



A critical review of evidence on the sociocultural impacts of food marketing and policy implications

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ABSTRACT

Historically, responsible marketing policy development has drawn on a substantive research agenda regarding the micro level effects of marketing on food choice. In contrast there has been almost no research on macro level effects. To date public health has been the main disciplinary source of evidence. As a first step towards exploring the significance of this evidence gap, a critically interpretive review of evidence on the effects of food marketing on the sociocultural food environment was conducted. A review of reviews approach was used to search for evidence across a broad multi-disciplinary range of evidence sources. This was supplemented with snowball searches of the reference lists of the identified reviews and included studies. Ten reviews and 31 individual studies met review inclusion criteria. Evidence of impacts on dietary norms, population level shifts in food and drink category preferences and in the cultural values underpinning food behaviours were identified. The review also identified evidence for two mechanisms of effect. The findings represent preliminary evidence in support of the case for the responsible marketing policy research agenda to be expanded from its historical focus on micro level impacts to include research directly focused on its macro level impacts. Expanding research scope to include a much stronger focus on evidence regarding the impacts of for-profit food marketing on the sociocultural food environment would provide direct research support to the strategic policy aim of creating a food environment that encourages healthy food behaviours.

1. Introduction

In 2004 the World Health Organization published its Global Strategy on Diet, Physical Activity and Health (WHO, 2004). In 2010, in support of the Strategy the World Health Assembly endorsed a ‘Set of Recommendations on the Marketing of Food and Non-alcoholic Beverages to Children’ (hereinafter Recommendations) (WHO, 2010a). A core aim of the Recommendations is to promote the responsible marketing of food and drinks, (hereinafter responsible marketing) ‘in order to reduce the impact of foods high in saturated fats, trans-fatty acids, free sugars, or salt on children’ and give them ‘the opportunity to grow and develop in an enabling food environment — one that fosters and encourages healthy dietary choices and promotes the maintenance of healthy weight’ (WHO, 2010b, p. 4).

In this article food marketing is used to describe any form of commercial advertising or other for-profit persuasive activity used to promote the purchase and/or consumption of a food or non-alcoholic beverage – for example price discounts, sponsorship, and point of sale incentives. Responsible marketing therefore describes the practice of restricting these techniques and strategies to only products and services supportive of the Global Strategy’s key goals. Hence, responsible marketing is used as the benchmark descriptor for the policy aim of food marketing that avoids the promotion of food and non-alcoholic drink products that are energy dense, low nutrition and/or high in fat, salt and/or sugar to children. The term ‘food environment’ is used to describe the collective physical and sociocultural conditions in which food behaviours, such as purchase, preparation and consumption choices are

enacted. The term *sociocultural food environment* more specifically refers to sociocultural factors known to influence these food behaviours such as food and diet-related social norms, cultural values, customary practices and habits viewed by the populations who practice them as socially ‘normal’, agreed and acceptable. A diagrammatic representation of responsible food marketing policies and strategies the assumptions and objectives, as interpreted by previous policy analysis is presented in Fig. 1: Schematic outline of responsible marketing policy goals and underpinning rationale.

During the last decade, countries all around the world, including in South and North America, Europe, Asia, the Middle East, and Africa have enacted policies designed to promote responsible marketing (Hawkes & Lobstein, 2011; Roberto et al., 2015). For example: In Chile, television, radio, web-based and magazines child-targeted advertising and promotional strategies that include cartoons and toys for high fat, salt and/or sugar foods are subject to restrictions (Roberto et al., 2015; JRC, n.d.). In Quebec, Canada, there is a long standing ban on electronic and print media advertising of fast foods (Dhar & Baylis, 2011, JRC, n.d.). In the Europe Union, controls on the promotion of ‘foods and beverages containing nutrients and substances with a nutritional or physiological effect, in particular those such as fat, trans-fatty acids, salt/sodium and sugars’ are addressed under Article 9.2 of the Audio Visual Media Services Directive and the EU Platform for Action on Diet, Physical Activity and Health (JRC, n.d.) In Taiwan, there are restrictions on the times that foods high in fat, salt and/or sugar can be advertised on children’s TV channels (JRC, n.d.). In South Africa, the controls on food marketing to children are restricted under its Advertising Standard

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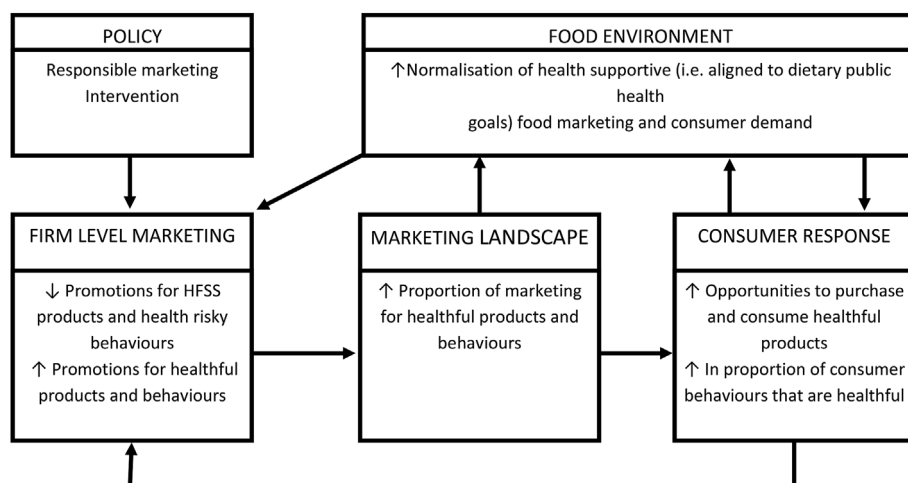


Fig. 1. Schematic outline of responsible marketing policy goals and underpinning rationale.

Authority Code of Advertising Practice (Cassim, 2010).

Independent evaluations of responsible marketing policy effectiveness indicate their impact on the food environment has been very limited (Cairns, 2015; Galbraith-Emami & Lobstein, 2013; Kraak et al., 2016). Promotions for low nutrition, energy dense food and drink products continue to be highly salient features of the physical and sociocultural food environment in which purchase and consumption decisions are made and consequent behaviours are enacted (Cairns, 2015; FTC, 2012).

To date public health research has been the main source of evidence. Evidence generated by public health scholars has focused on micro a level effect, that is, its direct effects on individuals' food choices and behaviours. This evidence has made important contributions to policy progress because it has been the primary source of evidence underpinning the marketing control policies that have been implemented since the 2004 WHO Global Strategy and the 2010 WHO Recommendations were published (Cairns, Angus, Hastings, & Caraher, 2013; Kraak et al., 2016). However, some of the public health literature has also noted that the focus in policy research and development on the direct, micro level effects of marketing on individual level food choices may be a reason for their weak impact on the food environment.

The food environment is a population level phenomenon. Any shifts or changes in its status have the potential capacity to alter behaviours at the macro level. Macro level impacts describe the moderating effects of population level processes that result in shifts in socially shared views of what is 'normal' and/or 'socially acceptable' behaviours and outcomes.

Analyses of food marketing control policies have observed that although improving the food environment is a recurring policy goal; their design and scope do not include any specific measures to constrain any macro level impacts.

The strong focus within policy making fora on micro level impacts and weak focus on macro level processes is mirrored in scholarly research agendas. There is a small evidence pool on the effects of marketing on the *physical food environment* – for example, the effects of high density of quick service restaurants in a neighbourhood on population level consumption patterns (see for example, Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). Health policy researchers have however, noted that there appears to be no published research that has specifically explored effects of marketing on the sociocultural food environment and/or any consequent population level impacts (Fitzpatrick, MacMillan, Hawkes, Anderson, & Dowler, 2010; Higgs & Thomas, 2016; Hill, 2010; Hill & Martin, 2014; Moore, 2007; Polonsky, Carlson, & Fry, 2003). Marketing researchers have also noted an absence of publicly available research findings on the nature and scale of any macro level impacts of marketing on sociocultural elements of the

food environment (Arnould & Thompson, 2005; McCracken, 1986; Moore, 2007; Smith, Drumwright, & Gentile, 2010; Wilkie & Moore, 2012).

