Literature Review of Research on Online Food and Beverage Marketing to Children

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Family Kids and Youth

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Background

The Committee of Advertising Practice (CAP)[1], along with its sister body, the Broadcast Committee of Advertising Practice (BCAP), write and maintain the UK Advertising Codes. The UK Code of Non-broadcast Advertising, Direct Marketing and Sales Promotion (the CAP Code), covers a diverse range of advertising media from traditional press and poster advertising to new, online media, such as marketing communications appearing in social networking. The CAP Code is partnered by the BCAP equivalent, the UK Code of Broadcast Advertising, which covers advertising on Ofcom licensed TV and radio services. The Advertising Codes are administered by the Advertising Standards Authority (ASA).[2]

CAP also offers the advertising industry authoritative advice and guidance on how to create campaigns that comply with the rules. It plays an important role in ensuring that the Code and rulings upheld by the ASA are followed, monitoring sectors and taking action against advertisers who continue to break the rules. To ensure consistency, transparency and clarification on subjects, CAP often uses experts and resources from other bodies to help advise it on certain matters relating to ads.

There is increasing concern about children's exposure to advertising for food products high in fat, salt and sugar (HFSS), particularly through new online marketing channels such as advergames and social networking sites. Organisations such as the Children's Food Campaign (Clark and Powell 2013), The British Heart Foundation (British Heart Foundation 2011) and The Family and Parenting Institute (Nairn and Hang 2012) have recently lobbied for tighter regulatory controls over HFSS food marketing to children[3].

CAP established a new, tighter regime to govern non-broadcast media in 2007, in part, in response to the work carried out by Ofcom and BCAP on HFSS advertising in broadcast media. While it believes that the present framework is proportionate and effective, CAP is nevertheless concerned to learn more about the digital and online landscape in terms of children, and HFSS food and drink marketing and advertising. It therefore commissioned Family Kids & Youth to review the existing literature on online marketing communications and children, especially that relating to food and drink.

The overall objective of the scoping review was to provide an up-to-date, robust, and comprehensive review of the latest literature on children, young people and online marketing communications, especially in relation to food and drink advertising. The brief also included a requirement to review 'grey literature', including books and articles that have been written on the subjects of advertising and marketing food and drink to children, some of which might help form public opinion.

The review aims to highlight areas that are currently under-researched and would benefit from increased robust scrutiny. In particular, the review has asked the following questions:

- What is the state of play of the scientific literature on online marketing communications and children? How much research is there? In what disciplines? In what languages?

[1] http://www.cap.org.uk/
[2] http://www.asa.org.uk/
[3] For more details see section 5.4 and 5.5

- Is this research part of the broader research agenda on “traditional” advertising (TV, radio, print, cinema, outdoor, etc.), or is it separate? Does it specifically look at food and drink marketing and advertising? Are many of the same academics active in both areas, or is it a new field?

- Are the same research methodologies being used? What methodological discussions are under way if any?

- What is the focus of the available research?

- What marketing techniques within the field of online marketing communications are being discussed?

- What are the leading academic views on the issue, in respect of children’s understanding of, and interaction with, online marketing communications, and their impact on children’s wellbeing, development and health – also vis-à-vis traditional media?

- Can consensual views be drawn out of the available research, or is the debate still largely open? If so, on which specific questions?

The literature review was carried out between 27 January 2014 and 31 October 2014. Using the keywords *children, youth, young people, adolescents, HFSS marketing, food marketing, unhealthy food marketing, online, internet, digital, marketing, advertising, advergames, social networking sites, mobile, location-based,* and *product placement,* we searched bibliographic databases using CSA Illumina with access to more than 100 databases including ERIC, BEI, Psychinfo and Web of Knowledge. The total number of papers and reports located was 158, of which 106 were used. Records have been kept of each paper used in the search.

Management Summary

A great deal of public commentary suggests that online food marketing plays a negative role in what has been described as a child obesity epidemic. Content analysis in this area suggests that food products high in fat, salt and sugar (HFSS) are being marketed online via websites, social networks, games and apps popular with children. These findings have similarities with previous findings from content analyses of advertising on children's television.

Experimental studies show that online marketing techniques can influence children's brand awareness and their short-term food preferences. There are, however, significant limitations to the literature available, and evidence of growing criticism of the methodology through which these findings are produced. There is limited in-depth, ethnographic or longitudinal research looking at the actual impact of online food marketing on children's diets, or how children and parents engage with the advertising they see in everyday life. There is a need for more robust evidence of a causal effect of online food advertising on children's eating habits, and for more sophisticated methods of measuring children's online advertising exposure.

The majority of the available research has been carried out in the US. Overall, out of 106 papers reviewed for this report, only eighteen describe research carried out in the UK. Although the internet is global and children may see sites based or targeted from outside the UK, there are difficulties in reading across findings from other countries to the UK experience. Different cultural approaches, eating habits and regulatory regimes must be taken into account. In the latter respect, the UK already has a framework of rules to which online food marketing is subject. Furthermore, some studies were conducted a number of years ago, when regulatory environments and corporate responsibility policies may not have fully taken 'new' media into account.

There is evidence from content analysis which indicates that products high in fat, salt and sugar are in some cases being advertised through new online marketing channels such as social networks and mobile apps. Given that children and teenagers are frequent users of mobile technology and social networks (and at an early age, despite some having a stated age limit of 13) there is concern that children are exposed to additional advertising for these products.

While earlier research focused mainly on advertisements in children's web page design, advergames are the form of advertising that has received the most attention from researchers. This is, in part, due to the popularity of online games in general with children, which is believed to make advergames a highly effective and low-cost form of advertising, although published evidence on children's actual playing of such branded or subsidised games is scant. There is very little research on children's understanding of new forms of data-driven advertising, such as, online data collection, targeted advertising, mobile advertising, location-based advertising and advertising on social networks.

Experimental studies have found that exposure to HFSS food advertising influences children's preference for these foods. Particularly, studies on advergames have found that children's attitude towards a brand are positively influenced after playing a game promoting it. An effect has also been found on children's stated intention to request the advertised product. Children have been found to be more likely to choose the advertised snack over other healthier snacks after playing the game. Similar studies with advergames promoting healthy eating have shown inconclusive results.

However, there has been considerable criticism of the artificial methods used in this kind of research. It would be more effective to study responses to advertising in conditions that resemble the environments in which children are naturally exposed to advertising and make eating choices, rather than the 'laboratory' conditions (for example bringing children into University viewing studios) currently employed. The studies also rely on children's self-reporting of product requests and do not verify this information with parental interviews or longer-term monitoring of the child's actual preferences and consumption.

Many researchers have argued for innovation in how online advertising exposure and impact is measured. It is argued that these methodologies must take into account that children consume media and advertising across a variety of platforms. With regards to advertising effect, it is suggested that research should focus more on long-term effects and less on before-and-after studies in artificial environments. It is also argued that, because children find it difficult to recognise more immersive forms of online marketing, research must focus more on unconscious processing of advertising.

Online marketing challenges previous literature on when children can critically understand marketing and how their understanding may mediate effect. There is evidence to show that children develop a mature understanding of the persuasive intent behind online marketing and how this shapes communication at a later stage than with traditional forms of advertising, such as TV. This is explained by the integrated nature of online marketing, which is likely to make it more difficult for children to recognise persuasive intent and source bias. It has also been suggested that the highly entertaining nature of some forms of online advertising, such as advergames, may distract children from applying their critical understanding of advertising.

However, research has also questioned the effect of advertising literacy on mediating effects. It has been shown that even children who have a high level of advertising literacy are influenced by online marketing. It is suggested that this is also due to the affective nature of online marketing communication, which leads it to being processed on a less conscious level, and it is argued that more research is needed to decide whether children's persuasion knowledge can be triggered.

Commentators argue that the regulation of online advertising to children does not effectively protect them from exposure to unhealthy food advertising, and governments are being encouraged to enforce stronger regulations. They argue that online marketing formats, particularly newer forms such as mobile marketing, marketing on social networks and advergames, are insufficiently covered by regulation. Our review suggests that there is a need for much more extensive, up-to-date evidence on these issues, and particularly on how children understand and respond to online marketing. Even so, it remains the case that the regulatory system and research will need to continue evolving in line with future developments in technology and marketing practice.

Preface by Professor David Buckingham

At first glance, the relationship between food marketing and childhood obesity would seem to be quite straightforward. It is frequently claimed that levels of childhood obesity are rising, to the point where leading authorities regularly describe it as an 'epidemic'. Meanwhile, most food and drink advertising is for products high in fat, salt and sugar (HFSS). The connections here would appear to be obvious: children watch ads for 'unhealthy' food, which cause them to prefer and to choose such foods, and so they become obese.

However, the evidence from research on this matter is rather less than conclusive. Despite some claims that there is an emerging consensus, reviews of the research disagree – in some cases, quite profoundly – in their overall conclusions. And when it comes to digital and online marketing in particular, the evidence is especially limited. As such, there is an urgent need for a more informed, evidence-based discussion of this issue; and the present report seeks to contribute to this.

The obesity 'epidemic'

In fact, claims about an 'epidemic' of childhood obesity would seem to be quite overstated. Government statistics, published by the Health and Social Care Information Centre (part of National Statistics) show that rates of childhood obesity have more or less flat-lined (and in some areas slightly declined) over the past ten years. There was a rise in the late 1990s, to a peak in 2004, but since then there has been a decline among younger children especially. The real rise in obesity is actually among adults, especially in middle age – yet (as is so often the case) much of the debate focuses on children.

The debate on this matter is also not helped by the recurrent conflation of the terms 'overweight' and 'obese'. Media reports repeatedly claim that high percentages of the population are 'overweight-and-obese'. Yet the dangers to health of being obese are significantly greater than those of merely being overweight; and many experts assert that being mildly overweight carries very little or no additional risk. Many argue that BMI (body mass index), which is routinely used to measure overweight, is not an especially helpful index when it comes to assessing risks to health. Some years ago, apparently at the behest of insurance companies, the cut-off point for defining overweight was lowered from a BMI of 27 to 25, instantly rendering millions of people 'overweight'.

Advertising content

When it comes to advertising and marketing, the evidence initially seems somewhat clearer. Prior to the introduction of restrictions on advertising during children's television (starting in 2007-8), Ofcom's research found that food advertising was dominated by breakfast cereals, confectionery, savoury snacks, soft drinks and fast-food restaurants; while advertising for staple items and fresh foods was declining. While the restrictions have led to a reduction in HFSS advertising around children's programmes, they do not apply to television advertising generally – to which children of course continue to be exposed.

One consequence of the restrictions, however, was that advertisers and marketers began to look to other media, and particularly to the emerging digital media that are so popular with younger

audiences. Branded websites, advergaming, viral marketing, social networking sites and other forms of social media offer significant opportunities to target specific audience groups. Several of these methods (like advergames) provide 'sticky' content, which attracts users to spend time and attention; while others (like social networking) have the advantages of 'word of mouth', which advertisers know is much more influential than traditional mass marketing. In addition, these techniques are often much less expensive than mainstream television and print advertising.

While the digital landscape is very difficult to measure, these new forms of marketing are undoubtedly on the increase. However, this is not to say that they are necessarily effective. As this report shows, there have been several research studies looking at the new techniques marketers are employing, specifically in advertising to children. However, it should be emphasised that content analysis of this kind does not in itself tell us anything about the effects, or the effectiveness, of such practices.

Effects of advertising

To find out about this, we need to look at research with audiences or consumers – in this case, children and young people – themselves. The problem here, as this report clearly demonstrates, is that the available evidence is both limited in its scope and extent and open to challenge in terms of the reliability of its methods. It is genuinely quite shocking to discover that, despite what appears to be growing concern about digital marketing to children, there is hardly any robust or rigorous research that looks at how children respond to it.

In terms of methods, the problems here are fairly familiar. Much of the available evidence comes from laboratory experiments. Typically, children are shown advertisements for particular products and subsequently asked if they would choose such products (or actually do so when given the opportunity). Children exposed to the advertisements are compared with a control group that is not exposed. At best, this shows that advertising can have short-term effects, if the opportunity to buy or consume is available, and if sufficient encouragement is given. But critics point out that the laboratory situation is very different from real life, where food consumption is influenced by a whole range of other factors.

Other evidence is correlational: it establishes associations between exposure to advertising and phenomena like obesity. However, this kind of research generally fails to establish causal relationships. It may be that advertising encourages people to eat an unhealthy or unbalanced diet, which in turn is one contributory factor in obesity. But it may equally be that people who are disposed (for various reasons) to eat an unhealthy diet – or are unable to afford a healthy one – are also inclined to spend a lot of time sitting in front of a screen.

In fact, much of this research measures children's reported exposure to media rather than their exposure to advertising specifically. This is problematic, as there are many possible ways in which media use might be associated with obesity. Watching television and surfing the internet are sedentary activities, which do not burn many calories. People who spend a lot of time in front of a screen tend to do less exercise, and are more likely to prefer other sedentary activities. These are also relatively inexpensive forms of entertainment, which is a major reason why television in particular is more heavily watched in less affluent families, who are also more likely to be obese.

This is not, of course, to imply that advertising has no impact on children's food preferences. The lack of convincing proof about the causal effects of marketing does not in itself mean that such effects do not exist. Even so, most reviews of research agree that any such impact is very small. One frequently quoted figure is that exposure to television advertising accounts for some 2% of the variation in children's food choice. However, food consumption is only one factor in obesity, and as such, the influence on obesity is bound to be even smaller than this; although one could argue that a variation of 2% is still not negligible.

Effects on obesity

However, when it comes to obesity specifically, the evidence is exceptionally limited. Research in this field has generally explored food preference or food choice rather than obesity *per se*. However, the relationship between the food people say they prefer and what they actually eat is not straightforward. They are not always able to eat what they would ideally wish to eat: a whole range of other factors, most notably price and availability, come into play. As we all know, children may well ask for many things that (for a variety of reasons) they do not get. As such, an expressed preference for 'unhealthy' foods – let alone things like brand recognition or brand preference – among children cannot on its own be taken to result in (or be equated with) obesity.

The major problem with this research – as with so much other research about media effects – is that it tends to consider the effects of advertising in isolation from other factors such as the influence of parents or peers. This makes it difficult to offer definitive conclusions about the *relative importance* of advertising as compared with these other factors. If we wish to understand children's behaviour as consumers, we need to take account of the broader social and cultural context. Simple cause-and-effect explanations do not do justice to the complexity of the issues.

Wider research on people's food consumption shows that taste preferences and dietary patterns are largely determined by other factors, and are in place from a very young age, well before children become aware of advertising. The early years are especially important: once established, taste preferences and eating habits appear to continue with relatively little change for the rest of a person's life. Some people are more genetically disposed towards obesity, or have an inherited preference for sweet food. Aspects of family interaction also play a role: obese children are more likely to have obese parents.

Lifestyle, and particularly the amount of physical exercise people take, is obviously another key factor. Evidence here suggests that while children's calorie intake has remained more or less steady over the past 30 years, the number of calories they burn through exercise has declined. This may relate to a number of other factors, not least the decline in free access to public space for play and exercise.

All these things relate in turn to other social differences, including ethnicity and age. The strongest association, however, is with poverty: at least in developed economies, poor people are much more likely to be obese than wealthy people. The reasons for this are partly to do with the availability and price of particular kinds of food, and the opportunity and time that people have to prepare it. If advertising does play a role here, it does so in the context of these other factors – which themselves interact in complex ways.

Digital marketing

Even so, this is not to imply that there is no cause for concern about food marketing to children, or about digital marketing specifically. There are two major issues at stake here: the possibility that marketing techniques might be misleading and the potential misuse of personal data for marketing purposes.

Previous research has shown that children are able to understand the persuasive intentions of television advertising from a fairly young age (although there is some debate about precisely when this occurs). When it comes to digital advertising, however, the issue can be more complex. It is hard to imagine that a child playing a game on a branded website or receiving unsolicited marketing emails will not recognise that there is some commercial intent here. Yet the situation is not always so clear. Much of this advertising is 'embedded', or inextricable from other content: the fact that this is indeed a commercial appeal, created by an advertiser or a company, is not always evident. In the case of viral marketing or social media advertising, the origin of the message is not always clear. Such techniques may therefore prove misleading in ways that are different from traditional advertising: put simply, it may be that people are trying to sell us things without us recognising that this is what they are doing.

Yet, as this report shows, there is very little evidence on whether children (or people in general) are actually misled by these kinds of techniques. Marketing techniques are undoubtedly changing; but equally, people's awareness of those techniques is also likely to be changing, not least because of the large amount of public and media commentary on the issue. It is hardly surprising if people are not aware of marketing techniques that are new and less widely understood; but the effectiveness of such techniques is likely to change once they do become aware of them. In this respect, studies showing that children do not understand new digital techniques are not especially significant: what we need to know is how they understand them once they have become common practice. It may be true today that children (like adults) have less understanding of some aspects of digital and online marketing than they do of television advertising; but it is less likely that this will be the case in five years' time.

The issue of data gathering raises similar questions. On a wider level, digital technology offers enormous potential for surveillance. For marketers, it provides opportunities to gather detailed information about individual consumers' habits and preferences and thereby to target them with products and advertising appeals that are most likely to engage them. Recent legislation means that we now have to be alerted to the use of 'cookies'; but there are many other ways in which information about us can be gathered online, and there are many situations in which we voluntarily and enthusiastically provide and share such information.

Yet there has been relatively little research about how consumers – and young consumers in particular – respond to this situation, and how their understanding might be changing over time. Are they aware of the intrusion of marketers in apparently 'private' spaces (such as social networking sites)? Are they concerned about it, or do they see it simply as a necessary price to pay for what are widely seen as 'free' online content and services? As with the issue of obesity, it is also pertinent to ask where the real problem lies. Some would argue that children are actually much more capable of understanding digital marketing techniques (or more 'digitally literate') than the majority of adults. So why should we assume that they are necessarily more vulnerable to influence?

However, the question of digital or media literacy is also far from straightforward. Obviously, the fact that somebody is aware of the persuasive intention of a given message does not necessarily mean that they are immune to its influence. Persuasion – including that of advertising and marketing – can obviously work on several levels: it often involves emotional and symbolic appeals that are not amenable to rational control. Adults, and all but very young children, know that advertisers are trying to sell them things; but this self-evidently does not mean that advertising has no influence. In this respect, digital advertising is no different from traditional advertising.

Education in media literacy – which would include studying advertising techniques – is a basic requirement in a modern consumer society. But to assume that such knowledge will somehow provide us with guaranteed protection against media influence is somewhat naïve. Advocates of media literacy education would argue that it has much broader aims in any case: it is not primarily intended as a kind of prophylactic against advertising.

Research and policy

As a researcher myself, it is probably predictable for me to conclude that we need more research on these issues – although this report more than amply supports this conclusion. We know a fair amount about what advertisers and marketers are doing in these new digital spaces. What we do not really know is what children and young people (and indeed adults) make of it – how far they understand it, how they respond to it, and, ultimately, the effects it might have on them.

Research of this kind can hopefully contribute to a better informed, and ideally less polarised, debate about the role of digital marketing. Yet in such a rapidly changing environment, we clearly cannot wait until we have all the evidence.

Obesity is a complex issue with multiple causes, and we need appropriately complex ways of understanding and addressing it. Yet even if the effects of marketing may be much smaller than other influences, this does not imply that nothing can or should be done about it. Some potential causes may be much easier to address at a policy level than others. Even so, the danger is that regulating advertising can become a distraction from the much more difficult aspects of the issue that need to be addressed – such as child poverty – and, at worst, an opportunity for politicians to look as though they are doing something about it.

The regulation of advertising self-evidently needs to keep pace with the times, and particularly with the digital techniques that are now emerging. Yet we also need to curb the tendency to fantasise – and indeed to panic – about the evil powers of advertising. It is vital to consider the potential unintended consequences of increasing regulation, and to balance the costs against the potential benefits. We hope that the careful and balanced analysis contained in this report will help to meet what is likely to be a difficult and continuing challenge.

Professor David Buckingham

London, October 2014

1.0 Introduction

Academic research on digital food and beverage marketing to children has to a large extent been shaped by increasing concerns towards the role marketing is argued to play in food consumption and public health. These concerns are particularly prevalent with regards to children. Child obesity has been recognised by the World Health Organization (WHO) as one of the major health challenges of the 21st century (WHO 2012). This is acknowledged to be a global problem but concerns are more widespread in the countries with higher obesity rates where obesity will have a major impact on public health care systems such as the United Kingdom, USA and Australia. The remit for this report was to carry out a global review of the research on online advertising to children and the findings presented therefore comment on research carried out in different markets and food cultures and under different regulations. It should however be highlighted that the regulations in the UK tend to be stricter than in many of those in other countries and that advertising practices commented on in some papers would be considered non-compliant with the CAP code. For a detailed overview of where each paper was published please see Appendix 2.

Although child obesity is recognised to be a complex problem with several causes, food and beverage marketing has been identified as an area of concern. WHO has stated that food and beverage marketing to children tends to promote products that are not recommended as part of a healthy diet and has suggested that this influences children's attitudes towards food and eating habits (WHO 2013). WHO also highlights increases in spending on online marketing, as has the American Federal Trade Commission (Leibowitz, Rosch et al. 2012), and sees this as a particular area of concern. It is important to highlight that these specific concerns have developed in light of more general unease regarding children's use of digital media, particularly mobile devices such as smartphones and tablets (for more on this see chapter 2.6).

This report presents an overview of the research available on online marketing to children, with a particular focus on food and beverage marketing. Much of the research focuses on online marketing of what is perceived to be unhealthy food or beverage products. Although definitions of 'unhealthy' vary considerably, in this report it is generally taken to mean products that are high in fat, salt or sugar (HFSS). The review will assess what conclusions can be drawn from the research to inform on-going policy development. Important topics of debate include the age at which children can understand online marketing, the mediating effect of advertising literacy and the effects of online marketing on brand attitudes and eating behaviour.

