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## Consumer vs. citizen willingness to pay for restaurant food safety

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## ABSTRACT

Individuals may display different preferences for food regulations when acting as a voting citizen than as a buying consumer. In this paper, we examine whether such a duality exists between citizens and consumers in the willingness to pay for food safety standards in restaurants. Using a split-sample willingness to pay survey, we find that individuals exhibit a higher willingness to pay for improved food safety standards in restaurants when acting as voting citizens than as buying consumers. Relying on consumer studies that focus on the buying context may therefore underestimate the support found among the public for new food regulations. This finding is important for policy makers using consumer studies in decision support and for researchers attempting to understand individual preferences.

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## Introduction

Individuals have multiple roles in life. For instance, in their role as consumers, they make purchases, while as citizens, they vote on laws that regulate the products they purchase. Vanhoner et al. (2007) labeled this the consumer–citizen duality, and pointed out that the same individual may exhibit preferences as a citizen that differ from those expressed as a consumer. A recent example is the 2008 ballot proposition in California on animal welfare where Californians voted overwhelmingly in support of a proposition prohibiting battery-farm-produced eggs, which at the time of the vote were the most popular type of eggs purchased and consumed in California (Norwood and Lusk, 2011, pp. 264–5). This example alone suggests that when eliciting preferences over food characteristics, it could matter whether we approach respondents as consumers or citizens. In this paper, we investigate the degree of consumer–citizen duality in the context of food safety standards in restaurants.

With the exception of Hamilton et al. (2003), who investigate consumer–citizen duality in a study comparing consumer willingness to pay (WTP) for pesticide-free food and support for regulation to reduce pesticide use in agriculture, little research in food economics has focused on the notion of consumer–citizen duality. However, there has been an ongoing debate in the environmental economics literature (Ajzen et al., 1996; Blamey et al., 1995; Curtis and McConnell, 2002; Nyborg, 2000; Ovaskainen and

Kniivilä, 2005; Russell et al., 2003; Sagoff, 1990). Sagoff (1990), for example, argues that individuals pursue their own goals when they act as consumers, whereas as voting citizens they are also concerned about what is good or right for the community. On this basis, he argues that any attempt to capture environmental values through market-mimicking mechanisms or monetary valuation studies draws on the false assumption that the preferences an individual exhibits as a citizen are the same as those the individual displays as a consumer.

Following this argument in Sagoff (1990), a consumer is likely to be concerned about price, taste, and nutrient content when buying food. In contrast, the citizen is also likely to be concerned about issues such as the place of origin, animal welfare, environmental friendliness, and fair trade. This listing corresponds well with some of the recent food quality regulations intensely debated in Europe and the United States (US). Some of the more contentious proposals include: the total or partial elimination of antibiotic use in livestock production (Lusk et al., 2006), a ban on the use of swine gestation crates or battery cages (Tonsor et al., 2009), a reduction in the amount of pesticide residuals permitted in fresh and processed foods (Florax et al., 2005), a requirement for the mandatory labeling of genetically engineered food (Lusk et al., 2005), and mandatory country-of-origin labeling (Loureiro and Umberger, 2003). Oddly, even though many of these issues are prone to the consumer–citizen duality, and public regulations are often the preferred policy instrument, the exploration of citizen preferences in the literature is more or less nonexistent. Instead, market-mimicking mechanisms, such as choice experiments where consumers choose between products with different labels, or experimental auctions where participants bid for different

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products, are the chosen methods of most studies. As a result, the most common output is an estimate of the average price premium consumers are willing to pay for products with specific attributes in a market setting (Alfnes and Rickertsen, 2011; Carlsson, 2011).

A focus on consumer buying behavior, as in most of the food economics and marketing literature, is appropriate for the purposes of food retailers and producers, but does not necessarily give the correct preference measure for policy makers. For proper economic analysis and recommendations, it is instead very important to identify the objectives before designing a study. If the objective is to provide decision support to marketers, then we should examine consumer-buying decisions. However, if the objective is to provide decision support to policy makers, then in addition to consumer preferences, we should also consider citizen preferences.

