

# Online Appendix for Strategic Responses to Personalized Pricing and Demand for Privacy: An Experiment

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## Abstract

This appendix describes the pre-registered treatments that are not present in the final article.

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## 1. Experimental Design<sup>1</sup>

### 1.1. Scope Treatments: Scope Standard and Scope Movies

The experiment runs exactly like in the Baseline treatments. But before the survey, additionally to the warning that the information from survey will be used for determining the price, the participants are informed about the lowest and the highest price that the algorithm selected among 300 other participants, given their survey responses.

### 1.2. Sample data

We collected and 305 and 303 responses in Scope Standard and Movies respectively. The average duration of the treatments was 7.5 minutes. Average payoff of participants was £6.3, including £0.75 fee for participation.

## 2. Results

Note that in what follows the treatments, Standard and Movies from the paper are referred to as Baseline Standard and Baseline Movies, respectively.

### 2.1. Strategic response in surveys

We replicate analyses, pooling data from main treatments and Scope.

**Result 1. (*strategic response*):** *Subjects attempt to manipulate their responses to the survey questions. We find significant manipulation in seven questions of the Standard survey and four questions of the Movies survey.*

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<sup>1</sup>Note that the “Standard” survey corresponds to the “Risk” survey in the final article.

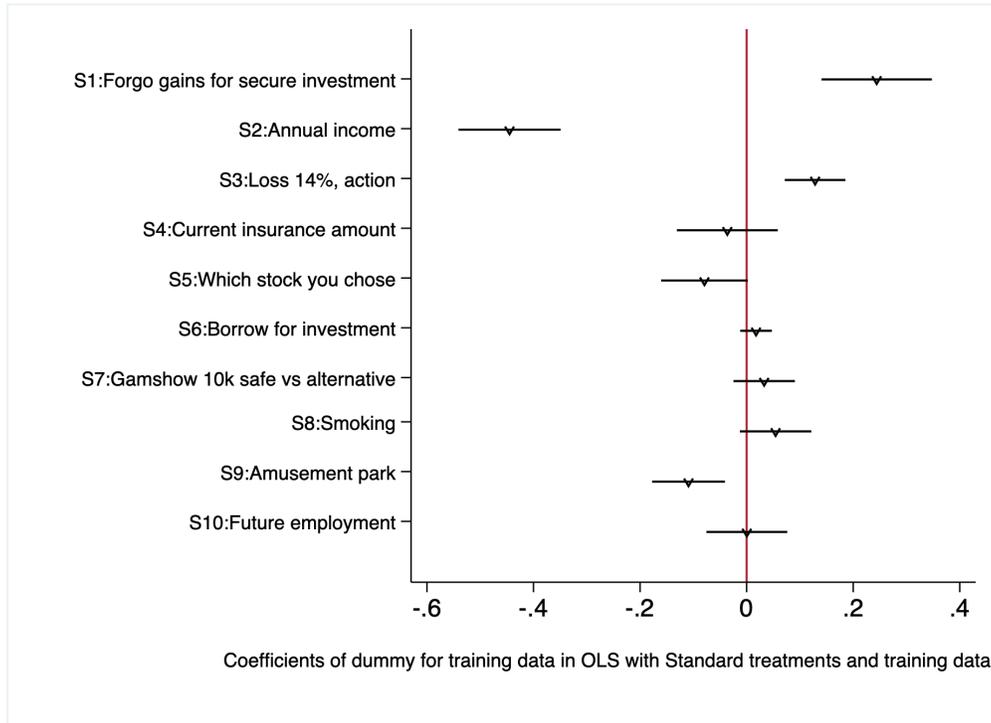


Figure 1: Coefficient of Dummy for training data in OLS with Standard treatments and training data

Table 1: P-values of variance and Mann-Whitney tests for equality of answers in the training data and treatments in the Standard survey

Question	p-value variance test	p-value Mann-Whitney test
S1:Forgo gains for secure investment	0.00	0.00
S2:Annual income	0.00	0.00
S3:Loss of 14%, action	0.10	0.00
S4:Current insurance amount	0.04	0.37
S5:Which stock you choose	0.68	0.052
S6:Borrow for investment	0.03	0.17
S7:Gameshow safe vs alternative	0.27	0.22
S8:Smoking	0.00	0.23
S9:Amusement park	0.44	0.00
S10:Future employments	0.76	0.83