1.1 Global regulatory initiatives on advertising to children

As digital communications are increasingly international, it is important to acknowledge the current global advertising regulatory context. The World Health Organisation (WHO) has recommended that governments play a leading role in reducing children's overall exposure to food marketing and setting rules on the persuasive techniques companies can use, with a view to protecting children from the adverse impacts of marketing.

This is a key policy action contained in the WHO Global Action Plan 2013–2020 for the Prevention and Control of Noncommunicable Diseases (NCDs), which was endorsed by the World Health

Assembly in May 2013. This accompanies the WHO's existing set of recommendations on the marketing of foods and non-alcoholic beverages to children, endorsed by the Sixty-third World Health Assembly in 2010.

In the US, the Federal Trade Commission (FTC) has, since 2009, reviewed trends in the food advertising market, the most recent analysis being published in December 2012. In America 18 companies are involved in the Children's Food and Beverage Advertising Initiative (CFBAI).[4] They account for 80% of food adverts on children's television and promise to advertise 'healthier or better-for-you' foods to children younger than 12 or, in some cases, not to market to them at all.

In 2005, the European Commission set up the platform for action on diet, physical activity and health, bringing together European business and consumer organisations to address issues of diet and physical activity. Its members have made 300 commitments. Through the World Federation of Advertisers (WFA), European food companies launched, in 2007, an EU Pledge (see section 1.1.1)

To address these issues and help advertisers and marketers to comply with the principles of responsible marketing communication, the International Chamber of Commerce published in 2012 the Framework for Responsible Food and Beverage Marketing. This sets out the principles for regulation of responsible food and beverage marketing communication related to children. ICC encourages marketers and advertisers to follow these principles and meet their obligation towards responsible, honest and decent marketing communication to children[5].

1.1.1 EU Pledge and IFBA Pledge

The EU Food Pledge[6] was launched in December 2007 by food and beverage companies as part of their commitment to the EU's Union Platform for Action on Diet, Physical Activity and Health, the multi-stakeholder forum set up by former EU Health and Consumer Affairs Commissioner Markos Kyprianou in 2005 to encourage stakeholders to take initiatives aimed at promoting healthy lifestyles in Europe. The EU Pledge commitment is owned by the World Federation of Advertisers (WFA) which supports the programme in the context of the EU Platform.

Through this Pledge, the food companies committed not to advertising food and beverage products to under 12s on TV, print and internet, except for those fulfilling special nutritional criteria based on accepted scientific evidence or applicable national and international dietary guidelines. They also committed not to communicate about products in primary schools, except where specifically requested by, or agreed with, the school administration for educational purposes.

The Pledge signatories now number 21 brands, representing over 80% of food and beverage advertising expenditure in the EU. The Pledge commitments were enhanced in January 2012 to company-owned websites.[7] By extending the coverage of the commitment to cover both third-party online advertising and brand websites, the EU Pledge covers online marketing comprehensively. The 2012 review extended the commitment to cover company-owned websites, which as a result

[4] http://www.bbb.org/council/the-national-partner-program/national-advertising-review-services/childrens-food-and-beverage-advertising-initiative/

[5] http://www.iccwbo.org/advocacy-codes-and-rules/areas-of-work/marketing-and-advertising/marketing-and-advertising-to-children/

[6] http://www.eu-pledge.eu

[7] http://www.eu-pledge.eu/content/enhanced-2012-commitments

includes advergames featuring on those websites. While social media and apps are not explicitly covered, members try to be in line with the 'spirit' of the EU Pledge and therefore avoid placing non-compliant products (or any products for those companies which do not apply nutrition criteria) on social media pages/apps primarily appealing to children under the age of 12. From the end of 2014, the signatories have also committed to advertising products according to common nutritional criteria now published.

Separately, again in conjunction with the World Federation of Advertisers, food and beverage companies published on 9 September 2014 enhanced global commitments on health and wellness designed to support recommendations and achieve objectives from two key reports; the 2004 WHO Global Strategy on Diet, Physical Activity and Health and the WHO Global Action Plan for the Prevention and Control of Non-communicable Diseases. This is referred to as the International Food and Beverage Alliance (IFBA) Pledge.[8] Their pledge focuses on five key areas, the most relevant of which are clear, fact-based nutritional information on packs and at point of sales as well as responsible advertising and marketing to children. IFBA policy requires members to only advertise products to children under 12 on television, in print and online that meet specific nutrition criteria. If their products do not meet these criteria, they cannot advertise at all.

The new policy recommendation expands IFBA policy to cover all media and ensure that products that do not meet country specific nutrition criteria are designed not to appeal to under 12s. In addition, IFBA members have committed to stop all food and drink advertisements to primary school children. The pledge does not include packaging, in-store and point of sale ads and user-generated content.

1.2 The nature of the research available

Due to the focus on obesity and public health, many research publications have been produced by health organisations and charities that lobby for stronger regulation of online marketing, such as the Yale Rudd Center for Food Policy and Obesity, the Public Health Advocacy Institute and the Robert Johnson Foundation in the US, and the British Heart Foundation, the Family and Parenting Institute, consumer organisation Which? and The Children's Food Campaign in the UK. It may be that such organisations fund academic research in this area, although funding sources are not always explicit. Several organisations however have produced content analyses of the existing online marketing material children may be exposed to as well as reviews or summaries of the research available (Berkeley Media Studies Group 2011; British Heart Foundation 2011; Clark and Powell 2013; Harris, Schwartz et al. 2013; Wilking, Gottlieb et al. 2013). These studies also review the development of regulations and food and beverage companies' adherence to these. The rapid growth in online marketing and the development of new and more targeted advertising methods lead some researchers to argue that online marketing is one step ahead of regulations and academic research (Hernandez and Chapa 2010; Scully, Wakefield et al. 2012). This is particularly the case in marketing on social networking sites and via branded mobile applications (Harris, Weinberg et al. 2013).

The research is predominantly being published in the US, followed by the UK, the Netherlands, Australia and Sweden (see Appendix 2). The prevalence of studies by American authors in this area

[8] https://ifballiance.org/documents/2014/09/dr-chan-letter-final-15-9-14.pdf

has important implications for the debate since the US could be argued to have a different food culture as well as a different regulatory system compared to the UK. Eighteen of 106 papers included in this study were written by British authors. Much of the research from the US is published by the health organisations mentioned above, or written by authors affiliated to the organisations, such as Dr Kathryn Montgomery, Dr Dale Kunkel and Dr Jennifer Harris. In the Netherlands, The Centre for Research on Children, Adolescents and the Media, part of the University of Amsterdam, regularly publishes studies on children's understanding of advertising and the impact of advertising on children's food choices. The centre also carries out studies on the impact of marketing on children's wellbeing and self-esteem. The research on advertising forms parts of the centre's overall focus on children's use of digital technology and how it affects their lives. The research is considered to be robust and balanced, and has previously been instrumental in shaping media policies in the Netherlands.

In Sweden, a group of researchers, including Helena Sandberg and Nils Holmberg, is looking at innovative ways of researching the role of advertising in children's lives. One strand has been qualitatively assessing children's attitudes to advertising and what role they feel it plays in their life. Another strand has used experimental methods to assess the extent and impact of unconscious processing of online advertising.

In addition to the consumer and health organisations mentioned above, research in the UK has been carried out by researchers affiliated to the University of Bath, predominantly by Agnes Nairn and Haiming Hand, as well as the University of Sheffield, the University of Hull and the University of Exeter.

Content analyses of marketing on brand websites or third-party websites are the most common methodology employed (41 papers). These assess the amount and nature of marketing messages on websites popular with children. Content analyses report tendencies in advertising practices and spending, but rarely comment on the reach and impact of these advertising practices. For example, although advergames are described as a popular format among advertisers, it is not known how many children are reached and for how long they engage with these games. Another challenge is the rapidly changing nature of online marketing which makes it difficult for research to remain relevant or accurate. There were 13 papers that largely or only discussed theoretical aspects of advertising to children, five reviews of academic and grey literature and eight reviews of advertising regulation.

A second category of research consisted of fieldwork with children or parents. This includes experimental studies looking at children's ability to recognise advertising, or the effect of exposure on their brand perceptions or food choice. It also includes studies measuring advertising exposure through eye-tracking technology. In experimental impact studies children are typically exposed to advertising and subsequently asked to choose from an option of food or snack products. It could be argued that these studies may not reflect how children typically encounter advertising and make eating decisions in their everyday life and a challenge for future research is finding innovative ways of assessing advertising effect among children. Research looking at children's perception of advertising on the internet and how they engage with it has been highlighted as one of the areas in need of more research (Martinez, Jarlbro et al. 2013). For a full breakdown of the methodologies used see appendix 2.

1.3 Research Limitations

Certain limitations of the body of research should be acknowledged. Despite the amount of criticism towards online marketing practices, there is still a lack of research in this area compared to more traditional forms of advertising (Rideout 2014). Specifically there is a need for more long term research, in particular research looking at longer term behavioural effects of online advertising exposure. As advertising now reaches children through a variety of channels, there is a need for more sophisticated methods of measuring children's exposure through these channels (Opree, Buijzen et al. 2014). There is also a lack of studies that explore children's perception of advertising and the role it plays in their lives.

A further limitation to the research in this area is the relationship between academic research and child health campaigns. The relationship between some researchers and organisations and charities that lobby for stronger regulation of marketing to children is acknowledged. Thirteen out of the 106 papers included in this review were published by independent organisations rather than in academic, peer-reviewed journals. Of these 13 papers however, 11 were carried out and written by academics. The two exceptions to this are reports from the Children's Food Campaign (2013) and the British Heart Foundation (2011). The 13 papers published by independent organisations have been included in this review as its remit was to include both academic and grey literature.

Although online marketing more easily crosses national boundaries and may be consumed across different markets, Kelly, King et al. (2013) argue that impact studies should still take into account country-specific factors such as existing advertising regulation, media use patterns and overall public health initiatives and concerns. As pointed out above, the prevalence of studies carried out in the US where the food culture is arguably different, has important implications for the field of study.

Similarly to television advertising, research on online marketing highlights the challenges associated with defining what constitutes a 'child audience' (Harris, Speers et al. 2012; Ustjanauskas, Harris et al. 2013). The US Children's Food and Beverage Advertising Initiative defines child audiences for the purposes of not targeting food advertising as having 35% or more children under 12[9], but some companies have chosen an even lower percentage.

However, research has argued that websites with less than 25% of children among their audience feature content that is described as highly appealing to children such as advergames and cartoon characters (Harris, Speers et al. 2012; Harris, Weinberg et al. 2013; Ustjanauskas, Harris et al. 2013). This presents a challenge to researchers looking at what products are being marketed to children. These arguments would benefit from data on the popularity of these games with children.

1.3.1 Evidence of effect

A review carried out in 2006 by Professor Sonia Livingstone for Ofcom found that television advertising had a modest direct effect on children's food preferences and health (Livingstone 2006).

[9] http://www.bbb.org/council/the-national-partner-program/national-advertising-review-services/childrens-food-and-beverage-advertising-initiative/about-the-initiative/

Livingstone carried out a meta-analysis of six international studies on television and advertising plus a review of the meta-analysis by the American Institute of Medicine from 2005. Based on these seven reports she finds that effects of television advertising on children's food choice and health are difficult to determine but believed to be small. The effect based on these reports is estimated at 2%.

A similar review of the effectiveness of online advertising has not been carried out and it is therefore not known how it compares with television advertising. It has been pointed out that this field of study has so far relied on content analyses of online advertising rather than robust evidence of the effect of advertising on children's eating habits. Research on advertising effects forms part of a wider field of media effects studies which have been heavily criticised for not acknowledging the socio-cultural context in which media is consumed (Valkenburg and Peter 2013).

Much of the research in this field, particularly experimental studies assessing children's understanding of advertising or advertising effects, tends to be carried out in environments that do not resemble the natural situations in which children would encounter advertising. These studies are often carried out in university laboratories, in which children are exposed to online advertising, for example an advergame, and subsequently asked to choose from a selection of food products. This could be argued to have little resemblance to the situations in which children make eating choices, and further research should therefore attempt to study effect in more natural settings. According to Folkvord, Anschutz et al. (2013), these studies have so far also been based on limited sample sizes. Although replicating children's exposure and reaction to advertising on a large scale is difficult, new methodologies should be developed specifically to assess the extent and impact of online marketing in a more accurate way (Dahl, Low et al. 2012; Rideout 2014). It has similarly been argued that the limited amount of time over which the impact is measured is another drawback of the research to date (Dias and Agante 2011). For more on this see section 6.

Research on online advertising is time sensitive. Due to the pace at which online marketing practices and children's media habits evolve, it is difficult for academic research to remain relevant. As a result newer marketing channels such as social networks, mobile apps and video networks such as YouTube are especially under-researched (Kelly, King et al. 2013). It could be argued that as marketing practices develop and some of these newer forms of online marketing become more familiar to children, attitude towards and understanding of such techniques will change.

Rideout (2014) argues that more research is needed to fully understand children's ability to recognise advertising and persuasive intent, especially in more embedded forms of advertising such as social marketing, advergames or sponsorship. Although advertising literacy has been a focus of a number a papers there is still no consensus with regards to whether this mediates the effects of online marketing (see section 8.2). Despite this area receiving increased attention, there is still a lack of research into children's processing of digital and interactive marketing and how this mediates effect (Waiguny, Nelson et al. 2012) (see section 7.2).

Dahl, Low et al. (2012) argue that, although there are considerable amounts of research assessing the impact of online marketing, there is very little research explaining how marketing information is received and processed. Another criticism is that communication theories are based on a one-way model of communication and do not take into account the potentially active role of the audience in interpreting or even creating marketing content (Valkenburg and Peter 2013).

2.0 Environment of Concern and Grey Literature

2.1 HFSS food marketing and childhood obesity

Obesity among adults as well as children is a complex problem with a range of causes, such as food prices, changes to food production and eating habits and an increase in sedentary behaviour. According to the Health and Social Care Information Centre (HSCI 2014) there is a positive relationship between deprivation and obesity levels in England. The role advertising may play in children's food choices, nutrition and health has been a topic of public interest in recent years and has received increasing academic attention (Taylor 2013). Online advertising has also increased significantly in recent years and this coincides with a sharp increase in online media use, particularly among children and young people (see section 3.0). According to the Advertising Association's Warc Expenditure Report[10], internet advertising expenditure (including online, mobile and tablet) reached £6.3bn in 2013 in the UK. This is a 15.6% increase compared to 2012. It is forecast to grow 14% in 2014, and a further 12.7% in 2015. Within this, mobile had a growth rate of 95.2% in 2013 and is forecast to continue growing rapidly by 75% in 2014 and 47% in 2015. Total advertising expenditure on children's TV in 2013 was £142m of a total TV ad spend of £4,642m[11]. Advertising on children's TV channels in 2013 accounted for just 3.1% of all TV advertising expenditure.

Online advertising of HFSS products in particular is argued to have grown sharply since regulations by Ofcom in 2006 restricted advertising of these programmes during children's programmes on television. Comprehensive figures for online advertising of HFSS products are however very difficult to compile due to a lack of agreement of what constitutes HFSS products.

Despite the levels of concern there has been little evidence produced of any causal effect of online advertising on children's food intake. The lack of robust evidence does not however mean that there is no effect or no cause for concern. Based on reviews of the available research on food marketing to children, the World Health Organisation (WHO) published a set of recommendations for marketing food and non-alcoholic beverages to children in 2010. This acknowledged that marketing plays a role in the dietary intake of children (WHO 2010). These guidelines were adopted and promoted by the United Nations General Assembly in 2011.

A recent report from WHO (WHO, 2013) stated that HFSS products such as soft drinks, sugared cereals, confectionary and snacks and fast-food outlets were more likely to be marketed to children than healthier options. The report found that while overall marketing expenditure was in decline, there has been a dramatic increase in spending on online marketing and considerable disquiet has been expressed about this. WHO announced in May 2014 that a special commission had been created to recommend action to end childhood obesity.[12] The commission will focus on issues including nutrition, health literacy, physical activity, paediatrics, developmental origins as well as marketing.

[10] http://expenditurereport.warc.com/

[11] Children's TV, for expenditure statistics, is defined as dedicated children's TV channels only. It does not include children's programming on general channels adult or family shows which may be viewed by children. Children's media consumption habits are explained in more detail on page 3.

[12] http://www.who.int/dietphysicalactivity/end-childhood-obesity/action-plan/en/

In the UK, the Children's Food Campaign published a report in 2013 arguing that the self-regulatory framework currently in place in the UK does not sufficiently protect children from the marketing of unhealthy food and beverage products (Clark and Powell, 2013). The report suggested that CAP and the ASA are unfit to administer the self-regulatory framework and do not respond to complaints from the public. It was argued that a legislative regulatory framework must be put in place to ensure that all children under 16 are protected from unhealthy food and drink marketing, which it is assumed has a detrimental effect on their eating habits and health.

The Children's Food Campaign and the British Heart Foundation, published a review in 2011, which also argued for stricter regulation of online marketing, have continued to argue publically for stricter regulation codes of both traditional and online marketing.[13] In March 2014, the campaign called for a ban on all televised food adverts until 9pm.[14] The campaign was followed by a Channel 4 Dispatches documentary investigating the extent to which children are marketed to online. The documentary featured, among others, Dr Haiming Hang from the University of Bath who argued that due to children's limited understanding of persuasive tactics, online marketing should be restricted.

In 2014 the National Obesity Forum released data suggesting that predictions of obesity levels reaching 50% of the population by 2050 could be underestimated.[15] Although there has been some fall in overweight and obese children in their final year of primary school, childhood obesity still remains 'worryingly high'.[16] According to the Health and Social Care Information Centre, the childhood obesity rate in the UK has levelled off in recent years (HSCI 2014). However, it is important to point out that the statistics for this vary depending on which age group of children is included. The National Obesity Forum called for 'hard-hitting anti-obesity campaigns'[17] similar to campaigns to reduce smoking, and cited Australia as a country that had already employed such tactics.[18]

The developments in the UK reflect similar global debates over the role of food and beverage marketing on children's health and wellbeing. In July 2013, the International Association for the Study of Obesity released a press release stating that, despite efforts to promote self-regulation, children were still exposed to large amounts of food and drink advertising (IASO 2013). The IASO called for stricter regulation to cover both broadcast and digital media. Similarly in the US, the Public Health Advocacy, part of the Berkeley Media Studies Group, and the Center for Digital Democracy published a literature review in December 2013 showing the extent of online marketing to children, urging state legislators to introduce stricter regulations (Wilking, Gottlieb et al. 2013).

In the US a third of all children are thought to be overweight or obese[19], with obesity in teenagers rising, but dropping among younger children.[20] Obesity remains a major health concern however and the American Academy of Pediatrics (AAP) has highlighted the role of media consumption, including advertising exposure, as playing a role in unhealthy food consumption (Council on Communications

[13] http://www.theguardian.com/sustainable-business/brands-increase-fast-food-marketing-kids
[14] http://www.bbc.co.uk/news/health-26665952
[15] http://www.bbc.co.uk/news/health-25708278
[16] http://www.nhs.uk/news/2014/01January/Pages/Report-warns-of-a-looming-UK-obesity-crisis.aspx
[17] http://www.marketingweek.co.uk/sectors/food-and-drink/news/anti-obesity-campaigns-should-be-as-hard-hitting-as-smoking-ads/4009081.article
[18] http://www.bbc.co.uk/news/health-25720618
[19] http://www.nccor.org/downloads/ChildhoodObesity_020509.pdf
[20] http://online.wsj.com/news/articles/SB10001424052702304834704579405393034903418

and Media 2011). The AAP notes that online marketing offers new ways of reaching children and adolescents, and points to food and beverage brands' usage of online marketing techniques such as advergames, designated children's areas and child-friendly designs (e.g. using cartoons).

2.2 The growth of social and mobile marketing

Advertising on social networking sites has also received criticism. Social marketing has changed rapidly in recent years and has become increasingly personalised and integrated into the social networking experience. Mobile advertising has been identified as a major growth area for social marketing, leading companies such as Facebook to invest heavily in mobile advertising analytics companies.[21] Facebook recently introduced video advertising into users' news feed which will play automatically.[22]

Recent figures have shown that the photo-sharing platform Instagram is becoming an important outlet for marketing companies, with brands such as Taco Bell in the US using it to target millennials more effectively.[23] Snapchat and Vine are other examples of social networks that are now receiving attention from marketers.

2.3 Data collection and social marketing to children

In addition to the perceived detrimental impact on food consumption and health, concerns have been voiced regarding children's privacy online. Although CAP's remit covers only limited aspects of data collection, this issue is likely to become increasingly important and adds important context. Digital advertising depends on gathering data from online users in order to produce targeted advertising and it is expected that as public awareness of data collection methods increases, there will be a need for a public debate over the implications for privacy.[24]

It has been suggested that the age at which children are protected by US COPPA regulation should be changed. COPPA (Children's Online Privacy Protection Act) currently prohibits any collection of personal data from users under 13 years old and these regulations apply to both American and overseas websites that target American audiences. In the US a group of politicians recently launched the 'Do Not Track Kids' bill, which proposes to extend the same protection to 13–15-year-olds and to curb the tracking of and targeted marketing to teenage users on the internet.[25]

Criticism has also been directed specifically at social networking websites for the way in which they are using data. In the US a group of parents, backed by child advocacy and privacy groups, have stated that they may ask a federal court to throw out a settlement with Facebook over the use of

[21] http://venturebeat.com/2014/03/22/facebook-begins-to-assert-itself-in-mobile-analytics/
[22] http://mashable.com/2014/03/13/facebook-video-ads-news-feed/?utm_cid=mash-com-Tw-main-link
[23] http://www.adweek.com/news/technology/taco-bell-buys-its-first-instagram-ads-push-waffle-tacos-156582
[24] http://www.economist.com/news/special-report/21615875-technology-has-transformed-advertising-consumers-need-be-kept-board-world
http://www.economist.com/news/special-report/21615869-technology-radically-changing-advertising-business-profound-consequences
[25] http://www.washingtonpost.com/business/technology/bills-would-curb-tracking-of-and-advertising-to-children-on-internet/2013/11/14/dee03382-4d58-11e3-ac54-aa84301ced81_story.html

images for advertising.[26] Facebook was ruled to have used users' images without permission in advertisements known as 'sponsored stories'. Some argue however that the company is still using children's images without seeking proper permission. Concerns have also been raised about the use of personal data on Instagram, another social networking site which is popular with teenagers and owned by Facebook.[27]

In Australia research carried out by the Baker IDI Heart and Diabetes Institute has argued that companies such as Cadbury, McDonald's and Coca-Cola have used methods of targeting children and adolescents online which would not be permitted through traditional media.[28] These include branded games, mobile apps and Facebook discount codes. The researchers argued that these companies used methods and styles that would appeal to children, despite the fact that children under 13 were not supposed to be using Facebook.

