Using Normative Influences in Food Waste Reduction

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Resumo

Consumers seem to have a reduced preference to buy fruits and vegetables with unusual appearance, products with damaged package and close to the expiration date, usually called suboptimal food products. However, this pattern of behaviour is an important contributor to food waste levels. Interventions aimed at encouraging the purchase of suboptimal food are scarce, however needed. Two experiments examined the effect of social norms in driving suboptimal food consumption. Appeals employing social norms proved to affect purchases intentions toward these products, acting as possible strategy to food waste reduction. We discuss how social norms can be used to tackle food waste and the implications for marketing and policy actions.

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Abstract: Consumers seem to have a reduced preference to buy fruits and vegetables with unusual appearance, products with damaged package and close to the expiration date, usually called suboptimal food products. However, this pattern of behaviour is an important contributor to food waste levels. Interventions aimed at encouraging the purchase of suboptimal food are scarce, however needed. Two experiments examined the effect of social norms in driving suboptimal food consumption. Appeals employing social norms proved to affect purchases intentions toward these products, acting as possible strategy to food waste reduction. We discuss how social norms can be used to tackle food waste and the implications for marketing and policy actions.

Key words: Suboptimal food products, food waste, social norms

1. Background

Food waste has received increasing attention due to its economic, social and financial impacts. The major problem to deal with the issue is the fact that food losses and waste occur throughout the entire food supply chain (Parfitt, Barthel, & Macnaughton, 2010). From a life-cycle assessment, it is possible to affirm that about one-third of the world's food are lost or wasted annually. Behaviours that result into waste are considered environmentally negative behaviours (Farr-Wharton, Foth, & Choi, 2014) and interventions aimed at encouraging pro-environmental behaviours are therefore necessary. Theories of social influence in trying to encourage pro-environmental behaviours emerge as a promising alternative (Nolan, Schultz, Cialdini, Griskevicius, & Goldstein, 2008).

Social norms are used as a form of influencing preferences and behaviours (Cialdini, Reno, & Kallgren, 1990), representing the common and accepted behaviour for a specific situation, directly affecting attitudes, intentions, preferences and choices (Cialdini et al., 1990; Melnyk, van Herpen, Fischer, & van Trijp (2013).

Despite a large body of research showing the importance and effects of normative influences, we focus on particular new environmentally friendly behaviour, namely the purchasing of suboptimal food products. Fruits and vegetables with different visual appearance, food product with damaged package and close to its expiration date are called suboptimal food products (de Hooge et al., 2017) and previous studies shown the reduced preference to buy and consume these products (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer, 2015; de Hooge et al., 2015; Loebnitz & Grunert, 2015; Loebnitz, Schuitema, & Grunert, 2015). The rejection of suboptimal food and consumers' preferences for cosmetic standards are considered important contributors to increase food waste levels (Beretta, Stoessel, Baier, & Hellweg 2013; Parfitt et al., 2010; Gustavsson, Cederberg, Sonesson, van Otterdijk, Meybeck, 2011), affecting the whole food supply chain.

However, no research thus far investigated how to change these patterns of behaviour, especially on how to influence consumers to buy and to consume suboptimal food products in trying to tackle food waste. With that mentioned, the present study investigates whether social norms can increase consumers' purchase intentions toward suboptimal food products. We propose that when suboptimal food products are accompanied by normative influences the purchases intentions to buy these products will be greater. In the end, this study helps to find different interventions to food waste reduction by identifying factors that increase consumers' acceptance of suboptimal food.

2. Study 1

Study 1 was designed to support the analysis of social norms. In this first experiment, we sought to identify the percentage of purchases of different persuasive messages to use as an indication of the prevalent social norm in study 2. Whereas we do not know exactly how many individuals would buy these products, we decided to investigate this issue in study 1, aiming to create a realistic norm in the second study. To further our analysis, we tested the influence of environmental, social and financial appeals on the acceptance of suboptimal products. These three claims are motivators for food waste reduction (Graham-Rowe et al., 2014), and are in accordance with the dimensions of sustainability. In this way, study 1 analysed which message produces higher purchases levels and the results are used as an indication of the prevalent norm in the second study.

Participants and design. Participants were 127 (66 female; Mage=24.78; SD=4.43) university students recruited from the south of Brazil. Participants were invited to participate in a laboratorial study about food consumption. The experiment employed a 3 (message type: environmental, social, financial) x 3 (suboptimal food: unusual appearance, close expiration date, package damaged) with a control group (with no message) mixed-design, with first factor between-subjects and the second within-subjects.

Procedure. Participants were randomly assigned to one of the four experimental conditions. To manipulate the message type, participants were invited to imagine that they were in a supermarket buying food products. In the environmental message condition, participants read the following message with the three different products: "*Knowing that you can show respect for nature and help save the environment buying this product, would you buy this product?"* / social: "*Knowing that millions of people live in extreme hunger and that you can help future generations buying this product, would you buy this product?"* / financial: "*Knowing you can save your money buying this product, would you buy this product?"*. The control group did not receive a message and only visualized the three products. Participants visualized the three products separately and potential order effects were controlled with counterbalancing.

