



Full length article

## Bringing habits and emotions into food waste behaviour

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## ABSTRACT

This study examined consumer food waste behaviour using a comprehensive model integrating the theory of planned behaviour (TPB), the theory of interpersonal behaviour, and the comprehensive model of environmental behaviour. Using a temporally lagged design, one hundred and seventy-two respondents answered four questionnaires over a period of 14 months. Questionnaires measured emotions in relation to food waste, habits, the TPB variables, intention to reduce food waste, and self-reported food waste behaviour. Results showed that the less well-studied variables of habits and emotions were important determinants of participants' intentions to reduce food waste and their current food waste behaviour. As expected, we found that negative emotions were associated with greater intentions to reduce food waste, but contrary to our predictions they were also associated with higher levels of food waste behaviour. In other words, participants who experienced more negative emotion when thinking about food waste intended to reduce their waste but actually ended up wasting more food. Results also show that participants with a greater sense of control, and more normative support for reducing food waste also had stronger intentions to engage in the behaviour. Our findings extend existing understanding and underscore the importance of the non-cognitive determinants of behaviour, namely emotions and habits. The implications for research and practice are discussed.

### 1. Introduction

Food waste is a significant global problem, with estimates suggesting that one third of edible food produced for human consumption is wasted globally each year (FAO, 2011; Goebel et al., 2015; Graham-Rowe et al., 2014a). The environmental costs of this waste are significant and can be seen in the environmental burden and resources required to produce the food as well as emissions associated with any food wasted. Food waste is a particular issue in developed countries where a major contribution to food waste is from households (Parfitt et al., 2010).

In the UK, for example, estimates suggest that 15 million tonnes of food and drink are thrown away annually, with almost half of that (7 million tonnes) attributed to households (WRAP, 2013). Reflecting global averages, the average household in the UK throws away approximately a third of the food they purchase for consumption (Evans, 2011a) which makes up 17% of household waste (Defra, 2015). The economic costs of this waste have been estimated at approximately £470 (USD 590) per year per household, and up to £700 (USD880) for families with children (WRAP, 2013).

Increasing evidence suggests that there are many positive consequences of reducing food waste (Parfitt et al., 2010; Quested et al.,

2013). Waste reduction at the level of household consumption is critical because the environmental impact accumulates throughout each of the following stages of the food life cycle (Williams and Wikström, 2011). Given the magnitude of waste, any reductions in food and drink waste at a household level may have a substantial positive environmental effect. Quested et al. (2013), for example, suggests that an average UK household has the potential to reduce greenhouse gas emissions by a similar amount to installing 270 mm (11 in.) of loft insulation or all household members foregoing an annual return flight from the UK to central Europe (WRAP, 2013).

Food waste reduction is a promising avenue for decreasing food waste and there is a growing body of literature that investigates consumers' food waste behaviour and its determinants (Visschers et al., 2016). Even so, compared to research on the quantity of wasted food, and the global impact of the food system, studies of consumer food waste behaviour are much less prevalent. We argue that there is more work to be done to more fully understand the determinants of food waste behaviour, and that the insights additional research could bring will provide a much stronger basis for efforts to promote food waste reduction at the household level.

Research on the determinants of food waste has to date been dominated by qualitative research (Evans, 2011b; Graham-Rowe et al., 2014b;

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Quested et al., 2013). These studies have been successful in advancing our understanding of consumer food waste behaviour and demonstrated that consumers' perceptions about food waste are important determinants of food waste behaviour. More recent work has quantified these effects and shown the relative importance of attitudes, norms, and perceived behavioural control as predictors of consumer food waste behaviour (Visschers et al., 2016). Each of these studies has pushed the field further, yet we argue more remains to be done. In particular, we note that there has been a lack of research that emphasises the non-cognitive determinants of food waste behaviour. Indeed, research on pro-environmental behaviour more generally has shown that the non-cognitive variables of habits and emotions are important drivers of behaviour. Yet, to our knowledge there have been no quantitative studies to date that have investigated the relative importance of these determinants as they relate to food waste behaviour and recent reviews have not identified studies in this domain (Hebrok and Boks, 2017).

In this paper we aim to advance the field by reporting the results of a study that examines both cognitive and affective determinants of consumers' food waste behaviour. The research is the result of an ongoing collaboration between the authors' university and the UK retailer Asda. Using a co-production process (Clark and Dickson, 2003), the researchers co-designed a suite of surveys that were administered to Asda's customer panel. These data were used to test a conceptual model of food waste behaviour that was based on the theory of planned behaviour (Ajzen, 1991), the theory of interpersonal behaviour (Triandis, 1977), and the comprehensive model of environmental behaviour (CMEB; Klöckner, 2013). In addition, we draw on current knowledge of the emotional determinants of behaviour (Bamberg and Möser, 2007; Weiss and Beal, 2005) to augment the model and identify the role of emotion as a driver of food waste behaviour.

In the following section of the paper we outline the theoretical framework and describe the key components of the conceptual model. We then present the hypotheses, followed by a description of the study methods and analysis process. Following this the results are presented and discussed in the context of existing literature. Implications for research, practice and policy are discussed, noting the limitations of the research and potential avenues for future research.

## 2. Background and theoretical framework

To identify the most important factors affecting food waste we developed a comprehensive model by integrating different theoretical perspectives. The theoretical foundation of this paper rests primarily on the theory of planned behaviour (TPB; Ajzen, 1991), and is supplemented by the theory of interpersonal behaviour (TIB; Triandis, 1977) and the comprehensive model of environmental behaviour (CMEB; Klöckner, 2013). We present our conceptual model in Fig. 1 and in the following sections we outline the hypotheses in the model and identify the

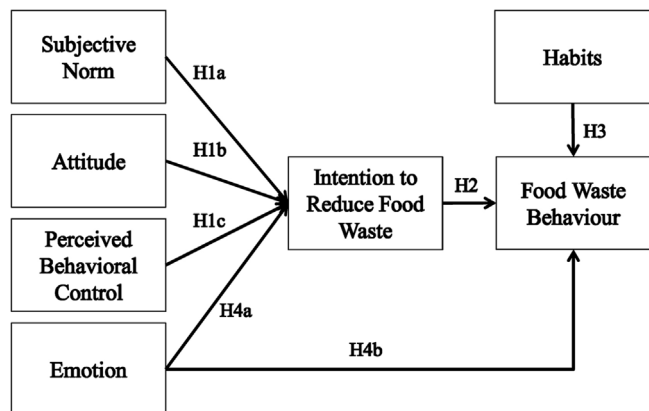


Fig. 1. Conceptual model of the determinants of food waste behaviour.

contribution of each of the three theories to the development of our model.

### 2.1. Theory of planned behaviour

The TPB has been used widely to predict and explain environmental behaviour. A recent meta-analysis by Klöckner (2013), showed that approximately 40% of all papers published in the environmental psychology domain used the TPB as the theoretical underpinnings of their research and it has been successfully used to predict household behaviours including water conservation (Fielding et al., 2012; Russell and Fielding, 2010), public transportation (Heath and Gifford, 2002), and recycling (Tonglet et al., 2004). The TPB suggests that behaviour is directly determined by intentions, which in turn are predicted by attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). Attitudes are a general measure of the favourability of a particular behaviour for the individual. Subjective norms are made up of the perceived expectations of other people who are important to the subject, or in other words, the social pressure to engage in that particular behaviour. Finally, perceived behavioural control is a measure that captures the degree to which people perceive that they have the ability, means, and opportunity to perform a particular behaviour. According to the TPB, intentions to engage in a specific behaviour are increased when individuals hold a positive attitude to the behaviour, if they think that important other people expect them to engage in a particular behaviour, and if they perceive that they have an adequate level of control to be able to engage in the intended behaviour. Each of these constructs is an indicator of perceptions that individuals hold. For instance, the extent to which an individual believes important others expect them to engage in a particular behaviour does not necessarily reflect what those significant others actually expect if they were asked directly. According to the TPB it is, however, the perception that is important in determining the behaviour, rather than actualities.

Consistent with the TPB (Ajzen, 1991), we expect that attitudes, subjective norms, and PBC will account for significant variance in intentions, and that these variables will emerge as positive predictors of intentions. Thus:

**H1a.** Attitudes to food waste will be positively related to intentions to reduce food waste.

**H1b.** Subjective norms in relation to food waste will be positively related to intentions to reduce food waste.

**H1c.** Perceived behavioural control of food waste will be positively related to intentions to reduce food waste.

In line with the TPB, we also expect that intentions will be a significant and negative predictor of food waste behaviour, in that the greater the intentions to reduce food waste, the lower the food waste behaviour that will be observed. Thus:

**H2.** Intentions to reduce food waste will be negatively related to food waste behaviour.

### 2.2. Habits and emotions

Although the theory of planned behaviour has received strong empirical support in explaining environmentally relevant behaviours, one of the key criticisms is that it under represents the contribution of the non-cognitive determinants of behaviour, particularly habits and emotions (Klöckner, 2013; Russell and Fielding, 2010). The TPB rests largely on the assumption that individuals make rational and reasoned choices (Bamberg, 2003; Bamberg and Möser, 2007; Hines et al., 1986; Vining and Ebreo, 2002). Because food waste behaviour has less visibility to other people (e.g., neighbours) than other types of pro-environmental behaviour (e.g., recycling or transport behaviours), the social normative drivers of food waste behaviour are likely to be of less

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