Notes: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

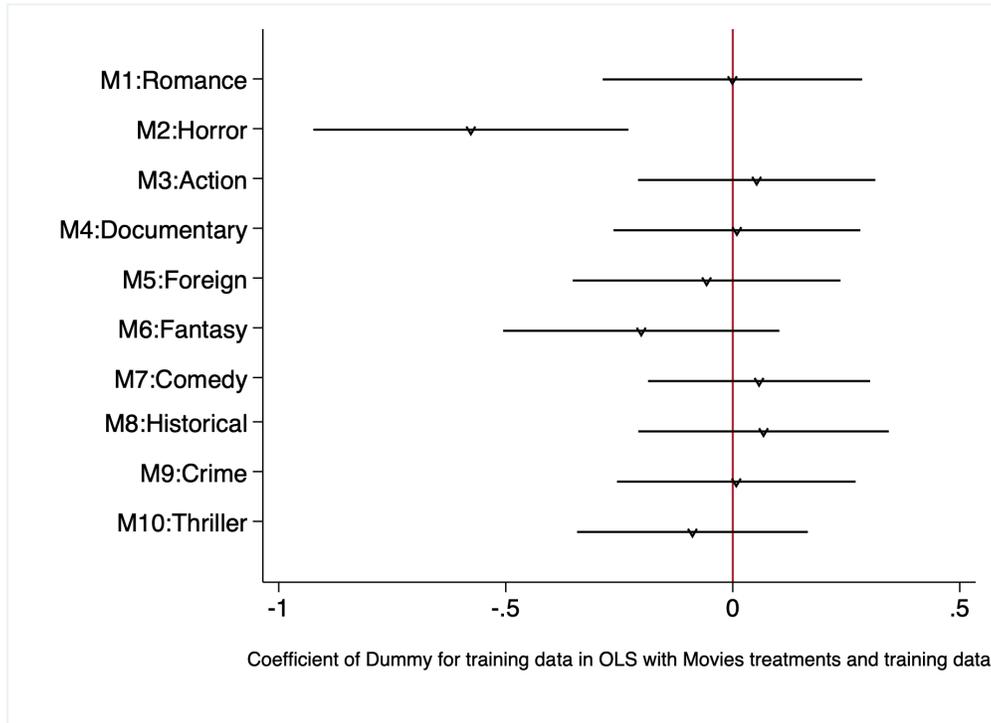


Figure 2: Coefficient of Dummy for training data in OLS with Movies treatments and training data

Table 2: P-values of variance and Mann-Whitney tests for equality of answers in the training data and treatments in the Standard survey

Question	p-value variance test	p-value Mann-Whitney test
M1:Romance	0.76	0.70
M2:Horror	0.87	0.00
M3:Action	0.040	0.51
M4:Documentary	0.52	0.31
M5:Foreign	0.21	0.64
M6:Fantasy	0.02	0.00
M7:Comedy	0.25	0.84
M8:Historical	0.75	0.01
M9:Crime	0.75	0.44
M10:Thriller	0.71	0.83

Notes: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 3: Predicted WTP and individual prices

	Predicted WTP (1)	Predicted WTP (2)	Predicted WTP (3)	Predicted WTP (4)	Individual price (5)	Individual price (6)
Baseline Standard	-0.081***	-0.083***				
	-0.023	-0.023				
Scope Standard	-0.083***	-0.085***			0.003	0.003
	-0.023	-0.023			-0.015	-0.015
Baseline Movies			0.054**	0.020	0.085***	0.085***
			0.023	0.024	0.015	0.015
Scope Movies			0.044*	0.026	0.040***	0.040***
			0.023	0.023	0.015	0.015
Age		0.00		-0.003***		0
		0.00		-0.001		0
Female		-0.061***		-0.001		-0.020*
		-0.019		-0.018		(0.011)
Constant	2.166***	2.197***	2.177***	2.316***	1.926***	1.935***
	(0.013)	(0.016)	(0.012)	(0.032)	(0.011)	(0.012)
Observations	1338	1338	1327	1327	1211	1211
$R^2$	0.014	0.022	0.005	0.023	0.033	0.036
Adjusted $R^2$	0.013	0.019	0.004	0.020	0.031	0.032
Sample	Train+Stan	Train+Stan	Train+Mov	Train+Mov	All, no train	All, no train

Notes: OLS; \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Result 2. (success of strategic response):** *The predicted willingness to pay is significantly lower in the Standard treatment than in the Training data. There is no significant difference in predicted willingness to pay between the Movies treatment and the training data, controlling for the age. Individual prices are significantly higher in the Movies treatments than in the Standard treatments.*

