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Social Emotions and Good Provider Norms in Tackling Household Food Waste: An Extension of the Theory of Planned Behavior

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Abstract: Many studies have explored the antecedents of food waste in the framework of the theory of planned behavior (TPB). Scholars have also made efforts to add explaining variables to the original TPB, with mixed results; they often fail to demonstrate the incremental validity of the extended models. In the current study, we sought to assess whether an extended TPB model including social emotions and Good Provider norms could predict intention to reduce food waste. We also measured two behaviors which may be predicted by intentions to reduce food waste: (1) reducing servings and (2) using leftovers. The results show that social emotions help explain leftovers utilization, whereas the Good Provider norms are inversely correlated to the reduction of servings. Compared to the traditional TPB model, the extended version has more predictive power, especially as regards reducing servings.

Keywords: servings; leftovers; social emotions; extended TPB

Citation: La Barbera, F.; Amato, M.; Riverso, R.; Verneau, F. Social Emotions and Good Provider Norms in Tackling Household Food Waste: An Extension of the Theory of Planned Behavior. *Sustainability* **2022**, *14*, 9681. https://doi.org/10.3390/su14159681

Academic Editor: Riccardo Testa

Received: 13 June 2022
Accepted: 4 August 2022
Published: 5 August 2022

1. Introduction

It is widely accepted that food waste is a global problem which concerns the whole supply chain [1], although, in Western developed countries, food waste is particularly relevant in the final stages of the supply chain [2]. The European Union generates around 88 million tonnes of food waste each year, and more than half of this value is attributable to households [3]. Recently, the issue of food waste has become even more central, as demonstrated by the European Green Deal and the actions put in place by the European Union to address the phenomenon, such as the Farm2Fork strategy [4] or the new Circular Economy Action Plan [5]. The European Union's goal is to halve the share of food waste by 2030, in line with the United Nations' 12th Sustainable Development Goal that aims to ensure sustainable production and consumption patterns [6]. To succeed in achieving this goal, waste prevention along the food chain is the preferred way to go [7]. Considering that households are the main perpetrators of food waste, wasting more than food industry and food distribution jointly [2], understanding and preventing food waste formation is of paramount importance.

Scholars have indeed multiplied their efforts to understand the factors which affect consumers' food waste. Many studies have explored the antecedents of food waste in the framework of the theory of planned behavior (TPB [8,9]), according to which behavioral intention is the direct antecedent of human behavior. Intention, in turn, is determined by three major factors: (1) attitude toward the behavior (ATT), which derives from the individual's beliefs about positive/negative consequences of the behavior in question; (2) subjective norm (SN), that is, the perceived social pressure to engage in the behavior; and (3) perceived behavioral control (PBC), namely an individual's belief about being capable of engaging in the behavior. In more recent years, it has been proposed to distinguish, in the normative domain, between injunctive norms, which derive from the individual's perceived expectations of relevant others ("How do they want me to do?"), and descriptive

norms, namely the individual's beliefs about relevant others' behavior ("How do they do it?") [10,11]. TPB has often been criticized for not taking sufficient account of affective factors influencing human intentions and behaviors [12,13]. Hence, many scholars have tried to explore the affective/emotional dimension, testing whether additional measures tapping into this area could have sufficient predictive validity, with encouraging results (see Sandberg and Conner [14] for a meta-analysis).

Extending TPB-Based Models of Food Waste

As we anticipated, research on food waste involving psychological and social factors has often been conducted in the TPB framework. Overall, these studies show the importance of attitudes, subjective norms, and perceived behavioral control in predicting the intention to reduce food waste [15,16]. Scholars also made efforts to add explaining variables to the original TPB, such as consumers' planning and shopping routines, moral attitudes, identity, and anticipated regret [15–19], with mixed results that still need to be clarified. Nevertheless, there is a lack of research on the role of affects and emotions in forming individuals' intention to reduce food waste. The few studies that explored the issue tended to consider emotion in a very general way, or to focus on a single emotion/affect. Furthermore, these studies generally fail to provide a comparison between the original TPB-based model, and the "augmented" one they propose, thus jeopardizing the possibility to assess the incremental validity of the new model and of the added factors [20,21].

