Doggy bag? Yes, please. On the use of social norms and default to reduce food waste

Matilde Giaccherini*°, Marianna Gilli§°, Susanna Mancinelli§°, Mariangela Zoli*°

° SEEDS (Sustainability, Environmental Economics, and Dynamic Studies)

* Università degli Studi di Roma Tor Vergata, CEIS and DEF

§ Università degli Studi di Ferrara

This version: May 2018

Very preliminary draft – Please do not quote

Abstract

The article evaluates the impact of two interventions aimed at reducing the sense of shame related to the use of doggy bags to take leftovers home at restaurants. We carried out a field experiment at seventeen restaurants located in two Italian provinces, one in the North and in one in the Center of Italy. Restaurants were randomly assigned to three groups: in the first, we distributed signs with a message intended to activate a social descriptive norm. In the second set, the message was intended to change the default option, which consists in the customers asking for the doggy bag. In our case, by default, the waiter delivered directly the doggy bag with leftovers. The third group of restaurants was used as a control with no intervention. The results suggest a statistically significant impact of the social norm, while the impact of the default change is not significant.

***Keywords**: food waste; doggy bag; social norm; default option; field experiment.*

1. Introduction

The issue of food waste has recently received much attention worldwide. According to Gustavsson et al. (2011), almost one-third of food produced for human consumption, corresponding to approximately 1.3 billion tonnes per year, is wasted globally, with industrialized countries that waste much more food on a per-capita basis compared to

developing countries. In European countries, it is estimated that 88 million tonnes of food was wasted in 2012, corresponding to 173 kilograms per person. Considering that the total amount of food produced in EU-28 in 2011 was 865 kg per person, food waste corresponded to 20% of the total amount produced (Stenmarck et al., 2016). In the absence of prevention policies, the EU Commission estimates that food waste will rise to about 126 million tons by 2020 (EU, 2010).

Food waste reduction is relevant in the perspective of improving food security and guaranteeing sustainable development paths by affecting the economic, social and environmental dimension of the food sector. By focusing on its environmental impacts, food waste is responsible for both the unnecessary use of the natural resources used for food production, and the local and global consequences of food waste disposal, including GHG emissions. Without accounting for emissions from land use change, the global carbon footprint of food produced and uneaten was estimated to be 3.3 Gtonnes of CO2 equivalent in 2007, putting food waste at the third place in the rank of top emitters, after the US and China (FAO, 2013).

Food waste and losses happen at all stages of the food chain, but the hospitality industry is considered to be responsible for a relevant part of food wastage. In the UK, for instance, 920,000 tons of food is wasted every year at the hospitality and food service sector outlets, of which 75% could be avoided (Parfitt et al., 2013), while in France 15% of all food waste is attributable to this sector (Sirieix et al., 2017). In Finland, 19% of all produced and served food in licensed restaurants is wasted, and of that 7%, corresponding to over 1 million kg per annum are leftovers (Silvennoinen et al., 2012).

Several initiatives can be undertaken to reduce food waste in the restaurant sector at

different levels. In this study, we focus on customers' attitude to reduce food waste at restaurants by using food boxes (the so-called "doggy-bag") to take their leftovers away.

Despite its widespread use in the US, the practice of boxing customers' leftovers is quite unusual, even unknown, in several EU countries. In a recent study conducted in France and in the Czech Republic, customers' behavior related to doggy bags has been investigated, finding that for the majority of the respondents "customers who ask for doggy bag are seen as consumers with financial problems" and that "leaving leftovers is clearly a symbol of social and/or financial status" (Sirieix et al., 2017, p.156). In Italy, a survey realized in 2016 by Coldiretti/Ixè on eating habits of Italian people shows that 22% of customers at restaurants think that asking for a doggy bag is impolite and a signal of low financial status. Accordingly, they are ashamed to take food away and prefer leaving it on the plate. Only 18% of the respondents reveal that they do not have leftovers.

In order to evaluate if feelings of shame and stigmatization related to the use of the doggy bag can be affected, we realized a field experiment in 18 restaurants located in two Italian provinces.

Specifically, we examine the impact of two different behavioral instruments aimed to incentivize the use of doggy bag and the consequential reduction of consumers' leftovers and of food waste.

In a first group of restaurants, we introduced signs on tables displaying a message intended to activate a social descriptive norm. In a second set of restaurants, the message was intended to change the default option in restaurants, which generally consists in the customer that has to ask for the doggy bag in order to have their leftovers boxed. In both cases, the aim of the messages was to reduce the sense of stigma and shame people feel

when they ask for the doggy bag.

Our preliminary findings suggest that the activation of the social norm has a statistically significant positive impact on the number of doggy bag requests. The impact of changing the default, at the opposite, needs to be further investigated.

The remainder of the paper is structured as follows: Section 2 provides a review of the relevant literature to conceptually frame the problem of doggy bag and the potential applicability of behavioral instruments. Section 3 provides details on the design of the experiment and its implementation, as well as a preliminary overview of the dataset. Section 4 reports our preliminary econometric findings and comments the results.

2. Doggy bags and consumers' behavior

The use of doggy bag allows consumers not to waste the food they have already paid for. Hence asking for a doggy bag should generally be welfare enhancing for at least two reasons. First, the warm glow the individuals perceive from not wasting food. In fact, consumers feel guilty if they waste food since it is a social, environmental and economic problem (Parizeau et al., 2015). Second, several studies[1] have observed that consumers are highly concerned about the waste of money that leftovers both at home and restaurant imply (Quested et al., 2013). The opportunity of taking away the food which diners have ordered and paid but not consumed should hence increase their utility due to both warm glow and monetary effects. Moreover, whilst other kinds of waste reduction are mostly hidden actions and are not generally driven by extrinsic motivation as social approval (Barr, 2007; Cecere et al., 2014; D'Amato et al. 2016), the practice of food waste reduction through

[1] For a survey on this topic, see the literature review in Stancu et al. (2016) and Visschers et al. (2016).

the use of doggy bag is a visible action for other costumers and the waiting staff of the restaurant. As such, it could be spurred by the individual's desire for peer approval.

Actually, the practice of the doggy bag is widely known and adopted in some countries, such as the United States, where costumers are even willing to pay higher tips to food servers for boxing their leftovers (Seiter and Weger, 2018).

On the contrary, in several European countries not only this practice is rarely adopted, but often asking for having one's own leftovers boxed at the restaurant is considered as embarrassing and as a source of shame. A recent survey by the Sustainable Restaurant Association (SRA) in the UK showed that 25% of diners were too embarrassed to ask for boxes[2]. A qualitative study conducted in France and in the Czech Republic about patrons' attitudes toward doggy bags in restaurants reveals that asking for the doggy bag at a restaurant is, for the majority of the respondents, a signal of financial problems; many of them are ashamed to ask for one, even if they would like to take their leftovers away (Sirieix et al., 2017). The same considerations hold for Italy, where according to a survey conducted by Coldiretti/Ixè in 2016, 22% of the respondents admit their feeling of shame to ask for the doggy bag, which is an impolite habit and a signal of being low-income. The interesting feature in these countries is that social norms prevent diners to undertake a pro-social behavior. Asking for a doggy bag may be welfare reducing if feelings of shame and stigmatization overwhelm the positive impact of warm glow and monetary reasons.

The problem we analyze is how to overcome individuals' feelings of shame and stigma toward the use of doggy bags that preclude them to undertake the pro-social behavior of reducing food waste.

[2] http://www.bbc.com/news/magazine-15106212.

In the psychological literature, "the feeling of stigma an individual possesses represents a deviation from the accepted standards of the society" (Lewis, M., 1998, p. 127). Shame, as well, is a feeling that concerns the individual's social sphere. Differently from guilt, which concerns the individual's private sphere and that can be felt even in the absence of the others' judgment, the feeling of shame depends on the feedback from the social environment and is strictly linked to what the others think about one's own action (Tangney et al., 2007; Zinck, 2008).

In this situation, traditional policy instruments may prove to be quite ineffective to influence individual decisions. Behavioral economics may provide useful suggestions to design the most suitable policy interventions in contexts where individuals are subject to cognitive limits (see, among others, Carlsson and Johansson-Stenman, 2012, Ferraro and Price, 2013; List and Samek, 2015).

Among the instruments suggested by behavioral economics, social norms and peer comparison have been shown to be effective in stimulating pro-environmental behaviors in situations such as recycling (Milford et al., 2015), water conservation (Ferraro and Price, 2013), towel re-use in hotels (Goldstein et al., 2008) and littering (Cialdini et al., 1990). In Cialdini (2003), particular emphasis is given to the importance of considering both injunctive and descriptive norms to motivate pro-environmental action, where the injunctive norm involves "perceptions of which behaviors are typically approved or disapproved" (Cialdini, 2003, p. 105), while the descriptive norm involves "perceptions of which behaviors are typically performed" (Cialdini, 2003, p. 105).

Among behavioral instruments aimed at nudging individuals towards pro-social actions, changing the default option is considered as a promising alternative to traditional policy instruments. In the environmental domain, for instance, some studies have examined the

effect of changing the way in which alternatives are presented. Egebark and Ekström (2016), for instance, test the impact of changing the default setting on printers from simplex to duplex, achieving a substantial reduction in paper use. Pichert and Katsikopoulos (2008) show that a pro-environmental behavior can be stimulated by changing the "grey" electricity default with green electricity. Among the reasons that explain why default effects occur, Dinner et al. (2011) identify the saving of the effort costs, as choosing the pre-set alternative does not imply any additional action, and endorsement, because, if the choice has been pre-selected, the individual may infer it is so for its merit.

3. Experimental design

Based on previous findings of the literature on the feeling of shame and the potential stigmatization related to the choice of asking the doggy bag, we have two expectations with respect to the treatment effects. First, the activation of a social descriptive norm is expected to affect the individual perception of the social approval towards the use of doggy bags and to reduce feelings of shame and stigma. Second, changing the choice setting by providing doggy bags as default in case of leftovers is also expected to reduce the sense of blame, stimulating individuals to accept to take their food home.

