/bread/ice cream), snacks (biscuits, crisps), sweets (confectionery), fast food/takeaways, condiments, and carbonated drinks. The food categories used by Oates and Newman (2010) included most types of food appearing on television. This study found some food and drink types that could not be classified into any of the categories of Oates and Newman (2010), such as jam, honey, wine and beer. The latter two would not normally be present in either advertising or programs aimed at a children audience. These food types are also listed in the tables of Results section.

The frequency of a food category was calculated as one if, within every 10 seconds of the segment, the food image was visually shown or the food name was verbally mentioned in the program. How the food was displayed in the program was analyzed. The analysis methods were developed by the first author. Foods that the characters did not interact with or that belonged to the scene setting were coded as the ones in the background; foods that the main characters interacted with or that were mentioned by the main characters were coded as the ones in the foreground.

Results

Analysis of advertisements

Article 37 of the Advertising Regulation Standard issued by China State Administration for Industry and Commerce, which is still efficient, defined children's advertising as 'advertising of products to be used by children or advertising using children as models' (State Administration of Commerce and Industry, 1999). According to this, advertisements aimed at children for this analysis were defined as those that promoted products used by children or advertisements in which children performed. Advertisements aimed at adults were defined as those that promoted products used by adults and in which only adults performed. A second scorer coded all the advertisements. Full agreement existed between the researcher and the second scorer for both categories and frequencies. Table 2 shows the advertisement categories

and the type of advertised products on CCTV.

Table 2 Categories of advertisements on CCTV

Category	CCTV advertisements (N)
PSA (public service announcement)	84
Adverts aimed at adults	214
Food adverts aimed at adults	2
Non-food adverts aimed at adults	212
Personal care products	143
Newspaper/magazines	50
Laundry and household products	19
Others (e.g. cameras, contact lenses, TV channels, TV program)	0
Adverts aimed at children	763
Non-food adverts aimed at children	400
Clothes, shoes	156
Personal care products	83
Supplement	65
Baby products	21
Toys	22
Others (e.g. TV channels, TV program)	53
Food adverts aimed at children	363
Healthy food	50
Baby food	29
Dairy	21
Unhealthy food	313
Unhealthy beverages	122
Snacks	78
Desserts	68
Fast food restaurants	29
Sweets	16

As shown in Table 2, a large proportion (71.9%) of advertisements on CCTV aimed at children, and of these, 47.6% were for food and beverages. Among the food advertisements aimed at children, unhealthy foods were the largest proportion (86.2%), and included snacks (e.g., savory food and bubble gum), fast food restaurants, desserts (e.g., biscuits and cakes), beverages, and sweets. Beverages made

up the largest proportion (39.0%) compared with other food categories. Healthy food advertisements included advertisements for milk and baby food.

The appeals of each advertisement were analyzed (Table 3). One advertisement could be coded into one or more categories, since more than one appeal could be potentially used. The number of different appeals used in a single advertisement ranged from zero to three. On CCTV, the four most frequently used appeals in children’s advertisements for unhealthy food were fun/happiness, using brand equity characters, nutritional claims, and sponsor/tie-in. The three most frequently used appeals in children’s advertisements for healthy food were using brand equity characters, nutritional claims, and reference to the family. The two most frequently used appeals in children’s advertisements for non-food were animation and story format. Celebrities and story format were the two most frequently used appeals in adults’ advertisements. Animation effects were only used in advertisements aimed at children. ‘Improve performance’ and nutritional claims appeared in advertisements for both healthy and unhealthy food. Consistent with Chinese tradition, many advertisements aimed at children were associated with family scene. What would be surprising is that some children’s advertisements for unhealthy food were associated with educational values.

Table 3 Primary appeals used in food and non-food advertisements aimed at children and advertisements aimed at adults

Appeal	CCTV			Adults’ ad
	Children’s ad		Non-food	
	Unhealthy food	Healthy food		
Taste	61	0	0	0
Fun/happiness	89	0	25	0
Improve performance	25	16	0	0

Brand equity characters	80	60	41	0
Licensed characters	0	8	0	0
Celebrities	42	0	29	67
Giveaway	9	8	8	0
Animation	14	10	123	0
Sponsor/tie-in	56	6	35	0
Nutrition	78	44	0	0
Expert	0	0	11	7
Story	36	0	57	33
Family	17	32	28	0
Education	30	0	0	0

Analysis of food references in programs

A second person coded food references in the first 30 minutes of one recorded program ‘Little Wise Tree’ using the same criteria as used by the researcher with high levels of agreement.

