

Approaches that operate at a less conscious level, for example through habit or ‘nudging’, do not rely on attitudes or motivation to influence behaviour. The most extensive and robust evidence we found for strategies that influence food choice in this way related to *choice architecture*, such as altering where products are placed or providing easy-reference labelling, like traffic light systems, to influence purchasing patterns. While the evidence supporting *choice architecture* shows a consistently positive effect, the amount of change brought about is modest. Thus, these approaches can be part of a solution, but need to be used in conjunction with other strategies. Working with the gatekeepers (i.e., shops, cafes, restaurants) of the places where food is accessed will be pivotal to greater implementation of choice architecture.

Increasing the visibility of people making positive (healthy or sustainable) food choices will help others to do the same. This works through a number of mechanisms. For example, *social modelling* (i.e., seeing others make a certain food choice) can help to increase people’s sense of capability by showing *how* they could incorporate healthy choices, *why* they should consider making more positive choices (i.e., through seeing the effects that others consider to be beneficial) and increasing their *confidence* to try. Increased visibility may also help to shift what people consider to be normal (influencing *social norms*), which can have a strong influence on their behaviour. This relates both to what we think others ‘normally’ do and what we feel others think we should do; people like to feel their behaviour is in line with others who they respect and value. While *marketing* has been shown to change such social norms to some extent, there is no strong evidence that any other specific strategies are effective in accomplishing this. However, any approach to normalise positive choices – or help people recognise that making a change is meaningful to them - works best if the case studies and examples are achievable (i.e., ‘people like me’) rather than aspirational. Modelling how positive choices fit into the lives of people across different sociodemographic groups is important to ensure an inclusive approach.

COVID-19 (for example, in relation to how we can build and maintain informal virtual social networks to provide support within communities).

Ultimately, conditions in which people feel that positive food choices are normal and supported by both others and their environment, rather than something requiring vigilance and hard work, will help positive choices to become less effortful and more sustainable.

Contents

Executive summary	2
Scope of the report	2
Methods	3
What works?	3
What works for whom?	5
What next?	6
1. Introduction	11
1.1 The Psychology of food choice	11
1.1.1 Key definitions:	12
1.2 Behaviours involved in food choice	13
2. Methods and Evidence base	14
2.1 Design	14
2.2 Search outcomes	14
3. Deliberate processes underpinning food choice	14
3.1 How deliberate processes influence food choice	14
3.2 Influencing deliberate processes underpinning food choice	17
3.2.1 Informing and educating	17
3.2.2 Motivation	18
3.2.3 Self-regulation	22
3.2.3 Capability	23
3.3 Disadvantages to intervening on attitudinal pathways	24
4 Non-conscious processes underpinning food choice	25
4.1 How non-conscious processes influence food choice	25
4.1.1 Habit	25
4.1.2 Mood	26
4.1.3 Impulse purchases/eating	27

4.2	Influencing non-conscious processes	28
4.2.1	Nudges and choice architecture	28
4.2.2	Making and breaking habits.....	29
5.	Indirect effects	32
5.1	How indirect effects influence food choice	32
5.1.1	Social norms and practices.....	32
5.1.2	Marketing and advertising.....	33
5.1.3	Environmental influences.....	34
5.2	Influencing indirect effects.....	35
5.2.1	Shifting social norms	35
6.	Differential effects across groups.....	37
6.1	Socio-economic position	37
6.2	Age.....	38
6.3	Weight status	40
7.	Who will respond, when and how?	41
7.1	Population segmentation.....	41
	Segment 1	42
	Segment 2	42
	Segment 3	43
	Segment 4	43
7.2	Using COM-B to assess the breadth of support for positive food choice	49
8.	Unintended consequences	50
8.1	Impact of interventions on people with, or at risk of, eating disorders	50
8.2	Health Literacy	51
8.3	Endorsing obesity stigma	51
8.4	Compromising perceptions of autonomy.....	52
9.	Recommendations.....	53

9.1	Caveats to the evidence review and conclusions.....	53
9.1.1	Quality	53
9.1.2	Measures included within interventions targeting “food choice”	54
9.2	Specific suggestions and recommendations	54
9.2.1	Continue: Policies currently in place.....	54
9.2.2	Extend: Policies currently in place to some degree	56
9.2.3	Start: New policy areas to explore	56
9.2.4	Recognising the importance of factors beyond the scope of this review	
	59	
	Appendix 1: Detail of review methodology	60
	Search strategy.....	60
	Search terms.....	61
	Inclusion and exclusion criteria:	62
	Data extraction.....	62
	Review quality:.....	62
	Assessment of moderating factors:.....	62
	Final review inclusion	62
	Data synthesis	62
	Appendix 2: Summary table of primary review aims and outcomes	64
	Appendix 3: Types of food choice behaviour incorporated in the evidence retrieved from the rapid review.....	94
	References.....	97

may deliberate between priorities and make our choice on the basis of preferences for a certain taste or ingredients, relative to how the options fit with our other goals and values, such as managing our weight or money, fitting in with our peers, or consideration for the environment. Across various theories of behaviour change our **attitudes**, **motivation** and perceptions of **capability** emerge as key factors in driving behaviour.

Theories of behaviour change, such as the Theory of Planned Behaviour (Abeykoon, Engler-Stringer et al. 2017), the Health Belief Model (Janz and Becker 1984) or Self-Determination Theory (Deci and Ryan 1985), set out the sequence of effects that drive our behaviour. For example, the Theory of Planned Behaviour suggests that our intentions to act are driven by our assessment of whether the behaviour is 'normal', whether we think doing the behaviour is within our control, and our attitude towards it. The Health Belief Model also draws in our view of whether we are susceptible to any negative consequences from the behaviour and how bad they would be, what we think are the barriers to changing behaviour and how much we would benefit if we changed. By altering these underlying factors, we assume there will be knock on effects on our intentions and behaviour.

The power of attitude-based processes in driving behaviour may vary in degree of 'elaboration' in thinking that a person gives to the choice they make. For instance, a person may consider products on all attributes deemed relevant for a choice, weigh the importance of these attributes before finally identifying the most preferred option. Equally, they may just make a quick choice according to simpler heuristics, such as choosing a product because a celebrity has recommended it. The characteristics of both the person, and the situation they are in when making a choice (for example, their mood, and whether they are with friends) may influence how much elaboration people give to each choice they make.

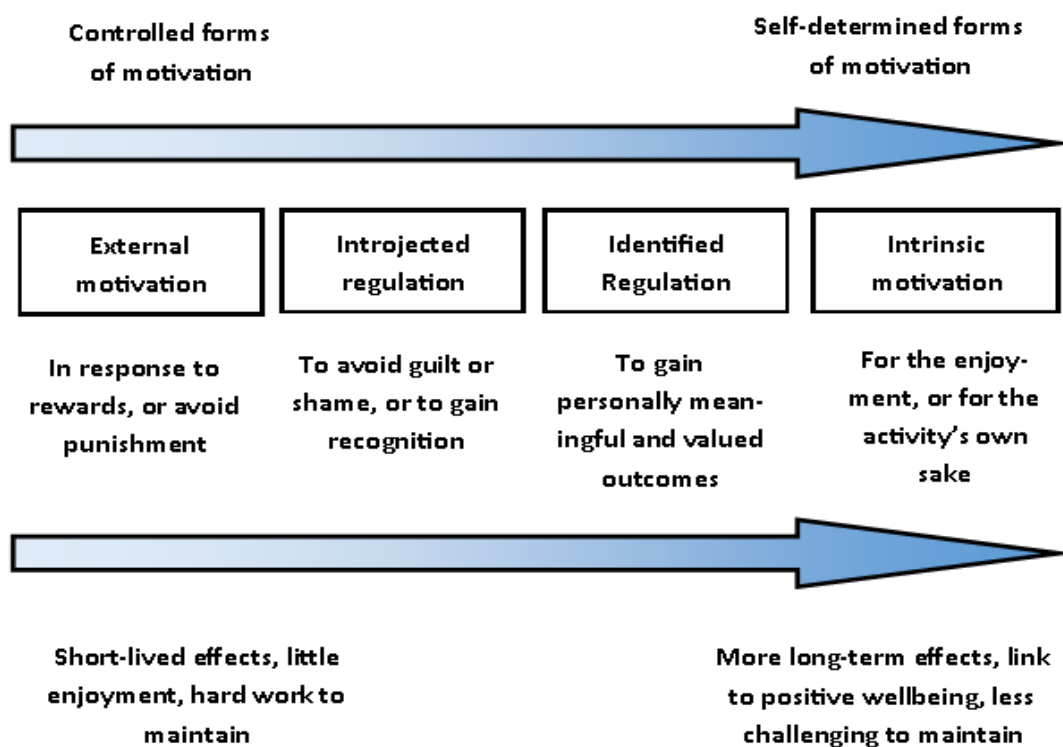
Attitudes refer to the degree to which people feel positive or negative (or agreement, disagreement) towards a given topic/action, as well to the specific views people may hold (for example, whether a certain food is 'healthy' or not).

Capability reflects perceptions like our sense of confidence that we are able to successfully complete a task we are faced with, and our sense of competence in a

given domain. People are more likely to take action when they feel they are likely to be successful.

Motivation refers to the reasons we have for acting, the origin of the reasons to act and strength of the drive. When we refer to motivation as part of deliberate processes, we are primarily concerned with the quality rather than quantity of motivation. Motivation can be seen to lie along a continuum from the poorest quality, which is the least self-determined, to the highest quality and most self-determined (Figure 2). People are more likely to make and sustain changes to their diet in order to control their weight when they do so through self-determined forms of motivation across age groups and clinical and non-clinical populations (e.g, Ng et al., 2012; Sheeran et al., 2020).

Figure 2: The motivation continuum



The COM-B framework of behaviour change has been created to help bring the determinants that influence our behaviour together to demonstrate the range of factors that need to be in place for sustained behaviour change (Michie, van Stralen & West, 2011). The framework makes explicit the need to ensure that across the environment as a whole, people need to experience **C**apability, **O**pportunity and

This is in part as incentives are a controlling form of motivation and do not map to why we should change to meet our own goals and values. Incentives can be seen as particularly controlling if the source is not trusted (for example, doubting employers' motives in promoting healthier canteen options).