Hence, the current study contributes to this area of scientific debate, introducing in the TPB framework—and assessing the incremental validity of—a measure related to a specific class of emotions of potential relevance in relation to food waste, namely social emotions. Until now, the possible contribution of social emotions to a TPB-based prediction model has not been formally tested, either in general or in relation to food waste. Generally speaking, all emotions are "social", meaning that they are influenced and often caused by social events [22]. Nevertheless, scholars have distinguished a subgroup of social emotions (e.g., shame) which necessarily depend on the (anticipated) beliefs, feelings, or actions of others. These emotions are social because of their strong connection with social norms, and they derive their defining quality from an intrinsic relation to social concerns [23]. From a review of the scientific literature on social emotions, and drawing on previous qualitative research on emotions and food waste [24], we selected six social emotions to be evaluated in the current study in a TPB-based research framework: anger [25], sadness [26], contempt, dislike [27], disappointment [28], and shame [29].

In addition, over the last few years, scholars have suggested that individuals' intentions and behaviors related to food waste might be influenced by the *Good Provider* norms (GPNs) [30–33]. In some cultural tradition, including the Italian tradition, caring for one's children, family members, and guests may involve the excessive purchase of food [24]. The Good Provider responds to the role of the good parent who looks after their children and offers them a variety of food choice. The Good Provider is the one who welcomes guests into the home and provides them with an overabundance of food. Scholars have pointed out that the Good Provider identity responds to an ideal role that many consumers aim to play, and this mentality motivates food choices and handling practices, including decisions to dispose of food [30,31,33–35]. Previous research provides early suggestions that even when individuals' hold attitudes against food waste, the importance that they place on the well-being of their families or guests leads them to take pleasure in "having a full fridge" and, on special occasions, having plenty of food. Therefore, the intention to reduce waste is weakened [24]. Nevertheless, there is still little evidence that the Good Provider norms can predict food waste-related intentions and behaviors [35]; in addition, previous studies failed to assess the incremental validity of the model including GPNs over the traditional TPB model [33]. Hence, in our study we evaluated the role of GPNs in a TPB framework.

In addition to the lack of clarity about the relevance of additional factors and the role of emotions, another major weakness of TPB research on food waste regards the relations between intention and behavior. Amato and colleagues [10] have highlighted

issues related to the operationalization of variables and compatibility of measures. Scholars have often measured intention to reduce food waste; then, as a measure of behavior, they asked participants how much food they had thrown away or generally throw away. However, throwing food away may hardly be intended as a behavioral implementation of the intention to reduce food waste. In the TPB framework, the items referring to the intention and behavior under investigation should refer to the same behavior. This is known as the compatibility principle (see [11]). Measuring the intention to reduce food waste and then—as a corresponding behavior—asking participants how much food they throw away (which is the opposite of the intention just measured) is not in line with the principle. Nevertheless, asking participants about their "not throwing food away" makes even less sense, because not throwing away food is not a behavior. Therefore, as pointed out by Amato and colleagues [10], it is necessary to investigate behaviors which are positive and real (such as reducing servings), and may be determined by the intention to avoid or mitigate food waste.

In line with the Waste Framework Directive adopted in the European Union (Directive 2008/98/EC)—which indicates prevention as the preferred and most efficient option and re-use as a second-best—Amato and colleagues [10] focused on reducing servings and using leftovers, providing early evidence that these behaviors may be effectively predicted by intention to reduce food waste with a TPB-based methodology. In this paper, we follow a similar approach, testing whether an extended version of TPB—including measures of social emotions and GPNs—would be effective in predicting intention to reduce food waste, and if this, in turn, would predict reducing servings and using leftovers.

2. Aims and Hypotheses

The current study was conducted in Italy. Italian consumers, bound by a strong culinary tradition characterized by a high consumption of perishable food products, waste on average about 67 kg of food per capita per year, which is higher than the European average [36]. Therefore, the first aim of the current research was to test the validity of a TPB-based model for the prediction of intentions to reduce food waste. Drawing on results of previous research, we expected the model to explain a significant amount of variance in participants' intentions (H1).