## 2.2. Privacy choices

Table 4: Privacy choices

	Privacy choice	Privacy choice
Baseline Movies	-0.079** (0.036)	-0.079** (0.036)
Scope Standard	-0.092** (0.036)	-0.094*** (0.036)
Scope Movies	-0.077** (0.036)	-0.077** (0.036)
Age		0.000 (0.000)
Female		0.046* (0.025)
Observations	1211	1211

Notes: Marginal effect of Probit regression of dummy for choice of private option. Sample includes all treatments. Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As for the Scope treatment, it has a significant negative effect on the proportion of subjects buying the private option in Standard. Again, it is the opposite of what we expected and contradicts hypothesis 5. One reason might be that our scope is lower than participants expected. Indeed, the average expected scope (difference between the guessed highest and lowest prices) is \$1.33 with no significant difference between treatments (note we elicited these beliefs only in Baselines). Note that our scope is \$1. Another potential explanation is

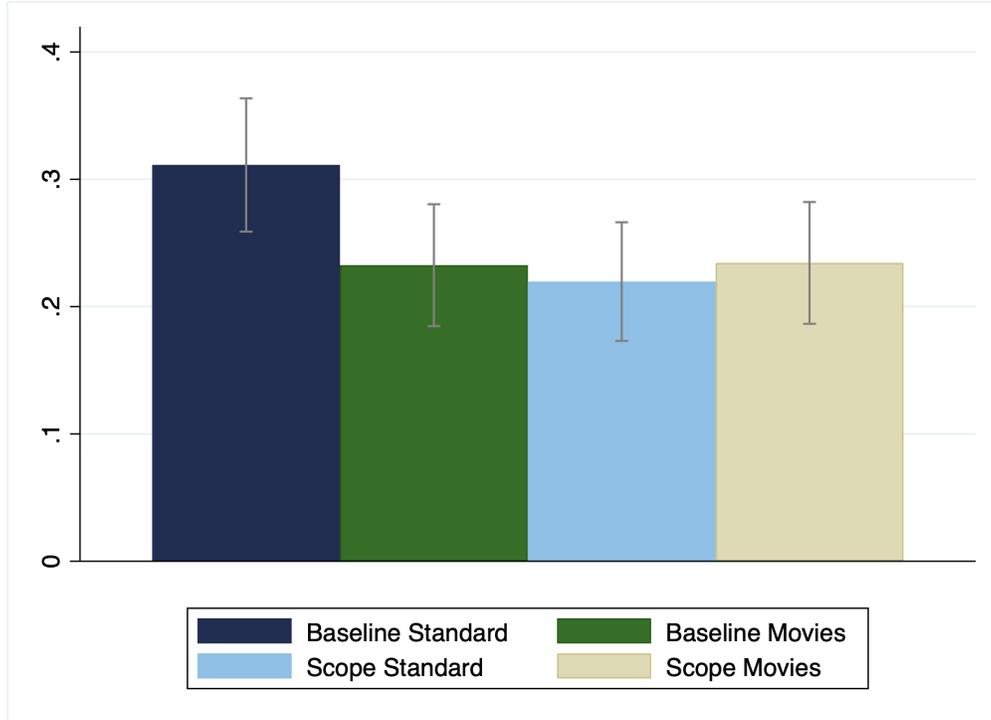


Figure 3: Choice of privacy

that participants are overconfident in their ability to manipulate the price, and the scope shows that the manipulation might be very profitable.

There is no treatment difference between scope and Baseline in Movies treatments.

**Result 3. (*demand for privacy*):** *The highest proportion of participants choosing the privacy option is in Baseline Standard, with the difference being significant relative to all other treatments. Providing the information on the scope of prices significantly reduces the proportion of participants choosing the private option in the Standard treatments.*

Next, we turn to the analysis of optimality of the privacy choice. We construct a dummy for optimal private choice, which is equal to 1 if: 1) the individualized price is high, and the participant chooses the private option; 2) the individualized price is low or middle, and the participant chooses not to buy the private option. It equals zero otherwise.

**Result 4. (*optimality of privacy choice*):** *Participants sort into buying the private option significantly more often in the Standard than in the Movies treatments. Providing the Scope of the prices significantly increases the optimality of the privacy choice in the Movies treatments.*

### 2.3. Buying decisions and revenue

Finally, looking at the revenues, we get the same treatment differences as in the case of buying decisions, with the highest revenues in Baseline Standard and significantly lower revenues in Scope treatments. Note that there is no significant difference between Scope Movies and Baseline Movies.

