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**Right here, right now: situated interventions to change consumer habits**

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## **ABSTRACT**

Consumer behavior-change interventions have traditionally encouraged consumers to form conscious intentions but, in the past decade, it has been shown that whilst these interventions have a medium-to-large effect in changing intentions, they have a much smaller effect in changing behavior. Consumers often do not act in accordance with their conscious intentions because situational cues in the immediate environment automatically elicit learned, habitual behaviors. It has therefore been suggested that researchers re-focus their efforts on developing interventions that target unconscious, unintentional influences on behavior, such as cue-behavior ('habit') associations. To develop effective consumer behavior-change interventions, however, we argue that it is first important to understand how consumer experiences are represented in memory, in order to successfully target the situational cues that most strongly predict engagement in habitual behavior. In this article, we present a situated cognition perspective of habits, and discuss how the situated cognition perspective extends our understanding of how consumer experiences are represented in memory, and the processes through which these situational representations can be retrieved in order to elicit habitual consumer behaviors. Based on the principles of situated cognition, we then discuss five ways interventions could change consumer habits by targeting situational cues in the consumer environment, and suggest how existing interventions utilizing these behavior-change strategies could be improved by integrating the principles of the situated cognition approach.

**Keywords:** situated cognition; behavior change; intervention; habits; intention-behavior gap; situated; automaticity; learning; memory

Predicting how consumers will behave in a variety of situations is a central concern in the field of consumer research. The idea that intentions constitute strong predictors of behavior has long dominated consumer research. The anticipated success of new products, for example, is often predicted on the basis of explicit product evaluations and self-reported purchasing intentions obtained in focus groups or online surveys (for a discussion, see e.g. Ji and Wood 2007; Labrecque et al. 2016). Similarly, interventions to change consumer behavior (e.g. public health or product marketing campaigns) have typically indexed consumers' self-reported intentions, attitudes, beliefs, and goals, and then attempted to change these via the provision of new information and/or guidelines (e.g. the 'five a day' public health campaign; for an overview, see Verplanken and Wood 2006; for general overviews of intentions, see Ajzen 1991; Rogers and Prentice-Dunn 1997). Consumers, however, do not often behave in accordance with their intentions.

For the past two decades, evidence has accumulated that whilst intentions are good predictors of engagement in one-off, infrequent behaviors (e.g. purchasing a new apartment), they are typically poor predictors of behaviors that are performed routinely in the same context (e.g. shopping or eating lunch; see, e.g. Gardner, de Bruijn, and Lally, 2011; Ouellette and Wood 1998; Ji and Wood 2007; Webb and Sheeran 2006). Indeed, evidence of this so-called 'intention-behavior gap' (e.g. Rothman et al. 2015; Sheeran and Webb 2016) has been reported across a range of consumer behaviors (e.g. Ji and Wood 2007; Young, Hwang, McDonald, and Oates 2016). The difficulty consumers experience acting in accordance with their conscious intentions is problematic for the design of effective consumer behavior-change interventions. Thus, it is perhaps unsurprising that whilst intention-based interventions have a medium-to-large effect in changing intentions, they have only a small-to-medium effect in changing behavior (Webb and Sheeran 2006). In other words, whilst interventions that encourage the formation of conscious intentions might change what

consumers report they will purchase in focus groups or in online surveys, they do not often change what consumers actually purchase when they are in the store. Furthermore, even in instances where intention-based interventions do result in behavior change, the effects are typically short-lived with most consumers returning to their original behaviors in the long-term (e.g. they eventually return to purchasing their usual food for lunch or their usual cleaning product in the store; for a discussion, see Wood and Neal, In Press). In recent years, it has therefore been suggested that researchers, marketers, and policy makers move away from intention-based models and instead focus on developing interventions that target unintentional, unconscious drivers of behavior (e.g. Hollands, Marteau, and Fletcher 2016; Marteau, Hollands, and Fletcher 2012; Sheeran, Gollwitzer, and Bargh 2013; Verplanken and Wood 2006).

In the past two decades, there has been growing evidence that context-response ('habit') associations constitute a highly influential unintentional driver of consumer behavior (see, e.g. Labrecque et al. 2016; Ji and Wood 2007; Verplanken and Wood 2006; Wood and Neal 2009;). Experience sampling research shows, for example, that approximately 43% of a consumer's actions are performed daily, often in the same context (Wood, Tam, and Witt 2002; see also Liu, Han, and Cohen 2015). Consumers tend to buy the same brands, purchase similar amounts across shopping episodes, and consume similar types of food at mealtimes (for a discussion, see Wood and Neal 2009). Research has also shown that the strength of consumers' habits predicts various eating and drinking behaviors and the likelihood of taking public transport (Ji and Wood 2007; van't Riet et al. 2011), alongside engagement in a range of health-related behaviors (for an overview, see Gardner, 2015). Furthermore, a recent study into the factors that predict the success of new products introduced to the consumer market showed that interference from existing habits accounts for 25% of instances where consumers failed to use new products (Labrecque et al. 2016). Specifically, Labrecque and colleagues

showed that the failure of these products was not due to the consumer disliking the product or experiencing difficulty using it, but rather forgetting to use the product and reverting back to their old habitual behaviors. Thus, the habits literature provides clear evidence that consumers readily form habits as they go about their daily activities including shopping, eating, travelling to work destinations, or using technology, and that these habits dominate behavior even when consumers hold intentions to act otherwise.

However, whilst the frequency of engaging in a given behavior and the stability of the context might predict when habitual consumer behavior is likely to emerge, these variables tell us very little about how consumers represent their consumer experiences in memory and the processes through which these complex situational representations give rise to habitual behavior. Specifically, there are several unanswered questions. First, how are the many internal and external cues present in consumer environments processed and integrated into a coherent representation in memory? Second, how are these complex, situational representations retrieved from memory in a manner that elicits habitual behavior? Third, what are the factors that determine which cues become associated with a given consumer behavior and the individual differences that follow? If researchers are to develop effective behavior-change interventions to target consumer behavior, we argue that it is vital to examine these unanswered questions in order to better understand the mechanisms underlying unintentional influences on consumer behavior, such as habits.

In this article, we therefore present a theory of how representations of situational consumer experiences stored in memory give rise to habits as a form of automatic consumer behavior, and we apply this theory to understanding and enhancing consumer behavior-change interventions. In brief, our theory suggests that the effects of habits on consumer behavior arise through the storage and retrieval of complex, multimodal cognitive representations in long-term memory. These complex representations, so-called ‘situated conceptualiza-

tions', are stored in memory as consumers go about their daily lives when, for example, shopping in the grocery store, taking public transport, and eating. Situated conceptualizations serve to integrate information from various modalities, including information about internal states, cognitions, affect, and actions, alongside external cues about objects and people present, visual cues, and information about time and space. The contents of consumers' situated conceptualizations are continually modified on the basis of new consumer experiences, with situated conceptualizations from various consumer experiences aggregated on the basis of their common elements. Once a situated conceptualization has been stored in memory, it can be reactivated on later occasions either directly, via exposure to any of the internal or external cues stored within it, or indirectly, via so-called 'pattern completion inferences' in which representations of non-present elements of the situated conceptualization are reactivated associatively. Thus, encountering a cue stored within a consumer's situated conceptualization can serve to reactivate the situated conceptualization, and the associated cues represented within it. This way, previously learned knowledge about a situation and about one's own behavior in that situation can be retrieved efficiently from memory, often resulting in cue-driven, habitual consumer behaviors.

In addition to advancing our theoretical understanding of the mechanisms underlying consumer habits as a form of situated action, the situated cognition perspective presented in this article also has practical applications for the design of effective consumer behavior-change interventions. To illustrate the applications of our theory, we discuss five ways that interventions can change consumer behavior by removing, replacing, or adding situational cues to consumer situations, and suggest how existing interventions utilizing these behavior-change strategies could be improved by integrating the principles of the situated cognition perspective.

## **HABITS AND THE INFLUENCE OF SITUATIONAL CUES ON CONSUMER BEHAVIOR**

A growing body of research shows that situational cues can influence behavior by activating learned habitual responses stored in memory (for a review, see Wood and Neal 2007). Whilst there is some debate surrounding the specific definition of a ‘habit’ (see Gardner 2015; Labrecque and Wood 2015), many researchers would agree that a habit refers to a learned association between a situational cue and a behavioral response. Habits are acquired by repeatedly performing the same goal-directed behavior in the same contexts (i.e. the same location or the same visual stimulus; see, e.g. Wood and R  nger 2016). In accordance with this definition, we refer to ‘habitual behavior’ as any act, choice, or state that is elicited by the retrieval of a learned cue-response association from memory (see, e.g. Aarts and Dijksterhuis 2000; Ouellette and Wood 1998; Verplanken and Wood 2006; Wood and Neal 2009).

The defining feature of habits is that once they are acquired, recurring situational cues automatically elicit the habitual behavior with little or no interference from intentional, deliberative processes (Wood and R  nger 2016). Importantly, a multitude of situational cues present in the environment can become associated with any behavior executed within that context, provided that the context is stable and the behavior is executed routinely in that context (see, e.g. Wood and Neal 2007; Wood and R  nger 2016). These situational cues could include sounds, textures, tastes, objects, times of day, affective or bodily states, previous actions in a sequence, or other people present (e.g. Neal, Wood, and Quinn 2006; Wood, Quinn, and Kashy 2002). If a consumer frequently eats potato chips for lunch, for example, the action of consuming potato chips could become habitual, elicited by a temporal cue (i.e. lunchtime). Alternatively, if another consumer frequently eats potato chips when they feel stressed at work, the action consuming potato chips could similarly become habitual, but elicited for this consumer by an internal mood cue (i.e. stress). Thus, one of the



defining characteristics of habits is that they are activated from memory by recurring situational cues in the environment, often despite intentions to act otherwise (Wood et al. 2014).

