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Consumer Panelist Behavior in Experimental Auctions: What Do We Learn From Their Bids?

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Abstract

Experimental economics procedures such as laboratory experimental auctions are increasingly being used to measure consumers' willingness-to-pay. A sealed-bid, fourth-price Vickrey-style auction was used to measure consumers' willingness-to-pay for flavor in beef steaks. Two hundred and forty-eight consumers from Chicago and San Francisco participated in the experimental auctions. The data gathered from these experimental auctions was then used to examine individual demand or utility in an experimental, uniform-price auction; and to analyze market demand and market price in an experimental auction when supply is fixed but demand varies. The results indicated that certain demographic variables may increase the probability that a participant wins or loses an experimental auction. The market price was found to be a function of the number of participants in a panel, as well as consumers' tastes and preferences. Changes in the market price of the auctions in the study appear to be more a function of the same factors that influence demand in the marketplace, rather than a wealth effect. Consumers in this research did appear to be expressing their true value for the auction product and the auction provided a valuable measure of consumers' WTP for flavor.

Keywords: Experimental auctions, Vickrey auctions, willingness-to-pay, beef demand

Introduction

In recent years, agricultural economists have become more involved in marketing research. This phenomenon is likely due to the continual evolution away from commodity marketing and toward individual product marketing. One area where agricultural economists' skills have been valued is consumer acceptance and willingness-to-pay (WTP) for new products and different product attributes.

Previous WTP studies conducted by economists used contingent valuation methods to form hypothetical scenarios to measure WTP. A central question regarding contingent valuation is whether values elicited from hypothetical surveys reflect consumers' true WTP. Due to the concern over the "hypothetical nature" of the contingent valuation approach, research conducted more recently has used experimental economic procedures such as laboratory experimental auctions to elicit WTP for new products and product attributes. A number of different auction techniques exist, but the majority of the research has used a variation of the second-price, sealed-bid auction; frequently referred to as a Vickrey auction (Menkhaus et al., 1992; Buhr et al., 1993; Hayes et al., 1995; Melton et al., 1996; Roosen et al., 1998).

The Vickrey auction, and similar, uniform nth-price auctions, are assumed to be demand-revealing because they provide an incentive for auction bidders to reveal their true preferences. According to Vickrey's (1961) theory, there is no gain from strategic bidding because the market price is independent of one's bid. Auction participants who bid less than their true value reduce their chances of winning the auctioned good at a potentially profitable price; and on the other hand, by submitting a bid more than their true value, auction participants have a greater probability of winning, but paying a price that is in excess of their true value (Shogren et al., 1994).

The demand-revealing theory of the Vickrey auction is based on the assumed behavior of auction participants. This theory may fail when applied to a simulated "real-world" laboratory setting where consumers use real money and actually experience the product in question. Previous research has suggested that ". . . a one trial second-price auction for an unfamiliar asset or risk might not accurately reflect the bidders' disciplined valuation (Shogren et al., 1994)." For example, Coppinger, Smith and Titus (1980) found that bid prices in second-price auctions took a considerable time to converge to their theoretically predicted value. Therefore, several trial auctions are necessary for the bidder to experience the unique auction concept and to form their values (Coursey and Smith, 1984; Menkhaus et. al., 1992; Hoffman et al., 1993; Shogren et al., 1994; Fox, et al., 1995; Hayes et al., 1995; Kagel, 1995)

Although the second-price auction with repeated trials gives bidders an opportunity to learn the auction price and to update their preferences and bids based on previous market prices, it also allows bidders to gain information about the upper end of the value distribution for a product (Shogren et al, 1994).[1] This information may create a strategic bidding environment, and the Vickrey auction may no longer be truly a demand-revealing auction.