We employ a split-sample survey to investigate consumer–citizen duality in WTP for new food safety standards in restaurants. More specifically, we assess the following four points. First, the degree to which consumers and citizens are willing to pay for reduced food safety risks in restaurants. Second, whether framing the WTP question as a citizen-oriented voting question or a consumer-oriented buying question affects the results. Third, whether the posted levels of risk reduction matters. Finally, whether there are demographic differences in the WTP for decreased food safety risk.

Since both voluntary and mandatory changes in food safety practices will result in increased food prices in restaurants, both the citizen-oriented voting question and the consumer-oriented buying question use restaurant price increases as payment vehicle. In the citizen oriented voting question, participants were asked if they would vote yes or no to new food safety standards if the new standards would result in restaurant price increases, while in the consumer oriented buying question participants were asked how much extra they would be willing to pay if a restaurant implemented new food safety standards.

### Consumer–citizen duality

Public and social choice theory suggests individuals have multiple preference orderings and that the one they use depends on the particular context (Arrow, 1951; Harsanyi, 1976; Mueller, 1987; Russell et al., 2003; Sagoff, 1990; Sen, 1977). Here, we are interested in the consumer–citizen duality found when individuals exhibit different preferences when they vote on regulations than when they act as consumers (Vanhonacker et al., 2007).

When voting individuals respond as citizens, they tend to place greater emphasis on public value than when making choices as consumers. For example, individuals tend to express more altruistic preferences when they assume the role of a citizen than when they assume the role of a consumer (Ajzen et al., 1996; Blamey et al., 1995; Hamilton et al., 2003; Harvey and Hubbard, 2013; Ovaskainen and Kniivilä, 2005; Wisser, 2007). For instance, in analyzing consumer preferences for a public good, Blamey et al. (1995) found that the responses in a referendum were influenced by citizen judgment concerning social goals. On this basis, they argued that this was because the referendum had more in common with political choices than consumer decisions in the market. On the contrary, a study by Curtis and McConnell (2002) found no difference in WTP between altruistic and purely private preference in a referendum to control deer population in the USA.

Some of the possible reasons for the discrepancy in preferences between citizens and consumers include trust, free riding, and the relative emphasis on prices in different contexts. For example, individuals are only willing to pay if they trust that the premium paid will contribute to improving the public good (Harper and Henson, 1999; Toma et al., 2011). For goods with a public good element, it is

in the individual's best interest to free ride and let others carry the cost of the public good. This results in individuals only being willing to pay when they are sure everybody else also is paying (Harvey and Hubbard, 2013). For instance, Wisser (2007) found respondents were willing to pay a higher premium when confronted with a collective payment mechanism than with a voluntary payment mechanism. Likewise, Loureiro and Hine (2004) found that participants were willing to pay a higher tax rate to support a mandatory versus a voluntary labeling system for genetically modified (GM) products. Also Carlsson et al. (2007) found that consumers preferred free-range eggs produced under regulations where battery-cage-produced eggs were banned to those produced under regulations where they were not. Furthermore, it could be that individuals perceive cost differently in different contexts. In a grocery store for example, the individual receives direct feedback when making the purchase, hence the consumer concentrates on all attributes, including price. In contrast, in a voting booth, there is no direct feedback on cost, and therefore a citizen could concentrate more on the non-price attributes when making a voting decision (Lusk and Norwood, 2011).