Another feature of habits is that they are initially acquired in the pursuit of goals, such as consuming healthy foods in order to lose weight or purchasing lower-priced items in order to save money (e.g. Aarts and Dijkershuis 2000; Neal et al. 2006; Wood and Neal 2007). Once a habit is well learned, however, research suggests that situational cues can elicit a habitual response even when the direct reward from performing the behavior is low. This suggests that fully automatized habits may no longer be mediated by goals<sup>1</sup>. In support of this idea, Neal and colleagues showed that individuals who frequently consume popcorn during visits to the movie theatre eat more popcorn than individuals who rarely consume it, even when the popcorn is stale and thus not particularly enjoyable to consume (Neal et al. 2011). Importantly, the observed increase in stale popcorn consumption for the strong-habit consumers was observed in a movie theatre context, but not in a campus meeting room (despite consumers also watching movie trailers in the meeting room context). Thus, it seems likely that situational cues present in the movie theatre elicited a learned habitual response in the strong-habit consumers, even when consumption of the popcorn was not particularly enjoyable or rewarding (see, e.g. Tricomi, Balleine, and O'Doherty 2009). The influence of cues even in situations where the reward-value of engaging in the habitual behavior is low could explain why situational cues elicit a strong influence on consumer behavior even in the face of conscious intentions to act otherwise.

## **A SITUATED COGNITION PERSPECTIVE ON HABITS**

Here, we introduce a situated cognition perspective to further refine our understanding of habitual behavior and derive implications for consumer habit-change interventions (see also

Barsalou 2016a). Generally, this situated cognition perspective is concerned with how complex multimodal situations are represented in memory, and how these representations give rise to automatic, cue-dependent behavior. The central premise of the situated cognition perspective is that, for any given experience, situational cues are integrated into complex, associative, multi-modal representations, so-called ‘situated conceptualizations’. The situational cues represented within a situation conceptualization could include, for example, the actions, emotions, or bodily states experienced in a given situation, alongside various other sources of information, such as sensory input, interoceptive states, cognitions, goals, information about time and space, and representations of the objects and people present (Barsalou et al. 2003; Barsalou 2016a 2016b; Barsalou 2003; Papies and Barsalou 2015). Importantly, the situational cues stored within any given situated conceptualization represent more than simply the environmental settings physically present in that situation, but rather the aggregation of multiple experiences over time (Papies and Barsalou 2015).

Situated conceptualizations can become encoded into memory in any context in which a consumer behavior is executed, or a cognition or internal state is experienced. Whilst in the grocery store, for example, consumers may encode a situated conceptualization that includes the action of pushing the cart up each aisle, the sensory input of browsing the shelves of available products, the goals pursued while selecting products, the bodily sensations of lifting and placing selected products in the cart, the sound of store music, and so on. As each grocery store cue is processed in parallel by its respective systems, the ‘local’ information relating to each cue becomes integrated by ‘association’ regions of the brain into a ‘global’ representation of the grocery store experience that is (1) stored in long-term memory and (2) integrated with existing situated conceptualizations on the basis of overlapping elements (e.g. previous experiences shopping episodes or watching TV commercials for grocery store products; Papies and Barsalou 2015).

If a particular situation is experienced often (e.g. if a consumer always shops in the same grocery store) the connections between elements across situated conceptualizations are strengthened, creating a distributed memory of the situational components with variously weighted connections between the elements (e.g. Barsalou 2016a). If situational features of the grocery store environment repeat frequently across experiences, for example, the weighting between these elements will be higher, ultimately giving rise to habits.

Another key feature of the situated cognition perspective is that once a situated conceptualization is stored in memory, the best-matching situated conceptualization will be reactivated to interpret and prepare action in a subsequent situation. Returning to the grocery store example, the best-matching situated conceptualization for a newly visited grocery store could reflect an experience in a store that has been visited by the consumer frequently in the past (e.g. their usual grocery store) or the closest available match with the cues perceived in the current environment (e.g. another store of the same chain; Barsalou 2011). As the perceptual features of the current grocery store environment are processed and the best-matching situated conceptualization becomes active, other non-present aspects of the grocery store situation might also become active via the associative retrieval of other cues stored within the situated conceptualization (e.g. Barsalou 2011; see also Barsalou 2016a; Barsalou 2003). Entering a new grocery store, for example, may not only reactivate the action of reaching for familiar products, but also non-present elements of the best-matching grocery store experience in memory, such as a representation of the store layout.

An implication of this ‘pattern completion inference’ process is that consumers can behave habitually even if the cue most strongly associated with the habitual response within the situated conceptualization is not directly present in the immediate environment, and even if the immediate environment has never been experienced before (see also Wood, Tam, and Witt 2002). Thus, habitual consumer behavior could sometimes be the result of perceiving a

cue present in the environment and other times the result of a pattern completion process in which a non-present cue is inferred associatively. This could explain why habitual behavior is so prevalent in daily life and is so resistant to change, as the distributed nature of situated conceptualizations means that there are typically numerous routes to activating a habit representation from memory.

To sum up, the situated cognition account suggests that habits can be understood as a form of situated action arising from aggregated situated conceptualizations encoded across previous experiences. Consequently, habitual behavior can be triggered directly by a multitude of internal or external cues that form part of these situated conceptualizations, or indirectly via pattern completion inferences that result from the associative retrieval of non-present cues stored within the situated conceptualization.

## **HOW DOES THE SITUATED COGNITION PERSPECTIVE EXTEND EXISTING HABIT ACCOUNTS?**

The situated cognition perspective provides a general cognitive mechanism that can account for a variety of automatic, cue-driven behaviors including, but not limited to, habits (for overviews, see Barsalou 2016a 2016b; Papies and Barsalou 2015; Papies 2016a 2016b 2017). Thus, although we focus in this article on applying the situated cognition perspective to consumer habits, the key principles of the situated cognition perspective can and have indeed been applied to understand the mechanisms of other cue-driven behaviors (e.g. impulses, short-term hedonic goals, priming, cravings, and desire; Barsalou 2016; Barsalou and Papies 2015; Papies et al. 2017)<sup>2</sup>. Importantly, existing habit accounts and the situated cognition perspective should be viewed as complementary, rather than competing, approaches with the situated cognition perspective allowing us to conceptualize habits as a specific form of situated action grounded in the conceptual processing systems in the brain.

The situated cognition perspective extends existing habit accounts in several ways. First, it informs our understanding of how habits are represented in memory. A key premise of the situated cognition perspective is that habitual behaviors emerge from complex, aggregated, multimodal situated conceptualizations rather than isolated cue-response associations (see, e.g. Neal et al. 2006; Wood and Neal 2007). Thus, whilst habit accounts typically assume that a habitual behavior is elicited by a recurring situational cue (or, more recently, associated cue compounds; Wood 2017), it follows from the situated cognition perspective that there are multiple routes to activating the same habitual behavior. The diversity in the range of cues that could activate a situated conceptualization can readily account for why consumers are typically poor at identifying the cue that best predicts their engagement in habitual behavior (Quinn et al. 2010), and why habitual behavior emerges in novel situations despite the apparent absence of the ‘habit cue’. Furthermore, the idea that habits emerge as populations of aggregated situated conceptualizations can also readily explain why linking new behaviors with existing habits (i.e. piggy-backing; see Judah, Gardner, and Aunger 2013) provides an effective way to automate performance of novel behaviors. Recent work, for example, has shown that an effective way to facilitate the long-term use of a new product (e.g. sunglasses, musical instrument, games console) is to integrate the use of the new product use into an existing habit (Labrecque et al. 2016). According to the situated cognition perspective, the more elements shared between previously stored situated conceptualizations and the new behaviors (e.g. time of day, visual cues, internal states), the more likely the new behavior is to benefit from capitalizing on the pre-existing cue associations across situated conceptualizations as the situated conceptualizations become aggregated in memory.

Second, the situated cognition perspective highlights the importance of considering the content of consumers’ situated conceptualization rather than simply considering the

stability of the contextual cues stored within it. At present, habit strength is typically measured by examining the frequency of behavioral performance and the stability of the context in which the behavior is executed (i.e. Behavioral Frequency  $\times$  Context Stability; for an overview of habit measures, see Labrecque and Wood 2015). Whilst some research has attempted to examine the stability of subcomponents of the context (e.g. stabilities of mood, physical location, time of day, other people present; Ji and Wood 2007), there has been relatively little consideration of how the specific situational cues that elicit habits vary across contexts, individuals, and behaviors. In the typical grocery store, for example, there are a multitude of external cues (e.g. product packaging, store music, store layout, other shoppers present) and internal cues (e.g. affective, interoceptive, and bodily states, short-term and long-term goals) present that could become represented within a consumer's situated conceptualization. Focusing only on the stability of the context (or even the stability of sub-components of the context) restricts our understanding of the mechanisms of habit activation and limits the design of effective behavior-change interventions. Furthermore, the frequency or self-reported perceived automaticity of a given behavior does not provide any insight into the contents of the representations that are driving the habitual behavior of interest (for a similar idea, see Moors, Boddez, and De Houwer 2017). Thus, we argue that if we are to fully understand the mechanisms through which habitual behaviors emerge, we need to not only study behavioral frequency and stability of situational cues, but also the specific cues within the situated conceptualization that best predict the occurrence of habitual behaviors within and between individuals (for methodological suggestions of how this could be achieved, see 'Discussion and Future Research' below).

