Your Plate or Mine?
An Experimental Study on Food Waste and the Impact of Altruism

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Abstract

Food waste is a significant economic and societal problem that negatively affects the environment and the economy. This paper aims to study the willingness to pay of consumers to prevent food waste and how altruism impacts this decision. In this study, I analyze this question using a contingent valuation method in the form of a survey distributed to Vrije University Amsterdam students. Analyzing the participants' response data using Wilcoxon Matched-Pairs Sign-Rank tests, logit, and multivariate regression models, I attempt to determine the impacts of altruism and socio-demographics on participants' willingness to pay to prevent the waste of six unique food items. Our results provide evidence that consumers are willing to pay more to prevent food waste in the altruistic versus personal scenarios and that respondents who identify as female and perceive themselves as altruistic have a higher probability of displaying this behavior.

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1 Introduction

According to the 2021 UNEP Food Waste Index Report, approximately 931 million tonnes of food waste was generated in 2019. That accounts for roughly 17% of total global food production that year. Food waste at this scale is an issue of great societal and environmental concern. Wasted food is a significant contributor to global climate change, and wasted food that could be sent to impoverished citizens instead ends up in landfills. In 2020, nearly 16 million impoverished citizens depended on food assistance/aid from local charities (Seberini, 2020). Furthermore, food insecurity can lead to increased malnutrition and other severe health impacts, especially in children, leading to increased mortality rates from pollution and increased healthcare costs (Freijer et al., 2018; Khalatbari-Soltani & Marques-Vidal, 2015).

While harming the health of the global populace, food waste also harms our planet by increasing carbon monoxide (C02) emissions when food is wasted prematurely and sent to landfills. In 2019, food dump emissions accounted for nearly 7% of total global emissions (Seberini, 2020). Animal products in these food dumps are particularly detrimental. They are wasted in lower volumes but generate disproportionately high emissions relative to other types of food waste (Venkat, 2012). Lastly, from a purely economic perspective, food waste represents billions of dollars of lost profits. In 2020, a study published by Seberini found that costs, when including negative environmental externalities, are approximately $2.6 trillion a year. Although this estimate focuses on all forms of food waste, consumer waste in particular contributes substantially to these high costs. Kumar Venkat (2012) conducted a study on the retail value of this waste and approximated that consumer waste reached nearly $125 billion in retail costs.

This issue is global and affects every country uniquely. Changes must occur at each point of food waste creation to mitigate the damages inflicted on the environment, economy, and society. Policies and actions targeting food waste should focus on each step of the process, from the waste in the agricultural and production sections to the waste stemming from overstocking and the practice of discarding “ugly produce” in the retail industry. However, although it is important to target all forms of food waste, most studies have found that household consumer waste is a relevant prevailing issue and that its impacts are often downplayed. The 2021 UNEP Food Waste Index Report found that of the 931 tonnes of food waste generated, 61% was created at the household level. The next highest contributor (26%) was from the food service industry. The food waste from households has been accelerating over time, with the 2021 estimate being approximately double the estimate from the FAOs report in 2011 (Gustavsson et al., 2011).

The majority of the economic literature surrounding food waste attempts to analyze the reasons consumers waste in an attempt to create policy that helps reduce these behaviors. Personal/cultural beliefs (Grasso et al., 2019), feelings of regret (Aydin & Yildirim, 2021; Mattar et al., 2018), procrastination (Blichfeldt et al., 2015), organization/shopping habits (Farr-Wharton et al., 2014; Romani et al., 2018), and poor food literacy (Kavanaugh & Quinlan, 2020; Wilson et al., 2017) are just a few of the reasons for consumer food waste that researchers have studied. Significant research has explored how much consumers are willing to pay for

environmental goods or services that lessen their impact on climate change. However, these studies seldom focus on consumers' willingness to pay as it relates to the unique problem of food waste. Simply understanding why a consumer might waste food can help implement actions that change consumer behavior. For example, using nudges to incentivize change or creating information campaigns to educate consumers is useful. However, it lacks a monetary estimate of how much they value reducing food waste.

This paper aims to derive consumers' willingness to pay (WTP) to prevent food waste. Specifically, the aim is to understand how altruism plays a role in food waste decision-making and how the differences in food items may impact how consumers value preventing food waste.

Given these key aims, the research question of this study is as follows:

"*How does the choice between personal consumption or charitable giving affect consumers' willingness to pay to prevent food waste?"*

This research applies a contingent valuation method in the form of an online survey to address this question by applying real outcomes for participant actions, allowing for the collection of revealed preference data. The participant's responses in the study are then analyzed using Wilcoxon matched-pairs signed-rank tests and multivariate regression analysis to explore the relationships between willingness to pay and altruism, personal gain, and socio-demographic characteristics. This study finds that an altruistic setting plays a significant role in gauging consumers' WTP, with gender playing a significant role as well. A secondary analysis also reveals evidence that consumers' altruistic perceptions of themselves are significant in not only their WTP but in predicting if they are willing to pay a price premium to prevent waste.

The structure of this paper is as follows: Section 2 will consist of a brief literature review. This review will cover previous literature regarding consumer willingness to pay regarding sustainable choices and food waste, along with research on altruism's effects. Section 3 will be the Experimental Design section which will describe the study/survey design, along with how the data was cleaned and analyzed using different regression analysis techniques. Section 4 will introduce our primary and secondary hypotheses that will be evaluated, along with included treatments for our study design. Section 5, Results, will summarize the regression results and discuss whether our hypotheses were correct and statistically significant. Section 6 is Further Explorations and includes a secondary analysis beyond our initial hypotheses. Section 7 is the paper's Discussion section, focusing on the study's implications and future research. Section 8 will contain our conclusions and general remarks on the study. Lastly, Sections 9 and 10 will be for References and an Appendix.

2 Literature Review

This section will briefly overview this study's key concepts and relevant literature. Additionally, it will cover the WTP for sustainable behavior and food, along with discussing altruism,

paternalistic altruism, and altruism's overall effect on a consumer's WTP to behave in an environmentally friendly way.

2.1 WTP & Sustainable Consumer Behavior

With increasing interest in sustainable and environmentally friendly behavior, researchers have come to various definitions of sustainable consumer behavior. For this research, the definition used will be from Trudel (2018), which defines *sustainable/environmental behavior* as "the extent to which decisions are driven with the intention to benefit or limit the impact on the environment." Trudel's definition is broad but beneficial for looking at what makes products sustainable, and it coincides neatly with the definitions of altruism used in this study, which a later section will discuss. The following necessary clarification is for the definition of sustainable products. Lennart (2007) defined *sustainable products* as "a product which will give as little impact on the environment as possible during its life cycle." Establishing these terms, we can now review the relevant literature regarding consumers' behavior and their WTP for sustainable products.

Overall, the literature largely agrees that having a higher WTP for acting sustainably or purchasing sustainable products depends on various characteristics. For example, personal beliefs, different demographics, and culture all impact one's WTP, but many studies have concluded comparable results for key demographics. For example, Fisher et al. (2012) used an online survey to ask participants about their sustainable behavior habits and looked at how seven key demographics responded. They found that of the seven demographics, women and those with higher incomes have positive statistically significant relationships with more environmentally friendly behaviors, also known as green behaviors. In contrast, age, race, the number of children in a household, education, and marital status had no significant ties to more green behavior or the use of green products (Fisher et al., 2012).

Shuai et al. (2014) expanded on this study by researching the impacts of carbon labeling products and how this leads to varying WTP values for goods. They conducted an experiment by introducing carbon labeling in China, calculated the differences in consumers' willingness to pay, and then used logistic regression to observe how specific demographics differed in their WTP for low-carbon products. This study found "positive relationships between education, monthly income and monthly spending and consumer willingness to pay" (Shuai et al., 2014). Although finding this relationship with education contrasts with Fisher et al.'s study, intuitively this makes sense. Having obtained a higher degree of education might lead to consumers having more food/environmental literacy and thus being able to better perceive the total net benefits that low-carbon food might have. Since lacking food literacy is a common cause of food waste (Wilson et al., 2017), we can see that education plays a role in many environmental decisions and that higher education typically leads to more sustainable behavior. As for income and monthly spending, having less of a budget constraint means that consumers can spend more on environmental products. In contrast, those with large monetary constraints can only afford cheaper options with a higher negative impact.

Other than demographic variables playing a significant role in consumer WTP, classic economic influences on sustainable decision-making should be briefly mentioned. Consumers are constrained by their budgets and product price, and often have to make decisions regarding substitution between various products, along with countless other variables. Biswas (2016) conducted research to investigate the drivers that lead to environmental purchases and how this affects the "green premium" consumers are willing to pay. They conclude that the most significant variables determining whether a consumer will pay a higher price due to a sustainable product are "price, availability, performance, and quality" (Biswas, 2016). Knowing that these more traditional determinants of goods also substantially impact consumers' buying decisions is vital for understanding their WTP for specific products. Although they may be WTP more for a green product, there are still limiting factors such as their budget and if the item is viewed as a "quality" item, demonstrating that a good merely being "green" is not enough.

Further specifying how food plays a role, recent literature has agreed that consumers are willing to pay more for sustainable food and find importance in environmentally friendly food practices. Understanding this allows for a better understanding of how preventing food waste is valued similarly to purchasing sustainable food.

A study done in Spain by de-Magistris & Gracia (2016) attempted to test a consumer's WTP for produce that was organic, locally grown, or both. They applied a real valuation method (RCE) to try and mitigate hypothetical and social bias. They then attempted to derive the WTP of three different groups of individuals — conventional consumers, short-distance consumers, and sustainable consumers — all ranked on their environmental preferences. They found that all groups, even the conventional consumers with the least environmental preferences, had a positive WTP for both locally grown and organic food. This research helped demonstrate that even those with minor environmental behavior would be willing to pay a positive premium for sustainable food.

