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## To disclose or not to disclose? Personal data fair trade and unraveling of privacy

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Dorothea Kübler

WZB Social Science Center & Technical University Berlin

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## Informed choice

European Data Protection Directive relies on **notice and consent**.

But:

- Individuals often do not read nor understand privacy policies. Firms do not know in advance what they will search for in the future and thus cannot ask for explicit consent.
- Externalities render focus on individual choices insufficient (group profiling, pressure to consent due to consent of others).

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Study II: Unraveling of privacy

# **Study I: Personal data fair trade**

(with Sören Preibusch, Google)

# Consumer empowerment

- Privacy activists pay users a share of the data rent (commodify.us, datacoup)
  - „Sharing the wealth“: individuals get access to their own data (Tene and Polonetsky 2013)
  - Websites “PleaseRobme” and “Fire Me!”
- Attempts to increase awareness, transparency, and fairness

## Personal data fair trade

- Value of personal data for a firm carries information about future uses of the data
- Do complete and transparent contracts about the worth of personal data change consumer behavior, that is,....
  - ...does the price convey information that makes people reluctant to share information?
  - ...do fairness concerns limit data revelation?

# Screenshot lab experiment (1): Data provision

The screenshot shows a web browser window with the address bar displaying `https://ssl.webpack.de/hosted.xq.is/survey.php`. The browser has a single tab titled "Umfrage". The page content includes a paragraph about the survey, a heading for required information, and a list of six questions with text input fields. The answers entered in the fields are: "15 Dez 1980", "Tunesien", "€1200", "weiblich", "Köpenick", and "Eiffelturm". A "Weiter" button is located at the bottom left.

Zum Abschluss der der heutigen Sitzung folgt nun noch eine kleine Umfrage vom Wissenschaftszentrum Berlin für Sozialforschung (WZB).

**Zunächst benötigen wir die folgenden Angaben über Sie:**

Geburtsdatum:	<input type="text" value="15 Dez 1980"/>
letztes Urlaubsland:	<input type="text" value="Tunesien"/>
Ausgaben für letzten Urlaub:	<input type="text" value="€1200"/>
Geschlecht:	<input type="text" value="weiblich"/>
Bezirk, in dem Sie wohnen:	<input type="text" value="Köpenick"/>
Lieblingsbauwerk:	<input type="text" value="Eiffelturm"/>




# Screenshot lab experiment (2): Data sharing

https://ssl.webpack.de/hosted.xq.is/survey.php

Umfrage

Die Forschung des Wissenschaftszentrums Berlin für Sozialforschung (WZB) dient Wissenschaft, Wirtschaft und Politik. Einige der gerade von Ihnen gemachten Angaben sind für Unternehmen von Interesse. Sie haben jetzt die Möglichkeit, folgende Ihrer Angaben an das Unternehmen phil goods zu übermitteln: Geburtsdatum, letztes Urlaubsland, Ausgaben für letzten Urlaub, Geschlecht, Bezirk, in dem Sie wohnen, Lieblingsbauwerk.

**phil goods®** Über phil goods: Bei phil goods finden Sie innovative Regionalia. Wir gestalten Produkte, die zugleich nützlich und schön sind: farbige Plätzchenausstechformen und Geschenke für Jung und Alt. Unsere Serie farbenfroher Plätzchenausstechformen vereint bekannte Bauwerke in bunter Eintracht. Auf das Wesentliche reduziert, markant und liebenswert. Mittlerweile Sammelobjekte! Wir benötigen Ihre Angaben, um die Wünsche unserer Kunden besser kennenzulernen. Helfen Sie uns dabei, die nächste Generation der Plätzchenausstechformen zu gestalten!



Ihre eben gemachten Angaben sind phil goods €2,50 wert. Das Unternehmen bietet Ihnen €0,10 an, so dass phil goods €2,40 des Werts behält.

- Wenn Sie Ihre Angaben übermitteln, behält phil goods davon €2,40, und Sie erhalten €0,10.
- Wenn Sie Ihre Angaben nicht übermitteln, erhält phil goods nichts, und Sie erhalten nichts.

