

Digital marketing of unhealthy foods to Australian children and adolescents

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Summary

The emergence of new media—including branded websites, social media and mobile applications—has created additional touch points for unhealthy food and beverage companies to target children and adolescents. The aim of this study was to perform an audit of new media for three top selling food and beverage brands in Australia. The top selling brand in three of the most advertised food and beverage categories was identified. Facebook, websites and mobile phone applications from these three brands were assessed using a combination of descriptive analyses and structured data collection during June and July 2013. Information on target audience, main focus of the activity, marketing strategies employed and connectivity were collected. Promotional activities were assessed against industry self-regulatory codes. McDonald's, Coca-Cola and Cadbury Dairy Milk were audited, with 21 promotional activities identified. These promotional activities appeared to use a number of marketing strategies, with frequent use of indirect product association, engagement techniques and branding. We identified strategic targeting of both children and adolescents. We found that while all promotional activities technically met self-regulatory codes (usually due to media-specific age restrictions) a number appeared to employ unhealthy food or beverage marketing directed to children. Brands are using engaging content via new media aimed at children and adolescents to promote unhealthy food and beverages. Given the limitations of self-regulatory codes in the context of new media, strategies need to be developed to reduce exposure of children and adolescents to marketing of unhealthy food and beverage products via these avenues.

Key words: advertising, children, food, media, adolescent

Childhood obesity has risen to unprecedented levels worldwide (Malik *et al.*, 2012) and a number of policies are being considered to combat this trend (World Health Organisation, 2012). The marketing of discretionary or unhealthy food and beverages has been identified as a potential contributor to this phenomenon (Hastings *et al.*, 2006). The National Health and Medical Research Council (NHMRC) Australian Dietary Guidelines define discretionary items as 'foods and drinks not necessary to provide the nutrients the

body needs. . . many of these are high in saturated fats, sugars, salt and/or alcohol' (NHMRC, 2013). From here forth discretionary foods will be referred to as 'unhealthy foods'. Marketing can influence preference, purchase, and consumption habits (Roedder *et al.*, 1983; Goldberg, 1990), and modest but consistent links have been found between food promotion and adverse health outcomes (Cairns *et al.*, 2013). The majority of advertised food and beverage products are unhealthy and calorie dense (Hastings *et al.*,

2006). In 2010 the World Health Organization (WHO) produced the report 'Set of Recommendations on the Marketing of Foods and Non-alcoholic Beverages to Children', which Australia endorsed (World Health Organisation, 2010). A key recommendation was to 'reduce both the exposure of children to, and power of, marketing of foods high in saturated fats, trans-fatty acids, free sugars, or salt' [(World Health Organisation, 2010), p. 8]. Another recommendation highlighted the need for governments to take a central role in driving implementation, monitoring and evaluation of marketing restrictions (World Health Organisation, 2010).

To date the majority of studies exploring marketing of unhealthy food and beverages to children have focused on television advertising (Hastings *et al.*, 2006). Although television remains an important avenue for food and beverage advertising, the propagation of new media within the past 5 years, such as branded websites, social media and mobile device applications, has created additional touch points for children and adolescents to be targeted (Montgomery *et al.*, 2013). Many concerns of television advertising can be translated to new media and digital marketing—mainly the capacity of children to distinguish between entertainment and commercial content, and the resulting influence on preference, request, purchase and consumption behaviours (Moore and Rideout, 2007). Furthermore, the unique characteristics of digital marketing create 'immersive, engaging, interactive environments' [(Montgomery *et al.*, 2013), p. 222], making the commercial intent of such practices difficult to discern, especially for children and adolescents.

The few audits of digital marketing practices have discovered a high prevalence of branded games and child-designated areas on food and beverage websites in the USA and Australia (Weber *et al.*, 2006; Kelly *et al.*, 2008). For example, a study of 119 Australian food product websites found that 29% had branded games, while 22% featured designated children's areas (Kelly *et al.*, 2008). A study of 40 US food and beverage brand websites found that 58% contained child-designated areas and 63% featured advergames (Weber *et al.*, 2006). However, the extent and nature of digital marketing on Facebook pages (one form of social media), company websites and mobile phone applications for the top selling brands of food and beverages in Australia has not been audited.