Yi (2019) expanded on this research by looking at not only single food items but on food production practices and a consumer's WTP for sustainably produced food. Conducting an online survey, Yi derived the WTP of sustainable aquaculture practices, specifically looking at a popular fish in Korea, the Korean Red Seabream. They found that when consumers were informed and knew about the fish being produced sustainably, the WTP for the fish was $10 higher than if the fish was produced in conventional aquaculture methods (Yi, 2019). This research shows that a higher WTP for sustainable goods is not limited to sustainable production and transport but that consumers are willing to pay higher prices for sustainably raised food.

Lastly, in a 2021 study done by Li & Kallas, they conducted a meta-analysis of 80 worldwide studies to look at multiple sustainable attributes of food products and if consumers were willing to pay a higher price premium for more sustainable food items. They find that consumers have a positive WTP of 29.5% for a higher price premium. This positive relationship is independent of the food's category, production method, or region of production (Li & Kallas, 2021). However, it

should also be noted that this analysis found that studies applying hypothetical approaches return higher WTP results of correspondents due to hypothetical bias. These overestimated results are consistent with the literature and are addressed in our study design.

2.2 Altruism, Paternalistic Altruism, and WTP for the Environment

Altruism plays a crucial role in reducing food waste, and donations to food banks/organizations can have significant positive impacts on those who are food insecure. However, there are many forms of altruism, and these different variations affect a consumer's WTP for an item.

Hartmann et al. (2017) define *altruism* as "acting to increase the welfare of others incurring personal costs but lacking personal gains." At the same time, altruism has often been expressed in more biological terms, where it is seen as enhancing another's fitness while weakening one's own fitness (Kennett, 1980). The former definition is more economical and will be used in this study, which focuses on welfare, costs, and benefits.

Altruistic actions and giving are not always thought of as pure, and there are many different variations of altruism studied that will influence how a consumer will act. Andreoni (1990) found that 'pure altruism' was not easily generalizable and situationally unique. He proposed the idea of impure altruism, assuming that when faced with two different options, "people are not indifferent between these alternatives: all else equal, they prefer the bundle with the most warm glow." This idea that there is an additional utility gain from the act of giving to others is truly relevant to environmental behavior. Suppose consumers gain additional utility through this "warm-glow" feeling, which is not purely the altruistic act of helping another. In that case, this can influence environmental decisions if additional altruistic acts of sustainability make them benefit even more by feeling good about being "green." Hartmann et al. (2017) expanded on this idea of a "Warm Glow" from altruistic giving by putting it into an environmental context. Although discovering that the warm glow feeling can often mediate altruism's effects, the study also found that combining the two can help explain additional variances in pro-environmental behavior. They find that the warm glow experienced in previous pro-environmental altruistic acts can reinforce these acts and increase consumers' future intention to act environmentally. Most importantly, they concluded that the feeling of a warm glow is the most significant driver of sustainable behavior and that it can often be stronger than altruism (Hartmann et al., 2017).

Paternalistic altruism is another key concept for this research and a significant influence on how much a consumer would be willing to pay to prevent food waste, specifically in the context of the saved food being donated to food banks. Paternalism, for our purposes, can be defined as "acts of coercion (restricting freedom of choice) aimed at improving the welfare of targeted individuals" (Kapeliushnikov, 2015). Paternalistic altruism is then the idea that altruistic actions can be influenced by the consumers deciding they know what is best for the health/welfare/utility of the person they are altruistically acting towards. McConnell (1997) describes this as saying the general public does not necessarily care about the real income or well-being of the individual receiving their services or their altruistic acts. Most importantly, they focus on the idea that the

goods they are giving are being used. Paternalistic Altruism is prominent in understanding altruistic acts in economics, and multiple studies have evaluated its relevance.

In a double-blind experiment by Breman et al. (2006), they found that in the case of looking at consumers' behavior and WTP for foreign aid giving, paternalistic actions focused on the health of those in need were much larger than purely altruistic donations. This result implies that although consumers might act altruistically, they believe they know what is best for the "health" of the individuals to whom they are charitably giving. Jacobsson et al. (2007) expanded this research by focusing on altruistic giving, particularly concerning physical health, an important consideration for donating various food types. Their main conclusions were that when acting charitably, consumers mainly focus on improving health over other welfare-improving acts and conclude that "altruism is predominantly paternalistic" (Jacobsson et al., 2007). Lastly, in a more recent study by Gangadharan et al. (2015), they focus on combining the ideas of the warm glow with paternalistic altruism. Their research shows that although approximately 60% of donors are paternalistic, those who receive a strong warm glow from giving restrict their donations less. The research implies that those with a strong "warm glow" from giving may mitigate some of the paternalistic actions we see arise in altruism. Another important note of this research is that in observing the type of donations when acting paternalistically, these are often restricted to food and necessities. The concept of necessity or "normal" food versus luxury food items when looking at altruism is a key component of our research and demonstrates the importance of their work (Gangadharan et al., 2015). Understanding how altruistic acts are influenced by personal feelings of gain or paternalistic ideas is helpful in clarifying how these differences affect a consumer's WTP for altruistic environmental acts.

In this study, I aim to explore altruism and its impacts on WTP. Fortunately, multiple studies have already helped lay the groundwork and provide a basis for our hypotheses and later comparisons. Guagnano (2001) studied altruism's influence on the WTP for recycled paper products. Using the Schwartz Norm Activation Model, which states that when being aware of negative social consequences, consumers feel more responsible and thus act more altruistically, they found that people have a higher WTP for environmental products (Guagnano, 2001). They also found that the majority of their participants were willing to pay more for recycled paper and that "the public may be willing to pay something extra for an alternative good that offers them no direct individual benefit" (Guagnano, 2001) due to consumers gaining additional value from acting altruistic since they know the good benefits the environment.

Ojea & Loureiro (2007) expanded on altruism and WTP by looking not solely at sustainable products but at protecting wildlife. Applying a contingent valuation method, they analyzed how altruistic values, alongside egoistic and biosphere values, affected the WTP of consumers to help a bird population recover in Spain. They found that altruistic values were highly significant, more than egoistic or biospheric, and helped reinforce that altruism is critical in dictating a consumer's WTP for environmental matters (Ojea & Loureiro, 2007). Understanding that

altruism plays an essential role in consumer WTP is vital in analyzing how this metric differs over varying environmental scenarios, and in the case of this study, food waste.

Lastly, Knez (2016) tried to derive how altruism and egoism changed the WTP of a consumer for pro-environmental behavior. Knez, applying a quasi-experiment design to analyze responses from an environmental survey distributed in Sweden, showed that compared to baseline or egoistic individuals, those rated high in altruism showed a greater WTP and ability to make sacrifices. Besides confirming that altruism tends to lead to higher WTP, this study also found that this may be due to altruistic individuals feeling they have more control and could make an impact with their help. In contrast, egoistic individuals believed they could not do as much to help the environment and were less willing to sacrifice and pay more (Knez, 2016). Their research is a significant addition to the literature because it reinforces that the perceived scope of an environmental issue may influence a consumer's WTP, depending on whether they think they alone can make an impact on the environmental issue.

Reviewing the literature and understanding the prior research on the interconnections between sustainable behavior, altruism, and WTP, the next section will discuss our experimental design and treatments used.

3 Experimental Design

This section will re-establish our research question, discuss pre-experimental concerns regarding contingent valuation methods, establish our study design and data collection methods, and explain the selection and importance of the analytical models used to obtain the results.

3.1 Contingent Valuation Methods

This study implements a contingent valuation method (CVM) that applies real decision outcomes in order to determine consumers' WTP to prevent food waste. This allows us to create a non-hypothetical experiment since decisions can come to fruition for randomly selected participants. Stated preference data is traditionally associated with environmental issues since they are not traded in any formal market. In our non-hypothetical case; however, participants save real food from being wasted. Although preventing waste is not a tangible item in a traded market, this allows our study to use revealed preference data instead of stated preference data. Another benefit of using a contingent valuation method for the study is that it is possible to change the attributes established and assign certain goods to observe the impacts of these changes. Additionally, the study is not constrained by data limitations since the CVM is semi-experimental, where this experiment was created to target our specific research question and interests.

However, CVM is not without faults, and there are biases that our study has been designed to mitigate and reduce. Firstly, hypothetical bias, defined as the difference between a consumer's real WTP and their hypothetical WTP within the experiment (Schmidt & Bijmolt, 2020), often leads to skewed and overstated values (Carson, 2012; Loomis, 2011). Our study design helps

mitigate this bias by allowing some randomly selected participants to receive the outcome of their decisions. Physically being able to receive money or food, with the amount of either dependent on their own decisions, makes this experiment more realistic and reduces hypothetical responses, helping mitigate, but not entirely remove this bias. Secondly, our study mitigates Starting Point Bias by creating a sliding price scale that allows consumers to indicate their WTP for an item. This allows for a range of responses above and below the non-arbitrarily determined grocery store price. Although the grocery store price of the food item is listed in each question and may lead to a slight starting point bias, this is necessary for determining whether a consumer is willing to pay more or less than the grocery store price, with the only change being preventing its waste. The design also implements a uniform randomization of the question block order to reduce any anchoring effects of the initial block answers. These structures were implemented to reduce the possibility of anchored responses, which have been shown to significantly impact WTP estimates (Simonson & Drolet, 2004; Veronesi et al., 2011; Wilson et al., 1997). Lastly, participants may misrepresent their true values/preferences to influence the study's outcomes strategically (Meginnis et al., 2011), indicating a potential strategic bias if respondents want to be seen as more environmentally friendly than they actually are. This bias is hard to mitigate and control, but by implementing a study online, there is no "face-to-face" with the researchers, reducing answers from those aiming to purely please.

Although contingent valuation methods are not without faults and potential biases could arise even with this study's attempts to mitigate them, it has been found that when appropriately structured, it can be reliable in determining a consumer's WTP for specific goods (Carson, 2012).

3.2 Experimental Design

This study used a survey that was designed using the program Qualtrics and distributed to both Vrije University's Amsterdam SBE Behavioral Lab and through social media channels such as Instagram and WhatsApp. This study took place between the dates of April 19th - 21st, 2023.