Concerns have also been raised over exposure to advertising on YouTube. It has been argued that the website does not sufficiently protect underage users. This has particularly been highlighted with regards to alcohol marketing, although it should be noted that alcohol differs from food and beverages as it and its marketing are subject to age restrictions.[29]

2.4 Government and Industry Responses

The World Federation of Advertisers notes there has been a global surge in regulatory action since 2011, when the United Nations held a conference on non-communicable diseases in New York.[30]

A commitment made by 20 large firms referred to as the 'EU Pledge' has had significant implications on online advertising practices in Europe.[31] Member companies have committed to not advertise products to children under 12, with the exception of products that fulfil certain nutritional criteria. The agreement covers media content with a child audience share of 35% or higher. The Pledge commitments were enhanced in January 2012 to include company-owned websites. By extending the coverage of the commitment to cover both third-party online advertising and brand websites, the EU Pledge covers online marketing. From the end of 2014, the signatories have also committed to advertising products according to common nutritional criteria now published. Food and beverage marketers also separately published global commitments known as the IFBA Pledge, which states that advertisers may only promote products to children under 12 on television, in print and online if these comply with nutritional guidelines for healthy eating (for more see section 1.1.1).

[26] http://www.washingtonpost.com/business/technology/parents-resume-privacy-fight-vs-facebook-over-use-of-childrens-images-in-ads/2014/02/12/5ceb9f82-9430-11e3-b46a-5a3d0d2130da_story.html
[27] http://www.washingtonpost.com/business/technology/preteens-use-of-instagram-creates-privacy-issue-child-advocates-say/2013/05/15/9c09d68c-b1a2-11e2-baf7-5bc2a9dc6f44_story.html
[28] http://www.heraldsun.com.au/news/fastfood-firms-on-facebook-and-social-media-to-exploit-advertising-standards-loopholes/story-fni0fiyv-1226740537320
[29] http://www.cam.ac.uk/research/news/underage-youth-exposed-to-alcohol-advertising-through-social-media
[30] http://www.economist.com/news/international/21590489-are-children-fair-game-sophisticated-and-relentless-marketing-techniques-many
[31] http://www.eu-pledge.eu/sites/eu-pledge.eu/files/reports/EU_Pledge_2012_Monitoring_Report.pdf

In addition to food and beverage companies choosing to implement global self-regulation , media companies like Disney have announced that it will not include promotions for unhealthy food products in its children's programming.[32]

In the UK, HFSS food advertising during children's programmes was restricted in 2006 following work by Ofcom;[33] the output of this work is embodied in rules now in the BCAP Code. The new rules followed calls from Government in 2003 to restrict HFSS advertising due to concerns over child obesity.[34] At the same time, CAP decided to tighten its Code with new content restrictions prohibiting marketing practices that were considered likely to unduly influence children's food preferences, such as promotional offers and the use of licensed characters and celebrities. The rules differ from those in the BCAP Code as they apply to all food advertisements, except those for fresh fruit and vegetables, which are directed at pre and primary school children; there is no utilisation of nutrient profiling to distinguish between healthy and less healthy products. In 2011 the coverage of the CAP system was extended to encompass advertisers' own websites and third party space under their control, principally, social media sites.

Later, concerns over the commercialisation of childhood led to the publication of the Buckingham Review (2009) and later the Bailey Review (2011). Following the Bailey Review, CAP carried out a review (2012) of the use of children as brand ambassadors and peer-to-peer marketing which included guidelines for responsible marketing to children. The ASA carried out a compliance study in 2013 which showed that advertisers largely complied with the regulations for marketing on social media websites (ASA 2013). The study involved 24 children whose internet use was monitored for up to 45 minutes. During this time the children saw a total of 427 advertisements. These 427 advertisements were assessed against the ASA Compliance Code. There is a need for more research which takes into account the regulatory system in the UK and its effectiveness.

2.5 The US view of the use of online advertising and marketing to children

In the US food and beverage marketing to children has increasingly received criticism and for context it is important to consider this since critics in the UK are influenced by this. Criticism particularly increased after the White House Task Force on Childhood Obesity identified food marketing as a contributor to the increase in obesity levels (2010). The Task Force was initiated as part of 'Let's Move', a programme led by First Lady Michelle Obama to combat child obesity[35].

According to the task force, digital forms of marketing provide new and more effective ways of reaching children and young people. While the FTC in the US noticed a 19.5% drop in food marketing to young consumers between 2005 and 2009, it also noted a 50% increase in online and mobile marketing (Leibowitz, Rosch et al. 2012). Following criticisms from the White House Task Force and

[32] http://www.economist.com/news/international/21590489-are-children-fair-game-sophisticated-and-relentless-marketing-techniques-many

[33] When the UK government published its Choosing Health white paper, Ofcom still held responsibility for regulating broadcast advertising. This was subsequently contracted out to BCAP and the ASA in 2004. Ofcom continued the work it had initiated in respond to the government's call for action on exposure to HFSS advertising and, following extensive consultation, instructed BCAP, under the terms of the contracting out agreement, to place new provisions in the BCAP Code.

[34] http://stakeholders.ofcom.org.uk/market-data-research/other/tv-research/hfss-final-review/

[35] http://www.letsmove.gov/

the FTC, the advertising industry has signalled that it is planning to enforce existing self-regulatory frameworks.[36] The FTC in the US recently launched investigations into mobile gaming companies and mobile marketing agencies that are believed to be breaching COPPA regulations.[37] While COPPA refers to the US market, children can access content from anywhere in the world, and UK advertisers and marketers need to be aware of this.

In 2013 the FTC made changes to the regulations and gave mobile marketers a period of time to amend their practices. The updates included changing the definition of children's online privacy to include 'persistent identifiers such as cookies that track a child's activity online, as well as geolocation information, photos, videos, and audio recordings'.[38] Companies that have not yet brought their practices in line with new regulations are now the focus of investigation and may be fined up to $16,000 for each violation. This means a company will be forced to pay $16,000 per app download or login where COPPA is being violated. For more on COPPA see 5.9.

2.6 Other countries' view of the use of online advertising and marketing to children

Changes to regulation are occurring in other countries. Although they often focus on TV or broader issues like advertising to younger children, they could have an impact on the various approaches to digital food advertising.

In an attempt to curb childhood obesity, Mexico has announced that it is banning the advertising of 'junk food' in the afternoons and evenings as well as during weekends.[39] This follows moves to increase taxes on unhealthy food and drink products. In Taiwan regulators have been given the power to restrict marketing and sales of food products thought to be unhealthy to children.

In many countries, governments have chosen to cooperate with industry on self-regulatory frameworks. According to the Economist, EU countries are planning to strengthen self-regulatory framework.[40] In Norway, where broadcasting advertising to children is banned, the government has given industry two years to enforce a ban on all advertising to children under 13, backed by the threat of legislation should industry fail to comply. The self-regulation framework and practice will be reviewed in 2015. In Singapore frameworks for advertising to children will be provided by the health ministry for the advertising industry to follow.

[36] http://www.economist.com/news/international/21590489-are-children-fair-game-sophisticated-and-relentless-marketing-techniques-many
[37] http://venturebeat.com/2014/03/27/feds-to-mobile-marketers-stop-targeting-kids-or-else-exclusive/
[38] http://www.ftc.gov/news-events/press-releases/2013/07/revised-childrens-online-privacy-protection-rule-goes-effect
[39] http://www.economist.com/news/international/21590489-are-children-fair-game-sophisticated-and-relentless-marketing-techniques-many
[40] http://www.economist.com/news/international/21590489-are-children-fair-game-sophisticated-and-relentless-marketing-techniques-many

3.0 Children's Use of Digital Media

Concerns over children's exposure to online marketing for unhealthy food and beverage products form part of a broader debate about children's use of digital media. Children's use of the internet has continued to increase and in recent years this has been driven by children's take-up of mobile devices such as tablets and smartphones. According to Ofcom (2014) this has implications for how we measure children's media use. As use of internet enabled devices such as tablets, smartphones and Smart TVs increases, it becomes difficult to distinguish what constitutes online and offline media use.

Results from Ofcom's annual survey, published October 2014 (Ofcom 2014b), show that seven out of ten children aged 5-15 (71%) have access to a tablet computer in the home. This is an increase of 20% compared with 2013 (from 51%). Two thirds (65%) of children aged 3-4 live in a household with access to a tablet. One in three children between five and 15 own their own tablet computer, up from of one in five in 2013 (19%). While laptops remain the most popular device used to go online children are increasingly using the internet on a smartphone or a tablet. 42% of children 5-15 go online using a tablet (up from 23% in 2013) and 36% use a smartphone to go online (up from 27% in 2013). Amongst children 3-4, 20% use a tablet to go online. The amount of time children spend online has increased slightly the last two years. Children aged 3-4 now spend on average 6.6 hours online per week and children 5-7 spend on average 7.2 hours online. For 8-11 year olds this increases to 10.5 hours (up from 9.2 hours in 2013) and for 12-15 year olds it increases further to 17.2 hours on average.

Another survey from Ofcom (2014a) has found that 60% of 6-11 year olds claim to use a tablet on a weekly basis, compared with 38% of adults. 49% of 12-15 year olds use tablets on a weekly basis. 27% of 6-11 year olds and 67% of 12-15 year olds use a smartphone every week.

Gaming, communication and watching video clips are three of the most common online activities among children. 20% of 8-11 year olds and 71% of 12-15 year olds have an active profile on a social networking website (Ofcom 2014b). 33% of children 5-15 play games online and 66% of 8-15 year olds watch YouTube channels. Short clips on the internet, such as YouTube, account for 7% of all video content consumed by children 6-11 (Ofcom 2014a). For 12-15 year olds this increases to 19%. 62% of all communication among 6-11 year olds happens through online chatting or video chatting, instant messaging, social networking sites or email. For 12-15 year olds this increases to 71%. Children 12-15 also spend more time going online than watching TV and say they prefer socialising online (33% prefer this) to watching TV (20% prefer this) (Ofcom 2014b).

Particular concern has been directed at digital media use among very young children. Research in Europe and the US has shown that digital media use among this young age group has also increased dramatically, particularly the use of tablets and smartphones (Holloway, Green et al. 2013; Ofcom 2014; Rideout 2013). Disquiet has been raised over what, if any, effect technology use may have on children's physical, social, cognitive and emotional development, since at a time when increased vulnerability to unwanted influences may occur (Choudhury and McKinney 2013).

There is concern that excessive media use among children may lead to 'addiction' and stories of internet addiction among children and teenagers have featured frequently in the media in recent

years.[41] This is despite research showing that only 1% of children exhibit pathological signs with regards to technology use (Smahel, Helsper et al. 2012). Other concerns relate to inappropriate content, cyberbullying, communication with strangers and a lack of time spent in face-to-face activities.

There is also unease expressed that children's media use displaces other activities such as exercise or sleep which may contribute to their health and wellbeing (Eggermont and Van den Bulck 2006; Cain and Gradisar 2010; Strasburger, Jordan et al. 2010; Garrison, Liekweg et al. 2011). However, although it is acknowledged that children are exposed to risks online, it has also been pointed out that the internet holds important benefits to children's social development (Valkenburg and Peter 2009; Livingstone, Haddon et al. 2011; Livingstone, Ólafsson et al. 2011; Pea, Nass et al. 2012).

[41] http://www.telegraph.co.uk/technology/10008707/Toddlers-becoming-so-addicted-to-iPads-they-require-therapy.html
http://online.wsj.com/news/articles/SB10001424127887324263404578615162292157222
http://www.bbc.co.uk/news/education-27040957

4.0 Children's Understanding of Marketing and Persuasive Intent

When considering the effects of online food and beverage marketing to children, it is important to consider the literature and research on children's understanding of marketing. Children have been recognised as a more vulnerable advertising audience because their understanding of advertising and persuasive intent is not yet fully developed. Many of the theories explaining children's understanding of advertising are based on models of cognitive development, in particular Jean Piaget's theoretical framework. It should be noted however that Piaget's theories have since been criticised, particularly for not taking account of socio-cultural differences and not acknowledging that children's development is influenced by the social or cultural world in which they live (Woodhead 1999).

According to Piaget, the child moves through a process of developmental stages, from immaturity to maturity. Although all children follow the same stages of development, it is an individual process and children do not develop at the same rate. Social competence is an element of child development which is especially important to the understanding of advertising, as it enables children to take the perspectives of other people, which, for example, allows them to understand that advertising messages are motivated by the intention to sell a product.

Roedder-John (1999) used Piaget's model of child development to create a theory of childhood consumer socialisation. Following Piaget, John argued that children pass through three stages of development: the perceptual stage (3–7), the analytical stage (7–11), and the reflective stage (11–16); and it is not until this final stage that children reach a sophisticated understanding of advertising.

Children's limited understanding of how advertising communicates and the intent behind it will, according to John, make children more vulnerable to its effects. Brian Young (1986; 1990) has similarly argued that unless children have acquired 'advertising literacy' they are less able to cognitively defend themselves against the effects of advertising. The process of acquiring advertising literacy is considered to be dependent on both cognitive development and consumer socialisation through direct exposure to consumer activities, often mediated by parents, peers or media (Roedder-John 1999; de la Ville and Tartas 2010).

Although it is acknowledged that acquiring advertising literacy is a gradual process (Kunkel, Wilcox et al. 2004; Gunter, Oates et al. 2005), there has been significant debate about the age at which children acquire mature levels of advertising literacy, particularly since the development of online marketing. Research has previously pointed to evidence that children can recognise an advertisement as different from a television programme around the age of seven or eight as an indication that this is when children have acquired advertising literacy (Donohue, Lucy et al. 1980; Macklin 1987).

It has since been pointed out that there is a difference between recognising an advertisement and understanding its persuasive role and how it is communicated (Andronikidis and Lambrianidou 2010). More recent research, particularly research on newer marketing formats such as advergames, product placements, endorsements and viral marketing, has shown that a mature understanding of persuasion tactics is not acquired until children are much older, often during adolescence (Oates,

Blades et al. 2001; Oates, Gunter et al. 2003; Owen, Auty et al. 2007; Kunkel 2010; Rozendaal, Buijzen et al. 2011; An, Jin et al. 2014; Oates, Li et al. 2014).

It has also been highlighted that having advertising literacy does not necessarily mean children will identify advertising, especially if the persuasive intent is more embedded or if the child is distracted, for example, by the entertaining nature of the content (Waiguny, Nelson et al. 2013). For discussion on children's understanding of online advertising and marketing see 8.1.

4.1 Media Smart in the UK

Launched in 2002, Media Smart develops and provides free educational materials for primary schools, teaching children to think critically about advertising in the context of their daily lives.

In 2014/15, Media Smart will be expanding its resources to provide resources to secondary school aged young people about advertising as well as for children of primary school age and parents. It will be updating existing resources in line with changes in the curriculum, and is planning to develop new resources on advertising in social media and mobile as well as information about cookies and privacy.

Media Smart UK is funded by the advertising industry and its resources are developed by teaching professionals and academics. An expert panel of leading academics, along with the European Commission, UK Government and Ofcom has been established to give advice on the resources.

In the last decade, Media Smart has produced a range of resources for teachers and parents about digital advertising, including three Digital Adwise lessons (an introduction to advertising, advertising to children, non-commercial advertising), five lessons produced by T-Mobile and Saatchi & Saatchi for Media Smart on various digital techniques including social media and viral advertising, and a parent pack about digital advertising techniques, published in November 2012 in response to the Bailey Review 'Letting Children be Children'.

Most recently, in February 2014, IAB created for Media Smart a short animated film, for children and parents, explaining what advertising is seen online. This can be viewed on www.mediasmart.org.uk.

5.0 Online Marketing of HFSS Products to Children

Public concern surrounding children's health, as well as disquiet about children's use of digital media, have had some influence on the academic debate about online marketing. Online marketing is highlighted as one of the multiple channels through which children are exposed to advertising (Ustjanauskas, Eckman et al. 2010; Scully, Wakefield et al. 2012; Cairns, Angus et al. 2013; Harris, Schwartz et al. 2013). It is argued that advertisers are increasingly responding to the changes in children's media preferences and that online marketing is therefore a major growth area (Montgomery and Chester 2011; Scully, Wakefield et al. 2012; Quilliam, Rifon et al. 2014).

Although some studies have looked at what impact marketing may have on children's wellbeing and materialism (Buckingham 2009; Ipsos Mori and Nairn 2011; Opree, Buijzen et al. 2012), the majority of research focuses either on food marketing and its role in food consumption and public health, or on children's understanding of advertising. As discussed earlier, the marketing of HFSS food products has received particular attention due to concerns of childhood obesity and the role that food marketing plays in this (Kelly, Bochynska et al. 2008; Quilliam, Lee et al. 2011; Dietz 2013; Panic, Cauberghe et al. 2013; Weatherspoon, Quilliam et al. 2013; Wilking, Gottlieb et al. 2013; Quilliam, Rifon et al. 2014).

The debate is founded on a correlation between products which tend to be marketed on websites popular with children and high levels of fat, salt and sugar. (Calvert 2008; Henry and Story 2009; Lingas, Dorfman et al. 2009; British Heart Foundation 2011; Montgomery, Grier et al. 2011; Sandberg 2011; Harris, Speers et al. 2012; Kervin, Jones et al. 2012; Cairns, Angus et al. 2013; Ustjanauskas, Harris et al. 2013; Quilliam, Rifon et al. 2014). These findings reflect similar findings found for television marketing (Institute of Medicine 2006).

It should be acknowledged that the debate over the effects of online marketing of HFSS food and beverage products to children forms part of a broader debate in academia concerning whether children are to be seen as sophisticated consumers of media or vulnerable innocents.

David Buckingham (2007) has previously highlighted that this polarisation is constructed, and that consumer society and the child's role in it is a complex social and cultural development which cannot be understood solely by the increase in advertising. Buckingham further argues that studies of children, marketing and consumption should also acknowledge factors such as social class, gender and ethnicity, as well as the consumption practices of parents.

5.1 Children's perception of online advertising

There is little evidence of how children perceive online advertising, although it is likely that attitudes towards advertising could significantly impact its effectiveness. The most recent report from Ofcom published October 2014 (Ofcom, 2014b) indicates that children increasingly dislike advertising online. 31% of 8-11 year olds and 46% of 12-15 year olds in the survey said there were too many adverts on the internet and this is an increase from 22% for 8-11 year olds and 35% last year.

A study with Spanish adolescents found that negative reactions towards brand placements in a game could reduce positive effects of brand attitude (Redondo 2012), but little similar research has been carried out with children.

It is argued that more research is needed to establish the popularity of online marketing techniques, especially advergames (Harris, Speers et al. 2012). According to Harris, Speers et al. (2012), children are disproportionately attracted to websites that feature advergames, but more sophisticated research on traffic data is needed to establish how many children visit these websites and how long they engage with the content.

A small study with nine and ten-year-old Swedish children (Martinez, Jarlbro et al. 2013) asked children how they felt about advertising online and explored their strategies for avoiding advertising they did not like. The authors argue that these children were mostly sophisticated internet users and had strategies to avoid unwanted advertising.

The children were either mostly negative or ambivalent towards advertising. The children who were negative towards advertising said they found advertising which interrupted what they were doing very annoying, for example, when watching videos on YouTube. They avoided the adverts either by looking away or using the time to do something else; similar to the way in which they would avoid advertising on television. However, children were entertained by some of the advertisements they had seen, predominantly the ones they found funny or that included animals or cartoon spokes-characters. More research exploring children and young people's attitudes to advertising across different markets would be beneficial in gaining a more nuanced understanding of the role marketing plays in children's lives.

5.2 Marketing to teenagers

It has been argued that food and beverage marketing to teenagers uses more innovative techniques than marketing to children. The Yale Rudd Center for Food Policy and Obesity noted that, while the number of banners ads for food and beverage brands or products in the US declined by over 50% from 2009 to 2012, marketing via mobile devices and social networks grew exponentially (Harris, Schwartz et al. 2013).

It is argued, therefore, that these brands have increasingly shifted their marketing away from advertising on third-party websites and towards marketing on social networks where teenagers are thought to be easier to reach. (Harris, Schwartz et al. 2013; Wilking, Gottlieb et al. 2013). There is however no research on what role online advertising plays in teenagers' social lives, their wider media use or eating habits.

These forms of advertising are argued to tap into adolescent development where identity formation, independence and peer contacts are very important (Montgomery 2011). While the Children's Online Privacy Protection Act (COPPA) currently states that personal data cannot be collected from children under 13, it has been argued that this should be extended to include teenagers as this group is a key demographic for food and beverage brands that have a strong presence online (Wilking, Gottlieb et al. 2013).

In the US, particular concern has been voiced by health organisations over the impact of food and beverage marketing to minority youths as they are more likely to suffer from obesity-related health problems such as diabetes

5.3 What makes online marketing different?

Part of the concern about online marketing comes from a belief that it fundamentally differs to traditional marketing. Compared to traditional marketing, online marketing is perceived to be offering children an 'immersive environment' (Montgomery and Chester 2009) where children are exposed to the advertised brands or products through a variety of multimedia formats, some of which allow the child to interact with the brand. Based on a content analysis of 17 websites targeted at children, researchers Cheyne, Dorfman et al. (2013) argued that there was a positive relationship between immersive environments and popularity and engagement. The researchers found that websites with more content and higher levels of multimedia content, interactivity and personalisation had higher visitor numbers and that children engaged for longer with the content on these websites.

The interactive nature of the internet is believed to make children's engagement with marketing material more meaningful, entertaining and personal (Bucy, Kim et al. 2011; Wilking, Gottlieb et al. 2013). Studies with children have found that interactive advertising content can establish positive brand associations (Sandberg, Gidlöf et al. 2011; Waiguny, Nelson et al. 2012; Cheyne, Dorfman et al. 2013; Rideout 2014).

Hang and Auty (2011) argue that the bidirectional flow of communication that occurs when children can interact with the marketing content will lead to increased engagement with the brand leading to greater effect on brand attitude. It is also suggested that data collection makes it easier for marketers to both target and measure their advertising campaigns in a more effective way (Wilking, Gottlieb et al. 2013).

According to Cheyne, Dorfman et al. (2013), the internet also offers increased opportunities for cross-promotions and viral marketing. In particular, the growth of social media through mobile devices has increased the opportunities for cross-media promotions. For example, social networks are used to increase awareness of other marketing channels (Wilking, Gottlieb et al. 2013). However, research into cross-media marketing is scarce as the research frameworks used to measure advertising only capture isolated mediums (Montgomery and Chester 2011).

Online marketing is thought to be increasingly global and, because much online marketing material for children relies heavily on visuals such as images, cartoons and games and less on text, it is easily translated into other languages, potentially making it more difficult to regulate (Flowers and Lustyik 2010). Currently however there is little robust evidence available to show the ways in which online marketing is communicated or understood differently by children.

5.4 Regulation compliance

A substantial amount of research on marketing to children has monitored compliance to advertising regulation and self-regulation, and evaluated the effectiveness of these frameworks in limiting

children's exposure to advertising. According to Chambers, Freeman et al. (2014), research on food advertising to children in general has shown that regulatory actions are more effective than self-regulation when it comes to reducing children's exposure.

With regards to online marketing specifically, there is, according to Chambers, Freeman et al. (2014), very little research on regulation effectiveness. This is partially due to the relatively short time in which online marketing has been widely used and a lack of regulation specifically targeting these forms of communication.

The starting point for much of the research on online marketing, particularly American and British publications, is a perception that online marketing is not sufficiently addressed by regulatory frameworks. The use of food packaging to direct children to websites, apps or social network profiles, the blurring of entertainment and marketing (for example, through the use of advergames) and incentive-based marketing such as sweepstakes and contests are areas regulators have been cited as areas to address (Bucy, Kim et al. 2011; Staiano and Calvert 2012; Wilking, Gottlieb et al. 2013). It should be noted that many of these publications are from organisations lobbying for stronger regulation of online marketing to children.

Based on a comparison of online advertising practice in three high-income countries (US, Spain and France), Lascu, Manrai et al. (2013) argue that it is not only advertising regulation that shapes how HFSS food and beverage companies market to children online, but also how regulations are enforced.

A comparison of French and English-language websites targeted at children in Canada, where the French-speaking region of Quebec has a much stronger regulatory system compared to the overall Canadian self-regulatory system, found little difference in how children were targeted (Kent, Dubois et al. 2013). The content analysis of 147 websites showed that websites affected by Quebec's Consumer Protection Act did not contain fewer advertisements targeted at children and that these advertisements did not differ in content or style compared with English-language websites.

It was further found that the Canadian self-regulatory system did not significantly reduce the amount of advertising to children. The researchers argue that although the Quebec regulatory system is much stricter it is not sufficiently *enforced* to have the desired effect on children's exposure to advertising. Based on this, the researchers argue that a regulatory framework should be implemented across Canada, but that, similar to the current Quebecois regulations, it should be monitored much more closely to ensure compliance. It should be noted that these results differ significantly from previous research on the effectiveness of the Quebec Consumer Protection Act. An influential study by Dhar and Baylis (2011) analysed household expenditure data from 1984 to 1992 and found that in households affected by the fast food advertising ban, fast food expenditure decreased by 13%. It was suggested that overall the ban had reduced fast food consumption by US$88 million per year, which was argued to be contributing to Quebec having the lowest obesity rate in Canada. It should be noted however that this study looked at fast food advertising in print media and on television, and the authors highlight that a fast food advertising ban is highly effective only if media markets do not overlap. A consequence of the increase of digital technology is that media markets increasingly converge. According to Kent, Dubois et al. (2013) a ban on online advertising needs much closer monitoring and stricter enforcement to ensure compliance.

The Children's Food Campaign recently published a review of online marketing of HFSS food to children in the UK on 100 websites in which it was suggested that the model of self-regulation does not protect children sufficiently (Clark and Powell 2013). It was further argued that the current self-regulatory framework is vague in language, does not distinguish between healthy and unhealthy food products, does not acknowledge the amount of unhealthy food marketing directed at children and provides inconsistent levels of protection depending on the age of the children.

American publications have similarly argued that the self-regulatory framework is in need of reinforcing as it is not adequately protecting children (Harris, Speers et al. 2012; Ustjanauskas, Harris et al. 2013). One of the criticisms is that many websites that attract significant numbers of children do not meet the definition of a 'child-targeting website' and therefore are not covered by CFBAI (Schwartz and Ustjanauskas 2012; Ustjanauskas, Harris et al. 2013). It should, however, be pointed out that these publications comment on the situation as it stood in 2009 and 2010, and many of these companies' advertising practices may have changed since then.

One study has looked specifically at the use of cartoon characters to market products to children on websites and how this practice has developed in light of self-regulatory codes such as the Children's Advertising Regulation Unit (CARU) (Bucy, Kim et al. 2011). The authors found that, although there had been a decrease in product characters created by the marketers, there had been an increase in the use of animated characters from other television programmes or movies.

It is argued that the integrated use of characters is less easily monitored by regulators. It was also found that the characters were rarely explicitly labelled as advertisements. As integrating commercial elements into the game will make it more challenging for children to understand the persuasive intent of advergames, it is suggested that ad breaks may aid this process (Bucy, Kim et al. 2011; Nairn and Hang 2012) (see more in section 6.2).

It is further suggested that, in both the American and British regulatory framework, there should be specifications for how ad breaks should look and where they should be placed as this practice has been found to vary significantly. While there is currently no consensus on whether ad breaks do in fact limit children's vulnerability to online advertising, it has been suggested that clear ad disclosure formats be included in regulatory frameworks (An and Stern 2011; Waiguny, Nelson et al. 2013).

Other strands of research argue that, due to the pace of technological innovation within marketing and the range of marketing methods employed, it will be increasingly difficult for regulators to maintain centralised control and it is suggested that more efforts should be directed towards educating children on the use of marketing (Skaar, Buckingham et al. 2011). Chambers, Freeman et al. (2014) similarly argue that, due to a lack of evidence on the effectiveness of regulations and children's limited understanding of online advertising, more focus should be placed on education.

Chambers, Freeman et al. (2014) have shown that studies assessing the effectiveness of regulation and self-regulation of advertising to children are limited by small sample sizes, in terms of both participants and advertising material. It is also suggested that these studies suffer from an over representation of industrial countries as well as a lack of focus on long-term effects (Waiguny, Terlutter et al. 2011; Chambers, Freeman et al. 2014).

5.5 Recommendations for regulators

In a review carried out for The Children's Food Campaign (Clark and Powell 2013) the UK Government is encouraged to enforce regulations across broadcast and non-broadcast marketing to children under 16, and it is suggested that regulation should include definitions of unhealthy food and means of determining whether marketing is targeting children.

It is argued that these regulations should be monitored by an organisation independent of the advertising industry. A report by the British Heart Foundation (2011) which reviewed advertising on 100 websites popular with children similarly argued that, while regulation of broadcast media has successfully limited the amount of televised HFSS food and beverage advertisements children are exposed to, the current self-regulatory framework in place in the UK does not provide the same protection online.

Regulation of advertising to children is largely shaped by the ethical issue of when children can understand advertising and, therefore, when it is fair to advertise to children. Based on new research evidence suggesting that the ability to recognise online advertising does not necessarily mediate the effects of advertising on children, it has been argued that regulation should focus less on when children can understand advertising and instead acknowledge that online advertising affects children independently of advertising literacy (Panic, Cauberghe et al. 2013).

With regards to the nutritional value of the foods advertised, it is argued that differences in definitions of healthy and unhealthy foods held by public health organisations, regulators and food companies themselves makes monitoring very difficult, and it is suggested that uniform nutritional definitions are enforced (Lascu, Manrai et al. 2013; Chambers, Freeman et al. 2014; Quilliam, Rifon et al. 2014).

A content analysis of food advergames in the US found that three different frameworks of nutritional value by the Institute of Medicine, the Federal Trade Commission (FTC) and the Center for Science in the Public Interest made it very difficult to provide clear evidence of the extent to which these advergames advertised healthy or unhealthy foods (Quilliam, Rifon et al. 2014). The authors also suggest that regulations should promote the inclusion of healthy lifestyle information in any advertising to children as their research found that this was only included in 55% of advergames popular with children.

5.6 Parental perceptions of online advertising

Previous research has shown that there is low awareness of advertising among parents (Ustjanauskas, Eckman et al. 2010; Clarke 2011). It is important, however, to remember that one of the criticisms of online marketing is that it is happening 'under the radar', thereby bypassing both parents and regulators (Thomson 2010; Berkeley Media Studies Group 2011).

A study carried out for Credos (2011) assessing parental perceptions found that, once prompted, parents were concerned but did not want to ban advertising, instead supporting ways of limiting children's exposure. However, research specifically discussing parental perceptions of online advertising is scarce.

According to a survey of over 2,400 American parents of children aged 2–17, 69% viewed media as a negative influence on their children's eating habits, followed by the food industry (61%) (Harris, Milici et al. 2012). Compared to findings from 2009 and 2010, parents were more likely to perceive food marketing as having a negative impact on their children's eating choices, and more likely to rank the internet as one of the top three locations where their child would view food marketing. A majority of parents supported suggested restrictions to food marketing in general, and mobile marketing (65%), viral marketing (62%) and online advertising specifically (61%).

Other studies have suggested that, unless prompted, parents rarely complain about online advertising. An audit of the parental feedback to an Australian children's website which contained advergames showed that almost no parents expressed complaints about the commercial nature of the content (Lewis 2010).

In a survey of 207 parents in the US, it was found that parents were generally unaware of advergames as a form of marketing directed at their children, but once made aware they overall expressed negative attitudes (Evans, Carlson et al. 2013). Parents were also found to have limited understanding of advergames and incorrectly identified children's website interfaces as advergames.

It has been suggested that parents' lack of awareness and understanding of advergames will make them less likely to mediate their child's exposure to this form of advertising. Dietz (2013) has similarly suggested that practices such as data collection, behavioural advertising and location-based advertising might be too complicated for many parents to critically understand, leaving them under-prepared to explain this to their children (Dietz 2013).

Two recent studies have looked at attitudes towards online advertising among parents in the UK (Cornish 2014, Newman and Oates 2014). Although these studies are somewhat limited by small sample sizes they raise some important issues with regards to parental awareness of online marketing. While parents in Newman and Oates' qualitative study with 14 families (16 parents and 29 children) believed that they were responsible for protecting their children from unwanted food marketing, they had very low awareness of online advertising. Similarly, the 42 parents interviewed by Cornish (2014) were generally unaware of online advertising and under-estimated their child's exposure to advertising on websites and advergames. Cornish specifically found that the majority of parents wrongly believed their children did not play advergames.

Parents in both studies expressed concern over television advertising and believed that advertising in general could impact their children's attitudes, but these concerns did not extend to online advertising. According to Cornish, parents also underestimated the impact of online advertising on their children. While it was felt that children would find the content highly entertaining, parents believed their children would not recognise it as advertising and therefore not be influenced. This is at odds with previous studies that have found that children can be influenced by unrecognised advertising (Hang 2012, Hand and Auty 2011, van Reijmersdal, Rozendaal et al. 2012).

Cornish points out that the need to raise awareness among parents in order for them to be better equipped to help their children become responsible consumers was highlighted in the Bailey Review (Department for Education 2011). She further argues that the low awareness of the extent and potential impact of digital advertising found among parents in her research will make it difficult for them to mediate their children's exposure. This was confirmed in the study by Newman and Oates

(2014), which showed that parents were more aware and critical of their child's exposure to television and in-store advertising, which they were more likely to mediate. Given the role that parents play in their child's consumer socialisation process, Cornish argues that more should be done to raise awareness among parents of the extent of digital marketing to children. Newman and Oates also points out that parents may be less likely to mediate their child's exposure to online advertising because online safety is generally a much more prevalent concern among parents compared to advertising.

According to Böttner and Ivens (2014), new marketing strategies such as advergames have renewed parental concerns around advertising to children and its impact on food habits. Parents' concerns in this study were founded on the belief that the embedded nature of online marketing will make persuasive intent difficult for children to recognise. The findings showed that parents were aware of the existence of advergames but had limited understanding of how these games were designed and were not aware that their children could freely access these games online.

The parents in Böttner and Ivens' study were, in general, supportive of more regulation and more responsible marketing to children. It is therefore argued that advertisers should acknowledge the increasing concern among parents towards online marketing to children which is currently less regulated than broadcast advertising. However, the findings of this quantitative study were limited by a small sample size of 362 parents, most of whom were mothers.

In a small, qualitative study that asked parents to comment on branded mobile apps directed at children (Muzellec, de Faultrier et al. 2014), it was found that parents were positive about apps that offered some sort of experience, entertainment or learning opportunity to their children. In discussions with parents, this was contrasted with what was considered much more passive advertising formats such as television ads.

It is, however, acknowledged that the findings were likely to be different if the apps were promoting a different sort of brand, for example, a fast-food brand. The parents involved in the fieldwork were aware of other mobile apps, for example, created by McDonald's and were more critical of these.

5.7 Children's online privacy

In addition to the impact of marketing on food consumption and health, concerns have also been voiced over the implications for children's online privacy. This is currently an area which has not been sufficiently discussed in academic literature. It is also the case that data collection practices and regulations change very rapidly making it difficult for academic research to remain relevant. Only certain aspects of data collection are part of CAP's remit, but as this issue is likely to become increasingly important it adds context. The main focus of the rules is on the use of data for marketing purposes, but the CAP Code includes rules governing online behavioural advertising (OBA), a sophisticated form of targeted advertising. Third parties, such as advertising networks, work with websites and advertisers to deliver customised advertising based upon the collection and use of web browsing activity. This includes: pages visited, ads clicked and products purchased or researched. This data, about a user's web browsing activity, is collected and analysed.

The CAP Code's rules mirror a wider European initiative by cooperating self-regulatory organisations to ensure that consumers are aware they are being targeted and have the opportunity to opt out. A

key provision relevant to the children's food debate is the prohibition on creating interest segments specifically designed for the purpose of targeting OBA to children aged 12 or under.

American COPPA regulations currently prohibit any collection of personal data from users under 13 years old and these regulations apply to both American and overseas websites that target American audiences (please see 2.5). Some researchers are, however, critical of the extent to which these regulations protect children's privacy, as it is argued that children may easily be able to get around requests for parental consent on websites (Shin, Huh et al. 2012).

It is also suggested that children will struggle to understand the commercial nature of data collection and online behavioural advertising. In one study with 381 9–12 year olds (Shin, Huh et al. 2012), it was found that children had limited understanding of data collection but that their willingness to give out personal data was positively linked with their experience using digital media. In other words, children who are frequent internet users are more likely to give out personal data.

Critical understanding of advertising was linked with negative attitudes towards online advertising but not with negative responses such as denying access to personal data. It is further argued that, as parents are likely to have lower levels of confidence with digital technology, more external support must be given to children to improve their critical understanding of online advertising and data collection. It is notable that Media Smart (see section 4.1) has stated that it aims to prepare some lesson resources in this area. Children's understanding of data collection and privacy is however an area in need of more research.

5.8 Measuring advertising exposure

These criticisms form part of a larger critique of existing communication theories arguing that current measurement methodologies are inadequate to assess new media communication forms (Dahl, Low et al. 2012; Valkenburg and Peter 2013). Valkenburg and Peter (2013) suggest that, while media-effects studies often only find small to moderate effects, researchers tend to argue that these findings go against common sense as everyday experiences seem to offer numerous examples of media effects.

One of the main challenges for media-effects studies in general, and marketing research in particular, is developing more sophisticated ways of measuring exposure in a reliable and valid way (Valkenburg and Peter 2013). Measurement techniques will need to include length and frequency of exposure as well as a way of differentiating between types of content. Media-effect studies have frequently used self-reporting as a method for data collection, although these are likely to be inaccurate even with adult respondents. Valkenburg and Peter (2013) further argue that research needs to develop clear indicators to help determine which individuals will be more susceptible to the effects of media and advertising.

Opree, Buijzen et al. (2014) similarly argue that a standardised measure of advertising exposure is needed, particularly one that takes longitudinal exposure into account. In an experimental study with 165 8–11 year old children, the researchers measured (1) exposure to the medium, (2) exposure to the content, (3) exposure to commercial content and (4) exposure to commercial content weighted by advertising density. It is argued that exposure to internet advertising is best

measured by asking children how often they use the internet and how often they visit certain websites, potentially weighting for advertising density on some websites.

Much of the research on online marketing uses syndicated data provided by companies such as Nielsen and comScore to assess the extent of marketing on websites targeting children. It is, however, argued that the cost of obtaining this data prohibits many researchers from having access to it (Harris, Schwartz et al. 2013).

Harris, Schwartz et al. (2013) further argue that this data is limited in that it does not provide information on the extent to which users interact with the marketing content. Furthermore, it does not include data on marketing on social networking sites and how users engage with brands in these spaces. When assessing the extent to which advergames promoting food products reached child audiences, Quilliam, Rifon et al. (2014) found that audience data was not available for many of the websites they had identified because these websites did not attract enough visitors to qualify for measurement.

6.0 What Are the Effects of Online Marketing on Children?

It has been argued that online marketing of food and beverages to children has a negative effect on children's health (Montgomery and Chester 2011; Thomson 2011; Cheyne, Dorfman et al. 2013; Kelly, King et al. 2013; Ustjanauskas, Harris et al. 2013; Quilliam, Rifon et al. 2014). It is, however, acknowledged that more evidence is needed to understand the relationship between advertising exposure, brand attitudes, actual brand purchase, eating patterns and health (Dahl, Low et al. 2012; Staiano and Calvert 2012; van Reijmersdal, Rozendaal et al. 2012; Harris, Weinberg et al. 2013).

Several studies have found that children's attitudes toward a brand improve following exposure to online marketing techniques such as websites, videos, competitions and advergames (Waiguny, Terlutter et al. 2011; Cheyne, Dorfman et al. 2013). There is, however, less research showing that positive brand associations are linked with increased consumption among children.

While several studies have attempted to monitor purchase attempts and children's likelihood to request a product (van Reijmersdal, Jansz et al. 2010; Hang and Auty 2011; Waiguny, Terlutter et al. 2011; van Reijmersdal, Rozendaal et al. 2012; Waiguny, Nelson et al. 2013), this is often measured directly after exposure to the marketing content and any long-term effects are, therefore, not captured. While one study (Waiguny, Nelson et al. 2013) did attempt to assess long-term effects by revisiting the children who participated in the experiment two weeks later, this study also relied on children's self-reporting of requests for the advertised product and this was not confirmed with parental interviews.

An Australian survey explored the association between advertising exposure and eating habits among over 12,000 12–17 year olds (Scully, Wakefield et al. 2012). The survey covered marketing seen on television, transportation and school in addition to online marketing. The survey found a positive link between all forms of advertising exposure and the consumption of unhealthy food and beverage products, and the link was particularly strong for online marketing. The authors argue that this is due to the personalised nature of online marketing and the ability to interact with the content.

The study however suffered from two major limitations. Firstly, it relied on self-reported exposure to marketing and food consumption. Previous research has suggested that young people tend to underestimate the amount of advertising they are exposed to, as well as their intake of unhealthy food and beverage products (Gwynn, Flood et al. 2010). The second limitation to this study is that is only includes special offers, give-aways and competitions which were directly communicated to the consumer, for example via email, therefore it only covers one aspect of the overall online marketing to which young people are potentially exposed.

More in-depth research is needed to understand the role of online marketing in children's lives. Despite increasing concerns around marketing to children and child wellbeing children's own voices are rarely heard in this debate. Ethnographic studies that investigate children and young people's attitudes to online marketing, what forms of online marketing they remember seeing and how they think it may influence their purchasing and eating habits can contribute a new aspect to the debate. Research should also investigate the relationship between peer influence and online marketing and what role online marketing content may play in peer communication.

6.1 Unconscious effects of advertising

Some studies have used more experimental methods to assess children's exposure to and processing of advertising such as eye-movement tracking. Hang (2012) found that the 9–11 year olds involved in the study mostly processed advertising outside their conscious awareness, but, despite the lack of conscious processing, their attitude towards the advertised brand still increased. Based on these findings, it is argued that brand recall or recognition may not be a suitable way to assess the effectiveness of brand placement in interactive games.

Other studies (Sandberg, Gidlöf et al. 2011; Holmberg, Sandberg et al. 2014) with Swedish teenagers using eye-movement tracking and in-depth interviews found that food and beverage advertising received more attention than other forms of advertising. The researchers suggest that this may be due to the perceived relevance of affordable and accessible food items compared to some of the other products and services that were advertised to them. It was further found that teenagers had a low awareness of the amount of advertising they had actually seen, and that they frequently understated that amount.

Understanding of unconscious processing of online advertising would be improved by longitudinal studies tracking the relationship between unconscious advertising exposure, brand attitudes and consumption.