A further complication of digital media is its uncertain relationship with marketing regulation codes. There is a lack of government regulation surrounding marketing to children via new media internationally (World Cancer Research Fund International, 2014). In Australia, like many countries, the industry self-regulatory codes did not include Facebook, or company or brand websites until January 2014 (AFGC, 2009; AFGC, 2011). Mobile

phone applications are not explicitly covered in the former or current Australian codes unless they contain interactive games (AFGC, 2009; AFGC, 2011). There has been no evaluation of the extent to which marketing of unhealthy food and beverage products, through new media, conforms to the self-regulatory codes in Australia.

An understanding of the ways in which Australian youth are targeted via new media may aid in examining whether vulnerable populations are being exposed to unhealthy food and beverage marketing through these avenues, and whether application of (stronger) regulatory codes may prevent such exposure. The aim of this study was to perform an audit of a number of new media to identify the marketing strategies employed, targeted audiences and connectivity of the top selling brands of food and beverages to children and adolescents. We further aimed to examine the extent to which marketing on new media aligned with industry self-regulatory codes.

METHODS

Overview

Our audit examined the new media digital marketing strategies of the highest selling brands in Australia for the product categories of fast food outlets, confectionery and soft drinks: McDonald's, Cadbury Dairy Milk (Cadbury) and Coca-Cola, respectively, which were identified via the Global Market Database (Euromonitor International, 2013a,b,c). These brands represent three of the five food product categories most advertised to children (Hastings *et al.*, 2006). The remaining two product categories (savory snacks and pre-sugared breakfast cereals) were excluded as neither top selling brand had sufficient presence on new media upon preliminary examination.

The promotional activities of the identified brands that were present on new media were audited on a weekly basis from 1 June to 31 July 2013. Data were collected on (1) target audience, (2) purpose of the promotional activity, (3) marketing strategies employed and (4) connectivity with other media. Additional information was collected on (5) the presence of unhealthy and healthy messages and (6) age restrictions to examine alignment with self-regulatory codes.

Definitions

New media is an umbrella term capturing specific media that have recently emerged and become commercialized, encapsulating company and brand websites, social media such as Facebook and Twitter, content sharing sites such as YouTube, in addition to mobile device applications

that can be downloaded onto smartphones, tablets and portable game consoles (Montgomery *et al.*, 2013).

Closely linked to the concept of new media is that of 'digital marketing'. Digital marketing is the process of using new media to engage in promotional activities, and includes strategies such as the use of advergames, child-designated areas on websites and viral marketing (Montgomery *et al.*, 2013).

'Promotion' is one element of the marketing mix, and can be defined as the provision of information to, or interaction or communication with, the consumer (Kotler and Armstrong, 2009). Therefore, 'promotional activity' is defined as any activity containing promotional material. Some promotional activities with the same name may be present across a number of different media and were defined as two separate promotional activities.

To align with the industry self-regulatory code, we defined children as 12 years or under and adolescents as 13–17 years of age.

Brand audit

For each brand, the following media were audited: Facebook websites, company/brand websites and mobile phone applications. Promotional activities of the selected brands were identified via these media. Where possible, Australian versions of media were audited, and were identified by searching for the brand name, and 'Australia', in each medium. Mobile phone applications could either be for an Australian or international audience. Once a promotional activity had been identified on one medium, its presence on other media was established, where possible.

Inclusion criteria for promotional activity

- The brand must be identifiable with the promotional activity.
- The promotional activity must actively use digital media with the aim of consumer engagement.
- The promotional activity must be active in June or July 2013.
- The promotional activity must have children or adolescents as one of the target audiences.
- The promotional activity must use English language.
- The promotional activity must either be for specific use in Australia if a website or Facebook page or for a general international audience if a mobile phone application.

