TIME PRESSURE AND RISK TAKING IN AUCTIONS: A FIELD EXPERIMENT

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Introduction

- Our everyday decisions are often made quickly and under time pressure.
- With countless stimuli appearing every minute, fast yet efficient processing of information is a must.
- The ability to decide under time pressure determines success in many professions.

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Importance of understanding the role of time pressure in decision-making under risk

Research questions

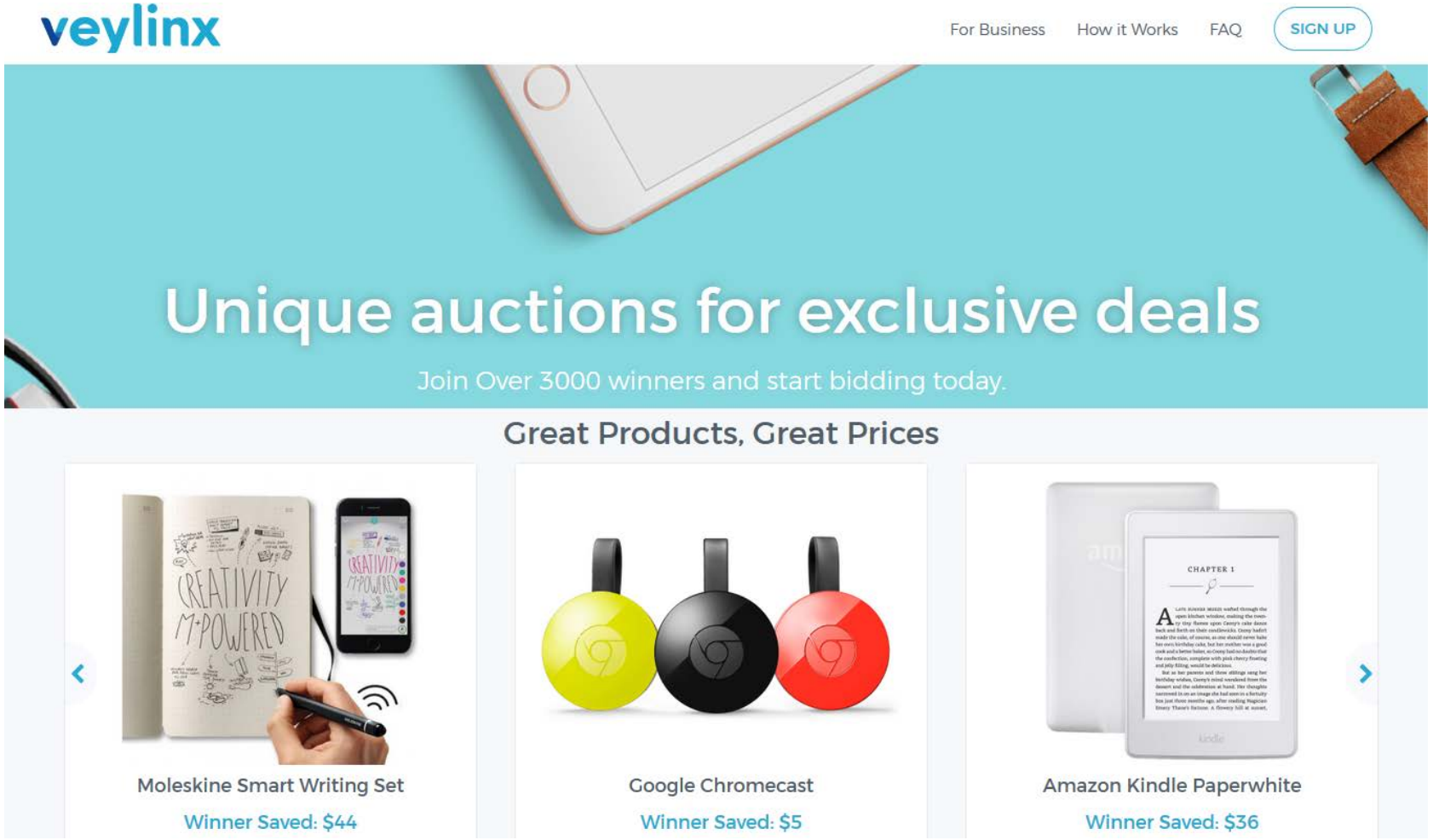
- An economic environment with both risk taking and time pressure: **Auctions**
- The value of an auctioned object is often uncertain and known after the auction.
- Participants place bids in a timely fashion, which is often a source of time pressure.

