Social Influence Fosters the Use of a Reusable Takeaway Box

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Abstract

The severe ecological and economic consequences of disposable takeaway containers call for the implementation of effective interventions: namely, the use of reusable takeaway boxes. The present field study examined how social influence determined whether customers chose a reusable or a disposable takeaway box at a takeaway restaurant. We unobtrusively recorded the takeaway packaging choices (reusable vs. disposable) of customers over lunchtimes during a period of four weeks. We operationalized social influence in two ways. First, we manipulated *social norms*. For half of the field days, we added a normative message to the existing informational material on the counter of the takeaway outlet. Second, we observed *social modeling* by recording whether the takeaway packaging choice took place in the presence of other customers using a reusable takeaway box. The results were mixed: On one hand, we found no effect from the manipulated social norm, which we discuss in the light of past interventions using social norm messages. On the other hand, we found an effect of the observed social modeling: witnessing others using a reusable takeaway box increased the odds of choosing one oneself. This finding demonstrates the importance of getting customers to perform the desired behavior, to serve as social role models for others.

Keywords: Consumer waste; Behavioral Change (Interventions); Social Influence; Social Norm; Social Modeling

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1. Introduction

In industrialized countries, packaging of takeaway foods and beverages constitutes the largest proportion of litter in public areas. In Switzerland, more than 50% of litter is made up of takeaway food and beverage packaging (Heeb, Ableidinger, Berger, & Hoffelner, 2004; Wälti & Almeida, 2016). In addition to its ecological consequences, public littering costs Swiss communities and the Swiss public transport systems around $200 million annually. Dealing with discarded packaging from takeaway foods and beverages alone costs $107 million annually. In comparison, littered cigarettes generate only about half these costs (Berger & Sommerhalder, 2011). To date, various governmental, for-profit, and non-profit organizations have introduced measures to solve this ecological and economic problem. One example is the introduction of reusable takeaway box systems[1]. For example, reCIRCLE[2] allows customers of participating restaurants to take away their food in a reusable box. Strictly speaking, customers rent the takeaway box for about $10 and can either return it to any collection bin after use and get back the 'rental fee', or reuse it. So far, various informational materials (e.g., flyers, signs and wobblers[3]) have been used to encourage the use of the system. Yet it remains challenging to effectively 'nudge' (see Thaler & Sunstein, 1999) customers' behavior in the direction of more environmental packaging options.

From the perspective of behavioral change (intervention) literature (e.g., Michie, van Stralen, & West, 2011; Schultz, 2014; Steg & Vlek, 2009), it is unclear whether informational material alone effectively changes behavior. This body of literature comprises various

[1] An example from the US is Go Box https://www.goboxpdx.com/
[2] www.reCIRCLE.ch
[3] A wobbler is a tag—typically with a message—that is attached to a (point-of-sales) surface such as a counter, shelf or buffet, to stand out to grab customers' attention.

intervention types that foster sustainable consumer behavior. (For comprehensive reviews of these intervention types, see e.g., Abrahamse, Steg, Vlek, & Rothengatter, 2005; Homburg & Matthies, 1998; Osbaldiston & Schott, 2012; Schultz, 2014.) Informational intervention is by far the most frequently applied and investigated type of intervention to promote sustainable consumer behavior (e.g., Schultz, 2002; Abrahamse et al., 2005; Cox et al., 2010; McKenzie-Mohr, 2011). This intervention type is based on the idea that learning information about the negative consequences of an undesired behavior and the positive consequences of a desired behavior will cause problem awareness and thus change behavior. Paradoxically, however, informational interventions are among the *least* effective intervention types. A meta-analysis comparing common intervention types reveals a relatively low average effect size for informational interventions such as instruction (g = .31) and justifications (g = .41) (Osbaldiston & Schott, 2012). Nevertheless, informational interventions are likely to be successful when combined with other interventions types (Kollmuss & Agyeman, 2002; McKenzie-Mohr, 2011; Steg, Keizer, Buunk, & Rothengatter, 2008).

An arguably promising intervention type to combine with informational interventions is social influence. The effect of social influence interventions is based on the idea that people have an urge to align their behavior to the words and actions of others (Asch, 1956; Burger, 2009; Milgram, 1964). A famous demonstration of the power of social influence shows that when a single pedestrian is gawking upwards, about 4% of passersby align their behavior to his or her behavior. However, if the crowd of gawkers grows to a dozen, around 40% of passersby join in (Milgram, Bickman, & Berkowitz, 1969).

