Illusion of control and conformism in the laboratory

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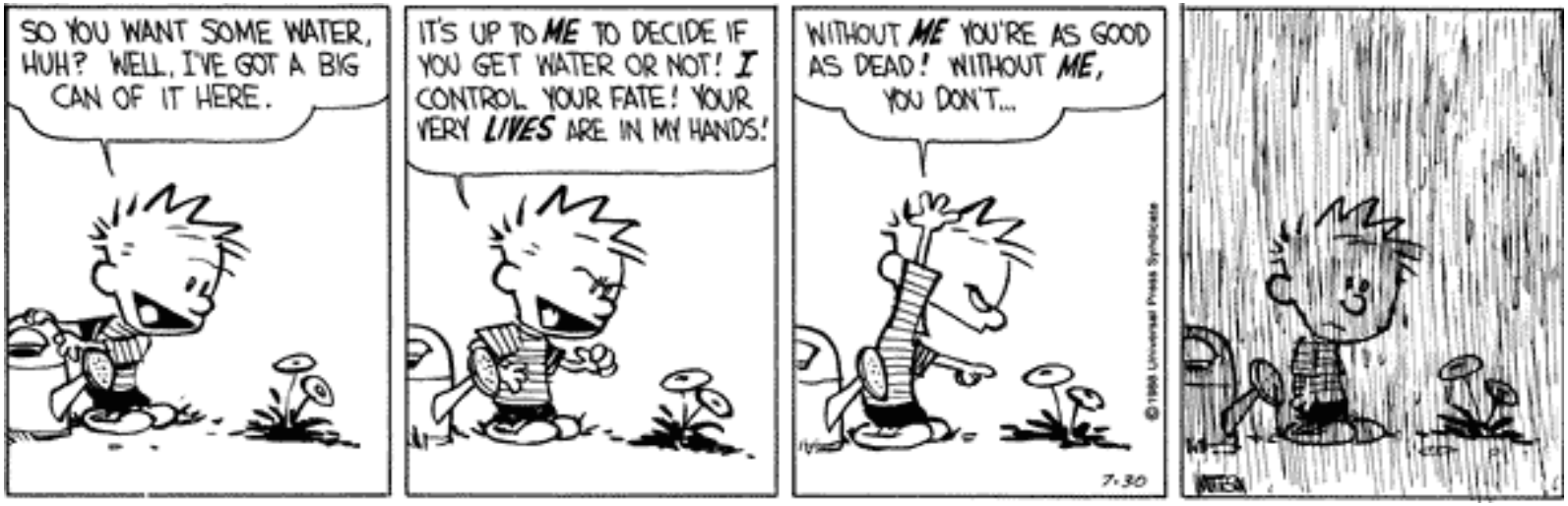
ESA Europe 2014
Prague, September X^{th}, 2014


SO YOU WANT SOME WATER, HUH? WELL, I'VE GOT A BIG CAN OF IT HERE.
IT'S UP TO ME TO DECIDE IF YOU GET WATER OR NOT! I CONTROL YOUR FATE! YOUR VERY LIVES ARE IN MY HANDS!
WITHOUT ME YOU'RE AS GOOD AS DEAD! WITHOUT ME, YOU DON'T...
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Illusion of control: definition

Real life

SKILL + LUCK = RESULTS

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Lotteries

Illusion of control: definition

Real life

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Lotteries

~~SKILL~~ + LUCK = RESULTS

This phenomenon has been called **Illusion of Control** (Langer 1975):
"an expectancy of a personal success probability inappropriately higher than the objective probability would warrant".
Factors from skill situations (competition, choice, familiarity, involvement) introduced into chance situations cause individuals to feel inappropriately confident.

Illusion of control: examples

In skill situations many things **matter** that **do not** matter in luck situations:

- **Familiarity** with the task;
- **Observation** of others performing the task;
- **External conditions** at the moment of choice;
- **Direct** involvement *vs.* delegation...

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In the psychology literature

- **card game** in the presence of a confident *vs.* nervous opponent
- being able to **choose** one's lottery ticket *vs.* being assigned one
- being **familiar** *vs.* not with a randomization device

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In the economics literature

- Charness and Gneezy (2010) letting subjects roll the **die** *vs.* experimenter rolling.
- Li (2011) same, plus letting subjects **pay** to gain/relinquish control.
- Poon (2011) **multiple** price list, to elicit WTP for control/no control.

This paper

Papers in economics usually implemented a limited version of illusion of control: control (or not) over the *(device driving the) resolution of uncertainty*.

In this paper, we implement **three** manipulations, to check the effects on choices of

(as in previous Econ literature) the resolution of uncertainty (who rolls the dice?)

(as in the Psy literature) the choice process (how much are you involved in the choice?)

(to check for bandwagon effects) the (indirect and unconscious) observation of others

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We can do that using one task only: the Bomb Risk Elicitation Task

The BRET

We developed the 'Bomb' Risk Elicitation Task (BRET)

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We developed the 'Bomb' Risk Elicitation Task (BRET)

- Subjects are shown a field with 100 boxes.
- Are told that under one of the boxes lies a *time bomb*
- Their task is to collect boxes.
- When they hit the *Start* button, the computer starts collecting...
- ...one box per second, automatically, in numerical order.
- The subjects must only *stop* the collection process.
- Once the task is over, the position of the bomb is determined (hence the *time bomb*).
- If bomb collected $\rightarrow$ earnings equal zero.
- If bomb not collected $\rightarrow$ earnings equal to number of boxes collected.