Shogren, List and Hayes (2000) recently tested the hypothesis that preference learning about an unfamiliar good, rather than the novelty of the laboratory experimental experience, influences auction bids. They compared the bids for three goods of varying familiarity: candy bars, mangos and irradiated meat, over four consecutive experimental auctions. Their results suggested that preference learning was the primary source of the high price premia paid for new food products in experimental laboratory valuations. They also found that bidding behavior differed across sessions, but only for the unfamiliar good; thus, the novel laboratory experimental experience did not entice subjects to bid differently for familiar goods.

Most of the previous literature has either examined the theory of the auction or empirically tested the theory using subjects such as university students. Few studies have examined how the auction dynamics worked in an experimental auction designed to measure WTP using consumers that are representative of the market population.

How valid are the WTP results elicited from experimental auctions if consumer behavior within the experimental auction is influenced by their demographics or their knowledge of the

[1] Shogren et al. (1994) designed a random *n*th-price auction to reduce the strategic bidding potential within repeated auctions. They found no significant difference in mean bids from second-price auctions and random *n*th-price auctions.

product in the experiment? How do the values elicited through the experimental auction compare to values observed in the retail market place? Is there a rational explanation or justification if the values differ significantly? Does economic theory hold up in experimental auction markets? Furthermore, how do repeated auctions impact consumers' bids?

Objectives

The overall objective of this paper is to extend the knowledge and understanding of experimental auctions by evaluating the dynamics of repeated, uniform-price (fourth-price) auctions and the bidding behavior of the panelists. This research has two specific objectives: 1) to examine individual demand or utility in an experimental, uniform-price auction, i.e., what influences bidding behavior; and 2) to analyze market demand, or more specifically, market price in an experimental auction when supply is fixed but demand varies.

Experimental Procedures

Twenty-four consumer taste panels were conducted in Chicago, IL and San Francisco, CA to determine consumer willingness-to-pay for beef flavor. Consumers were recruited over the phone by independent product development firms in each of the respective cities. Individuals who met the research requirements were invited to participate in a taste panel where they would have the opportunity to taste New York Strip Steaks. Consumers were told that they would receive $25 in Chicago and $35 in San Francisco for their participation, and that they would have the option to purchase steaks similar in quality to those they sampled in the taste panels. Twelve taste panels consisting of 12 consumers each were scheduled in both locations.

Upon arriving at the research facility, panelists were first paid the money they were promised over the phone, and were asked to complete two surveys, the first survey contained questions about the participants' demographic characteristics and meat purchasing behavior, and the second survey assessed participants' beef knowledge. Panelists then visually evaluated a pair of steaks in a simulated supermarket setting. Next, the unique fourth-price auction was explained, and three practice, non-binding auctions were completed to familiarize the participants with the auction process.

After the practice auctions were completed, the taste panel procedure and auction process was explained. Panelists were encouraged to bid their true value for each of the steaks and reminded that if they "won" a binding auction, they were obligated to purchase the one-pound package of steaks at the auction market price (fourth-highest bid). The individual experimental auctions consisted of four steps: 1) panelists completed a "blind" taste test and evaluation of a pair of steak samples, 2) panelists submitted two bids in dollars per pound for each sample in the pair, 3) all bid sheets were collected by the auction monitors, and 4) the auction monitor announced the market price (fourth-highest price) for each steak sample in the pair.

The four-step process was completed a total of three times: twice for a marbling comparison: USDA Choice steaks versus USDA Select steaks; and once for a country-of-origin comparison: USDA Select steaks versus Argentine steaks. Thus, each panelist had the

opportunity to bid on, and to purchase three pairs of steak samples; or in other words, panelists submitted a total of six bids and could have won or have purchased a total of six steak packages. Because the auction was a fourth-price auction, three one-pound packages of frozen steaks were sold for each of the six steak samples. Panelists were only allowed to purchase one package of steaks in each auction, so while the auction was a multi-unit auction, it was a single-unit demand auction rather than a multi-unit demand auction.[2]