Finally, we argue that the provision of a unified framework that provides a common mechanism across automatic, cue-driven behaviors is advantageous for the design of habit-change interventions. Although there are subtle differences in the ways in which situational

cues influence behavior, identifying a common mechanism across these influences (e.g. habits, impulses, affordances) is particularly beneficial for the development of consumer behavior-change interventions where there could be many situational influences on consumer behavior. Research in the marketing and consumer behavior domains has, for example, focused on the phenomena of ‘impulsive purchasing’ and the internal and external situational cues that could elicit such unplanned consumer behavior (for an overview, see Muruganatham and Bhakat 2013; see also e.g. Kacen, Hess, and Walker 2012; Strack, Werth, and Deutsch 2006; Verplanken et al. 2007). The literatures on consumer habits and impulse purchasing have, however, largely proceeded in isolation. Yet it is likely that, at the most basic level, these influences on consumer behavior similarly arise via the storage and retrieval of situated conceptualizations. The situated cognition account thus provides a useful general framework for researchers and policy makers who aim to develop effective, long-term interventions that target a variety of automatic, cue-driven processes on consumer behavior (see Papies 2016a 2016b 2017).

## **THE MECHANISMS OF SITUATED INTERVENTIONS TO CHANGE HABITUAL CONSUMER BEHAVIOR**

Applying the principles of the situated cognition perspective, there are several ways to develop effective ‘situated interventions’<sup>3</sup> that change the contents of consumers’ situated conceptualizations and/or change which situated conceptualization is activated in a given context (for an overview see Papies 2016a; Papies 2016b). First, situated interventions can remove the physical presence of situational cues that activate a specific (i.e. undesirable) situated conceptualization. Second, situated interventions can replace, or reduce attention to, situational cues that activate a specific situated conceptualization. Third, situated interventions can add new situational cues to the relevant context that, for example, activate compet-

ing long-term goals, provide additional information, prompt alternative behavioral responses, or activate less positive thoughts about engaging in the habitual behavior - and therefore change which situated conceptualization guides behavior in that context.

We suggest that interventions that successfully modify or replace the situational cues that activate situated conceptualizations are advantageous compared to intention-based interventions as situated interventions directly target the activation of automatic behaviors that would otherwise diminish the effect of intentions (see, e.g. Papies, 2016a, 2016b, 2017). Another advantage of developing situated interventions is that they are likely to elicit longer-term behavior change via the gradual formation of new situated conceptualizations, which could elicit new (favorable) habitual behaviors (Barsalou 2016b). The potential for the formation of new habits presents a significant advantage compared to intention-based interventions as, unlike intentions, habitual behaviors are resistant to the effects of time pressure, low self-control, and distraction (e.g. Hofmann et al. 2008; Neal, Wood, and Drolet 2013; Otto et al. 2013; Ouellette and Wood 1998). Thus, the formation of new situated conceptualizations could be an effective way for consumers to ‘outsource’ their control to the environment in situations where new habits could facilitate desirable behavior-change.

## **FIVE WAYS TO SITUATE CONSUMER HABIT-CHANGE INTERVENTIONS**

In the remainder of this article, we discuss five routes through which behavior-change interventions could target situational cues in the consumer environment through (1) removing or reducing exposure to situational cues that activate stored situated conceptualizations, or by adding situational cues that (2) prompt alternative behavioral responses, (3) activate long-term investment goals, (4) increase available information to consumers, or (5) signify the cost of engaging in the habitual behavior<sup>4</sup>. We discuss existing interventions that aim to change consumer behavior via these routes, and we suggest how the effectiveness of these interven-



tions could be improved by applying the principles of the situated cognition perspective.

Before proceeding, we note that each of the examples of existing interventions provided aims to modify consumer contexts by removing or adding situational cues. It is therefore assumed that these interventions could, in principle, target consumers' cue-driven *habitual* behavior. In the majority of cases, however, the specific influence or interactions of these existing interventions with habits has not yet been investigated and remains a key area for future research. Note also that some of the interventions discussed could be classed as examples of 'nudging'. Nudging is a popular umbrella term used in behavioral economics (and more recently in psychology) to describe any intervention that changes behavior in possibly subtle but predictable ways via changes to an individual's immediate environment (Thaler and Sunstein 2009). We highlight, however, that although 'nudging' might be a useful descriptive term, it tells us very little about the mechanisms underlying behavior-change interventions (e.g. Bucher et al. 2016). In the remainder of this article, we therefore not only detail the ways in which situated interventions modify the consumer environment, but also outline the mechanisms through which these interventions could influence consumer habits by modifying consumers' situated conceptualizations. By understanding the mechanisms associated with nudging and related phenomena in terms of situated conceptualizations and pattern completion inferences, it is our hope that readers can better study and implement these interventions to target automatic forms of consumer behavior beyond the examples discussed here or in any specific paper (e.g. Verplanken and Wood 2006; Wood and Neal In Press).

### ***1. Removing or reducing exposure to situational cues that activate stored situated conceptualizations***

Once a situated conceptualization is stored in memory, exposure to any element of the situated conceptualization on future occasions can lead to its retrieval. Furthermore, any

element of the situated conceptualization that is not directly activated by the current situation can be inferred via pattern completion inferences. Removing or reducing exposure to the populations of situational cues that activate stored situated conceptualizations should therefore provide an effective way to reduce consumers' engagement in habitual behaviors. The removal of situational cues that would otherwise elicit habitual behavior is beneficial as it could lead to longer-term behavior change – if consumers are consistently shielded from these cues, new situated conceptualizations for the situation can be encoded, reducing the overlap between the new situated conceptualization and the populations of associated situational cues that manifest as habits.

The idea that interventions should seek to remove situational cues in order to break existing habits and facilitate the formation of new habits has long been suggested in the habits literature. Verplanken and Wood (2006) suggested, for example, that interventions that remove cues from the immediate context in which habitual behaviors occur are likely to provide an effective habit-change strategy. In support of this suggestion, research in the associative learning literature shows that removing contextual cues is disruptive to previously learned associations in the environment (e.g. Thrailkill and Bouton 2014). Lifestyle changes that modify an individuals' context, such as moving to a new home or workplace, have also been associated with an increased likelihood of successfully breaking old habits (Heatherton and Nichols 1994; see also Boles et al. 2013; Plantinga and Bernell 2007; Thøgersen 2012; Walker, Thomas, and Verplanken 2015; Wood, Tam, and Witt 2005). As we discuss later in this section, however, the situated cognition perspective suggests that the long-term success of these interventions depends on the match between the new situation and the contents of consumers' stored situated conceptualizations. To date, there are some examples of existing interventions that aim to change consumer behavior by removing or reducing exposure to situational cues in the consumer environment.

**Removing or replacing salient cues on product packaging.** One way existing interventions aim to change consumer behavior is by removing or replacing salient cues on product packaging (Figure 1). In 2012, Australia became the first country in the world to prohibit brand logos and imagery from cigarette packaging, with cigarette packets designed in closely prescribed fonts, styles, and sizes. Since 2017, tobacco products sold in the UK similarly have standardized green packaging with graphic health warnings covering at least 65% of the front and back of the pack. Although the implementation of plain cigarette packaging has been debated, initial studies suggest that the implementation of plain packaging regulations in Australia has been effective in changing consumers' smoking behavior, resulting in a small-to-medium sized reduction in smoking prevalence (Zacher et al. 2014). The implementation of the plain packaging regulation further correlates with a decline in the prevalence of active smoking and with a reduction in the number of cigarette packets openly displayed by consumers in cafes, restaurants, and bars (Zacher et al. 2014). Laboratory research also shows that, relative to branded packaging, plain cigarette packaging reduces motivation to purchase cigarettes (Brose et al. 2014), self-reported engagement in smoking (Moodie et al. 2011; Moodie and Mackintosh 2013), the likelihood of accepting a packet of cigarettes (Hammond, Daniel, and White 2013), and engagement in tobacco-seeking behavior (Hogarth, Maynard, and Munafò 2015). Alongside reducing the activation of learned habits, research suggests that plain cigarette packaging could also change consumer behavior by increasing consumers' attention and positive attitudes towards health warnings displayed on packs (Maynard et al. 2015; Maynard, Munafò, and Leonards 2013; Munafò et al. 2011).

In sum, removing salient cues from tobacco packaging appears to have some success in reducing the purchase of tobacco products that, for some consumers, is likely to be elicited at least in part by habits. Although plain packaging has most prominently been used as an intervention to reduce tobacco consumption, the introduction of plain packaging could also

be an effective way to reduce consumers' purchase of other products where salient cues are present on product packaging, such on sugar-sweetened drinks (Bollard et al. 2016; Figure 1).

**Limiting exposure to product displays.** Another way that current interventions aim to change consumer behavior is by limiting consumers' exposure to in-store product displays. Point-of-sale displays have been shown to be an effective way to increase the marketing and sales of various products, suggesting that exposure to product displays automatically elicits consumers' learned purchasing habits (alongside impulses and product affordances; e.g. Nakamura et al. 2014; Paynter and Edwards 2009; Robertson, et al. 2016; Robertson et al. 2015). Restrictions on tobacco product displays at the point-of-sale are currently implemented in several countries, including Australia, Canada, New Zealand, and the UK. The exact implementation of the restrictions varies across countries, but generally require that stores keep tobacco products out of sight, for example, under counters, in cabinets, or behind opaque product shields. Although initial research reported limited effectiveness of tobacco product display restrictions (e.g. McNeill et al. 2011; The Centre for Tobacco Control Research 2008), more recent research shows the longer-term implementation of these restrictions has been associated with a reduction in the frequency of consumers' tobacco purchases in Australia and Canada by up to 30% (Carter, Phan, and Mills 2014; Li et al. 2013). Experimental research comparing open and enclosed tobacco product displays in a virtual shopping task also demonstrated that current smokers' and recent quitters' urges to smoke and current smokers' tobacco purchase attempts were lower following exposure to an enclosed display than following exposure to an open display (Kim et al. 2014). Thus, the use of product shields appears to be effective in reducing consumers' exposure to cues that would otherwise trigger cue-driven tobacco purchasing behaviors, such as habits, in some consumers. Restrictions on in-store displays of other products, such as sugar-sweetened drinks, alcohol, or fast food, could similarly form the basis of effective interventions to target

consumer habits. Future research is required to investigate this possibility.