BRET: interface, I

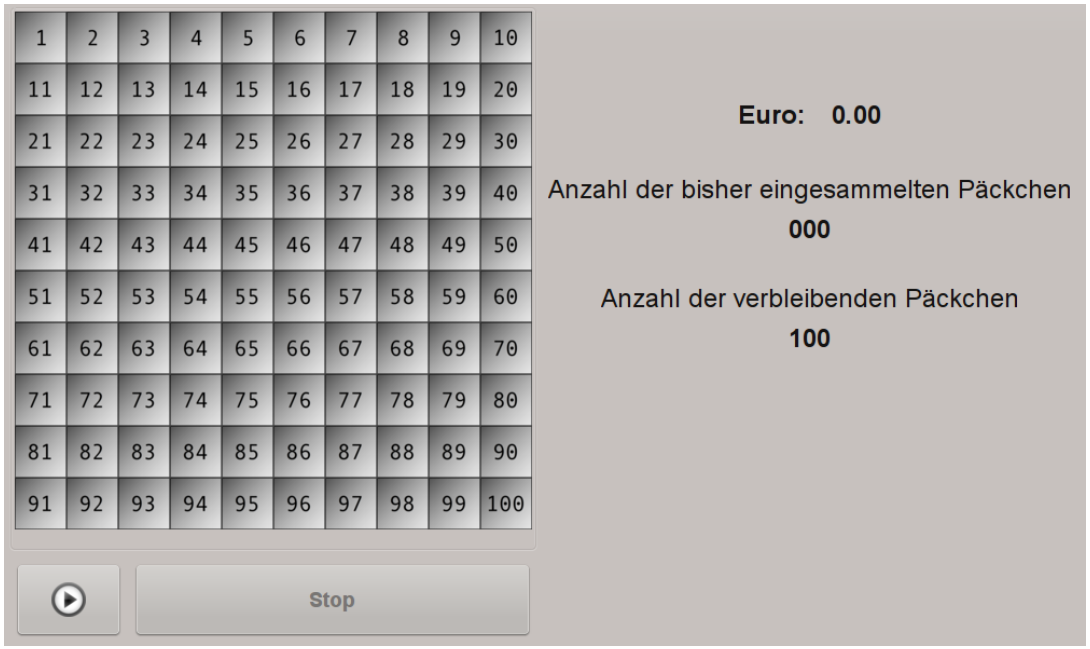

Figure: The BRET interface at the start of the experiment

BRET: interface, I

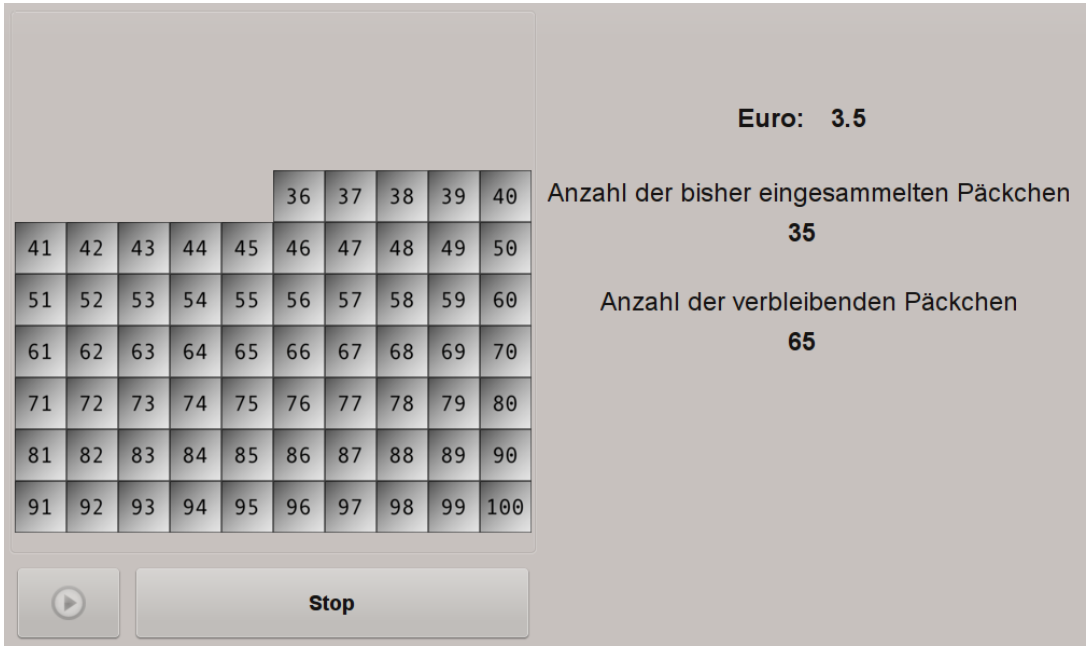

Figure: The BRET interface after 35 seconds

BRET: under the hood

- Theoretically, the task amounts to choosing the preferred among 101 lotteries.
- Each lottery is characterized as

$$L^k = \begin{cases} 0 & \frac{k}{100} \\ k & \frac{100-k}{100} \end{cases}$$

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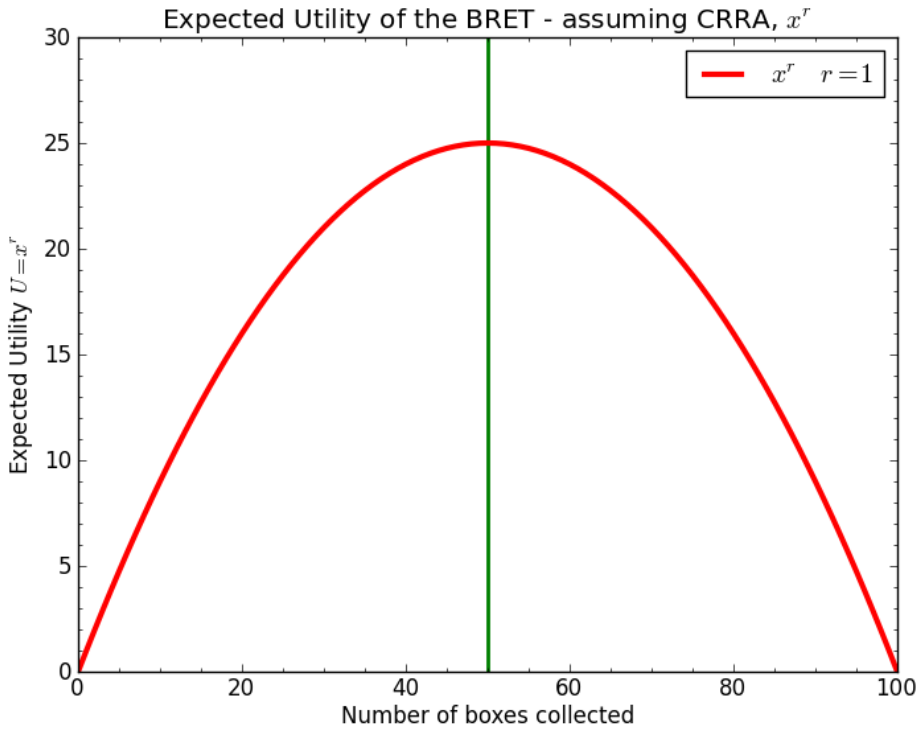
- Each lottery is characterized as

$$L^k = \begin{cases} 0 & \frac{k}{100} \\ k & \frac{100-k}{100} \end{cases}$$

- The 101 lotteries are all summarized by the parameter k...
- ...that is also governing probabilities.
- Example: at $k = 20$, $L = \{20\% : 0\,;\, 80\% : 20\}$

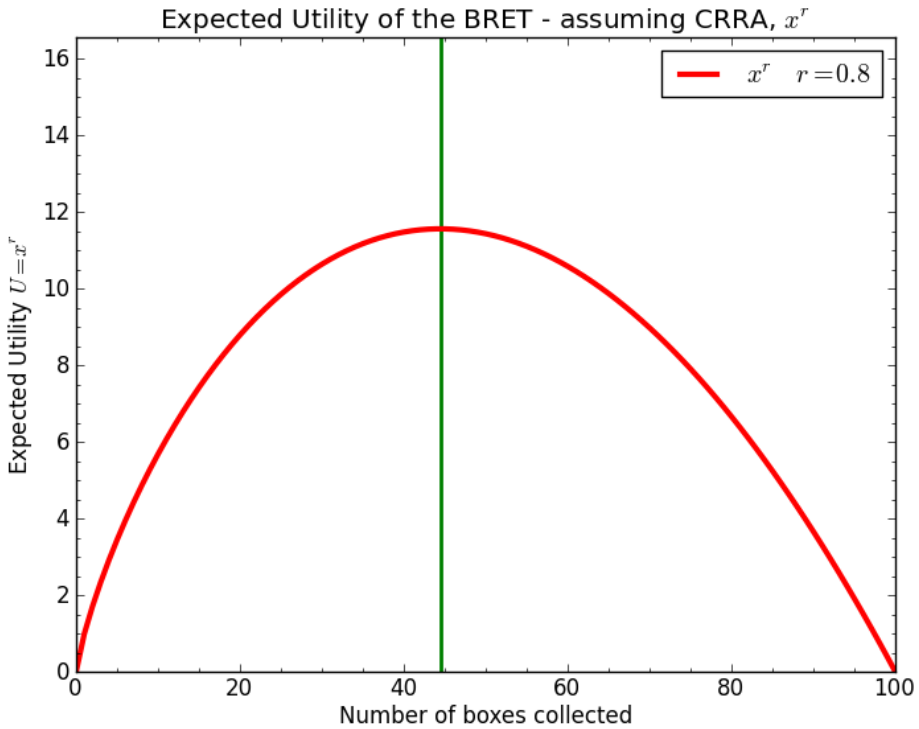
BRET: solution for the expected value maximizer



The expected value is maximized at $k^* = 50$.
Assuming a power CRRA utility function x^r, the optimal stopping point is:

$$k^* = 100\frac{r}{1+r}.$$

BRET: Risk averse subject



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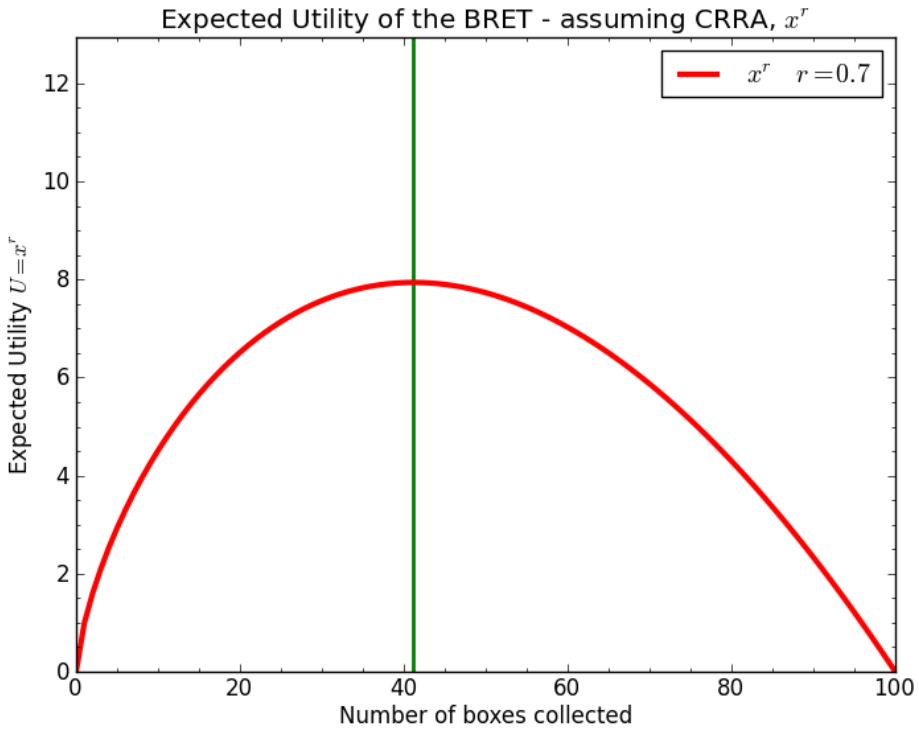

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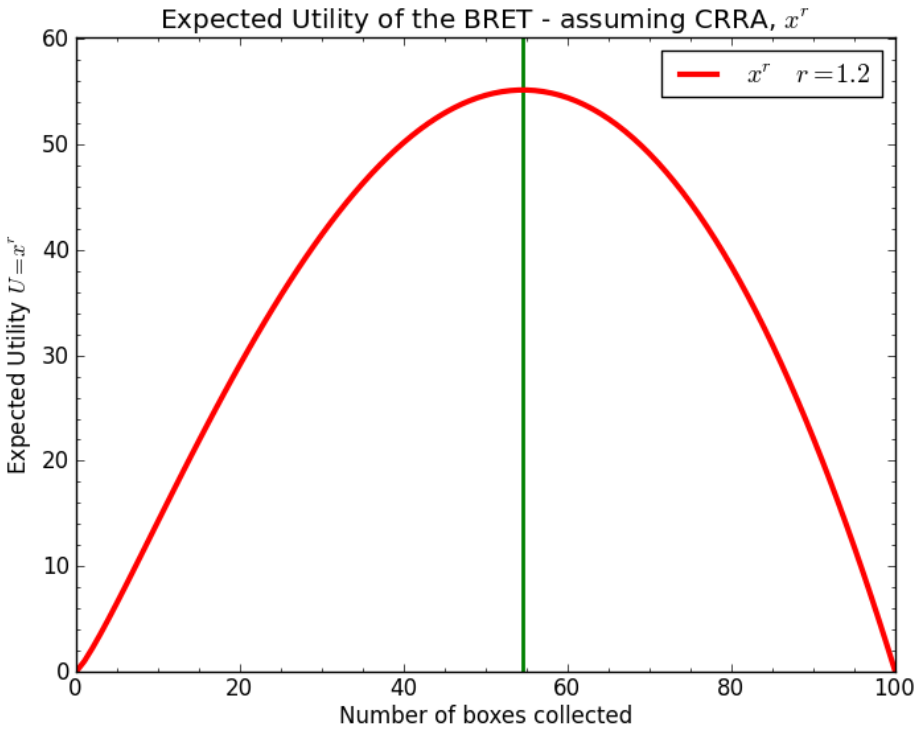
BRET: Risk lover subject



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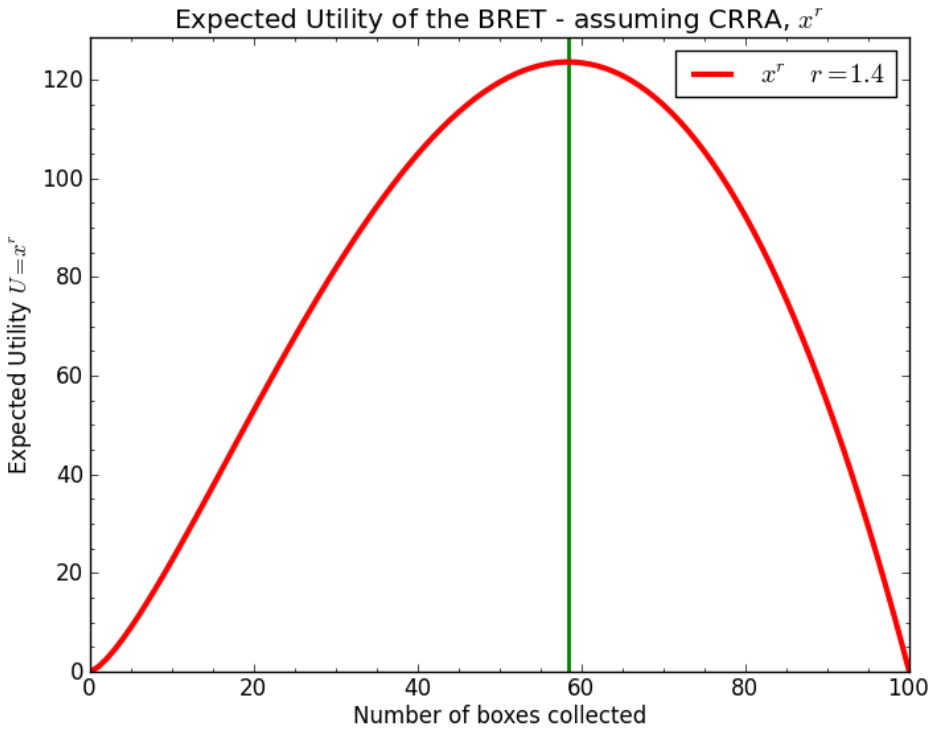

