Unwillingness to pay for privacy: A field experiment

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\textbf{A B S T R A C T}

We measure willingness to pay for privacy in a field experiment. Participants bought at most one DVD from one of two competing online stores. One store consistently required more sensitive personal data than the other, but otherwise the stores were identical. In one treatment, DVDs were one Euro cheaper at the store requesting more personal information, and almost all buyers chose the cheaper store. Surprisingly, in the second treatment when prices were identical, participants bought from both shops equally often.

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\section{1. Introduction}

The economics of privacy is controversial. The Chicago School (Posner, 1981) argues that privacy protection harms efficiency. In contrast, it has been asserted that property rights over the private data of individuals lead to the efficient outcome (Shapiro and Varian, 1997). But this view is contested too. First, privacy may lead to efficient equilibrium outcomes even if people do not appreciate it individually (Hermalin and Katz, 2006; Wathieu, 2009). Second, many contracts involving personal data are incomplete or highly opaque, as they typically lack clear-cut information about secondary uses and sharing of personal information. Consumers' limited ability to understand uses of their data, even retrospectively, could turn electronic retailing into a lemons market (Vila et al., 2003). Until now, economists have not systematically studied choices regarding privacy in such environments.

Previous studies have shown that consumers express concerns regarding misuse of personal data, yet continue to provide personal data on social networks and online shopping sites (see, for instance, (Acquisti and Grossklags, 2005)). To understand this behavior, observations from a natural environment have the disadvantage that the (unobservable) cost of switching to another supplier affects choices. In our experiment, we are able to control for this cost. Moreover, buying at the more privacy-friendly store does not prolong shopping time nor does it affect delivery time.\footnote{In an experiment by Berendt et al. (2005) with a monopoly online store, present-biased preferences are a potential source of observed privacy choices.} We simply confront consumers with different data requirements at two otherwise similar stores. Thus, unlike in the experiments of (Tsai et al., 2007; Egelman et al., 2009; Gideon et al., 2006), consumers are not guided by privacy ratings (e.g. in search engine results).

\section{2. Experimental design}

Participants were given the opportunity to buy one DVD from one of two online stores, named “SilverDisc Frankfurt” and “SilverDisc Cologne”. SilverDisc is a multichannel retailer of DVDs selling through Amazon, its own online shop, and a local branch in Berlin. The two branches in Frankfurt and Cologne are fictitious, but were chosen (with consent from SilverDisc) to minimize any differences between the two stores. All personal data provided by participants were given to SilverDisc and to Amazon as part of the transaction to purchase the DVD; this was explained in the instructions. On the order form, participants ticked a box to...
confirm that they agreed with the data protection regulations and
general terms and conditions of SilverDisc and Amazon, which
were available upon request from the experimenters.

A selection of DVDs were presented to the participants in a
folder together with two printed order forms, one for “SilverDisc
Frankfurt” and one for “SilverDisc Cologne”. Two treatments were
conducted. In both treatments, the mandatory data items common
to the two online shops were kept constant: last name, first
name, postal address and email address. In addition, “SilverDisc
Frankfurt” asked for date of birth and monthly income, whereas
“SilverDisc Cologne” asked for year of birth and favorite color as
mandatory fields. The required data items were clearly listed on
the two order forms given to the participants. In treatment EQ,
the prices at the two shops were equal, whereas in treatment
DIF all prices at “SilverDisc Frankfurt” were exactly one Euro
less than the prices at “SilverDisc Cologne”. Thus in DIF there
was a trade-off between data requirements and prices as subjects
found information on personal income more sensitive than on favorite
color (see Section 3).

After subjects had made their purchase decision, they were
asked to answer a post-experimental questionnaire. All 225
participants in the experiment (students from the Technical
University Berlin) received a show-up fee of 6 Euros. In addition,
all orders were subsidized by a discount of 7 Euros. The quoted
price on the order form corresponded to the Amazon.de retail price
plus the Amazon.de shipping costs (3 Euros) minus 1 Euro for
“SilverDisc Frankfurt” in treatment DIF.

3 Results

Of the 225 participants, 74 made a purchase. Lack of interest
in the products and their properties were decisive for 77% of the
non-buyers, and only 9% (14 out of 151) were put off by privacy
concerns or lack of trust. Table 1 provides an overview of the
results. In DIF, 39 of the 42 purchases were made at “SilverDisc
Frankfurt” where prices were 1 Euro lower. Thus, participants
predominantly chose the firm with the lower price and the more
sensitive data requirement, indicating that they are willing to
provide information about their monthly income and date of birth
for a 1 Euro discount.

To establish a benchmark of privacy concerns in purchasing
decisions, we conducted treatment EQ in which the two firms
asked for the same price, but differed with respect to the data items
required for the transaction. In this treatment, approximately
the same number of participants purchased a DVD at “SilverDisc
Frankfurt” and “SilverDisc Cologne”. Thus, the more privacy-
friendly firm failed to attract more customers even though prices
were equal at both stores.

3 Typically, neither Amazon nor SilverDisc ask for income and favorite color. Thus,
these data items had not been provided by subjects who had already shopped
at the online stores (75% with Amazon and 11% with SilverDisc) and represent a
true privacy cost as they were fully disclosed to SilverDisc after the experiment.

4 This is evidence against the hypothesis of private benefits or indifference but
collective costs when providing personal information (Wathieu, 2009).

5 Table 3 also shows that participants noticed the difference in data requirements
and prices between the two firms. Those who shopped with Cologne in treatment
EQ were significantly more satisfied with the firm’s privacy policy than those who
shopped with Frankfurt. In treatment DIF, those shopping with Frankfurt were
significantly happier with the prices than those shopping with Cologne.

Table 1
Number of purchases at the two stores per treatment.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>“SilverDisc Frankfurt”</th>
<th>“SilverDisc Cologne”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(income/date of birth)</td>
<td>(favorite color/year of birth)</td>
</tr>
<tr>
<td>EQ</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>DIF</td>
<td>39</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2
Sensitivity of mandatory data items.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Bought at</th>
<th>Less willing to provide data mandatory at Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cologne</td>
<td>Frankfurt</td>
</tr>
<tr>
<td>EQ</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>DIF</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>32</td>
</tr>
</tbody>
</table>

This table reports on the answers to the following question: “when you are asked for data, how willing are you to provide the following items?” Income and favorite color were listed among a number of other items.

Table 3
Absolute frequencies of satisfaction after purchase decision.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Bought at</th>
<th>Satisfaction high</th>
<th>Satisfaction low</th>
<th>Significance (Fisher’s exact)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EQ</td>
<td>Price</td>
<td>Frankfurt</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cologne</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Privacy</td>
<td>Frankfurt</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cologne</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>DIF</td>
<td>Price</td>
<td>Frankfurt</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cologne</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Privacy</td>
<td>Frankfurt</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cologne</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

This table reports on the answers to the question “how satisfied are you with the chosen store regarding price and privacy?” (satisfaction values z-transformed; missing data for participants exactly between high and low; p-values two-tailed).
discount, only half of the subjects shopped with the more privacy-friendly branch of the DVD retailer. This result is surprising given that most subjects who provide sensitive information are dissatisfied with it. Thus, observed behavior can neither be explained by a lack of awareness of privacy issues, nor can it be rationalized as a resolution of the trade-off between price and data protection in favor of price.

Two interpretations are possible: either the stated dissatisfaction with data collection and privacy protection can be regarded as uninformative as it is uncorrelated with choices, or behavior in the experiment is not in line with revealed-preference theory. In the latter case, the results shed doubt on the view that pure assignment of property rights in personal information is sufficient to achieve efficiency.

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References