We carried out a field experiment at seventeen restaurants located in two Italian provinces, one in the North and in one in the Center of Italy.

The restaurants were split randomly into three different groups, labelled: SOCIAL NORM, DEFAULT, and CONTROL group. The randomization process helps to control for potential correlation between the unobserved characteristics of the restaurants and the attitudes of the customers visiting them. Specifically, by assigning treatments randomly across the

restaurants, we can identify the causal effect of the two interventions on the increase in the doggy bags distributed in the restaurants. We consider a between-subject design and compare the average treatment effects of the two treatments compared to the control group. Since in this experiment the subjects, the customers of the restaurants, are unaware of participating, we feel entitled to draw causal estimates from our treatment effects (Levitt and List, 2009).

The experiment lasted 61 days, from March to May 2017[3]. During the fifteen days before running the experiment, we collected pre-treatment information about the number of doggy bags and the number of leftovers in the involved restaurants. As we will show thereafter, we used this information in the randomization process, together with other restaurants background characteristics.

The detailed experimental design is as follows. The SOCIAL NORM treatment involved five restaurants. In these restaurants, we distributed signs on the tables which emboldened diners to ask for doggy bags and to feel more comfortable about it through the activation of a social norm (see Figure A1 in the Appendix). Specifically, the message displayed on the signs conveyed a descriptive norm, informing guests that an increasing number of Italian guests in restaurants are used to asking for doggy bags at the end of their meal[4]. The message was intended to alleviate the feeling of stigma and embarrassment attached to taking leftovers home by referring to what other people are currently doing in the same situation.

[3] Missing data generally correspond to days when restaurants are closed.

[4] In both treatments the messages were written in Italian. It was not necessary to translate them into English because almost all customers in our restaurants are Italian, as clarified by preliminary interviews with the restaurant managers.

The DEFAULT treatment involved six other restaurants, where signs placed on the tables displayed the message: "At the end of your meal, the waiting staff will give you freely the food left over on your plate. If you do not want the doggy bag, please ask your waiter" (Figure A2). In this case, the treatment aims at reverting the default option, consisting in the customer who usually has to ask for the doggy bag in order to bring leftovers home. In this group of restaurants, at the opposite, waiters and restaurants managers had been instructed to give customers their remains of the meal with doggy bag as default; the customers had to declare not to want it. The aim of the intervention was again to reduce the sense of shame related to the request of the doggy bag.

Finally, six restaurants were assigned to the CONTROL group and did not receive any treatment.

In order to collect data about the number of doggy bags distributed every day and the number of leftovers which remained in the customers' plates (and not taken away with doggy bags), we asked the waiting staff of the restaurants to fill in a form, where they had also to register the daily number of covers. The data collection process then required the cooperation of the restaurants staff, but did not impose extra monetary costs for them, and was supervised by the researchers themselves. We also guaranteed the supply of a basic provision of doggy bags (about 300) to the restaurants, with the opportunity of asking for others if needed. To minimize the environmental impact of our experiment, the doggy bags were made from 100% recycled and biodegradable materials (see Figure A3), allowing the customers to either reuse or compost them after use[5].

[5] The price of a box is equal to 0.19 euros.

After a clear and detailed explanation of the aims of our project, the restaurant managers who agreed to participate in the experiment guaranteed full cooperation.

4. Empirical Analysis

In order to test our research hypotheses, in our empirical analysis we examine the effect of the treatments on the number of doggy bags (*Doggybags*) provided at daily level in each restaurant, according to the following econometric specification[6]:

$$Doggybags_{it} = \alpha + \beta_1 \text{social norm} + \beta_2 \text{default} + \gamma_1 DayOfWeekFE_t + \delta X_{it} + \theta Z_i + \varepsilon_{it}; \quad (1)$$

where $Doggybags_{it}$ is the number of doggy bags taken away in the restaurant i on day t.

To check the robustness of the treatments, we use as alternative dependent variable the ratio between the number of doggy bags distributed at each restaurant and a proxy of the total amount of food waste which would have been produced in the absence of doggy bags, corresponding to the sum of the leftovers and the number of doggy bags.

Formally:

$$Ratio_{it} = \frac{doggybags_{it}}{leftovers_{it} + doggy\ bags_{it}} \quad (2)$$

where $leftovers_{it}$ is the number of portions of unconsumed food which remain in customers' plates in the restaurant i on day t.

This variable can be interpreted as a measure of the food saving realized thanks to the

[6] The equation is estimated by using a pooled OLS approach.

use of doggy bags with respect to the total number of portions which would have been wasted in the absence.

SOCIAL NORM and DEFAULT are two dummy variables taking the value 1 if the restaurant is in the respective treatment group and 0 otherwise.

X_{it} is a vector of time-variant restaurants characteristics, including the number of covers at the restaurant ($Covers_{it}$), and the number of leftovers ($Leftovers_{it}$).