By contrast, there is a substantive pool of *generic* marketing evidence and theory on marketing's macro level, sociocultural impacts (Paek & Pan, 2004; Hartmann, Manchanda, Nair, Bothner, M., Dodds, Godes, ... & Tucker, 2008; Hunt, 1981; Mittelstaedt, Kilbourne, & Mittelstaedt, 2006; Peterson, 2006). There are also substantive pools of evidence regarding the moderating impacts of other factors (e.g. family, peers, and institutions) on the sociocultural food environment and in turn its macro level impacts on food behaviours in the social sciences, humanities, and food studies literatures. See for example, Harrison, Bost, McBride, Donovan, Grigsby-Toussaint, Kim & Jacobsohn (2011) Six C's model, or Atkins and Bowler's (2001) *Food in Society: Economy, Culture, Geography*. There is also a pool of evidence on the effects of social marketing interventions aimed at encouraging health supportive food behaviours and environments (see for example, Burchell, Rettie, & Patel, 2013; Carins & Rundle-Thiele, 2014).

In summary, there are established evidence bases on the generalised sociocultural effects of commercial marketing on populations, on the effects of social marketing on population level food behaviours, the effects of the sociocultural food environment on food behaviours and the effects of many macro level non-marketing factors on the sociocultural food environment. There is however an absence of research or evidence synthesis that has specifically explored commercial food marketing's macro level impacts on the sociocultural food environment. Consequently, there is a potential evidence gap regarding its long term, macro level contributions to socially shared and agreed food behaviour and their significance for policy aiming to shift the current food environment that predominantly promotes foods and beverages high in fat, salt and/or sugar to one that *fosters and encourages healthy dietary choices and promotes the maintenance of healthy weight*' (WHO, 2010b, p.4) (Harris, Brownell, & Bargh, 2009b; Harris, Pomeranz, Lobstein, & Brownell, 2009a; Moore, 2007; Story et al., 2008).

This article is intended as a first step towards addressing the identified gap in the research literature. It reports on a rapid evidence assessment and critically interpretive analysis of policy implications of collated evidence on macro level impacts of food marketing on the food environment and subsequent impacts on food behaviours. It constituted one part of a programme of mixed methods, applied research, commissioned by the Scottish Government during the period 2010–2015. The programme's purpose was to identify, develop and implement innovation in its responsible marketing policy thinking and research. This article reports on the specific aims of the evidence review which were: (1) to provide a multi-disciplinary overview of the characteristics of evidence and evidence gaps on the effects (if any) of food marketing on

Box 1

Glossary of terms for sociocultural determinants of dietary behaviours

Food culture is an umbrella term for socially accepted values, norms and practices regarding food purchase, provisioning, preparation and consumption. It is also used to describe habitual behaviours and eating patterns. Food cultures are dynamic and increasingly transitional phenomena. They reflect and facilitate functional and symbolic transformational food system change; and a means of expressing world views and belief systems (Fieldhouse, 1996; Germov & Williams, 2004).

Food norms are the observable, socially common practices (descriptive norms) and/or the social rules regarding acceptable and unacceptable behaviors (injunctive norms). They emerge from an iterative process of exposure of population groups to external factors and modification by group members (Jetten, Haslam, Haslam & Dingle, 2014; Rozin, 1996).

Food values and social consensus on acceptable and/or desirable food behaviours are the architectural base or ‘glue’ of socially endorsed practices. Social consensus on food and dietary cultural values emerges from social imitation, adaptation and thereby learning processes in response to social and technological innovation. They are spread by social networks and hence play a key role in the adoption and diffusion of innovations (Germov & Williams, 2004; Madan, Moturu, Lazer & Pentland, 2010; Sunstein, 1996).

Food practices and habits are population/network wide habitual, routinized and/or ritualised food behaviours. They fulfil symbolic as well as functional roles. They are the product of historic and contemporary cultural, social and economic influences and material characteristics of food systems (Atkins & Bowler, 2001; Fieldhouse, 1996;).

the sociocultural food environment; (2) to critically appraise the significance of the collated evidence for future policy and research planning; (3) to explore the case for expanding the scope of responsible marketing policy research to include macro level processes and their effects on sociocultural dimensions of the food environment.

The focus was on the effects of marketing on the food environment, a setting shared by all consumers. The scope of the study therefore included evidence on the macro level impacts of marketing on all age groups.

The choice of its research approach was guided and informed by an extensive literature on good practice in rapid evidence assessment and critical review of evidence methods (Civil Service, 2012; Gough, Thomas, & Oliver, 2012), Thomas, Newman, & Oliver, 2013; Grant & Booth, 2009; Hagen-Zanker & Mallett, 2013; Tricco, Langlois & Straus, 2017). This literature describes how and why approaches to evidence review such as rapid evidence assessment methods can more effectively support innovation in policy development and are therefore more appropriate than full systematic review. Rapid evidence assessment methods such as review of reviews methods are inductive whereas, systematic review is deductive. The former is more appropriate when the aim is to scope and map the available evidence, and identify under-recognised evidence; the latter is better suited to evaluating mature evidence bases, for example comparative assessment of implemented policy interventions and strategies. Therefore, in this instance where a central goal for commissioning the research was policy innovation; that is to provide support for ‘policy makers and others working in the public interest who want to learn about the art of the possible and the risk of the unthinkable, not just the trend line of the probable’ (Steinberg, 2007, p. 85), a critically interpretive literature review based on a review of review strategy best matched its policy purpose.

As stated above the review was not designed or intended to be a full systematic evidence review. However, as per good practice recommendation for critically interpretive evidence reviews design and conduct, the review did follow a systematic and pre-defined search and screen protocol. Its starting point was to identify and search evidence reviews that included food marketing and sociocultural food and/or diet related outcomes as variables of interest, and to build on this with by conducting snowball searches of the bibliographies of reviews included after full screening. This strategy was intended to maximise as far as possible the breadth of the search process, and ensure search and screening identified evidence from a heterogeneous mix of sources and thus generated a broad, albeit not fully comprehensive overview of extant evidence sources.

Database selection was based on the findings from previously conducted systematic reviews on the effects of food marketing on children's food behaviours, including one previously conducted and published by

the authors of this paper (Cairns, Angus, & Hastings, 2009; McGinnis, Gootman & Kraak, 2006; Moodie, Stuckler, Monteiro, Sheron, Neal, Thamarangsi ... & Casswell, 2013). These reviews all noted an absence of research specifically focusing on food marketing's macro level impacts on the environment and on population level determinants of food behaviours. In light of this, pilot searches of the business, food studies and social science literatures were conducted. The results of these exploratory searches and the results of the previous systematic reviews using less specialised databases indicated published research on the variables of interest to this study was challenging to identify but did exist, and therefore represented a novel and promising source of evidence.

In order to ‘translate’ and interpret this evidence for public health purposes, a critical lens on the significance of its findings for future responsible marketing policy development was applied. The purpose was to maximise the policy utility of findings and generate insights on how and why a broader policy research agenda might translate into innovative policy initiatives.

2. Methods

The review set out to answer the research question: ‘*What is the evidence that for-profit food marketing directly impacts sociocultural elements of the food environment?*’ The search and screen process followed a detailed protocol. The protocol is presented in **Box 1**: Protocol for evidence search, screening and data extraction. Because the review was not an systematic review, the protocol was not registered with the international databases available for public registration of systematic reviews.

To ensure the review was consistent in its identification and interpretation of evidence across a wide range of disciplines and subject areas, each with their own terminologies, a glossary of terms and constructs relevant to the review's aims was compiled. The glossary was developed during the pilot scanning of the food studies, business and social science literatures, in advance of the formally structured literature search. Further adaptations were made in the search and screening stages. A copy of the final glossary is provided in **Box 2**: Glossary of terms describing sociocultural determinants of dietary behaviours.