To prevent explicit collusion, which the theoretical Vickrey auction model assumed not to exist, communication was not allowed between participants during the auction procedures. All participants knew how many items were for sale in each period (three) and were also aware of their competition. Furthermore, the participants knew their own valuation for the product and were also informed of the market price for each auction from the previous period, but they were not given the actual values of their competitors. Thus, the independent private values information structure assumed in the Vickrey auction was present.[3]

Methodology

Tests of Consumer Theory in Experimental Auction Markets

The experimental design of this research was unique compared to previous applied experimental economic studies which measured consumers' WTP for food products. Several characteristics of the auction design allowed examination of the factors influencing both individual demand and market prices in experimental, sealed-bid Vickrey auctions. Consumer WTP was measured on an already established, familiar market good, beef steaks, that possessed two different quality attributes. Because consumers did not need to learn their preferences for a new product (Shogren, List and Hayes, 2000) the factors influencing consumers' demand for a familiar market good in a theoretically demand-revealing auction could be tested. Specifically, consumer behavior within the experimental auction could be explored, and the influence of participant demographics and their knowledge of the experimental product, on individual demand could be examined.

Rather than randomly selecting a binding auction (as suggested by Shogren et. al., 1994), all of the successive auctions were binding, purchase auctions. Hence, economic theory would suggest that as subsequent auctions were run, the market price may decrease as some buyers (panelists) become satiated and either place a lower value on the next good sold or choose to drop-out of the bidding process. This phenomenon is referred to as the "wealth effect" in auction literature (Friedman and Sunder, 1994; Shogren et al., 1994). If the wealth effect existed because of the binding nature of our successive auctions, then the market price in our successive binding auctions could be downward biased and the validity of the WTP value would be questionable.

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[2] The difference between multi-unit, single-demand auctions, and multi-unit demand auctions is important, as the latter of the two has been shown to be allocatively inefficient. List and Lucking-Reiley (2000) and Alsemgeest, Noussair and Olson (1998) discuss and compare multi-unit demand auctions to single-unit demand auctions.

[3] For an in depth explanation of the independent private values model see Kagel (1995).

Panel size varied from six to 12 participants in the experiment. This allowed us to examine a change in market demand and the resulting auction market price when the experiment is conducted with a varying number of consumer participants. How responsive is the auction market price to the size of the experimental panel? Two different payment levels and locations were used in the experiment, which also may have affected the market price.

Consumer Behavior in Experimental Auction Markets

Not all taste panelists in the experiment chose to actively participate in the auction. Panelists were told they could submit a bid of zero if they did not want to participate. However, if they submitted a bid of zero, they were asked to give an explanation of why they were bidding zero. This qualitative information is summarized in the results sections.

Most of the panelists did submit bids; however, some panelists never won an auction because they never submitted a bid above the market price. While other panelists won all six binding auctions. This experiment was primarily designed to determine consumers' taste preferences and to elicit consumers' WTP for their preferences. Yet, from the bids it was obvious that some panelists were winning auctions on products they did not prefer, while others did not win an auction on a product that they preferred. Are there demographic factors that would explain auction winners and losers?

The functional equation shown in Equation 1 was developed to examine the impact of consumer demographics and consumption habits on the probability that a consumer would either be a winner or a non-winner in the experimental auction markets.

$$\text{winner}_i = f(\textit{meat eater}, \textit{beef eater, price, age, education, household, employ, income, ethnic, gender, location}, \textit{knowledge}). \quad \textbf{(1)}$$

Panelists were categorized as *winners* if they submitted a bid greater than the market price in at least one of the six binding auctions, and were *nonwinners* otherwise. If the participant was a winner, then the dependent variable in Equation 1, *winner*, was equal to one. If the participant was a non-winner, then the dependent variable was equal to zero, *(i = 1 – 248)*.