A number of studies assessing the consumer–citizen duality are included in the literature on public and semipublic good valuation (Ajzen et al., 1996; Blamey et al., 1995; Curtis and McConnell, 2002; Hamilton et al., 2003; Nyborg, 2000; Ovaskainen and Kniivilä, 2005; Russell et al., 2003; Wisser, 2007). With the exception of Curtis and McConnell (2002), who find no difference in WTP between citizen and pure private preference, the results of these studies indicate that respondents given citizen-oriented WTP questions exhibit a higher WTP than those given consumer-oriented WTP questions. These results indicate a willingness to regulate away, even at cost, something they would not willingly pay extra for to avoid as a consumer. For example, Wisser (2007) found a higher WTP for renewable energy when participants were confronted with a collective payment mechanism than with a voluntary payment mechanism. Elsewhere, Ovaskainen and Kniivilä (2005) found that participants in a citizen role gave fewer zero-WTP responses and indicated a higher WTP to sustain conservation areas. Lastly, Hamilton et al. (2003) reported that some participants who supported the ban on use of pesticides in agriculture were somewhat inconsistently unwilling to pay a premium for pesticide-free food.

A related literature focuses on the differences between the attitudes and actions of individuals (the so-called attitude–behavior gap). Here, individuals say that they are concerned about ethical issues, such as animal welfare, fair trade, and sustainability, but these concerns are to a lesser degree expressed in buying behavior (Bray et al., 2011; Cowe and Williams, 2000; de Barcellos et al., 2011; Harper and Henson, 1999; Harvey and Hubbard, 2013; Verbeke et al., 2010).

### Food safety and regulatory issues

Safety is one of the most important characteristics of food in most countries (Alphonse and Alfnes, 2012; Lusk and Briggeman, 2009). Most public policies relating to food safety are the outcome of a complex trade-off between the interests of different groups affected by the policy (including consumers, farmers, consumer groups, retailers, manufacturers, and taxpayers).

We can divide the literature on preferences to food safety into a number of strands. One of the strands, including Hayes et al. (1995), Nayga et al. (2006), and Teisl and Roe (2010), consider the WTP for food treated using some new method to reduce the risk of foodborne pathogens. For the most part, they find a significant and positive WTP in supporting measures to reduce such risks. Another strand in the literature assesses the WTP for a reduction in

pesticide residuals (Baker, 1999; Baker and Crosbie, 1993; Buzby et al., 1995; Hamilton et al., 2003; Roosen et al., 1998). They also find a significant positive WTP to reducing such risks.

Most studies assessing the WTP for safer foods or assessing the cost–benefit ratio of reduced food safety risks are set-up as marketing studies and do not question respondents about what they want authorities to do. However, despite this, most studies derive policy advice from the results. One exception is work by Hamilton et al. (2003), which undertook both a market study and a regulation study and compared the WTP from both scenarios.

The country of origin of food is an issue that is also often associated with food safety. Both the European Union (EU) and the US now have mandatory country-of-origin labeling (COOL) on many food products. In general, studies of preferences toward COOL that have been used for policy recommendations have mainly been in the form of marketing studies investigating consumer preferences and choice (see, e.g., Alfnes and Rickertsen, 2003; Loureiro and Umberger, 2003; Loureiro and Umberger, 2005; Mabiso et al., 2005).

## Method and data

The survey data we use is part of a restaurant study conducted in 2010 at a university campus in the northeast of the US. A total of 864 participants were recruited to take part in the study and were offered a free meal for their participation.

The participants were recruited from the university and the local community. The local community represented approximately 25% of the final sample. The university participants were diverse and included (undergraduate and postgraduate) students, faculty, and other staff members. To avoid revealing the purpose of the study, there was minimal information given to the participants upon recruitment.

### Survey questions and design

We used two multiple-price-list (MPL) questions to elicit the WTP for improved food safety standards in restaurants. As seen in Table 1, we formed the first question as a consumer-oriented buying question and the second as a citizen-oriented voting question. The consumer question is a typical price list, whereas the citizen question is a series of yes or no votes at the different price levels. The price lists had six price intervals and were the same for the two questions. The lowest level being not willing to pay a 1% increase, or voting no to a 1% increase, and the highest level being willing to pay more than 30% or voting yes to an increase of more than 30%.