Our second aim was to examine the role of social emotions in the prediction of intentions and behaviors related to the reduction of food waste. Previous research did not provide evidence on this specific point. However, taking into account the significant contribution of affect-based measures to the prediction of behavioral intentions and behaviors (e.g., [14,20,37]), we expected social emotions to explain a significant proportion of variance over and above that explained by attitudes, subjective norms, and perceived behavioral control (H2).

In addition, we also sought to evaluate the role of the Good Provider norms in the framework of TPB, testing if their addition to a TPB-based model may significantly improve the prediction of intentions and behaviors related to food waste; previous research suggests that the role of this factor might be significant [24,33,35] (H3).

It is important to note that, according to the TPB's sufficiency principle (see also [10,11]), the three major constructs of the theory—that is, attitude, subjective norms, and perceived behavioral control—should be sufficient to predict intention. Other influential factors are possible, yet they are theorized as background factors and they are expected to influence intention only indirectly, via the mediation of the three major constructs of TPB. Hence, we should expect social emotions and Good Provider norms to influence intention only. Nevertheless, the few studies available on the point suggest a direct connection between emotions and Good Provider norms with behaviors [20,33]. Therefore, we tested the relations of these additional factors with both intention and behavior.

Finally, on the basis of a previous study by Amato et al. [10], we expected that intention to reduce food waste is significantly associated with both behaviors of reducing servings and using leftovers (H4) (Figure 1).

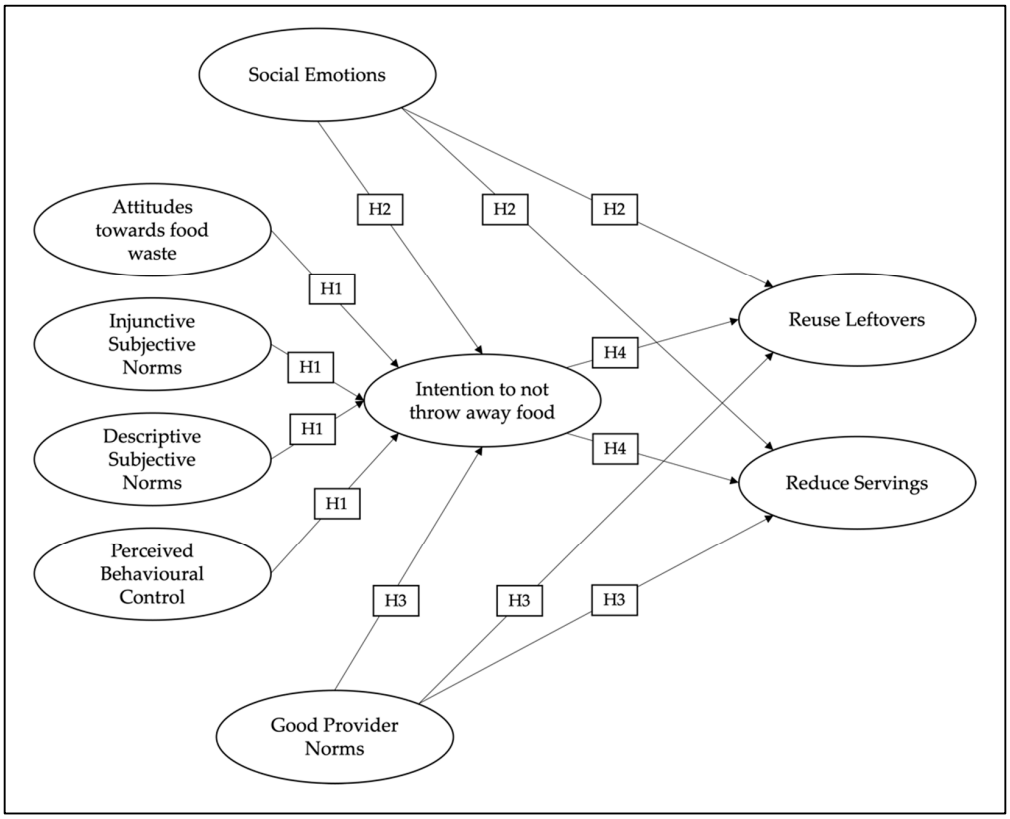

Figure 1. Extended TPB model. Source: Authors' elaboration.