This study survey was entirely online. Previous research suggests that using an online format should not lead to significantly different results compared to other delivery methods, such as handouts/interviewing respondents (Lindhjem & Navrud, 2011). Furthermore, our research was not constrained to a specific country or area but allowed respondents around the globe to participate. However, only respondents within the Netherlands can receive their decision outcomes through food or money saved.

The survey contains 18 questions, 12 of which gauge the consumer's WTP for preventing food waste. The survey includes a brief introduction, an instructions page explaining the purpose of the questions, and relevant information for answering the questions. The main section of the survey includes two blocks of six questions, each block presented to a respondent in a random order. One block asks respondents to record their WTP to save six different food items, three "luxury" and three "normal" food items, from being wasted. Respondents are told that these items will then be delivered to their homes. Participants are informed that a random price point is

generated and that if their WTP is above this number, the food will be saved, and if below, the food will be wasted. The other main block is identical, except the question asks whether respondents would pay to donate the food to a local food bank instead of saving it for their consumption. This was explained in the survey instructions (Appendix 10.1A) and demonstrated for respondents using Figure 1 below. This explanation re-emphasizes that this is not a hypothetical scenario and that participants' actions have real consequences.

Figure 1. Online Experiment Instruction Screen

After the main question blocks, two questions were pulled from Falk et al. (2018) to gauge the perceived altruistic tendencies of the participants. Participants are then asked to answer socio-demographic questions regarding their perceived income, age, gender, and education. Finally, if the participant resides in the Netherlands, there is a voluntary option to leave a mailing address to receive money or food if they are randomly selected. An exact copy of this survey was created specifically for the VU SBE Behavioral Lab, with the only significant difference being that the participants are redirected back to the Panl web page, the program used by the behavioral lab, instead of merely receiving a message that the survey was completed and submitted. To see the complete survey, see Appendix 10.1.

3.3 Wilcoxon Matched-Pairs Signed-Rank Test

In deciding the best approach to analyze our data, I chose to implement the Wilcoxon matched-pairs signed-rank test, which will also be referred to simply as the Wilcoxon Signed-Rank Test. This test fits the study particularly well as it is a non-parametric approach often used with ordinal data, such as ours, and is similar to a t-test for matched pairs (MacFarland & Yates, 2016). Not expecting our study data to have a linear or well-structured distribution, a non-parametric model will not constrain the data and allows for more flexibility.

This method will also help us determine if significant differences exist between a consumer's WTP for a specific good in the altruistic and personal consumption scenarios. Coleman (2018) defines the primary purpose of this model, which is to examine "whether or not the differences between the ranks of paired data come from a population with a median equal to zero." This will allow us to see how WTP differs between the two scenarios and between luxury and normal goods since each item is grouped into these ordinal categories. This test is based on four main observations: Dependent Observations, Random Sampling, Continuous Dependent Variables, and Ordinal-level measurements (Coleman, 2018). This study design meets all these assumptions and will allow for more consistent and reliable estimates as a result of the test.

The following model of the Wilcoxon Signed-Rank Test is based on (Coleman, 2018) and is the one used in this analysis. It represents the t-statistic of the test which is approximate to a Z-score following a normal distribution. The following formula includes our modifications to represent our specific variables:

$$Z_{WTP} = \frac{T - \overline{X_T}}{S_T} \qquad (1)$$

Z_{WTP} is the Z-score of the WTP estimates, T represents the rank differences of the observations, X_T is the mean calculated from the matched pairs, and S_T is the standard deviation of the matched pairs. The latter two variables are based on n, which is our total number of observations.

3.4 Statistical Methods

To further the analysis beyond the Wilcoxon Matched-Pairs Ranking test, I employed multiple multivariate regression models to test our socio-demographic hypotheses. These regressions were used to try and determine if there are significant relationships between preventing food waste and participants' characteristics.

Analyzing the three socio-demographic hypotheses regarding gender, education, and age, I ran multivariate linear regression models for the six items in both scenarios. I then decided to create three different models. First, a basic model including only the socio-demographic variables is labeled as Model 1. Next, an extended model—including the same variables as Model 1 and the variables related to the two altruistic questions in the study—is labeled as Model 2. Finally, the last extended model incorporates Models 1 and 2, while also accounting for the randomization of the block order and the total time a participant spent taking the survey. This regression model is labeled as Model 3. These variables were used to control for the survey structure and the respondents' participation level. Due to the higher R-Squared results, along with attempts to mitigate Omitted Variable Bias, Model 3 will be used in analyzing the results. Tables for each food item, labeled as Tables A.1 - A.6, are in Appendix 10.2.

After the primary analysis, I decided to further expand the research by creating a logit model used to help determine what characteristics influenced a consumer to be above or below the grocery store point provided for each item. In the initial analysis, Stata is used to analyze the

frequencies of occurrences, further explained in Section 5.4. However, to determine what variables may have impacted these results, a logit model was created that includes the same variables as Model 3 for the multivariate regressions, excluding the variable for survey total duration. I decided to use the logit model because our dependent variables were the “HorL” variables, dummy variables representing whether respondents were either below/equal to the grocery store price or above it, and this model allows us to determine the probability that a consumer is willing to pay above the grocery store price.

4 Hypothesis Development and Study Treatments

4.1 Main Hypotheses

In trying to derive a consumer’s WTP to prevent food waste and the impact of altruism on this estimate, this study developed the following hypotheses:

Hypothesis 1A: Consumers will have a higher willingness to pay for "normal" food items when a food bank receives potentially wasted food compared to when they personally receive the food.

Hypothesis 1B: Consumers will have a lower willingness to pay for "luxury" food items when a food bank receives potentially wasted food compared to when they personally receive the food.

To test these hypotheses, I established the following treatments within the study design. Firstly, the study survey includes a block of questions regarding food waste and personal consumption and an identical block regarding food waste and an altruistic act. These blocks ask identical questions except for where the food saved ends up, allowing us to control for each scenario in this study and see if the impact significantly differs. The study uses a within-subject design to randomize the order of two blocks, with the program Qualtrics randomizing the blocks uniformly. For the hypotheses, the six food items are divided into two groups to check for paternalistic altruism. Apples, bread, and cheese are the “normal goods,” while wine, chocolate, and stroopwafels are the “luxury goods” included. Treating for these different food categorizations, I can test our hypothesis to see if there is a lower WTP for luxury items when they are being donated by controlling for each food classification individually.

These hypotheses are also supported by various research that observed that the WTP for environmentally friendly goods/acts is higher and may increase a consumer's WTP above the baseline price (de-Magistris & Garcia, 2016; Li & Kallas, 2021; Yi, 2019), along with evidence that consumers will have higher WTP when participating in the altruistic act of donating (Guagnano, 2001; Knez, 2016; Ojea & Loureiro). Additionally, for Hypothesis 1B, it is observed that paternalistic altruism can play a key role in a consumer's overall WTP for sustainable products and environmental services (Breman et al., 2006; Gangadharan et al., 2015; Jacobsson et al., 2007; McConnell, 1997) and that consumers often limit their altruistic actions to those they believe will improve the person's welfare, although this might not be necessarily true.

4.2 Socio-Demographic Hypotheses

Socio-demographic characteristics significantly predict consumers' decisions regarding their inclination towards sustainable behavior, engagement in altruistic acts, and their WTP. To test our socio-demographic hypothesis, multiple independent variables, including age, gender, perceived income, and education, were used. These variables allow us to control for distinct groups within each variable, thus testing our hypotheses that certain demographic groups will be more willing to pay to prevent food waste. This allowed for the following hypotheses:

Hypothesis 2A*:* Female-identified participants will have a higher willingness to pay to prevent food waste.

This study included a dummy variable for Gender in order to determine its impacts. This hypothesis was developed with the support of current literature (Fisher et al., 2012; Iverson & Rundmo, 2002; Vecchio & Annunziata, 2015) that finds that women have significantly more concern for the environment and, due to this, act more sustainably in their actions and are willing to pay higher premiums for sustainable goods.

Hypothesis 2B: Participants with higher education levels will have a higher willingness to pay to prevent food waste.

The study design allows us to test this variable since it was included in the survey. This hypothesis was developed in line with the relevant literature (Meyer, 2015; Patel et al., 2017) that states that those with more education are often more food literate and knowledgeable about the actual environmental impacts of their decisions. As a result, they also tend to engage in more pro-environmental behavior (Meyer, 2015; Patel et al., 2017).

Hypothesis 2C: Older participants will have a higher willingness to pay to prevent food waste.

Asking participants to record their ages was a socio-demographic question used to create a variable for testing. This hypothesis, stating that older participants will have a higher WTP to prevent food waste, is largely debated but given our student population, I was interested to see if there was a difference between our oldest and youngest students. Relevant literature (Han et al., 2009; Patel et al., 2017; Wiernek et al., 2013) helps support this hypothesis and argues that older individuals tend to be more environmentally friendly than younger age groups, often due to more conservative behaviors.

5. Results

5.1 Descriptive Statistics

Through the survey distribution, the study collected a total of 596 participants before data cleansing. After removing incomplete submissions, the total number of participants was 533, with 491 participants from Vrije University's SBE Behavioral Lab and the remaining 42 participants completing the study through the various social media channels where the study was distributed. Due to the unbalanced number of responses between the behavioral lab and the

social media responses, I decided to focus solely on the results of the 491 participants from Vrije University's SBE Behavioral Lab.

Our socio-demographic group generally reflects a younger population with a low to medium range of education as the pool is mainly composed of Bachelor students at the university. Taking note of this, although the socio-demographic hypotheses were intended for a more global pool of students, it is recognized within this section that the low variance in participants may have reduced the significance of these socio-demographic variables. However, using the various statistical packages in Stata 17, descriptive statistics, frequencies, and pie graphs were created for all socio-demographic variables to understand our study population better.