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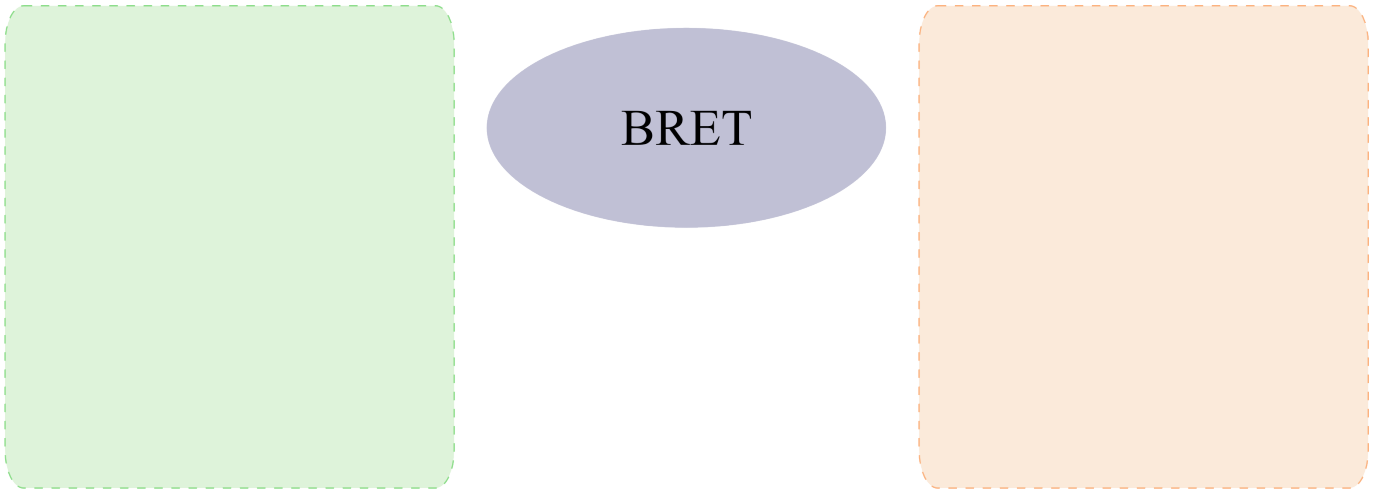
BRET: details

- each subject plays *one* practice round and *one* paying round only.
- no feedback about the position of the bomb until the end of the experiment.
- after the BRET task, subjects are exposed to two belief elicitations:
  1. beliefs about the position of the bomb. Subjects are given 5 intervals (0,20),(20,40)...(80,100) and asked to state their belief about the probability of the bomb lying in that interval. Incentivized with a Quadratic Scoring Rule. The 'correct' prediction is (20,20,20,20,20).
  2. beliefs about the probability of winning given their choice. The 'correct' prediction is 100 - chosen number of boxes.
- resolution of uncertainty: at the end of the experiment, the experimenter rolls two 10-sided dice to determine the position of the bomb.

Treatments



Control over the
resolution of uncertainty

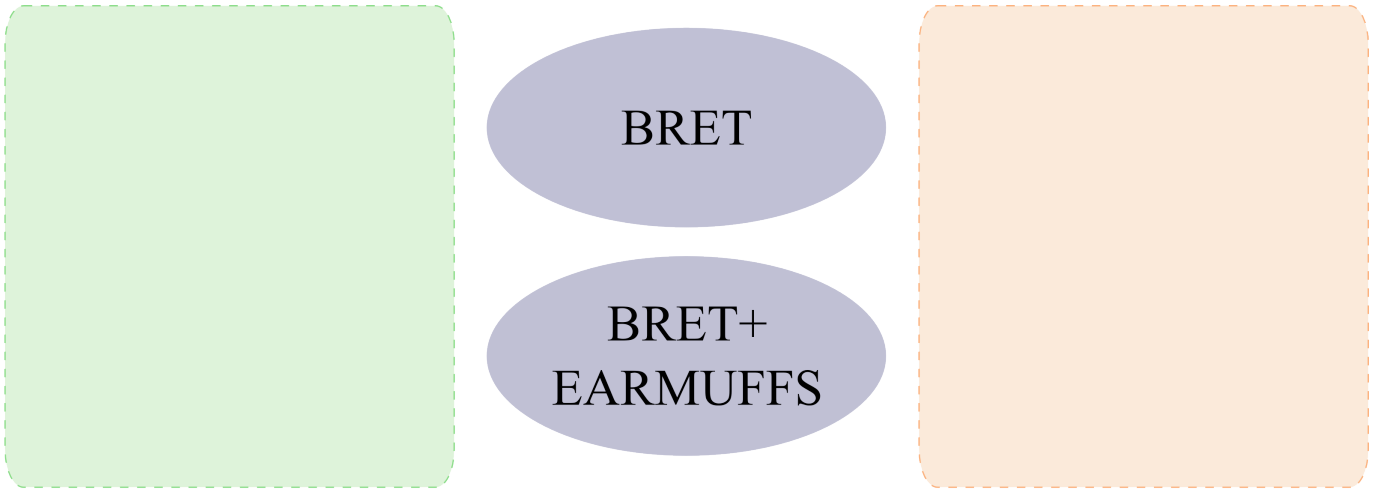
Control over the
choice process

Resolution of uncertainty : no control. The dice were rolled by the experimenter.

Choice : low control. The subjects had to stop the automatic collecting process.

Bandwagon : possible, but low probability. Subjects can hear the others click, but every subject just clicks *once*.

Baseline treatments: BRET with earmuffs



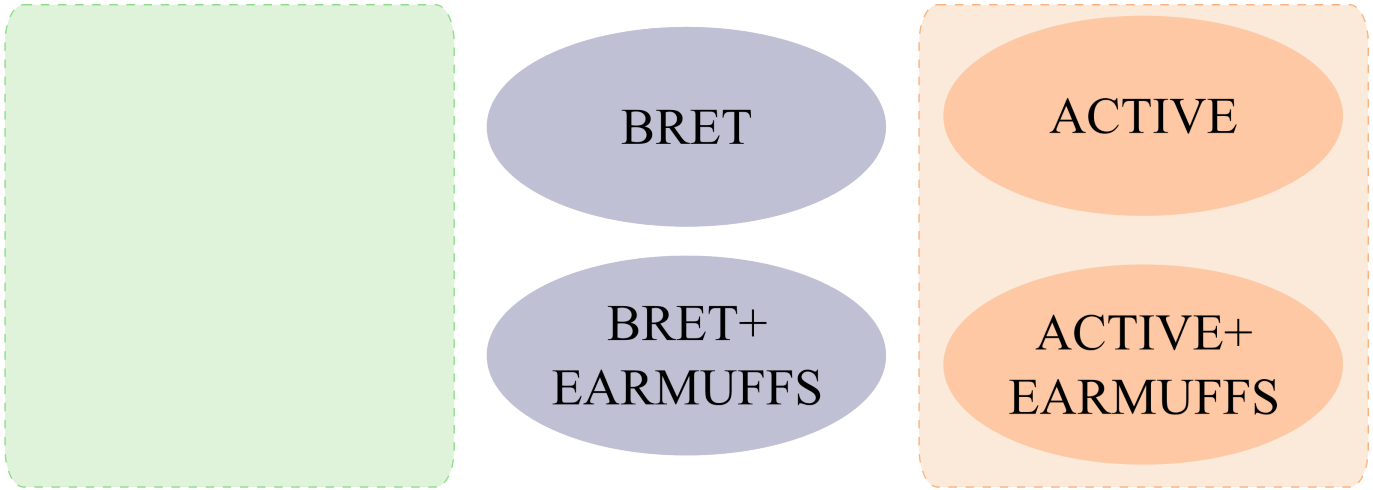
Control over the
resolution of uncertainty

Control over the
choice process

Bandwagon : not possible. Subjects do not hear other subjects clicking.

Earmuffs?