However, there may be occasions or means of using incentives that are not perceived as controlling, which could be a useful stimulus to behaviour change. For example, if incentives match public support, such that they are interpreted as the Government/workplace using incentives to encourage us to make changes that are important to us but difficult, they can be useful in bringing about quick changes if only a short-term change is needed (for example, changing diet during pregnancy).

Choosing healthy food may be more directly influenced by **goals and motivation** than choosing unhealthy foods (Chen & Antonelli, 2020). In part this is as our intentional goals usually relate to improving our choices, so cue us to notice opportunities to make a healthy choice and remember our rationale for doing so. Unhealthy choices may be driven more by non-conscious processes, for example related to the food environment (pricing deals, marketing) or characteristics of the food itself (for example, sensory elements related to pleasure).

Table 3.1: Influencing food choice through deliberate processes

Area	Mechanism of action	What works
Attitude	<p>Attitudes reflect our emotions and beliefs about food choices. These include:</p> <ul style="list-style-type: none"> • Beliefs about the attributes of a food choice – such as how healthy or sustainable. • Whether we feel positive or negative towards a food - this may be based on preferences (for example, taste, pleasure), and/or our values (for example, valuing health/sustainability). • Degree of ‘elaboration’ given to considering options, that is, how much effort is given to learning about and weighing up options. Interaction between the individual and the situation. 	<p>Provision of information/knowledge (about the attributes of food options)</p> <ul style="list-style-type: none"> • Product labelling • Product endorsement (health professionals /celebrities) • Education (for example, schools, or from health professionals) <p>Persuasion</p> <ul style="list-style-type: none"> • Public health campaigns • Advice from health professionals • Product endorsement (for example, medical expert or celebrity)
Motivation	<p>Motivation is the driving force behind engaging in behaviours that align with attitudes.</p> <ul style="list-style-type: none"> • Motivation is longer lasting when we feel we are autonomous in our decisions, not controlled by others. • Autonomous motivation stems from feeling we have a choice, a personally meaningful reason to act, that we are competent to do what we need to do and that we 	<p>Provision of information/knowledge (to provide a meaningful rationale)</p> <ul style="list-style-type: none"> • Product labelling • Product endorsement <p>Behavioural support for self-regulation (for example, group support programmes)</p> <ul style="list-style-type: none"> • Goal setting • Self-monitoring • Implementation intentions <p>Gamification</p>

Area	Mechanism of action	What works
	<p>feel closer to other people when behaving in a certain way.</p> <ul style="list-style-type: none"> • Making choices that override immediate pleasure to fit with longer term goals (for example, health) requires self-regulation. This takes effort - and therefore motivation - to maintain. 	<ul style="list-style-type: none"> • A way to engage people who would not normally seek out information <p>Social support</p>
Capability	<p>Perceptions of capability reflect our beliefs and confidence that we have the ability to successfully complete a task.</p> <ul style="list-style-type: none"> • Our assessment of our capability draws on the size of the task, our past experience, seeing others similar to us attempt to do the same, and our assessment of the support we have to take the task on. • We are more likely to try when we are confident that we will succeed; that is, confidence and perceived capability increases motivation. 	<p>Provision of information/knowledge (about the size and scale of the task)</p> <ul style="list-style-type: none"> • Product labelling • Self-monitoring to gain information on progress • Education (for example, schools or from health professionals) <p>Demonstrating success</p> <ul style="list-style-type: none"> • Using credible models in health promotion messaging <p>Facilitating graded tasks</p> <ul style="list-style-type: none"> • Breaking challenges down into component parts/ short term challenges (for example, 5 a day, Dry January) <p>Persuasion</p> <ul style="list-style-type: none"> • Advice from health professionals • Media/social media stories

Table 4.1 Influencing food choice through non-conscious processes

Area	Mechanism	What works
Habit	<p>Habits are a learned sequence of behaviours that are automatic, unconscious responses to cues or triggers:</p> <ul style="list-style-type: none"> • Habits form when experiencing “rewards” (for example, pleasurable tastes) to repeated behaviours in similar contexts. • Habits require little or no deliberation but are automatic responses to environmental cues. • Habits are stable behavioural patterns that are hard to break and can help to sustain positive behaviours over the long term. • Harder to override unwanted habits when stressed. 	<ul style="list-style-type: none"> • Disrupting environmental cues <ul style="list-style-type: none"> • Changing the environment to disrupt current negative habitual behaviours (for example, removing confectionary from till/POS areas, reducing prevalence of fast food outlets) • Product labelling • Fostering new habits <ul style="list-style-type: none"> • Implementation intentions – “if-then” plans to build the relationship between a cue and a desired response • Targeting interventions at times when the environment changes naturally (habit discontinuity), for example, moving house, school, workplace, life stage
Impulse	<p>Impulse or “impulsive buying” refers to an acute urge to make a choice or buy a product that you didn’t previously intend to eat or purchase.</p> <ul style="list-style-type: none"> • Impulse buying is predicted by the interaction between a person’s disposition (trait level impulsiveness), the situation (time spent in store, intensity of temptation etc.) and demographic characteristics. 	<p>Limited research but promising directions include:</p> <ul style="list-style-type: none"> • Behavioural support for self-regulation <ul style="list-style-type: none"> • Implementation intentions • Goal setting/planning (for example, setting the goal of only purchasing • pre-planned items on a list) • Awareness <ul style="list-style-type: none"> • Mindfulness-based interventions

Area	Mechanism	What works
Mood	<p>Mood refers to the valence of emotion (for example, positive or negative), as well as intensity and degree of arousal.</p> <ul style="list-style-type: none"> • Negative mood states (such as high stress) are associated with poor eating behaviours/food choice. • Positive mood states are associated with better diet quality and greater capacity for self-control. • More energy dense food choice is associated with negative mood and expectations that the food will alter mood. • Mood has a stronger effect on younger people. • Social influences may moderate the impact of mood on food choice. 	<ul style="list-style-type: none"> • Behavioural support for self-regulation <ul style="list-style-type: none"> • Goal setting/planning • Self-monitoring • Implementation intentions

Table 5.1 Influencing food choice through indirect effects

Mechanism	What works
<p>Social norms are collective representations of widely accepted actions and behaviours. We may be influenced by the norms of immediate social networks (friends, family, colleagues) as well as broader cultural groups (ethnic group, nationality).</p> <ul style="list-style-type: none"> • Encompasses perceived approval of others ('injunctive norms'), and what a person thinks most people do ('descriptive norms'). • More impactful when eating with others, particularly in relation to how much we eat. • May be particularly salient in adolescents and young people (for example, choosing a specific food to fit in or match a peers likes/dislikes). 	<ul style="list-style-type: none"> • Providing information on what others do <ul style="list-style-type: none"> • education (for example, schools, or from health professionals) • Public health campaigns (for example, 5-a-day) • Product endorsement (for example, medical expert, or celebrity) • Social modelling • Marketing <ul style="list-style-type: none"> • Cautious use of social media could be a persuasive means to altering perceptions of social norms (especially in young people) • Explore potential to influence through peer-to-peer interventions and social networks

Social media is an increasingly pervasive means of transmitting social norms, particularly among young people. Exposure to images which are perceived to be idyllic, for example, in relation to a desired body image or food choices, can have a positive influence on food choice and eating behaviour, but this is not always the case. Social media use has been associated with disordered eating in young people when it is used for social/self-comparisons (Rounsefell et al., 2020).

A means of altering other health behaviours is **influencing social networks**, for example, enhancing peer-to-peer information sharing or targeting health education at people within a network with the most social capital or influence. While these show promise for other health behaviours (for example, sexual health and substance

Table 7.1 details the relationships between the types of interventions included in this report, how they link to psychological processes and which population segment they would be most expected to influence.

Table 7.1: Relationship between psychological processes, intervention approaches and population segments

Psychological processes	Targets to change	Choice Architecture	Disrupting habitual cues	Education /information	Endorsement (celeb / expert)	Gamification	Incentives / pricing	Labelling (traffic light)	Labelling (info-dense)	Legislation (for example,	Social support	Social modelling	Supporting self-regulation [‡]
Deliberate processes: Attitudes	<ul style="list-style-type: none"> • Knowledge • Values 	-	Yes	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes
Deliberate processes: Motivation	<ul style="list-style-type: none"> • Reason to try • Self-regulation • Autonomy 	-	Yes	Yes	-	Yes	-	Yes	Yes	-	Yes	Yes	Yes
Deliberate processes: Capability	<ul style="list-style-type: none"> • Seeing success • Difficulty • Control 	-	Yes	Yes	-	-	-	Yes	Yes	-	Yes	Yes	Yes
Non-conscious	<ul style="list-style-type: none"> • Repetition • 'Cues' 	Yes	Yes	-	-	-	Yes	-	-	-	-	-	Yes

Psychological processes	Targets to change	Choice Architecture	Disrupting habitual cues	Education /information	Endorsement (celeb / expert)	Gamification	Incentives / pricing	Labelling (traffic light)	Labelling (info-dense)	Legislation (for example,	Social support	Social modelling	Supporting self-regulation [±]
process: Habit	<ul style="list-style-type: none"> Rewards 												
Non-conscious process: Impulse	<ul style="list-style-type: none"> Rewards or pleasure 	Yes	-	-	Yes	Yes	Yes	Yes	-	-	-	-	-
Non-conscious process: Mood [±]	<ul style="list-style-type: none"> Affect Stress 	-	-	-	-	Yes	-	-	-	-	Yes	-	-
Indirect effects: Social norms	<ul style="list-style-type: none"> Modelling Approval Convention 	-	-	-	Yes	-	-	-	-	-	Yes	Yes	-