Analyzing the outputs, the data revealed that the participants were predominantly male (71.49%) and that approximately 92% of participants were at an age level between 18-22, with the oldest respondent being 35. Regarding the question about perceived income, there were not many discrepancies in participants viewing their income as much higher or much lower than their peers. 40% of participants perceived their income as the same, 26% perceived their income as slightly higher, and 22% perceived their income as slightly lower than their peers. Finally, regarding the education level of the participants, our observations showed that 88% of participants have a high school degree, with the next largest group of participants having a bachelor's degree (9%). Again, this primarily reflects that our student pool is actively seeking higher education and that the study population has at least a base high school education.

Table 1 includes the descriptive statistics of the data, including the mean, standard deviation, and minimum and maximum for the WTP of each item in both altruistic and personal settings, along with the socio-demographic variables. The variables labeled with "PWTP" represent the personal scenario willingness to pay, and the variables with "CWTP" represent the altruistic scenario willingness to pay. Both are expressed in Euros.

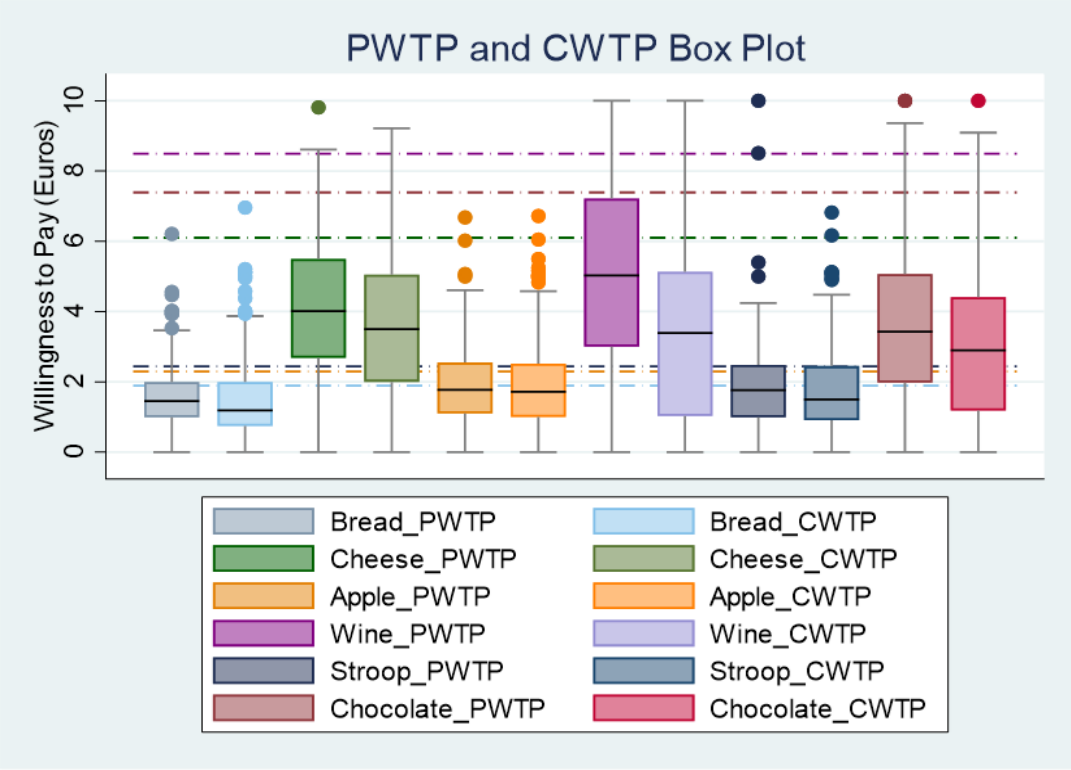
Table 1. Descriptive Statistics

Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Bread PWTP	491	1.51	.833	0	6.21
Bread CWTP	491	1.42	.965	0	6.96
Wine PWTP	491	5.119	2.959	0	10
Wine CWTP	491	3.668	2.899	0	10
Cheese PWTP	491	4.031	1.984	0	9.81
Cheese CWTP	491	3.635	2.08	0	9.21
Stroop PWTP	491	1.777	1.115	0	10
Stroop CWTP	491	1.715	1.125	0	6.82
Apple PWTP	491	1.891	1.051	0	6.68
Apple CWTP	491	1.854	1.136	0	6.72
Chocolate PWTP	491	3.668	2.335	0	10
Chocolate CWTP	491	3.03	2.208	0	10
Age	491	20.387	1.834	18	35
Gender	491	.285	.452	0	1
Perceived Income	491	2.982	.993	1	5
Education	491	2.281	.856	2	7

This table shows that the mean WTP for each item is higher in the personal scenario. However, in interpreting these descriptives alone, we observe high standard errors for many of the food items, suggesting high variation in our results. To better visualize these results, a box plot was created for each item, showing the percentiles the observations fall between, minimum and maximums, along with the mean willingness to pay, given by the black line in the center of each colored box. Items labeled with "PWTP" represent the WTP of consumers when they personally receive the food. At the same time, "CWTP" denotes the WTP in the scenario that the food item will be donated. The box plot also includes lines that reflect the grocery store prices of each item, with the color of the line corresponding to the color used for the box of each item. Lastly, the colored dots within the graph represent the outliers and maximum WTP for each scenario. This can be seen in Figure 2 below.

Figure 2. Willingness to Pay for Food Items: Altruistic Versus Personal Scenarios



First, this graph shows that all items in either setting have a mean that falls below the grocery store price. Observing the differences between the altruistic and personal scenarios, we also see that the mean willingness to pay is higher when the goods are consumed personally. However, it is interesting to note that there are a significant number of responses recorded above the grocery store price and that a significant percentage of participants were willing to pay more than the retail worth of the item, valuing the notion of saving it from potential waste. This result will be explored later in Section 5.4.

5.2 Main Hypotheses Analysis

To test our main hypothesis, Stata was used to run a Wilcoxon Signed-Rank Matched-Pairs test to test if there are statistically significant differences in the willingness to pay of consumers between the altruistic and personal scenarios, testing the difference between each item separately. First, the test was run assuming that the positive and negative ranks of the observations were equally distributed to gauge the significance of the change between the personal and altruistic settings. Following these tests, I ran the Wilcoxon Sign-Test, which lacks this assumption, allowing us to determine if the negative or positive changes were responsible for most of the significance. The results of these tests are combined in Table 2 below, with the initial test results being displayed and whether the results were based on negative or positive ranks used as a superscript indicator for the Z-values.

Table 2. Wilcoxon Tests

	Negative Ranks			Positive Ranks			Test Statistics		
	n	Mean Rank	Sum of Ranks	*n*	Mean Rank	Sum of Ranks	Ties	Z	Prob > |z|
Bread_PWTP = Bread_CWTP	*191*	253.36	48392	265	270.81	71764	35	3.716[b]	0.0002***
Cheese_PWTP = Cheese_CWTP	169	237.63	40160	299	268.73	80350	23	6.389[b]	0.0000***
Apple_PWTP = Apple_CWTP	217	259.50	56310.5	241	265.21	63914.5	33	1.209[b]	0.2267
Wine_PWTP = Wine_CWTP	107	199.77	21375	324	301.18	97581	60	12.125[b]	0.0000***
Stroop_PWTP = Stroop_CWTP	208	314.97	65513.5	246	221.83	54569.5	37	1.740[b]	0.0819*
Chocolate_PWTP = Chocolate_CWTP	151	230.25	34767	309	276.77	85523	31	8.069[b]	0.0000***

* Significant at the 0.1 level
** Significant at the 0.05 level
*** Significant at the >0.01 level
[a]Based on negative ranks
[b]Based on positive ranks

First, in analyzing the normal goods, the p-values reveal a statistical significance greater than a 99% confidence interval for bread (0.0002) and cheese (0.0000). These coefficients suggest a strong statistical difference in consumer WTP to prevent food waste in the altruistic and personal consumption scenarios. Furthermore, for both of these food items, there were more positive changes when moving from the personal to the altruistic scenario, demonstrating an increase in a consumer's WTP. The Wilcoxon Sign-test results also showed that for each of these items, the positive ranks were significant and led to the significance of the overall change between personal and altruistic settings. Although apples did not appear to have statistically significant differences (0.2267), the results still show the positive direction of the coefficients observed in the other two normal goods. These findings give compelling evidence in support of Hypothesis 1A, which hypothesized that people are more willing to pay to prevent the waste of “normal” goods in an altruistic setting than when they are personally receiving the food. The statistically significant positive increases in willingness to pay demonstrate that when faced with the altruistic setting,

consumers increase the amount they are willing to pay to prevent food waste by a statistically significant amount.

Regarding luxury goods, all p-values show statistical significance, with wine (0.0000) and chocolate (0.0000) at a significance greater than the 99% confidence interval and stroopwafels (0.0819) significant at the 90% confidence interval. These results further suggest that depending on where the potentially wasted food ends up influences what consumers decide to pay. Mirroring the normal goods, the Wilcoxon Sign-Test revealed that the majority of the changes in observations are positive amounts, with the exception of stroopwafels, and that without including the assumption that negative and positive ranks are equal, the positive rankings are the factor that leads to the statistical significance for the items. This finding implies that consumers are willing to pay more for luxury goods in an altruistic situation compared to the personal one. These results are in contrast with our main secondary hypothesis, Hypothesis 1B. This hypothesis stated that consumers would have a lower WTP for "luxury" food items received by food banks compared to personally receiving the food. However, these results suggest little evidence for that hypothesis.

Observing these results, there is solid evidence supporting Hypothesis 1A. The significance suggests a relationship between a consumer's WTP for normal goods and altruistic actions. However, I do not find substantial evidence to support Hypothesis 1B since our results do not suggest that consumers are willing to pay less for luxury items when donated to a food bank, but in fact, provide evidence for the opposite of this hypothesis.

5.3 Socio-Demographic Hypotheses Analysis

To test our socio-demographic hypotheses, I ran multivariate regressions to determine the effect of the socio-demographic characteristics on the WTP for each item in each scenario. The results of this analysis can be found in Tables A.1-A.6 in the Appendix, Section 10.2.