Data extraction

The collected data were qualitative and descriptive in nature. Consensus was reached between multiple researchers when categorization of promotional activities was not

clearly delineated. Primary intended target audience was identified based on the use of theme, visuals and/or language that would appeal to different target groups, including children, adolescents, general audience or another specific audience. There is no publicly available set of criteria from the self-regulatory codes from which to identify characteristics that illustrate the target audience, and there is little information on how previous coding systems have been applied. Therefore, a combination of adapted methods was used; a coding system used to identify the target audience for packaged food (Harris *et al.*, 2010), a policy brief on marketing to children from the Obesity Policy Coalition (OPC) (Obesity Policy Coalition, 2011), and a report by the General Surgeon which identifies themes used previously by tobacco companies to market their products to youth (NCCDPHP 2012), see Supplementary Appendix Table 1 for examples. The main purpose of the promotional activity was identified by the presence of certain elements: sponsorship (of sports, events or causes); product packaging (a new size or packaging of a product); specific product (one or several products were the focus); promotion (sweepstakes, limited time offers, giveaways or entertainment tie-ins) and general branding. These are mutually exclusive categories. These coding elements were adapted from a report from the Yale Rudd Centre for Food Policy and Obesity, which was developed for use with new media, including social media and mobile phone applications (Harris *et al.*, 2011). Marketing strategies were also identified using an adapted coding system from this report. These were engagement techniques (games, viral marketing, flash animation, music); featured third parties (charities, licensed characters, TV, movies, celebrities); products (products present, including varieties of products, size of products); branding (brand logos, slogans, spokes-characters); selling points (describes direct benefits of the product, such as physical/mental benefits, nutrition claims, new/improved, weight loss, hydration or satiation, flavour); and indirect product associations (describes messages that imply other benefits of the company and/or its brands, including fun, cool, sex, sports or humour). More than one marketing strategy could be identified for each promotional activity. Data were collected on whether a particular medium had links, references or mentions of other media to measure connectivity (e.g. advertisement of a mobile application on a brand website). The presence of healthy messages within a promotional activity, which included the promotion of healthy lifestyle, diet and/or physical activity, was collated. Age restrictions to use media were assessed.

Comparison with self-regulatory codes

In Australia regulation of food and beverage marketing is a combination of imposed governmental and industry

self-regulatory codes (MacKay *et al.*, 2011), in addition to company-specific policies (Sacks *et al.*, 2014). Current government regulation of marketing on new media focuses on consumers receiving ‘unsolicited commercial electronic messages’ [(Commonwealth of Australia, 1992), p. 291] and is not relevant to this audit. The Australian Food and Grocery Council (AFGC) has created two voluntary codes to which food and beverage companies can become signatories (AFGC, 2009; AFGC, 2011). These are the Responsible Children’s Marketing Initiative (RCMI) and the Quick Service Restaurant Initiative (QSR). Signatories to the RCMI ‘publicly commit to marketing communications to children under 12, only when it will further the goal of promoting healthy dietary choices and healthy lifestyles’ [(AFGC, 2011), p. 2]. The QRSI makes a similar pledge, but was specifically designed for quick service restaurants, and defines children as under 14 years of age (AFGC, 2009). In 2014, both of these codes were updated; see Supplementary Appendix Tables 2 and 3 for an overview of each of self-regulatory codes at both points in time. At the time of this audit, both codes applied to ‘radio, print, cinema and third-party internet sites’ [(AFGC, 2011), p. 1]. Mobile phone applications were covered by these codes if they featured interactive games. In January 2014, both codes were updated to include all internet sites. Across all media, the use of ‘popular personalities and characters’, as well as the use of ‘premium offers’ directed to children were no longer restricted in these new guidelines (AFGC, 2014a,b). Cadbury and Coca-Cola are signatories to the RCMI (Coca-Cola South Pacific, 2007; Mondelez International, 2014), while McDonald’s is a signatory to the QRSI (McDonald’s Australia, 2014). Company-specific policies vary between organizations and may be applicable to the company worldwide; therefore, to ensure consistency between companies, promotional activities were assessed against Australian self-regulatory codes.