Z_i includes restaurants characteristics which are constant over time, i.e. the average price of the menu ($Price_i$) and a set of dummy variables specifying if the majority of the diners are regular customers ($Patrons_i$), if it is located in the center of the municipality ($Center_i$), if the restaurant serves pizza ($Pizzeria_i$) or traditional cuisine ($Traditional_i$).

In order to consider short-term trends, we include day-of-the-week fixed effects to capture habitual trends, such as, for instance, higher customer attendance on specific days or during the weekends.

Figures 1 and 2 provide a first impression of the effect of the treatments. Figure 1 shows the average number of doggy bags distributed daily, by treatment group. The different colors highlight the change in doggy bag provisions between the pre-treatment and treatment period. Figure 2 depicts the pre-treatment and treatment average values of daily $Ratio$ in treated and control groups. Both figures suggest an impact of the messages, compared to untreated restaurants.

A clearer picture of the effect of the two interventions on the number of doggy bags and leftovers between the pre-treatment and treatment phases is provided in Figure 3. As the figure suggests, the treatments did not increase the total number of non-consumed food in the restaurants (the sum of leftovers and doggy bags). Further, comparing the pre-treatment

and treatment phase, there was a clear substitution between leftovers and doggy bags in both treated groups.

Summary statistics for the overall sample for dependent variables and restaurants characteristics are provided in Table 1.

To check for the existence of potential imbalances in restaurants characteristics across the three groups, we report the results of a regression testing for significant differences in the baseline period (pre-treatment phase), following the approach in Altmann and Traxler (2014). Table 2 shows the average values and standard deviations for relevant restaurants characteristics by treatment group, and the respective p-values of the F-test and t-test. Results suggest that both the number of doggy bags and the number of leftovers, together with other restaurants background characteristics are reasonably balanced between treatments and control.

5. Discussion of the results and concluding remarks

The first part of Table 3 contains parametric t-tests for the equivalency of mean respectively between SOCIAL NORM and DEFAULT with respect to the CONTROL group (i.e. $H_0 = \overline{X}_{TREATED} = \overline{X}_{UNTREATED}$).

Specifically, the first two columns report the test for the variable *Doggybags*, while columns 3 and 4 for the variable *Ratio*. Statistics show that both the number of doggy bags and Ratio in the SOCIAL NORM treatment are significantly different from the CONTROL group at $p < 0.001$ level. In the DEFAULT treatment, at the opposite, the average value of *Doggybags* is not significantly different from the CONTROL group, while the average *Ratio* is weakly significant. Nonparametric Mann-Whitney tests, which test whether the sampled

populations have identical probability distributions, presented in the second part of the Table, confirm previous insights. The probability distributions for both variables *Doggybags* and *Ratio* in the SOCIAL NORM treatment are significantly different from the sampled populations in the CONTROL group, while for the DEFAULT treatment, the distributions are similar.

Nevertheless, as noted by List (2001), the significance of the treatment effect for SOCIAL NORM may be the result of variables left uncontrolled, such as subject-specific characteristics that affect the delivery of doggy bags. Accordingly, we supplement the results of the statistical tests with the estimates resulting from running regressions of eq. 1. Table 4 presents the results of our regression analysis. The first two columns show the impact of the treatments on the number of doggy bags handed out in the restaurants. Specifically, column 1 displays the result of the regression considering only the dummy treatment as regressors, while column 2 reports results of the specification which provides the best fit for our data (given by the value of the Wald test statistics). SOCIAL NORM results statistically significant compared to the control group in both specifications, while DEFAULT turns out to be not significant. Analogously, column 3 and 4 presents the results for the effect of treatments only and for the best specification respectively, by adopting *Ratio* as dependent variable.

Looking at the restaurants characteristics, the impact of the covariates, where significant, is the one expected. In particular, the number of covers significantly affects both the number of doggy bags and *Ratio*, as it is reasonable if we consider that both food waste production and take away choices are affected by the number of customers. At the same time, however, it seems that a potential overcrowding of the restaurant does not affect customers' request, suggesting that the sense of shame is not strictly related to the number of diners.

Results for different model specifications are shown in Table A1 and A2 in the Appendix, and confirm previous insights.

Our results suggest that the message intended to activate a descriptive social norm is effective in reducing the feeling of shame that usually prevents people from asking to take food home. The change of the default option, instead, is not effective: the sense of stigma is not necessarily reduced when it is the waiter that provides the doggy bag. At the opposite, this effect can be even more pronounced, if the practice of boxing the leftovers is not accompanied by the awareness that it is socially approved.