**Increasing the effectiveness of these interventions.** As demonstrated by these examples, interventions that remove or reduce exposure to situational cues in the consumer environment are likely to have some success in reducing engagement in cue-driven forms of behaviors including, but not limited to, habits. Current interventions adopting this strategy, however, typically change only one aspect of the situation (e.g. product packaging or product displays) that policy-makers assume to most strongly predict engagement in the target behavior. According to the situated cognition framework, however, failure to take into account the associations between cues means that even after removing the most salient cue, pattern completion inferences could simply renew old habits, reducing or even eliminating the long-term effectiveness of the intervention. Even if consumers are shielded from brand packaging or in-store displays, for example, other unchanged cues associated with consumption (e.g. feelings of stress, other people present, store layout) could still activate stored situated conceptualizations (e.g., purchasing cigarettes in a corner store), giving rise to habitual behavior. Consistent with this idea, research suggests that even after the introduction of the cigarette product-display intervention in Australia, other unchanged situational features could still elicit consumers' habitual purchase of tobacco products (e.g. the price board displayed adjacent to the shielding, seeing other people smoking outside of the store, or even the shutter shielding the cigarettes; Burton et al. 2015; Burton, Spaniaard, and Hoek 2013). Similarly, the limited short-term effectiveness of the (partial) tobacco point of display ban in England has been attributed to the presence of residual cues in the consumer environment that could elicit tobacco-seeking behavior, including the presence of the word 'tobacco' on the product shield (Kuipers et al. 2016). Thus, we argue that the most successful habit-change interventions will remove a variety of cues in the target situation, in order to reduce the overlap between old and new situated conceptualizations.

Another implication that follows from the situated cognition perspective is the importance of considering individual differences in the contents of consumers' situated conceptualizations. A salient cue for one consumer may not be the most salient cue for another. In support of this idea, research by Shiffman and colleagues showed that there were differences in the extent to which situational cues predicted smoking in occasional smokers compared to daily smokers, such that occasional smoking was more strongly associated with environmental cues (e.g. being away from home, in a bar, being with friends; Shiffman et al. 2014). Thus, identifying how the content of consumers' situated conceptualizations differs according to key demographic factors is an important first step in the design of interventions that remove or reduce exposure to salient cues in the consumer environment.

Furthermore, developing ways for consumers to identify the contents of their situation conceptualizations that predict engagement in habitual behaviors may allow consumers to use this information to restructure their immediate environment. This is advantageous because whilst consumers have little control over product packaging and the layout of their local grocery store, they will most likely have some control over their home environment. Indeed, there exists some evidence that when smokers reconfigure their immediate environment to remove cues that may elicit smoking behavior, the likelihood of quitting is increased (Sun et al. 2007). One of the main difficulties, however, is that people find it very difficult to pinpoint the relevant cues that initiate habitual behaviors (Quinn et al. 2010). Thus, we suggest that using methodologies derived from the situated cognition perspective to identify the situational cues that best predict engagement in habitual behaviors could be an effective way to develop bespoke, person-specific habit-change interventions, as we discuss in more detail below (see 'Discussion and Future Research' below).

Finally, we argue that the extent to which cues trigger habitual behavior is likely to be highly context-dependent, meaning that interventions that remove, or reduce exposure to,

situational cues may not consistently be effective across contexts, even within the same individual. Consumers could have a smoking habit, for example, that is elicited by different cues across contexts. It is plausible that smoking in social settings is likely to be most strongly dominated by social cues (e.g. people present) whereas smoking alone is likely to be most strongly associated with internal cues (e.g. bodily and affective states). Future research should therefore investigate the extent to which the contents of situated conceptualizations, and thus the cues that elicit habitual behavior, transfer across situations.

## ***2. Adding situational cues that prompt additional or alternative behavioral responses***

Alongside removing situational cues from the consumer environment, another way that interventions could change consumer behavior is to add cues that prompt additional or alternative behavioral responses. By prompting consumers to engage in behaviors that they would not otherwise perform, interventions can encourage the formation of new situated conceptualizations, therefore reducing the likelihood of activating the situated conceptualization(s) that would otherwise elicit the (undesired) habitual behavior. Next, we discuss two examples of this approach.

**Manipulating product placement.** One way consumer habit-change interventions can prompt additional or alternative behavioral responses is by manipulating product placement. Product placement is a powerful cueing intervention often discussed in the context of ‘nudging’ behavior towards actions that would not otherwise be performed (see Marteau, et al. 2011). A recent meta-analysis of 18 studies that manipulated food product placement revealed that foods placed in more accessible locations were more likely to be selected compared with items placed in less accessible locations (Bucher et al. 2016; see also e.g. Maas, de Ridder, de Vet, and de Wit 2012; Rozin et al. 2011). By placing products that would ordinarily initiate habitual behaviors in less accessible locations and placing other products in more salient locations, it is possible to disrupt the activation of the situated conceptualization

usually activated in that situation and instead prompt the selection of healthier products that the consumer would not usually purchase (via, for example, affordances or impulse purchasing).

Product placement interventions can be implemented in a range of consumer behavior situations, such as shops, cafés, and online shopping environments. Placing healthy food products at eye-level in a cafeteria or next to the cash register, for example, has been shown to increase purchase of these food items relative to items placed in less accessible locations (Kroese, Marchiori, and De Ridder 2016; Thorndike et al. 2014). In addition to manipulating the physical accessibility of products, interventions can encourage consumers to make purchases that are inconsistent with their pre-existing habits by changing the placement of products in advertising material, for example, by placing specific food items in more prominent locations in restaurant menus (Dayan and Bar-Hillel 2011; see also Wisdom, Downs, and Loewenstein 2010). Thus, the placement of products in prominent locations in the consumer environment increases the relative salience of these cues by capturing attention at the moment where the situated conceptualization representing the habitual behavior would otherwise be retrieved, such as when making a purchase or placing a food order, prompting the activation of situated conceptualizations that would not otherwise be retrieved in that context.

**Changing the default options.** Another way consumer habit-change interventions can prompt alternative behaviors is by manipulating the option(s) presented to the consumer as the default choice (Thaler and Sunstein 2009). Research suggests that individuals often act in accordance with pre-set courses of actions (e.g. Johnson, Bellman, and Lohse 2002; Park, Jun, and Macinnis 2000). Requiring people to opt-out of, rather than opt-in to, donating their organs or taking a vaccine, for example, has been associated with increased organ donation (e.g. Johnson and Goldstein 2004) and vaccine uptake rates (e.g. Chapman et al. 2010).



Research suggests that changing the default options can similarly be effective to change consumer behavior. Data from quick-serve restaurants, for example, has shown that changing the default food options from fries and a fried dessert to either rice or beans and an applesauce dessert, reliably reduced purchase of the fries and fried dessert (McCluskey, Mittelhammer, and Asiseh 2012). A similar intervention that targeted children's meal options in another restaurant chain also showed that orders following implementation of the interventions were significantly more likely to include healthy side dishes (Anzman-Frasca et al. 2015).

Thus, it seems likely that changing the default options reduces the effort required to engage in alternative courses of action than would otherwise be initiated by the activation of the situated conceptualization usually retrieved in that situation. Importantly, however, we suggest that habit-change interventions that operate via changes to the default options should introduce the new default options without attracting too much attention to them. This way, the default options prompt alternative non-habitual behaviors, with the new option being viewed as 'normal' rather than 'exceptional', allowing for the gradual integration of the new behavior into consumers' situation conceptualizations for that situation, facilitating new habit formation. Future research is required, however, to investigate the effect of consumers' awareness on the effectiveness of default interventions.

**Increasing the effectiveness of these interventions.** Most interventions that aim to change consumer behavior via the addition of new cues focus on changing the immediate accessibility of pre-existing cues (e.g. food products in stores/restaurant or the position/default availability of items on menus). However, the addition of other cues into the consumer environment similarly can prompt alternative courses of action. One such cue relates to the behavior of other people present in the situation. According to a recent meta-analysis, for example, social modeling effects exert a strong influence over food consumption behavior

(Vartanian et al. 2015). Social modelling effects could arise through a variety of cues in the consumer environment, such as another person present (e.g. another diner or shopper), environmental cues (e.g. by leaving empty wrappers on display as a sign of what other people have eaten) or by textual information (e.g. by providing a list of amounts eaten by supposed previous participants in a study; for an overview of social eating effects, see Higgs and Thomas 2016). Research shows, for example, that perceived social norms predict habitual intake of food and vegetables, as well as snacking (Lally, Bartle, and Wardle 2011; Wouters, et al. 2010). Future research should therefore investigate the extent to which habitual behavior changes according to the social environment, and how the addition of social modelling cues influences the retrieval of consumers' situated conceptualizations.

Importantly, regardless of the cue, the situated cognition perspective suggests that the alternative behavior should be prompted at the critical moment in which the situated conceptualization leading to the undesired, habitual behavior would have otherwise become active; if the alternative behavior is prompted too early, the effects will diminish prior to the activation of situated conceptualization; if the alternative behavior is prompted too late, activation in the best-matching situated conceptualization will have already elicited the cue-driven behavior typically executed in that context.