Psychological processes	Targets to change	Choice Architecture	Disrupting habitual cues	Education /information	Endorsement (celeb / expert)	Gamification	Incentives / pricing	Labelling (traffic light)	Labelling (info-dense)	Legislation (for example,	Social support	Social modelling	Supporting self-regulation [±]
Indirect effects: Marketing /influencing	<ul style="list-style-type: none"> • Persuasion • Association 	Yes	-	-	Yes	-	Yes	Yes	-	-	Yes	Yes	-
Indirect effects: Environmental factors	<ul style="list-style-type: none"> • Cost • Availability 	-	-	-	-	-	Yes	-	-	Yes	-	-	-
Population segment*1	high opportunity low motivation	Positive	No effect	No effect	Positive	No effect	Positive	Positive	No effect	Positive	No effect	No effect	No effect
Population segment*2	low opportunity low motivation	Positive	No effect	No effect	Positive	No effect	Positive	No effect	No effect	Positive	No effect	No effect	No effect

Psychological processes	Targets to change	Choice Architecture	Disrupting habitual cues	Education /information	Endorsement (celeb / expert)	Gamification	Incentives / pricing	Labelling (traffic light)	Labelling (info-dense)	Legislation (for example,	Social support	Social modelling	Supporting self-regulation [‡]
Population segment*3	low opportunity high motivation	Positive	Positive	Positive	Positive	Positive	Positive	Positive	No effect	Positive	Positive	Positive	Positive
Population segment*4	high opportunity high motivation	Positive	No effect	Positive	No effect	Positive	Unkn own	Positive	Positive	Positive	Positive	Positive	Positive

Key: *All segments will be influenced by non-conscious and indirect effects to some degree, but those with higher motivation may be more likely to override barriers posed to intentional (healthy, sustainable) choices. Positive symbolises a likely positive effect, and no effect indicates that no effect is likely. [‡] Includes goal setting, implementation intentions, graded tasks, self-monitoring

all to understand that weight can follow changes to our environment that are beyond our control, reducing stigma and creating a social movement that encourages healthier food choices and appropriate intake. That is, we have an opportunity for messaging about “post COVID” health kicks that will be perceived as relevant to all.

- ii) The COVID-19 response has resulted in the establishment of lines of provision for vulnerable people. Many of these people were already less able to leave the home and gain access to healthy food prior to the pandemic and will remain more vulnerable going forwards. We have an opportunity to explore how we can continue to use these lines of provision not to provide emergency support, but as a route to enhance access to nutritious food and the social support and encouragement that motivates those with poorer health to eat well.
- iii) Digital literacy and access to equipment has dramatically improved across all age groups, and within most SEPs during the COVID-19 pandemic. We have an opportunity and perhaps responsibility to explore what this means for the quality of people’s food choices (for example, the impact of online food shopping for access, purchasing patterns, access to food delivery schemes, increased reliance on cashless payment systems), as well as understand the impact of digital exclusion as systems continue to evolve as we come out of the initial phase of the pandemic.

Take care to avoid: With point (i) and other approaches targeted at reducing food intake rather than improving diet quality, we need to engage with eating disorder charities and those experiencing disordered eating to ensure that messaging does not negatively impact people with eating disorders. This is likely to rely on messaging about what nutritious foods to increase, rather than focusing on restraint and reducing consumption.

6) Horizon scanning for societal behavioural shifts that could impact food and diet quality

A number of shifts in social practices have been observed in recent years that can impact on food choice or diet quality. These provide opportunities while habits are still forming and less established to embed healthier or more sustainable choices. Two examples spring to mind; the shift in public consciousness and willingness to

act to reduce plastic use, partly ignited by the David Attenborough Blue Planet series, and the (pre-COVID) shift to a carry-about coffee culture in which people increasingly move about public and work spaces with coffee constantly in hand. The first may have had a positive impact on sustainability, for example prompting cafes and restaurants to provide tap water more freely, and of course reducing food-related plastic use. The second may have undermined health as people drink more frequently, including drinks that are high in calories and sugar, and are exposed to increasing prompts and cues to purchase more attractive (usually sweet or creamy) products and accompaniments.

Identifying early indicators of social movements such as these, treating them as potential occasions of habit discontinuity at a population or community scale to harness the social shift for health and sustainability benefit, may effectively be pushing on an open door.

7) Explore how to shift social practices through on- and offline social networks

A person's social network influences their food choice and/or consumption (Zhang, De La Haye, Ji, & An, 2018) and subsequently weight and health. Individuals within social networks are remarkably similar in their choices and health states. As people increasingly struggle to work out what information to trust, research to implement what has been found in other settings with regards to disseminating ideas through social networks (for example through peer-to-peer approaches, identifying and supporting 'early adopters or use of knowledgeable and trusted influencers; Latkin & Knowlton, 2015) would be valuable when applied to food. Misinformation is widespread in the food domain, particularly among people or groups whose health literacy is low, so means of disseminating reliable information (such as sharing stories of potential immediate benefits of making more sustainable and healthy choices, how to do it and where to do it) could be useful.

People of all ages are increasingly comfortable and familiar with online environments, and health tracking tools have shown excellent success in enabling people to find social support from a ready pool of like-minded people (Chung et al., 2017), indicating that social networks are relevant both on and offline.

Areas highlighted for further research, whether as research is in its early stages or to establish the efficacy of new hypotheses are set out on Section 6.

Author /title	Review characteristics	Findings
		<p>“health-seeking” or looking to use the information for weight management purposes</p>
<p>Cecchini et al (2016)</p> <p>Impact of food labelling systems on food choices and eating behaviours.</p>	<p>Meta-analysis of 9 studies (11,144 participants).</p> <p>Includes lab studies, online and real-life experimental studies.</p>	<p>Food labelling increased the number of people selecting a healthier option by about 17.95% (CI: 11.24% to 24.66%). Traffic light labelling is the most effective labelling scheme.</p> <p>Food labelling didn’t significantly reduce calorie intake.</p>
<p>Christoph & An (2018)</p> <p>Effect of nutrition labels on dietary quality among college students: a systematic review and meta-analysis</p>	<p>19 studies conducted with college age students in real world settings (cafeteria or vending machines), and 3 in lab settings.</p> <p>Quality of studies; 9 rated higher, 6 lower, but both showed similar findings</p>	<p>Nutrition labels at the point of purchase were associated with decreased calorie purchase, (reduced in 8 or 13 trials), and a positive effect on diet quality (9 of 12 studies) were found to have a moderate but significant positive effect on dietary choices in college students. Studies in cafeterias and laboratories generally produced more positive effects than those in quick-service restaurants or vending machines. Contextual labels listing daily recommended intake or</p>

Author /title	Review characteristics	Findings
		including traffic lights or exercise equivalents displayed higher efficacy in this population
Daley et al, 2020 Effects of physical activity calorie equivalent food labelling to reduce food selection and consumption: systematic review and meta-analysis of randomised controlled studies.	15 studies identified exploring the effects of physical activity calorie equivalent (PACE) food labelling on the selection, purchase or consumption of food/drinks. Risk of bias was not well reported within studies, so confidence in the quality of studies was not strong.	PACE labelling led to significantly fewer calories being selected and consumed, relative to comparator labelling. There was no significant effect on purchasing.
Scapin, et al., 2020 Influence of sugar label formats on	23 studies extracted, informing on the association between I (Traffic light, warning sign, health warning, GDA, graphical depiction, alternative nutrition facts panel, health star rating) and consumer understanding of sugar content.	More quickly/easily interpretable formats such as traffic lights (with high in sugar text), warning signs, health warning messages and graphical designs have the most potential for influencing sugar content of consumer choices.

Author /title	Review characteristics	Findings
<p>consumer understanding and amount of sugar in food choices: a systematic review and meta-analyses</p>	<p>Quality of extracted studies assessed using a standardised tool; 4 strong, 12 moderate, 7 weak.</p>	<p>There is a large degree of variance in effect depending on the label format and content.</p>
<p>Shangguan, Afshin et al. 2019</p> <p>A meta-analysis of food labelling effects on consumer diet behaviors and industry practices.</p>	<p>60 studies assessed to explore the influence of food and beverage labelling (food labelling) on consumer behaviours, industry responses, and health outcomes.</p> <p>Evidence for publication bias was not identified.</p>	<p>Labelling was found to impact consumers and industry. Estimates of the size of effect for consumers were;</p> <ul style="list-style-type: none"> energy intake down by 6.6% total fat down by 10.6% other unhealthy dietary options down by 13.0% vegetable consumption up by 13.5% <p>Estimates of the size of effect for industry were;</p> <ul style="list-style-type: none"> decreased sodium by 8.9% decreased artificial trans fat by 64.3%

Author /title	Review characteristics	Findings
		No consistent differences were found according to the type of label, duration, product, region, population, voluntary or legislative approaches.
Sinclair et al, 2014 The influence of menu labeling on calories selected or consumed: a systematic review and meta-analysis.	17 studies were retrieved from searches designed to determine whether (1) the provision of menu-based nutrition information affects the selection and consumption of calories in restaurants and other foodservice establishments, (2) the format of the nutrition information (informative vs contextual or interpretive) influences calorie selection or consumption. Studies included those rated of high quality, but were mixed overall.	No effect of calorie labelling found on calories selected or consumed. Adding contextual or interpretive nutrition information on menus (for example, additional information, such as the recommended daily calories for an average adult, to help put the number of calories into context) did result in a reduction in calories Women were more likely to use information to select and consume fewer calories.