The independent variables used in the model were chosen based on previous studies examining consumer beef demand and assumed socioeconomic variables that would likely affect an individual consumer's demand for beef (Capps, 1989; Menkhaus et al., 1992). *Meat eater* was a categorical variable representing the number of times per week meat was eaten in the home. *Beef eater* was a discrete variable equal to one if beef was the meat product consumed most often in the household, and was equal to zero otherwise. *Price* was also a discrete variable equal to one if a participant indicated that price was the most important driver of their shopping decisions, and *price* was equal to zero otherwise. *Age, education, household, employ*, and *income* were all categorical variables used to represent the effect of a participant's age, education, household size, employment status and annual income on the probability they would win or lose an auction. *Ethnic* was a participant's ethnic background, and was equal to one if the participant was Caucasian, and was equal to two otherwise. *Gender* was the gender of the

participant. *Location* was equal to one for Chicago and two for San Francisco. *Knowledge* was the panelist's score on the beef knowledge quiz (10 = perfect score). Each of the categorical variables is further described in Table 1.

Equation 1 was estimated using a logit regression procedure. The logit model is based on the random utility model and is explained in depth in Green (1997, pp. 871-901). Panelists participating in the auctions were assumed to have two utilities: U^w and U^n. U^w was the panelist's utility of winning an auction, and purchasing a steak; and U^n was the panelist's utility of not winning an auction and not purchasing a steak. Direct observation of the participant's utility from winning or losing an auction was not possible, however, participants who submitted a higher bid were assumed to have a higher utility for the steak and were more likely to win an auction ($U^w > U^n$).

Market Price and Market Demand in Experimental Auction Markets

If an experimental, sealed-bid Vickrey auction is truly demand-revealing, the principles of consumer demand should also hold true in the auction setting. Changes in population, income, and tastes and preferences of the auction participants should shift the experimental market demand and market price as theory suggests. The various panel sizes and the panelists' taste panel rankings allowed examination of the factors affecting market price in the experimental auction. The three sequential auction time periods permitted checking to see if the "wealth effect" existed and biased the market price. The following regression equation was used to test the hypothesis that changes in market price from one auction to the next could be explained by changes in panel population, panelists' tastes and preferences, demographic and procedural differences between research locations, and a "wealth effect" associated with the repeated binding auctions:

$$market\ price_{in} = b_0 + b_1 pansize + b_2\ tprate + b_3\ tprate\ stdev + b_4 dpdummy + b_5\ time + b_6\ choice + e. \quad \textbf{(2)}$$

Where *market price* is the market price for the i^{th} auction and the n^{th} taste panel, where *i* takes the value of one to six for the six auctions in each taste panel, and *n* takes on the value of one to 24 for each of the 24 taste panels. *Pansize* is equal to the number of participants in an auction; *tprate* was the average taste panel rating based on consumers' overall acceptability ratings (1 = extremely undesirable, 8 = extremely desirable) for the sample; *tprate stdev* is the standard deviation of the taste panel rating, and is used to account for perceived variation in steak quality, *Dpdummy* is a dummy variable used to account for any differences attributable to demographics (Chicago versus San Francisco consumers) and research procedures (such as the $25 endowment in Chicago versus the $35 endowment in San Francisco) between research locations and is equal to 0 if the location was Chicago and is equal to 1 if the location was San Francisco; *Time* takes on a value of 1 for the first Choice versus Select steak comparison and auctions, a value of 2 for the second Choice versus Select steak comparison and auctions, and a value of 3 for the domestic steak versus Argentine steak comparison and auction, respectively.[4]

[4] When the model was estimated, the Argentine market prices were eliminated from the data set because of extremely low taste panel rating and extreme variations in market prices.

The *time* variable was included as a test of the hypothesis that successive bidding order did not influence the market prices. *Choice* is a dummy variable equal to 1 if the steak sample was a USDA Choice steak (high marbled) and is equal to 0 if the steak was a USDA Select steak (low marbled).