3. Materials and Methods

3.1. Participants and Procedure

A convenience sample of 401 Italian participants was recruited through a non-probabilistic snowball online sampling technique, using the Facebook social media (253 females, M_{age} = 37.41, SD_{age} = 13.74), asking participants to recruit other subjects from their acquaintances. Participants received no economic compensation or university credit for their participation. They were assured of anonymity and informed that they were free to discontinue participation at any time without penalty. After giving their consent, they completed an online TPB questionnaire developed following the guidelines provided by Fishbein and Ajzen [11], containing the measures described below. The items were presented in non-thematic order and employed a 7-point response format.

The study was conducted according to the guidelines of the Declaration of Helsinki, and the ethical guidelines provided by the American Psychological Association. The research protocol was approved by the Review Board of the Psychological and Social Research Lab R. Gentile, Federico II University of Napoli, research protocol number 0252019.

3.2. Measures

Intention (INT). Four items were used to measure participants' general intention not to waste food (e.g., "I try my best not to throw food away"). Answers were collected by 7-point self-anchoring scales, from *strongly disagree* to *strongly agree*. Responses were averaged, with higher values indicating a stronger intention (Cronbach's α = 0.73).

Attitude (ATT). Attitude was measured by asking participants to rate the statement "For me, wasting food is:" on four 7-point bipolar adjective scales (*good–bad*, *useful–useless*, *pleasant–unpleasant*, *intelligent–not intelligent*). A composite measure was computed by averaging the scores (Cronbach's α = 0.80). Higher values indicate more positive attitudes towards wasting food.

Injunctive subjective norm (SN-I). Three items were used to measure participants' subjective norms (injunctive) about wasting food (e.g., "Most people I care about think I should not waste food"; 7-point scales, *extremely unlikely–extremely likely*). Responses were averaged, with higher values indicating normative support in favor of not wasting food (Cronbach's $\alpha = 0.66$).

Descriptive subjective norm (SN-D). Two items were used to measure subjective norm (e.g., "Most people I care about do not waste food"; 7-point scales, *extremely unlikely–extremely likely*). The answers were aggregated into a single average score (Spearman–Brown $\rho = 0.76$). Higher values indicate descriptive norms supportive of not wasting food.

Perceived behavioral control (PBC). Two items were used to measure perceived behavioral control (e.g., "I am capable of not wasting food" (7-point scales, *strongly disagree–strongly agree*). The items were averaged to create a single score (Spearman–Brown $\rho = 0.84$). Higher values indicate higher perceived behavioral control.

Social emotions (SE). Participants were asked to think for a few seconds about food wasted, then to report how they feel about it, using a list of six emotions and selecting the respondence of each one to their feeling on a 7-point scale. As described in the Section 1, the social emotions on the list were anger, sadness, contempt, dislike, shame, and disappointment. The answers were aggregated into a single average score (Cronbach's $\alpha = 0.85$). Higher values indicate more positive self-reported social emotions towards wasting food.

Good Provider norm (GPN). Drawing on a previous study (La Barbera et al., 2016), two items were used to measure the Good Provider norm: "I like having my own refrigerator and pantry full" and "On special occasions (such as parties, dinners with friends, social events), I like to have plenty of food". Participants expressed their agreement with the items on a 7-point scale. The answers were aggregated into a single average score (Spearman–Brown $\rho = 0.64$). Higher values indicate a lower GPN.

Servings. Participants self-reported their behaviors connected to food servings by means of two items (e.g., "I try to prepare and serve the right portions to avoid leftovers"; 7-point scales, from *strongly disagree* to *strongly agree*). The answers were aggregated into a single average score (Spearman–Brown $\rho = 0.68$). Higher values indicate a self-reported behavior which tends to limit servings.