Pre-tests. To select the products, twenty-one participants rated in an online survey eleven images of suboptimal food. The selected products were a carrot with a different appearance, a yogurt with two days remaining to the expiration date, and a broken biscuit. Twenty-nine students participated in the second pre-test, to analyse the efficacy of manipulations, with the same procedures aforementioned.

Measures. Participants were asked if they would buy those products, with "yes" or "no" options. In the end, each participant answered three dependent variables.

Manipulation checks. For the message type, participants had to indicate their impression about the message with the product (e.g., "issues related to the environment"). Two items measured the opinions about the suboptimal carrot and biscuit (e.g. 1="appearance very similar to traditional patterns", 7="appearance very different from traditional patterns"). For the suboptimal yogurt, participants had to indicate the number of the days until the product expire (open answer question).

3. Results

Manipulation checks. The manipulation check of the messages occurred by checking the frequency of responses to each alternative in each experimental condition, mainly analysing whether these corresponded to the experimental situation in which the individual was assigned (75.8% in the environmental message answered correctly; 79.3% in social; and 66.7% in financial). For suboptimal food products, the image with an unusual appearance (M=5.91; SD=0.328), a damaged package (M=4.01; SD=0.284), and close to the expiration date (M=1.81; SD=0.119), were perceived as suboptimal, with no difference between conditions.

Dependent variable. Frequencies analyses revealed that social message produced higher purchase levels. Table 1 shows the results of each message.

Table 1 - Purchases frequencies (%)

Message	Carrot	Yogurt	Biscuit
Social	72.4	58.6	69.0
Environmental	66.7	45.5	45.5
Financial	63.6	57.6	57.6
Control	28.1	43.8	21.9

A logistic regression was modelled with repeated measures to analyse if individuals buy the product considering the type of message, image, and interaction between these two factors. The message type was the repeated measure in the model. There was a significant difference between the message type factor (Wald (3)=24.501, p<0.000). No significant interaction between the message type and the suboptimal factor was found (p=.237). In the same way, the type of suboptimal did not reveal a main effect (p=.270).

To analyse the four messages, differences between groups were compared. Analyses revealed a significant difference only between the control group and the other three groups (Wald (1)=18.14, p<0.0001). This means that between the environmental, social and financial messages no differences emerged (environmental x social, p=0.107; environmental x financial, p=0.398; social x financial, p=0.415). From the four messages, only the control group was considered different, having lower purchases levels.

4. Discussion

By investigating the sustainability dimensions in order to promote environmentally friendly food choices, it is possible to affirm that the variations of communication in environmental, social or financial appealing significantly influenced the purchases of suboptimal food products. However, differentiations between environmental, social and financial messages were not significant in our study. Consumers might choose to buy suboptimal food products due to economic reasons (financial message), but at the same time for ethical reasons (environmental and social messages).

Participants may associate these messages with quality aspects. The group that did not receive a positive inference (in this case the three different appeals) only accessed negative quality cues (the unusual appearance and characteristics of the products) (White, Lin, Dahl, & Ritchie, 2016). Consumers may assess negative credence quality cues (Grunert, 2007) when considering to buy suboptimal food products without a positive quality inference. It is known that consumers tend not to relate environmental issues with food (Hoek, Pearson, James, Lawrence, & Friel, 2017). However, the authors show that "social guilt" is usually associated with food and food waste issues. The higher purchases levels of the social message appeal may be associated with this factor and this message will be used in the following study.

5. Study 2

Study 2 analyses the effect of normative influences on the purchase intentions toward suboptimal food. The social norm manipulation uses the results from the first experiment, informing the number of individuals that approve and commonly buy the products (frequencies of intention to purchase from the social message). Written information is enough to affect the communicated behaviour and induce consumers to act accordingly (Schultz et al., 2008). Therefore, it is assumed that suboptimal food products with normative influence will have higher purchase intentions toward the products than suboptimal food products with no influence.

Purchasing suboptimal food may constitute pro-environmental behaviour (Loebnitz et al., 2015) and a way to act environmentally friendly (de Hooge et al., 2017). An antecedent of pro-environmental behaviour intentions is awareness of environmental problems (Schwartz, 1977; Stern, 2000). We assume that food waste problem awareness might also exert a positive influence on consumers' intentions toward suboptimal foods.

Participants and design. Participants were 111 (65 female, Mage=32.44; SD=8.91) who received an online invitation to participate in a survey about food consumption. The experiment employed a 2 (message appeal: normative influence, without message) x 3 (suboptimal food: unusual appearance, close expiration date, package damaged) in a mixed-design, with first factor between-subjects and the second within-subjects.

Procedure. Participants were assigned randomly to one of the two experimental conditions. To manipulate the social norm, participants were provided with the results from a recent survey (from study 1). For the carrot with an unusual appearance, they were informed that "*72.4% of the respondents approved and used to buy the product and think that people should buy it too to help the future generation and millions of people that live in extreme hunger".* The same occurred for the yogurt (with 58.6%) and the biscuit (69%). The control group did not receive a message and only visualized the three products. Potential order effects were controlled with counterbalancing.