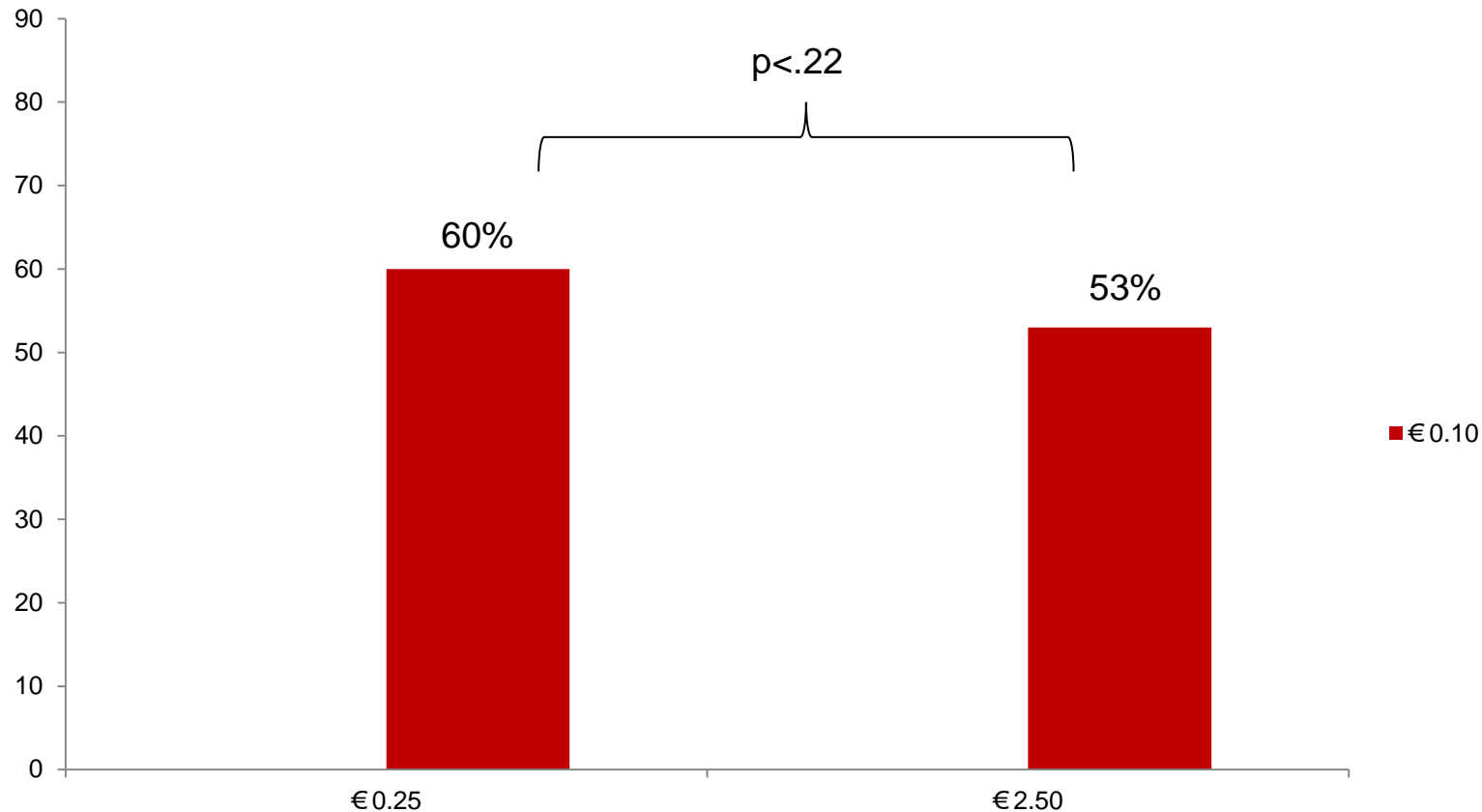
Ja, meine Angaben übermitteln

Nein, meine Angaben nicht übermitteln

## Design of experiment

- „The data you just provided are worth €2.50 [€0.25] to phil goods. Phil goods is offering you €0.10 such that phil goods keeps €2.40 [€0.15] of the value.“
- Hypothesis (based on ultimatum game results):  
Offer of €0.10 is rejected for value of €2.50 (4%), but is accepted for value of €0.25 (40%).
- Additional treatments:  
„The data you just provided are worth €2.50 [€0.25] to phil goods.“
- No deception as we pay the firm the indicated value of the data (true value is around zero), and we also transmit the data.

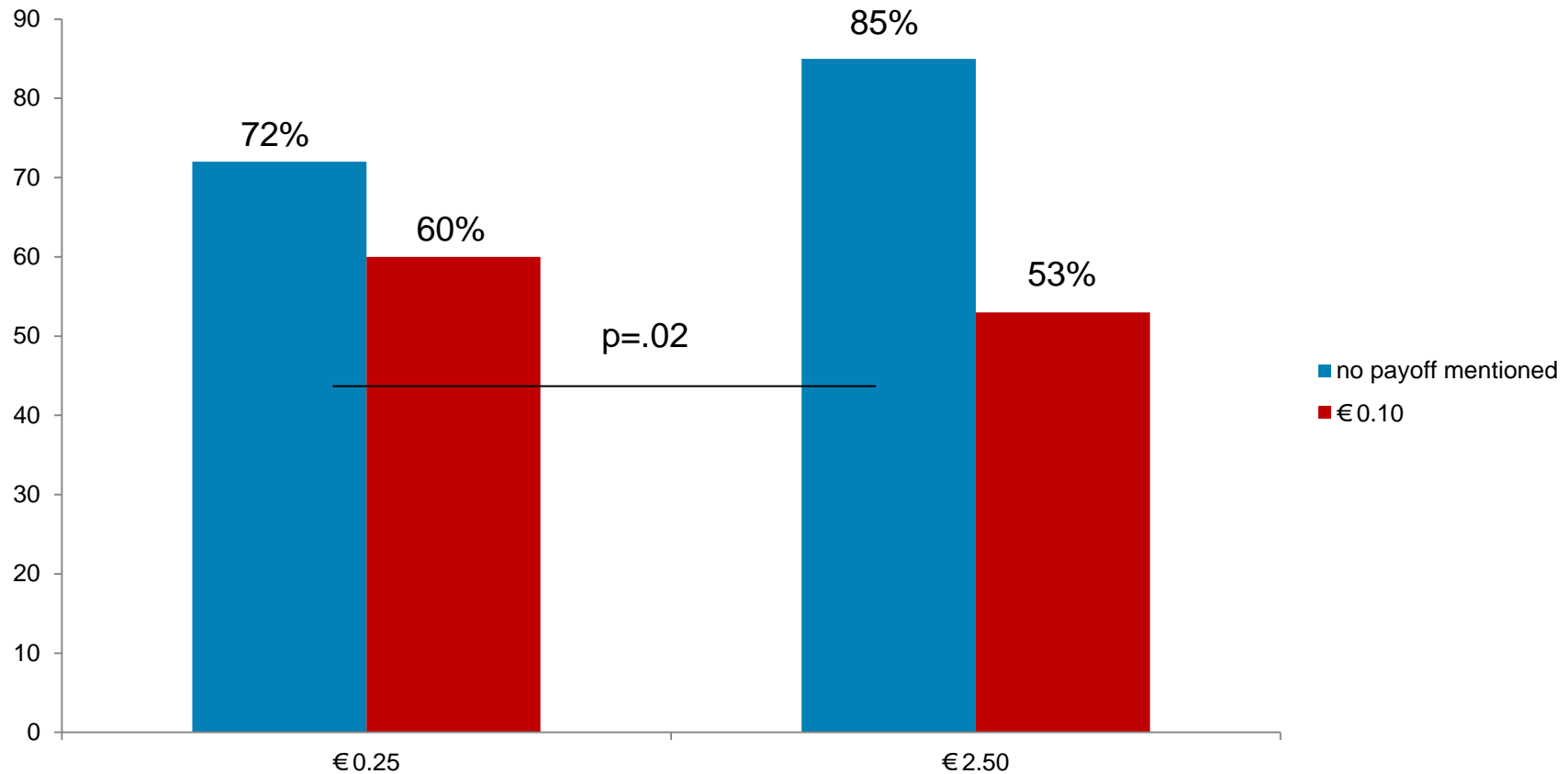
## Results of lab experiment: Data transmission



Share of participants transmitting their data when value to firm is €0.25 or €2.50.