7.0 Marketing Techniques

7.1 Marketing on websites for children

The overall critique of marketing to children on websites targeted at or popular with children is that the marketing material is perceived to be integrated into the overall content, thereby blurring the boundaries between entertainment and advertising. According to Rideout (2014), marketing formats such as banner ads, integrated videos and games, downloadable branded content, competitions, give-aways and links to social media sites are frequently used by companies to maximise exposure and engagement with the brand on websites children visit. According to Staiano and Calvert (2012), websites containing entertaining and immersive content appealing to children help promote positive attitudes towards the brand rather than a specific product, potentially making the child more able to recall and request the brand over other competing brands.

A review of Australian magazine websites targeted at children found that, in addition to banner ads, marketing messages were also included in the editorial content, such as in sponsored recipes and games, where it was suggested that children would find it more difficult to recognise advertising (Kervin, Jones et al. 2012). A British study found that cartoons, animations, brand characters, games, competitions, downloadable content and links to YouTube videos were common methods in creating 'child-friendly' websites around a food brand or product (British Heart Foundation 2011).

A study of the use of cartoon characters to market products targeted at children online argued that the emotional attachment to animated characters that children develop may be increased by the opportunity to interact with the character through competitions and games (Bucy, Kim et al. 2011). The authors further argue that the non-linear nature of content consumption online compared to, for example, that via the television may lead children to have a longer and deeper sense of engagement with the brand and the advertising content.

7.2 Targeted marketing online

van Reijmersdal, Rozendaal et al. (2014) have argued that there is a lack of research on targeted advertising to children online. The researchers carried out an experimental study looking at the relationship between targeted advertising and brand recall, brand attitude and purchase intention. The findings showed that targeted advertising was linked with positive brand attitude and purchase intention but not brand recall.

The results were stronger when children liked the ad rather than if there was any perceived relevance of the product. While research with adults has shown a negative effect of recognising the targeted nature of advertising, these findings were not replicated in the research with children. The results indicate that children may process targeted advertising differently to adults. Due to limited persuasion knowledge, children are believed to process targeted advertising using low levels of cognitive elaboration, relying more heavily on the affective aspects of advertising.

The children further expressed very little understanding of the difference between targeted and non-targeted advertising. Based on this, it is argued that children are influenced by targeted advertising online partially due to their lack of awareness of the commercial tactics in use. More

research is needed to ascertain children's understanding of targeted advertising and whether this form of advertising influences their attitudes or behaviour.

7.3 Marketing to children on social networking sites

It is acknowledged that children are exposed to a variety of marketing messages on social networking sites (O'Keeffe and Clarke-Peatson 2011; Dietz 2013; Wilking, Gottlieb et al. 2013). These may take the form of separate banner ads or of sponsored messages integrated into the user's feed.

There is a concern among researchers over what they see as a link between youth-oriented brands and a strong presence on social networking sites (Wilking, Gottlieb et al. 2013; Rideout 2014). A content analysis carried out for the British Heart Foundation (2011) similarly found that the majority of food companies included in the review had a presence on social networking sites, particularly Facebook. The extent to which children are exposed to and engage with marketing on social networking sites is however not clear and this is an area in which more research is needed.

Teenagers are seen to be a core demographic for social marketing as they are heavy users of mobile devices and social networks, and because they are seen to be likely to want to share experiences and material with their peers (Harris, Schwartz et al. 2013; Wilking, Gottlieb et al. 2013). It has also been suggested that social media should, for this reason, be used to a greater extent to promote healthier lifestyles and eating habits (Garcia-Marco, Moreno et al. 2012).

A review of online marketing to children in the US found that fast-food restaurants placed 19% of all their online display advertising on Facebook in 2012. It further noted that brands such as Starbucks, McDonald's, Pepsi and Subway had a significant presence on websites such as Facebook, Twitter and YouTube, with millions of followers and 'likes' (Harris, Schwartz et al. 2013).

The authors also noted an increase in activity on these sites, with more content being published and more opportunities for users to interact with the brand. Engagement tactics included posting images or videos, asking questions, hosting competitions or posting links to either company or third-party websites.

Promotion methods that receive criticism include asking the user to give access to personal and location-based data or requesting the user to 'like' the brand before being given access to content (Wilking, Gottlieb et al. 2013). Despite websites such as Facebook, Twitter and YouTube having an age limit of 13 or older, the authors found examples of what they argue to be child-targeted content.

Despite the increase in concerns, there is very little research on the advertising that children are exposed to on social networking sites, whether children pay attention to it and what the effects are (Rideout 2014). The majority of research looking at children's use of social networking sites has focused on privacy, social interactions and cyberbullying (Valkenburg and Peter 2007; Livingstone 2008; Clarke 2009; boyd and Marwich 2011; Lenhart 2012; boyd 2014).

Earlier work on virtual worlds, which are often the first form of online social network children are exposed to, has shown that marketing material, purchases and displaying consumer behaviour forms part of the experience of experimenting with identity for young people (Kjørstad, Brusdal et al. 2011;

Mantymaki and Salo 2011). However, it is likely that advertising on social networks that do not include avatars will receive a different response.

A survey (D'Silva, Bhuptani et al. 2011) of just over 100 Indian youths argued that this group was more likely to positively perceive and purchase brands that have a social media presence. In another qualitative study (Kelly, Kerr et al. 2010), the teenagers mostly claimed to not notice banner ads and argued that they were capable of 'mentally filtering' them out. They did, however, admit to liking advertising they could engage with, or that relieved them of boredom, such as games.

The teenagers had little understanding of the connection between their personal data and the advertising they saw. Since this study was published in 2010, when it could be argued there was less public awareness of personal data, this may have now changed. The participants admitted to playing branded games on social networks but did not perceive them as advertisements. It is argued that these teenagers generally saw themselves as empowered consumers capable of limiting their exposure to or influence by marketing.

7.3.1 Targeted advertising on social networking sites

Particular concern has been raised over behavioural and demographic advertising, where advertising is targeted based on web browsing behaviour and demographic data (Dietz 2013; Wilking, Gottlieb et al. 2013), as it is expected that children will find this form of advertising difficult to recognise and understand (O'Keeffe and Clarke-Peatson 2011).

It should be acknowledged that these messages may not be targeted at children. Most social networking sites will employ an age limit of 13, in line with COPPA regulations. It is known, however, that children frequently circumvent these age limits and lie about their age in order to set up a profile on websites such Facebook (Clarke 2009; boyd, Hargittai et al. 2011).

A compliance survey carried out by the British Advertising Standards Authority (ASA) found that advertisers largely complied with the regulations for marketing on social media websites (ASA 2013). It was, however, acknowledged that children who state an age older than their own on social media websites will be exposed to advertising which may be inappropriate for their age, and the ASA states that this 'presents real challenges for advertisers, their agencies, social media platforms, parents, guardians, and regulators' (ASA 2013).

Kjørstad, Brusdal et al. (2011) have similarly argued that one of the challenges for online marketing regulators is deciding who is responsible when a child sees something he or she is not meant to see. This is seen to be a much more complicated issue in a digital environment compared with broadcast and printed media. They further argue that a clearer understanding of the extent to which children are in fact exposed to advertisement targeted at older audiences and a discussion of what the impact this may have on them is needed to effectively inform policy.

Another aspect of social networking is video sharing platforms. YouTube is a highly popular medium with children (Ofcom 2013) and, therefore, a likely forum in which to encounter advertising. However, beyond alcohol and tobacco marketing there is little research on children's exposure to advertising through this medium.

According to Martinez, Jarlbro et al. (2013), the nine and ten-year-olds in their study were largely familiar with and often annoyed by the adverts they see on YouTube. The children described having to wait to watch the video they wanted to see and having to close the adverts down to prevent them from blocking the screen. They were often exposed to the same adverts repeatedly which they found irritating.

Nearly all fast-food restaurants included in the review by the Yale Rudd Center for Food Policy and Obesity (Harris, Schwartz et al. 2013) were found to have YouTube profiles. Although these profiles were not specifically targeting children, they argue that due to children's use of YouTube it is seen as an essential area for marketers to occupy.

7.4 Advergames

Advergames have received a great deal of public criticism[42] and academic attention (Taylor 2013). Due to low production costs and the popularity of games among children, advergames are believed to be a highly effective marketing format, and research studies have reported a high prevalence of advergames on websites popular with child audiences (Culp, Bell et al. 2010; Cicchirillo and Lin 2011; Hofmeister-Tóth and Nagy 2011; Quilliam, Lee et al. 2011; Thomson 2011; Staiano and Calvert 2012; An and Kang 2014; Clark and Powell 2012; Lee, Choi et al.2009; Harris, Speers et.al 2012). It is also likely however that the focus on advergames among researchers is partly due to the contained nature of the games which make them an easier subject of research compared with other forms of online marketing. It should be noted that the majority of these studies are carried out in the US and are therefore not necessarily indicative of the amount of advergames on websites popular with British children. As websites change continuously it should also be noted that findings produced by content analyses very quickly become outdated (see section 1.3 for more on this).

According to Staiano and Calvert (2012), advergames combine two social issues associated with obesity: media use as a part of overall sedentary behaviour and exposure to marketing for unhealthy food and beverage products. Similar to television advertising and online marketing in general, it has been found that the products and brands advertised through advergames are likely to be low in nutritional value (Mallinckrodt and Mizerski 2007; Turnipseed and Rask 2007; Lee, Choi et al. 2009; Pempek and Calvert 2009; Culp, Bell et al. 2010; Quilliam, Lee et al. 2011; Weatherspoon, Quilliam et al. 2013; Quilliam, Rifon et al. 2014; An and Kang 2014). A recent content analysis of 131 gaming websites that are popular with children found that 22 of these contained advergames and that of these 12 contained advergames that promoted food products (An and Kang 2014). The majority of these games promoted products that were high in calories and low in nutrition. 11 of the 12 websites were listed among the 20 most popular gaming websites for children.

Quilliam, Rifon et al. (2014) similarly found that few to none of the advergames promoting food products in the US included healthy foods. Despite the concerns around advergames, there is still a lack of research on the frequency at which children are exposed to these games and how much they play them, as well as children's ability to recognise the persuasive intent behind the games (Rideout 2014). There is also a lack of evidence of causality between the playing of advergames and food consumption.

[42] http://www.nytimes.com/2011/04/21/business/21marketing.html?_r=0

7.4.1 The effect of advergames on children's brand attitude

Advergames are argued to be able to create more positive emotions towards the brand or product compared to traditional advertising by integrating the logo, product, spokes-character or packaging into the dynamics of the game and allowing the child to interact with and customise these elements (Flowers and Lustyik 2010; Staiano and Calvert 2012; Waiguny, Nelson et al. 2012; Folkvord, Anschutz et al. 2013; Harris, Weinberg et al. 2013; Panic, Cauberghe et al. 2013). Online games are known to be very popular with children, and 88% of children aged 5–15 in the UK play games on a games console or internet-enabled device (Ofcom 2013) and it is for this reason assumed that children will also enjoy playing advergames.

A recent experimental study (Rifon et al. 2014) with 276 children between ages five and ten found that playing a custom-made advergame for an unknown brand had a positive impact on the children's brand attitude, taste expectations and perceived likelihood to request the product. Children were asked to either watch or play the advergame and were subsequently asked to rate how much they liked the game, what they thought of the advertised product, whether they would ask an adult to purchase the product for them and how they thought the product would taste. All responses were rated on a scale of 1-5. The results demonstrated that enjoying the game was correlated with a higher likelihood to express positive brand attitudes, positive taste expectations and a perceived likelihood to request the product. The effect on likelihood to request the product was not however followed up with subsequent interviews, so it is not known whether the game had an effect beyond the initial exposure. It should also be noted that although the game contained a custom-made brand, the product (a cereal) was based on other popular cereal brands, so it is possible that the children already had expectations of how the product would taste. The results also showed that increased brand integration was positively linked with brand attitude and likelihood to request the product. There was however no significant difference between those children who played the game and those who only watched someone else play it. Despite these limitations, the authors conclude that game attitudes transfer to brand attitudes and that enjoyment of an advergame can therefore lead to more positive brand attitudes and increased demand for the advertised brand.

Due to the immersive nature of game playing, it is argued that this format allows repeated and longitudinal exposure to the brand and marketing message (Mallinckrodt and Mizerski 2007; Dahl, Eagle et al. 2009; Culp, Bell et al. 2010; Hernandez and Chapa 2010; Dias and Agante 2011; Nairn and Hang 2012; Staiano and Calvert 2012). A content analysis of advergames that reach children in the US found that games targeted at children contained more brand identifiers than games targeted at adults (Quilliam, Rifon et al. 2014), and previous research has suggested that increased levels of brand identifiers is linked with increased brand recognition and recall among children (van Reijmersdal, Rozendaal et al. 2012).

Previous research has also shown that children are more influenced by affective forms of advertising and, therefore, integrating marketing messages into entertaining games is thought to be highly effective, leading to an association of the brand with fun and entertainment (Bailey, Wise et al. 2009; Culp, Bell et al. 2010; Thomson 2010; van Reijmersdal, Jansz et al. 2010; van Reijmersdal, Rozendaal et al. 2011; Waiguny, Nelson et al. 2012; Panic, Cauberghe et al. 2013).

Waiguny, Nelson et al. (2012; 2013) argue that engagement with digital media, specifically interactive media such as games, can bring the child into a state of 'flow' or 'presence' where the player is immersed in the game which will increase attention to and engagement with the brand. An experimental study found that higher levels of 'presence' in child players was linked with a reduced ability to identify advergames as advertising, and with positive brand beliefs (Waiguny, Nelson et al. 2013). Lower levels of 'presence' were linked with neutral or more negative brand beliefs.

One of the main objectives of research on advergames is establishing a link between playing the game and a brand preference (Mallinckrodt and Mizerski 2007; Cauberghe and De Pelsmacker 2010; van Reijmersdal, Jansz et al. 2010; Waiguny, Terlutter et al. 2011; van Reijmersdal, Rozendaal et al. 2012; Harris, Weinberg et al. 2013). Although many of these studies have found evidence of short-term effect, it has been argued that more research is needed to show long-term effects and what role advertising plays in the wider picture of public health (Jones, Wiese et al. 2008).

One of the few studies attempting to measure long-term effects (Waiguny, Nelson et al. 2013) did this by revisiting children who had been exposed to advergames for Nesquik two weeks later and asking them whether they had requested the advertised products from their parents. It was found that 30% of the 149 participating children reported having asked their parents for the advertised cereal.

The same study also found evidence to suggest that the narrative in the advergame influenced the children's brand beliefs. Children who had played the advergame where the Nesquik bunny was seen jumping higher after eating cereal were found to be more likely to think the product 'made you fit' compared to children who had not played the game. Similarly, a recent American study (Rifon et al. 2014) found that after exposure to a cereal advergame, the younger children in the sample (5-7) were more likely to have positive expectations of the advertised brand's taste and to believe that eating the advertised cereal would make them healthy. The authors express concern over the potential impact advergames for unhealthy food products could have on younger children's perception of the nutritional quality of the product.

A similar study (Waiguny, Terlutter et al. 2011) found that children who found the advergame for a German snack brand (Pombaer) were more likely to hold positive brand attitudes. The children were also more likely to report wanting to play the game again, to request the product and to recommend the game to a friend. It is therefore argued that advergames could be a highly effective form of viral marketing among children, although this is not empirically confirmed.

While exposure to advergames has been found in experimental studies to lead to positive brand attitudes and a preference for the brand it remains unclear exactly how popular there games are and therefore how widespread effect these games have. Future research should also include parent interview to find out whether advertising exposure is linked with product request.

7.4.2 Advergames and consumption of healthy or unhealthy foods

Experimental studies have found a positive link between playing advergames and the intake of promoted food (Pempek and Calvert 2009; Dias and Agante 2011; Folkvord, Anschutz et al. 2013, Mallingckrodt and Mizerski 2007). This is often shown when children's choices of snacks are monitored following advertising exposure. Dias and Agante (2011) assessed the impact on children's

liking of the brand or food type, as well as the impact on food choice, and found that children were significantly more likely to say they preferred, and subsequently choose, the products that had been advertised in the game.

A study by Mallinckrodt and Mizerski (2007) is frequently referenced as evidence of the ability of advergames to influence children's food choices. This study of 295 children aged 5–8 years old found substantial evidence that the children who had played an advergame for Fruit Loops were more likely to prefer this cereal brand following exposure compared to a control group. Playing the game however had no effect on children's likelihood to request the product. Although children's intention to request Fruit Loops was high before they played the advergame, interviews with parents found that the cereal was rarely purchased. This highlights the importance of including in the research not only children's preference directly after advertising exposure but also their actual requests and eating patterns over time. An overall critique of experimental studies in which children are asked to play an advergame and subsequently to choose between a selection of foods does not reflect how children normally make their eating choices and the findings from such studies should therefore be followed up with longer terms studies. There is, less of a consensus regarding whether advergames can also be used to market healthy foods as well. Findings from Pempek and Calvert's (2009) study, as well as Dias and Agante (2011), showed that children who played advergames promoting healthier foods were more likely to eat these compared to children who played advergames promoting snacks. Contrary to this, Folkvord, Anschutz et al. (2013) found that children who played 'healthy' and 'unhealthy' advergames were equally likely to eat more energy-dense foods compared to children who played games without food product advertising or who did not play games at all.

Another important finding from this study was that playing these games had an impact on consumption of food-types rather than of specific products. In other words, children were more likely to consume high-energy snacks in general, rather than just the promoted snack after playing advergames.

Similar results were found by Harris, Speers et al. (2012). In this study, exposure to advergames promoting HFSS products among children 7–12 years old was linked with increased consumption of HFSS products in general, not just the advertised brands or products. This study also found that children who were exposed to advergames promoting fruit subsequently consumed more fruit, but not at the expense of HFSS foods. In other words, children who played advergames promoting either healthy or unhealthy foods consumed more snacks than children who played games promoting non-food related products or did not play advergames at all. An and Kang (2014) has argued that the impact of advergames for unhealthy food products is potentially twofold: on the one hand these games promote the advertised brand or product, but on the other hand they also promote a type of food and eating habits that are nutritionally at odds with a recommended child diet.

Staiano and Calvert (2012) argue that more research is needed to assess how to most effectively use advergames to promote healthy eating, and that more funding should be directed towards creating such games in order to compete with the content promoting unhealthy foods.

7.4.3 Children's understanding of advergames as advertising

Much of the research on advergames has assessed children's ability to recognise the persuasive intent behind them. It is generally argued that because of the level of integration between game design and advertising content children will find it more difficult to recognise the persuasive intent behind the game which will make them more vulnerable to advertising effects (Sheehy, Kukulska-Hulme et al. 2005; Mallinckrodt and Mizerski 2007; Ali, Blades et al. 2009; Flowers and Lustyik 2010; An and Stern 2011; Cicchirillo and Lin 2011; Harris, Speers et al. 2012; Staiano and Calvert 2012; van Reijmersdal, Rozendaal et al. 2012; Rozendaal, Slot et al. 2013; Weatherspoon, Quilliam et al. 2013; An, Jin et al. 2014). In a content analysis of advergames on gaming websites popular with children An and Kang (2014) found that advergames were rarely distinguished from normal games. Based on this they argue that because children are not expecting to see advertising on these websites they may find it more difficult to recognise the advergames as such.

Empirical studies have confirmed that children find the persuasive intent behind advergames much more difficult to recognise and understand compared to, for example, television advertising (Ali, Blades et al. 2009; Wollslager 2009; Rozendaal, Buijzen et al. 2011; An, Jin et al. 2014; Oates, Li et al. 2014).

Waiguny, Nelson et al. (2012) argue that previous experience of playing games generally and advergames specifically, as well as knowledge of the brand, may influence impact. In another study, the familiarity with advergames and games in general was a strong predictor of whether children used persuasion knowledge as a critical defence (Rozendaal, Slot et al. 2013). This supports the argument that children who are more sophisticated media users may be less influenced by marketing. Other studies have, however, found opposite tendencies.

In Harris, Speers et al. (2012), previous experience playing advergames (as reported by parents) was linked to higher consumption of HFSS snacks following exposure to advergames that promoted these. The authors argue that being familiar with game design and mechanics may make the child less likely to process marketing messages.

The research so far is unclear about whether knowledge of the persuasive intent behind advergames has a positive or negative effect on brand perception (Mallinckrodt and Mizerski 2007; Waiguny, Nelson et al. 2012). According to van Reijmersdal, Rozendaal et al. (2011), the children in their study had a very limited understanding of the persuasive intent behind the advergames, but even if they did hold this knowledge it did not limit their susceptibility to persuasion. It is argued that, partly due to the affective nature of game playing, children are unable to independently retrieve and apply their persuasion knowledge. Similarly, Rifon et al. (2014) found that demonstrating persuasion knowledge did not mediate the effects of a cereal advergame, leading the authors to suggest that children are likely to be persuaded implicitly rather than explicitly by these forms of advertising.

It is argued that methods such as ad breaks and media literacy messages on websites containing advergames may limit their impact on children (Waiguny, Terlutter et al. 2011; Staiano and Calvert 2012). While earlier content analyses of the use of advergames on websites have shown that only a minority of these use ad breaks to disclose the commercial nature of the game (Moore 2006; An and Stern 2011; Quilliam, Lee et al. 2011), more recent research found that 71% of advergames that reached children in the US contained ad breaks (Quilliam, Rifon et al. 2014). In a recent content

analysis it was found that 47% of advergames contained ad breaks, but many of these had very low visibility and An therefore questions the extent to which these will help children activate their persuasion knowledge (An and Kang 2014).

Similarly, previous research (An and Stern 2011; An and Kang 2013) has found that, out of the websites that did use ad breaks, few of these ad breaks explained that the game contained commercial messages and many of the ad breaks were not made sufficiently visible on the website, which has previously been argued to make ad breaks less likely to mitigate the persuasive effect. There is no consensus on whether ad breaks do in fact help children identify persuasive content and whether this prevents influence (An and Kang 2013; Waiguny, Nelson et al. 2013).