Mood, Emotion and pleasure

Author /title	Review characteristics	Findings
<p>Bedard et al., 2020</p> <p>Can eating pleasure be a lever for healthy eating? A systematic scoping review of eating pleasure and its links with dietary behaviours and health</p>	<p>119 studies were reviewed, based in lab, online or real-world settings. All study designs were included, from participants aged 5 to older adulthood.</p> <p>Quality ratings not reported, in part as there was such a wide range of designs and outcomes.</p>	<p>22 dimensions of pleasure were identified from the literature with the most commonly reported being sensory experience (for example, taste, appearance, texture), social experiences, food characteristics, preparation, novelty and variety. 20 of 35 studies (57%) exploring the association between dietary outcomes and pleasure found favourable associations, although this was stronger for making favourable (i.e., more healthy) food choices than for overall dietary quality.</p> <p>Specifically considering food choice, 6 of 8 studies found a significant positive association between pleasure and positive food choice.</p>
<p>Clohessy et al, 2019</p> <p>Factors influencing employees' eating</p>	<p>22 studies (all designs accepted) investigating the impact of social support (at work) on healthy eating.</p> <p>Quality of studies was moderate to high.</p>	<p>Healthy eating was influenced negatively by; pressure at work, a culture of eating out, proximity to snacks (snacking increased later in the working day)</p>

Social media exposure

Author /title	Review characteristics	Findings
<p>Rounsefell et al., 2020</p> <p>Social media, body image and food choices in healthy young adults: A mixed methods systematic review.</p>	<p>30 studies, involving 11,125 participants exploring the impact of social media engagement on food choices.</p> <p>Participants were young adults, aged 18-30</p> <p>Mixed design studies were included, no clear indication of final quality rating.</p>	<p>Greater negative engagement in social media (for example, seeking reassurance) use was associated with more disordered food choices (i.e., greater eating restraint). However, greater exposure to idyllic images was associated with healthy eating, unless young adults engaged in social comparisons, which again predicted disordered eating.</p>

Gamification

Author /title	Review characteristics	Findings
<p>Yoshida-Montezuma, et al., 2020</p> <p>Does gamification improve fruit and vegetable intake in adolescents? a systematic review</p>	<p>7 studies investigating the impact of gamification (5 online, 2 board games) with adolescents.</p> <p>Quality assessed using a risk of bias tool, overall considered moderate.</p>	<p>Six of seven studies reported improvements to fruit and vegetable intake in participants that received the gamified intervention, primarily fruit and/or vegetable intake following the use rewards. Studies also indicated that the majority of studies using leader-boards and challenges were also effective.</p>

Choice architecture

Author /title	Review characteristics	Findings
<p>Bucher et al., 2016</p> <p>Nudging consumers towards healthier choices</p>	<p>Reported on 18 studies incorporating 13065 participants evaluating the impact of nudge techniques.</p> <p>Included studies in the field (cafeterias) and the lab, manipulating the proximity and order of products</p>	<p>16 of 18 studies showed that changing food position (increasing proximity/reducing distance to the consumer, or the order in which items are presented) nudged people towards a healthier food choice.</p>

Author /title	Review characteristics	Findings
	Most studies rated of neutral quality (with 1 stronger study, and 3 weak).	2 studies compared effects between overweight and healthy weight participants, finding no difference in effects.
<p>Harbers et al., 2020</p> <p>The effects of nudges on purchases, food choice, and energy intake or content of purchases in real-life food purchasing environment</p>	<p>75 studies included to review evidence of the effectiveness of the different types of microenvironment set out in the TIPPMME typology; i.e., any study manipulating the availability, position, functionality, presentation, size, and/or information of products (for example, foods), related objects (for example, shelves), or the wider environment (for example, supermarket) was altered.</p> <p>Majority were of moderate or higher quality.</p>	<p>There was evidence for a modest effect of both ‘informational nudges’ (for example, nutrition information and signs), and ‘positional nudges’ (i.e., moving products to closer and more salient positions in shop or restaurant).</p> <p>Nudges using symbols were considered to have no effect, and there was too little data to make strong conclusions on other types of nudge (for example, sizing, and floor layouts).</p> <p>Evidence investigating the moderating role of SEP was limited, although some studies reported greater effects in low SEP subgroups.</p>

Author /title	Review characteristics	Findings
<p>Broers et al., 2017</p> <p>A systematic review and meta-analysis of the effectiveness of nudging to increase fruit and vegetable choice.</p>	<p>14 studies, including those conducted in the field (cafeterias) and the lab. Examined impact of proximity, properties, placement & availability of products.</p> <p>Quality and risk of bias assessed, articles (n=8) removed if insufficient quality. Judged moderate quality.</p>	<p>Medium effect size for the placement of healthy products to influence healthy choices (positive effect in 4 of 7 studies).</p> <p>No consistent effect demonstrated for manipulating product properties (only 2 studies conducted).</p>
<p>Torris & Mobekk, 2019</p> <p>Improving Cardiovascular Health through Nudging Healthier Food Choices: A</p>	<p>21 studies looking at differences between types of nudge, inclusive of interventions in all settings and with people of all ages.</p> <p>Nudges considered: (Ambience, Functional design, Labeling, Presentation, Sizing, Price, Availability, Proximity, Priming, Promoting).</p>	<p>Overall, these interventions showed a positive effect, with traffic light labelling common to most of those reporting a small but positive effect on healthy food choice. Most used a combined approach, so it is hard to separate out individual factors.</p> <p>Sizing to reduce portion size showed mixed effects, while labelling and pricing approaches were associated with more positive (healthy) food</p>

Author /title	Review characteristics	Findings
Systematic Review.	Studies of poor quality were excluded. Most were conducted without people being aware of the trial, which increases validity and reduces the chance of social desirability effects.	choices. Prompting and priming were not associated with positive effects but were researched less often and usually in addition to other measures.
Allan et al., 2016 Environmental interventions for altering eating behaviours of employees in the workplace: a systematic review	22 studies conducted to explore the efficacy of nudges (labeling, presentation, sizing, availability, proximity, priming, prompting) in workplaces. Overall quality was weak.	Most interventions used a range of strategies, most commonly labelling at point of sale, changing portion sizes and changing proximity. Half of interventions resulted in more healthy food choices.
Pitts Online grocery shopping: promise and pitfalls for	24 studies exploring qualitative and quantitative findings of studies looking at the online shopping environment.	The landing screen may be important from a choice architecture perspective (i.e., online, positional nudge) – as products shown on the first screen seen predict product choice. Self-regulation may feel less effortful online than shopping in person. Shoppers

Author /title	Review characteristics	Findings
healthier food and beverage purchases	Assessment of quality of the incorporated studies was not available.	buy fewer perishable items online than when shopping in person. A (single) innovative study offered lower-calorie within-category 'swaps' for higher calorie options - there was some evidence of the lower-calorie 'swaps' improving the healthfulness of purchases

Socio-cultural impacts

Author /title	Review characteristics	Findings
Cairns, 2019 A critical review of evidence on the sociocultural impacts of food marketing and policy implications	10 umbrella reviews, and 31 individual studies exploring the impact of marketing on social norms and learning, in a model of impact on population level healthy diets. This review was conducted as a review of reviews search, with snowballing to look at other reviews.	Marketing and advertising were found to increase the salience of high fat, salt and/or sugar foods, along with price promotions, which prompt bulk buying and indirectly increase consumption. Similarly, food marketing contributes to the shifting of new behavioural norms; marketing weakens injunctive norms (i.e., norms that discourage over-consumption) and can make us believe certain products and practices (for example, snacking) are

Author /title	Review characteristics	Findings
		more regular and typical in an 'average' diet than they are.
<p>Ruddock et al, 2019</p> <p>A systematic review and meta-analysis of the social facilitation of eating</p>	<p>42 studies explored the effect of 'co-eating', through a range of study designs in people of all ages.</p> <p>Quality was not reported of individual trials.</p>	<p>Food intake was increased through social facilitation, i.e., in the presence of others. This was stronger when eating with friends and family than strangers. This increase could be considerable, estimated at around 29-48% in diary studies, and 12% in studies in which the researcher observes eating behaviour. Compared with eating alone.</p> <p>Hypothesised mechanisms include social norms (but only 1 study reported on this), modelling, but not distraction or changes in subjective mood.</p>
<p>Cruwys et al., 2015</p> <p>Social modeling of eating: A review of when and why</p>	<p>69 studies were reported exploring the impact of social modelling on food intake (k=58) or choice between food stuffs (k=11). While the studies included people of all ages (children upwards), most were conducted with children and young adults.</p>	<p>Strong evidence that people eat more or less of high fat, sugar and salty foods when the person they are with eats more or less of the same. This has not been studied to the same extent with healthy foods, but that evidence which exists suggests the</p>

Author /title	Review characteristics	Findings
social influence affects food intake and choice	No formal quality rating was conducted or study quality commented on.	<p>modelling effect is weaker/non-existent with less hedonic food types.</p> <p>Less evidence that modelling effects what people eat, more evidence to suggest it influences how much.</p> <p>Effects were similar regardless of weight status, but stronger in those who are more impulsive/display less self-control.</p>

Social factors and their influence on children and adolescents

Author /title	Review characteristics	Findings
Yee et 2017 The influence of parental practices on child promotive and preventive food consumption behaviors: a	<p>78 studies of parental influences were reported, the majority of which were cross-sectional. Studies were considered that explored associations from the age from 2-18.</p> <p>No formal quality rating was conducted or study quality commented on.</p>	<p>Healthy and unhealthy consumption associated most strongly with availability and parental modelling. Effects appear to be small to moderate in size. Guidance and education appear more supportive for healthy eating, whereas rules and restrictions may be more effective for prevention unhealthy eating. The availability of unhealthy food, plus modelling of eating by parents, pressure to eat</p>

Author /title	Review characteristics	Findings
systematic review and meta-analysis		<p>and food as a reward were all associated with unhealthy food consumption.</p> <p>For sugar sweetened beverage consumption, 8 of 38 studies showed some backlash to restrictions and rules, in that consumption increased. However most showed a reduction.</p> <p>Food as a reward did increase the consumption of the foods tried, but these are typically more unhealthy foods. There is little evidence as to whether healthy food could work equally well.</p> <p>Age of children showed a moderating effect, with rewards and praise showing better promise for younger children (7 and under), and rules and restricting availability more effective in children over 7.</p>