### ***3. Adding situational cues that activate long-term goals***

Consumers often have long-term goals to, for example, save money or purchase healthy foods (see, e.g. Ji and Wood 2007). The influence of these long-term goals on behavior, however, tends to be less than the effect of habits most likely because long-term goals are rarely activated at the moment in which the habitual behavior is initiated (e.g. when consumers enter the store and situated conceptualizations that favor short-term goals are activated). As discussed earlier, a premise of the situated cognition perspective is that goals can be represented alongside other internal and external situational cues within a situated conceptu-

alization. Thus, the activation of alternative situated conceptualization containing long-term goals (via the placement of additional situational cues) that are incompatible with the habitual behavior could form the basis of effective consumer situated habit-change interventions (Papies 2016a 2016b). ‘Goal priming’ interventions use situational cues to activate a pre-potent goal, such that the presentation of the goal prime elicits an effect on information processing and behavior in the pursuit of the primed goal (Custers and Aarts 2007).

A growing body of research has shown that the addition of goal-related cues into the critical situation is effective in activating a range of goal-directed behaviors (e.g. Anschutz, et al. 2008; Brunner 2010; Brunner and Siegrist 2012; Papies et al. 2014; Papies and Hamstra 2010; Papies and Veling 2013; Wryobeck and Chen 2003). Research shows, for example, that when chronic dieters are exposed to dieting magazines and commercials, these activated their long-term dieting goals, reducing their expected and actual intake from large food portions (Versluis and Papies 2016). A recent meta-analysis of the priming literature across domains confirmed that exposure to goal-related words can trigger behavior consistent with the primed goal, especially when the primed goal is strongly valued by the individual (Weingarten et al. 2016). Although much of the research into goal priming focuses on health-related behaviors, research has shown that goal priming can also be used to change other, non-health related consumer behaviors, such as the selection of environmentally sustainable products (Tate, Stewart, and Daly 2014). Importantly, whilst initially paying attention to the prime appears to be required for this approach to be effective at activating the alternative situated conceptualization containing the long-term goal, once consumers have processed the goal-related cue it appears to exert an effect on behavior without conscious awareness (Papies et al. 2014). These findings suggest that adding situational cues to the environment that prime long-term goals relevant to the consumer can reduce the influence of existing habits by activating situated conceptualizations consistent with primed long-term goal that would not otherwise

be retrieved in that situation.

Goal primes can be integrated into a range of consumer situations. In a field experiment conducted by Papies and colleagues, goal priming was successfully implemented in a grocery store by handing a recipe flyer to consumers as they entered the store (Papies et al. 2014). The findings showed that overweight and obese customers who were handed a recipe flyer containing health-related primes purchased 75% fewer high-calorie snacks than similar customers who were handed a flyer that did not contain any primes (Papies et al. 2014). Similarly, placing a poster in the window of a butcher store describing a low calorie recipe with words, such as ‘slim figure’, ‘extra slim’, and ‘weight’, resulted in reduced consumption of free meat snacks compared with a control condition in which the poster was not displayed (Papies and Hamstra 2010). Placing a poster that primed slimness next to a vending machine has also been shown to reliably increase sales of healthy food items (Stöckli et al. 2016).

Importantly, the presentation of goal prime cues could be an effective way to break consumer habits because it may serve to redirect attention away from situational cues that would otherwise activate consumers’ situated conceptualizations underlying habitual behavior. In support of this idea, recent findings suggest that presentation of a goal prime changes behavior by modifying the way in which consumers perceive their immediate environment, such that consumers attend more to products that are consistent with their activated goal state than they otherwise would. A recent eye-tracking experiment using an online grocery store task showed that the presentation of health-goal primes to consumers via advertisements on the screen, increased the time consumers spent looking at low-energy food products compared with a condition in which the advertisements did not contain any health primes (van der Laan et al. 2016). Furthermore, the amount of time consumers spent looking at the low-energy food products mediated the efficacy of the health goal prime in changing food choices. Therefore, if goal priming is to be successfully implemented as a consumer

habit-change intervention, it is essential that the prime is situated, such that it captures attention and activates the desired goal state in the situation and in moment in which the situated conceptualization representing the habitual behavior would typically be retrieved from memory.

Combined, these findings suggest that the addition of situational cues into the consumer environment can change automatic forms of behavior via the activation of motivationally relevant long-term goals (e.g. to lose weight) that compete with the automatically activated situated conceptualization. Whilst the use of goal primes may be a particularly effective intervention in the short-term, when a person consistently performs a goal-directed behavior within a specific context, this will likely become part of the situated conceptualization, associated with the multitude of cues present in that situation, thus inducing longer-term habit change. This could mean that the goal will become activated habitually on subsequent visits to the situation, even when goal primes are no longer present.

**Increasing the effectiveness of these interventions.** According to the situated cognition perspective, the effectiveness of consumer goal priming interventions depends on three key factors (for an extended discussion, see Papies 2016a): (1) identifying a target group of consumers who have a long-term goal that conflicts with their habitual behavior; (2) activating the long-term goal at the critical moment – if the long-term goal is activated too early, attention will not be sufficiently redirected away from the contextual cues that would otherwise elicit the situated conceptualization that would elicit habitual behavior; (3) consumers having already performed the behavior to achieve the long-term goal (e.g. dieting), and thus already have a stored a situated conceptualization representing the long-term goal and the associated goal-congruent behavior, in order for the goal prime to activate the situated conceptualization consistent with the long-term goal; (4) selecting situational cues that are strongly associated with the rewarding outcome of behaving in accordance with

the goal – to activate a long-term dieting goal, for example, the situational cues should represent the goal state of being thin, rather than the negative outcome of being overweight.

Future research should examine whether habit formation can arise from repeated exposure to goal prime cues and the mechanisms through which activated goals can be translated into habits (see also Papies 2016b). Furthermore, given the debate surrounding the extent to which habits are mediated by goals in the habits literature, a consideration of the extent to which the cued activation of long-term goals and the cued activation of habitual behavior within consumers' situated conceptualizations arise through similar routes is an important area for future research.

#### ***4. Adding informational cues to the situation***

Situational cues can communicate a normative message regarding the most 'appropriate' way to behave in a given situation, such as appropriate foods to select in a certain store or an appropriate amount of food to consume at a buffet. When consumers repeatedly behave in accordance with these cues, associations can form between populations of cues within consumers' situated conceptualizations, giving rise to habitual behavior. An established finding in food research is, for example, that consumers tend to be poor at judging how much is an appropriate amount of food to consume and therefore base their portion-appropriateness judgment on the portion or pack size presented to them (for a meta-analysis, see Hollands et al. 2015). The portion or pack size may be particularly strongly represented within some consumers' situated conceptualizations and this may activate a particularly strong consumption habit for these so-called 'plate-cleaners', who consistently consume the whole plate of food presented to them regardless of the portion size (e.g. Rolls, Morris, and Roe 2002). Research suggests, however, that whilst the portion or pack size may communicate an initial consumption starting point, the provision of additional informational cues could activate alternative situated conceptualizations that prompt consumers to adjust, or better regulate,

their habitual behavior via the activation of self-control (i.e. ‘stopping’) goals (e.g. Marchiori, Papies, and Klein 2014; Versluis, Papies, and Marchiori 2015).

Interventions could therefore change consumer habits by adding informational cues to the consumer environment associated with alternative courses of action to the default, habitual, response such as consuming a large amount of food when presented with a large portion. This way, there is a gradual shift in behavior as the new and old situated conceptualizations become integrated in memory, decreasing the strength of the old habit. Although the specific mechanisms through which informational cues influence behavior have not yet been investigated interventions that add information cues could change consumer behavior by (a) encouraging consumers to engage in, possibly unconscious or automatic, regulatory processes; (b) activating a long-term goal (see ‘Adding situational cues that activate long-term goals’ above); or (c) signifying the perceived cost related to the habitual behavior (see ‘Adding situational cues that increase the salience of negative outcomes associated with engaging in the habitual behavior’ below). In this section, we discuss two examples of how interventions can change behavior by adding informational cues into the consumer environment.

**Communicating normative information.** Firstly, interventions could add informational cues that communicate additional normative information to the consumer. Research suggests, for example, that the addition of pictorial serving size cues (Versluis et al. 2015; Figure 2) or written serving size labels (Spanos, Kenda, and Vartanian 2015) on food packaging is effective in reducing consumers’ food consumption, especially when placed on a large pack. The provision of plates and bowls containing consumption information has similarly been shown to be associated with greater weight loss in obese patients compared with plates with no portion size information (Kesman et al. 2011; Pedersen, Kang, and Kline 2007). In addition to being effective in modifying food consumption habits, the addition of informational cues can also influence alcohol consumption. In a recent study, for example, habitual

social alcohol drinkers were presented with beer in either a glass with volume markers that denoted 1/4, 1/2, and 3/4 points, or a plain glass. The results showed that the rate of consumption was slowed and the total interval duration between sips increased when the beer was served in the glass with volume markers than when the beer was presented in an unmarked glass (Troy et al. 2017; Figure 2). Combined, these findings suggest that when additional informational cues are provided to consumers at, or close to, the moment of consumption, consumers have more information on which to ‘adjust’ their consumption behavior. This could lead consumers to engage regulatory processes that limit the effect of cues that would otherwise activate the stored situated conceptualizations leading to habitual behavior. In other words, the provision of consumption-related cues could prime the activation of automatic forms of control that would not otherwise become activated in the situation, by making links in consumers’ situated conceptualizations between specific cues and self-control goals.