Screening was conducted by two researchers who worked independently. Screening was guided by the inclusion criteria specified in the protocol. These were any qualitative or quantitative study reporting on purchase and/or consumption responses and changes to food culture, norms, values, practices, habits and/or social agreement/shared perceptions. All age ranges were eligible. Eligible marketing activities included but were not restricted to direct marketing communications (e.g. paid for advertising; product attribute claims such as nutrition,

Box 2

Protocol for evidence search, screening and data extraction

Research question	What is the evidence that food marketing impacts sociocultural determinants of purchase and/or consumption behaviours?
Search terms	(diet OR food) AND (marketing OR advertising OR promotion) AND (systematic review); (food culture OR food norms OR food values OR food practices OR food habits OR dietary consensus OR food ways) AND (marketing OR advertising OR promotion) AND (systematic review); (food buying OR purchase OR consumption) AND (marketing OR advertising OR promotion) AND (systematic review)
Data sources	Web of Science, Business Source Premier, World Advertising Research Centre data bases searched for reviews 21.5.13 Hand search of related systematic literature searches. Retrieval of full text of individual studies identified as relevant from review content and bibliographies. Hand searches of grey literature available in the public domain, including Mintel, KeyNote and Euromonitor reports. Date range 2008–2013
Screening criteria	Any qualitative study or quantitative study reporting on purchase and/or consumption responses and changes to food culture, norms, values, practices, habits and/or social agreement/shared perceptions. All age ranges included. Marketing activities included but not restricted to direct marketing communications (e.g. paid for advertising; product attribute claims such as nutrition, sensory benefits; social media promotions), indirect marketing communications (e.g. sponsorship; branding), price incentives (e.g. direct price discounts; coupons, multipacks and buy one, get one free offers); packaging and point-of-sale promotions (e.g. shelf signage, impulse stands, end of aisle store location); distribution (e.g. visibility, accessibility and density of retail outlets, eating environment), product (e.g. pack size, pack variety, formulation designed to increase appeal).
Data extraction and synthesis	For reviews: Author(s), date of publication, publication type, date range of included studies, review aims and/or research questions, screening and quality criteria. For individual studies: Author(s), date of publication, publication type, study characteristics, participants, setting, marketing stimuli and response outcomes, any theoretical constructs that informed study design or analysis, screening and quality criteria. For reviews and individual studies: All findings that contributed conceptually or empirically to the purpose of our own review recorded in narrative form. Convergence and disparities between study and review findings grouped under thematic headings.

sensory benefits; social media promotions), indirect marketing communications (e.g. sponsorship; branding), price incentives (e.g. direct price discounts; coupons, multipacks and buy one, get one free offers); packaging and point-of-sale promotions (e.g. shelf signage, impulse stands, end of aisle store location); distribution (e.g. visibility, accessibility and density of retail outlets, eating environment), product (e.g. pack size, pack variety, formulation designed to increase appeal). Spell out inclusion criteria here.

Discussions between the two researchers conducting independent assessments were held regularly to ensure conceptual clarity and consistency in their screening decisions. Any review or single study paper, considered ambiguous by the researcher originally assigned to assess, was read by both researchers and a joint decision made following discussion. Randomised cross checking of independent screening decisions indicated researcher's independent assessment decisions were fully consistent throughout the process (i.e. screening by title, abstract and/or full text).

Searches were conducted on the Web of Science, Business Source Premier and the World Advertising Research Centre for the period 2008–2013 (inclusive) in the second quarter of 2013 using the search terms listed in the protocol. An update search was conducted in the third quarter of 2018 by the lead researcher only. Two researchers screened results of the search process by assessing titles and abstracts of the identified reviews. Full text copies of potentially relevant reviews were obtained, and then screened against the inclusion criteria detailed above. Using a snowballing process, bibliographies of reviews and included individual studies were then hand searched to identify other relevant individual studies. A summary of the search process is presented in Fig. 2: Search and screen flow chart.

Reviews and single study papers that met all inclusion criteria specified in the protocol and therefore assessed as relevant to the research question were documented using the 'SPIDER' (Sample, Phenomenon of Interest, Design, Evaluation, Research type) framework, with an additional sub-heading to record reported 'sociocultural impacts on behaviour' outcomes. The additional sub-heading was required because in all of the included evidence sources, reported sociocultural outcomes were secondary and/or incidental findings to the primary research objective of the research. The SPIDER framework has been developed as an organisational tool for reviews of qualitative and mixed methods evidence. It aims to provide an equally rigorous but

more suitable alternative to 'PICO' (Population, Intervention, Comparison Outcome) tool which is widely recognised as an excellent Data Extraction tool for reviews of quantitative evidence (Cooke, Smith, & Booth, 2012). A summary of included studies is provided in the Appendix, see Table 1: Summary of Included Studies.

An inductive approach to the thematic analysis was adopted. The aim underpinning this was to ensure that the main themes eventually identified reflected and captured as far as possible the diverse range of theory and evidence based constructs, and disciplinary traditions from which the included literature was sourced (Braun & Clarke, 2006; Harding & Whitehead, 2016). It was also guided by published guidelines for thematic analysis of qualitative secondary data for policy purposes (Grant & Booth, 2009; Robson, 2011, pp. 465–492; Thomas & Harden, 2008).

First, a descriptive coding frame based on the glossary as well as other terms (for example, 'glocalisation and 'eating patterns') identified by the researchers during initial screening and first full text reads was drafted. Validated coding techniques such as searching for terms, recording the frequency of their mention, and in what context, helped in identifying and categorising terms and their underlying meaning(s). Building on this, through an iterative process of repeatedly indexing and categorising themes of initial and emergent interest and regular discussions, macro level outcomes (e.g. social normalisation processes), their relationship to one another (e.g. links between exposure to food marketing and food behaviours that are frequently practised and considered socially acceptable or 'normal') and any other significant contextual data (e.g. country level socioeconomic development) were identified and refined. The repeated 'circling and parking of data' aimed to ensure the 'translation' of reported findings from a the diverse range of evidence sources, each with its own terminologies, taxonomies and paradigms to public health policy implications was as accurate and consistent as possible.

In the final, key stage, a thematic 'map', which provided a schematic overview of the main themes and how these relate to one another as identified by the thematic analysis, was constructed. This is included at the end of the Results section as Fig. 3: Food marketing sociocultural impacts.

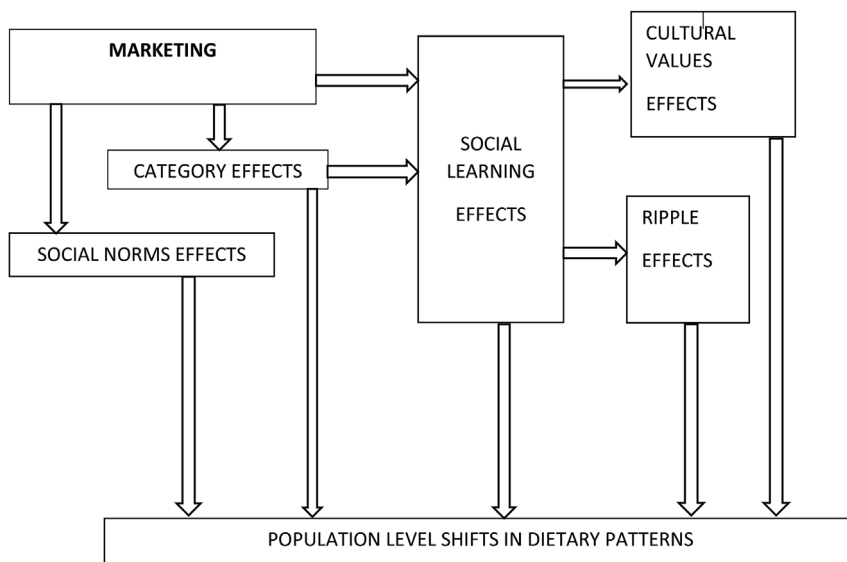


Fig. 2. Search and screen flow chart.

3. Results

Ten reviews and 31 individual studies published during the period 1989–2017 met the inclusion criteria. Twenty four of the individual studies were identified by hand searching bibliographies of included literature. None of the included studies had been specifically designed to examine macro level impacts of marketing on the sociocultural food environment. In all included studies, these results were reported as secondary findings. All the reviews reported sociocultural outcomes narratively. Almost all the individual studies used qualitative research methods and all five included quantitative studies provided both qualitative and quantitative analysis and discussion of their findings. Thematic analysis of the included literature identified five recurring themes/elements regarding the impact of food marketing on the sociocultural food environment. These were:

(1) **CATEGORY level effects:** Shifts in demand trends for whole categories of food and drink such as carbonated sweetened beverages,

ready meals, savoury snacks.

(2) **SOCIAL NORMS effects:** Changes in dietary and/or other food related behaviour norms manifested as changes in habits and socially common and accepted practices – for example whether it is considered the norm for children to eat with, and the same food as, adults in their household.

(3) **CULTURAL VALUES effects:** Cultural values are the principles/standards shared by a population group. They guide beliefs, attitudes, expectations and behaviours. For example strongly socially embedded values underpin food taboos and shifts in values may facilitate the adoption and diffusion of novel food behaviours.

(4) **SOCIAL LEARNING EFFECT PATHWAYS:** Social imitation and consensus building processes that drive the adoption and diffusion of marketing led innovation through a population.

(5) **RIPPLE EFFECT PATHWAYS:** The spread of sociocultural shifts through a social or economic system that impact non-target and/or secondary audiences as well as targeted customer groups.