Author /title	Review characteristics	Findings
<p>Rageliene et al., 2020</p> <p>The influence of peers' and siblings' on children's and adolescents' healthy eating behavior. A systematic literature review</p>	<p>29 studies were reported, looking at peer and sibling impacts on healthy eating in children up to the age of 18 (categorised into 3 groups).</p> <p>Studies were assessed for quality, and poor quality studies not included.</p>	<p>Most studies looked at peer, rather than sibling effects, or both together. In most cases the impact on healthy diet was negative, although not exclusively. 28% of studies showed a positive direction of effect.</p> <p>Mechanisms of a negative effect were explored through indirect social interactions, and included; following peers' eating patterns, adhering to social norms and peer approval, and modelling. Children think that eating healthily will be negatively judged as trying to appear better than others, or proud, and might expose them to being mocked.</p> <p>No significant links were found between peer support, or healthy injunctive norms for healthy eating and healthy choices. However, adolescents eat more 'junk food' when eating out with peers.</p>

Older adults

Author /title	Review characteristics	Findings
<p data-bbox="192 248 472 344">Baer, Deutschbein et al. 2020</p> <p data-bbox="192 416 472 839">Potential for, and readiness to, dietary-style changes during the retirement status passage: a systematic mixed-studies review</p>	<p data-bbox="495 248 1256 344">10 studies (5 qualitative, 5 quantitative) identified of studies exploring change in diet following retirement.</p> <p data-bbox="495 416 943 456">7/10 studies rated high quality.</p>	<p data-bbox="1301 248 2074 512">Findings were inconsistent, as common changes incorporated both improved diet (i.e., increased vegetable consumption [k = 4]), but also increased snacking [k=2]. This was mediated through changes in available time, mealtime structure and finances.</p>
<p data-bbox="192 916 439 956">Host et al, 2016</p> <p data-bbox="192 1027 472 1291">Factors Influencing Food Choice for Independently Living Older People—A</p>	<p data-bbox="495 916 1256 1011">24 studies of all designs, exploring factors influencing food choice in people aged over 50 years.</p> <p data-bbox="495 1083 909 1123">Quality graded as moderate.</p>	<p data-bbox="1301 916 2074 1179">Food choice can be dictated increasingly by physiological and biomechanical changes of older age (i.e., changes in taste, poor dentition), as well as consequences of functional limitation in relation to access to food and ability to cook.</p> <p data-bbox="1301 1251 2074 1347">Appetite effects of grief, bereavement and depression result in reduced nutrition, as can social</p>

Author /title	Review characteristics	Findings
Systematic Literature Review		<p>isolation for those for whom eating is a social activity (for example, reduced motivation for shopping, preparing and eating meals when alone). Food intake may therefore be greater when eating out, and/or when simulating company through the radio or TV. Efforts to maintain independence can have contrasting effects; getting out more and maintaining access to shops and amenities associated with a better diet, but failing to accept help predicts a poorer diet. Social support is largely predictive of a better diet.</p> <p>Self-perceived health and resources (rather than objective status) is positively associated with eating a healthy diet, as is an interest in healthy eating.</p>

Socio-economic position

Author /title	Review characteristics	Findings
Li et al., 2019	106 studies reporting on what aspects of socio-economic status (SES) may influence food choice,	The set of studies included have some limited facility to answer the question as the majority (75%) of studies were with UG students (i.e., young, well

Author /title	Review characteristics	Findings
<p>Socioeconomic Status and the Prediction of Health Promoting Dietary Behaviours: A Systematic Review and Meta-Analysis Based on the Theory of Planned Behaviour</p>	<p>incorporating a range of study designs with adult populations.</p> <p>Overall, quality was deemed medium to low.</p>	<p>educated) and were from a very disparate range of countries and therefore cultures.</p> <p>Nonetheless, the review assessed whether the positive association between variables as set out in the theory of planned behaviour (i.e., attitude, subjective norm, and perceived behaviour control (PBC)) and food choice (which was found to be significant across all studies) were moderated by indicators of SES. No moderation by any SES variable was detected.</p>
<p>Mackenbach et al., 2019</p> <p>A Systematic Review on Socioeconomic Differences in the Association</p>	<p>43 trials investigating the role of the food environment (price, proximity, accessibility) on adolescents and adults.</p> <p>Most studies good to moderate quality.</p>	<p>People from lower socio-economic groups are more responsive to price changes in their purchasing of unhealthy, vs healthy foods. Specifically, people with higher SEP may not be responsive to changes in fruit and vegetable pricing, only those from lower SE groups.</p>

Author /title	Review characteristics	Findings
between the Food Environment and Dietary Behaviors		The moderating effect of SES on other aspects of the food environment shows mixed findings; while most studies SEP does not moderate the impact of access on food choice, there are still some high-quality papers that report stronger associations in low SEP populations than in high SEP populations.
McGill et al., 2015 Are interventions to promote healthy eating equally effective for all? Systematic review of socioeconomic inequalities in impact	Review of 36 studies to compare the impact according to SEP, reporting on the categories of; Price (18), Place (6), Product (1), Promotion (4), and Person (18). The majority of price studies relied on modelling, so were considered of weak quality. Higher quality was observed in studies relating to place and person.	Better outcomes (and thus a reduction in inequalities) were found for people with lower SEP for price, as well as interventions that combined tax and subsidies. Interventions categorised as (i.e., promoting individual behaviour change through motivational routes, counselling) had a greater impact with increasing SEP Most studies identified in the initial screening did not explore differential effects by SEP, limiting the representativeness of these findings.

Skills

Author /title	Review characteristics	Findings
<p>Mills et al. 2017</p> <p>Health and social determinants and outcomes of home cooking: A systematic review of observational studies</p>	<p>38 studies, incorporating >230,000 participants. All studies were observational or cross-sectional. All ages considered.</p> <p>Quality was judged to be strong for quantitative research but weak for qualitative.</p>	<p>Greater levels of home cooking related to having a healthier diet, although there was less evidence of this over the longer term.</p> <p>Self-efficacy (measured by self-assessed cooking skills) had a strong impact on motivation to cook at home, as well as sense of perceived responsibility (i.e., role of wife and mother etc), and personal goals. Past experience did not show a consistent relationship.</p> <p>Social factors, including household type (i.e., having dependents) and having strong role models were also strong indicators of the likelihood to cook at home. There was no consistent outcome for SES.</p> <p>Time and cost moderated the relationship between self-efficacy and motivation and cooking at home,</p>

Author /title	Review characteristics	Findings
		and the relationship between cooking at home and healthy diet was stronger in men than women.

Marketing

Author /title	Review characteristics	Findings
<p>Russell et al., 2018</p> <p>The effect of screen advertising on children's dietary intake: A systematic review and meta-analysis</p>	<p>39 articles were reported, including lab based, real life settings and online survey data. Participants were children from age 2-18 years, conducted in a range of settings from labs, childcare facilities, schools and community settings.</p> <p>Quality of studies was assessed, but not used to exclude studies.</p>	<p>Exposure to food adverts was seen in shows ranging from cartoons, nature shows and children's programming, with most studies testing children's ad lib consumption of snacks made available while viewing footage.</p> <p>Even relatively short exposure to unhealthy food advertising on TV was associated with an increase in calorie intake of around 60 calories, though prompting an increase in consumption of unhealthy food.</p> <p>In observational studies, a moderate association was found between advert exposure and dietary intake. Children who are overweight or with obesity were more likely to be influenced by TV adverts than</p>

Author /title	Review characteristics	Findings
		healthy weight children. No consistent gender difference.
Villegas- Navas et al., 2020 The effects of foods embedded in entertainment media on children's food choices and food intake: A systematic review and meta-analysis	26 articles were identified, reporting on studies with children aged up to 18 years. Risk of bias was assessed as moderate.	Seeing foods embedded in entertainment media was linked to increased consumption of those foods; as most foods embedded have low nutritional value, this contributes to an overall poor diet. Children from 6-12 years significantly increased risk of choosing embedded foods compared with those younger.

Implementation intentions and impulse management

Author /title	Review characteristics	Findings
Adriaanse, Vinkers, De	23 studies investigating the effect of implementation intentions on eating behaviour, either by i) increase	Stronger findings for implementation intentions on promoting intake of healthy food, than reducing

Author /title	Review characteristics	Findings
<p>Ridder, Hox, & De Wit, 2011</p> <p>Do implementation intentions help to eat a healthy diet? A systematic review and meta-analysis of the empirical evidence</p>	<p>healthy eating (i.e., eating more fruits) or ii) diminishing unhealthy eating (i.e., eating fewer unhealthy snacks).</p> <p>No assessment of overall study quality was provided. The association of outcomes with study quality was mixed; higher quality outcome measures but lower quality control comparisons yielded stronger effects.</p>	<p>consumption of unhealthy food. Effects are of a moderate size.</p>
<p>Turton, Bruidegom, Cardi, Hirsch, & Treasure, 2016</p> <p>Novel methods to help develop healthier eating habits for eating</p>	<p>44 RCTs were identified, with a dependent variable of eating behaviour or weight (39 looking at the effect of implementation intentions, 5 on inhibition training, and 3 on attention bias modification).</p> <p>No explicit quality criteria were used, but all trials were RCTs, but the majority in lab conditions with only short-term follow up.</p>	<p>Implementation intentions had a small, positive effect on healthy food intake, and unhealthy food intake (i.e, reducing intake), but negligible impact on body weight.</p> <p>Inhibition training had a small to moderate effect on reducing unhealthy food intake</p> <p>Fewer studies were available on attention bias modification, but show a trend towards increasing</p>

Author /title	Review characteristics	Findings
and weight disorders: A systematic review and meta-analysis.		<p>healthy food intake and reducing unhealthy food intake.</p> <p>The authors suggest these approaches are used in conjunction with other methods.</p>
<p>van Beurden et al., 2016</p> <p>Techniques for modifying impulsive processes associated with unhealthy eating: A systematic review.</p>	<p>92 studies met review criteria, reporting on the techniques used to modify or manage impulsive processes related to eating.</p> <p>No formal quality assessment conducted due to wide range of study designs, but studies were assessed for risk of bias (for example, randomisation, sampling bias, sample size). Quality was judged overall to be weak.</p>	<p>The poor quality of the evidence limits the conclusions; presented more as a preliminary paper categorising types of technique that can be used, rather than definitive source of efficacy evidence.</p> <p>Suggests provisional evidence that visuospatial loading, physical activity, if-then planning can help to reduce food consumption (through reducing craving); mixed evidence of the efficacy of mindfulness. More research is needed for firm conclusions.</p>

Notes: SEP/SES - socio-economic position/status; RCT - randomised controlled trial; GDA - Guidance daily allowance; CASP - Critical Appraisal Skills programme; k indicates number of studies within a systematic review, n indicates number of participants in a study.