For interventions which are intended to foster sustainable behavior, social influence is often exerted by means of social norms or social modeling. (For a review see, e.g., Abrahamse &

Steg, 2013; McDonald & Crandall, 2015.) Social norm interventions apply rules and standards that guide people in their behavior by signaling what the majority does (*descriptive norm*) or what the majority (dis)approves of (*injunctive norm*). Apparently interventions are most effective when they combine both the descriptive and the injunctive norm (Griskevicius, Cialdini, & Goldstein, 2008; Schultz, Khazian, & Zaleski, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007).

Social modeling interventions use a confederate to act as a model; the confederate performs a desirable behavior anticipating that others will engage in this behavior when they observe it. Interventions are particularly effective when the demonstrated behavior is relevant, meaningful and easy, as well as when more than one model displays the target behavior (Abrahamse & Steg, 2013; Sussman & Gifford, 2013).

A meta-analysis comparing common intervention types seems to confirm the effectiveness of social influence, as it found that social influence interventions – mainly social modeling – are most effective in fostering sustainable behavior ($\underline{g}$ = .63; Osbaldiston & Schott, 2012). Note that a meta-analysis specifically comparing social influence interventions shows that social modeling is more effective in fostering sustainable behavior than social norms (Abrahamse & Steg, 2013). Nevertheless, social norm interventions have been tested relatively often and found to be successful. Most likely this is because they are particularly easy to implement at large scale (e.g., Goldstein, Cialdini, & Griskevicius, 2008; Griskevicius et al., 2008; Mortensen et al., 2017; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008; Schultz et al., 2008; Schultz et al., 2007; Sparkman & Walton, 2017).

Given the power of social norms and social modeling, we argue that social influence interventions are particularly useful in a social context such as a public takeaway outlet.

Deciding on takeaway packaging is public as customers have to (1) announce their takeaway packaging choice publicly to a vendor and (2) expose their takeaway packaging choice to the public until mealtime is over. In fact, the mere presence of others can induce a desire to manage one's impression (Argo, White, & Dahl, 2006; Latané, 1981; White & Dahl, 2006). Interestingly, it has been found that people feel particularly compelled to conform to prevalent social influence in the social context of a restaurant (Ariely & Levav, 2000; Hamerman, Rudell, & Martins, 2018). Although extensive empirical evidence stresses the impact of social modeling on general food consumption in restaurants (e.g., food intake; see e.g., Ariely & Levav, 2000; Cruwys, Bevelander, & Hermans, 2015), there is no evidence of the effect of social modeling on sustainable behavior in restaurants. In contrast, the impact of social norm interventions on sustainable behavior in restaurants is well documented. In fact, field studies show that normative messages on buffets or tables[4] successfully compel people to reduce their food waste (Kallbekken & Sælen, 2013; Stöckli, Dorn, & Liechti, 2018).

Note, however, that social modeling is well documented for promoting sustainable behaviors in other contexts. Seeing others putting their soda cans in the trash, for instance, makes it less likely that one will leave one's own can in the street (Geller, 1990). Likewise, being exposed to confederates' composting behavior makes it more likely that one will compost as well (Sussman & Gifford, 2013). Also, observing others turning off the water while soaping up in a shower room can induce the same behavior (Aronson & O'Leary, 1982-83).

[4] Normative messages such as the following two: 'Welcome back! Again! And again! Visit our buffet many times. That's better than taking a lot once.' (Kallbekken & Sælen, 2013) or 'Our guests expect a reduction of food waste. A third of all foods are thrown away. 45% of the waste occurs in households and restaurants. The majority of our guests expect that the wasting of food is reduced. Therefore, many people ask us to wrap their pizza leftovers. Please ask us to box your leftover pizza slices for takeaway to avert food waste.' (Stöckli, Dorn, & Liechti, 2018)

This research aims to test whether social norms and social modeling can be effectively used to promote the use of reusable (vs. disposable) takeaway boxes. Thus, our hypotheses are as follows:

H1: People are more likely to choose a reusable (vs. disposable) takeaway box when they are exposed to informational material advertising the reusable boxes *with* a normative message compared to *without* a normative message.

H2: People are more likely to choose a reusable (vs. disposable) takeaway box when they experience other customers choosing or using a reusable (vs. disposable) takeaway box compared to when they experience customers choosing or using only disposable takeaway boxes.