Both questions came in three versions, which varied in the degree of reduction in the probability of getting a food-related illness (25%, 50%, and 75%). To investigate the differences between the two question formats and the three risk-reduction levels, we randomly assigned each participant to one of these six combinations.

### Sample

Table 2 presents the descriptive statistics for the sample. As stated, while the study included consumers from a university town, the participants represented a wide range of demographic characteristics. In sum, age ranged from less than 25 years to more than 60 years, education ranged from less than Grade 12 to a PhD degree, and income ranged from a household income of less than \$20,000 per year to more than \$150,000 (all dollar values in US dollars). However, females were overrepresented, with almost twice as many female as male participants. The sample also included

students, employees, the unemployed, part-time workers, and retired people. Household size varied from those living alone to households with up to eight individuals. We tested for differences in participant characteristics between the consumer- and citizen-oriented subsamples using Hotelling's multivariate paired-comparison *T*-squared test, but were unable to reject the null hypothesis of equal sample characteristics ( $p = 0.29$ ). We included the six characteristics in Table 2.

### Econometric model

We follow common practice used in MPL studies and estimate an interval regression model (see, e.g., Andersen et al., 2006). This is because while the WTP is not observable, we do know an interval around the WTP. The consumers' WTP are based on the highest interval they said they would be willing to pay, and the citizens' WTP are based on the highest interval they said they would vote yes to.

In our analysis, we wish to investigate the differences in WTP associated with differences in risk reduction, the method of elicitation, and preferences over gender and age groups. To do this, we estimate the following four models (hereafter referred to as Models 1, 2, 3, and 4):

- (1) 
$$WTP_i^* = \beta_0 + \beta_1 50\%RR_i + \beta_2 75\%RR_i + \varepsilon_i$$
- (2) 
$$WTP_i^* = \beta_0 + \beta_1 50\%RR_i + \beta_2 75\%RR_i + \beta_3 Vote_i + \varepsilon_i$$
- (3) 
$$WTP_i^* = \beta_0 + \beta_1 50\%RR_i + \beta_2 75\%RR_i + \beta_3 Vote_i + \beta_4 female_i + \beta_5 femvote_i + \varepsilon_i$$
- (4) 
$$WTP_i^* = \beta_0 + \beta_1 50\%RR_i + \beta_2 75\%RR_i + \beta_3 Vote_i + \beta_4 yfem_i + \beta_5 ymale_i + \beta_6 omale_i + \beta_7 vyfem_i + \beta_8 vymale_i + \beta_9 vomale_i + \varepsilon_i$$

where  $WTP_i^*$  is the percentage of the meal price that participant  $i$  is willing to pay or vote yes to support reduced food safety risks,  $\beta_0$  is the constant term, and the remaining beta values measure the effect of the corresponding independent variables. The variables  $50\%RR_i$  and  $75\%RR_i$  are dummy variables taking values of one if participant  $i$  is questioned about a 50% and a 75% reduced risk, respectively, and zero otherwise. In Model 2, we include  $Vote_i$ , which is a dummy variable taking a value of one if participant  $i$  is in the citizen-oriented voting treatment and zero otherwise. In Model 3, we add  $female_i$ , which is a dummy variable taking a value of one if participant  $i$  is female and zero otherwise, and  $femvote_i$ , which is a dummy taking a value of one if participant  $i$  is a female voter and zero otherwise. In Model 4, we replace  $female_i$  and  $femvote_i$  with six dummies to capture the differences between the age and gender segments. The variables  $yfem_i$ ,  $ymale_i$ , and  $omale_i$  are a series of dummy variables indicating young female, young male, and older male respondents, respectively, while  $vyfem_i$ ,  $vymale_i$ , and  $vomale_i$  are a series of dummy variables denoting young female voters, young male voters, and old male voters, respectively.  $\varepsilon_i$  is the normally distributed error term. We estimate the models with the *intreg* command in STATA 12.