Promotional activities were assessed against both self-regulatory codes that were applicable at the time of data collection, and to the current codes. This was in order to identify whether the actual codes were adhered to, to identify whether adhering to the new codes would make a positive difference to the marketing of unhealthy products to children and adolescents, and to identify whether even stronger codes are needed to protect children and adolescents from marketing of unhealthy products.

RESULTS

A total of 21 promotional activities were identified and met the inclusion criteria (Table 1). Thirteen promotional activities were identified for Coca-Cola, comprising of

eight mobile applications, four Facebook pages and one brand website. Of McDonald’s four promotional activities, two were on Facebook, one was a mobile application and one was a brand website. Cadbury had three promotional activities on brand websites, and one Facebook page. All promotional activities had either a specific product, general branding or promotion as their main purpose, while none used either sponsorship or product packaging.

Target audience

Of the 21 identified promotional activities, the majority were deemed to be aimed primarily at adolescents. This was driven by the large number of Coca-Cola’s activities, of which the large majority (92%) were deemed to be primarily aimed at adolescents (children 8%). Half of McDonald’s promotional activities appeared to be aimed primarily at children, with none aimed primarily at adolescents. Half of Cadbury’s promotional activities appeared to be aimed primarily at children, with 25% aimed primarily at adolescents (see Table 1).

Types of marketing strategies

Eighty-five percent of promotional activities were deemed to use four or more marketing strategies simultaneously. Of the 21 promotional activities across all three brands, 20 appeared to employ indirect product associations, with the same number using engagement techniques (see Table 1). Branding ($n = 18$) and products ($n = 15$) were also prominent marketing strategies, while featured third parties ($n = 5$) and selling points ($n = 2$) were used less frequently. Engagement techniques, products, branding and indirect product associations were deemed to be used in every promotional activity targeted primarily at children. Conversely, while engagement techniques and indirect products associations were also used in all adolescent-targeted promotional activities, branding (75%) and products (50%) were present to a lesser extent. The most commonly identified marketing strategies—indirect product associations and engagement techniques—were examined in more depth.

In a breakdown of the type of indirect product associations, ‘fun’ appeared to be in all promotional activities, while ‘cool’ and ‘humour’ were present in 25% of cases. For example, indirect product associations of fun were deemed to be prominent in Cadbury’s *Vote for Creations* promotional activity. Users, once having ‘liked’ the Cadbury Facebook page, were able to vote for or against a new flavour of chocolate, featuring colourful and playful animations, and were subsequently encouraged to share with Facebook ‘friends’, and enter their email address to receive a monetary voucher for exclusive use on a block of

Table 1: Target audience, marketing strategies, connectivity and healthy messages present in promotional activities