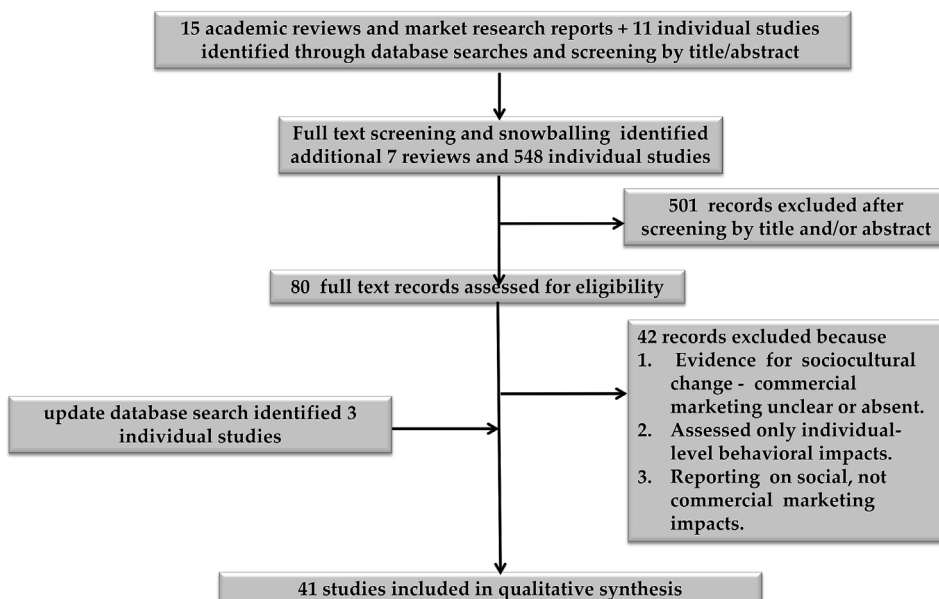


Fig. 3. Food marketing and sociocultural impacts.

A narrative synthesis of identified evidence structured by the five conceptual themes and the schematic overview of how the themes interact with one another to produce change in the sociocultural food environment (Fig. 3: Food marketing sociocultural impacts) are presented below.

3.1. Category level effects

Six reviews (Butland, Jebb, Kopelman, McPherson, Thomas, Mardell & Parry, 2007; Cairns et al., 2009; Chandon & Wansink, 2012; Harris et al., 2009b; McGinnis, Gootman & Kraak, 2006; Neslin & Van Heerde, 2009) and 10 individual studies (Ailawadi & Neslin, 1998; Grier, Mensinger, Huang, Kumanyika, & Stettler, 2007; Hawkes, 2006; Lucan, Maroko, Sanon, & Schechter, 2017; Reisch et al., 2013; Schneider and Davis, 2010; Scully, Wakefield, Niven, Chapman, Crawford, Pratt ... & NaSSDA Study Team 2012; Witkowski, 2007; Zheng & Kaiser, 2008; Zheng, Wohlgenant, Karns, & Kaufman, 2011) reported evidence of food marketing effects on category level purchase and consumption trends. For example, Scully et al. (2012) provide evidence that advertising and sponsorship increase environmental salience of heavily promoted product categories, such as high fat, salt and/or sugar foods. Butland et al. (2007), Cairns et al. (2009), and McGinnis, Gootman and Kraak (2006) provide evidence that frequent price promotions for the heavily promoted high fat, salt and/or sugar food categories also contribute to their salience in the food environment. Ailawadi and Neslin (1998), and Neslin and Van Heerde (2009) provide evidence that consumers use their knowledge of recurring price promotion to take advantage of price-based competition by adopting brand-elastic and bulk purchasing behaviours. This sustained uninterrupted availability facilitates the stockpiling of heavily promoted product categories and an increase in the frequency and volume of their habitual consumption (Ailawadi & Neslin, 1998; Chandon & Wansink, 2012).

A case study of a major marketing drive for global brand processed snack products in Thailand provides an illustrative example of marketing's effects on population level food and drink category purchase and consumption trends. The study documents how through a mix of global and traditional culture based marketing appeals (a marketing strategy commonly referred to as 'glocalisation'), transnational manufacturer introduced branded snack products to the Thai consumer market. In response to the newly arrived competition, local snack manufacturers also increased their marketing activities. As a consequence of the overall increase in salience-boosting promotional activities and availability, sales of snacks nationwide were increased by 35% over a five year period (Hawkes, 2006).

3.2. Social norms effects

Three reviews (Chandon & Wansink, 2012; Fitzpatrick et al., 2010; Harris et al., 2009b) and 19 individual studies (Buijzen, Schuurman, & Bomhof, 2008; Dhar & Baylis, 2011; French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001; Grier et al., 2007; Haws & Winterich, 2013; Herman & Polivy, 2005; Intemann et al., 2017; Nielsen & Popkin, 2003; Reisch et al., 2013; Schneider & Davis, 2010; Sharpe, Staelin, & Huber, 2008; Signorielli & Lears, 1992; Vermeer, Steenhuis, & Seidell, 2010; Wang, Zhai, Zhang, & Popkin, 2012; Wansink, 2010; Williams, Crockett, Harrison, & Thomas, 2012; Witkowski, 2007; Zheng et al., 2011; Zheng & Kaiser, 2008) were identified as evidence of food marketing contributing to the emergence of new behavioural norms.

Chandon & Wansink (2012), Wansink (2010) Signorielli and Lears (1992), Sharpe et al. (2008) for example demonstrate how intense marketing weaken and undermine injunctive norms that would otherwise discourage the excess consumption of energy dense, low nutrition food and drinks. Furthermore, their high levels of environmental salience strengthen descriptive norms (i.e. perceptions of what behaviours peers frequently engage in) that these products are regular and typical products in the 'average' diet (Dhar & Baylis, 2011; Grier et al., 2007;

Harris et al., 2009b). Through these 'normalising' effects the emergence and spread of new social norms about foods, drinks and associated behaviours such as snacking, household provisioning are facilitated (Buijzen et al., 2008; Chandon & Wansink, 2012; Wang et al., 2012; Witkowski, 2007).

Other factors such as socio-economic status, the provision of product information and health education are found to moderate but not fully reverse the cumulative normative effects of a food environment saturated with marketing cues to repeatedly purchase, consume for reasons other than hunger or nutritional needs (Epstein et al., 2012; Epstein, Temple, Roemmich, & Bouton, 2009; Zimmerman & Shimoga, 2014).

A large scale analysis of shifts in eating patterns in China tracked snacking patterns from 1991 up to 2009 by Wang et al. (2012) reported convincing quantitative and qualitative evidence of these effects: In 1991, 9.7% of participants aged 19–44 reported consuming at least one snack during a 3 day period. In 2004, this figure had increased to 16.3% and by 2009, to 38%. The steep increases in snacking frequency during the period 2004–2009 were attributed to the habit/social norm effects of marketing, increases in availability and purchasing power.

3.3. Effects on cultural values

Two reviews (Chandon & Wansink, 2012; Harris et al., 2009b) and 21 individual studies (Banwell et al., 2013; Barthel, 1989; Buijzen et al., 2008; Dhar & Baylis, 2011; French et al., 2001; Harris, Bargh, & Brownell, 2009; Haws & Winterich, 2013; Isaacs et al., 2010; Nielsen & Popkin, 2003; Peñaloza, 2001; Peñaloza & Gilly, 1999; Reisch et al., 2013; Schneider and Davis, 2010; Sharpe & Staelin, 2010; Sharpe et al., 2008; Signorielli & Lears, 1992; Signorielli & Staples, 1997; Wang et al., 2012; Wansink, 2010; Williams et al., 2012; Witkowski, 2007) were identified as evidence of food marketing impacts on cultural values and consequent shifts in dietary behaviours at the population level.

For example shifts in expectations/assumptions regarding portion sizes for food and drinks consumed in the home are demonstrated to be driven by twenty years of sector-level increases in out of home portion sizes (Nielsen & Popkin, 2003; Vermeer et al., 2010). Socially salient marketing cues to buy and consume food and drinks are found to be signal that engaging in excess consumption and/or 'mindless eating' patterns (of any/all food and/or drinks) is culturally acceptable (Chandon & Wansink, 2012; Herman & Polivy, 2005; Wansink, 2010).

A particularly striking example of rapid cultural value change was Peñaloza's, 2001 case study of red meat marketing to newly arrived immigrants to the US. The ethnographic found marketing campaigns designed to appeal to immigrants' acculturation aspirations successfully increased regular red meat consumption by framing the behaviour as an internal and external signal of authentic 'American' identity.

3.4. Social learning effect pathways

Two reviews (Montgomery & Chester, 2009, 2011) and ten individual studies (Barthel, 1989; Grier et al., 2007; Hawkes, 2006; Isaacs et al., 2010; Peñaloza, 2001; Peñaloza & Gilly, 1999; Reisch et al., 2013; Schneider and Davis, 2010; Wansink, 2010; Williams et al., 2012; Witkowski, 2007) were identified as evidence of social learning processes facilitating food marketing impacts.