It was hypothesized that the beta coefficients associated with *Pansize, tprate*, *tprate stdev*, d*pdummy* and *choice* dummy variables would be significant and positive. Based on demand theory, as population and consumers' tastes and preferences increased, demand should have also increased, shifting demand outward. While no a priori knowledge existed on likely differences in demand between the Chicago and San Francisco markets, it was hypothesized that the higher income endowment given to the San Francisco consumers would have increased their demand ceteris paribus.

Results

Two hundred and forty-eight consumers participated in the taste panels, 124 in both Chicago and San Francisco. The participants were primarily Caucasian females, were between the ages of 35 and 54 and had an annual household income of $40,000 to $69,000. The participants also consumed a large amount of meat in their diet, 58% of the respondents indicated that they prepared and ate meat 3-6 times per week. Beef (63%) and chicken (27%) were the meat products that the participants preferred to consume.

The Factors Influencing Individual Demand in Experimental Auction Markets

The first objective of this research was to determine the factors influencing participant behavior and individual demand in an experimental auction market. To address this objective, a frequency analysis was first completed to examine the number of *winners* and *nonwinners* in the data set. A panelist was defined as a *winner* if they submitted a bid above the market price in at least one of the six binding auctions and a *nonwinner* otherwise. Approximately 65% of the participants won at least one auction, 19.9% of the participants won at least four auctions, and seven individuals (only 3.1%) won all six auctions. Of those individuals winning an auction, 45.6% won at least one sample that was not their preferred sample in the pair.

These statistics indicate that some consumers may have consistently bid a slightly higher or lower value (strategically bid) to increase the probability that they either won or lost an auction. Were there any demographic characteristics that increased the probability of an auction participant winning or losing an auction? Did some participants who indicated that they ate beef several times per week place a higher value on the steak than consumers who ate primarily poultry or pork? Did participants in a lower income category participate only for the monetary payoffs and try to avoid winning an auction? An answer of "yes" to any of these questions may indicate that some participants' auction behavior was inconsistent with the demand-revealing property of the Vickrey auction (i.e. some participants did not bid their true value) and the validity of the auction is questioned.

Table 2 provides a somewhat qualitative analysis of the consumers who chose to exit the market altogether and submitted zero bids on all products (22 participants). The quotes from individuals who consistently bid zero in all six of the experimental auctions were placed in five categories: unknown source, storage, not interested in purchasing meat, needed money, and did not like the product. The comments ranged from "not interested in purchasing steak today" to "college student, [and I am] broke". Some of these reasons may be representative of the same group of people who choose not to purchase beef in the supermarket on certain days, influencing the "real world" market price for beef. This raises the question of whether or not these individuals bias the auction market and what can future researchers do to prevent these individuals from participating in research trials? Or should anything be done to prevent these participants from participating because they actually represent true market behavior?

Equation 1 was estimated with the logit procedures of SAS to examine the effect of demographic variables on the probability that an auction participant would be an auction *winner*. The results of the logit model are shown in Table 3. The coefficients on the *beef eater*, *price*, *education* and *ethnic* variables were all significant ($\alpha = .05$). Participants who consumed beef most often in their household were less likely to win an auction. Consumers with a higher education, consumers who were price-driven and non-Caucasian consumers were more likely to win an auction. The knowledge variable was not significant. The negative sign of the *beef eater* coefficient is opposite of the expected sign; this may indicate that the participants in this study who indicated that they did not typically purchase beef do so because of price, not because they prefer another meat. While some variables were significant, the overall model was not a good predictor of auction winners, thus, researchers may not need to be as concerned as previously thought about selecting auction participants.

The Factors Influencing Market Demand and Price in Experimental Auction Markets

The second objective of this research was to determine the factors influencing market price and market demand in an experimental auction market. The overall average market price for all auctions and the average market price for each of the panel sizes are shown in Table 4. No significant difference existed between market prices; however, the number of observations for each panel size was relatively small. In order to examine the factors influencing market demand in the auctions, Equation 2 was estimated using the ordinary least squares (OLS) regression procedures of SAS. Due to correlated independent variables, two OLS regressions were run: one without the *choice* dummy variable and one without the *tprate* variable. The results of the estimation are shown in Table 5. The independent variables explained 57% - 68% of the variation in market price (adjusted $R^2 = .57$ and .68). The variation in market price in the experimental auctions was explained by the same factors that influence market price or shift market demand in the "real world".

