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Normative prompts reduce consumer food waste in restaurants

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ABSTRACT

This field study demonstrates that prompts reduce food waste in a restaurant. Based on the behavioral change literature, it was hypothesized that (1) informational prompts encourage consumers to reduce food waste, and that (2) an informational prompt with a normative message is more effective than a prompt with only an informative message. The results were mixed. As expected, diners who were exposed to prompts asked to take away their leftovers more frequently than diners who were exposed to no prompts. However, prompts with an informative *and* normative message were no more powerful than prompts with only an informative message.

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1. Introduction

In today's world, a significant amount of food ends up as waste (Evans, 2012). Food waste leads to numerous societal, environmental, and economical ills. Among other concerns, food waste threatens global food security (Godfray et al., 2010), adds to climate change (Knipe, 2005; Ventour, 2008), and is linked to food price inflation (Quested et al., 2013). In industrialized countries, consumers are the single biggest producer of food waste (Beretta et al., 2013; Parfitt et al., 2010). Studies show that they waste 330 kg of food per year per household (Quested et al., 2013). Given that 65% of this waste could be avoided by more sustainable behavior (Farr-Wharton et al., 2014), there is an urgent need to change consumer behavior. It is important that consumer behavior does not only have to change in private contexts such as in the home, but also in public contexts such as restaurants. The increasing frequency of eating out (see Thyberg and Tonjes, 2016) and growing food-waste-related challenges for restaurants that are caused by guests underscores this urgency (Sustainable Restaurant Association, 2010, cited in Papargyropoulou et al., 2014).

Over the last two decades, practitioners (e.g., WRAP) have applied various behavioral change interventions, including awareness campaigns, in an attempt to reduce food waste at the consumer level. In contrast, researchers have only recently started to examine what drives consumer food waste (e.g., Block et al.,

2016; Porpino, 2016; Stancu et al., 2016; Stefan et al., 2013; Visschers et al., 2016) and what prevention options and policies would be effective (e.g., Hebrok and Boks, 2017; Thyberg and Tonjes, 2016). So far, practitioners and researchers have not done much to test the effect of concrete anti-consumer-food-waste interventions (e.g., Kallbekken and Sælen, 2013; Whitehair et al., 2013).

In general, behavioral change research has identified many intervention types that foster sustainable consumer behavior. Comprehensive reviews of these intervention types can be found elsewhere (e.g., Abrahamse et al., 2005; Homburg and Matthies, 1998; Osbaldiston and Schott, 2012; Schultz, 2014). Informational interventions are by far the most frequently applied and investigated type of intervention to promote sustainable consumer behavior. Informational interventions are based on the idea that information about the negative consequences of an undesired behavior (e.g., wasted resources) and the positive consequences of a desired behavior (e.g., saved resources) causes problem awareness and thus changes behavior. Yet, evidence shows that information alone seldom produces behavioral change and is more likely to be successful when combined with other intervention types (Kollmuss and Agyeman, 2002; McKenzie-Mohr, 2013; Steg et al., 2008). A meta-analysis comparing common intervention types underlines this, as it reveals a relatively low average effect size ($g = .31$) for information-only interventions (Osbaldiston and Schott, 2012).

The limited effectiveness of informational interventions is relevant when designing anti-consumer-food-waste interventions for two reasons: First, real-world campaigns against consumer food waste almost exclusively implement informational interventions.

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Second, the academic food waste literature mainly recommends informational interventions and rarely other intervention types (e.g., Carlsson-Kanyama, 2004; Jørisen et al., 2015; Priefer et al., 2016; Stancu et al., 2016). Researchers and practitioners should test the effectiveness of extending informational interventions and campaigns with other intervention types.

One intervention type to consider is prompts: verbal or written reminders to perform or avoid a certain behavior. According to behavioral change literature, prompts are relatively effective intervention type ($g = .62$; Osbaldiston and Schott, 2012). Prompts are particularly effective when they occur before the target behavior takes place, when they address a specific (vs. loosely defined) behavior that is easy to perform, and when they are worded politely (vs. as a demand) (Steg et al., 2008). Accordingly, organizations concerned with food waste encourage stakeholders in the food service sector (e.g., restaurants) to prompt their customers to reduce food waste. For instance, in their guidelines document, 'Resource Pack for Hospitality and Food Service Sector: Engaging with Consumers to Help Reduce Plate Waste', WRAP proposes that restaurants place messages on menus, posters, the buffet, or table cards.¹ Although we do not know of any documented evaluation of real-world implementations of prompts, experimental research provides first evidence that prompts can reduce food waste. In one study, for example, a simple print message (i.e., 'All Taste No Waste—Eat What You Take, Don't Waste Food') in a university dining facility led to students reducing food waste by 15% (Whitehair et al., 2013). Similarly, a written prompt with a 'normative-connoted message' (i.e., 'Welcome back! Again! And again! Visit our buffet many times. That's better than taking a lot once.') on breakfast buffets led hotel guests to reduce food waste by 20% (Kallbekken and Sælen, 2013).

