

Written Exam at the Department of Economics winter 2019-20

**The Psychology of Choice**  
-  
**Experimental Theory and Methods**

Final Exam

January 14, 2020

(3-hour closed book exam)

Answers only in English.

**This exam question consists of xx pages in total**

**Falling ill during the exam**

If you fall ill during an examination at Peter Bangs Vej, you must:

- contact an invigilator who will show you how to register and submit a blank exam paper.
- leave the examination.
- contact your GP and submit a medical report to the Faculty of Social Sciences no later than five (5) days from the date of the exam.

**Be careful not to cheat at exams!**

You cheat at an exam, if during the exam, you:

- Make use of exam aids that are not allowed
- Communicate with or otherwise receive help from other people
- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text
- Use the ideas or thoughts of others without making use of source referencing, so it may appear to be your own idea or your thoughts
- Or if you otherwise violate the rules that apply to the exam

## (1) Attention

During the course, we experienced that salient attributes automatically draws attention. We also saw that a simple model – Saliency Theory – could describe the fundamental principles of salience. In the following, you will be asked to consider Saliency Theory as described in *Bordalo, P., Gennaioli, N., and Shleifer, A. (2012) "Salience in experimental tests of the endowment effect", American Economic Review, 102(3), 47-52.*

In *Bordalo et al. (2012)*, Saliency Theory is i.a. used to explain the “endowment effect” when trading mugs and pens in a two-stage experiment. In the first stage, subjects are endowed with a mug. In the second stage, the same subjects are given the opportunity to trade the mug for a pen of similar value. The endowment effect holds that very few subjects chose to trade, sometimes as few as ten percent.

- a. Consider a mug  $M$  with attributes  $(q_{i,M}, 0)$  and a pen  $P$  with attributes  $(0, q_{j,P})$ . The first attribute  $i$  describes the good's drinking quality. The second attribute  $j$  its writing quality. The zeros capture the fact that experiments involve no writing mugs or drinking pens. The mug and the pen are assumed to have the same quality level  $q_{i,M} = q_{j,P} = q > 0$ . When the mug's attribute  $i$  is more salient than its attribute  $j$ , for example, then the mug's decision weights are defined by  $w_{i,M} = (1/(1+\delta)) \cdot (1/2)$  and  $w_{j,M} = 1 - w_{i,M}$ , respectively. State the perceived linear utility  $v_M$  of a mug  $M$ . Give an example of what happens with  $v_M$  as the sensitivity parameter  $\delta \in (0, 1]$  change.
- b. The salient attribute is determined by the saliency function  $\sigma$  that, for example, measures the extent to which the mug  $M$ 's attribute  $q_{i,M}$  “stands out” relative to the average of that attribute,  $q_i^* = (q_{i,M} + q_{i,P})/2$ , in the choice set. Assume that mug's drinking quality saliency has functional form  $\sigma(q_{i,M}, q_i^*) = |q_{i,M} - q_i^*| / (|q_{i,M}| + |q_i^*|)$ . Similar for its writing quality. By example, show how the saliency function  $\sigma$  changes with the distance  $|q_{i,M} - q_i^*|$ . Furthermore, show how the saliency function  $\sigma$  changes as  $q_{i,M}$  and  $q_i^*$  rise with the same value  $\varepsilon$ . Finally, describe the underlying attentional mechanisms.
- c. Because the decision maker is given the mug  $(q, 0)$  in the first stage, he evaluates it against the status quo  $(0, 0)$  of not having it. His consideration set is thus  $\{(q, 0), (0, 0)\}$ . Write-up the average drinking quality  $q_i^*$  of the goods. Use the saliency function  $\sigma$  to show the attribute of the mug that is salient. State the subjects' perceived linear utility  $v_M$ .
- d. In the second stage, the decision maker must decide whether to trade his mug for a pen. His consideration set thus becomes  $\{(q, 0), (0, 0), (0, q)\}$ . Write-up the average drinking quality  $q_i^*$  and average writing quality  $q_j^*$ . Use the saliency function  $\sigma$  to show which attribute of the mug and pen, respectively, that is salient. State the subjects' perceived linear utilities  $v_M$  and  $v_P$ . Show how a warm glow of ownership can explain the endowment effect. (Hint: Introduce a warm glow parameter  $\gamma > 0$  into the mug's decision weight).

## (2) Heuristics

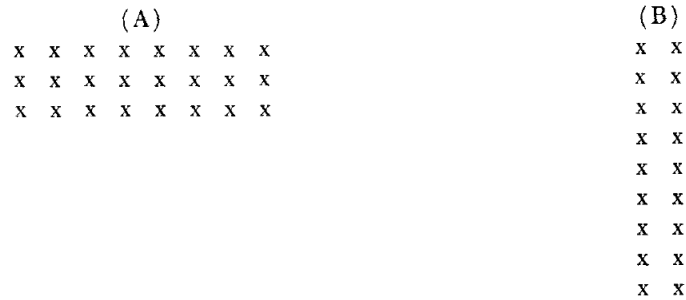
During the course, we saw that when faced with the difficult task of judging probability or frequency, people employ a limited number of heuristics that reduce these judgements to simpler ones. Availability and representativeness were two such heuristics. We will consider them in the following.

- a. Explain the concept ‘availability’.

- b. Tversky A. and Kahneman, D. (1973) "Availability: A Heuristic for Judging Frequency and Probability", *Cognitive Psychology*, 5(2), 207–232, presented the availability heuristics by citing different examples. One example was:

**Study 4: Permutations**

"Consider the two structures, A and B, which are displayed below.



A path in a structure is a line that connects an element in the top row to an element in the bottom row, and passes through one and only one element in each row.

In which of the two structures are there more paths?  
How many paths do you think there are in each structure?"

Most subjects judge that there are more paths in (A) than (B). However there are in fact less. Explain by the use of the availability heuristic why most subjects' judgements are wrong.

- c. Explain the concept 'representativeness'.
- d. Tversky A. and Kahneman, D. (1974) "Judgment under Uncertainty: Heuristics and Biases", *Science*, 185(4157), 1124-1131, presented the representativeness heuristics by citing different examples. One example was:

In considering tosses of a coin for heads or tails, for example, people regard the sequence H-T-H-T-T-H to be more likely than the sequence H-H-H-T-T-T, which does not appear random, and also more likely than the sequence H-H-H-H-T-H, which does not represent the fairness of the coin (2).

Explain this finding by the use of the representativeness heuristic.

**(3) Anchoring**

We often have to make decisions involving considerable uncertainty. All these decisions implicitly involve judgments about the likelihoods of uncertain outcomes. During the course, we saw that such judgments could be influenced by anchoring.

- a. Explain the concept of 'coherent arbitrariness' developed by Ariely, D., Loewenstein, G. and Prelec, D. (2003), "Coherent Arbitrariness: Stable Demand Curves without Stable Preferences", *The Quarterly Journal of Economics*, 118(1), 73-105. Discuss possible implications of this idea.
- b. Describe one of the experiments that Ariely et al. (2003) conducted.
- c. Discuss how well the experiment chosen in question 3.b identifies coherent arbitrariness.