Appendix 3: Types of food choice behaviour incorporated in the evidence retrieved from the rapid review

Food-related behaviour (and setting)	Approaches reported	Evidence quality and availability / areas for further study
Shopping	Choice architecture <ul style="list-style-type: none"> - Labelling - Product placement - Portion size* Price manipulations	Extensive evidence, consistent positive effects reported. Implementation: Challenge is to implement the findings within commercial organisations.
Eating out (school or work cafeteria setting)	Choice architecture <ul style="list-style-type: none"> - Labelling - Product placement Price manipulations Social/peer interventions	Good volume of evidence, but limited generalisability (adult research primarily in student populations). Implementation: Some challenges to implement vs financial interests of organisations. Areas for further research: How to harness social support and peer influences to create more positive norms in canteens used by consistent social groups such as colleagues or students.
Eating out (restaurant setting)	Choice architecture <ul style="list-style-type: none"> - Labelling - Portion control 	Good volume of evidence, much in simulated situations. Implementation: Likely differential public health impact of focusing on fast food vs other restaurants. Risk of unintended

Food-related behaviour (and setting)	Approaches reported	Evidence quality and availability / areas for further study
		<p>consequences for labelling at point of consumption.</p> <p>Areas for further research:</p> <p>Not clear how much impact eating out has on diet overall (i.e., importance on targeting eating out).</p>
Increasing fruit and vegetable intake	<p>Educational interventions</p> <p>Choice architecture</p> <ul style="list-style-type: none"> - Product placement - Cues and prompts <p>Price manipulations</p>	<p>Gamification</p> <p>Good volume of evidence, pervasive messaging, albeit focussed primarily on health benefits.</p> <p>Implementation:</p> <p>Key challenge is providing access to good quality fruit and vegetables at affordable prices to people from lower SEPs/living in more deprived areas, and those using food banks (i.e., increasing opportunity).</p> <p>Gamification tends to show short-term effects in children, but potential to boost familiarity and influence preferences. Long term effects less well understood.</p>
Snacking	<p>Educational interventions</p> <p>Choice architecture</p> <ul style="list-style-type: none"> - Product placement - Cues and prompts 	<p>Good evidence on determinants of snacking, less on how to influence snacking behaviour.</p> <p>Implementation: Competing with significant marketing promoting snack consumption and pervasive availability.</p>

Food-related behaviour (and setting)	Approaches reported	Evidence quality and availability / areas for further study
	Behavioural support - for example, “if then” plans	Areas for further research: How to change social practices (including norms) to reduce snacking/grazing habits of typically energy dense products.

Notes: The behaviours reported above relate to motives or outcomes relevant to health or sustainability agendas (for example, purchasing choices may be made to fulfil either agenda) so are not differentiated here, but elaborated on where relevant in the text. * In a review of an earlier draft of this report it was noted that there are surprisingly few references to portion size. No specific search was made for portion size, however interventions aimed at reducing portion size were included in the review where they reported impact on fat, salt or sugar intake specifically, in line with the research question. Portion control studies that reported on overall dietary outcome, calorie intake etc without reference to specific dietary components were not included as they did not meet the inclusion criteria.

References

- Abeykoon, A.H., Engler-Stringer, R. and Muhajarine, N., 2017. Health-related outcomes of new grocery store interventions: a systematic review. *Public health nutrition*, 20(12), pp.2236-2248.
<https://doi.org/10.1017/S1368980017000933>
- Adriaanse, M.A., de Ridder, D.T. and de Wit, J.B., 2009. Finding the critical cue: Implementation intentions to change one's diet work best when tailored to personally relevant reasons for unhealthy eating. *Personality and social psychology bulletin*, 35(1), pp.60-71.
<https://doi.org/10.1177/0146167208325612>
- Adriaanse, M.A., Vinkers, C.D., De Ridder, D.T., Hox, J.J. and De Wit, J.B., 2011. Do implementation intentions help to eat a healthy diet? A systematic review and meta-analysis of the empirical evidence. *Appetite*, 56(1), pp.183-193.
<https://doi.org/10.1016/j.appet.2010.10.012>
- Allan, J., et al., *Environmental interventions for altering eating behaviours of employees in the workplace: a systematic review*. *Obesity Reviews*, 2017. 18(2): p. 214-226. <https://doi.org/10.1111/obr.12470>
- Allender, S., Brown, A.D., Bolton, K.A., Fraser, P., Lowe, J. and Hovmand, P., 2019. Translating systems thinking into practice for community action on childhood obesity. *Obesity Reviews*, 20, pp.179-184. <https://doi.org/10.1111/obr.12865>
- Amos, C., Holmes, G.R. and Keneson, W.C., 2014. A meta-analysis of consumer impulse buying. *Journal of Retailing and Consumer Services*, 21(2), pp.86-97.
<https://doi.org/10.1016/j.jretconser.2013.11.004>
- Anastasiou, K., Miller, M. and Dickinson, K., 2019. The relationship between food label use and dietary intake in adults: A systematic review. *Appetite*, 138, pp.280-291. <https://doi.org/10.1016/j.appet.2019.03.025>
- Baer, N.R., Deutschbein, J. and Schenk, L., 2020. Potential for, and readiness to, dietary-style changes during the retirement status passage: a systematic mixed-studies review. *Nutrition reviews*, 78(12), pp.969-988
<https://doi.org/10.1093/nutrit/nuaa017>
- BBC 2020. Eating disorders: MPs call for government action amid pandemic rise.
<https://www.bbc.co.uk/news/uk-england-south-yorkshire-56292701>

BEAT (Beat Eating Disorders) 2018.

<https://www.beateatingdisorders.org.uk/news/beats-response-government-plan-calorie-count>

Bédard, A., Lamarche, P.O., Grégoire, L.M., Trudel-Guy, C., Provencher, V., Desroches, S. and Lemieux, S., 2020. Can eating pleasure be a lever for healthy eating? A systematic scoping review of eating pleasure and its links with dietary behaviors and health. *PLoS one*, 15(12), p.e0244292.

<https://doi.org/10.1371/journal.pone.0244292>

Broers, V.J., De Breucker, C., Van den Broucke, S. and Luminet, O., 2017. A systematic review and meta-analysis of the effectiveness of nudging to increase fruit and vegetable choice. *The European Journal of Public Health*, 27(5), pp.912-920. <https://doi.org/10.1093/eurpub/ckx085>

Bucher, T., Murawski, B., Duncanson, K., Labbe, D. and Van der Horst, K., 2018. The effect of the labelled serving size on consumption: A systematic review. *Appetite*, 128, pp.50-57. <https://doi.org/10.1016/j.appet.2018.05.137>

Burgoine, T., Sarkar, C., Webster, C.J. and Monsivais, P., 2018. Examining the interaction of fast-food outlet exposure and income on diet and obesity: evidence from 51,361 UK Biobank participants. *International Journal of Behavioral Nutrition and Physical Activity*, 15(1), pp.1-12.

<https://doi.org/10.1186/s12966-018-0699-8>

Cairns, G., 2019. A critical review of evidence on the sociocultural impacts of food marketing and policy implications. *Appetite*, 136, pp.193-207 <https://doi.org/10.1016/j.appet.2019.02.002>

Campbell, E.T., Franks, A.T. and Joseph, P.V., 2019. Adolescent obesity in the past decade: A systematic review of genetics and determinants of food choice. *Journal of the American Association of Nurse Practitioners*, 31(6), p.344. <https://doi.org/10.1097/JXX.000000000000154>

Cecchini, M. and Warin, L., 2016. Impact of food labelling systems on food choices and eating behaviours: a systematic review and meta-analysis of randomized studies. *Obesity reviews*, 17(3), pp.201-210. <https://doi.org/10.1111/obr.12364>

Chen, P.J. and Antonelli, M., 2020. Conceptual Models of Food Choice: Influential Factors Related to Foods, Individual Differences, and Society. *Foods*, 9(12), p.1898. <https://doi.org/10.3390/foods9121898>

- Christoph, M.J. and An, R., 2018. Effect of nutrition labels on dietary quality among college students: a systematic review and meta-analysis. *Nutrition reviews*, 76(3), pp.187-203. <https://doi.org/10.1093/nutrit/nux069>
- Chung, C.F., Agapie, E., Schroeder, J., Mishra, S., Fogarty, J. and Munson, S.A., 2017, May. When personal tracking becomes social: Examining the use of Instagram for healthy eating. In *Proceedings of the 2017 CHI Conference on human factors in computing systems* (pp. 1674-1687). <https://doi.org/10.1145/3025453.3025747>
- Clohessy, S., Walasek, L. and Meyer, C., 2019. Factors influencing employees' eating behaviours in the office-based workplace: A systematic review. *Obesity Reviews*, 20(12), pp.1771-1780. <https://doi.org/10.1111/obr.12920>
- Coggon, J. and J. Adams, 2021. "Let them choose not to eat cake...": Public health ethics, effectiveness and equity in government obesity strategy." *Future Healthcare Journal* 8(1), 49. <https://doi.org/10.7861/fhj.2020-0246>
- Cruwys, T., Bevelander, K.E. and Hermans, R.C., 2015. Social modeling of eating: A review of when and why social influence affects food intake and choice. *Appetite*, 86, pp.3-18. <https://doi.org/10.1016/j.appet.2014.08.035>
- Daley, A.J., McGee, E., Bayliss, S., Coombe, A. and Parretti, H.M., 2020. Effects of physical activity calorie equivalent food labelling to reduce food selection and consumption: systematic review and meta-analysis of randomised controlled studies. *J Epidemiol Community Health*, 74(3), pp.269-275. <https://doi.org/10.1136/jech-2019-213216>
- Davison, J., Share, M., Hennessy, M., Bunting, B., Markovina, J. and Stewart-Knox, B., 2015. Correlates of food choice in unemployed young people: The role of demographic factors, self-efficacy, food involvement, food poverty and physical activity. *Food quality and preference*, 46, pp.40-47. <https://doi.org/10.1016/j.foodqual.2015.06.014>
- de Araujo, I.E., Schatzker, M. and Small, D.M., 2020. Rethinking food reward. *Annual review of psychology*, 71, pp.139-164. <https://doi.org/10.1146/annurev-psych-122216-011643>
- Deci, E.L. and Ryan, R.M., 1985. Toward an organismic integration theory. In *Intrinsic motivation and self-determination in human behavior* (pp. 113-148). Springer, Boston, MA. https://doi.org/10.1007/978-1-4899-2271-7_5