## Results and discussion

### Willingness to pay

Fig. 1 and Table 3 present the results from the citizen-oriented voting questions and the consumer-oriented buying questions for all three levels of reduced food safety risk (25%, 50%, and 75%). Commencing with the figure, we can see that for both buyers (in

**Table 1**  
Willingness to pay questions.

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A. Consider the restaurant in your neighborhood. Please indicate how much extra you would be willing to pay if this restaurant implemented food safety standards that reduced the chances of getting a food-related illness by 25% / 50% / 75%?

I am not willing to pay extra to ensure safe food

1%–5% of meal price

6%–10% of meal price

11%–20% of meal price

21%–30% of meal price

More than 30% of meal price

B. Please indicate if you would vote “Yes” or “No” to new food safety regulations that would reduce food safety risk at your neighborhood restaurant by 25% / 50% / 75% and increase the price of the restaurant meals by the following amounts.

% of meal price increase	How would you vote?	
1%–5% of meal price	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6%–10% of meal price	<input type="checkbox"/> Yes	<input type="checkbox"/> No
11%–20% of meal price	<input type="checkbox"/> Yes	<input type="checkbox"/> No
21%–30% of meal price	<input type="checkbox"/> Yes	<input type="checkbox"/> No
More than 30% of meal price	<input type="checkbox"/> Yes	<input type="checkbox"/> No

---

**Table 2**  
Sample descriptive statistics.

Variable	Full sample				Split treatment groups							
	Mean	Std. dev.	Min.	Max.	Buyers				Voters			
	Mean	Std. dev.	Min.	Max.	Mean	Std. dev.	Min.	Max.	Mean	Std. dev.	Min.	Max.
Age <sup>a</sup>	3.30	1.67	1	6	3.31	1.70	1	6	3.28	1.64	1	6
Female <sup>b</sup>	0.67	0.47	0	1	0.66	0.47	0	1	0.68	0.47	0	1
Income <sup>c</sup>	4.33	2.14	1	8	4.42	2.08	1	8	4.25	2.19	1	8
Education <sup>d</sup>	4.00	1.09	1	6	4.00	1.07	2	6	3.90	1.10	1	6
Under 5 <sup>e</sup>	0.12	0.33	0	1	0.11	0.31	0	1	0.14	0.34	0	1
HH size <sup>f</sup>	2.63	1.26	1	8	2.61	1.27	1	7	2.67	1.27	1	8

<sup>a</sup> Age scale: less than 25 years = 1, 26–30 years = 2; 31–40 years = 3, 41–50 years = 4, 51–60 years = 5, and >60 years = 6.

<sup>b</sup> One if female, 0 if male.

<sup>c</sup> Income scale: less than \$20,000 = 1, \$20,001–\$30,000 = 2, \$30,001–\$40,000 = 3, \$40,001–\$50,000 = 4, \$50,001–\$70,000 = 5, \$70,001–\$100,000 = 6, \$100,001–\$150,000 = 7, and >\$150,000 = 8.

<sup>d</sup> Education scale: less than grade 12 = 1, high school = 2, college = 3, bachelor's degree = 4, master's or professional degree = 5, and doctoral degree = 6.