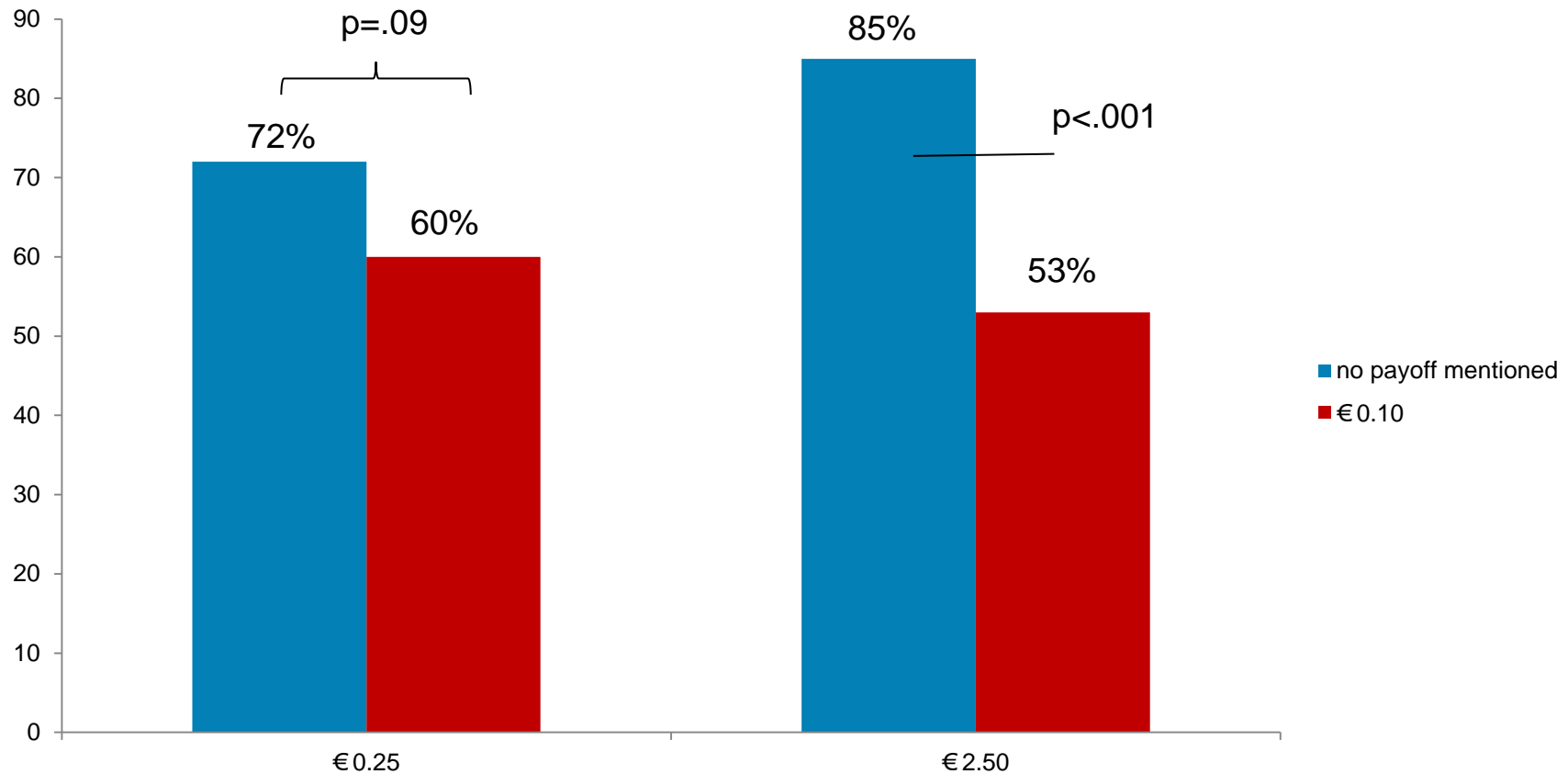
(N between 92 and 96)

## Results of lab experiment: Data transmission



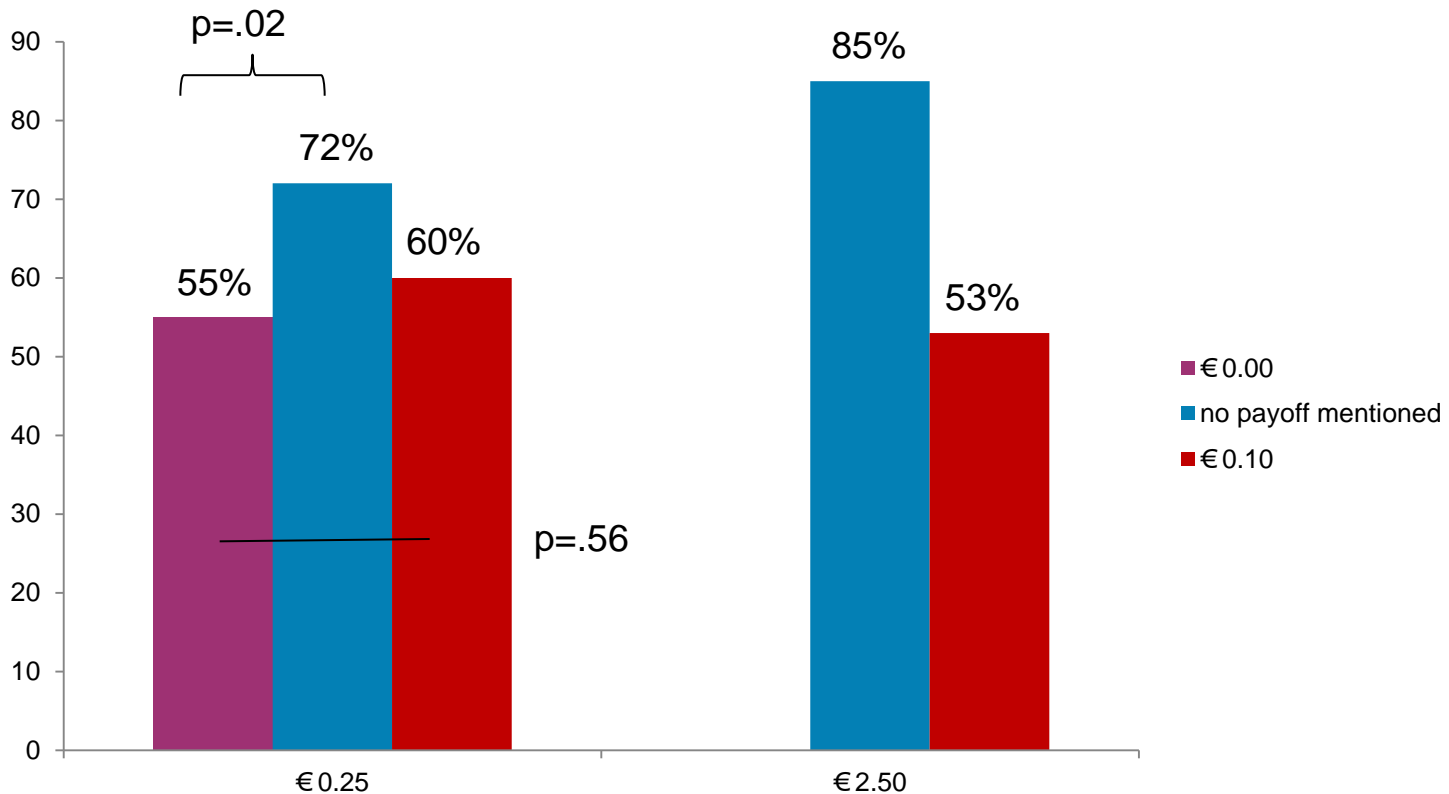
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## Design of mTurk experiment

- Online experiment on Amazon Mechanical Turk (mTurk)
- philgoods collects personal information
- Six mandatory questions plus one control question for which they were compensated with \$0.30.
- Three optional data items. The value of these optional data for the firm is highlighted as well as the share paid out to the respondent.