Table 4 shows the total frequency of food in each category verbally or visually displayed in background or foreground of the programs on CCTV in the total recorded time of 56 hours. Fruits and vegetables made up the largest proportion of food shown in programs. Fruits and vegetables frequently appeared in the foreground as well as in the background. Grains were the second most frequent category, and meat and fish were the third. Unhealthy foods like snacks and desserts made up a miniscule proportion.

Table 4 Total frequency of food in each category shown in programs on CCTV

		Total	Visual	Verbal	Percentage
Fruit and vegetables	Fore	466	272	194	33.33%
	Back	571	571		40.84%
Meat and fish	Fore	61	42	19	4.36%
	Back	15	15		1.07%
Grains	Fore	85	57	28	6.08%

	Back	5	4	1	0.36%
Dairy	Fore	20	10	10	1.43%
	Back	1	1		0.07%
Beverages	Fore	10	6	4	0.72%
	Back				
Snacks	Fore	12	5	7	0.86%
	Back	1	1		0.07%
Desserts	Fore	70	53	17	5.01%
	Back	4	4		0.29%
Sweets	Fore	28	16	12	2.00%
	Back				
Fast food/takeaways/chips	Fore				
	Back				
Jam, honey, sugar	Fore	14	3	11	1.00%
	Back				
Wine or Beer	Fore	3	1	2	0.21%
	Back				
Carbonate drinks	Fore	30	22	8	2.15%
	Back	2	2		0.14%
Total		1398	1085	313	100%

No product placement was observed in children's programs on CCTV until November 20, 2009. From then, CCTV began to broadcast a cartoon show called 'Magic Biscuits' which was sponsored by Danone Prince Biscuits. The cartoon used the brand equity character, the 'prince', as the main character and promoted the idea that eating the biscuits could give the prince more energy to defeat the enemy. Consequently, the whole cartoon show was an advertisement for the biscuits.

Discussion

Advertisement categories

Previous Western studies have shown that children are exposed to a large number of food advertisements, and that advertisements for unhealthy food make up a large proportion (Batada & Borzekowski, 2008; Lewis & Hill, 1998; Consumers

International, 1996). This study showed that, as in Western countries, food advertisements made up the largest proportion of advertisements in China aimed at children during their peak viewing hours. Most of the food advertisements aimed at children on CCTV were unhealthy food advertisements promoting high-fat/high-sugar foods.

This study showed that the first three categories of foods most frequently advertised on CCTV were beverages, desserts, and snacks on CCTV. Content analyses in the United States have revealed that breakfast cereal and fast food restaurants are the two most heavily advertised categories among food advertisements, and that desserts and sweets or snacks are usually the third most frequently advertised (Batada & Borzekowski, 2008; Lewis & Hill, 1998; Sixsmith & Furnham, 2010). Compared with Western countries, fast food restaurants were not advertised as frequently in China. Fast food in China is not as popular as in Western countries. Lin (2001) argued that ‘speed-oriented’ services such as fast food restaurant McDonald’s are perceived as aspects of the US cultural symbolism, while a normal Chinese family ritual is centered on preparing three meals daily with fresh ingredients. No advertisements were made for breakfast cereal because Chinese people do not typically eat cereal. However, desserts, sweets, and sugar-added beverages were frequently advertised food during children’s programming, which was in line with the research from Western countries (Batada & Borzekowski, 2008; Lewis & Hill, 1998; Sixsmith & Furnham, 2010).

Advertising appeals

This study found that advertising appeals of taste, fun/happiness, using brand equity characters, nutritional claims, and sponsor/tie-in were frequently used in children’s advertisements for unhealthy food. This finding was consistent with some Western research which has shown that fun and action are two frequently used appeals in advertisements aimed at children (Hastings et al., 2003; Lewis & Hill, 1998; Connor, 2006; Folta et al., 2006).