Promotional Activity	Brand	Primary target audience	Engagement Techniques	Featured Third Parties	Products	Branding	Selling Points	Indirect Product Associations	Connectivity	Healthy Messages
Coke Rewards	Coca-Cola	Adolescent	Yes	Yes	No	Yes	No	Yes	3	No
Coke Rewards Facebook	Coca-Cola	Adolescent	Yes	Yes	No	Yes	No	Yes	1	No
Share a Coke and A Song	Coca-Cola	Adolescent	Yes	No	Yes	Yes	No	Yes	1	No
Coca-Cola Ice-Up	Coca-Cola	Adolescent	Yes	No	Yes	Yes	No	Yes	0	No
Open Happiness	Coca-Cola	Adolescent	Yes	No	Yes	Yes	No	Yes	0	No
Coke Drink	Coca-Cola	Children	Yes	No	Yes	Yes	No	Yes	0	No
Magic Coke Bottle	Coca-Cola	Adolescent	Yes	No	Yes	Yes	No	Yes	0	No
Spin the Coke	Coca-Cola	Adolescent	Yes	No	Yes	Yes	No	Yes	1	No
Coke Cheers	Coca-Cola	Adolescent	Yes	No	No	Yes	No	Yes	2	No
Crabs and Penguins	Coca-Cola	Adolescent	Yes	No	No	No	No	Yes	2	Yes
Talking Crab	Coca-Cola	Adolescent	Yes	No	No	No	No	Yes	1	Yes
Talking Penguin	Coca-Cola	Adolescent	Yes	No	No	No	No	Yes	1	Yes
Cup O Rama	Coca-Cola	Adolescent	Yes	Yes	Yes	Yes	No	Yes	0	No
JoyVille	Cadbury	Children	Yes	No	Yes	Yes	Yes	Yes	3	No
Vote for Creations	Cadbury	Children	Yes	No	Yes	Yes	Yes	Yes	2	No
Match for Cash	Cadbury	General	Yes	No	Yes	Yes	No	Yes	3	No
Win a Dream Give A Dream	Cadbury	Adolescent	No	Yes	Yes	Yes	No	Yes	1	No
Pickle Club Facebook	McDonald's	Other	Yes	No	Yes	Yes	No	Yes	1	No
Pickle Club Mobile	McDonald's	Other	Yes	No	Yes	Yes	No	No	1	No
Happy Meal	McDonald's	Children	Yes	Yes	Yes	Yes	No	Yes	1	Yes
Big Mac Farm Challenge	McDonald's	Children	Yes	No	Yes	Yes	No	Yes	0	No

Cadbury chocolate. Fun (100%) and humour (40%), as indirect product associations, were deemed to commonly feature in child-targeted promotional activities, while those targeted towards adolescents appeared to include fun (100%), in addition to associations of sports (33%) and cool (25%).

All types of engagement techniques—flash animation, music, games and viral marketing—appeared to be commonly used. A sub-analysis was conducted on the type of engagement technique used, finding that flash animation and music were often used in conjunction with each other (91%). Conversely, in 80% of promotional activities that employed viral marketing, no other form of engagement technique was present. Within child-focused promotional activities, flash animation (100%) and music (80%) were commonly present, as were games (60%). Viral marketing was more common amongst adolescent-targeted promotional activities (58%) than in those targeted to children (40%).

Connectivity

All promotional activities on websites were connected to the main brand website. This was to be expected as this was largely how promotional activities were identified. Over half of the mobile phone applications encouraged users to login to Facebook and share content with ‘friends’. Websites featured links to login to Facebook, ‘like’ the brand and/or share content with friends in 60% of cases. An example was *Coke Rewards*, which was a loyalty program based on the purchase of specially marked bottles of Coca-Cola, Diet Coke or Coke Zero. Each product contained a unique code which translated to tokens once entered into the *Coke Rewards* website. Tokens could be used to purchase a range of products, receive discounts to popular brands and gain entry into sweepstakes. If users signed in using Facebook they received 10 free tokens. *Coke Rewards* also had a prominent tab on the Australian Coca-Cola Facebook page which encouraged viewers to sign up and connect through Facebook, and promoted a variety of prizes to be won or purchased with tokens.

Healthy messages

It was deemed that healthy messages were present in 4 of the 21 promotional activities, with none from Cadbury. All identified healthy messages involved the portrayal of physical activity or healthy foods, rather than direct messages. Healthy food messages were only present in one promotional activity, while those with physical activity messages were present in four; three of which were found within Coca-Cola mobile phone applications. For

example, Coca-Cola’s *Talking Penguin* mobile phone application involved users directing a penguin to perform a variety of actions, such as kicking a soccer ball or dancing, with the option of uploading the resulting video to Facebook. There were no explicit messages on healthy lifestyles communicated within this game. Another example is the McDonald’s *Happy Meal* website, which portrayed physical activity through games involving surfing and playing hockey, in addition to portraying fruit and vegetables. Twenty percent of child-targeted promotional activities had healthy messages, compared with one in four of those targeted primarily towards adolescents.