Figure 1 – Average daily number of doggy bags per treatment group

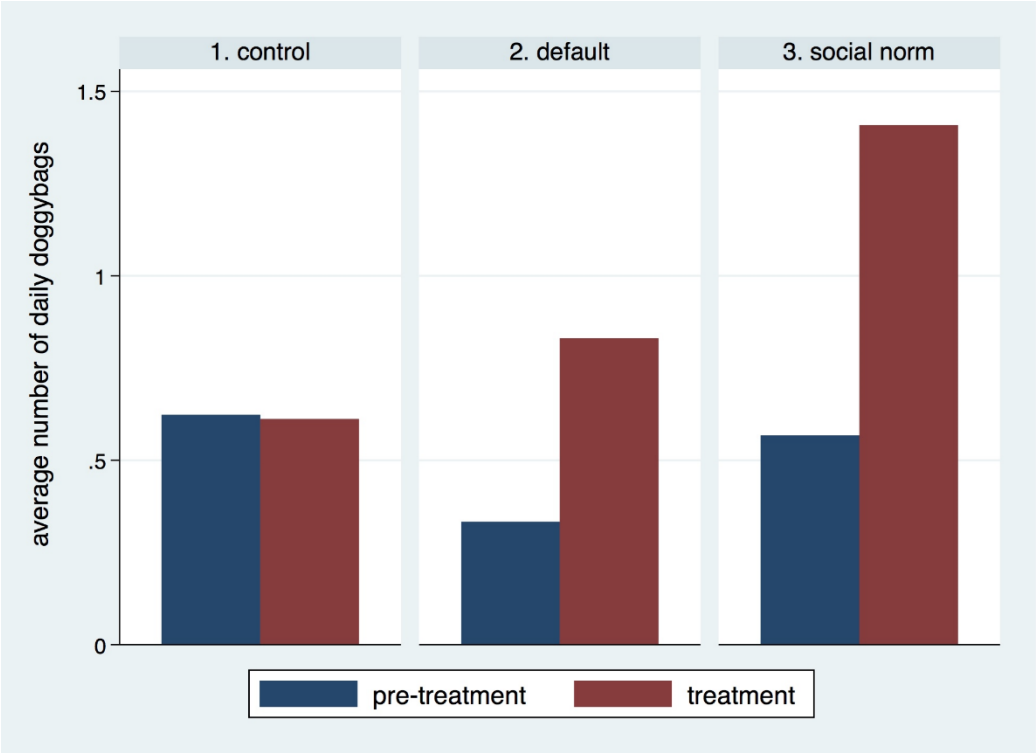

Figure 2 – Average Ratio per treatment group

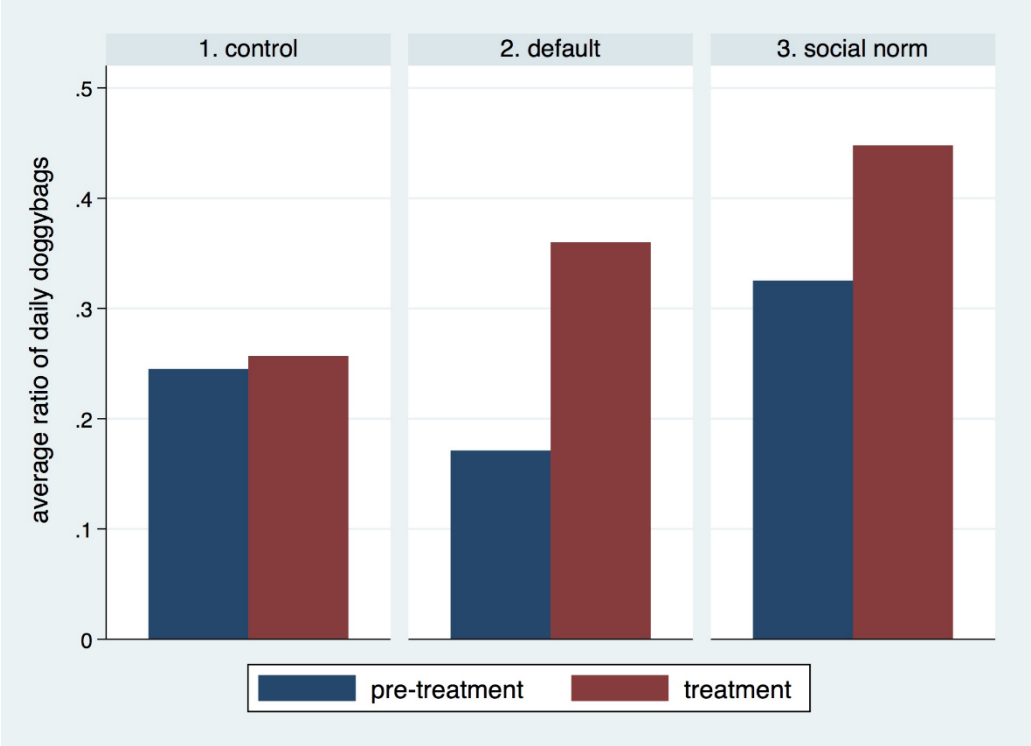

Figure 3 – Comparison of average daily number of doggy bags and leftovers per treatment group in the pre-treatment and treatment phases