Hypothesis 2A states that female-identified participants will have a higher WTP to prevent food waste. Observing the output under Model 3 for both the personal and altruistic scenario, Columns (5) and (6) in Tables A.1-A.6, this study finds that gender is only a statistically significant predictor in specific cases. All six food items had significant results regarding gender in at least one of the scenarios, except wine, which did not have statistically significant results, and apples, where gender was statistically significant in both the altruistic and personal WTP scenarios. Statistical significance also ranged from significance at the 90% confidence level to the 99% confidence level. Observing whether significance is more common in one of the specific scenarios, it was found that the split was equal, with significance appearing equally in both the personal and altruistic situations. Regarding whether female-identified students were more likely to pay higher amounts to prevent food waste, we can observe that all the results, significant or not, had a positive impact on WTP. In Tables A.1-A.6, Gender was a dummy variable, with female-identified participants having a designated value of 1 and males identified as 0. This variable, labeled now in the tables as "Female," then shows that identifying as female leads to a

positive increase in a participant's WTP to prevent food waste. These results provide evidence that female-identified participants are more likely to have a higher willingness to pay to prevent food waste and helps support Hypothesis 2A. Although not every scenario was significant, these results provide good evidence in support of the hypothesis, which is especially significant due to the homogeneity of the data pool used.

Our second socio-demographic hypothesis, Hypothesis 2B, was that participants with higher education levels would have a higher WTP to prevent food waste. Education, a categorical variable, was used in each model in Tables A.1-A.6. Still, to explore the impacts of these variables better, I created dummy variables for each education option listed within the survey, excluding the most prevalent category, those with a "High School Degree," to test for a causal impact. These tests did not lead to any further developments or emerging significance, so the traditional models were used and reported within this study. This led to the use of the traditional Model 3, represented by columns (5) and (6), which exclude these dummy variables. Across the food items, we see positive coefficient results in the personal setting for each food item, and in the altruistic setting, we see a mix of positive and negative coefficients. However, none of these results are statistically significant at any level or in any specific scenario. Due to these findings, our results do not provide enough evidence to support Hypothesis 2B and suggest that education may not have a statistically significant impact on reducing food waste. Still, the limitations regarding using the student pool are a recognized factor that potentially reduces the statistical power of our analysis since education is fairly homogeneous among our participants.

Finally, I analyzed the models in terms of age to test Hypothesis 2C, that older participants will have a higher WTP to prevent food waste. Using Model 3, the study finds that age has no statistically significant impact on food item waste. One possible explanation for this is that most of our population, approximately 90%, were between the ages of 18-22, so there is little variation within the data. In both the personal and altruistic situations, statistical significance is rarely observed. Between the twelve possible combinations of items and scenarios, the only item that had significance in both scenarios was the Stroopwafels. Stroopwafels had a coefficient of -.107 with statistical significance in the 99% confidence interval in the personal consumption scenario and a statistically significant (90% confidence interval) coefficient of -.051 for the altruistic situation. One interesting result was that although nearly all the items showed no significance across all models, items, and differences in altruistic or personal settings, each coefficient had a negative value, implying that age might reduce one's WTP for items. However, this provides no tangible evidence of a relationship due to the lack of significance regarding these variables. Overall, from these results, I find a lack of evidence supporting Hypothesis 2C and can conclude that within our study, age does not have a statistically significant impact on a consumer's WTP to prevent food waste in both a personal consumption and altruistic giving situation.

Observing the socio-demographic results of this study, it is difficult to truly obtain the significance of each socio-demographic variable. Drawing conclusions for the three hypotheses, I do not find enough evidence to support Hypothesis 2B and 2C, that age and education are

statistically significant variables for determining a consumer's WTP to prevent food waste. However, our results support Hypothesis 2A, which regards Gender, and provide sufficient evidence in favor of gender playing a significant role in a consumer's WTP. In addition, the results support that female-identified participants are, on average, more willing to pay to prevent food waste than male-identified participants. This study also finds that these results were not specific to an altruistic or personal food waste scenario but were equally significant in both cases.

6. Further Explorations

Expanding beyond our primary analysis, I conducted a secondary analysis to gain a deeper understanding of our results. In this analysis, I look at how certain mechanisms within our study may have impacted the results, along with an analysis of how the altruistic variables influenced participants' willingness to pay to prevent food waste, to see if there is evidence of the "warm-glow" feeling discussed within the literature review. I also wanted to gain insight into the instances of participants having a WTP higher than the grocery store price and aim to determine if there are significant variables that predict these behaviors.

6.1 Ordering Effects

One interesting analysis to conduct was how the randomized order of the altruistic and personal question blocks influenced a consumer's WTP. After sorting between the participants who started with the altruistic block versus the personal block, in all cases, we observe a higher mean WTP for normal goods in both the altruistic and personal settings if the altruistic block is presented first. This implies that people may state a higher than average WTP for the altruistic donation and then, when responding in the personal block, view their personal gain of the food as having a higher value, thus leading to a higher WTP for the goods in both the altruistic and personal settings. However, luxury goods had more variation in their results. Wine is the only good with a corresponding higher WTP for an item, depending on which block is first. For example, participants have a higher WTP to personally receive the food when they start with the personal block and have a higher WTP to donate the food when they start in the altruistic block. Stroopwafels and chocolate both follow along with the rest of the normal goods, with starting in the altruistic block leading to a higher personal WTP for stroopwafels, but no change in altruistic WTP, and chocolate leading to both a higher personal and altruistic WTP. Overall, with the block randomization order, there appears to be evidence of an ordering effect, and if participants are exposed to the altruistic scenario first, it raises their willingness to pay in all scenarios. This could be because participants, not knowing about a potential gain to themselves, record a higher average WTP for the altruistic situation due to an added value by a "warm glow" of preventing waste, and then when they discover they can also gain the items, are willing to pay even more to prevent the food from being wasted.

The presence of an ordering effect, the idea that the order in which information is presented can impact a respondent's answers or decisions, is not a novel one and can often be found in economic literature regarding contingent valuation methods (Krosnick & Alwin, 1987;

McFarland, 1981). For example, Stewart et al. (2002), in their study regarding healthcare programs, found that this effect often leads to an overstatement of participants' WTP in the first scenario presented. This phenomenon helps to explain why we see higher WTP results for both the personal and altruistic settings, because if consumers are presented with the altruistic setting first, they may overstate their actual WTP. Then, having the opportunity to obtain the goods and get additional value leads to a higher WTP than if the order was reversed. Although this study tried to mitigate this effect and any anchoring effects by randomizing the block order of questions, it still had relevant effects on the results.

6.2 Altruistic Tendencies

Determining that there were significant differences in how consumers responded between the personal and altruistic situations, this study further explored the use of the two questions pulled from Falk et al. (2018). These were aimed to try and gauge a consumer's altruistic tendencies by providing them with qualitative and quantitative questions to assess altruism, specifically in the case of donations. The "Willingness To Act" question was a Likert scale ranging from 0-10, with 10 showing the highest level of altruistic actions. The "Hypothetical Charitable Act" question allowed participants to choose an amount to donate between 0 and 1000 euros that they were randomly gifted. In both cases, the higher the number, the more altruistic the participant perceives themselves and claims to be. With the food items in our study being donated to a food bank in the altruistic setting, these are fairly relevant to our analysis. To test to see if there was any relationship between how participants responded to the Falk Altruistic questions and their willingness to pay to prevent waste, these were included in the multivariate regression models, and the results can be found in Tables A.1-A.6, columns (5) and (6), which represent Model 3 in the Appendix.

First, the results highlight that the coefficients for both questions are positive in all scenarios, suggesting a positive relationship between how participants answered and their recorded WTP. Intuitively, this makes sense because if consumers choose to donate more of the money or view themselves as someone motivated by altruistic acts, they will also record higher WTP to prevent waste, at least when donating the food. Regarding the normal goods, both variables are statistically significant in the altruistic setting for all three of the food items. In the personal setting, they were significant for two of the food items, although each food item did not have the same altruistic variable showing significance. Regarding the luxury goods, in both the personal and altruistic situations, two luxury goods, stroopwafels and chocolate, were statistically significantly impacted by the variable "Hypothetical Charitable Act." These results demonstrate that there is a strong and statistically significant relationship between the questions gauging one's altruistic tendencies and provides evidence that consumers who see themselves as more altruistic tend to have a higher WTP. This is shown not only in altruistic situations but hypothetically in the personal setting if the "warm-glow" feeling they get from preventing food waste is similar to the value they receive from acting altruistically. Although intuitively, consumers who see themselves as altruistic should be more willing to pay to donate or prevent food waste, it is

significant to see that there is an actual impact on their WTP and evidence of a positive relationship. Participants having a higher WTP in altruistic situations when they were gauged as more altruistic credits that participants did not want to simply appear altruistic or suffer from a social desirability or strategic bias, which leads to greater validity within our analysis.

6.3 HorL Variable Analysis

While conducting the primary analysis, I decided to try and determine if participants were willing to pay above the stated grocery store price, thus demonstrating that the prevention of the food being wasted provides additional value, reflected in the difference in the monetary price points. To conduct this analysis, dummy variables were created for each food item in both scenarios. The variables indicated if participants' WTP was below or equal to the grocery store price, denoted 0, or if the value was above it, denoted 1. After running initial descriptive statistics, the following table, Table 3, was created and contains the frequencies and percentages of responses above and below the grocery store price shown for each item. The letter "P" before an item once again represents the personal scenario, and the letter "C" the altruistic scenario.