To test our hypotheses, we operationalized social influence in two ways. First, we manipulated *social norms.* That is, we tested whether a social norm message is more effective than an informational message in advocating the use of a reusable takeaway box. Second, we observed *social modeling* to account for 'real-life' demonstrations of the use of reusable takeaway boxes by other customers.

2. Method

2.1. Design, Procedure and Sample

The field study was run in an Asian takeaway restaurant in a Swiss city over a period of four weeks. The takeaway outlet was chosen because it was among the best frequented restaurants participating in the local reusable takeaway box system reCIRCLE. The study was run only on weekdays for 120 minutes each day over lunch time (always from 11:30 am to 1:30 pm).

The experimental design of the study consisted of the between-subjects factor *manipulated social norm* (message: informational vs. social norm). On each day a sign with

either the informational message or the social norm message was placed on the counter of the takeaway outlet. Message types were permuted to avoid “weekday effects”.

In addition, the design included the factor *observed social modeling* (demonstration of target behavior: not present vs. present). That is, we coded whether or not customers experienced other customers choosing reusable takeaway boxes.

During data collection, an experimenter sat at a table next to the takeaway outlet and unobtrusively recorded (1) the type of takeaway packaging chosen for every order, (2) whether customers experienced social modeling or not and (3) the gender of the customers. The sample consisted of 2,643 takeaway meals ordered by 2,560 customers, of which 796 were female and 1,764 were male. Due to the aim of observing the orders unobtrusively, further demographic information could not be recorded.

2.2. Material

2.2.1. Manipulated Social Norm

To evaluate the impact of the manipulated social norm, we varied the messages on a set of informational materials advertising the reCIRCLE box within the takeaway outlet. While in the *informational message condition* (= control group), we used the existing informational material, which read “Order the reBOX with your meal — now!”; in the *social norm message condition* (= experimental group), we added a social norm message reading “Our customers demand a reduction of packaging waste. Many of them already use the reBOX,” with the sentence “Order the reBOX with your meal — now!” as a subheader (see the original German-language messages in Figure 1).

Figure 1. The wobbler as used in the *informational message condition* (on the left) and the *social norm message condition* (on the right; both in German).

The set of informational materials consisted of a A5 sign, a 'wobbler' mounted to a sample reusable takeaway box, and a stack of A6 flyers. As they were the informational material provided by reCIRCLE, the sign and the flyer also contained general explanations of how to rent a reusable takeaway box. The entire set was designed in accordance with the reCIRCLE corporate design and placed on top of the counter in the takeaway outlet. (See Figure 2 for a view of the takeaway outlet.)

Figure 2. The display of the manipulated social norm at the takeaway outlet.

2.2.2. Observed Social Modeling

To measure whether 'real-life' social modeling in favor of choosing a reusable takeaway box was present, we coded for the following two behaviors of other customers in the takeaway outlet: (1) choosing a reusable takeaway box, or (2) bringing along their own reusable takeaway box. Whenever any of these two behaviors occurred, we coded the takeaway packaging choices of all the customers in the outlet as being exposed to social modeling towards choosing a reusable takeaway box.

2.2.3. Takeaway Packaging Choice

To measure what kind of takeaway packaging customers chose for their food, we recorded each of the three possible outcomes: (1) customers chose to take their food in a disposable takeaway box, (2) customers chose to take their food in a reusable takeaway box (reBOX), or (3) customers brought along a reusable takeaway box. The staff of the takeaway

outlet was instructed to not proactively suggest any of the packaging options, to allow an unconfounded test of the hypothesized factors.

3. Results

To test the effect of social influence on the takeaway packaging choice, we handled our data in two ways. First, we recoded customers' takeaway packaging choices into a dichotomous response variable (disposable vs. reusable). Any customer order that included two or more meals was treated as a single choice[5]. Second, orders by customers who brought their own reusable takeaway box were excluded (n = 110). Our final sample therefore included 2,450 takeaway packaging choices, of which 2,410 customers chose a disposable takeaway box and 40 customers chose a reusable takeaway box (see Table 1a and 1b).

Table 1a. Takeaway Packaging Choices for Manipulated Social Norm

		Choice of Takeaway Box	
		Disposable	Reusable
Manipulated Social Norm	Informational Message	1189 (99%)	15 (1%)
	Social Norm Message	1221 (98%)	25 (2%)

Note. Overview of the takeaway packaging choices (disposable vs. reusable) for the *informational message condition* (control group) and the *social norm message condition* (experimental group). Percentages in brackets show the percentages of customers who made each takeaway packaging choice (disposable vs. reusable) for the two factor levels.