Leftovers. Participants self-reported their behaviors connected to leftovers by means of two items (e.g., "I always try to use leftover food"; 7-point scales, from *strongly disagree* to *strongly agree*). The answers were aggregated into a single average score (Spearman–Brown $\rho = 0.79$). Higher values indicate more self-reported utilization of food leftovers.

Descriptive statistics of constructs and measuring items is provided in Table 1.

3.3. Statistical Analysis

Cronbach's alpha was used to test the internal coherence of multi-item scales. According to the most common rules of thumb, acceptable values range from 0.70 to 0.90. Nevertheless, this coefficient is very sensitive to the number of items included in the scale; for brief scales, values above 0.60 are also reasonable, because it has been shown that Cronbach's alpha tends to underestimate the internal consistency of brief scales [37]. We used Spearman–Brown's coefficient for two-item scales to obtain more accurate results [38].

In order to assess the predictive validity of the TPB model, and the incremental validity of the augmented model, we used stepwise regression analyses. In the first step, the original TPB model was evaluated, with the TPB's major constructs—attitude, injunctive and descriptive norms, and perceived behavioral control—as predictors. In the next step, social emotions and Good Provider norms were entered in the regression as additional predictors. The significance of difference in terms of variance explained by the model due to the introduction of the additional factors was formally assessed. The statistical analysis was conducted by SPSS 27 (SPSS Inc., Chicago, IL, USA); the accepted level of significance of the null hypothesis test was set at $p < 0.05$.

Table 1. Descriptive statistics of constructs and measuring items.

	Mean (SD)
Intention to not throw away food (Cronbach's α = 0.73)	
In general, I try to avoid throwing food away	6.38 (1.01)
I strive to avoid throwing away food	6.11 (1.29)
My general intention is to avoid throwing away food	6.64 (0.74)
I do everything to avoid throwing away food	6.22 (1.20)
Attitude towards food waste (Cronbach's α = 0.77)	
For me, throwing away food is … (Useful–Useless)	6.59 (1.02)
For me, throwing away food is … (Positive–Negative)	6.70 (0.71)
For me, throwing away food is … (Pleasant–Unpleasant)	6.63 (0.81)
For me, throwing away food is … (Good–Bad)	6.57 (0.88)
Injunctive Subjective Norms (Cronbach's α = 0.66)	
Most people who are important to me believe that I should not throw food away	5.39 (1.80)
Other people expect me not to throw food away	5.25 (1.73)
Most people whose opinion is important to me approve my avoidance of throwing away food	5.90 (1.54)
Descriptive Subjective Norms (Spearman–Brown ρ = 0.66)	
Most people close to me do not throw away food	5.26 (1.65)
In general, I think most people who are important to me do not throw away as much food	4.99 (1.63)
Perceived Behavioural Control (Spearman–Brown ρ = 0.84)	
I am able not to throw food away	5.72 (1.48)
I feel capable of not throwing food away	5.89 (1.36)
Social Emotions (Cronbach's α = 0.70)	
Anger	5.12 (1.82)
Sadness	5.37 (1.77)
Contempt	4.41 (2.06)
Dislike	4.27 (2.08)
Shame	4.74 (2.07)
Disappointment	5.28 (1.80)
Good Provider Norm (Spearman-Brown ρ = 0.64)	
I like having my own refrigerator and pantry full	4.90 (1.57)
On special occasions (such as parties, dinners with friends, social events), I like to have plenty of food	5.45 (1.45)
Leftovers (Spearman-Brown ρ = 0.79)	
I always try to use leftover food	5.96 (1.29)
I always try to use leftovers in a creative way	5.46 (1.58)
Servings (Spearman-Brown ρ = 0.68)	
I try to prepare and serve the right portions to avoid leftovers	5.98 (1.24)
I always try not to put more food on the table than I have to	5.33 (1.51)

Note: n = 401.