# Screenshot mTurk experiment

phil goods®

At phil goods, you find innovative regional articles. We design objects that are both useful and tasteful: colourful cookie cutters and wooden stacking toys as souvenirs and presents for young and old alike. Our series of souvenirs and cookie cutters unites famous monuments in colourful concord: reduced to their essential outline. Truly, the cookie cutting edge in design. Fun to collect!

We are now running a survey to better understand your needs. We need your help in designing our next generation cookie cutters!



**The following fields must be completed:**

First name:	<input type="text"/>
Gender:	<input type="text"/>
State where you live:	<input type="text"/>
Favorite color:	<input type="text"/>
Favorite monument:	<input type="text"/>
Hours spent baking last month:	<input type="text"/>
Number of mandatory questions:	<input type="text"/>

**The following fields are optional:**

**This information is worth \$0.25 to us.**

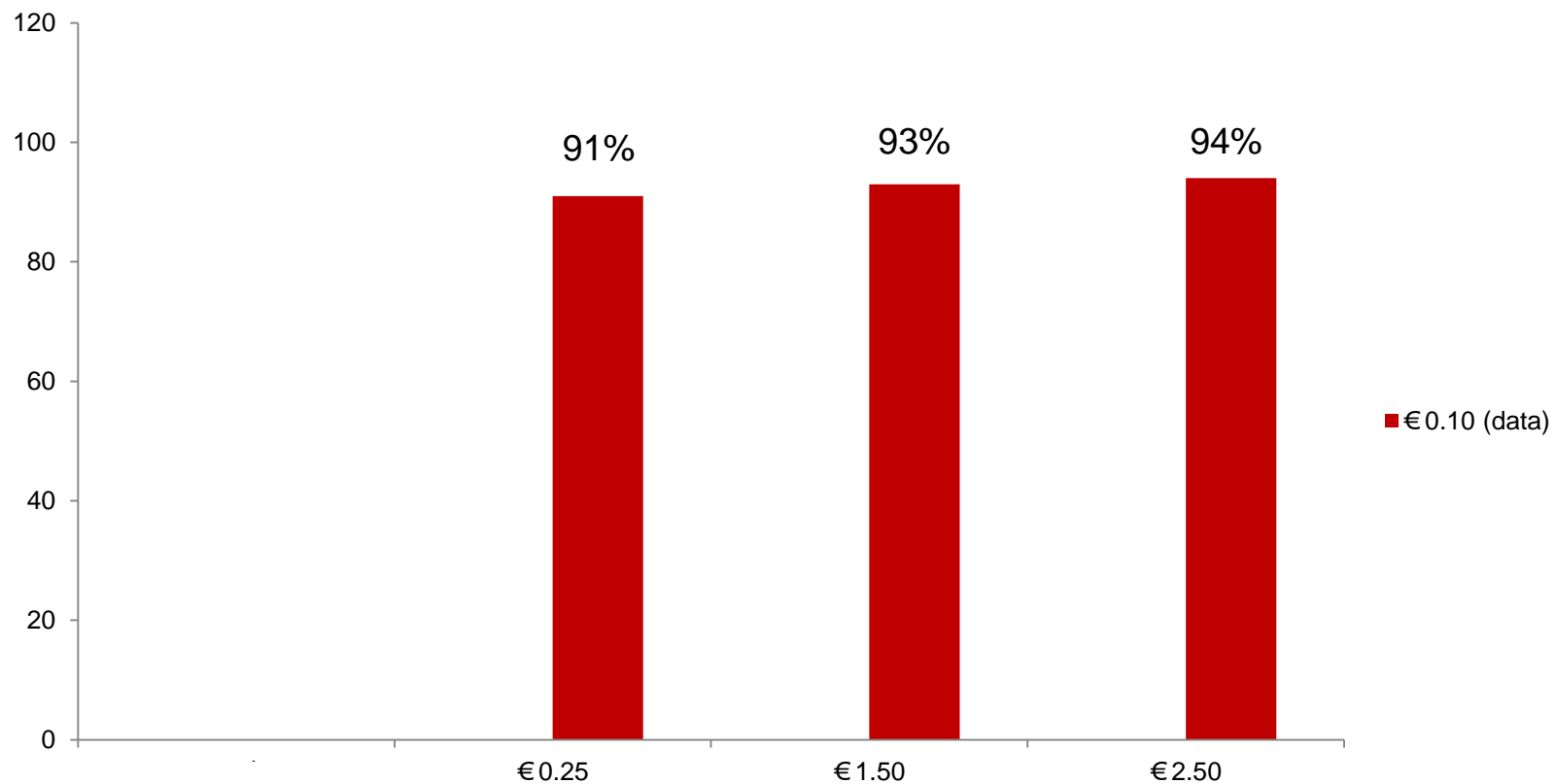
**If you complete these fields, we will give you a \$0.10 bonus.**

Date of birth:	<input type="text"/>
Destination of your last vacation:	<input type="text"/>
Money spent on last vacation:	<input type="text"/>