Table 1b. Takeaway Packaging Choices for Observed Social Modeling

		Choice of Takeaway Box	
		Disposable	Reusable
Observed Social Modeling	Not Present	2072 (99%)	20 (1%)
	Present	338 (94%)	20 (6%)

Note. Overview of the takeaway packaging choices (disposable vs. reusable) for customers exposed versus not exposed to social modeling. Percentages in brackets show the percentages of customers who made each takeaway packaging choice (disposable vs. reusable) for the two factor levels.

[5] Number of recoded orders: $n_{\text{two meals}} = 60$, $n_{\text{three meals}} = 4$, $n_{\text{four meals}} = 5$

A logistic regression was used to analyze the effects of both the manipulated social norm and observed social modeling, while controlling for the influence of gender. An overview of the results can be found in Table 2. Contrary to our hypothesis, the results reveal that when controlling for gender and observed social modeling, the manipulated social norm did not affect the takeaway packaging choice. That is, people were equally likely to choose a reusable (vs. disposable) takeaway box when they were exposed to informational material with or without a normative message advertising reusable takeaway boxes, $b = 0.36$, $p = .283$. When controlling for gender and the manipulated social norm, the observed social modeling did affect the takeaway packaging choice: Observing another customer using a reusable takeaway box increased the likelihood of choosing a reusable takeaway box, $b = 1.79$, $p < .001$. Independent of the manipulated social norm and the observed social modeling, women were more likely than men to choose a reusable takeaway box, $b = 0.80$, $p = .014$. According to the adjusted odds ratio, the odds of choosing a reusable takeaway box were approximately six times higher when observing other customers using or choosing a reusable takeaway box, as when observing other customers using or choosing disposable takeaway boxes, OR = 5.99, 95% CI [3.16, 11.34]. In addition, the odds of choosing a reusable takeaway box were approximately twice as high for women as for men, OR = 2.23, 95% CI [1.17, 4.22][6].

Table 2. Logistic Regression Predicting Takeaway Packaging Choice

Variable	***B***	***SE***	***p***	***z***	***OR***	***95% CI***
Gender[a]	0.80	0.32	.014	2.47	2.23	[1.17, 4.22]

[6] Note that there was a marginal and very small correlation between the manipulated social norm and the observed social modeling, $r(2448) = .03$, $p = .086$.

Manipulated Social Norm[b]	0.36	0.33	.283	1.07	1.43	[0.75, 2.81]
Observed Social Modeling[c]	1.79	0.32	<.001	5.54	5.99	[3.16, 11.34]

Note. *B* = regression coefficient, *SE* = standard error, *p* = probability value, *OR* = adjusted odds ratio, *CI* = confidence interval for adjusted odds ratio (*OR*).
[a]Reference category: men
[b]Reference category: informational message
[c]Reference category: social modeling not present

4. Discussion

This research tested whether social influence can promote the use of reusable (vs. disposable) takeaway boxes. A field study in a takeaway outlet where reusable takeaway boxes were offered through the local startup reCIRCLE examined (1) whether the existing informational materials were more effective when complemented by a social norm message, and (2) whether 'real-life' social modeling encouraged customers to choose reusable takeaway boxes.

In contrast to our hypothesis, the likelihood of choosing a reusable (vs. disposable) takeaway box was unaffected by adding a social norm message to the informational materials. As hypothesized, however, customers were more likely to choose a reusable (vs. disposable) takeaway box when they observed others using or choosing a reusable takeaway box. In other words, while we found evidence for social modeling, we did not find evidence for the impact of our manipulated social norm. Interestingly, we found that women were more likely, compared to men, to choose reusable (vs. disposable) takeaway boxes.

Failing to replicate the effect of social norms on pro-environmental behavior has theoretical as well methodological implications. From a theoretical perspective, it is relevant that the ineffectiveness of this manipulated social norm contradicts diverse behavioral change

theories (e.g., the Focus Theory of Normative Conduct (Cialdini, Reno, & Kallgren, 1990); Schwartz's (1975) Norm Activation Theory; and Ajzen's (1985) Theory of Planned Behavior), as well as empirical evidence showing that social norms foster pro-environmental behavior (e.g., Goldstein et al., 2008; Griskevicius et al., 2008; Mortensen et al., 2017; Nolan et al., 2008; Schultz et al., 2008; Schultz et al., 2007; Sparkman & Walton, 2017). Indeed, when we designed our social norm intervention we considered the findings of successful interventions which used normative connoted messages in restaurants to reduce food waste (see, Kallbekken & Sælen, 2013; Stöckli et al., 2018) and combined a descriptive norm with an injunctive norm, since that combination is more effective than the individual components (see Griskevicius et al., 2008; Schultz et al., 2008, 2007). Yet, a meta-analysis comparing the relative effectiveness of different social influence interventions suggests that social norms have a comparably weak effect size (Abrahamse & Steg, 2013). This substantiates our finding that, while the social influence intervention in form of social norms was ineffective, the social modeling was effective.