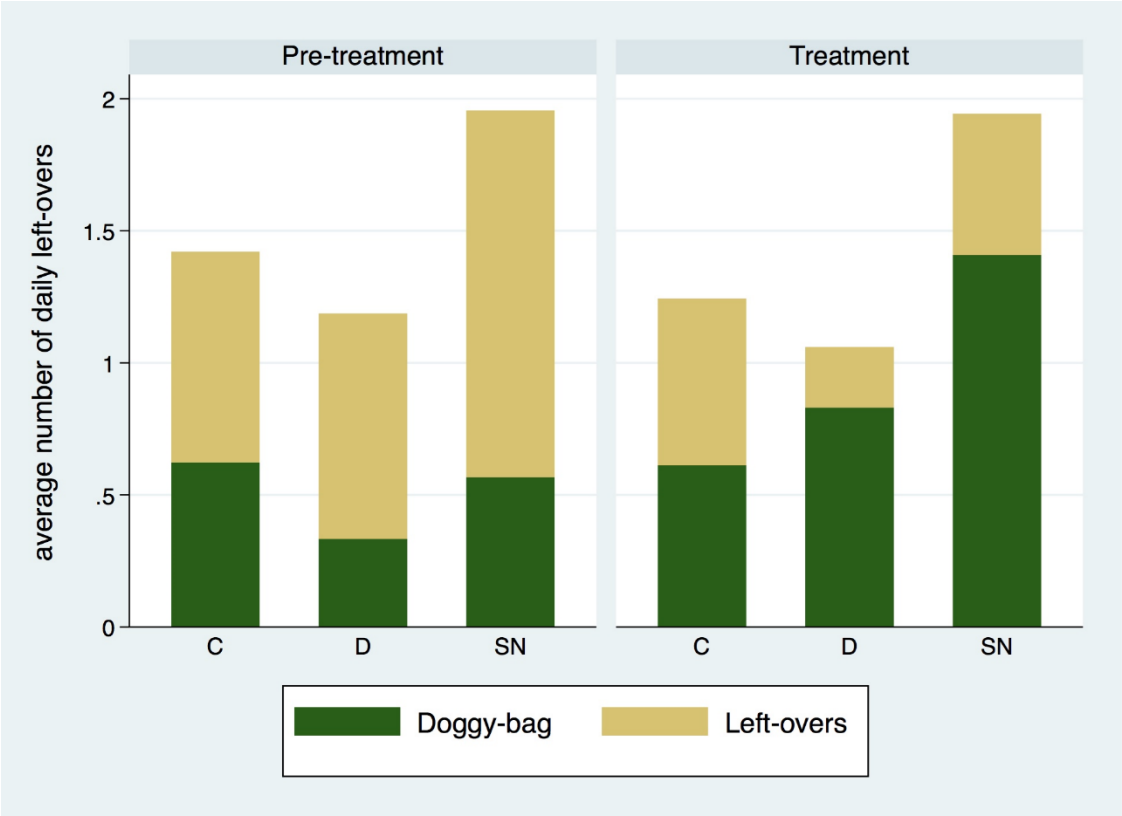

Table 1 - Summary statistics and variable description

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
Doggybag	n. of daily doggy bags delivered	1206	0,849	1,46	0	12
Ratio	see eq. 2	1206	0,317	0,43	0	1
Leftovers	n. of leftovers (excluding doggy bags)	1206	0,572	1,41	0	12
Price	average price of the menu	1601	18,325	8,51	5	35
Covers	daily number of customers	1206	34,337	27,91	0	150
Patrons	takes value 1 if the restaurant has regular customers	1601	0,841	0,37	0	1
Center	takes value 1 if the restaurant is located in the town centre	1601	0,490	0,50	0	1
Traditional	traditional cuisine	1601	0,331	0,47	0	1
Pizzeria	Pizza restaurant	1601	0,338	0,47	0	1

Table 2 – Descriptive statistics and randomization validation

	Control	*Default*	*Social Norm*	*Treatments F-test (p-values)*	*Control t-test (p-values)*
Doggybag	0.623 (0.94)	0.333 (0.74)	0.567 (0.80)	1.201	0.331
Leftovers	0.797 (1.41)	0.853 (2.36)	1.388 (2.95)	0.103	0.720
Covers	58.333 (40.40)	52.143 (21.90)	78.00 (42.43)	0.747	0.819
Price	17.833 (9.46)	17.429 (6.96)	20.80 (9.01)	0.242	0.831

	Control	*Default*	*Social Norm*	*Treatments Chi2 test (p-values)*	*Control t-test (p-values)*
Food waste on total waste	0.50 (0.50)	0.143 (0.35)	0.200 (0.40)	0.364	0.160
Traditional	0.333 (0.47)	0.429 (0.50)	0.400 (0.49)	0.942	0.739
Other Restaurant	0.167 (0.37)	0.286 (0.45)	0.200 0.40)	0.875	0.695
Pizzeria	0.333 (0.47)	0.286 (0.45)	0.40 (0.49)	0.923	0.568
Province	0.833 (0.37)	0.714 (0.45)	0.600 (0.49)	0.706	0.466
Suburbs	0.500 (0.50)	0.286 (0.45)	0.400 (0.49)	0.744	0.509
Center	0.333 (0.47)	0.714 (0.45)	0.400 (0.49)	0.366	0.332
Patrons	0.833 (0.38)	0.857 (0.35)	0.800 (0.40)	0.968	1.000

Note: Mean values (standard deviations in parentheses). The final two columns report (i) p-values of F-tests from regressions of the respective characteristic on treatment dummies and (ii) p-values of t-tests comparing the characteristic in the control group vs all treated restaurants. In the second table estimations are carried out through probit regression (Wald chi2 value is reported).