Finish Survey

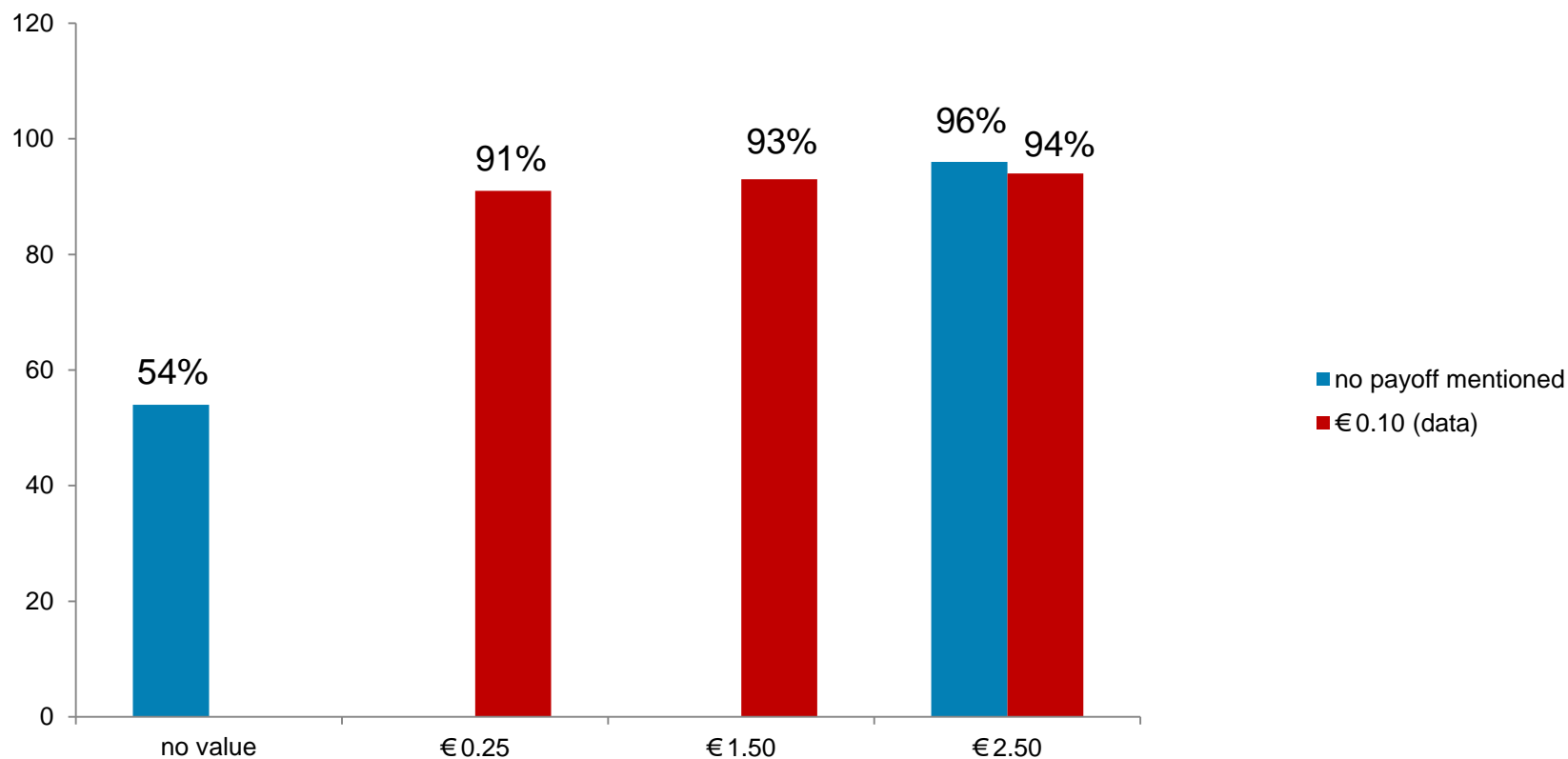


## Results of mTurk experiment: Data provision



(N between 107 and 200)

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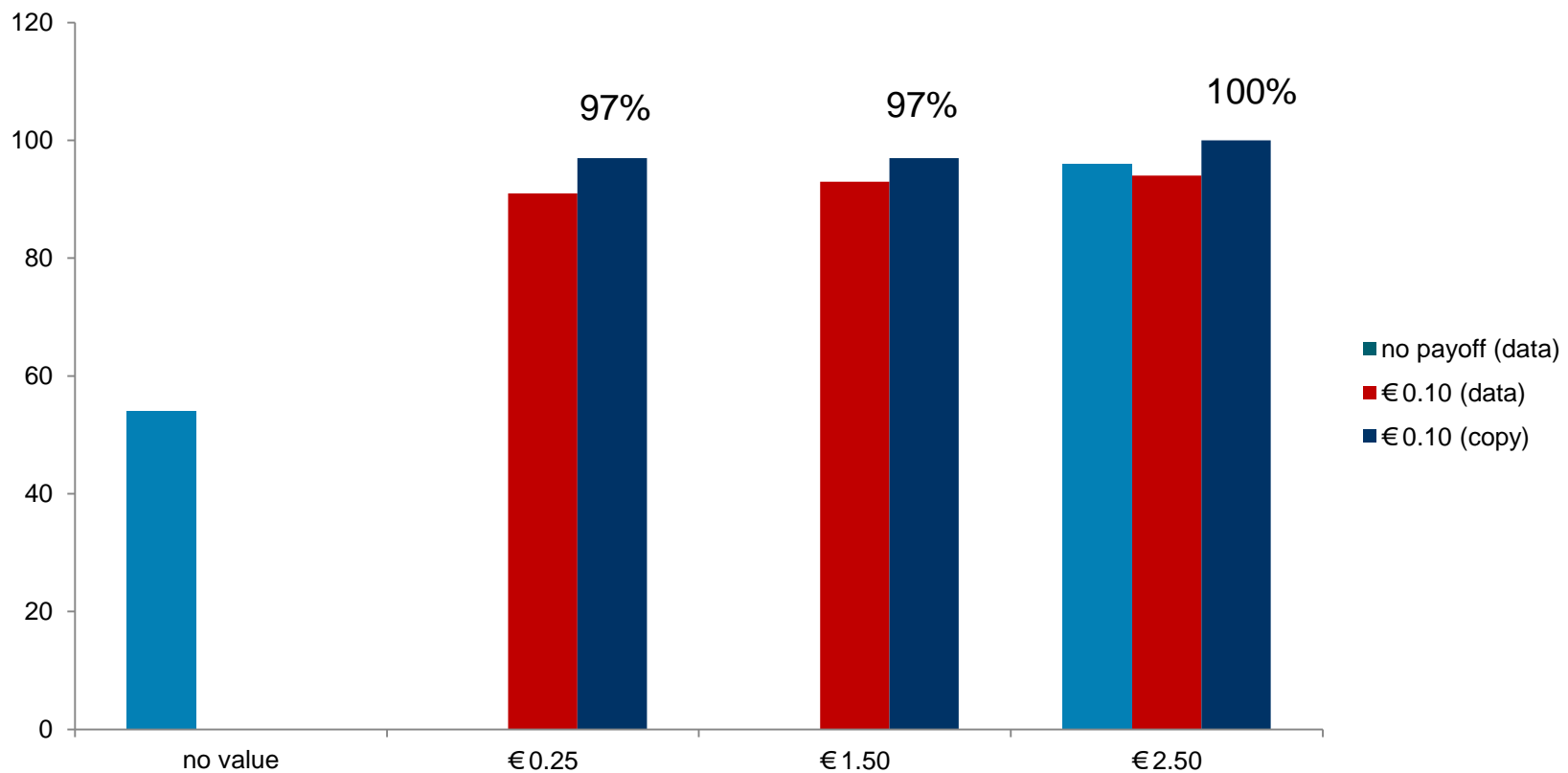