1) **How does time pressure affect bidding behaviour in auctions?**
2) **To what extent does uncertainty moderate this relationship?**

- Previous studies focus on endogenous time pressure due to increased competition.
- To our knowledge, this is the first (field) study that manipulates time pressure exogenously.

Study design – A field experiment on Veylinx

- An auction platform
- Registered participants
- Real purchases
- Sealed-bid auctions



Study design

- A lottery ticket (with a guaranteed gift card of EUR 5)
- A second-price sealed-bid auction
- Each participant bid once
- Procedure:
  1. An e-mail invitation – it informed there would be some time limit for placing a bid;
  2. After clicking "Start", a screen with the rules – i.a. an explanation of the second-price auction
  3. A bidding screen
  4. Several follow-up questions
  5. An outcome e-mail
- May-June 2015; each auction lasted one day

Study design

A bidding screen

Study design

- 4 treatments
- Between-subject

EUR 2,000 with probability of 1/11 ↓

EUR 200 with probability of 10/11 ↓

	Low Probability (1/11)	**High Probability (10/11)**
6 minutes → **Low Time Pressure (6 min)**		
25 seconds → **High Time Pressure (25 sec)**		

Study design – shares of the participants

- 1,679 respondents
- representative of the Dutch general population

	EUR 2,000 with probability of 1/11 ↓ **Low Probability (1/11)**	EUR 200 with probability of 10/11 ↓ **High Probability (10/11)**
Low Time Pressure (6 min)	25.8%	23.1%
High Time Pressure (25 sec)	28.0%	23.1%

Study design – shares of the participants

- 986 respondents bid within the time limit

	EUR 2,000 with probability of 1/11 ↓	EUR 200 with probability of 10/11 ↓
	Low Probability (1/11)	**High Probability (10/11)**
Low Time Pressure (6 min)	70.2% (304 obs.)	74.2% (287 obs.)
High Time Pressure (25 sec)	46.4% (218 obs.)	45.5% (177 obs.)

Study design – follow-up questions

- How would you best describe your bid?
  - ❑ Intuitive
  - ❑ Considerate
  - ❑ No opinion

- When you placed your bid, did you take into account the expected value of your payment if you win? Note that this is (10/11) x 200 + 5 = EUR 187.
  - ❑ Yes, I took into account the expected value.
  - ❑ Yes, and other aspects.
  - ❑ No, only other aspects.
  - ❑ No opinion

Faster, more time-pressured, and more intuitive decisions under high time pressure

		6 min	25 sec	6 min vs. 25 sec
1/11	Median bidding time	28 sec.	18 sec.	$p < 0.001$
	Perceived time pressure (1-5)	1.6	2.8	$p < 0.001$
	Intuitive bidders	40.0%	61.5%	$p < 0.001$
10/11	Median bidding time	32 sec.	19 sec.	$p < 0.001$
	Perceived time pressure (1-5)	1.7	2.9	$p < 0.001$
	Intuitive bidders	47.2%	66.4%	$p < 0.001$
1/11 vs. 10/11	Median bidding time	$p = 0.01$	$p = 0.51$	
	Perceived time pressure (1-5)	$p = 0.14$	$p = 0.39$	
	Intuitive bidders	$p = 0.06$	$p = 0.19$	

Note: p are p-values from Mann-Whitney tests and tests of proportions.