Table 3 - Unconditional tests of equivalency

Groups mean comparison with respect to control group (t-test)

	Social Norm	Default opt	Social Norm	Default opt
Doggybags	0.747***	0.127		
	(6.68)	(1.53)		
Ratio			0.180***	0.0705*
			(5.94)	(2.36)
Observations	768	774	768	774

t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

	Social Norm	Default opt	Social Norm	Default opt
Doggybags	5.749***	0.684		
	(0.000)	(0.4940)		
Ratio			5.416***	1.342
			(0.000)	(0.1797)
Observations	768	774	768	774

p-values in parentheses; * p<0.05, ** p<0.01, *** p<0.001

Table 4 – Regression results

VARIABLES	(1) Doggybags	(2) Doggybags	(3) Ratio	(4) Ratio
Default	0.309	0.201	0.150	0.0715
	(0.278)	(0.324)	(0.0981)	(0.0822)
Social Norm	0.866*	0.830**	0.241**	0.198**
	(0.513)	(0.415)		(0.0991)
Leftovers		0.369*		
		(0.197)		
Price		0.00960		-0.00248
		(0.0176)		(0.00465)
Covers		0.0142***		0.00389***
		(0.00445)		(0.000798)
Patrons				-0.138*
				(0.0795)
Constant	0.605**	-0.0622	0.336***	0.425**
	(0.259)	(0.598)	(0.105)	(0.173)
Time FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Restaurant dummy	Yes	Yes	Yes	Yes
Observations	766	766	766	766
Number of id	17	17	17	17
Wald (chi2)	40.67	4260	92.30	5975
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)

References

Barr, S., 2007. Factors influencing environmental attitudes and behaviors: A UK case study of household waste management. *Environment and behavior*, *39*(4), 435-473.

Carlsson, F., & Johansson-Stenman, O., 2012. Behavioral economics and environmental policy. *Annual Review of Resource Economics*, *4*(1), 75-99.

Cecere, G., Mancinelli, S., & Mazzanti, M., 2014. Waste prevention and social preferences: the role of intrinsic and extrinsic motivations. *Ecological Economics*, *107*, 163-176.

Cialdini, R. B., 2003. Crafting normative messages to protect the environment. *Current directions in psychological science*, *12*(4), 105-109.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A.,1990. A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of personality and social psychology*, *58*(6), 1015.

D'Amato, A., Mancinelli, S., & Zoli, M., 2016. Complementarity vs substitutability in waste management behaviors. *Ecological Economics*, *123*, 84-94.

Dinner, I., Johnson, E. J., Goldstein, D. G., & Liu, K., 2011. Partitioning default effects: Why people choose not to choose. *Journal of Experimental Psychology: Applied, 17*(4), 332-341

Egebark, J., & Ekström, M., 2016. Can indifference make the world greener?. *Journal of Environmental Economics and Management*, *76*, 1-13.

European Commission (DG Environment), 2010, Preparatory study on food waste across EU 27, Final report.

FAO (2013), Food wastage footprint, Impacts on natural resources. Final report.

Ferraro, P. J., and Price, M. K., 2013. Using non-pecuniary strategies to influence behavior: evidence from a large-scale field experiment. *Review of Economics and Statistics*, Vol. 95, No. 1, pp. 64-73.

Gustavsson, J., Cederberg, C., Sonesson, U., Otterdijk, R. and Meybeck, A. (2011). Global Food
Losses and Food Waste. FAO Rome, Italy. 2011

Lewis, M. (1998). Shame and stigma. In P. Gilbert and B. Andrews (Eds.), *Shame: Interpersonal behavior, psychopathology, and culture* (pp. 126-140). New York: Oxford University Press.

List, J. A., 2011, Summer. Why economists should conduct field experiments and 14 tips for pulling one off. *Journal of Economic Perspectives*, Vol.25, No. 3, pp. 3-16.

List, J. A. 2001. Do explicit warnings eliminate the hypothetical bias in elicitation procedures? Evidence from field auctions for sportscards. *American economic review*, 91(5), pp. 1498-1507.

Milford, A. B., Øvrum, A., and Helgesen, H., 2015. *Nudges to increase recycling and reduce waste*, Discussion Paper, Norwegian Agricultural Economics Research Institute

Parfitt, J., Eatherley, D., Hawkins, R., Prowse, G., 2013. Waste in the UK Hospitality and Food Service Sector (Technical Report No. HFS001-00 6). Waste and Resources Action Programme (WRAP), UK.

Parizeau, K., von Massow, M., & Martin, R., 2015. Household-level dynamics of food waste production and related beliefs, attitudes, and behaviours in Guelph, Ontario. *Waste Management*, *35*, 207-217.