In the first regression, the *pansize*, *tprate*, and *dpdummy* coefficients were all significant, and as hypothesized, the signs on all of three coefficients were positive. As panel size increased, market demand increased and the market price also increased. The average market prices were plotted in Figure 1. Graphically, the average market price appeared to increase for all treatments as the panel size increased from 6 to 11 panelists. The average market price then decreased slightly from panels of size 11 to size 12.

The significance and positive sign of the *tprate* coefficient indicated that market prices increased with higher taste panel ratings (increasing tastes and preferences increased market price). The significant and positive sign on the *dpdummy* dummy variable was not surprising; cultural differences between Chicago and San Francisco may have influenced consumers' WTP. Procedural differences between locations may have also caused these differences; for example, the San Francisco consumers were given a larger income endowment, which may have increased the market price in San Francisco (an increase in market income should shift the demand curve out and increase market price). The insignificance of the *time* variable indicated that consumers in our study did not reach a significant level of satiation, thus, no "wealth effect" was apparent from these results.

In the second OLS regression model, the *pansize* and *dpdummy* variables were significant and positive, similar to the first OLS regression. The *tprate stdev* and *choice* dummy variables were also significant. If the steak was higher marbled, USDA Choice beef, then market price increased by $.22/lb.; thus, based on taste, consumers were willing-to-pay a significant premium for the higher marbled beef. The negative coefficient on the *tprate stdev* variable indicates that an increase in the perceived variability or quality of the steak (by one unit) will decrease the market price by $.37/lb.

Summary

These results indicate that certain demographic variables may increase the probability that a participant wins or loses an experimental auction. In particular, in this research, consumers who were "price-driven" shoppers may have realized that they were getting a "good deal" and may have bid high enough to win an auction and to purchase the steaks.

The market price was found to be a function of the number of participants in a panel, as well as consumers' tastes and preferences. Thus, changes in the market price of the auctions in the study appear to be more a function of the same factors that affect demand in the marketplace, rather than the "wealth effect." This is not to say that if auction participants had been given the opportunity to complete one or more rounds of bidding, that satiation would not have occurred. However, the wealth effect did not appear to bias the bids in this research. Consumers in our research did appear to be expressing their true value for the auction product and the auction provided a valuable measure of consumers' WTP for flavor.

Implications

Our research indicates that Adam Smith's theory of the invisible hand is at work in an experimental market as it is in the real world market place. Individual participants pursuing their own self-interest, results in an equilibrium market price. However, our research also shows that the experimental auction market price is influenced by panel size and consumers' tastes and preferences for the auctioned good. If researchers are interested in the experimental auction price being similar to the real world market price for a product, then pre-trial experiments will need to be conducted to determine the correct panel size and payment. Further research is also necessary to identify the appropriate panel size to use when auctioning multiple products. Research examining the effect of income endowment on market price would also be interesting.

The use of experimental auctions to determine consumer acceptance and WTP for product attributes or new products is increasing. Each research project requires specific alterations to fit the experimental procedures to the research settings. The information gained from our research should aid future researchers in selecting consumers for their experiment, in eliciting more accurate consumer WTP through experimental auction markets and in interpreting their results.