4. Results

A hierarchical regression analysis was performed to test for the direct effects of the TPB predictors on intention and for the additional factors. On the first step, intention was regressed on attitude, injunctive and descriptive norms, and perceived behavioral control. The model is specified as follows (Equation (1)):

$$intention_i = \alpha + \beta_1 ATT_i + \beta_2 SNI_i + \beta_3 SND_i + \beta_4 PBC_i + \varepsilon \quad (1)$$

where $intention_i$ is the intention score for the ith participant; ATT is the score of the attitude measure; SNI is the score of the injunctive subjective norm measure; SND is the score of the descriptive subjective norm measure; and PBC is the score of the perceived behavioral control measure.

The original TPB model explained 39% of the variance, and all predictors were significantly associated with intention, except for injunctive norms. On the second step, social emotions and Good Provider norms were added as predictors of intention, yielding no significant difference in explained variance, $F < 1$. The model is specified as follows (Equation (2)):

$$intention_i = \alpha + \beta_1 ATT_i + \beta_2 SNI_i + \beta_3 SND_i + \beta_4 PBC_i + \beta_5 SE_i + \beta_6 GP_i + \varepsilon \quad (2)$$

where $intention_i$ is the intention score for the ith participant; *ATT* is the score of the attitude measure; *SNI* is the score of the injunctive subjective norm measure; *SND* is the score of the descriptive subjective norm measure; *PBC* is the score of the perceived behavioral control measure; *SE* is the score of the social emotion measure; and *GP* is the score of the Good Provider measure.

The results are summarized in Table 2.

Table 2. TPB original and extended models of intention to reduce food waste.

	Predictor	B	Std Err	t	R^2	ΔR^2
Step 1					0.390	/
	ATT	0.311 ***	0.051	6.148		
	SN-I	0.034	0.029	1.146		
	SN-D	0.105 ***	0.026	4.098		
	PBC	0.218 ***	0.027	8.119		
Step 2					0.393	0.003
	ATT	0.299 ***	0.052	5.773		
	SN-I	0.025	0.030	0.842		
	SN-D	0.105 ***	0.026	4.101		
	PBC	0.214 ***	0.027	7.940		
	SE	0.028	0.023	1.205		
	GPN	0.018	0.025	0.709		

Note: Dependent variable: Intention; *** = $p < 0.001$; $n = 401$.

A second hierarchical regression analysis was performed to test the effects of TPB predictors plus additional factors on using leftovers. On the first step, using leftovers was regressed on attitude, injunctive and descriptive norms, and perceived behavioral control. The model is specified as in Equation (1). The original TPB model explained about 36% of the variance. In line with the theory, only intention and perceived behavioral control were significantly associated with the behavior. On the second step, social emotions and Good Provider norms were added as predictors of the behavior; the model is specified as in Equation (2). Entering the additional predictors did provide a significant improvement of the model. Social emotions were significantly associated with the behavior, whereas Good Provider norms were not. The results are summarized in Table 3.

A final hierarchical regression analysis was performed to test the effects of the original TPB predictors and of the additional factors on reducing servings. On the first step, reducing servings was regressed on attitude, injunctive and descriptive norms, and perceived behavioral control: the original TPB model accounted for 18% of the variance. Similar to the previous analysis, only intention and perceived behavioral control were significantly associated with the behavior. On the second step, social emotions and Good Provider norms were added to the model, yielding a significant increment in explained variance. Contrary to the case of using leftovers, Good Provider norms were significantly associated with reducing servings; social emotions had a marginal effect. The results are summarized in Table 4.

Table 3. TPB original and extended models of intention to use leftovers.

	Predictor	β	Std Err	t	R^2	ΔR^2
					0.357	/
Step 1	ATT	0.141	0.088	1.603		
	SN-I	0.038	0.049	0.774		
	SN-D	0.056	0.043	1.298		
	PBC	0.113 *	0.048	2.358		
	INT	0.722 ***	0.084	8.646		
					0.373	0.016 **
Step 2	ATT	0.098	0.089	1.101		
	SN-I	0.009	0.050	0.177		
	SN-D	0.058	0.043	1.355		
	PBC	0.105 *	0.048	2.185		
	INT	0.704 ***	0.083	8.490		
	SE	0.109 ***	0.038	2.847		
	GPN	0.054	0.041	1.316		

Note: Dependent variable: leftovers; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; $n = 401$.

Table 4. TPB original and extended models of intention to reduce servings.

	Predictor	β	Std Err	t	R^2	ΔR^2
					0.183	/
Step 1	ATT	0.021	0.091	0.228		
	SN-I	−0.010	0.050	−0.198		
	SN-D	0.033	0.045	0.749		
	PBC	0.148 ***	0.050	2.984		
	INT	0.443 ***	0.086	5.150		
					0.229	0.046 ***
Step 2	ATT	−0.014	0.090	−0.151		
	SN-I	0.014	0.050	0.278		
	SN-D	0.025	0.044	0.568		
	PBC	0.131 ***	0.048	2.694		
	INT	0.448 ***	0.084	5.332		
	SE	0.067	0.039	1.731		
	GPN	−0.188 ***	0.042	−4.530		

Note: Dependent variable: servings; *** = $p < 0.001$; $n = 401$.

5. Discussion

The study results contribute in several ways to the scientific knowledge about psychological and social factors which influence people's intentions and behaviors related to household food waste.

First, the model built solely on the basis of TPB proved reliable and predictive of intention to reduce household food waste; importantly, it also predicted two specific behaviors, namely using leftovers and reducing servings, which have been defined as highly valuable and recommended by international entities (Directive 2008/98/EC). These results confirm previous findings [10] and suggest an important avenue for future research as well. In order to contrast food waste at the household level, there is a need for individuating and promoting specific behaviors through education, communication, and policy. Research should therefore investigate the antecedents of those behaviors that are considered as most valuable and effective against household food waste—such as using leftovers and reducing servings—rather than focusing on "non-behaviors" such as "not throwing food away".

Second, research guided by TPB has often tried to extend the theory by adding novel factors, yet it has often failed to formally demonstrate the significance and size of the incremental validity of these extended TPBs compared to the original. In the realm of food studies, for example, Russell and colleagues [20] have paid attention to affective

dimensions; however, they failed to assess their extended model in comparison to the original TPB model, thus making it difficult to understand the importance of the factors they introduced. In a similar fashion, Visschers and colleagues [33] explored the important topic of Good Provider norms in a TPB framework, yet failed to assess the incremental validity of the (extended) model including GPNs over the traditional TPB model. Tønnesen and Grunert [39] also added several factors to the original TPB model, including an affective measure; nevertheless, the addition of these new factors determined a significant worsening in statistical fit indexes, and even a decrement in explained variance.

In the current study, we sought to overcome these limitations of previous research by analyzing the incremental validity of the new explaining factors we propose. In this way, we set the conditions to conduct more reliable evaluations about the contribution of those factors in explaining intentions and behaviors, over and beyond the traditional TPB model.

Overall, the addition of social emotions and Good Provider norms makes a difference, especially in the case of the prediction of reducing servings, increasing the explained variance by almost 5%. This increase was mostly due to the significant effect of Good Provider norms, whereas social emotions had a marginal effect. This could be very important, because reducing servings is the behavior recognized as the most effective in combating household food waste and promoting a more efficient allocation of resources [40], and is thus the one on which scientists, stakeholders, and institutions should concentrate their efforts. Our research strongly supports the idea that a Good Provider mentality may be a significant burden which impedes individuals when it comes to reducing servings and adhering to campaigns and recommendations against food waste. Moreover, since a systematic over-portioning may be related to obesity, the overconsumption leading to body fat, health problems, and excess resource utilization is considered by several researchers as an indirect form of food waste [41,42].

Actions aiming at reducing food waste should be aware of this, especially when operating in contexts in which the Good Provider mentality is widespread, and strategies for overcoming this burden should be developed. The social construction of a "new Good Provider" mentality, based on quality over quantity, which recognizes the importance of healthy food and acknowledge the overabundance of food as a threat for people's health, may be a promising path for future research and interventions.

Social emotions showed instead a significant and positive association with the using of leftovers, which significantly increased the predictive power of the TPB traditional model, yet with a small gain in explained variance (<2%). This result confirms the suggestions of previous qualitative research, showing that using leftovers is a behavior fed by feelings of shame [24]. This could be somewhat dangerous in a sense because people who resolve their emotional conflicts about food waste by means of reusing leftovers would likely be less motivated to reducing servings, which is the most effective behavior against food waste, as already discussed. Moreover, the construction and spread of a *New Good Provider* identity might be an interesting path for social action against household food waste.

Our findings also highlight a theoretical question as regards the TPB's sufficiency principle, because social emotions and Good Provider norms affect behaviors directly, without the mediation of intention. As regards social emotions, this may be explained in relation to the paramount tradition of research on implicit social cognition and non-deliberative decision processes, which maintains that human behaviors might be affected by non-cognitive and non-conscious factors, such as implicit associations and affective states (see, for example, [43]). However, research on the effects of affect/emotions in TPB still needs clarifications. A meta-analysis by Rivis and colleagues [44] showed that the effect of anticipated affects on behavior is mediated by intention. Nevertheless, a recent study by Richards and colleagues [45] shows that affects directly influence weight loss behaviors. Overall, there is a need for research in relation to specific fields and behaviors, and specific categories of emotions. In this sense, our study contributes to the scientific knowledge in the field of food waste and in relation to social emotions, opening avenues for future research as well.

Interestingly, the Good Provider norms are not linked to intention, but directly associated with a behavior (reducing servings). At least one study by Visschers and colleagues [33] already found a direct association between GPNs and food waste-related behaviors. This could seem surprising, because the Good Provider norms might be associated with the concept of subjective norms, and thus one should expect them—in a TPB framework—to influence the intention instead. Nevertheless, the Good Provider norms may also be intended as a more general kind of norm, which transcends the individual's expectations about what their significant others do (descriptive norms) and expect them to do (injunctive norms). General moral orientation, such as moral or personal norms, have often been found to be directly associated with behaviors in TPB research (see, for example, [46] for the pro-environmental domain).

6. Conclusions

The current study has confirmed the applicability of the TPB model with additional predictors, namely the Good Provider norms and social emotions, to explain individuals' positive behaviors against household food waste generation. Our findings show that social emotions help explain leftovers utilization, whereas the Good Provider norms are inversely correlated to the reduction of servings. Compared to the traditional TPB model, the extended version has more predictive power, especially as regards reducing servings.

Although extending the TPB with additional predictors appears promising, further research is needed, also considering that our study presents several important limitations that need to be acknowledged. First, the research was conducted in Italy with a non-probabilistic sample; therefore, some caution should be adopted about the generalization of results to different contexts and behaviors, which need appropriate investigation. Another important limit regards the information on food waste-related behaviors (using leftovers and reducing servings), which have been collected using self-report measures, which might suffer from social desirability bias [47,48]. Although self-report measures of behavior have often been employed in previous research on food waste guided by TPB [15,16,46], further investigation of the role of social emotions and Good Provider norms could be fruitfully conducted with direct behavioral measures. This becomes even more important because our results show a direct connection between social emotions and Good Provider norms on the one hand, and food waste-related behaviors on the other hand, thus underlining the relevance of operationalization and measurement of food waste-related behaviors, which could be an intriguing research path for TPB-guided studies on household food waste.

Author Contributions: Conceptualization, M.A., F.V., R.R. and F.L.B.; methodology, F.L.B.; formal analysis, F.L.B.; investigation, M.A. and R.R.; writing—original draft preparation, M.A., F.V., R.R. and F.L.B.; writing—review and editing, M.A., F.V., R.R. and F.L.B.; supervision, F.L.B. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and the ethical guidelines provided by the American Psychological Association. The research protocol was approved by the Review Board of the Psychological and Social Research Lab *R. Gentile*, Federico II University of Napoli, research protocol number 0252019.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data will be shared upon reasonable request to the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

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