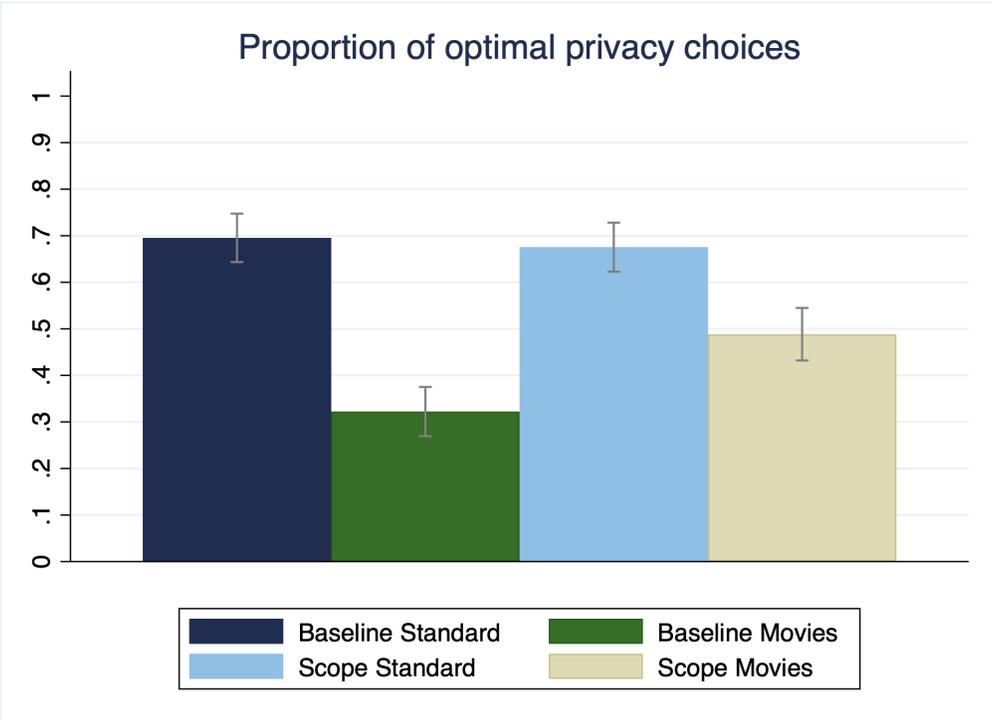


Figure 4: Optimal choice of privacy

Table 5: Optimality of privacy choices

	Optimal privacy choice	Optimal privacy choice
Baseline Movies	-0.373*** (0.038)	-0.373*** (0.038)
Scope Standard	-0.020 (0.038)	-0.018 (0.038)
Scope Movies	-0.207*** (0.039)	-0.207*** (0.039)
Age		-0.000 (0.000)
Female		0.041 (0.027)
Observations	1211	1211

Notes: Marginal effect of Probit regression of dummy for optimal choice of private option. Sample includes all treatments. Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 6: Buying decisions

	Bought lottery	Bought lottery	Bought lottery	Bought lottery
Baseline Movies	-0.098** (0.040)	-0.097** (0.040)	-0.029 (0.041)	-0.029 (0.041)
Scope Standard	-0.143*** (0.040)	-0.145*** (0.040)	-0.132*** (0.039)	-0.124*** (0.039)
Scope Movies	-0.134*** (0.040)	-0.134*** (0.040)	-0.092** (0.040)	-0.089** (0.040)
Age		0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Female		-0.041 (0.028)	-0.056** (0.028)	-0.059** (0.028)
Price			-0.652*** (0.092)	-0.566*** (0.094)
Privacy				0.094*** (0.033)
Observations	1211	1211	1211	1211

Notes: Marginal effect of Probit regression of dummy for buying the lottery. Sample includes all treatments. Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 7: Revenue

	Revenue	Revenue
Baseline Movies	-0.117 -0.077	-0.117 -0.077
Scope Standard	-0.262*** -0.077	-0.265*** -0.077
Scope Movies	-0.214*** -0.077	-0.214*** -0.077
Age		0 0
Gender=1		0 (.)
Gender=2		-0.091* -0.055
Gender=3		0.021 -0.183
Constant	1.046*** -0.055	1.090*** -0.061
Observations	1211	1211
$R^2$	0.011	0.014
Adjusted $R^2$	0.009	0.01
controls	Age, Gender	Age, Gender

Notes: OLS; \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .