

# Let's face it: assessing the welfare effects of calorie labelling using automatic facial coding

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## Abstract

Behaviourally informed approaches to public policy have proliferated over the past decade (OECD, 2017; Troussard and Van Bavel, 2018). Among these approaches, choice-preserving interventions that steer people's behaviour in specific directions have attracted attention (Thaler and Sunstein, 2009; Lowenstein and Chater, 2017). Despite the proliferation of such "nudges", most evaluations of these interventions stop far short of a welfare analysis, most commonly presenting the magnitude of behaviour change achieved or less frequently a form of cost-effectiveness analysis based on the resources used or saved by the nudge (Bernartzi et al., 2017). Where attempts have been made to provide a more comprehensive account of welfare effects, they have relied on using proxy measures of welfare, such as willingness to pay (WTP) (Alcott and Kessler, 2019; Rafiq, 2019) or the short-term impacts on subjective well-being (SWB) (Thunström, 2019). Asking about WTP and SWB yields important insights into the potentially heterogeneous effects of an intervention, but the self-reported nature of the data means they are vulnerable to a host of reporting biases.

In this paper, we offer an alternative approach that sheds new light on the short-run welfare effects of nudges using unobtrusive data. Our approach involves using automatic facial expression coding to capture the emotional costs and benefits of behavioural interventions. Facial expression coding technology can be used to read expressions via built-in webcams when people engage with tasks on a computer screen in the lab or the wild. Automatic facial expression coding is increasingly used to capture individuals' emotions for a variety of purposes, including marketing research where it has been used to measure individuals' responses to online advertising (Teixeira, Wedel and Peter, 2012); clinical settings where it has been used to monitor patients' depression symptoms (Girard et al., 2013); and public policy research to assess individuals' responses to bureaucratic red tape (Hattke, Hensel and Kalucza, 2019). Automatic facial coding has not yet been put to use to understand the impacts of behaviourally informed interventions, including nudges, on people's experienced well-being.

In the current work, we study the impacts of a behavioural intervention that has been incorporated into policy in the US since 2014: namely, the mandatory provision of calorie information on movie theatre snack menus (US Food and Drug Administration, 2014). In an exploratory lab study, we use facial expression coding to assess the short-run emotional impacts of being presented with calorie information about a popcorn snack in the context of a stylised 'Cinema experience'. The results of the study indicate that calorie information has heterogeneous impacts on people's likelihood of choosing the snack and on the emotions they experience during the moment of choice which vary based on their level of health consciousness. The information does not, however, affect the emotions people go on to experience while viewing movie clips, suggesting that the emotional effects of the information are short-lived. We conclude by emphasising the potential of automatic facial expression coding

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to provide new insights into the short-run welfare effects of nudges and calling for further research into this promising technique.