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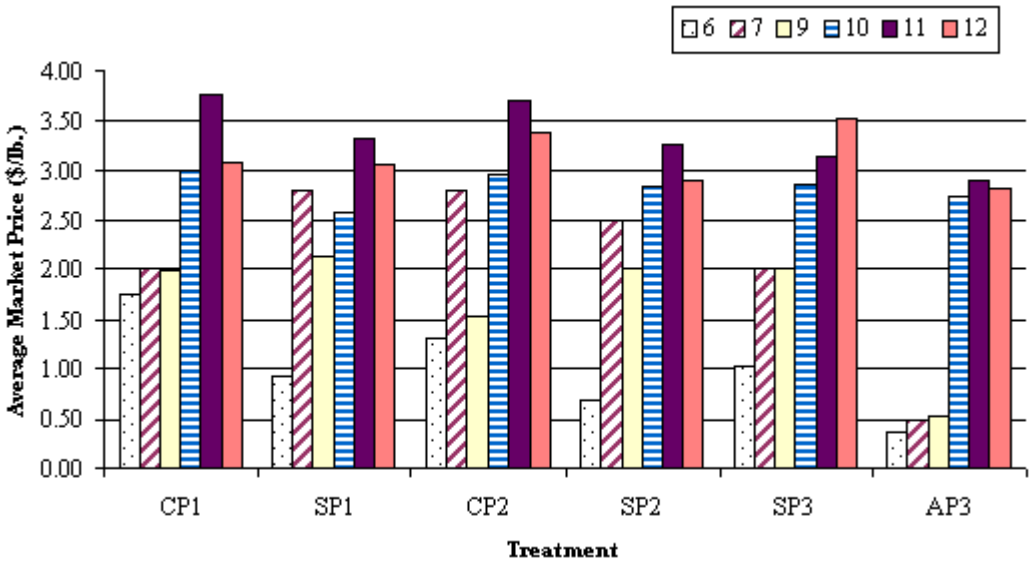

Figure 1. Average Auction Market Prices by Treatment and Panel Size.

Table 1. Description of the Categorical Variables Used in Winner Equation.

Variable	Definition	Possible Values
Winner	Consumer won or lost an auction.	1 = consumer won at least one auction 0 = otherwise
Meat eater	Number of times per week meat was eaten in the home	1 = 1-2 times, 2 = 3-4 times, 3 = 5-6 times 4 = 7-8 times, 5 = 9-10, 6 = more than 10
Beef eater	Meat product consumed most often	1 = beef was the meat product consumed most often 0 = otherwise
Price	Driver of shopping decisions	1 = price, 0 = otherwise
Age	Consumer's age category	1 = under 25 years, 2 = 25-34 years, 3 = 35-44 years, 4 = 45-54 years, 5 = 55-64 years, 6 = over 64 years
Education	Level of education	1 = completed at least a college degree, 0 =otherwise
Household	Number of family members living at home	1 = 4 or more family members 0 = otherwise
Employ	Category of employment level	1 = employed either full or part-time 0 = otherwise
Income	Income category	1 = 10,000-19,999, 2 = 20,000-29,999 3 = 30,000-39,999, 4 = 40,000-49,999 5 = 50,000-59,999, 6 = 60,000-69,999 7 = 70,000-79,999, 8 = 80,000-89,999 9 = 90,000-99,999, 10 = greater than 100,000
Ethnic	Ethnic background Category	1= Caucasian, 0 =otherwise
Gender	Gender category	1 = female, 0 = male
Loc	Location of taste panel research	1 = Chicago, 2 = San Francisco
Knowledge	Panelist's knowledge quiz score	10 = perfect score, 0 = no correct answers

Table 2. Comments from Panelists Bidding Zero in All Auctions.

Category	Comment
Unknown Source	· Not interested in purchasing, I like to see exactly the piece of meat I'm buying. · I don't buy meat from unknown sources. I don't know if meat stayed frozen. · I only purchase from known sources.
Storage	· In between housing. No freezer. · Freezer is full. · Moving. · I've already done my shopping for this week, and I have no room for any meat right now.
Not Interested in Purchasing Meat	· Just purchased meat. · Don't want to win any steaks. · I am not bidding because I feel that it was not made clear when I was asked to participate that there was to be an auction and I don't want to buy meat now (If I were to purchase this meat I would be willing to spend $4.99/lb). · Was good, but don't want to purchase at this time. · Do not want to purchase meat at this time. · Just not interested.
Need Money	· I choose to keep the money. · Broke. · Not bad, but it's the end of the month and I'm broke. · College Student – no money. · Not prepared to spend $ today.
Did Not Like	· Don't care for enough to purchase. · Did not like enough to purchase · Either bad cook or all meat was bad · Did not care for product.