A second intervention type to consider is social influence. Social influence as an intervention type is based on the idea that behavior that conforms to social norms is more likely to be adopted. According to behavioral change literature, social influence is a relatively effective intervention strategy ($g = .63$; Osbaldiston and Schott, 2012). Social norms are particularly effective when not only signaling what the majority does (*descriptive norm*) but also what the majority (dis)approves of (*injunctive norm*) (Griskevicius et al., 2008; Nolan et al., 2008; Schultz et al., 2007). We do not know of any real-world examples where practitioners explicitly apply social norms in order to tackle consumer food waste. Likewise, we did not find evidence of a systematic, scientific examination of social norms as anti-consumer-food-waste interventions.

So far, we argue that combining intervention types—namely informational interventions, prompts, and social norms—is an effective strategy to tackle consumer food waste. Consumers are particularly susceptible to anti-food-waste prompts and social norms in a restaurant context (Kallbekken and Sælen, 2013; Whitehair et al., 2013). In restaurants, prompts work well because a specific, easy-to-perform target behavior such as taking away leftovers (vs. throwing out leftovers) can be addressed where they occur (see Steg et al., 2008). Social norms seem to work well in a restaurant because it is a public context. Typically, social norms exert more influence on food decisions in public contexts, where one's behavior is visible to others (Templeton et al., 2016). Recent experimental evidence showing how normative the act of taking away leftovers is underlines the importance of social norms in restaurants. In fact, in an anonymous restaurant dining situation (with an unknown companion) taking away leftovers is more embarrassing (i.e. norm-violating) and thus less likely than in a personal restaurant dining situation (with a socially close compan-

ion). Importantly, this difference weakens when servers orally inform diners about the norm of taking away leftovers (Hamerman et al., 2018). This implies that restaurants can establish social norms and foster anti-consumer-food-waste behaviors.

Taken together, neither practitioners nor researchers have systematically tested the promising combinations of informational interventions, prompts, and social norms as anti-consumer-food-waste interventions. Therefore, this field study aimed to test the effect of an informational prompt and an informational *and* normative prompt on consumer food waste in a restaurant. It was hypothesized that diners are more likely to take away their leftovers when exposed to a prompt than when exposed to no prompt. Further, it was hypothesized that a prompt with both an informative *and* normative message is more effective than a prompt with only an informative message.

2. Method

2.1. Sample, design, and procedure

The field study employed a one-factorial between-subjects design with the factor *intervention* (control vs. informational prompt vs. informational and normative prompt). The three intervention conditions were tested in a pizzeria in a Swiss city for six weeks. Data was collected only on weekdays. Conditions were counterbalanced across weekdays, so that conditions were equally tested across weekdays. Every weekday, data was collected for 90 min around the main dining time.

During data collection, two experimenters were present and pretended to be diners. Diners were not aware of the ongoing field study. If a diner had leftovers, waiters were instructed to clear the dishes and inform an experimenter about the diner. Only pizza dishes that were not finished qualified as leftovers. Experimenters unobtrusively approached diners who had leftovers (irrespective of whether they had asked for takeaway boxes or not). Diners were told that they had been selected randomly and were asked to fill in a questionnaire. In order to disguise the main purpose of the study, they were asked whether they liked the pizza. Then they indicated sociodemographic details, whether they made use of the takeaway option, and whether they wanted to receive an email with a debriefing after the end of the study. Finally, participants were thanked and given a five-Swiss-franc voucher for their next pizza. The final sample consisted of 54 diners (43 women, $M_{age} = 37$, $SD_{age} = 15$ years).

2.2. Material

2.2.1. Intervention

According to the idea of a three-step intervention design, different (or no) place cards were placed on each table in the pizzeria showing different messages for the information-alone and the information-plus-social-norm condition. The messages were in German and were displayed on both sides of the cards. The place cards were made of brown DIN A6 120 g/m² paper. White silhouettes of cutlery on a red circular background were depicted on the bottom right corners of the folded paper. In the control condition, no place card was put on the table.

Fig. 1 depicts the front of the original place cards. In the information-alone prompt condition, the place cards displayed only information about food waste: 'Food waste happens in the restaurant too. A third of all foods are thrown away. 45% of waste occurs in households and restaurants. Please ask us to box your leftover pizza slices for takeaway to avert food waste.' In the informational and normative prompt condition, normative aspects were stressed: 'Our guests expect a reduction of food waste. A third of all

¹ See: http://www.wrap.org.uk/sites/files/wrap/UK%20LFHWHospitalityResourcePack_0.pdf.

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