Through this mechanism social consensus on the adoption of novel food products and related dietary behaviours is fostered and consequently, a new marketing-driven social norm, trend or value can spread through a population or social group. A mediation analysis of parents' exposure to fast food advertising and their children's consumption of fast foods included in the review provided a good example of this mechanism of effect. The study found no correlation between parent's personal, individual level, attitudes to fast foods and their children's consumption of fast foods. A statistically significant, direct correlation

between parents' increasing propensity to feed their children fast foods and the strength of their perceptions regarding the socially acceptability and prevalence of children's fast food consumption within their social networks however was found (Grier et al., 2007).

3.5. Ripple effect pathways

Two reviews (Montgomery & Chester, 2009, 2011) and 8 individual studies (Banwell et al., 2013; Isaacs et al., 2010; Lucan et al., 2017; Peñaloza, 2001; Peñaloza & Gilly, 1999; Williams et al., 2012; Witkowski, 2007; Zheng & Kaiser, 2008) were identified as evidence of food marketing ripple effects.

Montgomery, Chester, Grier, and Dorfman (2012) note that receivers of peer-to-peer marketing through social networks assumed the socially shared information is more trustworthy and credible than business to consumer marketing. They note that audiences are not always aware that the original source of the communication was a business to consumer marketing promotion. They and others note that in these circumstances, the protective effects of advertising literacy, health motivations and cognitive defences against promotional food marketing techniques are undermined (Carter, Edwards, Signal, & Hoek, 2012; Epstein et al., 2012; Goldberg & Gunasti, 2007; Haws & Winterich, 2013).

A case study of an integrated soft drinks marketing campaign provides a good example of this mechanism of effect and its effectiveness. The campaign included free music, entertainment, games, news, and branded product rewards. As a consequence, a third of its 15 million registered members recommended membership to an average of 3.7 personal contacts. The campaign's communication impacts were therefore increased by approximately 18.5 million (i.e. more than double the number of directly targeted impacts). Even though some impacts would have been duplicates, it is clear that the reach of the campaign was extended from its direct target audience to a social community connected by their shared non-commercial interests (in this case, music and games) (Montgomery & Chester, 2011).

4. Discussion

The review captured evidence of food marketing contributing to macro level shifts in the sociocultural food environment. Evidence of population level shifts in purchase propensities, increased demand for heavily promoted food categories and the evolution of new norms, values and food behaviours through social learning processes was identified. Evidence of impacts on non-target as well as target audiences through ripple pathways was also identified.

Macro level impacts are mediated via dynamic system level processes and linkages. They may be intended or unintended and are perhaps most commonly, a mix of both. They may have positive or negative consequences for the dietary health and wellbeing of individuals and/or populations. Currently however, because food marketing is heavily dominated by promotions for low nutrition, energy dense foods and drinks (Butland et al., 2007; Cairns et al., 2009; Moodie et al., 2013) the bulk of contemporary food marketing is not supportive of dietary public health goals.

To date, the focus of food marketing policy and research has been skewed towards the nutritional quality of promoted foods. There has been less explicit exploration or discussion regarding the behaviours competitive marketing tends to promote – for example, eating in the absence of hunger or consuming quantities in excess of nutritional needs. The review's findings however, highlight the need for policy to consider restricting the promotion of health risky behaviours as well as the types of food and drink products that can be promoted to children. For example, strengthening controls on the promotion of snacking as a behavioural norm, in addition to restricting child-targeted promotions for snack products such as crisps and confectionery.

The review's findings of macro level impacts also contribute to the

evidence base supporting the case for non-communicable disease prevention and control policy development, including responsible marketing policy, to more explicitly recognise that ecological determinants of health are as important as factors affecting individual choice (Butland et al., 2007; McCarthy et al., 2011; Rutter et al., 2017; Story et al., 2008). One implication for future policy development for example, is that, if effects at the environmental level can be measured and added to measures of the effects of food marketing on individual choice, computations/estimates of effect sizes are increased and thus strengthen the evidence-based public health case for more comprehensive and restrictive policy controls on food marketing. A second implication is that evidence on the environmental impacts of food marketing contributes to the growing evidence base indicating the benefits of reframing non-communicable disease prevention and control policies as whole system challenges. Whole system approaches do not replace interest in the role of individual choice and the case for encouraging individuals to take responsibility for their personal food behaviours. Instead they expand policy scope, for example by strengthening the case for controls on outdoor advertising that children are exposed to (e.g. around schools and public transport systems) as well as specifically child-targeted food advertising and marketing. Although, there has been some initiatives towards this broader aim, for example, isolated examples of bans on outdoor advertising of high fat, salt and/or sugar foods and drinks around schools further development and more widespread implementation has been impeded by the historic resistance of the food industry and the hesitancy of policy makers to implement policies that they perceive as having potentially important but unknown and/or unquantifiable public health benefits and large scale economic implications (Harris et al., 2009a; Moodie et al., 2013; Roberto, Swinburn, Hawkes, Huang, Costa, Ashe ... & Brownell, 2015).

As noted above, interest in how systems science can be used to address the public health challenge of non-communicable diseases and their complex multifactorial aetiology is growing (Finegood, Merth, & Rutter, 2010; Rutter et al., 2017; Smith & Petticrew, 2010; Swinburn, Sacks, Vandevijvere, Kumanyika, Lobstein, Neal ... & L'abbé, 2013). An early but still highly relevant systems-oriented resource available to inform and support a more systems-oriented approach to food marketing control policy is the obesity systems map developed by the Foresight review team (Butland et al., 2007; Finegood et al., 2010; Gortmaker, Swinburn, Levy, Carter, Mabry, Finegood ... & Moodie, 2011; Rutter et al., 2017). The map identifies four psychobiological traits as key to the current 'steady state' of the obesogenic system. The four traits are appetite control, psychological ambivalence, dietary habit and physical activity. Links can be traced between the psychobiological traits of appetite, psychological ambivalence, dietary habit and food marketing (Butland et al., 2007, p. 43–46).

System science logic indicates targeting these four factors could reduce marketing's contribution to the steady state of the system and its obesogenic outcomes (Finegood et al., 2010; Gortmaker et al., 2011). For instance, this review's identification of evidence of marketing effects on category choices and social norms provides a rationale for policy controls designed to reduce the reinforcing impacts of marketing low nutrition, energy dense foods on health risky food norms. An example of a policy action targeted to this aim would be prohibiting all price promotions for low nutrition, energy dense foods and drinks. Foresight evidence on psychological ambivalence and appetite acting as barriers to individual level behaviour change, and this review's identification of evidence on the effects of food marketing on sociocultural norms and values indicates there may be a compelling case for policy to take active steps to reduce the currently very high levels of social salience and price promotions for foods and drinks that are low nutrition and energy dense.

A quantitative analysis of the effects of a Canadian food marketing intervention on household food expenditures provides an indication of the potential cost-effectiveness of interventions disrupting sociocultural elements of an obesogenic food environment: An evaluation of the

effects of a fast food advertising ban for French language TV advertising found an US\$88 million reduction in food advertising expenditure resulted in a 13% reduction in household propensity to purchase fast foods. The study estimated that over a 15 year period the effect would result in 0.6 kg less weight gain per person than for individuals living in a food marketing environment that normalised the purchase and consumption of just this one food category. The study compared its effects on French TV viewers to the behaviours of Canadians who were native English speakers. They were not impacted by the ban because English language TV did not ban fast food advertising. Through a carefully controlled analysis of its impacts and how they were mediated, the study demonstrated that individual level reductions in exposure to advertising could not fully account for the intervention's effects. It demonstrated that the reduction in purchase propensity was in fact attributable to the ban's effects on its sociocultural environment. (Dhar & Baylis, 2011).

Additionally, evidence on marketing tapping into ripple effect pathways that reach non-target audiences strengthens the argument for restricting marketing activities targeting physical and sociocultural environment (e.g. sponsorship at sports events and social media facilitated peer-to-peer marketing. Evidence on the effects of food marketing being facilitated through social learning processes and as a consequence increasing the likelihood of their widespread adoption and diffusion of novel products and behaviours also strengthens the case for policy to aim to constrain marketing's aggregate and cumulative impacts on the food environment, in addition to restricting the marketing activities of individual companies (Harris et al., 2009a; Moodie et al., 2013; Schrempf, 2014). The paucity of evidence on sector level impact has been used by the food industry to lobby against the reframing of the issue as a shared, sector and societal level responsibility and has consequently been a key barrier to progressing the development and implementation of responsible marketing policy interventions targeting environmental level impacts (University of Copenhagen, 2013; Swinburn et al., 2013; Kraak et al., 2016).