Several current interventions attempt to change consumer behavior by placing informational labels on food and drink products. Nutritional labeling, for example, is mandatory within the EU, and new legislation in the US requires that restaurant menus include calorie information alongside a statement to consumers that additional nutritional information is available on request. The US Food and Drug Administration (FDA) also recently announced that by July 2018, all food packaging in the US must depict labels containing nutritional information presented both ‘per serving’ and ‘per package’ (for an overview, see Malik, Willett, and Hu 2016; FDA, 2016a). The aim of these labels is to allow consumers to make more ‘informed choices’ about the products that they purchase. Recent reviews suggest, however, that whilst these informational labels on food and drink products tend to be effective in helping consumers to identify healthy products, they do not seem to have a discernable effect on actual purchases (Hawley et al. 2012; Shemilt, Hendry, and Marteau 2017; VanEpps et al. 2016).



It is possible that the effectiveness of informational cues in changing consumer habits is influenced by the extent to which they effectively communicate an alternative course of action (see Versluis et al. 2015). Serving size information, for example, might be more effective when it can easily be mapped onto the food portion or package. In support of this idea, research suggests consumers find it difficult to understand nutritional or serving size information that is reported in grams (Faulkner et al. 2012), and instead typically represent their consumption in more easily countable units (Geier, Rozin, and Doros 2006; Marchiori, Waroquier, and Klein 2011). Beyond food research, studies suggest that the placement of energy-efficiency labels on household products might be more effective in changing consumer behavior if they show the monetary difference between different energy rating levels rather than only providing an abstract rating level. In other words, labels that make it easier to evaluate information in terms of size or monetary cost are more effective in reducing the ‘information asymmetry’ between the labels and the cost involved with the selection of the product (see, e.g. Gaspar and Antunes 2011), increasing the likelihood of activating alternative situated conceptualizations.

**Communicating risks.** Secondly, interventions could add informational cues that communicate a public health message about the risks involved in engaging in the habitual behavior. Research suggests that the use of large, pictorial labels that communicate a health-warning message on tobacco packaging appears to be associated with reduced tobacco purchases (e.g. Hammond 2011; Figure 3). Recent work has similarly shown that, relative to a no warning label condition, the inclusion of a health-warning label on sugary drink packaging in a mock vending machine task resulted in reduced consumers’ selection of the sugary drinks and reduced selection of coupons for future sugary drink purchases (VanEpps and Roberto 2016; see also Roberto, Wong, Musicus, and Hammond 2016). Outside of the laboratory, existing interventions that add health-related warning labels directly to food packaging also seem

effective in changing behavior. The mandatory inclusion of a salt warning ('high salt content') on food products in Finland, for example was linked with population-level reductions in salt intake (He and MacGregor 2009; Trieu et al. 2015; see Figure 3). Similarly, the addition of artificial sweetener warning labels on sugary drinks in the US was also associated with decreased sales of these products (Schucker et al. 1983; note that these labels were removed in 2000).

The introduction of warning labels on food and drink products is expected to increase in the coming years; in 2015, for example, city supervisors in San Francisco passed an ordinance requiring billboards advertising sugar-sweetened drinks to include a health warning message. The addition of health warning labels on product packaging or advertisements might be effective in activating health-related goals via the activation of situated conceptualizations containing long-term goals (see above) or increasing the salience of negative outcomes associated with behavioral performance in consumers' existing situation conceptualizations (see below). Future research is required to investigate these possibilities and to determine whether public health labels prompt consumers to better regulate their existing habits, form new habits, or both.

**Increasing the effectiveness of these interventions.** When developing habit-change interventions based on the implementation of informational cues, it follows from the situated cognition perspective that it is important to consider three key factors that may moderate their effectiveness. Firstly, consumers must notice the informational cue in order for it to influence consumer habits (see, e.g. Versluis et al. 2015). This suggests that to change habitual behavior, it is essential that the informational cue is salient enough to compete with the other visual features of the packaging or consumer environment, otherwise the cue will not be stored within consumers' situated conceptualization, and behavior will not be changed in the long-term. Consistent with this suggestion, the U.S. FDA (2016b) suggests that informational

labels relating to food products should be placed adjacent to the name or price of menu options or in close proximity if the food products are not listed on a menu or menu board. Another way to increase attention to informational labels could be to include emotive content. Research by Harris and colleagues suggests that emotionally stimulating warning messages (e.g. familial impact and financial factors) have the advantage of capturing the attention of gamblers over traditional messages about responsibility (Harris, Parke, and Griffiths 2016).

Secondly, it is likely that consumers' own and perceptions of others' evaluations of, for example, appropriate consumption amounts are likely to moderate the effectiveness of informational cues (Versluis et al. 2015; see also Fay et al. 2011). Research shows, for example, that exposure to a message emphasizing the healthy eating habits of other students increased consumption of fruit and vegetables, relative to exposure to a message communicating the health benefits of fruit and vegetable consumption (Robinson, Fleming, and Higgs 2014). Importantly, the effects of the social norm message on consumption were only observed in consumers who did not have strong fruit and vegetable consumption habits, suggesting that normative messages could facilitate the formation of new situated conceptualizations in consumers who do not already have strong healthy eating habits. Combined, this suggests that interventions that operate via the addition of informational cues might be best accompanied with interventions that educate consumers about, for example, the nutritional properties of the products they and others eat, in order to increase their motivation to take health-relevant information into account.

Thirdly, informational cues should be presented in such a way that consumers can readily process the implications of the information provided, in order for the cues to become associated with alternative courses of action or communicate the direct negative implications of engaging in the habitual behavior. Research shows that the optimal warning messages aimed at problem gamblers were those that contained information about the amount of money

spent compared to self-appraisal messages (Gainsbury et al. 2015). Furthermore, the addition of warning labels or consumption markers on plates or glasses, for example, might be more successful in reducing consumers' food consumption than the addition of serving size recommendations that require effort to map on to the plates or glasses used. By integrating the warning label into the cue that would otherwise elicit habitual consumption (e.g. the plate or glass), the alternative behavior is prompted at the crucial moment in which the previously learned situated conceptualization is activated, gradually changing the weights between the elements represented within the situated conceptualization for that context.

Combined, we suggest that interventions can target consumer habits by placing additional cues in the environment that provide consumers with additional information. Little research has been conducted into the specific mechanisms through which informational cues influence habitual consumer behavior. It could be, for example, that informational labels that provide consumption cues reduce the influence of existing habits by prompting consumers to monitor their habitual behavior in an automatic manner without conscious awareness. Alternatively, informational cues that provide consumers with a health-warning message could reduce the influence of habits by, for example, activating situated conceptualizations representing a long-term health-related goal or increasing the perceived cost associated with engaging in the habitual behavior. Thus, whilst the addition of informational labels appears to be effective in changing consumer behavior, future research is required into the mechanisms through which these behavior change effects arise and the extent to which this new information is integrated into consumers' existing situated conceptualizations. A systematic understanding of these mechanisms would allow us to further develop and fully harness the potential of these habit-changing interventions.

***5. Adding situational cues that increase the salience of negative outcomes associated with engaging in the habitual behavior***

A popular behavior-change intervention in the field of behavioral economics is to increase the cost of engaging in the behavior (e.g. Thaler and Sunstein 2009). Although such interventions are likely to be effective in changing behavior, it follows from the situated cognition perspective that these interventions are likely to be most effective when they are accompanied with situational cues that clearly remind consumers of the cost incurred when engaging in the habitual behavior. Situational cues can increase the salience of a variety of costs associated with performing a given habitual behavior, such as a health-related (e.g. via health-warning labels; see ‘Adding informational cues to the situation’ above) or financial costs, or they can increase the salience of restrictions on where the habitual behavior can occur (irrespective of whether the situated conceptualization is activated). Across all types of cost, we argue that additional situational cues that highlight negative outcomes associated with performing a habitual behavior serve to change behavior by activating less positive thoughts about engaging in the behavior, thus changing the content of consumers’ situated conceptualizations.

Limited research to date has directly examined the effect of adding situational cues that highlight the cost of engaging in habitual behaviors. In this section, we therefore discuss examples of interventions that aim to increase costs of a given behavior and highlight throughout how the effectiveness of these interventions could be increased via the addition of situational cues to the relevant consumer context that (a) highlight price increases due to taxation or minimum product price regulations or (b) highlight restrictions on the situations in which consumers can engage in the habitual behavior.

**Increasing the salience of costs.** One way interventions can disrupt consumer habits is by adding situational cues that increase the salience of financial costs of a specific product. By adding such cues, the situational cue that would otherwise activate the situated conceptualization representing the habitual response, also becomes tied to a negative affective state within

the situated conceptualization. Consistent with this idea, research suggests that the most effective interventions that introduce a financial cost are those that also add a situational cue that highlights the increased financial cost at the moment of product selection, such as on the product price label, rather than at the point-of-purchase (Chetty, Looney, and Kroft 2009).

Similarly, when consumers are aware of the tax increase, raising cigarette prices is an effective way to reduce rates of smoking in youths, young adults, and consumers with low socioeconomic status (e.g. Bader, Boisclair, and Ferrence 2011; Chaloupka, Straif, and Leon 2011; Nikaj and Chaloupka 2014; Van Hasselt et al. 2015; see also Jha and Peto 2015).

Similar effects of price increases via tax or minimal pricing policies have also been reported for alcohol purchases (Booth et al. 2008; Wagenaar, Tobler, and Komro 2010). Research on data from British Columbia, where minimum alcohol pricing policies are currently in place, also shows that a minimum unit price for alcohol is associated with a reduction in the prevalence of alcohol-related deaths and hospital admissions (Stockwell et al. 2013; Zhao et al. 2013). In particular, alcohol-pricing increases may be particularly effective amongst heavy drinkers, who most likely have strong alcohol consumption habits (Holmes et al. 2014), especially when the alcohol-pricing increase is made salient at the point of product selection.