Nutritional/health claims as an appeal are often used in food products aimed at children in Western countries (Wicks et al., 2009; Gantz et al., 2007; Connor, 2006; Folta et al., 2006). The findings of this study were in line with previous research on

this point in Western cultures. The healthy food advertisements found in this study promoted that after drinking the branded milk, children would grow taller very quickly. Some unhealthy food advertisements also used nutritional claims. For example, a beverage claimed that it contained many kinds of fruit juice and was full of vitamins. Using this appeal in unhealthy food advertisements may put the viewers into doubt about how 'healthy' the food or beverage is.

Some researchers have found that taste/flavor is the most commonly used appeal (Wicks et al., 2009; Gantz et al., 2007). This study showed that taste/flavor appeal was only used for unhealthy food advertisements aimed at children. This was because most healthy food advertisements were for milk and they used nutritional claims.

Some Western studies have found that promotional characters are used very frequently in children's advertisements (Batada & Borzekowski, 2008; Rodd & Patel, 2005). This study was in line with previous research: promotional characters including brand equity characters, licensed characters, and celebrities were frequently used in both food and non-food advertisements on CCTV aimed at children. Using famous characters in advertisements aimed at children would enhance their brand recognition and liking and positive attitudes toward the brand (Connor, 2006; Erdogan, 1999).

Consistent with Western research, animation was one of the most commonly used appeals in children's advertisements and was much more frequently used in non-food advertisements than in food advertisements (Batada & Borzekowski, 2008; Rodd & Patel, 2005). Sixsmith and Furnham (2010) found that advertisements aimed at children included more cartoons than those aimed at adults. The present study had the same finding which showed that animation was frequently used in child-oriented advertisements, but not at all in adult-oriented advertisements.

Chinese cultural values in advertisements

Many studies have shown that consumers are inclined to have favorable attitudes toward advertisements and tend to buy the advertised products if advertising messages are congruent with their cultural beliefs (Belk et al., 1985; Boddeyn et al., 1986). Chinese advertisements reflect Chinese social and cultural values.

Zhang and Harwood (2004) suggested that references to the family were frequently

used in advertisements and were common across product categories and TV channels in China. Chinese value their family a lot, hence, in many advertisements stories move in a family scene. Chinese advertisements employed group consensus appeals more than US advertisements did. In other words, Chinese advertisements tend to show how a purchase may reflect conformity to family preference rather than to individual choice. Consistent with Chinese culture which tends to be collective and values 'family' a lot, the present study found that many advertisements aimed at children were associated with family scenes. For example, an advertisement for porridge showed that the grandmother told her granddaughter that the porridge was the taste of love; an advertisement for shower gel showed that all family members were using this brand and had fun together. This is also in coherence with Chinese culture, which emphasizes veneration for the elderly and tradition and implies that if the product is with the permission of elder family members it will be suitable for children.

Folta et al. (2006) found that by associating a product with physical activity, the product is promoted as increasing the athletic ability or physical performance, but found no advertisements associating the product with academic success or pleasing a parent. In contrast to what Folta et al. found, the present study showed that Chinese advertisements often advocated food as a way to achieve academic success, or as a way to please parents. This was consistent with Chinese culture which stems from Confucianism and values education (Zhang & Harwood, 2004). In the present study, the advertising appeal, 'improve performance', was found in many food advertisements aimed at children. Healthy food advertisements aimed at children in the present study were mostly for dairy products, such as milk and milk powder. These advertisements promoted that after drinking the advertised milk children would have good performance at school and be better than their peers. However, it may be not appropriate for unhealthy food advertisements aimed at children to use the appeal 'improve performance'. One advertisement for chocolate biscuit showed that after eating the biscuit during the study break the boy had increased his learning efficiency.

Also, this study found that some unhealthy food advertisements aimed at children were associated with educational values. The typical advertisement was KFC in which the brand equity character told children to eat an apple every day and asked children to take a break after watching TV for a long time to protect eyes. In this way, the

brand for unhealthy food may gain positive attitudes from children and thus increase its reputation.