Comparison with self-regulatory codes

All 21 promotional activities appeared to technically conform to the self-regulatory codes in 2013, with only mobile phone applications containing interactive games covered by these codes, in addition to the age restrictions of the media. When assessed against the codes introduced in 2014, which were expanded to include all internet sites, it appeared that one promotional activity no longer conformed to these codes (Joyville; Table 2). While all other promotional activities technically conformed to the codes, we identified a number of characteristics which could be argued are against the intent of the codes and contravening WHO recommendations (World Health Organisation, 2010). Five promotional activities were identified as being primarily directed towards children (see Table 2). Of these, four displayed unhealthy food choices. Of those that displayed unhealthy food choices, two used products in interactive games and one used premium offers. Coca-Cola’s *Coke Drink* mobile phone application featured a bottle of Coca-Cola being used in an interactive game. Cadbury’s *Joyville* website featured chocolate in interactive games, while the *Vote for Creations* Facebook page engaged in premium offers. McDonald’s *Big Mac Farm Challenge* featured a Big Mac burger.

A key factor enabling each promotional activity to technically conform to the self-regulatory codes was the age restriction of the media itself. There are age restrictions on Facebook, where the user must identify as being 13 years or older. Similarly, mobile phone application, as well as the accounts required to download them, have age restriction, which are identified in Table 2. The only websites that did not have an over 13 age restriction were McDonald’s *Happy Meal*, and Cadbury’s *Joyville*.

Furthermore, McDonald’s is a signatory to the QRSI, which defines children as under 14 years of age (AFGC, 2009). Access to both the *Pickle Club* Facebook page and mobile application is available to those aged 13 years or over. Thus, a number of 13 year olds may be

Table 2: Comparison with self-regulatory codes

Promotional activities aimed at children	Age restrictions	Displays unhealthy food choices ^a	Use of products in interactive games	Use of premium offers	Use of popular personalities & characters
Coke Drink	Over 13 to download, no play restrictions	Yes	Yes	No	No
JoyVille	No	Yes	Yes	No	No
Vote for Creations	Over 13	Yes	No	Yes	No
Happy Meal	No	No	No	No	Yes
Big Mac Farm Challenge	Over 13	Yes	No	No	No

^aUnhealthy food was identified high in saturated fat, added sugar or added salt (NHMRC, 2013).

exposed to premium offers through these media. However, since this premium was not directed primarily to children, it would adhere to the self-regulatory code. Furthermore, *Pickle Club* is run by a franchise owner, and it is unclear how the self-regulatory codes apply in this context.

DISCUSSION

New media creates novel avenues for food and beverage companies to communicate with children and adolescents. Our marketing audit of three major food and beverage brands demonstrates the pervasive and engaging presence of these brands on new media, which have the potential to appeal to children and adolescents. We identified 21 promotional activities during June and July in 2013, across a range of new media. These promotional activities used a number of marketing strategies, with frequent use of indirect product association, engagement techniques and branding, while a number appeared to be targeted primarily to children.

Engagement techniques of flash animation, games and music were common among promotional activities aimed at children, while viral marketing was frequently used in those aimed at adolescents. Coca-Cola appeared to primarily target adolescents in most promotional activities, while Cadbury and McDonald's were both deemed primarily to target children in approximately half of their promotional activities. Healthy messages appeared to feature infrequently and were, more often than not, focused on physical activity rather than nutrition.

Given that the codes applicable at the time of data collection only applied to some mobile phone applications, these codes were technically met. However, the Cadbury *Joyville* website could be deemed to contravene the current RCMI. Furthermore, we identified a number of promotional activities apparently marketing unhealthy food or beverage products that would meet self-regulatory guidelines

solely due to the age restrictions of the media itself (e.g. Facebook and Apple ID age restrictions). These characteristics seem to be incongruous with both the intent of the codes and the WHO recommendations on marketing to children.