In addition to tobacco and alcohol, habit-change interventions via product price increases are being increasingly implemented to reduce purchasing of sugary drinks. Systematic reviews indicate that adding a tax to sugar-sweetened beverages is an effective way to reduce their consumption, as well as long-term obesity (e.g. Cabrera Escobar et al. 2013; Eyles et al. 2012; Ng et al. 2012; Powell et al. 2013; Thow, Downs, and Jan 2014). It has been shown, for example, that there is a negative correlation between sugar-sweetened beverage price increases and consumption, with the reduction in purchase highest amongst the lowest socioeconomic groups (Nakhimovsky et al. 2016). Following the implementation of the 2014 10% sugary drink tax in Mexico there was an average 6% decline in purchases of

these (Colchero et al. 2016). It seems likely that the sugar-sweetened drink tax will be more widely implemented in the coming years. Again, we suggest that consumers should be made aware of any price increases at the moment of product selection.

For some behaviors, the use of situational cues to highlight an increased financial cost works in conjunction with interventions that change the default option (see ‘Adding situational cues that prompt alternative behavioral responses’ above). Take, for example, the five pence plastic carrier bag charge currently implemented across stores in the UK. Next to increasing the salience of the plastic carrier bag charge via situational cues at the cashiers desk or during checkout of online grocery store purchases (Figure 4), the carrier bag charge also changes the default options by requiring that consumers opt-in, rather than opt-out, of using carrier bags. Research shows that the carrier bag charge has been highly effective in reducing the use of plastic carrier bags in both Wales and Ireland (Convery, McDonnell, and Ferreira 2007; Thomas, Poortinga, and Sautkina 2016), with consumers opting to bring their own carrier bags rather than purchase those available in store. This suggests that the inclusion of situational cues to highlight a cost of engaging in the habitual behavior can be effectively combined with interventions that change the default options available to consumers, and thus prompt the activation of alternative situated conceptualizations.

**Increasing the salience of restrictions.** Another way interventions can disrupt consumer habits by adding cues that increase the salience of restrictions on the locations in which consumers can engage in the habitual behavior. In this sense, imposing a ban that prohibits engagement in habitual behaviors in situations where the behavior would typically occur increases the so-called ‘behavioral friction’ of engaging in the habitual behavior, effectively breaking the automatic link between the context and the behavior, and the cues that reinforce it in the situations where the behavior would have otherwise occurred (for an extended discussion of this idea, see Orbell and Verplanken 2010).

The most prominent example of an intervention that operates through imposing policy-level restrictions on the situations in which habitual behaviors occur is the ban on smoking in public places (for a discussion of the smoking in relation to the habits literature, Wood and Neal, In Press). Research has shown that smoking bans are associated with decreased rates of smoking and smoking-related illnesses (e.g. Apsley and Semple 2012; Fichtenberg and Glantz 2002; Lemmens et al. 2008; Longo et al. 2001; Sargent, Shepard, and Glantz 2004). Several factors are likely to influence the efficacy of smoke-free regulation. Firstly, it seems likely the smoking ban should be enforced in many public settings by placing various signs and symbols reminding consumers that they cannot smoke indoors (see Figure 5). In the UK, for example, at the entrance to smoke-free establishments, property owners are required to display the appropriate no smoking signage and feature the internationally recognized ‘no smoking’ symbol of a lit/burning cigarette with a red bar through it alongside featuring the phrase “No smoking. It is against the law to smoke in these premises”. The addition of situational cues to the environment is likely to operate by reinforcing the ban, such that the thought of the habitual behavior itself becomes less desirable by changing the affective state associated with engaging in the habitual behavior in consumers’ stored situated conceptualizations. Secondly, it is likely important to remove situational cues from the environment that would typically activate situated conceptualizations that initiate engagement in the habitual behavior. It has been shown, for example, that the removal of cues associated with smoking, such as ashtrays, reduces levels of second-hand smoking in the immediate surrounding area, indicative of a reduction in smoking rates (Vardavas et al. 2013; see ‘Removing or reducing exposure to situational cues that activate stored situated conceptualizations’ above for a discussion of how habit-change interventions can remove cues from the environment). Thirdly, the consistency with which the ban is implemented also seems to be a key determinant of its success. It has been shown, for example, that in the Netherlands, where



smoke-free regulations are implemented in large but not small establishments, the effects on reducing smoking are much lower than those reported in countries, such as the UK, where the regulations are universally applied to all public places (Gonzalez and Glantz 2013).

Although the smoking ban is the most prominent example of current interventions that operate via restrictions on the locations in which habitual behaviors can occur, other smaller-scale interventions similarly operate by imposing restrictions on the situations in which the habitual behavior can occur. Many school districts in the US, for example, have banned the sale of sugar-sweetened beverages on city property (for a discussion, see Malik, Willett, and Hu 2016). Furthermore, several local authorities in the UK have imposed restrictions on the areas in which individuals can consume alcoholic beverages in public places. In Scotland, for example, the 2005 Licensing Act prevents the sale of alcoholic products in stores before 10am and after 10pm. As with the smoking ban, these restrictions are likely to be best enforced by clearly displayed signage denoting the product sale restrictions or areas in which alcohol consumption is prohibited (Figure 5).

In principle, the idea of developing an effective habit-change intervention that serves to make the outcome of engaging in the habitual behavior less rewarding is contrary to the findings suggesting that once a habit is fully automatized it persists even if engaging in the behavior is unpleasant (i.e. the strong-habit popcorn consumer continue to eat the popcorn even if it is stale; Neal et al. 2012). Importantly, however, we suggest that habit-change interventions that pair habitual behavior with negative outcomes will only be successful in changing habits if situational cues are placed in the immediate environment signaling to consumers the negative aspects of engaging in the habitual behavior (i.e. if consumers are not made aware of the popcorn being stale, they will continue to behave in a habitual manner). If the cost of engaging in the habitual behavior is not signified by an additional cue, the activation of an alternative situated conceptualization will not be prompted, and consum-

ers will continue to behave habitually. Thus, we suggest that interventions based on this route will be most effective if the negative outcomes of engaging in the habitual behavior are clearly reinforced by situational cues (e.g. price labels at the check-out, signage in pubs and bars) at the moment at which the situated conceptualization driving the habitual behavior would otherwise be activated.

## **DISCUSSION AND FUTURE RESEARCH**

Research shows that consumers routinely form cue-response ('habit') associations between recurring situational cues and behavioral responses. In this article, we introduced a situated cognition account of how habits are represented and retrieved from memory via the formation of complex representations, situated conceptualizations, in memory. Situated conceptualizations can represent the actions, cognitions, and internal states experienced in a given context, alongside various other sources of contextual information. Consumers encounter a multitude of situational cues in daily life, any one of which can activate (possibly without awareness) a stored situated conceptualization, leading to a variety of cue-driven forms of behavior (including habits). The ease with which situated conceptualizations can be retrieved from memory explains why strong habits so readily dominate consumer behavior, even when consumers have conscious intentions to behave otherwise. Alongside adding to theoretical accounts of habits, the situated conceptualization idea also has practical applications for the design of effective interventions that target habitual consumer behavior. Given the multitude of situational cues stored within consumers' situated conceptualizations, it is perhaps unsurprising that behavior-change interventions often fail to exert a lasting, long-term effect on behavior. In order to better understand and implement consumer behavior-change interventions, we next suggest some key areas for future research that follow from the situated cognition account.

The influence of situational cues on behavior has long been recognized in the fields of consumer research and marketing. Early work by Belk (1975), for example, identified various situational cues thought to influence purchasing behavior, such as physical, social and temporal elements, goals, and states of the individual. Similarly, Bitner (1992) coined the term ‘servicescape’ to refer to the situational features of stores thought to influence the behavior of customers and staff (e.g. temperature, air quality, odour, music, layout, furnishings, social interactions). Little is currently known, however, about how these cues interact in memory and how the effect of these cues on behaviors differs between individuals and across experiences. This is a key outstanding issue in the field of consumer research. According to the situated cognition perspective, an important step in developing effective behavior-change interventions should be to identify the contents of consumers’ situated conceptualizations for the product or behavior of interest.

Consumer researchers could examine the content of consumers’ situated conceptualizations in various ways. One established methodology that could be readily applied to the consumer research domain is the feature-listing task. Feature listing has been widely used in the conceptual processing literature to examine how individuals represent various concepts (e.g. Santos et al. 2011). In this task, participants are typically presented with a series of words or images and are asked to list “features that are typically true of these concepts”. Research using the feature-listing task has shown that consumers readily represent food products in terms of the situation in which the food is consumed (e.g. ‘on the sofa’, ‘eat sociably together’) in addition to the immediate sensory experience of consumption (e.g. ‘sweet’, ‘salty), especially if the food is considered to be tempting (e.g. chips, cookies; Papies 2013). Another recent study using the feature-listing task showed that alcoholic drinks are more strongly represented in terms of social features (e.g. ‘with friends’) than non-alcoholic drinks (Keesman et al. Under Review).

As an alternative to the feature-listing task, consumer researchers could use open-ended questions to investigate the cues most strongly associated with the product or situation of interest. These open-ended questions could, for example, instruct consumers to ‘write down all the words, images, associations, feelings, emotions, and sensations that come to mind’ when they think of the target product (as in Piqueras-Fiszman, Ares, and Varela 2011; see also Spinelli et al. 2017; for a general overview, see Piqueras-Fiszman 2014). Alternatively, recent work suggests that examining the content of social media posts could allow consumer researchers to identify the situational cues most often depicted or mentioned in relation to the target product or behavior (e.g. see Vidal et al. 2015). Combined, the use of the feature-listing task or open-ended questions could provide a relatively easy, cost-effective way for consumer researchers to gain an insight into the content of consumers’ situated conceptualizations in focus groups or self-report questionnaires. A ‘big data’ content analysis of social media posts could allow consumer researchers to identify more general trends in how consumers’ represent a variety of products or consumer behavior situations, and how these change over time. This could potentially provide important insights into the multitude of cues that trigger habitual consumer behavior that should be targeted in habit-change interventions.