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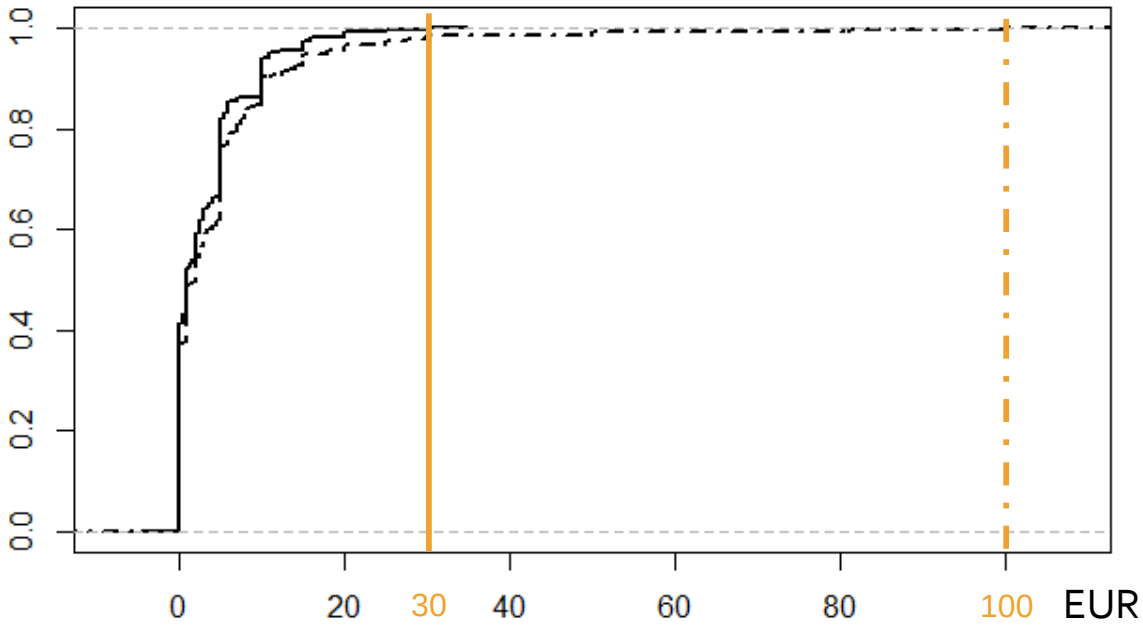
Slightly more likely to disregard the expected value under high time pressure

	1/11		10/11	
	6 min	**25 sec**	**6 min**	**25 sec**
Considered only EV	13.0%	13.5%	13.9%	11.5%
Considered EV and other factors	25.6%	15.7%	20.7%	12.7%
Did not consider EV	44.4%	55.1%	45.4%	49.1%
No opinion	17.0%	15.7%	19.9%	26.8%
6 min vs. 25 sec	p = 0.053		p = 0.102	
1/11 vs. 10/11	for 6 min: p = 0.569; for 25 sec: p = 0.093			

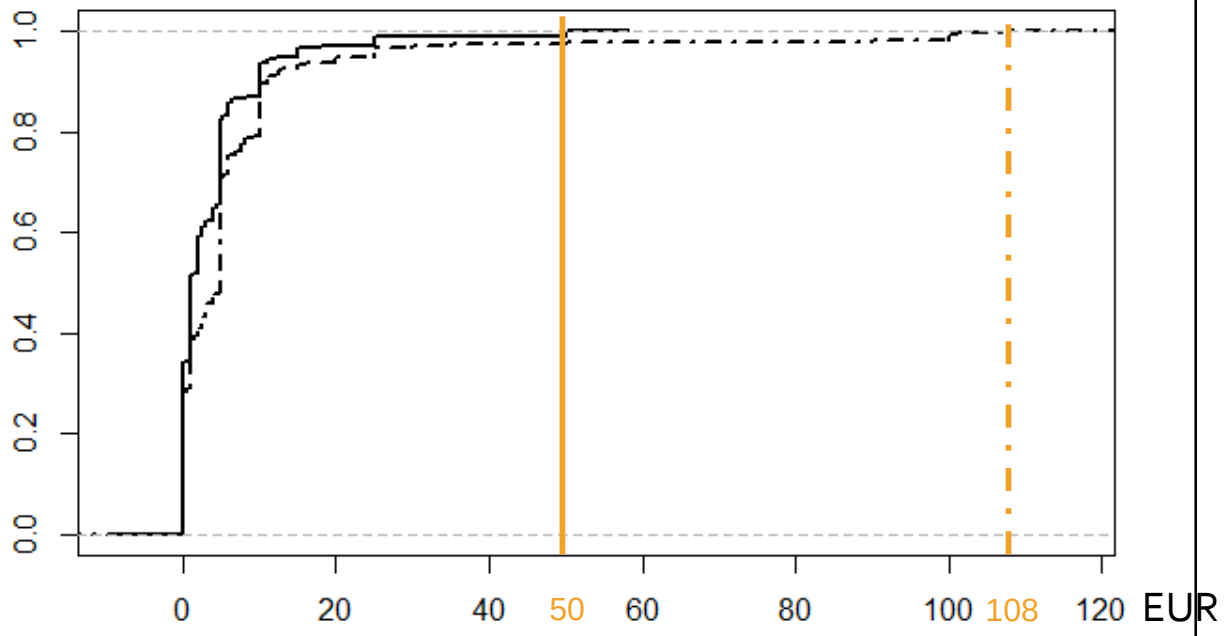
Note: p are p-values from chi-squared tests.