Note: N between 107 and 200

## Treatments of mTurk experiment: copy task

- Is the provision of personal data different from other tasks?  
Do subjects enjoy providing information about themselves?
- Control treatments ('copy'): participants had to copy name, job title and email from a scanned business card

# Results mTurk experiment: Transcription task



(N between 107 and 200)

## Discussion of main results

- Fairness concerns are observed to a limited extent in the lab, but not on mTurk. Such concerns can be avoided by not mentioning payoff to the consumer.

Possible explanations:

- Perceived asymmetry between firm and participants
- Unfairness of offer is less salient when no payoff mentioned.

- Subjects tend to provide more personal information, the higher its value to the firm.

Possible explanations:

- phil goods is perceived as a nice firm
- Subjects are efficiency oriented

# **Study II: Voluntary Disclosure of Information and Unravelling**

(with Volker Benndorf and Hans-Theo Normann,  
University of Düsseldorf)

# Strategic interactions and data provision

- How voluntary is voluntary data provision?
- Car insurance with or without GPS tracking
- Health insurance with or without fitness tracking
- CV background check

# Motivation

[www.mybackgroundcheck.com](http://www.mybackgroundcheck.com)

## Employment Background Checks

- 1 Look at your background check.
- 2 Make sure it's correct.
- 3 You decide what information to share with employers. You're in control!

### Job Seeker Background Check Includes:

- ✓ Criminal search current residence
- ✓ Criminal search current residence other name (i.e. a maiden name)
- ✓ Criminal search two other counties
- ✓ Criminal search two other counties one other name (i.e. a maiden name)
- ✓ US Criminal Database search
- ✓ US Criminal Database search one other name (i.e. a maiden name)
- ✓ SSN Address Locator search

Order Now »

**\$44.95**





# Motivation

*“As for privacy in general, it is difficult to see how a pooling equilibrium is avoided in which privacy is ‘voluntarily’ surrendered, making the legal protection of privacy futile”*

(Richard Posner, 1998)

- è Use experiments to understand conditions under which unraveling happens

# Lemons market with quality certification

## Workers

- $N=6$  workers
- heterogeneous wrt productivity
- two actions:
  - reveal** productivity at a cost
  - conceal** (not reveal) productivity

## Employers

- do not know worker's productivity unless revealed
- know set of productivities in the market
- perfect competition
- played by the computer in the experiment

Thus, workers are payed their (expected) productivity.

# The Revelation Game

## —Payoffs:

- Workers who *reveal*:  
earn their *productivity minus revelation cost of 100*
- Workers who *conceal*:  
earn *average productivity* of workers who conceal

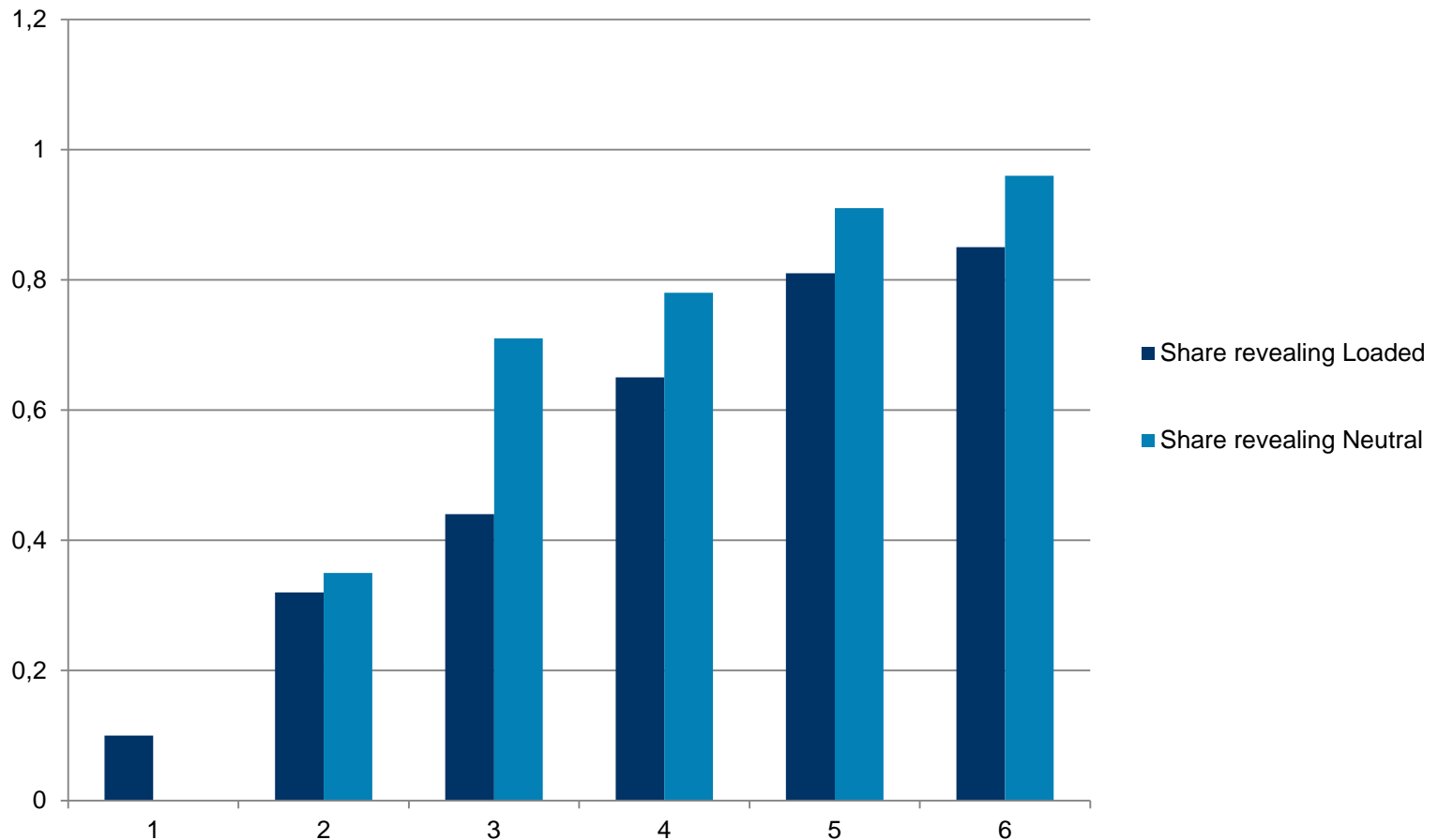
## —Equilibrium:

- Sorting of productivity types
- Amount of unraveling depends on revelation costs

## Unravelling in an experimental market

Cost: 100			Number not revealed: 1			
Subject	Revealed?	Productivity	profits conceal	profits reveal	incentive	monetary incentive
1	0	200	200.0	100	No	-100.00
2	1	448	200.0	348	Yes	148.00
3	1	510	200.0	410	Yes	210.00
4	1	551	200.0	451	Yes	251.00
5	1	582	200.0	482	Yes	282.00
6	1	607	200.0	507	Yes	307.00

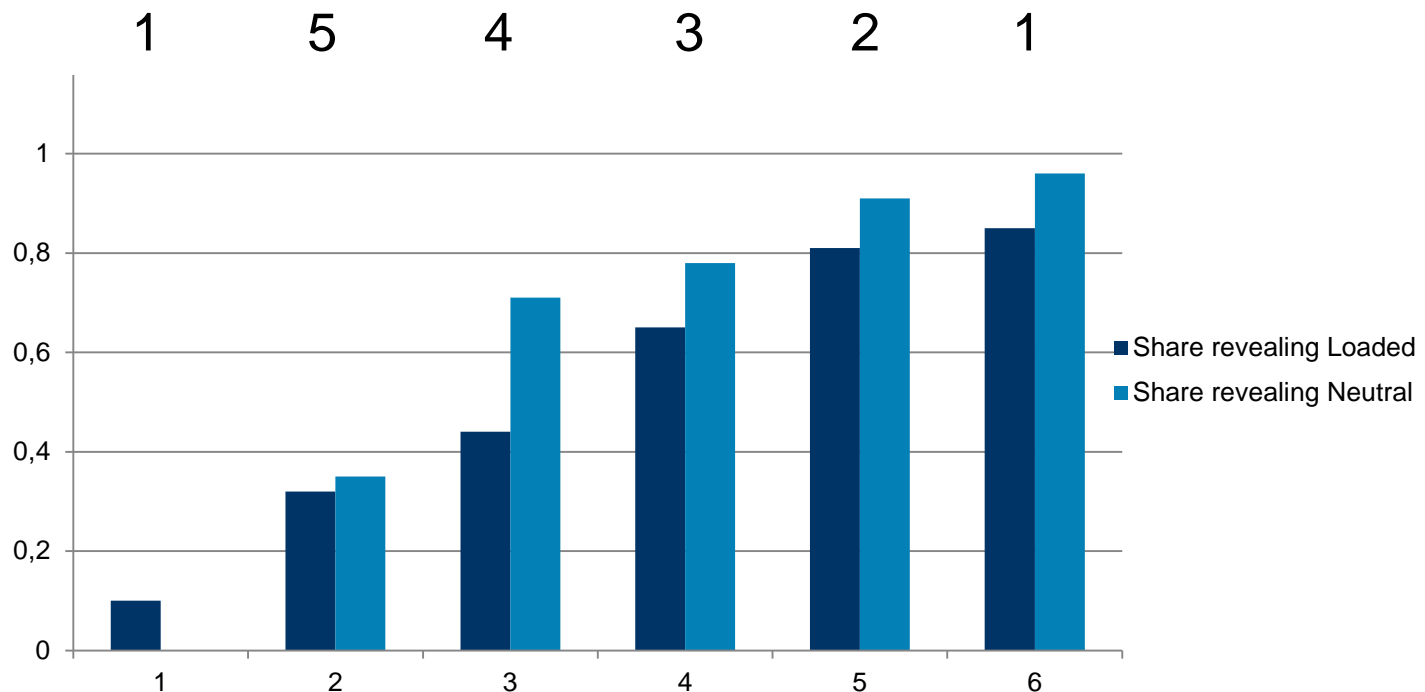
## Results: Revelation rates of worker types



Averages of 15 rounds with fixed groups of 6 and changing roles.

# Limited depth of reasoning

Level- $k$  requirement for equilibrium play:



è Reveal choices are correlated with minimum required k-levels

## New treatments

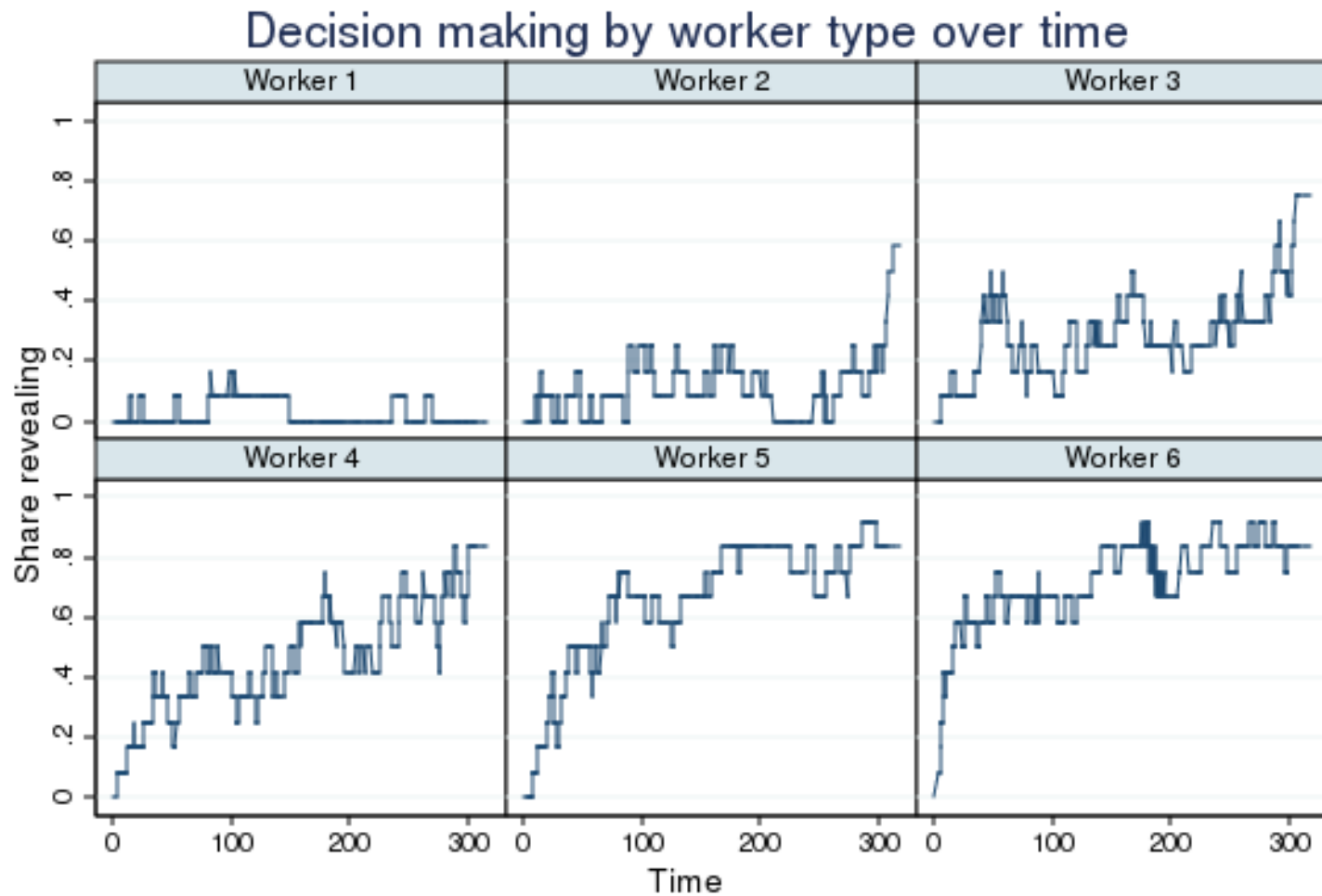
**Main difference to previous experiments:**