Pichert, D., & Katsikopoulos, K. V., 2008. Green defaults: Information presentation and pro-environmental behaviour. *Journal of Environmental Psychology*, *28*(1), 63-73.

Quested, T. E., Marsh, E., Stunell, D., & Parry, A. D., 2013. Spaghetti soup: The complex world of food waste behaviours. *Resources, Conservation and Recycling*, *79*, 43-51.

Seiter, J. S., & Weger Jr, H., 2018. The principle of reciprocity in hospitality contexts: the relationship between tipping behavior and food servers' approaches to handling leftovers. *Journal of Hospitality & Tourism Research*, *42*(2), 287-294.

Silvennoinen, K., Katajajuuri, J.-M., Hartikainen, H., Jalkanen, L., Koivupuro, H.-K., Reinikainen, A., 2012. Food waste volume and composition in the Finnish Supply chain: special focus on food service sector. In: Fourth International Symposium on Energy from Biomass andWaste, Venice, Italy, 12e15 November 2012: Proceedings Venice 2012. Cisa Publisher, p. 14.

Sirieix, L., Lála, J., & Kocmanová, K., 2017. Understanding the antecedents of consumers' attitudes towards doggy bags in restaurants: Concern about food waste, culture, norms and emotions. *Journal of Retailing and Consumer Services*, *34*, 153-158.

Stancu, V., Haugaard, P., & Lähteenmäki, L., 2016. Determinants of consumer food waste behaviour: Two routes to food waste. *Appetite*, *96*, 7-17.

Stenmarck, Å., Jensen, C., Quested, T., Moates, G., 2016. Estimates of European Food Waste Levels. Stockholm, Retrieved from ⟨http://www.eu-fusions.org/ phocadownload/ Publications/Estimates of European food waste levels.pdf⟩.

Tangney, J. P., Stuewig, J., & Mashek, D. J., 2007. Moral emotions and moral behavior. *Annual Review of Psychology, 58,* 435-372

Visschers, V. H., Wickli, N., & Siegrist, M., 2016. Sorting out food waste behaviour: A survey on the motivators and barriers of self-reported amounts of food waste in households. *Journal of Environmental Psychology*, *45*, 66-78.

Zinck, A., 2008. Self-referential emotions. *Consciousness and Cognition, 17,* 496-505.

Appendix

Figure A1 – The message for the treatment Social Norm

Figure A2 – The message for the treatment Default

Figure A3 – The doggy bag used in the experiment

Table A1 – Robustness check for regression results (dependent variable *Doggybags*)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Default	0.309	0.491	0.491	0.201	0.205	0.257**
	(0.278)	(0.311)	(0.303)	(0.324)	(0.126)	(0.126)
Social Norm	0.866*	0.980**	0.980**	0.830**	0.799***	0.784***
	(0.513)	(0.431)	(0.418)	(0.415)	(0.124)	(0.128)
Leftovers		0.519**	0.519**	0.369*	0.379***	0.338***
		(0.204)	(0.208)	(0.197)	(0.0528)	(0.0527)
Price			0.000156	0.00960	0.00970	0.0299***
			(0.0154)	(0.0176)	(0.00650)	(0.00748)
Covers				0.0142***	0.0137***	0.0106***
				(0.00445)	(0.00200)	(0.00226)
Patrons					-0.494***	-0.640***
					(0.166)	(0.176)
Center						-0.0348
						(0.130)
Traditional						0.426***
						(0.134)
Pizzeria						0.782***
						(0.175)
Constant	0.605**	0.465	0.463	-0.0622	0.394	-0.149
	(0.259)	(0.335)	(0.504)	(0.598)	(0.271)	(0.310)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	766	766	766	766	766	766
Number of id	17	17	17	17	17	17
Wald (chi2)	40.67	210.9	789.4	4260	289.6	357.0
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A2 – Robustness check for regression results (dependent variable *Ratio*)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Default	0.150	0.150*	0.0879	0.0715	0.0670*
	(0.0981)	(0.0901)	(0.0916)	(0.0822)	(0.0384)
Social Norm	0.241**	0.252***	0.216**	0.198**	0.178***
	(0.0961)	(0.0972)	(0.101)	(0.0991)	(0.0400)
Price		-0.00687	-0.00300	-0.00248	0.000638
		(0.00471)	(0.00417)	(0.00465)	(0.00235)
Covers			0.00446***	0.00389***	0.00263***
			(0.000872)	(0.000798)	(0.000677)
Patrons				-0.138*	-0.203***
				(0.0795)	(0.0556)
Center					0.0462
					(0.0408)
Traditional					-0.00439
					(0.0424)
Pizzeria					0.163***
					(0.0552)
Constant	0.336***	0.452***	0.262**	0.425**	0.392***
	(0.105)	(0.144)	(0.130)	(0.173)	(0.0979)
Time FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Observations	766	766	766	766	766
Number of id	17	17	17	17	17
Wald (chi2)	92.30	229.9	1063	5975	155.0
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1