7.5 Peer-to-peer marketing

Peers play an important role in children's socialisation process, and in the formation of ideas and attitudes. Children are frequent users of social networks and messaging services to engage and communicate with friends and family, and it is suggested that this may be used to encourage users to promote products to their friends (Berkeley Media Studies Group 2011; Montgomery and Chester 2011; Harris, Schwartz et al. 2013).

In consumer socialisation theory this is referred to as normative peer influence (Story, Neumark-Sztainer et al. 2002; Mangleburg, Doney et al. 2004). It is argued that highly engaging content such as advergames may lead children to influence their peers to play the game and consume the product (Hofmeister-Tóth and Nagy 2011), but there is still very little research exploring this area (Rozendaal, Slot et al. 2013).

Rozendaal, Slot et al. (2013) found that children who were susceptible to peer influence or valued the opinion of their peers about brands were more likely to express a desire for the advertised brand in an advergame. However, the nature of peer influence and how it may impact purchase, product request or consumption is under researched.

7.6 Mobile marketing

Mobile marketing refers to advertising on mobile devices, including mobile phones, smartphones and tablets. It includes text-message advertising, mobile website banners ads, QR codes and applications such as games. Content analyses has shown the existence of mobile content which is perceived to be appealing to children (Harris, Schwartz et al. 2013) but there is no empirical evidence of children's exposure to and engagement with mobile marketing and what the impact on attitudes and behaviour may be.

According to Dahl, Low et al. (2012), much of the criticism of mobile marketing comes from a concern that these forms of communication have developed very rapidly and may currently fall outside of the remit of regulators. The authors carried out a detailed content analysis and found that a large number of food and beverage products and brands were using mobile advergames. They further argue that it is likely that children are more susceptible to these forms of marketing than adults and that these games contribute to a higher level of brand awareness among children, but it is acknowledged that no empirical evidence is available to support these claims.

Advertising through apps downloaded onto mobile devices is thought to be an important new marketing avenue and one that there is still little public understanding of (Wilking, Gottlieb et al. 2013; Rideout 2014). Dahl, Low et al. (2012) have argued that, although there is little research looking at mobile phone-based advergames, it is expected that these have an impact on young consumers due to the extent to which the marketing industry employs these methods.

As previously mentioned, advergames as a marketing technique has received attention due to the popularity of games with children and the power of influence these games are thought to have. Mobile advergames are thought to be an extension of this technique making the games available to children and teenagers when they are not at a computer screen (Harris, Schwartz et al. 2013; Wilking, Gottlieb et al. 2013; Rideout 2014). McDonald's McPlay and Wendy's Pet Play apps are mentioned as examples of this. It is argued that unhealthy food products are more likely to be promoted using mobile marketing techniques such as apps which are considered likely to appeal to children and teenagers (Harris, Schwartz et al. 2013).

In a small study with parents and children, Muzellec, de Faultrier et al. (2014) questioned how mobile apps influence brand relationships. Two apps were tested; one designed by a toy retailer and the other by a clothing retailer. It was found that parents valued the educational or social experience of both of the apps, in other words the opportunity to share an experience with their child. There was no impact on parents' or children's purchase intentions, but it was argued that this might be due to the companies being retailers rather than products, as well as the need for brands to build relationships over a period of time.

7.7 'Path to Purchase'

It is argued that online marketing can drive the shopping experience by shortening the distance between marketing messages and purchase-decisions through, for example, personalised search results, geo-location targeting, mobile coupons, personalised ads and viral or peer-to-peer marketing (Wilking, Gottlieb et al. 2013). By making the marketing messages more personalised, the shopping process is made simpler for the consumer and, through the use of mobile marketing, consumers can be reached while they are on the go and potentially close to a retail point.

This is expected to become increasingly prominent as mobile payment methods become more common. Companies such as McDonald's, Mondelēz, KFC and Coca-Cola have been identified as developing 'path-to-purchase' strategies, but there is no research on the extent to which children or teenagers are exposed to this and how they engage with it (Wilking, Gottlieb et al. 2013).

7.8 Location-based advertising

Location-based advertising is thought to enhance mobile marketing by potentially targeting consumers when they are in proximity to retail sites. Due to their heavy use of mobile devices and what is thought to be a limited understanding of how these commercial processes work, teenagers are believed to be particularly vulnerable to this (Wilking, Gottlieb et al. 2013). However, there is no available research on the extent to which teenagers are exposed to location-based targeting and whether they make use of these promotions.

8.0 Children's Understanding of Online Marketing

The ethics of marketing to children are to a large extent based on our knowledge of when children can critically understand persuasive intent and, thereby, are believed to be able to protect themselves from the influences of advertising. The majority of research on children and advertising has been carried out with traditional forms of advertising, but an increasing number of papers have argued that advances in online marketing question the legitimacy of previous findings (Nairn and Fine 2008; Leslie, Levine et al. 2009; Andronikidis and Lambrianidou 2010; Carter, Patterson et al. 2011).

8.1 When can children understand online marketing?

Children's understanding of marketing and advertising was discussed in the sections above (see 4.0). It has been found that children tend to rely on structural cues to distinguish television advertising from content, for example by adverts being shorter than the main programme (Ali, Blades et al. 2009; Cai and Zhao 2010; Oates, Li et al. 2014), and such cues are thought to be less prevalent in the case of online marketing. Online marketing content tends to be much more integrated into the overall web design which is argued to make it more challenging for children to identify the persuasive intent behind marketing messages (Moore 2006; Brady, Farrell et al. 2008; Bucy, Kim et al. 2011; Kervin, Jones et al. 2012; Nairn and Hang 2012; Cheyne, Dorfman et al. 2013; Owen, Lewis et al. 2013; Wilking, Gottlieb et al. 2013; Rideout 2014).

An, Jin et al. (2014) similarly argue that the embedded nature of online advertising formats such as advergames might in fact fall outside of what children traditionally consider advertising. In a pilot study of a questionnaire aimed to measure children's awareness of the extent of advertising on websites they frequently visited, Shin, Huh et al. (2012) found that children only thought of banner ads as advertising and did not mention more integrated marketing forms such as advergames, viral marketing or branded communities on social networks.

Kunkel (2010) has argued that during the development of advertising literacy children will understand 'selling intent' before they understand 'persuasive intent' and 'source bias'. This means that children will understand that someone is trying to sell them something before they understand that a message may be trying to persuade them and that this will shape the form of communication (Owen, Patterson et al. 2011). This is particularly relevant for advertising formats that are not clearly selling a specific product.

Experimental studies have shown that children's understanding of online advertising matures at a much later age compared to their understanding of television advertising (Ali, Blades et al. 2009; Rozendaal, Buijzen et al. 2011; Owen, Lewis et al. 2013; An, Jin et al. 2014; Oates, Li et al. 2014). They have also shown that children's understanding of integrated marketing techniques such as product placements, endorsements and advergames develops later than their understanding of stand-alone advertising (Mallinckrodt and Mizerski 2007; McAlister and Cornwell 2009; van Reijmersdal, Rozendaal et al. 2012; Owen, Lewis et al. 2013; Waiguny, Nelson et al. 2013).

The affective and engaging nature of advertising is also believed to make it more difficult for children to recognise its persuasive origin. Waiguny, Nelson et al. (2013) found that children who

experienced a higher state of engagement with an advergame were less likely to identify the game as advertising and this was linked with positive brand attitudes.

Owen, Lewis et al. (2013) found that integration of brand or marketing messages was negatively linked with children's understanding of persuasive intent. The researchers compared 6–7 and 9–10-year-old children's understanding of non-traditional marketing (including in-game brand placement, advergames, product licensing and sponsorship) with television marketing and found low levels of understanding of the persuasive intent in non-traditional formats. Although the older children showed a more sophisticated understanding of the persuasive intent of television advertising, they still had low awareness of persuasive intent in non-traditional marketing formats.

There is little research on children's understanding of newer marketing formats such as mobile marketing, social marketing and online behavioural advertising. A recent report by Ofcom (2014b) however found that only one in three children between 12 and 15 who use a search engine understand which Google results are sponsored or paid for. Among children 8-11 only 13% are able to identify the sponsored links. The report also found however that 56% of children 12-15 say they are aware of personalised advertising (after being shown a description of what this is). 34% of children say they are not aware websites could use information in this way (Ofcom, October 2014, pp 94).

Following these results, it is argued that existing perceptions of when it is fair to advertise to children are not suitable for non-traditional marketing formats and that regulation should be revised to reflect this.

8.2 The mediating effect of advertising literacy

There is still no consensus on whether persuasion knowledge protects children against unwanted advertising (Livingstone and Helsper 2006; van Reijmersdal, Rozendaal et al. 2011; Panic, Hudders et al. 2012). According to the Persuasion Knowledge Model (Friestad and Wright 1994), the knowledge consumers have about marketers' motives and tactics helps them identify how, when and why advertising is trying to influence them. As a result, they are more capable of defending themselves against unwanted influence.

It is argued that this understanding is not yet fully developed in children, making them more vulnerable to advertising. It has, however, been acknowledged that even with traditional marketing formats such as television advertising children who have acquired literacy are not necessarily less vulnerable (Roedder-John 1999; Livingstone 2008). An influential study by Livingstone and Helsper (2006) found that younger children were not significantly more influenced by advertising than teenagers and adults were, despite lower levels of advertising literacy.

Several experimental studies have assessed the relationship between persuasion knowledge and advertising effects specifically with regards to advergames (van Reijmersdal, Rozendaal et al. 2011; van Reijmersdal, Rozendaal et al. 2012; Panic, Cauberghe et al. 2013; Waiguny, Nelson et al. 2013; An, Jin et al. 2014; Vanwesenbeech, Walrave et al. 2014). These studies have found that children have a very limited understanding of the persuasive intent behind advergames. The research is, however, not in agreement about whether children's persuasive knowledge can be triggered.

In one study with 7–9-year-olds (An, Jin et al. 2014), the children's persuasive awareness was significantly improved by exposure to an advertising literacy programme previous to playing the advergame. These children also expressed greater detachment from and criticism towards advertising in general, but no changes to specific brand response or attitude was observed. Another study found that children who were able to identify advergames as advertising were less likely to request the advertised product (Waiguny, Nelson et al. 2013).

Several other studies have, however, found that advertising literacy had no impact on attitude changes or purchase intent after exposure to advergames (van Reijmersdal, Rozendaal et al. 2011; van Reijmersdal, Rozendaal et al. 2012; Panic, Cauberghe et al. 2013; Vanwesenbeech, Walrave et al. 2014). Panic, Cauberghe et al. (2013) argue that children's inability to retrieve and apply persuasion knowledge as a defence against advertising effects can be explained by the highly enjoyable nature of advergames and affective nature of communication, as well as the persuasive intent behind advergames being more complicated for children to fully comprehend.

It suggested that more research is needed to understand the nature and role of persuasion knowledge and how children can be encouraged to activate it while exposed to highly immersive marketing environments (van Reijmersdal, Rozendaal et al. 2011). The differences in results with regards to the relationship between advertising literacy and effects have been suggested to be in part caused by the age differences in children participating across the various studies (5–12 years old), as children go through significant developmental changes at these ages (Waiguny, Nelson et al. 2013).

It is further suggested that advertising disclaimers or ad breaks may help children understand the persuasive intent behind advergames and other forms of online marketing, but acknowledged that more research is needed to confirm this (An and Kang 2013; Owen, Lewis et al. 2013; Panic, Cauberghe et al. 2013; Waiguny, Nelson et al. 2013).

Despite the uncertainty about whether persuasive knowledge limits the influence of marketing on children, it is argued that more should be done to teach children to recognise and critically assess commercial marketing on the internet (van Reijmersdal, Rozendaal et al. 2011; Kervin, Jones et al. 2012; Owen, Lewis et al. 2013; An, Jin et al. 2014). Examples of existing media literacy programmes about advertising include Media Smart in the UK (see 4.1), the Canadian MediaSmarts[43] and American Admongo[44] programmes.

8.3 Dual processes of communication

It has been argued that, while research has focused on the age at which children acquire advertising literacy, very little is known about the details of how children process new marketing formats (Panic, Hudders et al. 2012; Panic, Cauberghe et al. 2013). It has been suggested that online advertising may be processed differently to traditional forms of advertising and that children may process advertising differently from adults (van Reijmersdal, Rozendaal et al. 2014). Specifically, it is argued that much of online marketing content relies on implicit rather than explicit communication, which will make it more difficult for children to consciously recognise persuasive intent and, therefore, limit the effect

[43] http://mediasmarts.ca/
[44] http://www.admongo.gov/

of the advertising (Nairn and Fine 2008; Nairn and Hang 2012; van Reijmersdal, Rozendaal et al. 2012; An, Jin et al. 2014).

Rozendaal, Slot et al. (2013) argue that the affect-based nature of much of the advertising targeted at children and their immature cognitive abilities make it highly unlikely that children activate and apply their knowledge of marketing and persuasive intent. Dual process models of persuasion therefore argue that advertising research must account for both conscious and unconscious processes of communication and persuasion (Livingstone and Helsper 2006; Nairn and Fine 2008; Montgomery, Grier et al. 2011).

While conscious processing is associated with high levels of elaboration of the content, for example a direct television advertisement where the benefits of the advertised products are listed, unconscious processing is associated with affective responses and little elaboration of the content. The selling intent in these cases is less clear and the advertising message focuses more on attitude change. Due to the perceived reliance on implicit persuasion and the following effects on children's attitudes, it is suggested that research must focus on how children process this information and how they can be prompted to retrieve critical understanding of persuasive intent (Rozendaal, Capierre et al. 2011).

Therefore, it is suggested that research would need to focus on long-term effects of advertising rather than before-and-after comparisons used frequently in studies assessing cognitive modes of processing (An, Jin et al. 2014). It is similarly argued that if children find online advertising more difficult to recognise and understand research should focus on the effects of unrecognised advertising (Ali, Blades et al. 2009; Hang and Auty 2011; van Reijmersdal, Rozendaal et al. 2012).

9.0 Further Research

Despite continuing concerns over online HFSS advertising to children there is still a need for more evidence of the relationship between advertising and food consumption. Although experimental studies have found evidence of short term brand preference, brand recognition and eating choice, the context in which these studies are carried out are very different from the situations in which children naturally encounter advertising and choose what foods to eat. More long term and ethnographic research is needed to understand the role online advertising plays alongside other factors that determine what children eat, such as family and peer dynamics, taste preference, socio-economic class and food prices.

Although the concerns about HFSS marketing are more prevalent with regards to children, there is very little research that looks at young people's own attitude to advertising. More research with children is needed to fully understand what role online advertising plays in their lives, how often they see it and how it may be influencing them.

The field of study has until now relied heavily on content analyses which does not produce evidence of reach or effect. Researchers should therefore focus on evidence of effect, preferably causal rather than correlational. Studies of advertising effect should however acknowledge that advertising is only one of several potential factors that influence children's eating behaviour.

As pointed out earlier, children's use of digital media and online marketing practices develop at a fast pace and academic research often struggles to remain relevant and accurate. Not only content analyses but also research on children's understanding of advertising as well as on advertising effect should be regularly updated. It may be that as newer forms of online marketing become more familiar with children, their understanding will increase which may influence effect. It may also be likely that children's and adults' attitudes towards online marketing techniques change over time and that this may have an impact on effect.

There is a need to explore more fully the differences between online and traditional advertising. Some studies have suggested that the highly entertaining or affective nature of some forms of online advertising may make children more susceptible or more influenced. It has been suggested that online advertising is likely to influence children on a subconscious level, but there is little evidence that shows how this form of communication works. Further comparative studies exploring how online advertising is perceived and understood are needed to address this.

It has been pointed out that the majority of research has been carried out in the US. Independent research should be carried out in the UK, reflecting British children's lives and British advertising regulations is therefore needed.

10.0 Conclusions

This report has shown that there remains considerable disquiet among campaigners and some academic researchers over the ways in which HFSS food and beverage products are marketed to children, and the impact this is believed to have on eating habits and child health. This forms part of the broader debate on children's use of digital media and its implications for their physical, emotional, social and mental wellbeing.

However, the evidence in support of such concerns remains limited. The studies reviewed in this report are from around the world and span several years. Inevitably, this means that most are not about the UK situation, either of children's online media, use or of food marketing and its regulation; many are out-of-date in both areas. Much of the research, including much of the academic and all of the 'grey' literature reviewed in this report, is written by or for critics of such marketing; as such, it needs to be approached with some caution.

There are significant limitations to the literature available, notably a need for evidence of a causal effect of online advertising on children's actual eating habits, and more research undertaken taking into account the existing regulatory situation in the UK. There is also a need for more long term research that measures behavioural effects of online advertising exposure as well as a need for more sophisticated methods of measuring online advertising exposure. This should take into account the existing regulatory situation in the UK and its effectiveness.

Just as with previous research on television marketing, it has been found that food products that are marketed to children online are not in line with recommendations for a healthy diet, and this imbalance towards 'unhealthy' foods is believed to influence children's attitudes and food choices. Experimental studies have shown direct influence on children's brand attitudes and on their eating behaviour following advertising exposure. The methodologies used in many of these studies have, however, been criticised for not addressing the natural environments in which children would encounter advertising and make their purchasing or eating decisions, or would influence their parents' decisions. These studies do not take into account other factors likely to influence children's eating habits, such as family and peer dynamics, taste preferences and their wider social and cultural environment. There is also insufficient data on the frequency at which children are exposed to advertising online and the length of time they interact with it.

While research initially focused on advertising in general on websites popular with children such as banner ads and logos, the literature increasingly looks at more integrated marketing techniques. The advergame remains the marketing technique which has received the most academic attention and criticism. This is due to the popularity of online games in general with children, as well as the immersive and engaging nature of these games. It is not known how many children play advergames specifically, and for how long.

It is expected that higher levels of brand integration and interactivity will increase positive effects on brand attitudes, brand requests and consumption. The nature of advergames is also believed to make children less likely to recognise or understand the persuasive intent behind the game, which may or may not make children more vulnerable to advertising effects. There is however a lack of evidence to show the long term effect of advergames of children's eating habits.

There is increasing concern over marketing via social networks and mobile applications in the literature, but currently little empirical research on the extent to which children are exposed to this and what the effects are. With regards to marketing on social networking sites, it is acknowledged that children may state an older age in order to sign up, as most social networks will require the user to be 13 years of age, and, therefore, be exposed to advertising which is inappropriate for their age.

Empirical research has shown that children reach a mature understanding of integrated and online marketing at a later age compared with television marketing. The more integrated the advertising is into the overall content, the more children struggle to recognise the persuasive intent behind it.

There is less consensus of what the implications of this are on the impact advertising has on children. Some studies have shown that acquiring advertising literacy does not mediate the effects of online marketing, suggesting that cognitive models of persuasion may need to be revisited. Specifically, it has been argued that online marketing may employ more affective forms of communication and more implicit forms of persuasion which are not processed on the same conscious cognitive level compared with explicit forms of persuasion. Based on this, it is suggested that research must to a greater extent focus on implicit forms of persuasion and unconscious processing of advertising among children. It has also been suggested that researchers must find more reliable and sophisticated methods of measuring advertising exposure. As children are increasingly likely to be exposed to advertising via a variety of channels and formats, methodologies that take this cross-media communications environment into account are needed.

The regulation of advertising and marketing self-evidently needs to adapt in line with changing technologies and techniques. In the current changing environment of online advertising to children, the regulatory framework and research needs to keep evolving. Campaigners argue that it does not effectively protect children from exposure to unhealthy food advertising, and that governments are being encouraged to enforce stronger regulations. This review is suggesting that there is a need for much more extensive, up-to-date evidence, particularly on how children understand and respond to online marketing.

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Appendix 1: Famliy Kids and Youth and Research Methodology

Family Kids and Youth is an award-winning London-based agency specialising entirely in global research with families, children and young people, providing both quantitative and qualitative research and consultancy. The team has worked on many projects with children and young people, most recently for IKEA, The Prudential, Tablets for Schools, Youth United, the BACP and Unilever.

Family Kids and Youth is a Company Partner of the Market Research Society (MRS), and holds membership with the British Educational Research Association (BERA), ESOMAR and the British Psychology Society (BPS), abiding by the codes of conduct of these organizations, including those guidelines involving research with children. We publish papers in academic journals, and speak at international conferences. Our collaboration with the University of Cambridge means we are able to access research and specialists in the field of child development and children and media. Barbie works alongside a highly qualified and experienced team of researchers. For further details visit our website www.kidsandyouth.com.

Report Authors

Working on this report were Dr Barbie Clarke and Siv Svanaes. Project leader was Dr Barbie Clarke and lead researcher was Siv Svanaes. Consultant on the report and author of the Preface was Professor David Buckingham.

Family Kids and Youth founder Barbie Clarke completed her PhD in child and adolescent psychosocial development at the University of Cambridge where she has taught post-graduate students and has published research on children's interaction with digital technology. Siv Svanaes completed her MSc at the LSE where she worked with Professor Sonia Livingstone, author and lead researcher of the EU Kids Online study. Siv was awarded a Distinction for her MSc which looked at children's media consumption. Siv has worked at Family Kids and Youth since 2011 and is Project Manager for FK&Y's Tablets for Schools research.

David Buckingham is Professor of Communication and Media Studies at Loughborough University. A leading researcher on children's and young people's interactions with electronic media and on media literacy education, Professor Buckingham was previously a Professor of Education at the Institute of Education, London University, where he founded and directed the Centre for the Study of Children, Youth and Media.

Research Methodology

The literature review was carried out between 27 January 2014 and 31 August 2014. Using the keywords *children, youth, young people, adolescents, HFSS marketing, food marketing, unhealthy food marketing, online, internet, digital, marketing, advertising, advergames, social networking sites, mobile, location-based,* and *product placement*, we searched bibliographic databases using CSA

Illumina with access to more than 100 databases including ERIC, BEI, Psychinfo and Web of Knowledge.

Material was critiqued in terms of study design, methodology, robust analysis and strength of findings. The total number of papers and reports located was 158, of which 106 were used. Records have been kept of each paper used in the search. We also considered the 'grey literature', that is the many articles and press releases that have appeared about children's interaction with media. In total, we considered over 106 academic papers and over 20 press cuttings and press releases.