Another area of future research that arises from the situated cognition perspective is to consider the specific automatic processes that are influenced in order to bring about behavior change, and whether the situated interventions highlighted in this article serve to disrupt old habits, form new habits, or some combination of both. The interventions discussed in this article have largely been found to be effective in changing behavior via the addition or removal of situational cues. We therefore assume that they have some effect on the activation of consumers’ situated conceptualizations and thus, their consumer habits. In most cases, however, research has not yet assessed (a) to what degree the target behavior was habitual,

(b) whether the intervention disrupted the association between situational cues and habitual behaviors among those consumers who had existing habits, and (c) whether this caused the observed changes in behavior. A related area for future research is to investigate exactly how new situated conceptualizations in a given context interact with existing situated conceptualizations, and to what degree conscious awareness is involved in regulating behavior in such situations. These remain important open research questions, since understanding how interventions influence automatic processes, such as habits, is essential for their effectiveness.

According to the situated cognition perspective no two consumers will have the same situated conceptualization for a given situation. Specifically, there are three key sources of variance across individuals: (1) as each consumer has different experiences and attends to different cues within a given situation, they encode different situated conceptualizations; (2) as situated conceptualizations are aggregated across experiences, no one consumer will have the same pattern of cues and associations represented in memory; (3) different cues are likely to activate different situated conceptualizations across consumers, different pattern completion inferences follow, producing different habitual behaviors. It is therefore vital that consumer researchers seek to understand the content of consumers' situated conceptualizations for a variety of consumption environments, and the elements of these situated conceptualizations that best predict behavior. Other individual difference variables, for example the levels of trait or state self-control amongst consumers, could also be key moderators of the effectiveness of certain interventions especially, for example, interventions that cue regulatory forms of behavior via the provision of informational cues (Rising and Bol 2016). Similarly, goal-priming interventions seem to be most effective for consumers for whom the primed concept is motivationally relevant (for a discussion, see e.g. Papies 2016a). Therefore, research into the effectiveness of habit-change interventions should begin by indexing potentially relevant individual differences in order to identify target groups of consumers who

most benefit from specific interventions.

Finally, future research should investigate whether the effectiveness of the situated interventions outlined here varies across types of consumer behavior. Habits influence a wide range of consumer behaviors, from food consumption to taking public transport, but the relative effectiveness of the discussed interventions in influencing each of these behaviors is not yet clear. It is possible, for example, that interventions that add informational cues might be best suited to changing food consumption habits, whereas the interventions that remove cues from the environment might be better applied to change consumer-purchasing habits for products with salient brand cues. In order to understand these differences, and to develop effective habit-change interventions, the contents of consumers' situated conceptualizations should be studied across various habitual consumer behaviors to determine the internal or external salient cues that typically elicit habits in these domains.

### ***Conclusions***

In this article we argued that habitual consumer behavior can be understood through the influence of situational cues in the environment that are stored within complex multimodal representations in memory. In order to develop effective behavior change interventions, we argue that consumer researchers should focus on identifying influential cues in the consumer environment that elicit automatic forms of behavior and designing interventions that (1) remove or modify these cues, or add new situational cues that (2) trigger alternative behaviors, (3) activate long-term motivationally-relevant goals, (4) provide additional information on which consumers' can 'adjust' their behavior, or (5) highlight the cost of engaging in the habitual behavior. Importantly, without understanding the contents of consumers' situated conceptualizations, and how these vary across individuals and contexts, the long-term effectiveness of these interventions will be limited. In focusing on developing interventions that aim to modify the content and activation of consumers' stored situated conceptualiza-

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tions, researchers in the domain of consumer behavior can move away from intention-based interventions and towards the development of effective, long-lasting interventions that target habitual consumer behavior via unintentional, unconscious routes to behavior change.

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### Footnotes

<sup>1</sup> In support of this idea, neuroimaging evidence suggests that goal-directed and habitual (stimulus-response) behaviors are associated with different patterns of neural activation (Knowlton and Patterson 2016; Tricomi et al. 2009; Yin and Knowlton 2006). However, it is important to highlight that the role of goals in the activation of habits has been previously subject to debate (for opposing perspectives, see Aarts and Dijksterhuis 2000; Neal et al. 2011).

<sup>2</sup> Research in the domain of situated cognition suggests that the re-activation of stored situated conceptualizations could lead to ‘simulations’ of previous experiences or events within the context (e.g. Barsalou 2003 2008 2009 2016a). Although simulations are not required to explain how habits influence behavior, the idea that situated conceptualizations can trigger simulations is useful in accounting for how encountering situational cues, such as food cues, can elicit a strong motivational desire to engage in the associated behavior, such as food consumption (see, Papies 2013). For a consideration of how simulations that originate from stored situated conceptualizations could influence consumer behavior, see Papies et al. (2017).

<sup>3</sup> Situated interventions can be broadly divided into two categories, namely ‘cueing interventions’ and ‘training interventions’ (e.g. Papies, 2016a 2016b, 2017). The habit-change interventions discussed here are examples of ‘cueing interventions’ as they aim to change existing habits by modifying the critical situational cues in the consumer environment. ‘Training interventions’, on the other hand, aim to change behavior by modifying the contents of existing situated conceptualizations often via the use of high-repetition training tasks (Papies, 2016b 2017). As we discuss below, however, there is likely to be substantial overlap between these routes when repeated behavior is concerned, as consistently implemented cueing interventions can also serve a training function, by modifying existing situated conceptualizations via retrieval and application.

<sup>4</sup> Note, that these routes should not be considered mutually exclusive and, in practice, any single intervention could plausibly utilize several of these routes in order to elicit habit change.

### Figure captions

**Figure 1:** Example of a plain packaged (a) cigarette packet and (b) sugar-sweetened beverage bottle with brand cues removed.

**Figure 2:** Example of (a) a pictorial serving size label based on Versluis et al. (2015) and (b) an alcoholic beverage glass with consumption markers based on Troy et al. (2016).

**Figure 3:** Example of (a) a health-warning label featured on the front of Australian cigarette packets and (b) a possible food product health-warning label based on the salt intake intervention currently implemented in Finland.

**Figure 4:** Example carrier bag charge reminder currently presented to UK consumers at the checkout of an online grocery store. Note that alongside highlighting the charge, the default option selected is ‘Don’t use carrier bags’ requiring consumers to opt-out of the default in order to receive their groceries delivered in carrier bags.

**Figure 5:** Example cues displayed to consumers in the UK that enforce (a) the smoking ban and (b) alcohol consumption restricted areas.

**Figure 1**

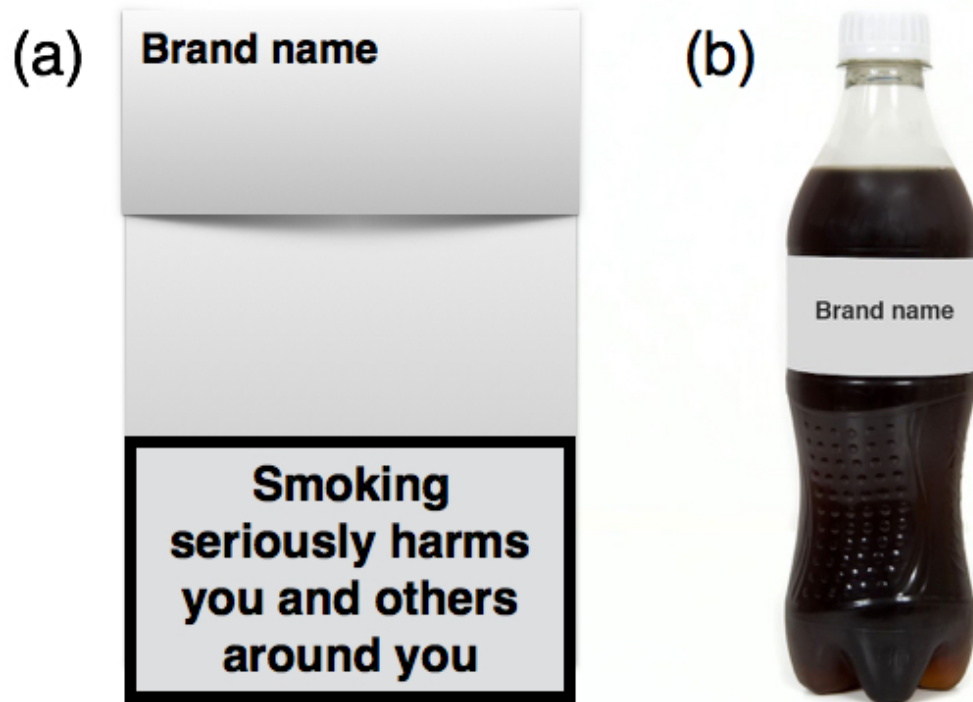


Figure 2




Figure 3




Figure 4


**Carrier bags**



If you would like carrier bags we will charge 40p (based on an average of 8 bags per order).

- All proceeds are donated to charities in line with Government Legislation
- If you do not wish for your shopping to be bagged, please select the 'Don't use bags' option and you will not be charged
- The choice you select now will default for future orders, however you can amend this at any time
- If you use our Click & Collect lockers or automated collection points, we will automatically select the carrier bag option for you.

☐ Use carrier bags (+ £0.40)

☒ Don't use carrier bags

[Why is there a charge?](#)



Figure 5