Foods shown in programs

The present study showed that most of the food references that Chinese children were exposed to during programs were healthy foods. Fruits and vegetables took up the largest proportion of food references shown in programs; grains and meat were the second and third most frequent references.

Researchers have found that in the US, children were exposed to healthier food items than healthy food in television programming (Radnitz et al., 2009; Tapper, Horne, & Lowe, 2003). Compared with healthy foods, unhealthy foods were shown more extensively, were valued more highly by characters, and were consumed to a greater extent (Radnitz et al., 2009). Contrary to the US findings, this study showed that children's programs in China were characterized by healthy food choices.

In the UK, HFSS product (food high in fat, sugar, or salt) advertising during children's programs has been restricted since 2007 and all HFSS advertising was excluded from children's channels from 2009 (Roseman, Poor, & Stephenson, 2014). Before 2007, TV advertising was dominated by advertisements for fatty and sugary foods and soft drinks, but programs were more likely to contain depictions of fruits and vegetables and less likely to contain depictions of fatty and sugary foods than were advertisements (Ofcom, 2010). The findings of the present study were similar to the situation in the UK before 2007.

In contrast to the research in the US which has shown frequent product placements for foods in children's programs (Dickinson, 2005), the present study found almost no product placement in the children's programs. Product placement is allowed in China but is seemingly not common during children's programming. However, one cartoon show used a brand equity character of a biscuit brand as a character to promote positive attitudes toward the biscuit throughout the program.

Conclusions

The results of this study indicated that similar to Western countries, advertisements broadcast in children's channels established an unhealthy environment in China. The advertising appeals used in advertisements in China were almost similar to those in many Western countries, such as fun and happiness, taste appeals, and claims about nutrition. The present study reflected the status quo of television environment that Chinese children are exposed to.

Children under a certain age are vulnerable to advertising's persuasive messages because of limited cognitive ability to understand advertising (Kunkel et al., 2004). Several studies have found that children below the age of 4-5 years cannot distinguish commercial from non-commercial content even when program/commercial separators are present (Butter, Popovich, Stackhouse, & Garner, 1981; Stutts, Vance, & Hudleson, 1981). Children aged 5-6 years have the lowest level of understanding of the nature of advertising and can't attribute the assistive, informative, or entertainment intent to a commercial, viewing the purpose of advertising as to make fun and make you laugh, while children aged more than 8 years can attribute the selling intent to a commercial, thinking that advertisements are to encourage people to buy things (Gunter, Oates, & Blades, 2005; Young, 1990). Children aged more than 10 or 11 years can understand the relationship between advertisements, television stations and programs (Andronikidis & Lambrianidou, 2010; Chan, 2000; Lawlor & Prothero, 2003, 2008), understand that concepts such as audience targeting and segmentation are one component of conceptual advertising literacy (Rozendaal et al., 2011), and realize the tactics that advertisements use to enhance persuasion, such as making exaggerated product claims or making the product look more appealing than it is in reality (Mallalieu et al., 2005; Robertson & Rossiter, 1974).

Because of children's limited understanding of advertising, food advertisements can easily exert a strong influence on children's nutritional knowledge, food preferences, and food purchasing and purchase-related behavior (Hastings et al., 2003). Therefore, children's exposure to a large number of unhealthy food advertisements, as found in this study, could contribute to children's obesity.

Limitations

This study had several limitations. First, the study investigated only the national channel. Other local channels are also worth investigating. Hence, this study might not have accurately represented the overall state of advertisements aimed at children in China. Second, this study only investigated children's programming in a certain time period. This may be the reason why it found almost no product placement during children's programming, indicating that product placement is not forbidden in children's programs. It is possible that children may see more product placements in other time periods or in other channels. Third, this study has provided the only evidence that Chinese children are facing an unhealthy environment on television, which is mainly caused by food advertisements, but the impact of such environment on children's health is derived from literature and conjecture. The significance of correlation and causal association between food advertising in children's TV programs and problems such as obesity need to be further studied using additional data from children audience and careful design of statistical examination.

Author contributions

Shiyong Li contributed to conception and design, acquisition, analysis, and interpretation, and drafted the article. Jialu Ye contributed to analysis and adjusting the article's format. Mark Blades and Caroline Oates critically revised the article and gave final approval.

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