**Quasi-sequential decision making**

Subjects have 5 minutes to decide. During this period, subjects always see the current vector of decisions and their payoff on the screen.

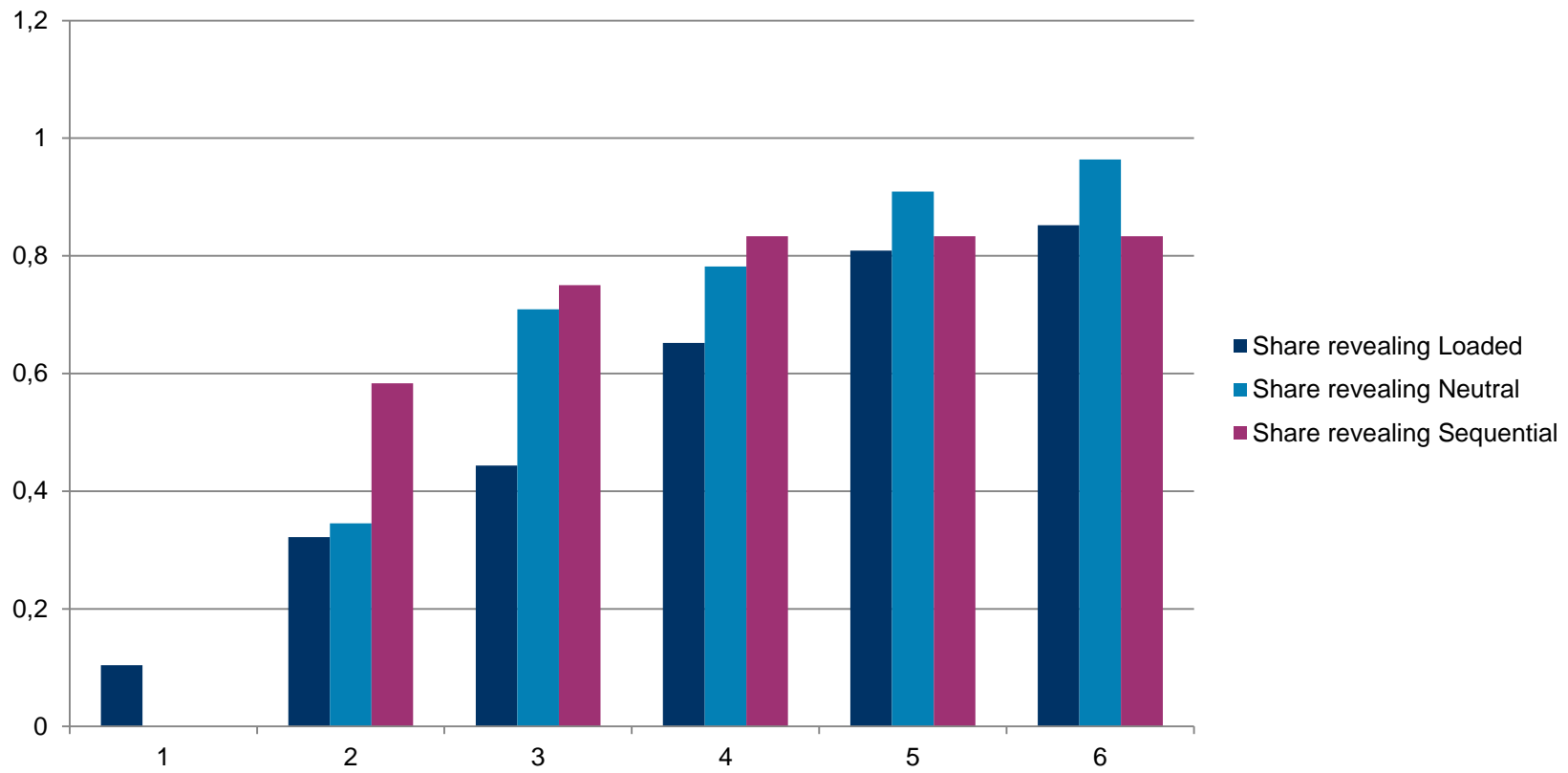
Simplifies strategic reasoning necessary to reach the equilibrium:  
level-1 suffices.

# Unraveling over time





# Unraveling rates of worker types



# Conclusions

## Study I:

- Transparency with respect to value of data does not reduce data revelation even if deals offered are unfair. Presentation effects matter.
- ‘Nudging’ consumers with prices for their data and unfair offers has only limited effects.

## Study II:

- Lab experiments demonstrate substantial unraveling across all treatments
- Protection of privacy may require non-lenient policies (such as GINA in the US)

**‘Notice and consent’** appear insufficient to limit data revelation in both studies.

# Thank you!