While there has been no previous examination of the interrelatedness of new media (differing categories of food and beverage products and multiple brands), previous studies also identified the presence of child content or child-designated areas on Australian food product websites (Kelly *et al.*, 2008; Jones and Reid, 2010). The high interactivity between media found in this study is similar to a previously conducted audit, where over 90% of US beverage company websites, popular among children and adolescents, had social media links and Facebook pages, which often promoted mobile phone applications (Harris *et al.*, 2011). Similar to the findings in our audit, this study also found frequent use of multiple engagement techniques as well as flash animation, music and viral marketing among child-focused brand websites (Harris *et al.*, 2011). Previous studies conducted in Australia similarly found that third-party promotional characters and promotion were relatively common on food product websites (Kelly *et al.*, 2008) and child-targeted websites (Jones *et al.*, 2008), respectively. Furthermore, our finding that many promotional activities incorporated games is supported by the literature, where 29% of Australian (Kelly *et al.*, 2008) and 63% of US (Weber *et al.*, 2006) food and beverage websites featured advergames.

This study is the first to conduct an audit of multiple food and beverage brands that Australian children and adolescents are exposed to via new media. Strengths of this study include the employment of a standard data collection method, based on previously conducted media content analyses. Additionally, the weekly observations of new media ensured that data on the majority of promotional activities active during this two-month period was collected. The

examination of Australian-specific Facebook and brand websites enabled these results to represent the exposure of food and beverage marketing to Australian youth via new media. Furthermore, the examination of multiple media channels better represented the multitude of touch points that children and adolescents are exposed to.

A limitation of this study is that the audited promotional activities were not an exhaustive list. Given the different lengths of accessibility between promotional activities present on different media, some may need to be monitored for longer periods of time in order to observe changes, or multiple initiatives. This study did not examine the actual exposure of children and adolescents to these promotional activities, or the age of consumers accessing these media channels. However, given the omnipresent nature of new media in this age group, exposure is likely to be high. In 2013, 83% of 13–17 year olds and 25% of 8–12 year olds had accessed Facebook in the previous 4 weeks (Australian Communications and Media Authority, 2013). This not only clearly demonstrates that a large proportion of children and adolescents have access to, and use new media, but are doing so despite age restrictions. A further limitation of this study is that our audit did not assess all elements of digital marketing. For example, Facebook and banner advertising, direct mobile phone messaging, Google advertising and user-specific targeted content were not audited. Further examination of the exposure to children of unhealthy food and beverage messaging via these other means are essential. Furthermore, while it is recognized that there are also applicable company-specific policies (Sacks et al., 2014), the aim of this study was to assess the role of broad, generalized self-regulatory codes.

One of the key implications of this study is that the exposure of children and adolescents to food and beverage marketing may be underestimated when only traditional media, such as television, is taken into account. Australian children have increasing access to new media, where 95% of 8–11 year olds had used the internet in the last 4 weeks, and 51% of 10–11 year olds are doing so via a handheld mobile device (Australian Communications and Media Authority, 2013). As we have demonstrated, new media represents a substantial potential avenue for marketing of unhealthy food and beverages products to children and adolescents. User download profiles of two applications analysed in our study, *Magic Coke Bottle*, and *Spin The Coke*, were examined in a previous study, finding that 12- to 17-year-old US users composed 39 and 26% of downloads, respectively (Harris et al., 2011). While receptivity to television fast food advertising has previously been associated with obesity (McClure et al., 2013), an examination of the exposure of unhealthy product marketing via new media and its relationship with weight gain and obesity is necessary. This is

especially pertinent given that previous studies indicate that children are less able to recognize advertisements on websites compared with television (van Reijmersdal et al., 2012; Blades et al., 2013). Future studies should examine the impact of these media on purchasing, consumption and preferences of youth. Furthermore, the unique aspects of marketing via new media, such as viral marketing, should be examined to determine their effect on behaviour.