Control over the choice: active BRET

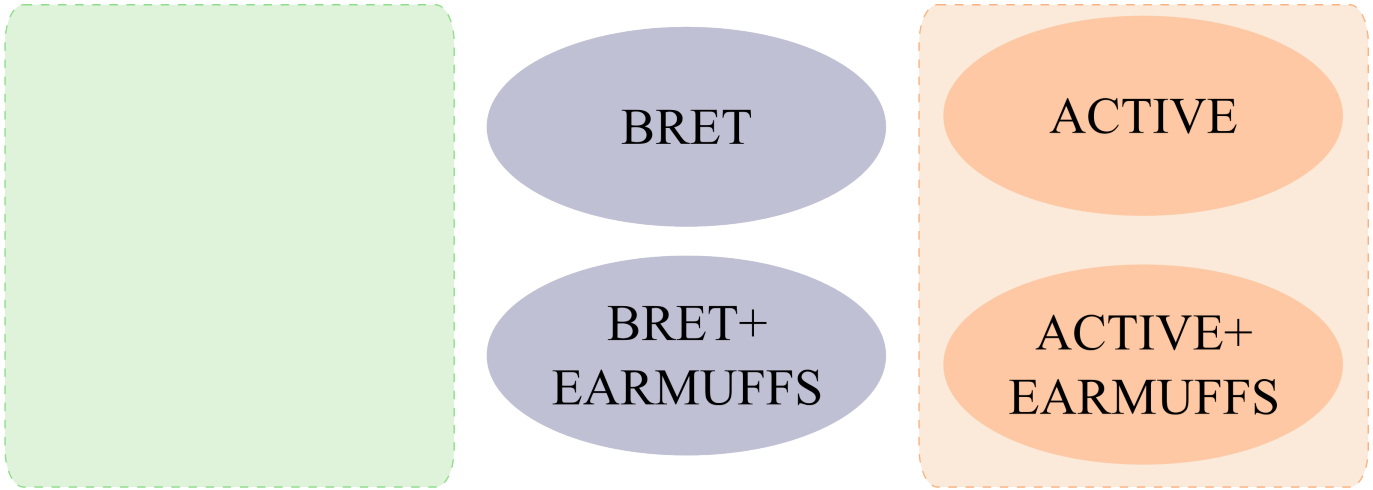


Active treatment

Choice : high control. The subjects had to click for each block.

Bandwagon : possible. Subjects hear each other and they make lots of clicks.

Control over the choice: active BRET



Active treatment

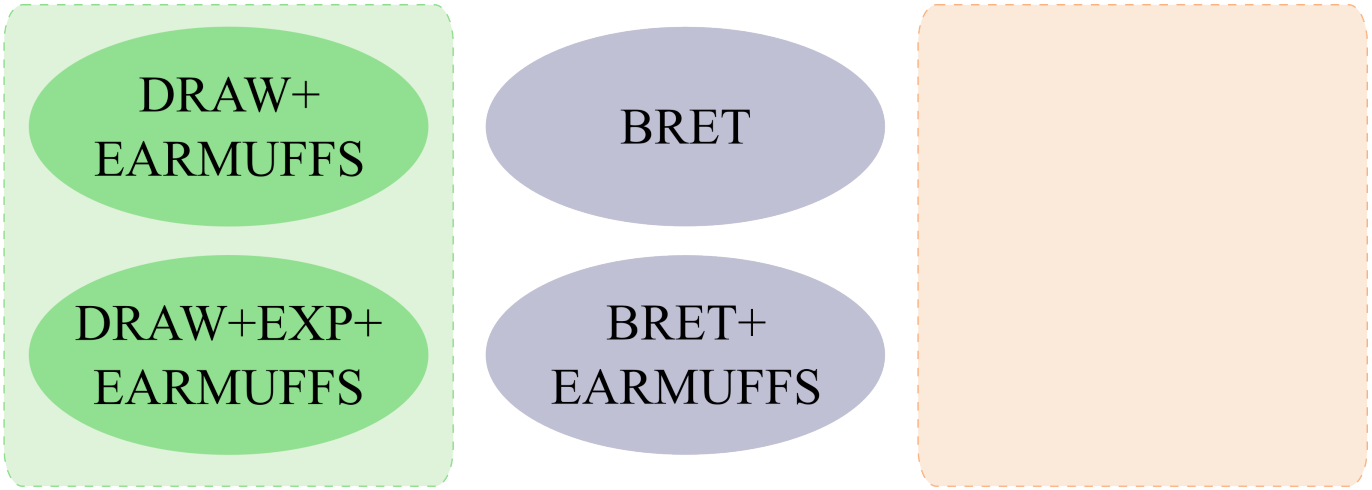
Choice : high control. The subjects had to click for each block.

Bandwagon : possible. Subjects hear each other and they make lots of clicks.

Active + earmuffs

No bandwagon possible: subjects do not hear others clicking.

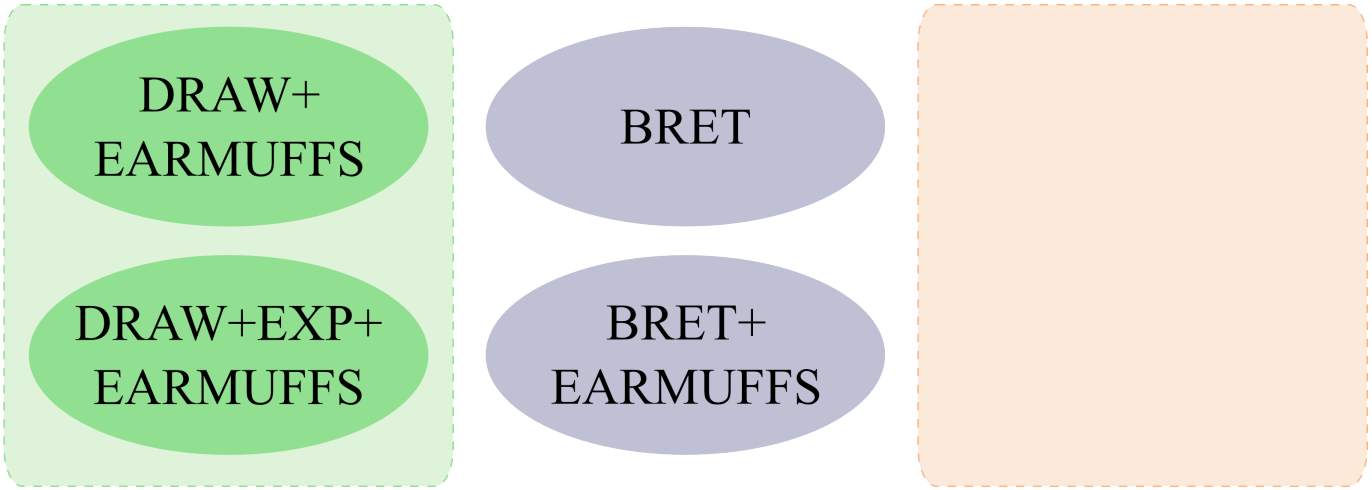
Control over the resolution of uncertainty



Draw treatment

- each subject receives a die at the **end** of the experiment
- s/he is allowed to practice with it for a short while
- at the end of the experiment, supervised, s/he throws the die

Control over the resolution of uncertainty



Draw treatment

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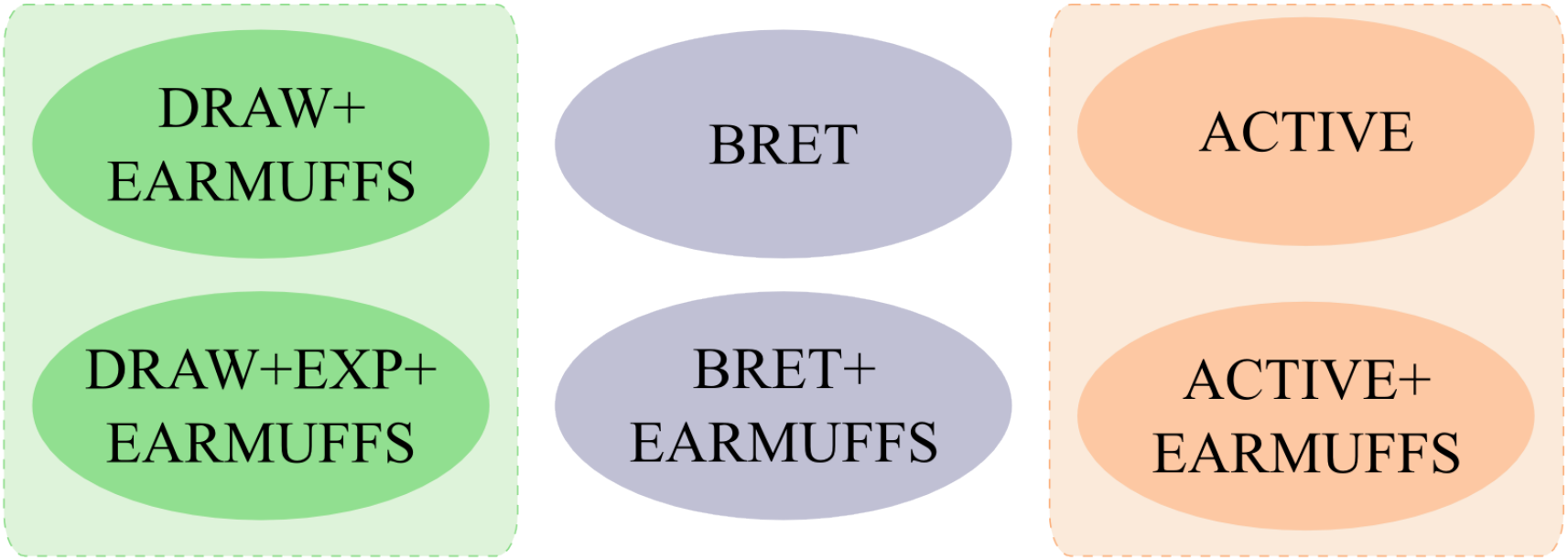
Draw + experience treatment

- each subject receives a die at the **beginning** of the experiment
- s/he is allowed to practice with it whenever they want

Treatments: summing up



Control over the **resolution of uncertainty**

Control over the **choice process**

The experiment

- Experiment was run in Jena, Germany, in 2013.
- 478 subjects, mostly students.
- Between-subjects design: each subject did *one* treatment only

For each subject:

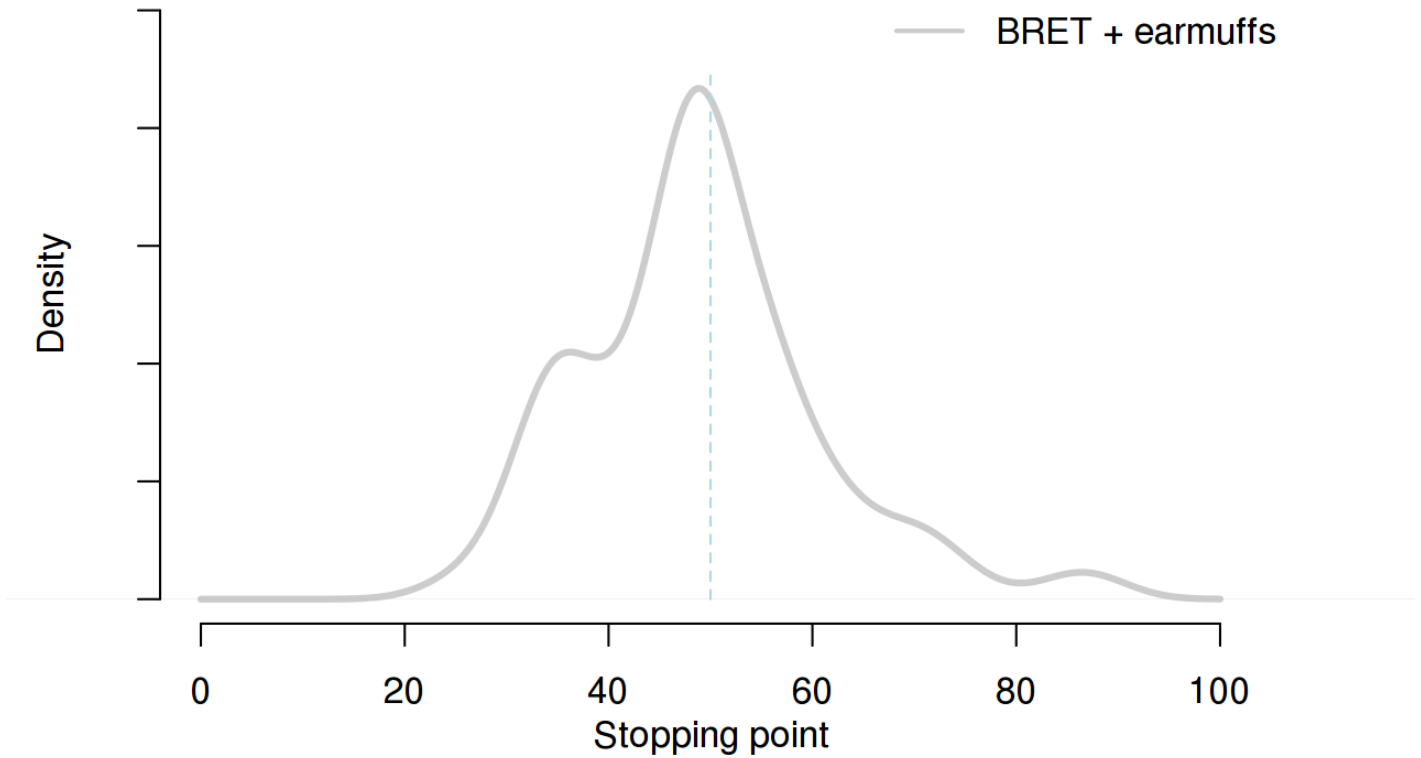
- Control questions: questions about understanding of uniform distribution
- Main task
- Belief elicitation I: belief about position of the bomb (should be a uniform)
- Belief elicitation II: belief about likelihood of explosion (should be = to boxes collected)
- Questionnaire: SOEP risk question

Results overview

	Choice		SOEP	
	Mean	*St.Dev*	*Mean*	*St.Dev*
BRET + earmuffs	49.15116	11.77686	4.94186	2.093995
Draw + earmuffs	50.26882	12.85635	5.26882	2.054368
Draw + exp + earmuffs	49.20968	10.28151	5.17742	1.851222
Active	54.82313	14.9793	5.38775	1.848542
Active + earmuffs	47.72222	13.6522	4.84444	1.965495

- **No** effect of control over the *resolution of uncertainty*
- **No** effect of control over choice alone
- **Small** but significant bandwagon effect $\Rightarrow$ risk-loving
- Treatments **do not** differ by self-reported risk attitude (SOEP)