In addition to strengthening the public health case for intervention, paradigmatic shifts from an almost exclusive focus on the effects of food marketing on individual food behaviours to one that also takes into account its effects on the environment the behaviours are enacted would also better align food marketing policy controls with contemporary marketing theory and evidence on the importance of understanding marketing for research and marketing planning and management purposes as a systems-based, not individual transactions-based phenomenon (Smith et al., 2010; Witkowski, 2007).

4.1. Study limitations and strengths

The search strategy limited to a review of review, supplemented with snowball searches, ensured the evidence review covered nearly three decades of research (1989–2018), but will not have identified all relevant studies published during this period.

The review was exploratory in its design and aims. Its findings therefore do not provide any insight on the magnitude of the effect size of food marketing on sociocultural elements of the food environment. Furthermore, because the focus of this review was on the effects of marketing on the food environment setting but the majority of the evidence identified reported effects on individuals or households it does not provide the contextual data needed to assess the scale of its significance for future policy effectiveness. Four evidence sources were grey literature; peer review is only confirmed for two of these which further adds to the limitations of the review to assess potential significance of the findings for future policy development.

Additionally, the review did not identify any primary research on

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.appet.2019.02.002>.

sociocultural impacts, instead it was only able to identify studies reporting evidence of impacts as secondary, incidental findings it. Therefore, the review has not tested any counter-factual explanations, for example, impacts are attributable to other, currently unknown factors and identified relationships are correlational rather than causal.

Another significant limitation is the large proportion of identified evidence from research conducted on the food environments of developed economies. The search and screen strategy did partially address this limitation because it was designed to capture evidence from an internationally wide range of sources. However, this limitation, which is not unique to this study (evidence reviews of marketing's micro level impacts such as Cairns et al., 2009; WHO, 2010b; WHO, 2012 also report this as a limitation), is perhaps of ever greater importance, as food marketing becomes increasingly globalised.

Nevertheless, as the first evidence synthesis on the sociocultural impacts of food marketing, the review makes the following contributions:

The review identified a fragmented pool of evidence indicating marketing is almost directly contributing to macro level shifts in food behaviours through its impacts on the sociocultural food environment and as a consequence macro level determinants of food behaviours. These impacts can affect long term food behaviours as well as the well-recognised short term, direct effects on individual consumption choices.

The pool of evidence provides some foundational insights that a future research agenda regarding food marketing's macro level impacts on the food environment could draw on. For example it has highlighted the potential strategic benefits of shifting policy focus from corporate level promotion effects to the aggregate and cumulative effects of marketing, in order to better support the food environment goals of responsible marketing policy.

The review has demonstrated the prescience of the multiple calls for dietary public health policy development to promote policy innovation by increasing the utilisation of evidence and methods from other disciplines and fields (McCarthy et al., 2011; Moodie et al., 2013; Seiders & Petty, 2004; University of Copenhagen, 2013). It identified under-recognised evidence generated by disciplines such as business and marketing, cultural anthropology, and food studies can bring novel insights on policy options.

5. Conclusion

The review has presented provisional but promising evidence that food marketing can influence food behaviours by moderating socio-cultural elements of the food environment. It has demonstrated that macro level conceptualisations of marketing more closely reflect the real world practices of current food and drink marketing and the strategic aims of responsible marketing policy. In summary, the review has revealed a compelling case for the responsible food marketing policy research community to revise prevailing assumptions underpinning current research strategies and objectives. The potential benefits to policy development of reframing and expanding the research agenda from micro to multi-level impacts, that include macro level factors are significant. It may provide an explanation for the weak impact of extant policies, and more crucially support innovative step changes in the aims, design and impacts of responsible marketing research and policy.

Acknowledgement

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Table 1
Summary of Included Studies

Evidence source	Research type/methodology	Sample	Phenomenon of interest	Evaluation/Primary research findings	Sociocultural impacts on behaviour
Ailawadi and Neslin (1998)	Econometric analysis	2 years' time series purchase data for 2 products (yoghurt and ketchup) in USA.	Purchase trends in response to frequently recurring price promotions.	Permanent increases in category level purchasing of product categories with frequently marketed via price promotions.	Permanent increase in household purchase and consumption of frequently promoted product categories.
Banwell et al. (2013)	Mixed ethnography and other qualitative methods.	7 fresh food markets in Thailand.	Diet-related impacts of globalisation on a middle income country undergoing rapid economic development.	Fresh markets closing or adapting (by imitating competitor strategies) in response to rising penetration of western style supermarkets. Increases in obesity in Thailand associated with supermarket growth.	Changes in perception and practices regarding regional cuisine, women's roles and social networks.
Barthel (1989)	Historical research; socio-historical case study.	Analysis of mainly secondary (some primary) 1937–1989 data sources (US and UK).	The contributions of modernist design and marketing to shifts in symbolic meaning of boxed chocolates.	Marketing impacts more influential than modernist design values, resulting in the social positioning of boxed chocolates as luxury products.	Normalisation of chocolate as a contributor to positive interpersonal relations and intrapersonal wellbeing.
Buijzen et al. (2008)	Diary–survey study (quantitative).	234 households with children aged 4–12 years in Netherlands.	Impacts of children's exposure to food advertising on consumption of advertised food brands, advertised energy-dense food product categories, and food products overall.	Overall, exposure significantly correlated with consumption of advertised brands and energy-dense product categories. Advertising only significantly associated with increased consumption of food products overall in lower income Family children. Family communication was an important moderator of the relationship between advertising and the food consumption variables.	Effect size of spill-over impacts of television food advertising on generic unhealthy consumption patterns were bigger than brand level impacts.
Butland et al. (2007)	Mixed methods; qualitative and quantitative.	Synthesis of multiple UK government commissioned evidence reviews, systems mapping, scenario planning, and qualitative and quantitative modelling (date range not specified).	Identification and mapping of obesogenic system factors, their relative contributions, linkages, pathways of effects and thereby the identification of promising policy intervention options.	A substantial degree of intervention aimed at behaviours and the cues for behaviours relating to food, physical activity and physiological and psychosocial factors at multiple levels of governance are urgently required to reverse the normalisation of obesity.	The cumulative social, economic, physical and cultural effects of current marketing practices on food behaviours are contributing to the obesogenic system.
Cairns et al. (2009).	Systematic review and evidence synthesis.	Review and narrative synthesis of global evidence base 1970–2008.	Scale, nature, and effects of food marketing on children.	Food and beverage marketing mainly promotes low nutrition, high energy foods. It is widespread, and engaging. There are clear (small to modest) measurable impacts on food preferences, purchase requests, consumption, and diet-related health outcomes.	Evidence of direct and indirect effects of marketing on category level food preferences, beliefs and consumption patterns.
Chandon and Wansink (2012)	Critically interpretive literature review.	Marketing, consumer research, and social science literature (date range not specified).	Integrative review of food marketing impacts on all age groups.	Food marketing increases consumption volumes and therefore risk of excess weight gain.	Food marketing impacts the food environment and consumer's unconscious (mindless) responses. Effects size and pathways are important future research priorities.
Dhar & Baylis, 2011	Natural experiment (quantitative).	Household expenditure survey data from 1984 to 1992 in Canada.	The effects of ban on child-specific TV advertising on household consumption patterns compared to control group.	Ban decreased household purchase propensity by 13% per week and reduced consumption by US\$ 88 million per year.	Variance in consumption attributed to impacts on differences in food environment and in turn their effects on dietary norms and values. Tentative evidence that the effect of the ban were sustained into young adulthood.
Fitzpatrick et al. (2010)	Qualitative; case study.	Literature review/documentary analysis (date range not specified) + 11 key informant interviews. Scotland + 3 comparator countries.	Contemporary food culture of Scotland, and its determinants.	Multiple determinants of food culture identified. These and their aggregated impacts on food culture and its impact in turn on health policy effectiveness and health outcomes under-researched and under-recognised.	Advertising influences how people perceive foods. Shifts in shared perception include changes in attitudes to product categories and dietary practices (e.g. social acceptability of snack foods and snacking behaviours).
French et al. (2001)	Quantitative; survey.	Community-based sample of 4746 adolescent students in USA.	Demographic, behavioural and dietary correlates of frequency of fast food restaurant use	Frequency of fast food restaurant use positively associated with total energy, fat, fast food	Significant correlations between frequency of fast food restaurant use and social

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Table 1 (continued)