Table 3. Results from the Experimental Auction *Winners* Logit Model.

Variable	Coefficient	Chi-Square
Meat Eater	-0.1345	2.6840
Beef Eater	-0.5156 [a]	5.2423
Price	0.7329 [a]	7.8256
Age	-0.0532	0.2094
Education	0.3040 [a]	10.895
Household	0.0203	0.0471
Employ	-0.0096	0.0053
Income	-0.0497	1.1971
Ethnic	0.3001 [a]	9.0305
Gender	-0.4166	2.3449
Loc	0.1967	0.6759
Knowledge	-0.1090	2.6085

[a] Variable is significant at the $\alpha = .05$ level

n = 440, Pseudo $R^2 = .1344$

Table 4. Average Market Prices ($/lb) for Varying Panel Sizes (Standard Deviation is in parenthesis).

		Average Market Price for Treatment					
		Pair One		Pair Two		Pair Three	
Panel Size[a]	# Obs.	Choice	Select	Choice	Select	Domestic	Argentine
6	3	$ 1.75 (1.14)	$ 0.92 (0.14)	$ 1.31 (0.59)	$ 0.67 (0.30)	$1.02 (0.91)	$0.37 (0.23)
7	1	$ 2.00 (NA)	$ 2.79 (NA)	$ 2.79 (NA)	$ 2.50 (NA)	$2.00 (NA)	$0.50 (NA)
9	2	$ 1.98 (0.39)	$ 2.12 (1.23)	$ 1.53 (0.67)	$ 2.00 (0.01)	$2.00 (0.71)	$0.53 (0.67)
10	3	$ 2.99 (0.01)	$ 2.56 (0.11)	$ 2.95 (0.51)	$ 2.85 (0.57)	$2.85 (0.26)	$2.73 (0.45)
11	5	$ 3.76 (0.78)	$ 3.30 (0.60)	$ 3.69 (0.70)	$ 3.25 (0.87)	$3.15 (0.60)	$2.91 (1.00)
12	10	$ 3.08 (0.31)	$ 3.06 (0.69)	$ 3.36 (0.52)	$ 2.90 (0.69)	$3.51 (0.82)	$2.82 (0.64)
Overall Mean[c]		$2.91 (0.85)	$2.69 (0.95)	$2.94 (0.99)	$2.59 (1.00)	$2.85 (1.08)	$2.23 (1.22)

[a] Panel size is equal to the number of participants (consumers) in each panel.
[b] Number of observations is equal to the number of panels in a panel size category.
[c] Overall mean is the average of all market prices for a treatment (n=24 per treatment).

Table 5. Market Price OLS Regression Results.

	Taste Ranking Model		Choice Model	
Variable	**Coefficient**	**t -value**	**Coefficient**	**t -value**
intercept	-3.2979[a]	-6.14	-0.7377	-1.86
pansize	0.2812 [a]	10.66	0.3422 [a]	12.01
tprate	0.6385 [a]	6.50		
tprate stdev	-0.1168	-0.86	-0.3703 [a]	-2.48
dpdummy	0.2055 [a]	1.94	0.3974 [a]	3.38
time	-0.0796	-1.08	0.1497	1.79
choice dum			0.2159 [b]	1.70
Adj. R^2	0.68		0.57	

[a] Variable is significant at the $\alpha = .05$ level
[b] Variable is significant at the $\alpha = .10$ level
n = 120, Adjusted $R^2 = .68$