- Deliens, T., et al., *Dietary interventions among university students: A systematic review*. *Appetite*, 2016. **105**: p. 14-26.
<https://doi.org/10.1016/j.appet.2016.05.003>
- Devonport, T.J., Nicholls, W. and Fullerton, C., 2019. A systematic review of the association between emotions and eating behaviour in normal and overweight adult populations. *Journal of Health Psychology*, 24(1), pp.3-24.
<https://doi.org/10.1177/1359105317697813>
- Elwell-Sutton, T., Marshall, L., Bibby, J. and Volmert, A., 2019. Briefing: Reframing the conversation on the social determinants of health. *The Health Foundation, London*.
- Fedewa, A.L. and Davis, M.C., 2015. How food as a reward is detrimental to children's health, learning, and behavior. *Journal of School Health*, 85(9), pp.648-658. <https://doi.org/10.1111/josh.12294>
- Gilal, F.G., Zhang, J., Paul, J. and Gilal, N.G., 2019. The role of self-determination theory in marketing science: An integrative review and agenda for research. *European Management Journal*, 37(1), pp.29-44.
<https://doi.org/10.1016/j.emj.2018.10.004>
- Gillison, F.B., Rouse, P., Standage, M., Sebire, S.J. and Ryan, R.M., 2019. A meta-analysis of techniques to promote motivation for health behaviour change from a self-determination theory perspective. *Health Psychology Review*, 13(1), pp.110-130. <https://doi.org/10.1080/17437199.2018.1534071>
- The Guardian, 20th September, 2006:
<https://www.theguardian.com/education/2006/sep/20/schoolmeals.schools>
- Harbers, M.C., Beulens, J.W., Rutters, F., de Boer, F., Gillebaart, M., Sluijs, I. and van der Schouw, Y.T., 2020. The effects of nudges on purchases, food choice, and energy intake or content of purchases in real-life food purchasing environments: a systematic review and evidence synthesis. *Nutrition journal*, 19(1), pp.1-27. <https://doi.org/10.1186/s12937-020-00623-y>
- Haynos, A.F. and Roberto, C.A., 2017. The effects of restaurant menu calorie labeling on hypothetical meal choices of females with disordered eating. *International Journal of Eating Disorders*, 50(3), pp.275-283.
<https://doi.org/10.1002/eat.22675>
- Health Survey for England (HSE), 2019. <https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/2019>

- Hermans, R.C., Herman, C.P., Larsen, J.K. and Engels, R.C., 2010. Social modeling effects on young women's breakfast intake. *Journal of the American Dietetic Association*, 110(12), pp.1901-1905. <https://doi.org/10.1016/j.jada.2010.09.007>
- Hollands, G.J., Shemilt, I., Marteau, T.M., Jebb, S.A., Kelly, M.P., Nakamura, R., Suhrcke, M. and Ogilvie, D., 2013. Altering choice architecture to change population health behaviour: a large-scale conceptual and empirical scoping review of interventions within micro-environments.
- Host, A., McMahon, A.T., Walton, K. and Charlton, K., 2016. Factors influencing food choice for independently living older people—a systematic literature review. *Journal of nutrition in gerontology and geriatrics*, 35(2), pp.67-94. <https://doi.org/10.1080/21551197.2016.1168760>
- Houghtaling, B., Serrano, E.L., Kraak, V.I., Harden, S.M., Davis, G.C. and Misyak, S.A., 2019. A systematic review of factors that influence food store owner and manager decision making and ability or willingness to use choice architecture and marketing mix strategies to encourage healthy consumer purchases in the United States, 2005–2017. *International Journal of Behavioral Nutrition and Physical Activity*, 16(1), pp.1-14. <https://doi.org/10.1186/s12966-019-0767-8>
- Hsu, M.S., Rouf, A. and Allman-Farinelli, M., 2018. Effectiveness and behavioral mechanisms of social media interventions for positive nutrition behaviors in adolescents: a systematic review. *Journal of Adolescent Health*, 63(5), pp.531-545. <https://doi.org/10.1016/j.jadohealth.2018.06.009>
- Hunter, R.F., de la Haye, K., Murray, J.M., Badham, J., Valente, T.W., Clarke, M. and Kee, F., 2019. Social network interventions for health behaviours and outcomes: a systematic review and meta-analysis. *PLoS medicine*, 16(9), p.e1002890. <https://doi.org/10.1371/journal.pmed.1002890>
- Janz, N.K. and Becker, M.H., 1984. The health belief model: A decade later. *Health education quarterly*, 11(1), pp.1-47. <https://doi.org/10.1177/109019818401100101>
- Khaled, K., Tsofliou, F., Hundley, V., Helmreich, R. and Almilaji, O., 2020. Perceived stress and diet quality in women of reproductive age: A systematic review and meta-analysis. *Nutrition journal*, 19(1), pp.1-15. <https://doi.org/10.1186/s12937-020-00609-w>
- Kraak, V.I., Englund, T., Misyak, S. and Serrano, E.L., 2017. A novel marketing mix and choice architecture framework to nudge restaurant customers toward

- healthy food environments to reduce obesity in the United States. *Obesity Reviews*, 18(8), pp.852-868. <https://doi.org/10.1111/obr.12553>
- Lake, A.A., 2018. Neighbourhood food environments: food choice, foodscapes and planning for health. *Proceedings of the Nutrition Society*, 77(3), pp.239-246. <https://doi.org/10.1017/S0029665118000022>
- Lasko-Skinner, R and Sweetland J., 2021. Food in a pandemic. Editors: DEMOS; Food Standards Agency: Renew Normal: Food in a Pandemic
- Latkin, C.A. and Knowlton, A.R., 2015. Social network assessments and interventions for health behavior change: a critical review. *Behavioral Medicine*, 41(3), pp.90-97. <https://doi.org/10.1080/08964289.2015.1034645>
- Li, A.S.W., Figg, G. and Schüz, B., 2019. Socioeconomic status and the prediction of health promoting dietary behaviours: A systematic review and meta-analysis based on the theory of planned behaviour. *Applied Psychology: Health and Well-Being*, 11(3), pp.382-406. <https://doi.org/10.1111/aphw.12154>
- Mackenbach, J.D., Nelissen, K.G., Dijkstra, S.C., Poelman, M.P., Daams, J.G., Leijssen, J.B. and Nicolaou, M., 2019. A systematic review on socioeconomic differences in the association between the food environment and dietary behaviors. *Nutrients*, 11(9), p.2215. <https://doi.org/10.3390/nu11092215>
- Marty, L., Chambaron, S., Nicklaus, S. and Monnery-Patris, S., 2018. Learned pleasure from eating: An opportunity to promote healthy eating in children?. *Appetite*, 120, pp.265-274. <https://doi.org/10.1016/j.appet.2017.09.006>
- McCarthy, M.B., Collins, A.M., Flaherty, S.J. and McCarthy, S.N., 2017. Healthy eating habit: A role for goals, identity, and self-control?. *Psychology & Marketing*, 34(8), pp.772-785. <https://doi.org/10.1002/mar.21021>
- McDermott, L., O'Sullivan, T., Stead, M. and Hastings, G., 2006. International food advertising, pester power and its effects. *International Journal of Advertising*, 25(4), pp.513-539. <https://doi.org/10.1080/02650487.2006.11072986>
- McGill, R., Anwar, E., Orton, L., Bromley, H., Lloyd-Williams, F., O'Flaherty, M., Taylor-Robinson, D., Guzman-Castillo, M., Gillespie, D., Moreira, P. and Allen, K., 2015. Are interventions to promote healthy eating equally effective for all?

- Systematic review of socioeconomic inequalities in impact. *BMC public health*, 15(1), pp.1-15. <https://doi.org/10.1186/s12889-015-1781-7>
- Mennella, J.A. and Bobowski, N.K., 2015. The sweetness and bitterness of childhood: Insights from basic research on taste preferences. *Physiology & behavior*, 152, pp.502-507. <https://doi.org/10.1016/j.physbeh.2015.05.015>
- Miao, L. and Mattila, A.S., 2013. Impulse buying in restaurant food consumption. *Journal of foodservice business research*, 16(5), pp.448-467. <https://doi.org/10.1080/15378020.2013.850379>
- Michie, S., Van Stralen, M.M. and West, R., 2011. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation science*, 6(1), pp.1-12. <https://doi.org/10.1186/1748-5908-6-42>
- Mills, S., White, M., Brown, H., Wrieden, W., Kwasnicka, D., Halligan, J., Robalino, S. and Adams, J., 2017. Health and social determinants and outcomes of home cooking: A systematic review of observational studies. *Appetite*, 111, pp.116-134. <https://doi.org/10.1016/j.appet.2016.12.022>
- Mohan, G., Sivakumaran, B. and Sharma, P., 2013. Impact of store environment on impulse buying behavior. *European Journal of marketing*. <https://doi.org/10.1108/EJM-03-2011-0110>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G. and Prisma Group, 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS medicine*, 6(7), p.e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- Moller, A.C., Ryan, R.M. and Deci, E.L., 2006. Self-determination theory and public policy: Improving the quality of consumer decisions without using coercion. *Journal of Public Policy & Marketing*, 25(1), pp.104-116. <https://doi.org/10.1509/jppm.25.1.104>
- Ng, J.Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E.L., Ryan, R.M., Duda, J.L. and Williams, G.C., 2012. Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science*, 7(4), pp.325-340. <https://doi.org/10.1177/1745691612447309>
- Perez-Cueto, F.J., 2019. An umbrella review of systematic reviews on food choice and nutrition published between 2017 and-2019. *Nutrients*, 11(10), p.2398. <https://doi.org/10.3390/nu11102398>