Results: choice distributions



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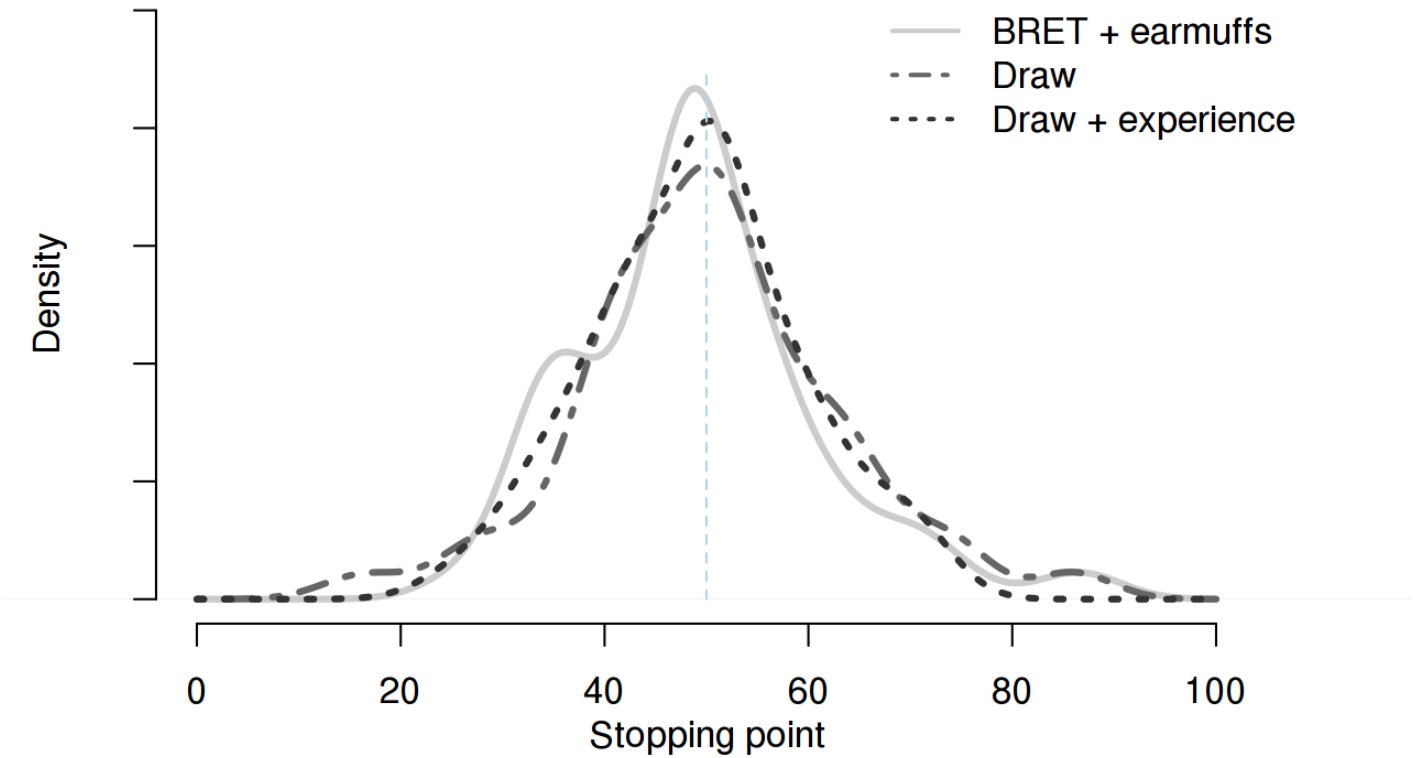

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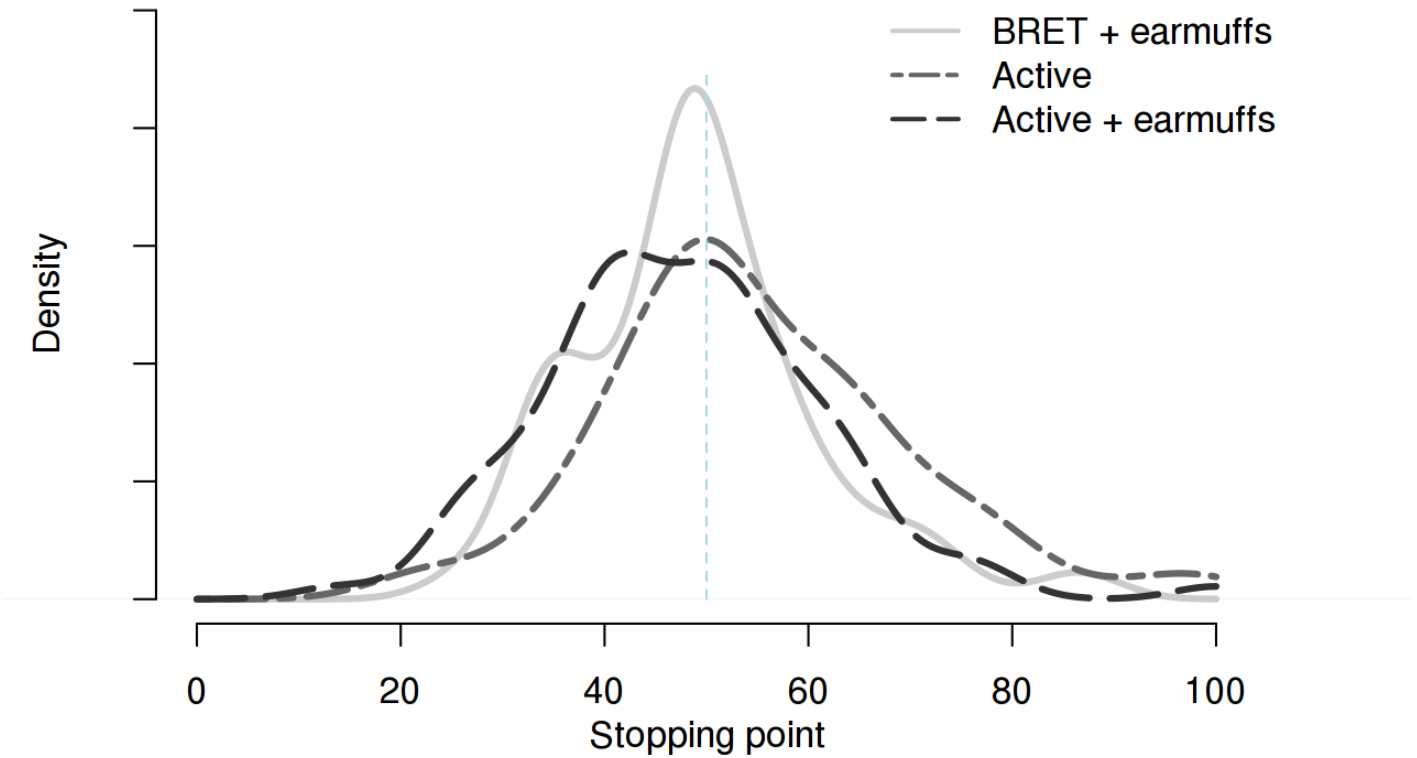