Table 3. HorL Frequencies

	Freq. Above	Percent	Frequency Below/Equal	Percent
P_Bread_HorL	177	36.05	314	63.95
C_Bread_HorL	166	33.81	325	66.19
P_Cheese_HorL	93	18.94	398	81.06
C_Cheese_HorL	84	17.11	407	82.89
P_Apple_HorL	159	32.38	332	67.62
C_Apple_Horl	163	33.20	328	66.8
P_Wine_HorL	88	17.92	403	82.08
C_Wine_HorL	46	9.37	445	90.63
P_Stroop_HorL	132	26.88	359	73.12
C_Stoop_HorL	129	26.27	362	73.73
P_Chocolate_HorL	45	9.16	446	90.84
C_Chocolate_HorL	30	6.11	461	93.89

In analyzing the results, we observe that, on average, the percentage of responses above the grocery store price is higher when goods are personally consumed compared to when they are donated to a food bank. The greatest difference regarding this is in wine, which jumps from 9.37% of responses above the grocery store price when charitably donated to 17.92% when personally consumed. Apples and stroopwafels are on the other end of this range, with no significant changes if the response is below or above the grocery price in either scenario.

For all food items in both scenarios, the average response above the grocery store price is 22.17%. Looking at the differences between both the food waste scenarios and the difference in the types of goods, we observe that a higher percentage of responses are above the price in the personal (23.50%) compared to the charitable (20.83%) setting, as well as a higher percentage above the price in normal goods (28.50%) compared to luxury goods (15.83%). These results are interesting because they show that roughly 1/5th of the responses were above the marked grocery store price. This demonstrates that some consumers may be willing to pay more for a good if a perceived added value stems from its connection to the environment or to a societal issue like food scarcity. Although this is beyond our study's scope, these results suggest that some individuals are concerned with food waste and are willing to pay more than the value of an item or a premium to save it from being wasted.

Recognizing that a considerable number of participants were willing to pay above the retail price, I then analyzed the types of consumers willing to pay this greater amount. To test this, I ran logit models for each HorL dummy variable to determine which variables influence the choice between paying above the retail price. The variables included and the analysis results can be found in Tables 4 & 5.

Table 4. HorL Logit Model - Normal Goods

	(1) P_Bread_HorL	(2) C_Bread_HorL	(3) P_Cheese_HorL	(4) C_Cheese_HorL	(5) P_Apple_HorL	(6) C_Apple_HorL
Age	-.0915	-.0576	-.0255	-.0435	-.1225*	-.041
	(.0624)	(.0588)	(.0727)	(.0713)	(.072)	(.0576)
Female	.4247**	.6897***	.2396	.621**	.5203**	.6059***
	(.2145)	(.2154)	(.2532)	(.2592)	(.2219)	(.2167)
Education	-.118	.0435	-.0416	-.0383	-.0706	-.0897
	(.1252)	(.1229)	(.153)	(.1864)	(.1306)	(.1279)
Perceived Income	-.0206	.0841	.1048	-.0229	.2458**	-.0038
	(.0965)	(.1013)	(.1161)	(.1217)	(.1027)	(.0999)
Willingness To Act	.1385**	.1555***	.0721	.2223***	.1353**	.2262***
	(.0547)	(.0529)	(.0651)	(.0731)	(.0575)	(.0588)
Hypothetical Charitable Act	.0004	.0012*	.0007	.0011	.0006	.0011*
	(.0006)	(.0006)	(.0007)	(.0007)	(.0006)	(.0006)
Block Randomization Order	.1084	.2458	.5701**	.2457	.4491**	.2103
	(.1934)	(.1996)	(.2354)	(.25)	(.2011)	(.2023)
_cons	.4999	-1.3339	-2.0745	-2.5011	-.1526	-1.5469
	(1.2719)	(1.2022)	(1.4777)	(1.578)	(1.4404)	(1.1357)
Observations	491	491	491	491	491	491
Pseudo R^2	.0337	.0624	.0254	.0662	.057	.0728

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 5. HorL Logit Model - Luxury Goods

	(1) P_Wine_HorL	(2) C_Wine_HorL	(3) P_Stroop_HorL	(4) C_Stroop_HorL	(5) P_Chocolate_HorL	(6) C_Chocolate_HorL
Age	-.0595	-.1687	-.1991***	-.1134*	-.1353	-.1451
	(.067)	(.1139)	(.0766)	(.0608)	(.1197)	(.1533)
Female	.0439	.3977	.2088	.4468*	.3813	.3968
	(.272)	(.3495)	(.2393)	(.2291)	(.339)	(.4082)
Education	.0982	.3824***	.0167	.0722	.221	.2106
	(.1347)	(.1475)	(.1244)	(.136)	(.1584)	(.2175)
Perceived Income	.2256*	.4371**	.2661**	.1709	.2403	.2899
	(.1193)	(.1718)	(.1082)	(.1059)	(.1593)	(.1796)
Willingness To Act	.0998	.246***	.0969	.1455**	.078	.2303**
	(.07)	(.0831)	(.0636)	(.0634)	(.0954)	(.0958)
Hypothetical Charitable Act	-.0001	.0002	.0011*	.0019***	.001	.0012
	(.0007)	(.001)	(.0007)	(.0007)	(.0008)	(.0009)
Block Randomization Order	-.1765	.8436**	.3216	.0046	.3294	.132
	(.2396)	(.339)	(.212)	(.2149)	(.3179)	(.3873)
_cons	-1.7792	-3.423	1.1968	-.7443	-1.7453	-3.1311
	(1.3497)	(2.409)	(1.5081)	(1.2334)	(2.2201)	(2.8923)
Observations	491	491	491	491	491	491
Pseudo R^2	.0166	.1012	.049	.0647	.0388	.0681

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Analyzing Tables 4 & 5, there are two fairly consistent variables among the food items that were statistically significant in impacting whether or not a participant was willing to pay above the marked retail price. First, the "Willingness To Act" variable showed a positive relationship for all food items and was statistically significant regarding all the food items within the altruistic situation and for two of the food items within the personal situation. These significant results provide evidence that consumers who ranked themselves as more altruistic were also more likely to be the participants that were willing to pay above the retail price, especially in the altruistic situation. This coincides with our analysis of the altruistic-gauging questions and further supports that those who perceive themselves as more altruistic are willing to pay more to prevent food from being wasted and instead donated. The next most significant item was Gender, labeled as "Female" within the tables since female-identified participants have a value of 1, and male-identified participants have a value of 0 within our regression model. For this socio-demographic variable, there were once again positive coefficients across all food items, revealing a positive relationship between a participant identifying as female and their probability of recording a WTP higher than the grocery store price. Significant results were observed mainly within the normal food items and the altruistic scenarios. Overall, identifying as female was a significant factor for 6/12 items within the study, which provides some evidence that once again supports Hypothesis 2A, that female-identified students have a higher WTP for preventing waste and reflectively are then more likely to pay above the retail price.

Observing that a significant fraction of participants were willing to pay above the listed grocery store price, this analysis provides some evidence that participants who perceive themselves as altruistic and identify as female are more likely to pay above this price. These results also support that there is a higher probability that participants pay above this price point if the goods are deemed "normal goods" and the participants can personally consume the goods versus charitably donating them.

7. Discussion

This paper aimed to answer the research question, "How does the choice between personal consumption or charitable giving affect consumers' willingness to pay to prevent food waste?" Our results provide evidence that given the choice between an altruistic and personal scenario of food waste prevention, participants are more willing to pay to prevent this waste in an altruistic setting when the food is donated to a food bank. This idea that consumers are willing to pay more in an altruistic scenario corresponds with the literature regarding altruism and the "warm-glow" effect of giving (de-Magistris & Garcia, 2016; Guagnano, 2001; Knez, 2016; Li & Kallas, 2021; Ojea & Loureiro; Yi, 2019). However, these results did not show evidence of paternalistic altruism, which is often seen in this type of giving. In addition, there was evidence of the opposite and that the type of item, "normal" versus "luxury," did not matter to consumers in preventing food waste. This discovery contradicts the literature regarding paternalistic altruism and implies that there might be significant factors that can reduce or diminish its presence in altruistic decision-making. For example, this may provide evidence that the environmental action of preventing waste may have mitigated the effects of paternalistic actions. Another possibility is that the "warm glow" often accompanying sustainable decisions may also reduce paternalistic actions in altruistic decision-making. Future research in this direction could study this relationship and see if there is a connection between paternalistic altruism and environmentally friendly altruistic actions.

The socio-demographic analysis also led to results that supported and contrasted with previous literature. Our study found that female-identified individuals and those who perceive themselves as altruistic have a higher willingness to pay to prevent food waste. Still, this study also found a lack of evidence regarding age and education, which are often found to have a relationship with a consumer's willingness to pay. The limitations that may have led to these results are further discussed in Section 7.3.

7.1 Theoretical Implications

One key area that this study provided evidence for was that consumers were willing to pay to prevent food waste in both the altruistic and personal scenarios. The majority of participants were willing to pay approximately one standard deviation below the price to prevent the waste, and 1/5th of participants valued preventing the waste above the grocery store price, leading to a positive premium on the food items. These results can lead to many theoretical implications. For example, if consumers value saving retail food that will be wasted, even if the amount is lower than the grocery store price, retail grocery stores could sell food close to its time of waste at a

discount price. Doing this would not only lead to the consumer benefitting by preventing waste and having reduced prices on goods, but also benefits the grocery stores that can make back a portion of the money that would have been discarded for zero profit. There is an increasing interest in the idea of discounting food that will be wasted, and successful implementations of this idea have developed. Apps like TooGoodTo allows consumers to pay a discounted price for a box of food items. Although a relatively new app, research has shown that the perceived economic and environmental benefits are often shared by both the consumers and providers using the app, showing overall benefits for both (Vo-Thanh et al., 2021). However, working to achieve this on a greater retail level may be difficult, and research has shown that regulation and the logistics of implementing large-scale systems can hinder the development of these food waste prevention networks (Alexander & Smaje, 2008; Hermsdorf et al., 2017).

Another theoretical implication of this research is that a significant number of consumers within the study were willing to pay more to prevent the food from being wasted and donated than they would for actually receiving the food items (although not necessarily more than the item is worth). Theoretically, this could then be used to help reduce food scarcity if grocery stores allow consumers to save food from being wasted by having it donated to a local food bank at a price below the grocery store amount. This implementation could benefit society by helping reduce food insecurity and economically by allowing the grocery stores to earn some profit on food that would be wasted. However, on the consumer side, it is unlikely that purely the good feeling of donating is enough to incentivize people to act altruistically. Further research should be considered regarding the potential nudges or incentives needed to motivate consumers to participate in preventing food waste via supporting food banks. This would also reflect on a consumer's willingness to prevent a company’s waste, which may be a fairly unpopular idea for most.