From a methodological perspective, it is worth noting that the implementation of the manipulated social norm in our field study might have been suboptimal. While customers may have been exposed to potential real-life social modeling the whole time they spent lining up in the restaurant, it is likely that some customers did not notice the social norm intervention, as it was only visible once they reached the counter (see Figure 2). Also, it is possible that the messages were too long to be processed and not eye-catching enough to attract attention. Clearly, this methodological limitation is significant from a theoretical perspective as norm salience is key to the success of social norm interventions (e.g., according to the Theory of Normative Conduct, see Cialdini et al., 1990).

The successful demonstration of inducing behavioral change through real-life social modeling offers valuable insights on how to foster the use of eco-friendly packaging. Our finding not only substantiates evidence within behavioral change research for the potential of role models to foster sustainable behavior (e.g., Abrahamse & Steg, 2013) but also conforms with research that shows how normative public food choices are (e.g., Ariely & Levav, 2000; Hamerman et al., 2018). Our finding – namely, that social modeling has more impact than normative messages – has also been found in food composting behavior. Here, normative prompts were ineffective when they were applied alone as well as when they were combined with the confederate models (Sussman & Gifford, 2013). However, in water conservation behavior, the impact of normative messages was substantially increased by combining them with confederate models (Aronson & O'Leary, 1982-83). However, a comparison between these studies is difficult as they use different methods of operationalization of social norm. While our work used a normative message that included a combination of inductive norm and descriptive norm, the works of Aronson and O'Leary (1982-83) and Sussman and Gifford (2013) used an inductive norm alone. Within their work the descriptive norm was made salient through confederates engaging in the target behavior.

It is well-established that the more people that engage in a target behavior, the more likely its diffusion becomes (Aronson & O'Leary, 1982-83; Milgram et al., 1969; Sussman, Greeno, Gifford, & Scannell, 2013). Three aspects of our findings are particularly interesting with respect to the diffusion of behaviors through social influence. First, our findings propose that small consumer groups can be effective at establishing sustainable behavior as more normative. Second, our findings suggest that even behaviors that contradict the present norm can be induced by social influence. Third, the growing trend towards green consumption may have

been a key factor. Indeed, recent research shows that dynamic norms are more effective in changing behavior than static norms. In contrast to static norms (i.e., behaviors that are seen as unchanging), dynamic norms are behaviors that are shown by a minority of people, are *counternormative* , but are also become more commonly done (i.e., behaviors that are seen as changing; see Mortensen et al., 2017; Sparkman & Walton, 2017). Replications of our research could contribute to this new stream of research and address underlying mechanisms; for example, by investigating whether the future perceived norm explains the effect of social modeling on behavior change (see Sparkman & Walton, 2017). Future research could also experimentally manipulate the dynamic social norm by varying whether a social role model is present or not. Such research would address a further limitation of the present study: the fact that this study examined neither boundary conditions for the observed behavioral change, nor the underlying psychological processes that are responsible for the observed effect.

Even though this field study demonstrated social modeling induced by a small group of consumers, the rate of the desired behavior requires further discussion. While customers used their own reBOX 110 times and contributed to 40 new choices of a reusable takeaway box, 2,410 meals were still ordered in disposable takeaway boxes. These numbers raise the question of whether the reCIRCLE offering itself and its existing informational materials induce detrimental psychological processes that impact the rate of the desired behavior. One critical element of the reCIRCLE system is that its customers rent the reBOX for about $10. In addition to potentially feeling like one is being charged for acting sustainably, having to spend $10 can be a barrier. While the sustainable option should be easy (Schultz, 2014), in this case it is the less convenient option.

In conclusion, the serious ecological and economic consequences of the production and discarding of disposable takeaway containers calls for the implementation of effective interventions to foster the use of reusable takeaway boxes. The present field study demonstrates the importance of getting at least a small group of consumers to perform a desired behavior in order to serve as social role models for others.

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