An additional finding was the presence of what appeared to be child-targeted promotional activities, such as *Joyville*, *Vote for Creations*, *Coke Drink*, and the *Big Mac Farm Challenge*. For example, the *Joyville* website featured talking cats, short activities, colourful animations, music and the use of simple humour. This targeting of children with unhealthy food or beverage products would contravene the current self-regulatory codes. Furthermore, given children are accessing Facebook in large numbers (Australian Communications and Media Authority, 2013), age restrictions cannot be relied on to prevent children from exposure to seemingly child-targeted marketing of unhealthy food and beverages. For example, participants of *Vote for Creations* are given a voucher to be solely used on a 300 g block of chocolate—accessible only through the Cadbury Facebook page—encouraging consumption through direct price incentives. Examining the actual age of consumers who view content via these new media channels may aid in informing the extent of children's exposure to unhealthy food and beverage messages. There should also be further studies that examine the impact price incentives have on adolescent's behaviour, as this population are heavy users of social media (Harrison and Jackson, 2013).

A further finding of this study is that signatories to the QRSI may be at risk of contravention given their definition of children is under 14 years of age (AFGC 2009), and Facebook and some mobile phone applications allow 13 year olds access. Therefore, there may be content, such as the *Pickle Club* mobile application and Facebook page, and the Facebook *Big Mac Farm Challenge*, which expose 13 year olds to unhealthy messages and promotional deals. This demonstrates a failure of the self-regulatory codes to restrict marketing to children. Signatories to the QRSI—such as McDonald's—should carefully examine their content on new media to ensure they are promoting healthy choices to (their definition of) children, and should not rely on media age restrictions. Both *Pickle Club* promotional activities were initiated by franchise owners—whether they are also held to these codes is unclear, however their exclusion would seemingly contradict the intent of the codes. Ensuring adherence to the intent of self-regulatory codes for their promotional activities on new media should be a priority for food and beverage companies to

demonstrate commitment to their pledges and ensure adherence to the WHO recommendations.

The recent broadening of the self-regulatory codes to include all forms of internet is commendable. Further broadening to explicitly include all forms of mobile device applications is needed. The reduction in scope of the new codes to no longer restrict the use of popular characters, or premium offers directed at children represents an unfortunate step back. Furthermore, given the use of new media by children, food and beverage companies should not rely on media age restrictions to adhere to self-regulatory codes. The overall exposure of children to any unhealthy food and beverage advertising, and not just those specifically targeted towards them, is not addressed within the self-regulatory codes (Smithers *et al.*, 2013). The inclusion of adolescents, who are specifically targeted via new media, within the codes would represent a strong commitment by the food and beverage industry to reduce harmful effects of marketing potentially unhealthy products.

Government oversight has previously been recommended as a way to more effectively enforce voluntary codes (Galbraith-Emami and Lobstein, 2013). A 2014 literature review on the self-regulation of food and beverage marketing on any media concluded that, in general, self-regulatory codes were ineffective, tended to be vague, and only resulted in small demonstrable effects (Ronit and Jensen, 2014).

CONCLUSION

From this analysis of marketing via new media, we found that mobile phone applications, brand websites and Facebook were being employed by food and beverage companies to market unhealthy food and beverages to children and adolescents. Child-targeted marketing of food and beverages was evident, with frequent use of flash animation and music. Strategic targeting of adolescents was also observed, with a number of promotional activities using desirable promotions and viral marketing. One of the key issues identified was the reliance on easily circumvented age-restrictions on mobile phone applications, Facebook and some websites, which is likely to result in children less than 13 years of age being exposed to appealing but unhealthy food and beverage advertising.

Given the limitations of self-regulatory codes in the context of new media, strategies need to be developed to reduce exposure of children and adolescents to marketing of unhealthy food and beverage products via new media, which may include encompassing all forms of communication in regulation, tightening of self-regulatory guidelines, stronger governmental oversight, and meaningful sanctions for breaches of codes.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

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CONFLICT OF INTEREST

None declared.

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