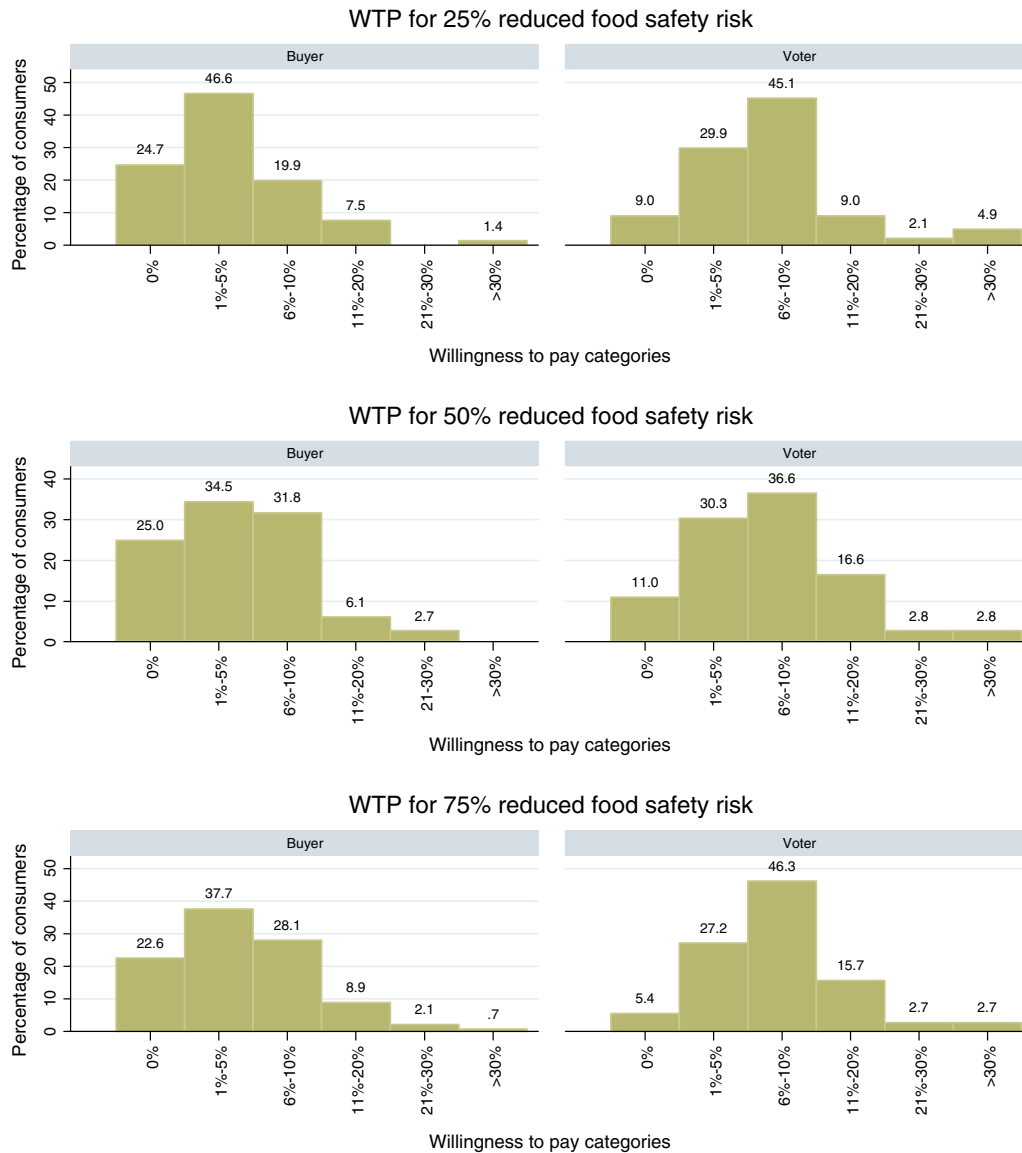
<sup>e</sup> One if have a child under 5 years, 0 otherwise.

<sup>f</sup> HH size: Number of people living in a household

the first column) and voters (in the second column) there is no notable difference in the WTP across the risk-reduction levels. However, comparing the figures across the columns, we can see a difference in the WTP between buyers and voters for all three levels of food safety risk reduction. As shown by the 50% reduction in food safety risk, 25% of buyers were unwilling to pay anything, while the corresponding figure for citizens was only 11%. Further, 60% of buyers were willing to pay less than 6%, while the

corresponding figure for citizens was 41%. Furthermore, the median WTP, which is important for a majority vote, differ between the two question formats. The consumer-oriented buying question gave a median in the 1–5% interval, while the citizen-oriented voting question gave a median in the 6–10% interval. We found similar results for the 25% and 75% reduced food safety risks.

Table 3 presents the estimation results from the four models. We estimate Model 1 using a split sample with the results



**Fig. 1.** Willingness to pay for food safety improvements by buyers and voters. Note: Consumers were asked if they were willing to pay an increase in price for better food safety, while the voters were asked if they were willing to vote yes to new food safety regulations increasing food prices. The zero category for buyers are those that said they would not pay anything for increased food safety, while the zero category for the voters are those that said they would vote no to any regulation increasing the price.

presented in columns 1 and 2. Columns 3–5 provide the pooled sample results for Models 2, 3, and 4, respectively. For the most part, these results confirm the patterns depicted in Fig. 1. For example, in the first two columns including only the reduction in risk levels as explanatory variables, we see from the goodness of fit measure that the explanatory variables do not have a significant impact on the WTP. In the next three columns, also including question format as an explanatory variable, we can see from the goodness of fit measure that the explanatory variables have a significant impact. In line with that, we find in the full-sample estimations a significant difference in the WTP between buyers and voters, and no significant differences across risk-reduction levels. The latter results are consistent with the lack of scale effects found in much of the literature investigating consumer WTP for reduced risks in food (see, e.g., Hayes et al. (1995) and Lichtenstein (1978)).

In Model 1, we found that on average participants answering the consumer-oriented buying question were willing to pay a 3.96% (=3.44% + 0.52%) price increase for a 50% reduction in food safety risk, while those that responded to the citizen-oriented voting question were willing to pay a price increase of 7.44%

(=7.60% – 0.16%). We find similar differences in the remaining three models and for the other risk-reduction levels. To obtain a monetary value for the WTP, these percentages should be used together with the average amounts of \$5.60, \$7.80, and \$13.60 the respondents said they would spend in a restaurant for breakfast, lunch, and dinner, respectively. As for the other sample characteristics, there were no significant differences between the two subsamples with respect to how much they spent in restaurants.

The differences in WTP between the consumer-oriented buying question and the citizen-oriented voting question accord well with the limited literature on consumer–citizen duality for food and nonfood products (see, e.g., Ovaskainen and Kniivilä (2005) and Hamilton et al., 2003).

#### Demographic differences

When we include demographic effects in Models 3 and 4, gender becomes statistically significant. On average, female participants were willing to pay 1.45% more than male participants for risk reduction. Model 3 shows that on average, male and female buyers

**Table 3**  
Willingness to pay for reduced food safety risk.

Variables	Split sample		Full sample		
	Model 1 Buyers	Model 1 Voters	Model 2	Model 3	Model 4
Constant	3.44*** (0.58)	7.60*** (0.64)	3.55*** (0.51)	2.58*** (0.72)	4.39*** (0.70)
50% reduced risk	0.52 (0.81)	-0.16 (0.91)	0.17 (0.61)	0.15 (0.61)	0.16 (0.61)
75% reduced risk	1.04 (0.81)	0.59 (0.90)	0.81 (0.61)	0.85 (0.61)	0.84 (0.61)
Voting			3.88*** (0.50)	4.88*** (0.88)	2.95*** (0.86)
Female				1.45* (0.76)	
FemaleVoting				-1.51 (1.07)	
YoungFemale					-0.77 (0.88)
YoungMale					-2.01** (1.03)
OldMale					-1.57 (1.11)
VoteYoungFemale					0.86 (1.22)
VoteYoungMale					1.85 (1.43)
VoteOldMale					2.14 (1.63)
N	431	433	864	884	864
Log likelihood	-699.09	-794.26	-1496.06	-1494.24	-1493.63
LR chi <sup>2</sup>	1.63	0.77	60.51	64.15	65.37
Prob > chi <sup>2</sup>	0.44	0.68	0.00	0.00	0.00

Note: standard errors in parenthesis.