Evidence source	Research type/methodology	Sample	Phenomenon of interest	Evaluation/Primary research findings	Sociocultural impacts on behaviour
				items such as soft and pizza consumption Also, student employment, television viewing, home availability of unhealthy foods, and perceived barriers to healthy eating. Inversely associated with fruit, vegetables and milk consumption, as well as students' own and perceived maternal and peer concerns about healthy eating.	norms/perceptions of peers and family attitudes to 'healthy eating', time use and convenience preferences.
Grier et al. (2007)	Quantitative; cross-sectional survey	312 parents of children aged 2–12 year living in ethnically diverse and medically underserved communities in USA.	Cross sectional study of children's fast food consumption against measures of parental exposure to promotions, and attitudes, access and descriptive social norms variables.	Greater exposure to fast-food promotion is positively associated with beliefs that eating fast food is normative to participants' friends, family, and community members and with frequency of children's fast-food consumption.	Variance in consumption correlated most strongly with descriptive norms.
Harris et al. (2009b)	Integrative qualitative evidence review.	Evidence review (date range not specified)	Psychological effects and mechanisms of effect of food marketing on food behaviours.	Awareness, understanding, ability and motivation to resist persuasive effects of marketing required to counter harmful effects of low nutrition, energy dense food and beverage products.	Normative effects on unhealthy dietary behaviours and beliefs appear to be mediated via social developmental processes and interaction with other environmental influences.
Harris et al. (2009c)	Quantitative; 3 laboratory-based psychology experiments.	118 children equally divided into treatment and control groups participated in 2 experiments; 98 adults recruited into single experiment in USA.	Cueing effects of TV food advertising on snacking behaviours of children and adults.	Food advertising increased consumption of products not in the presented advertisements; effects were not related to reported hunger or other conscious influences	Increases in consumption partially attributed to imitative behaviours in adults and vicarious learning mechanisms in children.
Harris et al. (2009a)	Integrative qualitative evidence review.	Evidence review (no date range specified)	The impacts of food marketing on children's diets and the effectiveness of policy controls aiming to constrain adverse effects	Food marketing creates significant structural barriers to improvement in children's nutritional health through multiple mechanisms.	Cumulative, category level effects on sub-conscious, food-based social practices and values of children and adults.
Hawkes (2006)	Qualitative; integrative evidence review	China, Brazil, India Thailand, Mexico focused case studies and supporting secondary analysis of trade and nutrition data.	The contribution of agri-food policies and globalised trade to the nutrition transition in developing economies.	Economic policies and global food marketing have contributed to higher vegetable oil and highly-processed foods consumption and may widen health inequalities.	Global food marketing contributes to shifts in cultural norms about what to eat, where and how much.
Haws and Winterich (2013)	Quantitative; laboratory-based and online choice studies	5 experiments involving n = 102, 100, 100, 81 and 327 US adults participants.	Relative effect sizes of health goals, health cues and supersize price promotions on consumption decisions.	Supersize pricing results in increased consumption of low nutrition products because of the tendency to favour financial value. Supersize pricing applied to healthier foods also results in increased consumption. Health cues reduce the effects of supersize promotions.	Price promotions reduce the positive effects of personal values, goals and reasoning on 'healthy eating' choices.
Herman and Polivy (2005)	Qualitative; critically interpretive evidence review.	Integrative review, no date range specified.	Conceptual analysis of the effects of personal and situational norms on consumption decisions and behaviours.	Evidence indicates normatively focused policy approaches to obesity control are likely to be more effective than neuro-biologically focused interventions.	Effects on perceptions regarding 'appropriate' behaviours and expectancies especially portion size and expectancy/acceptability of consumption in excess of satiety.
Intemann et al. (2017)	Longitudinal prospective cohort study (quantitative).	Wave 1 (2007/8): 16,228 children aged 21- years living in 8 European countries Wave 2 (2009) 13,596, comprising 68% of from Wave 1. Wave 3 (date not reported) 9, 617 comprising 52% of Wave 1.	How contemporary food systems influence nutritional quality of children's diets, with particular focus on marketing systems.	Parental socioeconomic status, children's media consumption and current marketing strategies employed by the food industry were associated with a low-quality diet and unhealthy food intake in European children.	
Isaacs et al., 2010;	Qualitative; ethnography.	Two field studies, 125 consumer interviews, two market trader focus group discussions conducted in North Thailand town in 2008.	Short and long term impacts of supermarket entry into middle income country on the food environment and food culture.	Cultural conventions with respect to social regard, involvement and specialization are important determinants of responses to food retailing, and it	Changes to social, cultural and ecological values influencing diet and consumption behaviours and the mechanisms through which these

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Table 1 (continued)

Evidence source	Research type/methodology	Sample	Phenomenon of interest	Evaluation/Primary research findings	Sociocultural impacts on behaviour
Lucan et al. (2017)	Mixed methods (mapping, qualitative and quantitative correlation analysis)	2012 primary data on all adverts (n = 1586) displayed on subway system serving approximately 3 million residents of a defined US city area (the Bronx, NY), analysed against secondary demographic data collected by US census survey and prevalence of diet-related diseases in the subway catchment area, collected by city health department survey (n not reported).	Distribution and potential impacts of print advertising for foods and beverages displayed in the subway system section on dietary intake and prevalence of diet related conditions in the surrounding residential catchment area	is as yet unclear how the penetration of western-style supermarkets will moderate future consumer values, practices and norms. Distribution indicates advertising targeted to most economically, educationally and ethnically disadvantaged areas, and to areas with highest proportions of children. Strong health negative correlations between advert exposures and sugary-drink consumption, fruit-and-vegetable intake, diabetes, hypertension, and raised cholesterol.	changes interact with other environmental factors and spread. Clear ecological level evidence of links between marketing in public settings and population level health outcomes.
McGinnis et al. (2006)	Literature review – systematic analysis and narrative synthesis	Up to 2004, no start date specified.	Systematic review of the nature and effects of food marketing on children.	Food marketing Influences the diets and health of children. • contributes to a (health) risky environment • Private sector does not use its potential to encourage healthful diets. Multi-sectoral intervention needed. • Public policy is weak.	Interactive socialising effects of marketing on cultural values and eating patterns of children and their social networks.
Montgomery and Chester (2009)	Technical report	Mainly grey literature including market research reports and marketing expenditure data + some academic process and impact evaluations.	Digitally facilitated interactive food marketing to adolescents.	Key features of ubiquitous connectivity, personalization, peer-to-peer networking, engagement, immersion, and content creation are purposefully exploiting the special relationship that teenagers have with new media.	Marketing promotes diffusions of novel practices and products via social networks
Montgomery and Chester (2011)	Mixed methods review of digital marketing methods, mechanisms of effects and impacts.	Contemporary digital marketing practices and 4 case studies of transnational food and beverage companies.	Digital food marketing targeted to children and adolescents reach, nature and impacts.	Some of the digital marketing techniques being used to promote products to children are designed to tap into unconscious choice processes, and some violate consumer privacy and/or are deceptive.	Cumulative exposure impacts on social norms, expectations spread through digitally facilitated social networks
Neslin and Van Heerde (2009)	Synthesis of econometric analysis data.	Theory and empirical evidence relating to 9 effect pathways and impacts of price promotions on markets and consumer behaviours.	Dynamic effects of price promotions offered to consumers.	Price promotions generate category level increases in consumer stockpiling (rate and quantity of purchase) and increased consumption. Promotions increase brand level loyalty and demand elasticity (state dependence, reference pricing and price sensitivity). Promotions increase market level competition and long term/permanent penetration for small and new brands but not older and/or brands with large market share.	Permanent effects on category level household purchase and consumption behaviours.
Nielsen & Popkin, 2003;	Secondary analysis of nationally representative data (quantitative)	63380 individuals aged 2 years and older participating in the US Nationwide Food Consumption Survey (1977–1978) and the Continuing Survey of Food Intake by Individuals (1989–1991, 1994–1996, and 1998).	Portion size trends	Portion sizes and energy intake for specific food types markedly increased; greatest increases for food consumed at fast food establishments and in the home.	Universal, significant increases, but especially in home and fast food restaurant settings of portion size and energy intake observed over. Changes attributed to 'fast food pricing and marketing and 'advertising climate' identified as barrier to more healthful patterns and trends in dietary behaviours.
Peñaloza and Gilly (1999)	Longitudinal ethnography	1989–1996 data set drawn from 343 h of journalised fieldwork, interviews	Acculturation processes and outcomes in contemporary markets.	Marketers serve as bicultural mediators, both accommodating their consumers and	Immigrant consumers' adapt dietary values and

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Table 1 (continued)

