



Nudging healthier food and beverage choices through salience and priming. Evidence from a systematic review



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ABSTRACT

High rates of overweight, obesity and chronic disease are partly attributable to an increased prevalence of poor dietary choices, which are in part due to the modern environment being conducive to the development of habitual unhealthy food and beverage choices. Nudging aims to influence habitual behaviors by altering the presentation of options to consumers. This systematic literature review investigated nudging interventions, as attributed by the original authors, and their effectiveness for influencing healthier choices. Eight bibliographic databases from the disciplines of psychology, business and health were searched. Included studies were available in the English language and as full-text peer reviewed publication. Studies used nudging or choice architecture interventions that influenced adult food and beverage choices. The number of papers reporting nudging interventions (as attributed by the authors) was low, with only thirteen articles included in the review (comprising 26 primary studies). All studies fall into 'salience' and 'priming' – type nudging interventions, which were tested across different adult populations and settings – including laboratories, canteens, cafeterias and restaurants. According to the NHMRC levels of evidence (NHMRC, 2007) only two interventions were of a high level of evidence, and the majority of articles received average or poor quality ratings, as per the Scottish Intercollegiate Guidelines. Combined 'salience' and 'priming' nudges showed consistent positive influence on healthier food and beverage choices. This review had limited ability to determine effectiveness of nudging due to various populations and settings tested and the use and reporting of incomparable outcome measures. This is the first review to synthesize nudging interventions, finding minimal uptake of nudging in the academic literature, and mixed effectiveness of nudging for influencing healthier food and beverage choices. This review is registered with PROSPERO – CRD42013005056.

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1. Introduction and background

The prevalence of overweight and obesity have more than doubled in the last 35 years. In 2014, globally 52% of adults were overweight or obese, making overweight and obesity a major public health concern (World Health Organization, 2015b). Excessive weight is a major risk factor for a range of preventable chronic diseases, including cardiovascular disease, cancer, osteoarthritis and diabetes (World Health Organization, 2015a).

The increased prevalence of overweight, obesity and chronic disease is partly attributable to an increase in unhealthy dietary behaviors (Drewnowski, Monsivias, Mailliot, & Darmon, 2007; Hung et al., 2004; Kant, 2000; Lock, Pomerleau, Causer, Altmann, & McKee, 2005; Tohill, 2005; WHO, 2003). An unhealthy diet comprises minimal fruit and vegetable intake and excessive consumption of processed convenience foods high in salt, saturated fat, trans fat and sugar (WHO, 2003). Traditional dietary patterns comprising high intake of fruit, vegetables, legumes, nuts and fish have been associated with low prevalence of chronic illness (Hu & et al., 2013). However the modern food industry has been blamed for fuelling the prevalence of unhealthy diets through poor nutrition labeling, increasing portion sizes (by altering the shape and sizes of serving containers) and increasing the accessibility and availability of processed convenience foods (Chandon & Wansink, 2010). Examples include cheap and often highly discounted processed foods, conveniently located fast-food chain restaurants, and constant exposure to advertising of these products.

There have been considerable efforts made by Governments and health-promoting organizations to facilitate healthier dietary behaviors (Guthrie, Mancino & Lin, 2015; Obesity Australia., 2013). The majority of health promotion efforts provide general education and information to consumers regarding healthy diets, and/or aim to improve attitudes, intentions and self-efficacy towards healthier dietary behaviors (Thomson & Ravia, 2011; Wansink, 2015). For example, the 'How do you measure up' campaign in Australia highlighted the dangers of an increased weight circumference, in an attempt to change consumer attitudes and intentions to lead a healthier lifestyle. Similarly, the 'Swap It Don't Stop It' campaign informed consumers that they do not have to stop doing the things that they love, but can make small swaps (i.e. smaller portions, healthier alternative behaviors) to try to improve attitudes and intentions towards leading a healthier lifestyle.

However these interventions have had limited effectiveness, with weak to modest effects on behavior change (Bhattarai et al.,

2013; Brambilla-Macias et al., 2011; Snyder, 2007; Snyder et al., 2004; Thomson & Ravia, 2011). The limited effectiveness of these types of interventions may be due to their reliance on behavior change theories that assume dietary behaviors are rational, conscious decisions, such as the Theory of Planned Behavior (Ajzen, 1985), the Health Behavior Model (Rosenstock, 1974) and the Transtheoretical Model (Prochaska & DiClemente, 1994). However, dietary behaviors are mostly habitual (Koster, 2003, 2009; Wansink & Sobal, 2007; Wood, Quinn, & Kashy, 2002) and occur without conscious effort (Kahneman, 2003, 2011; Neal, Wood, & Quinn, 2006). While habits can be difficult to change, they are also strongly influenced by cues in the environment which are often processed outside of conscious awareness. Thus, modifying an environment in which dietary choices occur could be an effective approach to dietary behavior change (Combris, Bazoche, Giraud-Heraud & Issanchou et al., 2009; King, Meiselman, Hottenstein, Work, & Cronk, 2007; King, Weber, Meiselman, & Lv, 2004; Marteau, Hollands, & Fletcher, 2012; Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008).

The environment can be changed by *nudging*. Nudging is a relatively new concept based on Behavioral Economic theory which has been developing since the early 1970s, yet the term "nudging" was only coined for the first time by Thaler and Sunstein in 2008.

Nudging is defined as 'any addition to or modification of the environment that influenced consumers in a predictable way, without changing economic incentive' (Thaler & Sunstein, 2008, pp. 6). Nudging alters the environment by changing the presentation of options to consumers – referred to as the *choice architecture* (Thaler & Sunstein, 2008). This altered environment can consciously or subconsciously influence consumers without removing options or changing economic incentive (Thaler & Sunstein, 2008; Thaler, Sunstein, & Balz, 2010). This ability for nudging to act on either a conscious or subconscious levels is discussed by Hansen and Jespersen (2013). While the concept of nudging is relatively new, the principles have been evident in Marketing for decades, with retail environments altering the physical and mental availability of products through rearranging supermarket and shelf layout, and placing promotional materials at the point-of-purchase (Romaniuk & Sharp, 2015; Sharp, 2010). The effectiveness of altering the presentation of products suggests that nudging may be a viable approach for influencing habitual dietary choices (Thaler & Sunstein, 2008; Vallgård, 2012). There have been various classifications of nudging (Hollands et al., 2013; Ly, Mazar, Zhao, & Soman, 2013), however the categories identified by Blumenthal-Barby and Burroughs (2012), in our opinion, allow for simpler

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