Lower bids under high time pressure

Cumulative distribution of bids in 1/11



Cumulative distribution of bids in 10/11



6 min - - -

25 sec ——

Lower bids under high time pressure

		6 min	25 sec	6 min vs. 25 sec
1/11	Mean bid	4.88	3.28	
	Standard deviation	9.95	4.75	
	Median	2	1	p = 0.17
	Zero bidders	35.86%	39.91%	
	Mean non-zero bid	7.61	5.46	
10/11	Mean bid	6.95	3.82	
	Standard deviation	15.14	6.76	
	Median	5	1	**p < 0.01**
	Zero bidders	27.18%	33.33%	
	Mean non-zero bid	9.55	5.73	
1/11 vs. 10/11	Mean bid amount	**p = 0.01**	p = 0.46	

Note: p are p-values from Mann-Whitney tests.

When no time pressure, higher bids after long deliberation

Correlations between a bid amount and response time

	6 min	25 sec
1/11	0.42 $p < 0.001$	0.13 $p = 0.13$
10/11	0.33 $p < 0.001$	0.09 $p = 0.34$

Females bid lower

		Mean bids (St. dev.)		
		Male	**Female**	**Mann-Whitney test**
1/11	**6 min**	6.56 (12.97)	2.97 (3.70)	p = 0.108
	25 sec	3.92 (5.49)	2.60 (3.72)	p = 0.203
10/11	**6 min**	10.24 (21.43)	4.27 (5.22)	**p = 0.029**
	25 sec	5.17 (8.74)	2.45 (3.38)	**p = 0.034**

Bidders' types: Considering expected value is related to higher bids

Mean bids (St. dev.)

	Considered EV	Did not consider EV	Mann-Whitney test
6 min	10.45 (20.48)	3.78 (4.96)	**p = 0.001**
25 sec	4.89 (7.79)	3.42 (4.28)	p = 0.640

- Bids were generally much lower than the expected value.
- Considering the expected value was expected to increase (and indeed increased) the bids.

Bidders' types: Intuitive and deliberate bidders behave differently

Mean bids (St. dev.)

	Intuitive	Deliberate	Mann-Whitney test
6 min	6.50 (11.90)	6.69 (15.74)	p = 0.002
25 sec	4.29 (6.08)	2.88 (4.91)	p = 0.001

- Under high time pressure, deliberation is associated with (extremely) low bids.
- Under low time pressure, deliberation leads to polarised bidding (high standard deviations).
- Presumably, some of the deliberate bidders drew closer to the expected value, while others might have perceived little chance to win and signaled their negative attitude with a very low bid.

	Considered EV	Did not consider EV
Intuitive	16.30%	33.39%
Deliberate	26.33%	23.98%

Main findings

- High time pressure discourages taking a chance.

  It may be related to:
  - the feeling of being insufficiently informed (Gretschko and Rajko, 2015).
  - an aversion to making choices that might induce regret.

- The effect is particularly strong for auctions with a high probability of a positive outcome.

  This is more relevant for typical auctions, in which a product will rather be delivered in a good state / good quality.

Our contribution

- A **field** experiment in a quasi-natural environment with full experimenter's control.
- To the literature on **optimal auction duration**:
  Overly short auction duration may have a negative effect on revenues.
- Evidence (partially) consistent with the notion of **non-linear probability weighting influenced by affect** (Rottenstreich and Hsee, 2001).
  - When decision time is limited, participants act more intuitively and attach an excessively high weight to the likely, unattractive outcome by submitting low bids in the high probability treatment.
  - However, we do not observe an analogous mechanism of (positive) emotions increasing the weight of the unlikely, attractive outcome in the low probability treatment.

Limitations

- Severe sample selection.
- Bids are extremely low, corresponding to strong risk / loss aversion.
- This could be partly because the Veylinx users are not used to bidding on an abstract lottery.
- Many participants could also have recognised that their chance of winning was very low – they could have expected many participants in the auction and their willingness to pay for the risky lottery was limited.

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