



Changing ‘gut feelings’ about food: An evaluative conditioning effect on implicit food evaluations and food choice



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ABSTRACT

The aim of this study was to test the effect of an evaluative conditioning (EC) task on implicit food evaluations and choices between healthy and unhealthy food, and whether the effect of the EC task on food choice would be mediated by implicit food evaluations. To induce the EC effect on implicit food evaluations and food choice, images of healthy and unhealthy foods were repeatedly paired with images of positively and negatively valenced faces, the pairing (healthy-positive/unhealthy-negative or healthy-negative/unhealthy-positive) manipulated between participants. Implicit food evaluations were measured using an Implicit Association Task (IAT), and food choice was measured using a food decision-making task consisting of 22 choices between healthy and unhealthy food items. Results showed a direct effect of EC condition on implicit food evaluations, but not on explicit food choice for the whole sample. However, an indirect effect of the EC task on food choice, mediated by implicit food evaluations, was found. Contingency awareness – whether participants were aware that foods were being paired with valenced stimuli – did not affect the strength of the EC effect, nor did attention to the EC task. Surprisingly, emotional eating was found to moderate the effect of the EC task on both implicit food evaluations and food choice, showing that the EC task had an effect only for those who scored low on emotional eating. In conclusion, this study makes a unique contribution to the EC literature by showing that food choice can be altered by conditioning implicit food evaluations, but that this may only work for people who do not score particularly high on emotional eating.

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1. Introduction

The rapid rise of obesity is quickly becoming one of the biggest problems in the western world, at both personal and societal levels. Obesity has been identified as a risk factor for psychological, social and emotional issues (Carr & Friedman, 2005; Falkner et al., 2001; Jackson, Beeken, & Wardle, 2015). Moreover, obesity is a risk factor for many severe physical health issues, such as heart disease and diabetes (Mokdad et al., 2003; Must et al., 1999). Thus as an attempt to reduce incidence and negative ramifications of obesity, a large amount of psychological research in the previous decade has been

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conducted on eating behaviour and behaviour change (e.g. Hattar, Hagger, & Pal, 2015; Harris, Bargh, & Brownell, 2009; Moffitt, Brinkworth, Noakes, & Mohr, 2012; Wansink, Painter, & North, 2005). This study aims to contribute to and extend this literature by studying the potential of harnessing psychological principles on learning and conditioning to influence eating behaviour.

Much of this research has focused on changing eating behaviour by increasing food-related self-control (Johnson, Pratt, & Wardle, 2012), or attempting to give people the tools to consciously override 'gut feelings' and reactions – their implicit food evaluations (de Houwer, Gawronski, & Barnes-Holmes, 2013) – that cause them to regularly overeat (e.g. Hattar et al., 2015). Implicit food evaluations are thoughts or feelings automatically associated with specific food items, which influence one's liking of these foods (Walsh & Kiviniemi, 2014). While consciously trying to override implicit evaluations leading to harmful food choices can indeed lead to improved eating habits (Adriaanse, Vinkers, de Ridder, Hox, & de Wit, 2011), this may not be the best way to counter overeating (Hofmann, Friese, & Wiers, 2009). Intuitively it would be easier if, instead of having to battle your gut feelings constantly in order to eat more healthily, these gut feelings told you to eat healthy food. This idea, combined with the fact that eating is thought to be a primarily automatic and habitual behaviour governed by these automatic signals (Cohen & Babey, 2012; Naughton, McCarthy, & McCarthy, 2015), is why more recently research has also focused on trying to change eating behaviour by actively targeting and altering implicit evaluations. This approach has generated some positive results in the health behaviour domain (Wiers, Rinck, Kordts, Houben, & Strack, 2010; but see Becker, Jostmann, Wiers, & Holland, 2015) and involves harnessing valence information to alter the implicit value of a given food category by association, for example by associating healthy food with positively-valenced stimuli. This associative procedure has proven especially useful for people who generally exhibit low self-control, because the barrier between their implicit food evaluations and their actual food consumption is low, meaning that they are quick to put impulse to action (Haynes, Kemp, & Moffitt, 2015). Thus, because their implicit evaluations of different foods are a good predictor of actual eating behaviour (Ellis, Kiviniemi, & Cook-Cottone, 2014), changing their implicit evaluations of healthy and unhealthy foods could lead to a decrease in unhealthy eating, with a resulting decrease in obesity. This evaluative conditioning may be much more effective than attempts to alter food choice through conscious, deliberative routes (Hofmann et al., 2009). The aim of this study was to likewise change people's implicit food evaluations to bring about a change in eating behaviour.