Appendix 2: Summary of Academic Papers

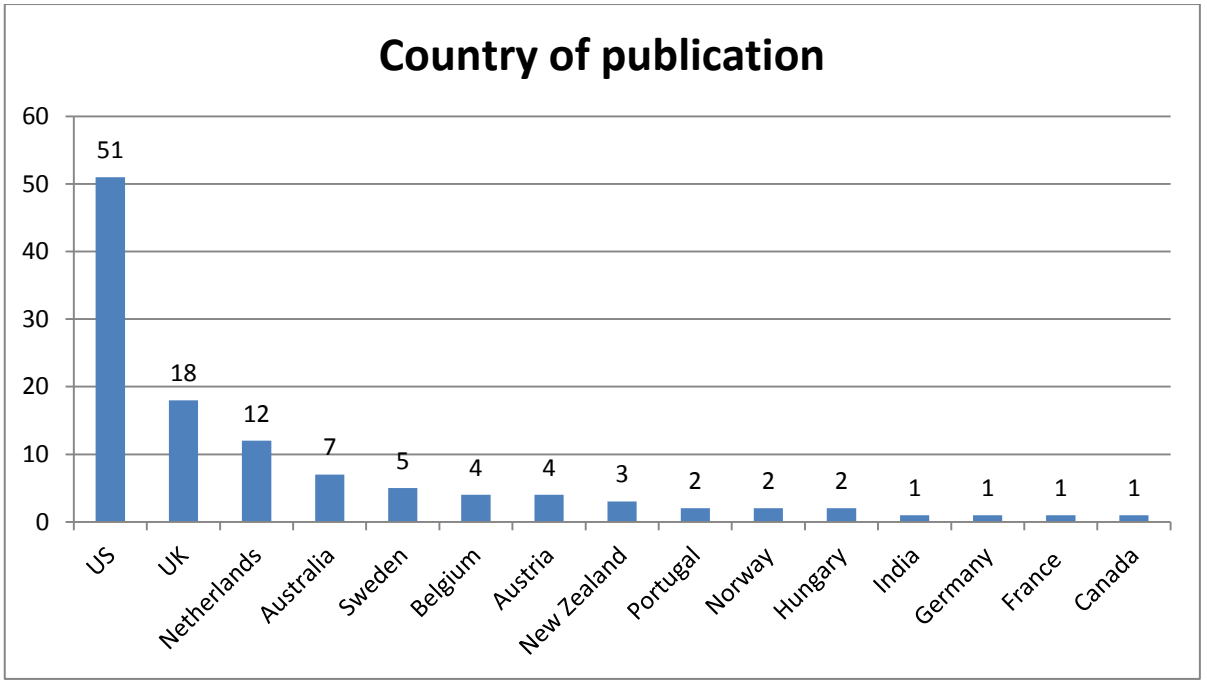
Papers by Country

	US	UK	Netherlands	Australia	Sweden	Belgium	Austria	New Zealand	Portugal	Norway	Hungary	India	Germany	France	Canada
Ali, Blades, et al. (2009)	x	x													
An & Kang (2014)	x														
An & Kang (2013)	x														
An & Stern (2011)	x														
An, Jin, et al. (2014)	x														
Bailey, Wise, et al. (2009)	x														
Berkeley Media Studies Group (2011)	x														
Böttner & Ivens (2014)													x		
Brady, Mendelson, et al. (2010)	x														
British Heart Foundation (2011)		x													
Bucy, Kim, et al. (2011)	x														
Cai & Zhao (2010)	x														
Cairns (2013)	x														
Cairns, Angus, et al. (2013)	x														
Cauberghe & De Pelsmacker (2010)						x									
Chambers, Freeman, et al. (2014)		x													
Cheyne, Dorfman, et al. (2013)	x														
Cicchirillo & Lin (2011)	x														
Clark & Powell (2013)		x													
Corbett & Walker (2009)		x													
Cornish, L. S. (2014)		x													
Culp, Bell, et al. (2010)	x														
Dahl, Low, et al. (2012)		x													
Dahl, Stephan, et al. (2009)		x													
Dias & Agante (2011)									x						
Dietz (2013)	x														
D'Silva, Bhuptani, et al. (2011)												x			
Evans, Carlson, et al. (2013)	x														
Flowers & Lustyik (2010)		x									x				

Details	US	UK	Netherlands	Australia	Sweden	Belgium	Austria	New Zealand	Portugal	Norway	Hungary	India	Germany	France	Canada
Folkvord (2012)			x												
Folkvord, Anschutz, et al. (2013)			x				x								
Garcia-Marco, Moreno, et al. (2012)		x													
Hang & Auty (2011)		x													
Hang (2012)		x													
Harris, Milici, et al. (2012)	x														
Harris, Schwartz, et al. (2013)	x														
Harris, Speers, et al. (2012)	x														
Harris, Weinberg, et al. (2013)	x														
Henry & Story (2009)	x														
Hernandez, M., D. and S. Chapa (2010)	x														
Hofmeister-Tóth & Nagy (2011)											x				
Holmberg, Sandberg, et al. (2014)					x										
Jones & Reid (2010)				x											
Kelly, Bochynska, et al. (2008)				x											
Kelly, Kerr, et al. (2010)	x														
Kelly, King, et al. (2013)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Kent, Dubois, et al. (2013)															x
Kervin, Jones, et al. (2012)				x											
Kunkel (2010)	x														
Lascu, Manrai, et al. (2013)	x														
Lee, Choi, et al. (2009)	x														
Leslie, Levine, et al. (2009)	x														
Lewis (2010)				x											
Lingas, Dorfman, et al. (2009)	x														
Mallinckrodt & Mizerski (2007)				x											
Mantymaki & Salo (2011)										x					
Martinez, Jarlbro, et al. (2013)					x										
McAlister & Cornwell (2009)	x														

Details	US	UK	Netherlands	Australia	Sweden	Belgium	Austria	New Zealand	Portugal	Norway	Hungary	India	Germany	France	Canada
Montgomery & Chester (2009)	x														
Montgomery & Chester (2011)	x														
Muzellec, de Faultrier, et al. (2014)														x	
Nairn & Dew (2007)		x													
Nairn & Fine (2008)		x													
Nairn & Hang (2012)		x													
Newman and Oates. (2014)		x													
Oates, Li, et al. (2014)		x													
O'Keeffe, & Clarke-Peatson (2011)	x														
Opree, Buijzen, et al. (2012)			x												
Opree, Buijzen, et al. (2014)			x												
Owen, Lewis, et al. (2013)		x	x												
Owen, Patterson, et al. (2011)				x											
Panic, Cauberghe, et al. (2013)						x									
Panic, Hudders, et al. (2012)						x									
Pempek & Calvert (2009)	x														
Powell, Harris, et al. (2013)	x														
Quilliam, Lee, et al. (2011)	x														
Quilliam, Rifon, et al. (2014)	x														
Rideout (2014)	x														
Rifon, Quilliam, et al. (2014).	x														
Rozendaal, Buijzen, et al. (2011)			x												
Rozendaal, Slot, et al. (2013)			x												
Sandberg (2011)					x										
Sandberg, Gidlöf, et al. (2011)					x										
Sandberg, Gildöf, et al. (2011)					x										
Schwartz & Ustjanauskas (2012)	x														
Scully, Wakefield, et al. (2012)				x											
Shin, Huh, et al. (2012)	x														

Details	US	UK	Netherlands	Australia	Sweden	Belgium	Austria	New Zealand	Portugal	Norway	Hungary	India	Germany	France	Canada
Skaar, Buckingham, et al. (2011)		x								x					
Staiano & Calvert (2012)	x														
Taylor (2013)	x														
Thomson (2010)	x														
Thomson (2011)	x														
Ustjanauskas, Eckman, et al. (2010)	x														
Ustjanauskas, Harris, et al. (2013)	x														
Valkenburg & Peter (2013)			x												
van Reijmersdal, Jansz, et al. (2010)			x												
van Reijmersdal, Rozendaal, et al. (2011)			x												
van Reijmersdal, Rozendaal, et al. (2012)			x												
van Reijmersdal, Rozendaal, et al. (2014)			x												
Vanwesenbeech, Walrave, et al. (2014)						x									
Waiguny, Nelson, et al. (2012)	x						x	x							
Waiguny, Nelson, et al. (2013)	x						x	x							
Waiguny, Terlutter, et al. (2011)							x	x							
Weatherspoon, Quilliam, et al. (2013)	x														



Total: 106 (9 papers were international collaborations)

Papers by Subject

Details	Dig. marketing	Unhealthy foods	Healthy eating	Advergames	Mobile marketing	Websites	SNS	Persuasion knowledge	Methodology	Regulation
Ali, Blades, et al. (2009)						X		X		
An & Kang. (2014)		X		X						
An & Kang (2013)				X				X		
An & Stern (2011)				X				X		
An, Jin, et al. (2014)				X				X		
Bailey, Wise, et al. (2009)		X		X						
Berkeley Media Studies Group (2011)	X	X								
Böttner & Ivens (2014)				X						
Brady, Mendelson, et al. (2010)	X	X								
British Heart Foundation (2011)	X									X
Bucy, Kim, et al. (2011)						X				
Cai & Zhao (2010)				X						
Cairns (2013)	X									X
Cairns, Angus, et al. (2013)	X	X								
Cauberghe & De Pelsmacker (2010)				X						
Chambers, Freeman, et al. (2014)			X							X
Cheyne, Dorfman, et al. (2013)	X									
Cicchirillo & Lin (2011)		X		X						
Clark & Powell (2013)	X									X
Corbett & Walker (2009)	X	X								
Cornish, L. S. (2014)	X			X		X				
Culp, Bell, et al. (2010)		X		X						
Dahl, Low, et al. (2012)				X	X					
Dahl, Stephan, et al. (2009)		X		X				X		
Dias & Agante (2011)		X	X	X						
Dias & Agante (2011)		X	X			X				
Dietz (2013)	X									X
D'Silva, Bhuptani, et al. (2011)							X			

Details	Dig. marketing	Unhealthy foods	Healthy eating	Advergames	Mobile marketing	Websites	SNS	Persuasion knowledge	Methodology	Regulation
Evans, Carlson, et al. (2013)				X						
Flowers & Lustyik (2010)				X						
Folkvord (2012)		X	X	X						
Folkvord, Anschutz, et al. (2013)		X	X	X						
Garcia-Marco, Moreno, et al. (2012)			X				X			
Hang & Auty (2011)				X						
Hang (2012)				X				X		
Harris, Milici, et al. (2012)	X									
Harris, Schwartz, et al. (2013)	X	X								X
Harris, Speers, et al. (2012)		X		X						
Harris, Weinberg, et al. (2013)	X									X
Henry & Story (2009)			X			X				
Hernandez, M., D. and S. Chapa (2010)		X		X						
Hofmeister-Tóth & Nagy (2011)				X						
Holmberg, Sandberg, et al. (2014)	X									
Jones & Reid (2010)		X				X				
Kelly, Bochynska, et al. (2008)		X				X				
Kelly, Kerr, et al. (2010)							X			
Kelly, King, et al. (2013)	X									X
Kent, Dubois, et al. (2013)	X									X
Kervin, Jones, et al. (2012)						X				
Kunkel (2010)								X	X	
Lascu, Manrai, et al. (2013)	X									X
Lee, Choi, et al. (2009)		X		X						
Leslie, Levine, et al. (2009)								X		
Lewis (2010)				X						
Lingas, Dorfman, et al. (2009)		X				X				
Mallinckrodt & Mizerski (2007)		X		X						
Mantymaki & Salo (2011)							X			
Martinez, Jarlbro, et al. (2013)	X									

Details	Dig. marketing	Unhealthy foods	Healthy eating	Advergames	Mobile marketing	Websites	SNS	Persuasion knowledge	Methodology	Regulation
McAlister & Cornwell (2009)								X		
Montgomery & Chester (2009)	X	X								
Montgomery & Chester (2011)		X								X
Muzellec, de Faultrier, et al. (2014)				X	X					
Nairn & Dew (2007)	X							X		
Nairn & Fine (2008)								X		
Nairn & Hang (2012)				X				X		
Newman & Oates (2014)	X	X								
Oates, Li, et al. (2014)				X				X		
O'Keeffe, & Clarke-Peatson (2011)							X			
Opree, Buijzen, et al. (2012)	X									
Opree, Buijzen, et al. (2014)									X	
Owen, Lewis, et al. (2013)	X							X		
Owen, Patterson, et al. (2011)		X						X		X
Panic, Cauberghe, et al. (2013)				X				X		
Panic, Hudders, et al. (2012)	X							X		
Pempek & Calvert (2009)			X			X				
Powell, Harris, et al. (2013)	X									
Quilliam, Lee, et al. (2011)			X	X						X
Quilliam, Rifon, et al. (2014)			X	X						
Rideout (2014)	X									X
Rifon, Quilliam, et al. (2014).		X		X				X		
Rozendaal, Buijzen, et al. (2011)	X							X		
Rozendaal, Slot, et al. (2013)				X						
Sandberg (2011)	X	X								
Sandberg, Gidlöf, et al. (2011)	X									
Sandberg, Gildöf, et al. (2011)	X									
Schwartz & Ustjanauskas (2012)	X									
Scully, Wakefield, et al. (2012)	X	X								
Shin, Huh, et al. (2012)				X				X		

Details	Dig. marketing	Unhealthy foods	Healthy eating	Advergames	Mobile marketing	Websites	SNS	Persuasion knowledge	Methodology	Regulation
Skaar, Buckingham, et al. (2011)	X									
Staiano & Calvert (2012)		X		X						X
Taylor (2013)	X									
Thomson (2010)		X		X						
Thomson (2011)		X		X						
Ustjanauskas, Eckman, et al. (2010)	X									
Ustjanauskas, Harris, et al. (2013)		X				X				
Valkenburg & Peter (2013)									X	
van Reijmersdal, Jansz, et al. (2010)				X						
van Reijmersdal, Rozendaal, et al. (2011)				X				X		
van Reijmersdal, Rozendaal, et al. (2012)				X				X		
van Reijmersdal, Rozendaal, et al. (2014)	X							X		
Vanwesenbeech, Walrave, et al. (2014)				X				X		
Waiguny, Nelson, et al. (2012)				X				X		
Waiguny, Nelson, et al. (2013)				X				X		
Waiguny, Terlutter, et al. (2011)			X	X						
Weatherspoon, Quilliam, et al. (2013)	X	X								
Wilking, Gottlieb, et al. (2013)	X	X								X

Papers by Methodology

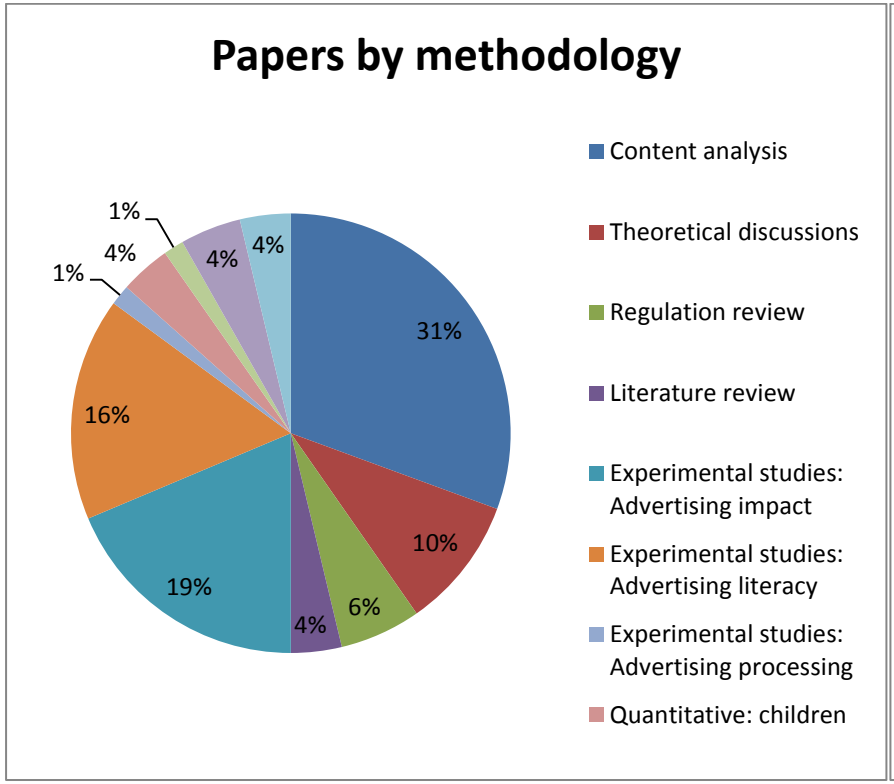
Details	Literature review	Content analysis	Experimental studies: advertising literacy	Experimental studies: advertising impact	Experimental studies: Advertising processing	Interviews with children	Interviews with parents	Review of regulation	Quant: children	Quant: parents	Theoretical discussions
Ali, Blades, et al. (2009)			X								
An & Kang. (2014)		X									
An & Kang (2013)			X	X							
An & Stern (2011)			X	X							
An, Jin, et al. (2014)			X								
Bailey, Wise, et al. (2009)				X							
Berkeley Media Studies Group (2011)		X									
Böttner & Ivens (2014)							X				
Brady, Mendelson, et al. (2010)		X									
British Heart Foundation (2011)		X									
Bucy, Kim, et al. (2011)		X									
Cai & Zhao (2010)		X									
Cairns (2013)		X									
Cairns, Angus, et al. (2013)	X										
Cauberghe & De Pelsmacker (2010)				X							
Chambers, Freeman, et al. (2014)	X							X			
Cheyne, Dorfman, et al. (2013)		X									
Cicchirillo & Lin (2011)		X									
Clark & Powell (2013)								X			
Corbett & Walker (2009)		X									
Cornish, L. S. (2014)						X	X				
Culp, Bell, et al. (2010)		X									
Dahl, Low, et al. (2012)		X									
Dahl, Stephan, et al. (2009)		X									
Dias & Agante (2011)				X							

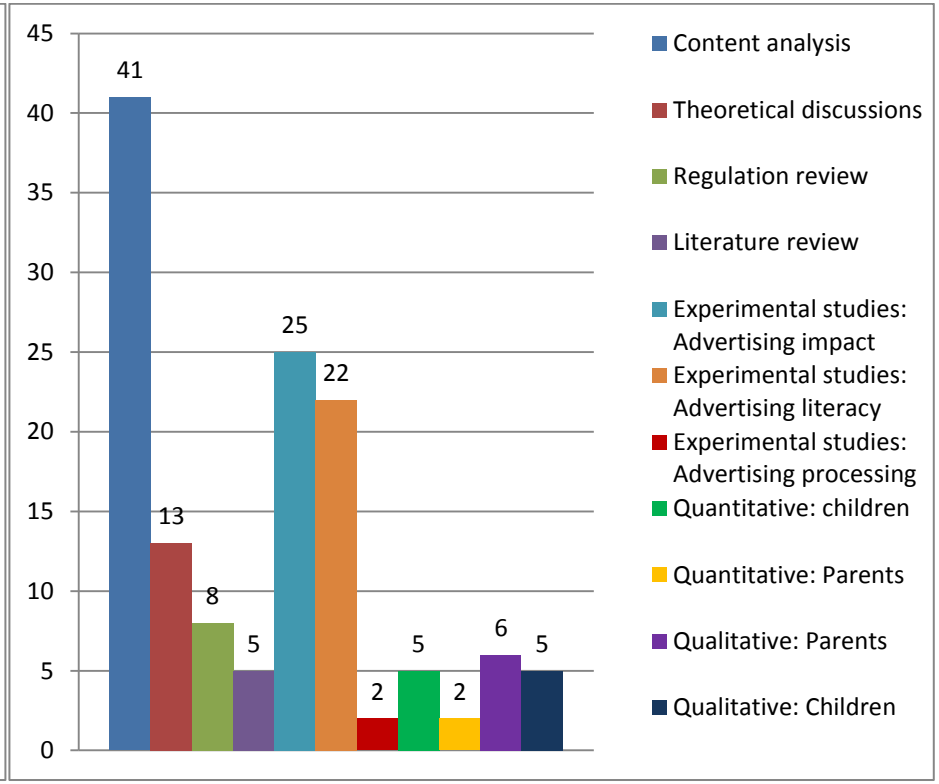
Details	Literature review	Content analysis	Experimental studies: advertising literacy	Experimental studies: advertising impact	Experimental studies: Advertising processing	Interviews with children	Interviews with parents	Review of regulation	Quant: children	Quant: parents	Theoretical discussions
Dietz (2013)		X						X			
D'Silva, Bhuptani, et al. (2011)									X		
Evans, Carlson, et al. (2013)										X	
Flowers & Lustyik (2010)		X						X			
Folkvord (2012)				X							
Folkvord, Anschutz, et al. (2013)				X							
Garcia-Marco, Moreno, et al. (2012)											X
Hang & Auty (2011)				X							
Hang (2012)			X	X							
Harris, Milici, et al. (2012)										X	
Harris, Schwartz, et al. (2013)		X									
Harris, Speers, et al. (2012)		X		X							
Harris, Weinberg, et al. (2013)		X									
Henry & Story (2009)		X									
Hernandez, M., D. and S. Chapa (2010)				X							
Hofmeister-Tóth & Nagy (2011)		X									
Holmberg, Sandberg, et al. (2014)				X							
Jones & Reid (2010)		X									
Kelly, Bochynska, et al. (2008)		X									
Kelly, Kerr, et al. (2010)						X					
Kelly, King, et al. (2013)	X										
Kent, Dubois, et al. (2013)		X						X			
Kervin, Jones, et al. (2012)		X									
Kunkel (2010)											X
Lascu, Manrai, et al. (2013)		X						X			
Lee, Choi, et al. (2009)		X									
Leslie, Levine, et al. (2009)											X