7.2 Policy Implications

One practical policy implication of this study is a policy aimed at requiring or incentivizing grocery stores to reduce their prices for a small window of time for items that are going to be wasted. Since the majority of consumers are willing to pay for food items that are about to be wasted, this could allow for both the consumers to benefit from a reduced price and the store to benefit from the increased profit. In addition, a policy could be in place for produce/food items that expire quicker and get thrown out daily. Another practical implication could be a policy aimed at reducing the complications of the regulatory rules surrounding food donation and disposal. Policies that better educate on how to prevent food waste through re-pricing or donation and allow companies to create deals with local food banks could allow for smoother networks of food waste production. For example, to cut distribution costs and the logistics of donating food, policies that allow for companies to establish their own network of transportation, collection, and contracts, along with requirements on the safety rules of the food donated, could cut down on the complexity of an overarching policy and help not only prevent food waste but benefit the economy.

7.3 Limitations and Directions for Further Research

In this section, I will discuss the research limitations and provide insight into how future research can expand and improve on our study and further the literature surrounding food waste in the economic and global communities.

Our study, applying a contingent valuation method, was subject to some biases and limitations that influenced the final results. Although this study discussed these and tried to account for them (Section 3.1), biases and imperfect pooling methods arose within our data and its collection. One limitation of our approach is that all of our participants came from the SBE Career Pool Lab, making our population more homogenous. This limits our research, as it now reflects a primarily student study specific to a singular college within the Netherlands. This observation population reduces the experiment's external validity and skews the participants' socio-demographics within the study. This lack of variance within the participant pool may have influenced our results, especially when looking at the socio-demographic impacts since the majority of students are the same age, gender, and education level. Future research should extend the number of participants and the time frame when observations are collected for the experiment. A more diverse set of participants will allow for better inference and determinations of causal impacts. Future research should expand past student pools for the research and include more global participants to allow for how cultural and locational dietary differences may affect the research.

Another one of the limitations of our research was the presence of Anchoring Bias. Although previously discussed as an issue to contingent valuation methods and this study's attempts to help lessen the issue, it is still observed within our results. Comparing the mean WTP for each item in both personal and altruistic situations, we see that the average answer is relatively close to the grocery store price of the item listed in the survey as a reference point. It was also observed that the bias is much stronger when observing the three least expensive goods compared to the three most expensive goods. The three least expensive food items, apples, stroopwafels, and bread, all have grocery store prices that fall between one standard deviation of the mean WTP, thus implying a higher anchoring effect of the grocery store prices. However, the study found that the three most expensive food items, cheese, wine, and chocolates, all had grocery store prices that were greater than one standard deviation from the mean. In all cases, the mean moves in a negative direction from the grocery store price. This difference in the anchoring effect might be impacted by the idea that since the food is going to be wasted, participants would not want to pay high prices, even if the value of the good is relatively higher. Future research might expand on this research by attempting to reduce this bias by removing a reference starting point, allowing participants to observe multiple prices for the same food item, or configuring their questions so that only a range of prices is given. Realistically, the best approach to try and reduce this bias is to conduct research that establishes a greater range of revealed preference data for the willingness to pay to prevent food waste or that looks at a relationship over time. Conducting research that allows participants to partake in a real situation where they have to use their own money, compared to our experiment with a budget given to the participants, would

help reduce both of these biases and allow for more causal interpretations, greatly expanding the validity of the research and helping to further study real monetary impacts.

Lastly, one direction for future research could be to more adeptly study the relationship between food waste and altruism, further gauging how a consumer's WTP depends on their range of altruistic tendencies. Our study, focusing on a single altruistic scenario and a focus on paternalistic altruism, is only a fraction of the different forms and types of altruism. Attempting to further this research should incorporate more variation regarding altruism's role, including aspects like "warm-glow" individuals, pure altruism, group-based altruism vs. individual, or how distinct cultures' perceptions of morality affect participants' altruistic preferences and actions. Combining this with a greater range of food items and prices, questions, scenarios, and categories of food will help introduce more variation into the study and better allow researchers to pinpoint specific behaviors, allowing for a better understanding of consumers' relationship with altruism and food waste. Unfortunately, our study, constrained by a short timetable, could not expand into these more complex areas of interest. However, future research in this area can significantly improve the literature and continue moving it forward.

8. Conclusion

This paper used a contingent valuation method to attempt to identify a consumer's willingness to pay to prevent food waste, focusing on how this value is impacted by altruism. An online survey for our study was distributed to collect data from 491 participants at Vrije University, leading to research reflective of a student study. After analyzing the study results using a Wilcoxon Matched-Pairs Sign-Rank test and multivariate and logit regression models, I found evidence in support of two of the five hypotheses and was able to answer the initial research question.

Regarding the research question, this research provides evidence that consumers have a higher willingness to pay when confronted with an altruistic scenario of preventing food waste compared to a scenario where they personally gain. This study also concluded that female-identified participants, along with those who perceive themselves as altruistic, have a higher WTP to prevent food waste. This supports the existing literature regarding environmental behavior and socio-demographics. These results imply that consumers not only value environmentally friendly behavior but may also gain additional value when this behavior is done in an altruistic context. Further research needs to expand on this topic and account for a more global approach regarding the food waste scenarios discussed and variation in participants, along with investigating the relationship between paternalistic altruism and sustainable behavior to see if the former has a mitigating or substantial effect on the latter. Additional exploration of this topic can help unveil the various environmental, societal, and economic benefits that stem from keeping food out of the garbage and on your plate.

9. References

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10. Appendix

10.1 Survey

A Survey Introduction and Instructions

Welcome to this study.

Everyone is welcome to complete this study and there is a chance for participants to receive some food items or money. However, **only participants in the Netherlands will be eligible to receive their study outcomes. This can be in the form of money and/or food saved, depending on your actions.**

In order to make the setting as realistic as possible, 10 participants of the study will be selected at random to receive their outcomes. This can mean physically receiving the food you saved from waste, money or both. This will be explained more in the next section.

By checking this box to continue, you give informed consent for the data within this survey to be used.

○ I have read and understood the provided information, and consent to participate in this study.

Instructions:

Each question will present you with a food item that is about to be wasted by a local grocery store. For each question, a **random price point** will be generated and represents the price that is needed for the food to be saved. **This number is not revealed to you in the question and will remain unknown**. However, the grocery store price of the food item is listed above the price scale and is known. You will then have to determine on the price scale how much you are willing to pay to prevent this food from being wasted. Responses **below** the random price point will **waste** the food item. Responses **above** this random price point will **save** the food item. The random price point can be anywhere between 0-10€ on the price scale and is uniformly distributed. Two examples of this are shown in the pictures below:

Ten randomly selected participants will physically receive the outcomes of their decisions. This can be a combination of money and/or food and is dependent on their own answers. One of the choices will be randomly selected and then a combination of food and/or money, with a maximum budget of 10€, can be received. There will also be evidence provided if the food is wasted or saved. For example, a respondent who saved the food can receive the item she/he saved from being wasted. Alternatively, if someone is unwilling to pay to save a food item, she/he can receive the money not spent, along with photo evidence of the food being wasted.

The end of this study will provide an opportunity to leave a mailing address in the Netherlands that will only be confidentially used to send out the results to the 10 randomly selected participants.

B Main Survey Questions - Altruistic Scenario

How much are you willing to pay to prevent this loaf of bread from being wasted and donated to Voedselbanken Nederland (a local food bank)?

Price: 1.89€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this bottle of wine from being wasted and donated to Voedselbanken Nederland (a local food bank)?

Price: 8.49€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this block of cheese from being wasted and donated to Voedselbanken Nederland (a local food bank)?

Price: 6.10€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this pack of Stroopwafels from being wasted and donated to Voedselbanken Nederland (a local food bank)?

Price: 2.44€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this container of apples from being wasted and donated to Voedselbanken Nederland (a local food bank)?

Price: 2.29€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this box of chocolates from being wasted and donated to Voedselbanken Nederland (a local food bank)?

Price: 7.39€

C Main Survey Question - Personal Consumption Scenario

How much are you willing to pay to prevent this loaf of bread from being wasted and delivered to your home?

Price: 1.89€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this bottle of wine from being wasted and delivered to your home?

Price: 8.49€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this block of cheese from being wasted and delivered to your home?

Price: 6.10€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this pack of Stroopwafels from being wasted and delivered to your home?

Price: 2.44€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this container of apples from being wasted and delivered to your home?

Price: 2.29€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

How much are you willing to pay to prevent this box of chocolates from being wasted and delivered to your home?

Price: 7.39€

0 1 2 3 4 5 6 7 8 9 10

Price (€)

D Socio-Demographic Questions

Please record your age in the box below:

What is your gender?

- ○ Male
- ○ Female
- ○ Non-binary / third gender
- ○ Prefer not to say

How high do you perceive your monthly income compared to that of your peers?

- ○ Much Lower
- ○ Slightly Lower
- ○ The Same
- ○ Slightly Higher
- ○ Much Higher

What is the highest level of school you have completed?

- ○ Less than a high school degree
- ○ High School Degree or Equivalent
- ○ Associate Degree
- ○ Bachelor Degree
- ○ Masters Degree
- ○ Doctorate
- ○ Prefer not to say

E Altruistic Questions

How willing are you to give to good causes without expecting anything in return?