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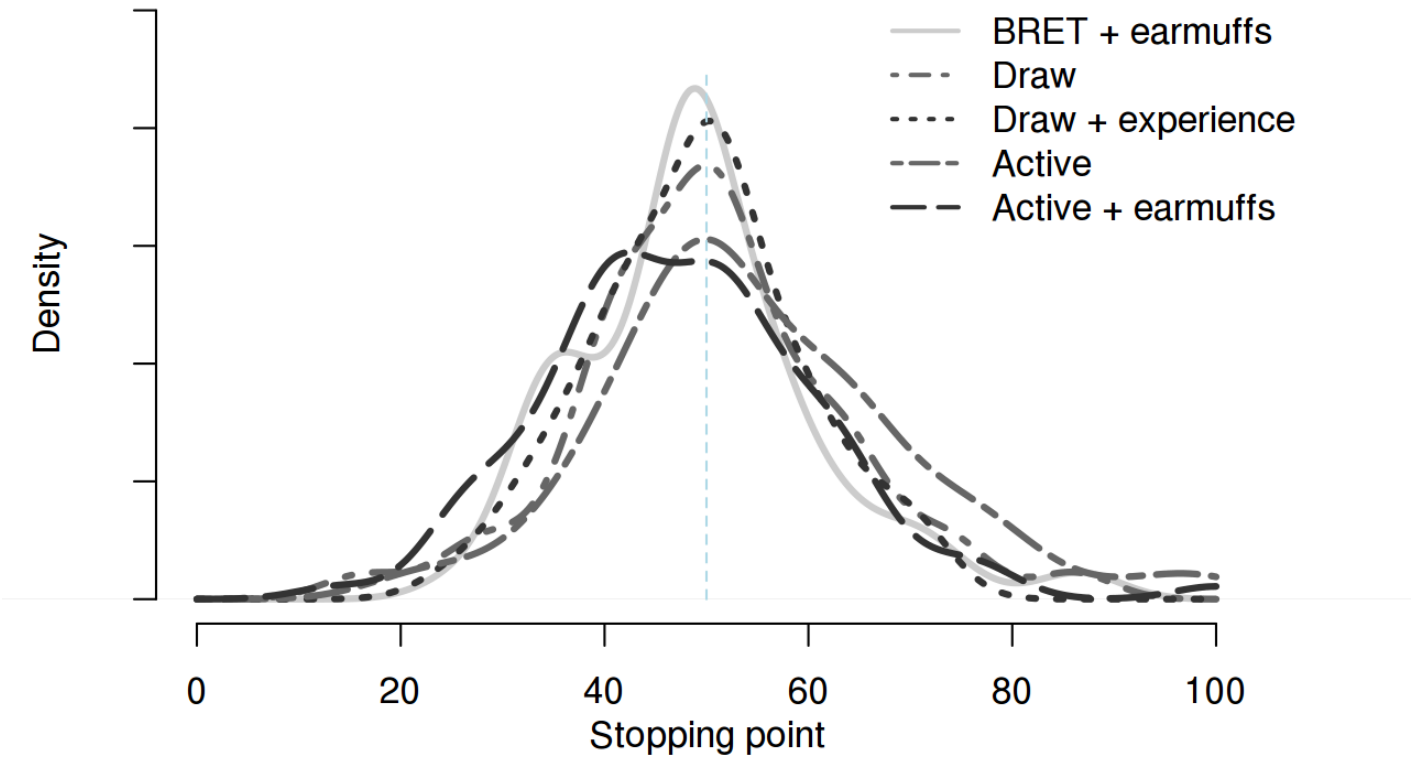
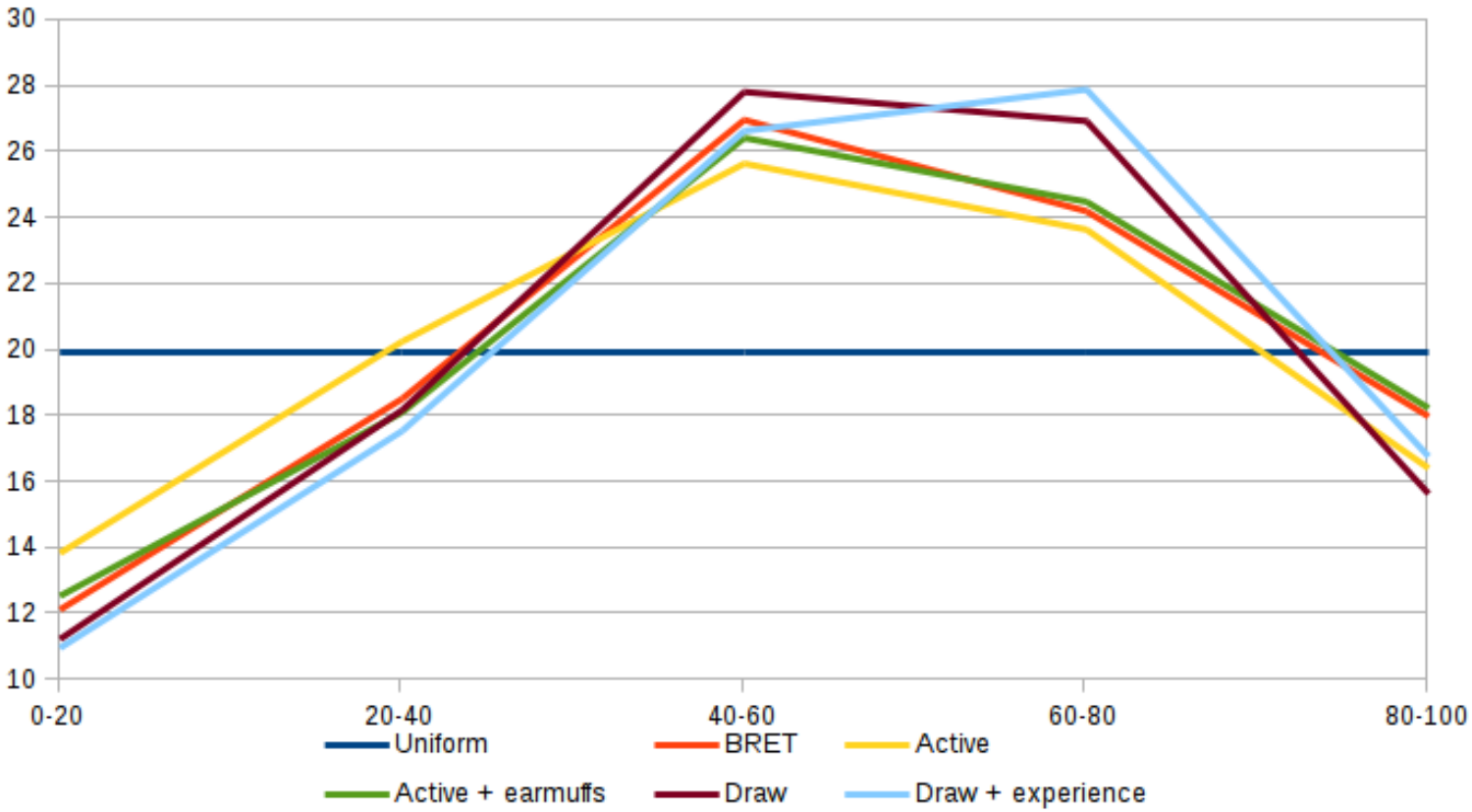


Significance tests

- Treatments are not different w.r.t. self-reported risk attitude (Kwallis p-value 0.23)
- Treatments are different w.r.t. risk elicited (Kwallis p-value 0.001)
- Pairwise ranksum tests indicate that Active is different from all others

	BRET	Active	Active + E	Draw	Draw + Exp
BRET	-	**0.00**	0.51	0.36	0.61
Active		-	**0.00**	**0.02**	**0.01**
Active+earmuffs			-	0.14	0.32
Draw				-	0.69
Draw + experience					

Beliefs I: position of the bomb



- beliefs are not uniform
- tests confirm significant difference for each interval

Beliefs II: probability of winning

	Probability of winning		Overconfidence
	Belief	Actual	
BRET	51.8372	50.84884	0.9883721
Active	50.6207	45.17687	5.44383
Active + earmuffs	50.9556	52.27778	-1.322222
Draw	50.5699	49.73118	0.8387097
Draw + experience	51.0645	50.79032	0.2741936

- Subjects are more overconfident in the Active treatment
- This result is robust to eliminating all the subjects that just gave in 50-50 answers

Beliefs II: really overconfidence?

- But subjects held also wrong beliefs about the position of the bomb
- What happens if we take them seriously, i.e. compute their subjective winning probability *given* their beliefs on the position of the bomb?

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	Probability of winning		Adjusted
	Belief	Adjusted	overconfidence
BRET	51.8372	57.9843	-6.147093
Active	50.6207	52.68879	-2.068104
Active + earmuffs	50.9556	60.52555	-9.57
Draw	50.5699	55.69086	-5.120968
Draw + experience	51.0645	59.06936	-8.004839

Conclusion

Main points

- illusion of control can stem from several behaviors
- we test in this paper **three** of them:
  1. control over the resolution of uncertainty
  2. control over the choice itself
  3. bandwagon and (unconscious) imitation effects
- we find *no* evidence of 1. and 2.
- we find rather strong evidence of 3.

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Take-home message

Beware of imitation effects in the lab!

Thanks!