1.1. Evaluative conditioning

One way in which researchers have tried to influence people's implicit food evaluations is through evaluative conditioning (EC). The EC procedure consists of the consistent pairing of a conditioned stimulus (CS), which initially is neutrally valenced, with an unconditioned stimulus (US), which is positively or negatively valenced, to change one's implicit evaluations of the CS (de Houwer, Thomas, & Baeyens, 2001; Hofmann, Perugini, de Houwer, & Baeyens, 2010; Levey & Martin, 1975; Walsh & Kiviniemi, 2014). Previous studies have shown that the EC procedure can indeed be employed successfully to change one's liking of a specific stimulus, which is called 'the EC effect' throughout this article (Dwyer, Jarratt, & Dick, 2007; see Hofmann et al., 2010; for a review). For instance, many studies have shown that pairing healthy food with positive stimuli and unhealthy food with negative stimuli can prompt one to like healthy food more and unhealthy food less, and vice versa (e.g. Hollands, Marteau, & Prestwich, 2011; Lebens et al., 2011; Walsh & Kiviniemi, 2014). An influence of EC tasks on eating behaviour is less well supported. While some studies have found that EC tasks can affect food choice in the lab (Hollands et al., 2011; Walsh & Kiviniemi, 2014), others fail to observe any such influence (Lebens et al., 2011). In short, although the evidence for an EC effect on implicit evaluations is quite strong, the evidence for an EC effect on explicit food choice is conflicting. Therefore, the purpose of this study was to investigate the relationship between implicit and explicit measures by investigating whether an EC task affects explicit eating behaviour by changing implicit food evaluations (that is, through a mediation effect of implicit evaluations of food on explicit food choice). This is an important question, because should it be the case that a change in implicit food evaluations mediates the effect of the EC task on food choice, this would mean that food choice is altered through an automatic, non-cognitive mechanism. This would make targeting implicit, rather than explicit, processes a potential avenue for behaviour change, circumventing the inconsistencies and difficulties associated with nutritional behaviour change through explicit processes.

Hollands et al. (2011) tried to address this question of mediation. However, their study paired food stimuli with positively and negatively valenced body images, which is problematic. Firstly, one's implicit evaluations of body images are not necessarily intrinsic; studies have shown that multiple factors, including peer pressure, maternal influence and media exposure, affect how negatively one evaluates overweight or obese bodies (Stice, 1998). Thus, people's cognitive, emotional and affective relationship with body images is a complex one, and not unambiguously positive or negative (Lascelles, Field, & Davey, 2003). Secondly, one's evaluation of different body images are likely linked with several food- and health-related beliefs and attitudes, making body USs and food CSs interdependent prior to the experiment, which may reduce US effectiveness. To overcome these problems, the current study used happy and angry faces as USs. Humans arguably have an intrinsic preference for happy faces over angry faces (D'Entremont & Muir, 1999; Kim & Johnson, 2013), without prior association with food. In addition, because virtually everyone regularly encounters faces in their everyday environment, one might sooner assume that no one has especially strong, unique associations with faces compared to other people. Using highly valenced non-human pictures (e.g. a train wreck) that might not be so common makes it much more likely that some but not all participants have particular associations with one or more of the images, leading to larger individual differences in image valence. To avoid these larger individual differences in image valence, happy and angry faces were chosen over other

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