Completely Unwilling to Do So										Very Willing To Do So
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Imagine the following situation: Today you unexpectedly received 1000 Euro. How much of this amount would you donate to a good cause? (Values between 0 and 1000 allowed)

10.2 Socio-Demographic Multivariate Regression Tables

Table A.1 Bread Models

	(1) PWTP	(2) CWTP	(3) PWTP	(4) CWTP	(5) PWTP	(6) CWTP
Age	-.041**	-.0084	-.0472**	-.0212	-.0448**	-.0213
	(.0184)	(.024)	(.0186)	(.0235)	(.0191)	(.0239)
Female	.1766**	.5027***	.107	.3659***	.0969	.3662***
	(.0857)	(.1044)	(.0878)	(.1024)	(.0879)	(.1034)
Perceived Income	.0259	.0514	.0264	.0516	.0261	.0516
	(.0374)	(.0415)	(.0375)	(.0416)	(.0377)	(.0417)
Education	.0485	.0148	.0431	.0044	.0403	.0046
	(.0558)	(.054)	(.0565)	(.0561)	(.0557)	(.0567)
Willingness To Act			.0287	.0645***	.0299	.0645***
			(.0208)	(.0238)	(.0209)	(.0238)
Hypothetical Charitable Act			.0005**	.0008**	.0005**	.0008**
			(.0002)	(.0003)	(.0002)	(.0003)
Block Randomization Order					.1513**	.0016
					(.0756)	(.084)
Total Survey Duration					0	0
					(0)	(0)
_cons	2.1066***	1.2617***	2.0302***	1.0844**	1.9081***	1.0847**
	(.41)	(.4874)	(.4064)	(.4688)	(.4161)	(.4823)
Observations	491	491	491	491	491	491
R-squared	.0195	.0591	.0357	.1056	.044	.1056
Demographics	YES	YES	YES	YES	YES	YES
Altruism	NO	NO	YES	YES	YES	YES
Survey FE	NO	NO	NO	NO	YES	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table A.2 Cheese Models

	(1) PWTP	(2) CWTP	(3) PWTP	(4) CWTP	(5) PWTP	(6) CWTP
Age	-.0105	-.0238	-.0226	-.058	-.0161	-.0518
	(.0567)	(.0495)	(.0564)	(.0504)	(.0569)	(.0522)
Female	.4887**	.6727***	.3849*	.3109	.357*	.2849
	(.1967)	(.2119)	(.207)	(.215)	(.2083)	(.2145)
Perceived Income	.1804**	.0767	.1769**	.0766	.1761**	.0758
	(.0889)	(.0967)	(.0891)	(.0972)	(.0893)	(.0974)
Education	.038	-.0067	.0313	-.0341	.0184	-.0417
	(.0922)	(.1073)	(.0957)	(.116)	(.0944)	(.114)
Willingness To Act			.0863	.1767***	.088*	.1797***
			(.0524)	(.053)	(.0526)	(.0526)
Hypothetical Charitable Act			.0002	.0021***	.0002	.0021***
			(.0006)	(.0006)	(.0006)	(.0006)
Block Randomization Order					.2156	.3743**
					(.1786)	(.1791)
Total Survey Duration					0***	0
					(0)	(0)
_cons	3.4808***	3.7157***	3.2205***	3.2261***	2.9951**	2.9209***
	(1.1676)	(1.0443)	(1.1756)	(1.0529)	(1.1855)	(1.0856)
Observations	491	491	491	491	491	491
R-squared	.021	.0237	.0293	.0939	.0342	.1021
Demographics	YES	YES	YES	YES	YES	YES
Altruism	NO	NO	YES	YES	YES	YES
Survey FE	NO	NO	NO	NO	YES	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table A.3 Apple Models

	(1) PWTP	(2) CWTP	(3) PWTP	(4) CWTP	(5) PWTP	(6) CWTP
Age	-.0369	-.0207	-.0497	-.0411	-.0449	-.0385
	(.0321)	(.0255)	(.0311)	(.025)	(.0316)	(.0256)
Female	.349***	.4837***	.2204**	.2818**	.2004*	.2708**
	(.1046)	(.1217)	(.1069)	(.1186)	(.1069)	(.119)
Perceived Income	.0682	-.0017	.0673	-.0035	.0667	-.0039
	(.044)	(.0492)	(.0442)	(.0483)	(.0443)	(.0485)
Education	.0319	.0006	.0225	-.0141	.0157	-.0183
	(.0507)	(.0513)	(.0535)	(.0543)	(.0527)	(.0546)
Willingness To Act			.0716***	.1174***	.0736***	.1183***
			(.0269)	(.0279)	(.0273)	(.028)
Hypothetical Charitable Act			.0006*	.0009**	.0006*	.0009**
			(.0004)	(.0004)	(.0003)	(.0004)
Block Randomization Order					.2502***	.117
					(.0929)	(.0979)
Total Survey Duration					0**	0
					(0)	(0)
_cons	2.2682***	2.1428***	2.0645***	1.8065***	1.8505***	1.7***
	(.6428)	(.5189)	(.6273)	(.4953)	(.6336)	(.5093)
Observations	491	491	491	491	491	491
R-squared	.0317	.0391	.0671	.1149	.0821	.118
Demographics	YES	YES	YES	YES	YES	YES
Altruism	NO	NO	YES	YES	YES	YES
Survey FE	NO	NO	NO	NO	YES	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table A.4 Wine Models

	(1) PWTP	(2) CWTP	(3) PWTP	(4) CWTP	(5) PWTP	(6) CWTP
Age	-.0619	-.0863	-.0673	-.1001	-.0682	-.081
	(.0732)	(.0615)	(.075)	(.0644)	(.073)	(.0649)
Female	.0536	.6567**	-.0057	.502	-.0051	.4208
	(.3014)	(.294)	(.3144)	(.3082)	(.3153)	(.3066)
Perceived Income	.2588*	.2682**	.259*	.2693**	.2591*	.2667**
	(.1339)	(.1274)	(.1338)	(.1274)	(.1332)	(.1274)
Education	.0411	.1602	.0365	.1481	.0225	.1163
	(.163)	(.1753)	(.1652)	(.1822)	(.172)	(.171)
Willingness To Act			.0262	.064	.0216	.0706
			(.0772)	(.0716)	(.0766)	(.0716)
Hypothetical Charitable Act			.0004	.001	.0003	.0011
			(.0009)	(.001)	(.0009)	(.0009)
Block Randomization Order					-.5693**	.8496***
					(.2688)	(.2576)
Total Survey Duration					.0001***	0***
					(0)	(0)
_cons	5.5001***	4.0738***	5.429***	3.9032***	5.7441***	3.1253**
	(1.514)	(1.3189)	(1.5324)	(1.3315)	(1.4962)	(1.3466)
Observations	491	491	491	491	491	491
R-squared	.0087	.0232	.0097	.0298	.0223	.0552
Demographics	YES	YES	YES	YES	YES	YES
Altruism	NO	NO	YES	YES	YES	YES
Survey FE	NO	NO	NO	NO	YES	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table A.5 Stroopwafel Models

	(1) PWTP	(2) CWTP	(3) PWTP	(4) CWTP	(5) PWTP	(6) CWTP
Age	-.1013***	-.0364*	-.1104***	-.0521**	-.1073***	-.0505**
	(.0236)	(.0209)	(.0242)	(.0218)	(.0242)	(.0218)
Female	.1804*	.4108***	.0715	.235**	.0583	.2278**
	(.1064)	(.1125)	(.1114)	(.1138)	(.1129)	(.1152)
Perceived Income	.0555	.0527	.0572	.054	.0568	.0538
	(.0542)	(.0477)	(.055)	(.0484)	(.055)	(.0485)
Education	.0381	-.009	.0293	-.0227	.0245	-.0271
	(.0529)	(.0564)	(.0528)	(.0579)	(.0518)	(.0583)
Willingness To Act			.0349	.0725***	.0361	.0726***
			(.0253)	(.0271)	(.0256)	(.0272)
Hypothetical Charitable Act			.0008**	.0012***	.0008**	.0012***
			(.0004)	(.0004)	(.0004)	(.0004)
Block Randomization Order					.1515	.0136
					(.1005)	(.098)
Total Survey Duration					0	0**
					(0)	(0)
_cons	3.538***	2.2032***	3.4522***	2.0102***	3.3186***	1.975***
	(.5579)	(.4512)	(.5548)	(.4533)	(.5422)	(.4508)
Observations	491	491	491	491	491	491
R-squared	.0351	.0345	.058	.0912	.0631	.0923
Demographics	YES	YES	YES	YES	YES	YES
Altruism	NO	NO	YES	YES	YES	YES
Survey FE	NO	NO	NO	NO	YES	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table A.6 Chocolate Models

	(1) PWTP	(2) CWTP	(3) PWTP	(4) CWTP	(5) PWTP	(6) CWTP
Age	-.0882	-.1322***	-.0991	-.1588***	-.0946	-.1503***
	(.0667)	(.0508)	(.0692)	(.0527)	(.0691)	(.0519)
Female	.6443***	.4352**	.4862**	.093	.4662**	.0563
	(.2209)	(.2212)	(.2343)	(.2251)	(.2346)	(.2248)
Perceived Income	.2373**	.173*	.2434**	.1814*	.2428**	.1803*
	(.105)	(.0977)	(.1052)	(.0991)	(.1055)	(.0993)
Education	.1446	.2023	.1307	.1736	.1184	.1559
	(.1528)	(.1314)	(.1605)	(.1361)	(.1613)	(.1332)
Willingness To Act			.0141	.079	.0143	.0809
			(.0583)	(.0509)	(.0586)	(.0511)
Hypothetical Charitable Act			.0016**	.003***	.0017**	.003***
			(.0008)	(.0007)	(.0008)	(.0007)
Block Randomization Order					.0358	.2513
					(.208)	(.19)
Total Survey Duration					0*	0**
					(0)	(0)
_cons	4.2456***	4.6234***	4.2438***	4.4564***	4.1475***	4.1779***
	(1.3719)	(1.0713)	(1.3902)	(1.0717)	(1.3928)	(1.0573)
Observations	491	491	491	491	491	491
R-squared	.0321	.0286	.0457	.09	.0476	.0965
Demographics	YES	YES	YES	YES	YES	YES
Altruism	NO	NO	YES	YES	YES	YES
Survey FE	NO	NO	NO	NO	YES	YES

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*