Evidence source	Research type/methodology	Sample	Phenomenon of interest	Evaluation/Primary research findings	Sociocultural impacts on behaviour
Peñaloza, 2001;	Longitudinal ethnography (qualitative)	(transcribed) with 15 retailers, 16 Mexican immigrant consumer interviews + 450 photographs in USA. Data set drawn from 210 h of participant observation, verbatim transcriptions of 88 interviews (29 consumers + 59 supply side individuals), photographs and analysis of material artefacts collected over 7 years in USA.	Consumers' cultural production in response to event-based, dynamic interactions with food production and marketing at trade show and rodeo.	working to alter their consumption patterns. Consumers recreate western cultural meanings and memories related to competition, naturalism, freedom/independence, and family traditions.	behaviours in response to marketing campaigns. Marketing-driven cultural shifts in food choices and dietary patterns.
Reisch et al. (-2013)	Mixed methods: longitudinal survey and supplementary laboratory experiments (quantitative)	229 children aged 6–9 years living in 5 countries in Europe and participating in a large scale prospective cohort study in 2007/8 and follow up 2009.	How food marketing affects children's food knowledge and preferences, diet, and weight status and the moderating effects of the social, physical, and media environment.	Attitudes and norms environment positively associated with healthier food preferences and diet quality, including proportional fat intake. Better food knowledge not linked to healthier food preferences and diet not linked to weight status	Food choices found to be strongly affected by availability, affordability, and accessibility, particularly if supported by social norms.
Schneider & Davies, 2010	Socio-historical analysis of documentary evidence	Advertising, editorial content and articles of 72 issues of <i>Australian Women's Weekly</i> 1951–2001.	Health food promotion and its contribution to socially constructed 'dietary health' knowledge, attitudes and perceptions.	In an age of increasing 'gastroanomy', the food industry in conjunction with nutritionists and other "experts" create and fulfil consumer needs for normative regulation in food consumption	Active reshaping and reframing of dietary norms, value, practices and underpinning rules and symbolic meanings.
Scully et al. (2012)	Web-based questionnaire of (quantitative, correlational analysis)	Cross-sectional survey of exposure to marketing and eating choices of 12,188 Australian secondary students aged 12–17 years.	Associations between food marketing exposure and adolescents' food choices and reported consumption of energy-dense, nutrient-poor foods.	Cumulative exposure to television food advertising and other food marketing sources correlated positively and in dose-response patterns with adolescents' energy dense, low nutrition food choices and eating behaviours (e.g. snacking). <i>Effects of bundling</i> generate an average increase of 110–130 calories per meal. <i>In addition to the traditional economic rationale for consumer purchase of bundles, consumers also perceive increased utility because of reduced ordering burdens and its effects on consumer price sensitivity to specific products. Consumer choices are modifiable</i>	Dose-response effects of cumulative exposure to food promotions on routine/regular food behaviours.
Sharpe and Steaelin (2010)	Series of simulated decision making experiments and data used to model potential impact of tax and size standardisation policy interventions (quantitative)	215 U.S. adults, aged 21 + and demographically diverse who ate at a fast-food restaurant at least once a month.	Consumer choice responses to fast food restaurant series of fast food meal combinations (bundles) offers.	Extremeness aversion and price insensitivity cause consumers to increase their consumption when the smallest drink size is dropped or when a larger drink size is added to a set	Sector-wide reductions in portion size norms reduce energy intake more effectively than consumer level impacts on actual and perceived economic costs.
Sharpe et al. (-2008)	Pre-validated simulated decision making experiment (validation study results also reported).	304 U.S. adults aged 20 + who frequented fast food restaurants at least once a month.	Consumer heuristics and their effects on soft drink consumption in fast food restaurant settings.	Extremeness aversion and price insensitivity cause consumers to increase their consumption when the smallest drink size is dropped or when a larger drink size is added to a set	Real life super sizing of choice sets interpreted by consumers as indicators of portion size norms. Socially shared experiences of the food environment increase acceptance and diffusion of price incentivised excess consumption choices.
Signorielli and Lears (1992)		200 fourth- and fifth-grade students in USA.	Relationship between TV viewing and unhealthy dietary behaviours and intra personal behavioural determinants.	Overall, in most demographic subgroups strong positive relations between TV viewing and 'bad' eating habits. TV viewing was also related to unhealthy conceptions about food and incorrect knowledge about principles of nutrition.	Gender, education, race, and occupation and educational attainment of parents.
Signorielli and Staples (1997)		US	Cultivation analysis examining relationship between TV viewing and conceptions relating to health and nutrition of young people.		As per earlier study, strong correlations between TV viewing and unhealthy eating habits and conceptions about food after controlling for gender, education, race, and occupation and educational attainment of parents..

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Table 1 (continued)

Evidence source	Research type/methodology	Sample	Phenomenon of interest	Evaluation/Primary research findings	Sociocultural impacts on behaviour
Vermeer et al. (2010)	Focus group discussions (qualitative)	8 semi-structured focus group discussions involving 49 Dutch participants.	Exploring consumer attitudes to portion size, responses to interventions aimed at reducing portion sizes and mechanism of diffusion for .	Participants reported that historically portion sizes have increased and they found self-regulation of large portion sizes difficult.	Participants reported that large portion sizes and positive attitudes to value-size pricing had become the social norm.
Wang et al. (2012)	Secondary analysis of 4 waves of a large national dietary survey (quantitative).	45,402 individuals age 2 years + recruited into using full socioeconomic, demographic, and 3-day and 24-h dietary recall data collected from 1991, 2004, 2006, and 2009 China Health and Nutrition Survey	Dynamic shifts in snacking behaviours and patterns of consumers in China and association with social demographic factors.	Snacking prevalence, frequency of daily snacking occasions, and percentage of total daily energy intake (EI) from snacks increased significantly across all ages between 1991 and 2009, with a dramatic increase after 2004.	Increases in food marketing and advertising activity identified as important contributory factor in the population level transition from a tradition of 2–3 meals/day toward overall pattern of meals combined with multiple snacks events.
Wansink (2010)	Mixed methods – review and synthesis of results of author's own natural experiments, laboratory based experiments and literature reviews (qualitative and quantitative).	No date ranges specified for evidence selection. Experiments included used various large samples of US adult consumers, including 2500 self-selected respondents recruited to web-based intervention study.	Normative effects of environmental cues on food intake volumes.	Environmental factors influence eating because they increase consumption norms and decrease consumption monitoring.	Range of environmental antecedents including marketing identified as macro determinants of shifts in consumption norms.
Williams et al. (2012)	Conceptual analysis (qualitative).	International evidence and theory based analysis of the socio-cultural context in which marketing efforts are developed, perceived and interpreted.	The relationship between marketing activities, food culture, and health disparities.	Food culture shapes the demand for food and the meaning attached to particular foods, preparation styles, and eating practices, while marketing activities shape the overall environment in which food choices are made.	Identification of marketing and advertising as a major contributory factor in sector level shifts in sociocultural values, norms and expectations regarding food choice, behaviours and health outcomes. Also identified as influential barrier to reversal of current trends.
Witkowski (2007)	Conceptual analysis (qualitative and quantitative)	Global + low and middle income country data used to construct model of marketing and three other macro level variables on dietary health epidemiological trends in developing and developed economies.	Trends in food marketing and obesity in developing countries, + ethical and policy implications.	Excess weight gain in developing countries is primarily a consequence of economic development. Marketing focused on short term commercial success contributes by making energy dense foods affordable, accessible and appealing especially in conditions of globalisation and economic liberalisation	Globally distributed, energy dense, processed products and their culturally adapted promotion contribute to changes to food environments and contextual effects on population behaviours.
Zheng and Kaiser (2008)	Econometric analysis (quantitative)	Time series data (1974–2005) on advertising expenditure and consumption of non-alcoholic beverages.	Direct and cross over impacts of advertising on the demand for non-alcoholic beverages in the United States.	Advertising increases demand for fluid milk, soft drinks, coffee and tea, but not for juice or bottled water. Advertising spill over effects occur in over 50% of the cases considered	Effects of advertising on population level beverage consumption are large scale, sustained, and impact across multiple product categories and settings.
Zheng et al. (2011)	Modelling experiment (quantitative and qualitative).	2004–2006 supermarket scanner data for approximately 40,000 US households .	Contributors to the development of habitual consumption of sugar sweetened beverages and the potential effects of retail tax on the demand curve.	Taxing store-purchased sugar-sweetened beverages are likely to result in a moderate reduction in consumption of sugar-sweetened beverages. Habit formation and greater demand inelasticity amongst lower income consumers negatively moderate impact of the proposed tax intervention.	Cross-product effects on consumer beverage purchase and consumption habits.

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