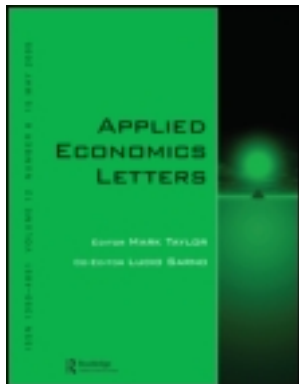


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An empirical investigation of rewards' effect on experimental auctions outcomes

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An empirical investigation of rewards' effect on experimental auctions outcomes

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We examine the effect of earned participation rewards on willingness to pay (WTP) bids in experimental auctions. Our results show that when subjects are provided with a fixed reward, they bid more than those who had to earn their reward.

Keywords: experimental auctions; earned participation rewards; willingness to pay (WTP)

JEL Classification: D44; C92; Q13

I. Introduction

Owing to the strong evidence that individuals overstate their true willingness to pay (WTP) in hypothetical situations, there has recently been increased interest in measuring WTP using experimental auctions (Lusk and Shogren, 2007). These mechanisms have the strong advantages of being incentive-compatible and replicate real-life settings, since they involve real goods and money (Drichoutis *et al.*, 2008). On the other hand, experimental auction designs are built upon several methodological choices that inherently have a number of limitations. While there is extensive literature on the effects of experimental design issues, such as auction mechanism (Lusk *et al.*, 2007), initial endowments (Corrigan and Rousu, 2006a) and practice rounds (Brown, 2005), there has been surprisingly little attention paid to the effect participation rewards might have on experimental auction results. Therefore, the objective of this study was to empirically assess the effect of earned participation rewards on WTP bids in experimental auctions.

II. The Experiment

Following Depositario *et al.* (2009), participants were recruited among undergraduate students in the city of Naples, South of Italy. The only requirements were to be a University student and a regular yogurt consumer (between daily and bi-weekly user).

The data were collected in the winter of 2012. Participants were randomly assigned to one of the two treatments: the control (in which the show-up fee was automatically provided) and the other treatment, in which the fee was earned. Subjects participated in sessions, which varied from 12 to 15 students. In total, 10 sessions were held and 132 subjects participated in our study. The experiment was programmed and conducted with the software z-Tree (Fischbacher, 2007). Sessions were held in the morning, which is a common consumption time for yogurt; each session lasted approximately 1 hour to 1 hour and 15 minutes.

During the session, consisting of five rounds, participants had to bid for three different types of yogurts: a conventional, a functional and an organic (presented in

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a standard sale package, with two servings). In the treatment group, consisting of five sessions, individuals had an opportunity to increase their participation reward of 5€ through a questionnaire game composed of ten questions on different topics (such as history, geography and mathematics). Half a euro was gained for every correct answer. In the control group, also consisting of five sessions, participants did not take part in the game, and randomly received rewards ranging from €5 to €10. The five sessions with the questionnaire game were held first, and we used the results to determine the distribution of payouts on the control group (the exact same 66 rewards' values resulting from the game were distributed to the second group of participants, mean = 6.88, SD = 1.34).

Using the Pearson chi-square test, we ascertained that the groups were not significantly different from each other (in terms of yogurt consumption frequency, gender, age and household composition). We used the fifth-price Vickrey auction in order to elicit consumers' WTP. The choice of the fifth highest bid makes it possible to increase the number of participants in the transaction, and hence to increase the degree of involvement in the auction of those individuals who attribute low values to the products on sale. As noted by Lusk *et al.* (2004), this type of auction combines the advantages of second-price and random *n*th-price

auctions. In addition, Lusk *et al.* (2007) demonstrated that if the number of participants who could purchase the product is approximately half the session, all bidders would generally be more engaged. No reference price was given to respondents since previous scholars have demonstrated that provision of reference or field price information influences bid values in experimental auctions (Corrigan and Rousu, 2006b; Drichoutis *et al.*, 2008). In the training auctions, with University gadgets, we posted prices to explain the auction mechanism, but during the yogurt auctions, we did not reveal any bidding information. We made it clear to the subjects that only one round and one product will be binding, to avoid demand reductions and wealth effects.

III. Empirical Results

Table 1 shows the differences between WTP means and medians of the two treatments for the three types of yogurt. Subjects who received fixed, non-earned rewards reveal significantly higher WTP for all the auctioned products.

Table 2 reports the parameter estimates of random effects Tobit models, where the dependent variable is participant *i*'s WTP for each yogurt in the presence and

Table 1. Average WTP differences between treatment and control and Wilcoxon signed-rank test

Wilcoxon signed-rank test	Δ Mean	Δ Median	SD	<i>p</i>
Δ Conventional yogurt Nonearned reward – Earned reward	0.49	0.4	0.91	<0.001
Δ Organic yogurt Nonearned reward – Earned reward	0.56	0.5	1.07	<0.001
Δ Functional yogurt Nonearned reward – Earned reward	0.65	1.0	1.36	<0.001

Table 2. Random-effects Tobit model estimates: WTP for yogurts (*N* = 132)

Variables	Conventional yogurt		Organic yogurt		Functional yogurt	
	Parameter	<i>p</i>	Parameter	<i>p</i>	Parameter	<i>p</i>
Constant	0.181	0.142	0.098	0.185	0.219	0.108
Random vs. Earned reward ^a	0.318**	0.000	0.397**	0.001	0.411**	0.000
Round 2	0.244**	0.001	0.276**	0.000	0.308	0.000
Round 3	0.263**	0.000	0.288**	0.001	0.314**	0.002
Round 4	0.269**	0.000	0.302**	0.001	0.321**	0.001
Round 5	0.274**	0.000	0.296**	0.000	0.337**	0.000
Age ^b	0.212	0.332	0.248	0.109	0.315	0.000
Female	0.143	0.089	0.262	0.183	0.321	0.123
Yogurt consumption frequency ^c	0.326**	0.003	0.139**	0.002	0.214**	0.002
SD of individual-specific error	0.721**	0.004				
Likelihood ratio test that $\sigma(u) = 0$	5033.26**					

Note: ^a0 = subjects earned money through the questionnaire game, 1 = randomly assigned reward.

^bage is a dummy where 0 = between 18 and 24 years old, 1 = over 24.

^cdummy 0 = low consumption frequency, 1 = high consumption frequency.

**significant at 0.01 level.

the absence of an earned reward. Consistent with the results from Table 1, we find that randomly assigned rewards have a positive and statistically significant impact on bids in all models, suggesting that the way rewards are distributed affects value estimates. We specifically model WTP as: $WTP_i = f(\text{Randomly assigned fixed Reward, Round 2, Round 3, Round 4, Round 5, Age, Gender, Yogurt consumption frequency})$ per $i = 1, 2, \dots, 132$.

IV. Concluding Remarks

Paying experimental subjects a participation fee to reward their opportunity cost is a common practice in experimental economics. Previous research has investigated the importance of earned remuneration in dictator games, concluding that earned money is considered differently to windfall gains (Cherry *et al.*, 2002; List and Cherry, 2008). In this study, we explored the issue of earned rewards in the fifth-price Vickrey auctions. We conclude that when subjects are provided randomly with a fixed reward, compared to a reward earned through a questionnaire game, they tend to bid more for the auctioned products. Consequently, a critical implication of our finding is the importance of addressing the issue of earned rewards in experimental auctions that elicit home-grown values. This is highly relevant if results of auction experiments should be transferred to predict actual purchase decisions at the market, therefore reward mechanisms should also be considered as an important feature in planning experimental design.

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