Details	Literature review	Content analysis	Experimental studies: advertising literacy	Experimental studies: advertising impact	Experimental studies: Advertising processing	Interviews with children	Interviews with parents	Review of regulation	Quant: children	Quant: parents	Theoretical discussions
Lewis (2010)		X									
Lingas, Dorfman, et al. (2009)		X									
Mallinckrodt & Mizerski (2007)			X	X							
Mantymaki & Salo (2011)						X					
Martinez, Jarlbro, et al. (2013)						X					
McAlister & Cornwell (2009)											X
Montgomery & Chester (2009)		X									
Montgomery & Chester (2011)		X						X			
Muzellec, de Faultrier, et al. (2014)							X				
Nairn & Dew (2007)		X									X
Nairn & Fine (2008)											X
Nairn & Hang (2012)	X										
Newman & Oates. (2014)						X	X				
Oates, Li, et al. (2014)			X								
O'Keeffe, & Clarke-Peatson (2011)	X										
Opree, Buijzen, et al. (2012)									X		
Opree, Buijzen, et al. (2014)									X		X
Owen, Lewis, et al. (2013)			X								
Owen, Patterson, et al. (2011)			X								
Panic, Cauberghe, et al. (2013)			X	X							
Panic, Hudders, et al. (2012)			X								
Pempek & Calvert (2009)				X			X				
Powell, Harris, et al. (2013)		X									
Quilliam, Lee, et al. (2011)		X						X			
Quilliam, Rifon, et al. (2014)		X									
Rideout (2014)		X									
Rifon, Quilliam, et al. (2014).			X	X							

Details	Literature review	Content analysis	Experimental studies: advertising literacy	Experimental studies: advertising impact	Experimental studies: Advertising processing	Interviews with children	Interviews with parents	Review of regulation	Quant: children	Quant: parents	Theoretical discussions
Rozendaal, Buijzen, et al. (2011)			X								
Rozendaal, Slot, et al. (2013)			X	X							
Sandberg (2011)		X									
Sandberg, Gidlöf, et al. (2011)					X						
Sandberg, Gildöf, et al. (2011)					X						
Schwartz & Ustjanauskas (2012)		X									
Scully, Wakefield, et al. (2012)		X							X		
Shin, Huh, et al. (2012)									X		
Skaar, Buckingham, et al. (2011)											X
Staiano & Calvert (2012)		X									X
Taylor (2013)											X
Thomson (2010)											X
Thomson (2011)											X
Ustjanauskas, Eckman, et al. (2010)							X				
Ustjanauskas, Harris, et al. (2013)		X									
Valkenburg & Peter (2013)											X
van Reijmersdal, Jansz, et al. (2010)			X	X							
van Reijmersdal, Rozendaal, et al. (2011)			X	X							
van Reijmersdal, Rozendaal, et al. (2012)			X	X							
van Reijmersdal, Rozendaal, et al. (2014)			X	X							
Vanwesenbeech, Walrave, et al. (2014)			X	X							
Waiguny, Nelson, et al. (2012)			X	X							
Waiguny, Nelson, et al. (2013)			X	X							

Details	Literature review	Content analysis	Experimental studies: advertising literacy	Experimental studies: advertising impact	Experimental studies: Advertising processing	Interviews with children	Interviews with parents	Review of regulation	Quant: children	Quant: parents	Theoretical discussions
Waiguny, Terlutter, et al. (2011)			X	X							
Weatherspoon, Quilliam, et al. (2013)		X									





Appendix 3: Overview of all literature reviewed by FK&Y for report: press/grey literature, peer reviewed papers and papers published by NGOs, charities etc

Press / Grey Literature (23)	
Liza Ramrayka*: Brands continue to target fast food marketing at kids*	http://www.theguardian.com/sustainable-business/brands-increase-fast-food-marketing-kids
BBC News: *Ban TV junk food ads until 21.00, say campaigners.*	http://www.bbc.co.uk/news/health-26665952
BBC News: *Obesity crisis: future projections 'underestimated'.*	http://www.bbc.co.uk/news/health-25708278
NHS: *Report warns of a looming UK obesity crisis*	http://www.nhs.uk/news/2014/01January/Pages/Report-warns-of-a-looming-UK-obesity-crisis.aspx
Marketing Week: *Anti-obesity campaigns should be as hard-hitting as smoking ads*	http://www.marketingweek.co.uk/sectors/food-and-drink/news/anti-obesity-campaigns-should-be-as-hard-hitting-as-smoking-ads/4009081.article
BBC News: *Obesity: Shock tactics used in Australian campaign*	http://www.bbc.co.uk/news/health-25720618
NCCOR: *Childhood Obesity in the United States*	http://www.nccor.org/downloads/ChildhoodObesity_020509.pdf
Cecelia Kang: *Parents resume privacy fight vs. Facebook over use of children's images in ads.*	http://www.washingtonpost.com/business/technology/parents-resume-privacy-fight-vs-facebook-over-use-of-childrens-images-in-ads/2014/02/12/5ceb9f82-9430-11e3-b46a-5a3d0d2130da_story.html
Richard Byrne-Reilly: *Fed to mobile marketers: Stop targeting kids, or else*	http://venturebeat.com/2014/03/27/feds-to-mobile-marketers-stop-targeting-kids-or-else-exclusive/
Cecilia Kang: *Preteens' use of Instagram creates privacy issue, child advocates say*	http://www.washingtonpost.com/business/technology/preteens-use-of-instagram-creates-privacy-issue-child-advocates-say/2013/05/15/9c09d68c-b1a2-11e2-baf7-5bc2a9dc6f44_story.html
Grant McArthur: *Fast food firms on social media to exploit advertising standards loopholes.*	http://www.heraldsun.com.au/news/fastfood-firms-on-facebook-and-social-media-to-exploit-advertising-standards-loopholes/story-fni0fiyv-1226740537320
Cambridge University Press: *Underage youth exposed to alcohol advertising through social media.*	http://www.cam.ac.uk/research/news/underage-youth-exposed-to-alcohol-advertising-through-social-media
The Economist: *Cookie Monster Crumbles*	http://www.economist.com/news/international/21590489-are-children-fair-game-sophisticated-and-relentless-marketing-techniques-many
Betsy McKay: *U.S. Childhood Obesity Rates Fall 40% in Decade*	http://online.wsj.com/news/articles/SB10001424052702304834704579405393034903418

Richard Byrne-Reilly: *Facebook takes mobile ad analytics in-house*	http://venturebeat.com/2014/03/22/facebook-begins-to-assert-itself-in-mobile-analytics/
Todd Wasserman: *Facebook says video ads to hit news feed 'over the next few months'*	http://mashable.com/2014/03/13/facebook-video-ads-news-feed/?utm_cid=mash-com-Tw-main-link
Christopher Heine: *Taco Bells buys its first Instagram ads to push waffle tacos.*	http://www.adweek.com/news/technology/taco-bell-buys-its-first-instagram-ads-push-waffle-tacos-156582
The Economist: *The World Wild Web*	http://www.economist.com/news/special-report/21615875-technology-has-transformed-advertising-consumers-need-be-kept-board-world
Cecilia Kang: *Bills would curb tracking of and advertising to children on Internet*	http://www.washingtonpost.com/business/technology/bills-would-curb-tracking-of-and-advertising-to-children-on-internet/2013/11/14/dee03382-4d58-11e3-ac54-aa84301ced81_story.html
Victoria Ward: Toddlers becoming so addicted to iPads they require therapy.	http://www.telegraph.co.uk/technology/10008707/Toddlers-becoming-so-addicted-to-iPads-they-require-therapy.html
In-Soo Nam: *A Rising Addiction Among Youths: Smartphones*	http://online.wsj.com/news/articles/SB10001424127887324263404578615162292157222
Katherine Sellgren: *Pupils 'addicted to Tablet computers' teachers warn.*	http://www.bbc.co.uk/news/education-27040957
Matt Richtel: *In online games, a path to young consumers.*	http://www.nytimes.com/2011/04/21/business/21marketing.html?_r=0

Peer Reviewed Papers (94)	
Ali, Blades, et al. (2009)	"Young children's ability to recognize advertisements in web page designs." British Journal of Developmental Psychology **27**(1): 13.
An & Kang. (2014)	"Advertising or Games?: Advergames on the Internet Gaming Sites targeting Children." International Journal of Advertising **33**(3): 509.
An & Kang (2013)	"Do Online Ad Breaks Clearly Tell Kids That Advergames are Advertisements That Intend to Sell Things?" International Journal of Advertising **32**(4): 13.
An & Stern (2011)	"Mitigating the Effects of Advergames on Children." Journal of Advertising **40**(1): 13.
An, Jin, et al. (2014)	"Children's Advertising Literacy for Advergames: Perception of the Game as Advertising." Journal of Advertising **43**(1): 63.
Bailey, Wise, et al. (2009)	"How Avatar Customizability Affects Children's Arousal and Subjective Presence During Junk Food–Sponsored Online Video Games." Cyberpsychology and Behavior **12**(3): 9.

Böttner & Ivens (2014)	Advertising Directed At Children - an Empirical Investigation from Parents' Perspective on TV Advertising and Advergames. Child and Teen Consumption Conference. Edinburgh, Scotland.
Brady, Mendelson, et al. (2010)	"Beyond Television: Children's Engagement with Online Food and Beverage Marketing." Clinical Medicine: Pediatrics **2**: 9.
Bucy, Kim, et al. (2011)	"Host Selling in Cyberspace: Product Personalities and Character Advertising on Popular Children's Websites." New Media and Society **13**(8): 21.
Cai & Zhao (2010)	"CLICK HERE, KIDS!: Online advertising practices on popular children's websites." Journal of Children and Media **42**(2): 20.
Cairns (2013)	Evolutions in food marketing, quantifying the impact and policy implications. Appetite, 62,1 2013
Cairns, Angus, et al. (2013)	"Systematic Reviews of the Evidence on the Nature, Extent and Effects of Food Marketing to Children. A Retrospective Summary " Appetite **March**(62): 7.
Cauberghe & De Pelsmacker (2010)	"Advergames: The Impact of Brand Prominence and Game Repetition on Brand Responses." Journal of Advertising **39**: 13.
Chambers, Freeman, et al. (2014)	Regulation to Curb the Harmful Effects of Advertising of Foods High in Fat, Sugar and Salt to Children: a Systematic Review. Child and Teen Consumption Conference. Edinburgh, Scotland.
Cheyne, Dorfman, et al. (2013)	"Marketing Sugary Cereals to Children in the Digital Age: A Content Analysis of 17 Child-Targeted Websites." Journal of Health Communication **0**(1): 20.
Cicchirillo & Lin (2011)	"Stop Playing with Your Food: A Comparison of For-Profit and Non-Profit Food-Related Advergames." Journal of Advertising Research **51**(3): 16.
Corbett & Walker (2009)	Catchy cartoons, wayward websites and mobile marketing – food marketing to children in a global World'. Education Review. 2009;21(2)
Cornish, L. S. (2014)	"'Mum, can I play on the internet?' Parents' understanding, perception and responses to online advertising designed for children." International Journal of Advertising **33**(3): 437.
Culp, Bell, et al. (2010)	"Characteristics of Food Industry Web Sites and ''Advergames'' Targeting Children." Journal of Nutrition Education and Behavior **42**(3): 5.
Dahl, Low, et al. (2012)	Mobile Phone-based Advergames. Australian and New Zealand Marketing Academy Conference, Adelaide, Sa, ANZMAC.
Dahl, Stephan, et al. (2009)	"Analyzing advergames: active diversions or actually deception: An exploratory study of online advergames content." Young Consumers: Insight and Ideas for Responsible Marketers **10**(1): 14.
Dias & Agante (2011)	"Can Advergames Boost Children's Healthier Eating Habits? A Comparison Between Healthy and Non-Healthy Food." Journal of Consumer Behaviour: An International Research Review **10**(3): 19.
Dietz (2013)	Dietz, W. H. (2013). "New Strategies to Improve Food Marketing to Children." Health Affairs **32**(9).

D'Silva, Bhuptani, et al. (2011)	D'Silva, B., R. Bhuptani, et al. (2011). "Influence of Social Media Marketing on Brand Choice Behaviour Among Youth in India: An Empirical Study." International Conference on Technology and Business Management **28**: 8.
Evans, Carlson, et al. (2013)	"Coddling Our Kids: Can Parenting Style Affect Attitudes Toward Advergames? ." Journal of Advertising **42**(2-3): 13.
Flowers & Lustyik (2010)	"Virtual Junk Food Playgrounds in Europe." Virtual Worlds for Kids **3**(2): 25.
Folkvord (2012)	The effect of playing advergames promoting healthy or unhealthy foods on actual food intake among children. Appetite Volume 59, Issue 2, October 2012
Folkvord, Anschutz, et al. (2013)	"The Effect of Playing Advergames That Promote Energy-Dense Snacks or Fruit on Actual Food Intake Among Children." American Journal of Clinical Nutrition: 7.
Garcia-Marco, Moreno, et al. (2012)	"Impact of Social Marketing in the Prevention of Childhood Obesity." Advances in Nutrition **3**(6).
Hang & Auty (2011)	"Children playing branded video games: The impact of interactivitiy on product placement effectiveness." Journal of Consumer Psychology **21**(1): 8.
Hang (2012)	"The implicit influence of bimodal brand placement on children: information integration or information interference?" International Journal of Advertising **31**(3).
Harris, Speers, et al. (2012)	"US Food Company Branded Advergames on the Internet:Children's Exposure and Effects on Snack Consumption." Journal of Chilren and Media **6**(1): 18.
Harris, Weinberg, et al. (2013)	Monitoring Food Company Marketing to Children to Spotlight Best and Worst Practices. Advances in Communication Research to Reduce Childhood Obesity. J. D. Williams, K. E. Pasch and C. A. Collins. New York, Springer.
Henry & Story (2009)	"'Food and Beverage Brands That Market to Children and Adolescents on the Internet: A Content Analysis of Branded Web Sites'." Journal of Nutrition Education and Behaviour **41**(5): 7.
Hernandez, M., D. and S. Chapa (2010)	"Adolescents, advergames and snack foods: Effects of positive affect and experience on memory and choice." Journal of Marketing Communications **16**(1-2): 10.
Hofmeister-Tóth & Nagy (2011)	"The content analysis of advergames in Hungary." Qualitative Market Research **14**(3): 15.
Holmberg, Sandberg, et al. (2014)	"Advert Saliency Distracts Children's Visual Attention During Task-Oriented Internet Use." Frontiers in Psychology **5**(51).
Jones & Reid (2010)	"Marketing to children and teens on Australian food company web sites." Young Consumers: Insight and Ideas for Responsible Marketers **11**(1): 10.
Kelly, Bochynska, et al. (2008)	"Internet food marketing on popular children's websites and food product websites in Australia'." Public Health Nutrition **11**(11): 11.
Kelly, Kerr, et al. (2010)	"Avoidance of Advertising in Social Networking Sites: The Teenage Perspective." Journal of Interactive Advertising **10**(2): 12.
Kelly, King, et al. (2013)	"Monitoring Food and Non-Alcoholic Beverage Promotions to Children." Obesity Reviews **14**(1): 10.

Kent, Dubois, et al. (2013)	"Internet Marketing Directed at Children on Food and Restaurant Websites in Two Policy Environments." Obesity **21**(4): 7.
Kervin, Jones, et al. (2012)	"Online Advertising: Examining the Content and Messages Within Websites Targeted at Children." E-Learning and Digital Media **9**(1): 22.
Kunkel (2010)	"Commentary: Mismeasurement of children's understanding of the persuasive intent of advertising." Journal of Children and Media **4**(1): 9.
Lascu, Manrai, et al. (2013)	"Online Marketing of Food Products to Children: the Effect of National Consumer Policies in High-Income Countries." Young Consumers: Insight and Ideas for Responsible Marketers **14**(1): 22.
Lee, Choi, et al. (2009)	"Playing With Food: Content Analysis of Food Advergames." The Journal of Consumer Affairs **43**(1): 26.
Leslie, Levine, et al. (2009)	Adolescents' Psychological & Neurobiological Development: Implications for Digital Marketing. Memo prepared for The Second NPLAN/BMSG Meeting on Digital Media and Marketing to Children for the NPLAN Marketing to Children Learning Community.
Lewis (2010)	"Hidden Consumerism: 'Advergames' and Preschool Children. Parents Give the Thumbs Up?" Journal of Digital Research and Publishing **99**: 8.
Lingas, Dorfman, et al. (2009)	"Nutrition Content of Food and Beverage Products On Web Sites Popular With Children'." American Journal of Public Health **9**(3): 5.
Mallinckrodt & Mizerski (2007)	"The effects of playing an advergame on young children's perceptions, preferences, and requests." Journal of Advertising **36**(2): 14.
Mantymaki & Salo (2011)	"Teenagers in Social Virtual Worlds: Continuous Use and Purchasing Behaviour in Habbo Hotel." Computers in Human Behavior **27**(6).
Martinez, Jarlbro, et al. (2013)	"Children's Views and Practices Regarding Online Advertising." Nordicom Review **34**(2): 16.
McAlister & Cornwell (2009)	"Preschool children's persuasion knowledge: The contribution of theory of mind." Journal of Public Policy & Marketing **28**(2): 11.
Montgomery & Chester (2009)	"Interactive Food and Beverage Marketing: Targeting Adolescents in a Digital Age." Journal of Adolescent Health **45**: 10.
Muzellec, de Faultrier, et al. (2014)	Children's Experience Of Retailer's Mobile Applications And The Effect On Brand Relationship. Child and Teen Consumption Conference. Edinburgh, Scotland
Nairn & Dew (2007)	'Pop-ups, pop-unders, banners and buttons: The ethics of online advertising to primary school children'. *Direct, Data and Digital Marketing Practice*, 9 (1), p. 30
Nairn & Fine (2008)	"Who's messing with my mind? The implications of dual-process models for the ethics of advertising to children." International Journal of Advertising: The Quarterly Review of Marketing Communications **27**(3): 24.
Newman & Oates. (2014)	"Parental mediation of food marketing communications aimed at children." International Journal of Advertising **33**(3): 579.
Oates, Li, et al. (2014)	Becoming Knowledgeable Consumers: The Ability of Young Children to Recognise When They Are Being Targeted by Marketers in Different Media. Child and Teen Consumption Conference. Edinburgh, Scotland.

O'Keeffe, & Clarke-Peatson (2011)	"The Impact of Social Media on Children, Adolescents, and Families." Pediatrics **127**(4): 6.
Opree, Buijzen, et al. (2012)	"Lower Life Satisfaction Related to Materialism in Children Frequently Exposed to Advertising." Pediatrics **130**(3): 8.
Opree, Buijzen, et al. (2014)	Children's Advertising Exposure: Assessing the Reliability and Validity of Survey Measures. Child and Teen Consumption Conference. Edinburgh.
Owen, Lewis, et al. (2013)	"Is Children's Understanding of Nontraditional Advertising Comparable to Their Understanding of Television Advertising? ." Journal of Public Policy & Marketing **32**(2): 1
Owen, Patterson, et al. (2011)	"Children's understanding of the selling versus persuasive intent of junk food advertising: Implications for regulation." Social Science & Medicine **72**(6): 7.
Panic, Cauberghe, et al. (2013)	"Comparing TV Ads and Advergames Targeting Children: The Impact of Persuasion Knowledge on Behavioral Responses." Journal of Advertising **42**(2-3): 10.
Panic, Hudders, et al. (2012)	Children and a Changing Media Environment: Investigating Persuasion Knowledge for Integrated Advertising Formats. Research in Advertising.
Pempek & Calvert (2009)	"Tipping the balance: use of advergames to promote consumption of nutritious foods and beverages by low-income African American children." Archives of Pediatrics & Adolescent Medicine **163**(7): 5.
Powell, Harris, et al. (2013)	Food Marketing Expenditures Aimed at Youth: Putting the numbers in context. American Journal of Preventive Medicine 2013 October, 45, 4
Quilliam, Lee, et al. (2011)	"The Impetus for (and Limited Power of) Business Self-Regulation: The Example of Advergames." The Journal of Consumer Affairs(Summer): 24.
Quilliam, Rifon, et al. (2014)	"Characteristics of food advergames that reach children and the nutrient quality of the food they advertise." Internet Research **24**(10): 19.
Rifon, Quilliam, et al. (2014).	"Age dependent effects of food advergame brand integration and interactivity." International Journal of Advertising **33**(3):475.
Rozendaal, Buijzen, et al. (2011)	"Children's Understanding of Advertisers' Persuasive Tactics." International Journal of Advertising **30**: 22.
Rozendaal, Slot, et al. (2013)	"Children's Responses to Advertising in Social Games." Journal of Advertising **42**(2-3): 13.
Sandberg (2011)	"Tiger talk and candy king: Marketing of unhealthy food and beverages to Swedish children." Communications **36**: 18.
Sandberg, Gidlöf, et al. (2011)	"Children's exposure to and perceptions of online advertising." International Journal of Communication **5**: 29.
Schwartz & Ustjanauskas (2012)	"Food Marketing to Youth: Current Threats and Opportunities." Childhood Obesity **8**(2): 4.
Scully, Wakefield, et al. (2012)	"Association Between Food Marketing Exposure And Adolescents' Food Choices And Eating Behaviors." Appetite **58**(1): 14.
Shin, Huh, et al. (2012)	"Developmental Antecedents to Children's Responses to Online Advertising." International Journal of Advertising **31**(4).
Skaar, Buckingham, et al. (2011)	"Marketing on the Internet: a New Educational Challenge." Media Educational Research Journal **1**: 18.
Staiano & Calvert (2012)	"Digital Gaming and Pediatric Obesity: At the Intersection of Science and Social Policy." Social Issues Policy Review **6**(1): 23.

Taylor (2013)	"Editorial: Hot Topics in Advertising." International Journal of Advertising **32**(1): 6.
Thomson (2010)	"Marshmallow Power and Frooty Treasures: Disciplining the Child Consumer through Online Cereal Advergaming." Critical Studies in Media Communication **27**(5): 17.
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