- Pitt, E., Gallegos, D., Comans, T., Cameron, C. and Thornton, L., 2017. Exploring the influence of local food environments on food behaviours: a systematic review of qualitative literature. *Public health nutrition*, 20(13), pp.2393-2405. <https://doi.org/10.1017/S1368980017001069>
- Pitts, S.B.J., Ng, S.W., Blitstein, J.L., Gustafson, A. and Niculescu, M., 2018. Online grocery shopping: promise and pitfalls for healthier food and beverage purchases. *Public health nutrition*, 21(18), pp.3360-3376. <https://doi.org/10.1017/S1368980018002409>
- Public Health England, 2015. Improving health literacy to reduce health inequalities https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/460710/4b_Health_Literacy-Briefing.pdf
- Public Health England, 2020. Community-Centred Public Health: Taking a Whole System Approach.
- Ragelienė, T. and Grønhøj, A., 2020. The influence of peers' and siblings' on children's and adolescents' healthy eating behavior. A systematic literature review. *Appetite*, 148, p.104592. <https://doi.org/10.1016/j.appet.2020.104592>
- Riebl, S.K., Estabrooks, P.A., Dunsmore, J.C., Savla, J., Frisard, M.I., Dietrich, A.M., Peng, Y., Zhang, X. and Davy, B.M., 2015. A systematic literature review and meta-analysis: The Theory of Planned Behavior's application to understand and predict nutrition-related behaviors in youth. *Eating behaviors*, 18, pp.160-178. <https://doi.org/10.1016/j.eatbeh.2015.05.016>
- Robinson, E., Fleming, A. and Higgs, S., 2014. Prompting healthier eating: Testing the use of health and social norm based messages. *Health Psychology*, 33(9), p.1057. <https://doi.org/10.1037/a0034213>
- Robinson, E., Harris, E., Thomas, J., Aveyard, P. and Higgs, S., 2013. Reducing high calorie snack food in young adults: a role for social norms and health based messages. *International Journal of Behavioral Nutrition and Physical Activity*, 10(1), pp.1-8. <https://doi.org/10.1186/1479-5868-10-73>
- Rounsefell, K., Gibson, S., McLean, S., Blair, M., Molenaar, A., Brennan, L., Truby, H. and McCaffrey, T.A., 2020. Social media, body image and food choices in healthy young adults: A mixed methods systematic review. *Nutrition & Dietetics*, 77(1), pp.19-40. <https://doi.org/10.1111/1747-0080.12581>
- Ruddock, H.K., Brunstrom, J.M., Vartanian, L.R. and Higgs, S., 2019. A systematic review and meta-analysis of the social facilitation of eating. *The American*

journal of clinical nutrition, 110(4), pp.842-861.

<https://doi.org/10.1093/ajcn/nqz155>

Russell, S.J., Croker, H. and Viner, R.M., 2019. The effect of screen advertising on children's dietary intake: A systematic review and meta-analysis. *Obesity reviews*, 20(4), pp.554-568.

<https://doi.org/10.1111/obr.12812>

Scapin, T., Fernandes, A.C., Curioni, C.C., Pettigrew, S., Neal, B., Coyle, D.H., Rodrigues, V.M., Bernardo, G.L., Uggioni, P.L. and Proença, R.P., 2020.

Influence of sugar label formats on consumer understanding and amount of sugar in food choices: a systematic review and meta-analyses. *Nutrition Reviews*.

<https://doi.org/10.1093/nutrit/nuaa108>

Shangguan, S., Afshin, A., Shulkin, M., Ma, W., Marsden, D., Smith, J., Saheb-Kashaf, M., Shi, P., Micha, R., Imamura, F. and Mozaffarian, D., 2019. A meta-analysis of food labeling effects on consumer diet behaviors and industry practices. *American journal of preventive medicine*, 56(2), pp.300-314.

<https://doi.org/10.1016/j.amepre.2018.09.024>

Sheeran, P., Wright, C.E., Avishai, A., Villegas, M.E., Lindemans, J.W., Klein, W.M.,

Rothman, A.J., Miles, E. and Ntoumanis, N., 2020. Self-determination theory interventions for health behavior change: Meta-analysis and meta-analytic structural equation modeling of randomized controlled trials. *Journal of consulting and clinical psychology*, 88(8), p.726.

<https://doi.org/10.1037/ccp0000501>

Sinclair, S.E., Cooper, M. and Mansfield, E.D., 2014. The influence of menu labeling on calories selected or consumed: a systematic review and meta-analysis. *Journal of the Academy of Nutrition and Dietetics*, 114(9), pp.1375-1388.

<https://doi.org/10.1016/j.jand.2014.05.014>

Stok, F.M., De Vet, E., Wardle, J., Chu, M.T., De Wit, J. and De Ridder, D.T., 2015. Navigating the obesogenic environment: How psychological sensitivity to the food environment and self-regulatory competence are associated with adolescent unhealthy snacking. *Eating behaviors*, 17, pp.19-22.

<https://doi.org/10.1016/j.eatbeh.2014.12.003>

<https://doi.org/10.1016/j.eatbeh.2014.12.003>

<https://doi.org/10.1016/j.eatbeh.2014.12.003>

Stok, F.M., de Vet, E., de Wit, J.B., Luszczynska, A., Safron, M. and de Ridder, D.T., 2015. The proof is in the eating: subjective peer norms are associated with adolescents' eating behaviour. *Public health nutrition*, 18(6), pp.1044-1051.

<https://doi.org/10.1017/S1368980014001268>

<https://doi.org/10.1017/S1368980014001268>

- Thürmer, J.L., Bieleke, M., Wieber, F. and Gollwitzer, P.M., 2020. If-then plans help regulate automatic peer influence on impulse buying. *European Journal of Marketing*. <https://doi.org/10.1108/EJM-05-2018-0341>
- Tørris, C. and Mobekk, H., 2019. Improving Cardiovascular Health through Nudging Healthier Food Choices: A Systematic Review. *Nutrients*, 11(10), p.2520. <https://doi.org/10.3390/nu11102520>
- Turton, R., Bruidegom, K., Cardi, V., Hirsch, C.R. and Treasure, J., 2016. Novel methods to help develop healthier eating habits for eating and weight disorders: A systematic review and meta-analysis. *Neuroscience & Biobehavioral Reviews*, 61, pp.132-155. <https://doi.org/10.1016/j.neubiorev.2015.12.008>
- UK Government Obesity Strategy., 2020. *Tackling obesity: empowering adults and children to live healthier lives*
<https://www.gov.uk/government/publications/tackling-obesity-government-strategy/tackling-obesity-empowering-adults-and-children-to-live-healthier-lives>
- van Beurden, S.B., Greaves, C.J., Smith, J.R. and Abraham, C., 2016. Techniques for modifying impulsive processes associated with unhealthy eating: A systematic review. *Health Psychology*, 35(8), p.793. <https://doi.org/10.1037/hea0000337>
- Verplanken, B., 2018. Promoting sustainability: Towards a segmentation model of individual and household behaviour and behaviour change. *Sustainable Development*, 26(3), pp.193-205. <https://doi.org/10.1002/sd.1694>
- Villegas-Navas, V., Montero-Simo, M.J. and Araque-Padilla, R.A., 2020. The Effects of Foods Embedded in Entertainment Media on Children's Food Choices and Food Intake: A Systematic Review and Meta-Analyses. *Nutrients*, 12(4), p.964. <https://doi.org/10.3390/nu12040964>
- Vinkers, C.D., Adriaanse, M.A., Kroese, F.M. and de Ridder, D.T., 2015. Better sorry than safe: Making a Plan B reduces effectiveness of implementation intentions in healthy eating goals. *Psychology & health*, 30(7), pp.821-838. <https://doi.org/10.1080/08870446.2014.997730>
- Wethington, H.R., Finnie, R.K., Buchanan, L.R., Okasako-Schmucker, D.L., Mercer, S.L., Merlo, C., Wang, Y., Pratt, C.A., Ochiai, E., Glanz, K. and Community Preventive Services Task Force, 2020. Healthier Food and Beverage Interventions in Schools: Four Community Guide Systematic

- Reviews. *American journal of preventive medicine*, 59(1), pp.e15-e26.
<https://doi.org/10.1016/j.amepre.2020.01.011>
- Whitelock, E. and Ensaff, H., 2018. On your own: older adults' food choice and dietary habits. *Nutrients*, 10(4), p.413. <https://doi.org/10.3390/nu10040413>
- Yee, A.Z., Lwin, M.O. and Ho, S.S., 2017. The influence of parental practices on child promotive and preventive food consumption behaviors: a systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), pp.1-14. <https://doi.org/10.1186/s12966-017-0501-3>
- Yoshida-Montezuma, Y., Ahmed, M. and Ezezika, O., 2020. Does gamification improve fruit and vegetable intake in adolescents? a systematic review. *Nutrition and Health*, 26(4), pp.347-366.
<https://doi.org/10.1177/0260106020936143>
- Zhang, S., De La Haye, K., Ji, M. and An, R., 2018. Applications of social network analysis to obesity: a systematic review. *Obesity reviews*, 19(7), pp.976-988.
<https://doi.org/10.1111/obr.12684>
- Zorbas, C., Palermo, C., Chung, A., Iguacel, I., Peeters, A., Bennett, R. and Backholer, K., 2018. Factors perceived to influence healthy eating: a systematic review and meta-ethnographic synthesis of the literature. *Nutrition reviews*, 76(12), pp.861-874. <https://doi.org/10.1093/nutrit/nuy043>