Measures. Participants indicated individually their *intentions* to purchase the products ("How likely would you be to purchase this food item?"; 1="very unlikely", 7="very likely"). *Food waste problem awareness* was assessed with ten items (based on Loebnitz et al., 2015) (e.g., "We can avoid food waste by selling fruits and vegetables with 'abnormal' shapes"; 1 = "strongly disagree", 7 = "strongly agree").

Manipulation checks. Perceptions of the suboptimal food images were assessed with the same items as in Experiment 1, we only changed the manipulation check of the product with a close expiration date, using in this study a Likert-scale (1 = very far from the expiration date, 7 = "very close from the expiration date").

6. Results

Manipulation checks. Products were perceived as suboptimal: the image with an unusual appearance (M=6.12; SD=1.04), a damaged package (M=4.60; SD=1.80), and close to the expiration date (M=6.18; SD=1.02).

Dependent variable. Consistent with our hypotheses, a mixed-design analysis of variance revealed a main effect for the normative condition F (1, 109)=11.40, p<0.001. That is, informing participants that other individuals generally approve and buy the products significantly increased the purchases intentions (M=3.89, SD=0.19) when compared to the control group (M=2.99, SD=0,19). Also, a significant main effect for suboptimal food emerged, F (2, 108)=8.02, p<.001. Results of LSD post-hoc tests show that purchases intentions differ between the three products (Mcarrot=3.92, SD=0.21, Myogurt=3.44, SD=0.19, Mbiscuit=2.95, SD=0.17). The interaction between norms and suboptimal food was not significant. To analyse the effect of food waste problem awareness on consumers' purchase intentions, the variable was included in another analysis as covariates. Problem awareness emerged as significant predictor of consumers' purchase intentions (F(1, 108)=13.00, p<0.000).

7. Discussion

Study 2 revealed the effect of normative influences on purchase intentions toward suboptimal food products. The results show that social norms have the power to guide the behaviour, especially in environmental issues (Nolan et al., 2008). Participants exposed to the norms towards suboptimal food have higher intentions to purchase those products when comparted to the group that received any message. Additionally, problem awareness can drive

personal norms (Nordlund & Garvill, 2003). The results show that increasing problem awareness of food waste issues might exert a positive effect in purchase intentions toward suboptimal food.

8. General Discussion

Individuals indeed have lower purchase intentions toward suboptimal food (Mcontrol=2.99, SD=0.19). However, at the same time, these two studies showed how different strategies change this pattern of behaviour and how they can be used to deal with food waste issues, especially when analysing suboptimal food rejection. Retailers tent to discard suboptimal food, assuming that consumers will not buy these products (Loebnitz & Grunert, 2015). However, social norms are a potentially powerful motivator of prosocial behaviour (Goldstein, Cialdini, & Griskevicius, 2008) and can be used to with suboptimal food as potential strategy to food waste reduction.

It is known that social norms are maximized in uncertain, ambiguous and unclear situations (Cialdini & Goldstein, 2004; Lapinski & Rimal, 2005). When consumers are uncertain of a particular behaviour, they tend to look to the behaviour of others, searching evidences of how to act (Griskevicius, Cialdini, & Goldstein, 2008). This may be the case when retailers stop rejecting suboptimal food (Loebnitz et al., 2015) and start to sell them as valuable products. Consumers may face confusion or uncertainty when fruits and vegetables with different appearance, products with close expiration date or products with damages in package start being sold. Normative influences could, therefore, guide consumers' behaviour towards buying suboptimal food products. With behaviours occurring in public settings, such as supermarkets, normative influences have greater effects (Lapinski & Rimal, 2005).

Additionally, it is known that increasing problem awareness is a tool to push pro-environmental behaviours (Redman & Redman, 2014). The present findings suggest that awareness of food waste issues exert a positive effect in purchase intentions toward suboptimal food. Awareness of food waste problem may exert a negative feeling on individuals, as guilt feelings (Graham-Rowe et al., 2014), which induces individuals to conform to the behaviour of not wasting, in this case, buying suboptimal food.

The findings can be used with strategies to tackle food waste, especially when focusing on suboptimal food products. Communication campaigns and incentives to waste reduction by the use of social norms can increase consumers' acceptance of suboptimal products, not only in the retail environment, but also in the household setting.

More research is needed to understand if these effects occur with different products and in different contexts. Field studies to analyse real purchase behaviour should be stimulated, mainly because we cannot rule out that participants gave social desirable answers in these studies.

This research advances in a topic that urges attention. Higher levels of food waste are no longer acceptable. Our study demonstrated that social norms can affect prevention of food waste. Therefore, consumer-level change must be supported systemically by education and different initiatives, since they might lead to substantial decline in food waste going to landfill, saving public and private resources and contributing the sustainable development goals. Our results can also help to foster more direct and personalized communication regarding waste minimization.

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