\*  $P < 0.10$ .

\*\*  $P < 0.05$ .

\*\*\*  $P < 0.01$ .

were willing to pay respective price increases of 2.73% ( $=2.58\% + 0.15\%$ ) and 4.18% ( $=2.58\% + 0.15\% + 1.45\%$ ) for a 50% reduction in risk. The corresponding percentages for voters are 7.61% ( $=2.58\% + 0.15\% + 4.88\%$ ) and 7.55% ( $=2.58\% + 0.15\% + 1.45\% + 4.88\% - 1.51\%$ ). Hence, gender had a significant effect on WTP among those given the consumer-oriented buying question, but no effect was found on WTP among those given the citizen-oriented voting question. When including age-gender segments in Model 4, we see that the biggest difference in WTP among those given the consumer oriented buying question were between the older women and the young men, but again the differences cancel out for the voters. Young male buyers were willing to pay 2.01% less than older female buyers for risk reduction, but the voters were only willing to pay 0.16% less ( $= -2.01\% + 1.85\%$ ), and the latter differences were insignificant. This indicates that while men and women have a similar WTP for a reduction in the foodborne risk level at a society level, women are more willing than men to pay to protect themselves when at a restaurant. This is in line with previous findings that suggest women worry more about food safety than men (Baiardi et al., 2012; Chattopadhyay and Duflo, 2004).

#### Design and sample issues

As most studies, this study also has its weaknesses. Most important is the fact that it uses non-consequential survey questions, and therefore is likely to suffer from hypothetical biases, which are inflating the WTP for improved food safety. The second weakness is the university town sample, which even though it is relatively large and has a reasonable good spread in characteristics, is unlikely to be fully representative of the population. A third issue is the use of the multiple price list format. We chose it because it works in both question formats, but neither in buying nor in voting

situations are people used to such price list. A fourth issue is that in the citizen question the participants have to vote no to all the price increases to give a zero WTP, while in the consumer question there is a zero WTP alternative.

In our mind, these design and sample issues do not change the main conclusion and recommendations. However, more research is required.

#### Conclusion and recommendation

The question is whether it matters whether we elicit consumer or citizen preferences when valuating food safety. For example, US citizens often vote for different propositions in elections, and can potentially vote for regulations with an effect on both private and/or public values, such as food safety, animal welfare, sustainability and the environment. However, most studies investigating the WTP for such attributes use market-mimicking mechanisms that are unlikely to reflect how people want public policies to change.

In this study, we used a split-sample to see if respondents responded to a consumer-oriented WTP question differently from a citizen-oriented WTP question. We find that people are willing to pay twice as high a price premium if asked a voting question than if asked a buying question. In the consumer-oriented buying question, women show a significantly higher WTP for improved food safety than men, but this gender difference disappears when we move to the citizen-oriented voting question. Furthermore, the median WTP, which is important for a majority vote, is also higher in the citizen-oriented voting question. This indicates that people show different preferences when they act in different roles, and that they behave differently when they are voting for a proposition than they do when they act as consumers. Consequently, consumer behavior studies that do not account for these differences could poorly predict the results of a regulatory study, and vice versa.

The fact that consumer preferences may be different from citizen or political preferences has implications on how we design valuation or WTP surveys. Our results suggest that the use of a market-mimicking approach could significantly underestimate the WTP for public policy. In fact, our market-mimicking question yields a WTP that is only about half of what we obtained from our citizen-oriented voting question. Therefore, it is important for researchers to consider exactly what their objective is when designing a valuation study, identify whether they are interested in measuring consumer or citizen preferences, and then apply the appropriate approach for the specific goal. We find that both consumer-oriented and citizen-oriented participants are willing to pay a premium for reduced food safety risks in restaurants. We also find evidence of a consumer-citizen duality, in the sense that the valuation of food characteristics differs in the two settings. However, the level of reduced food safety risk does not appear to matter.

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