

Written Exam for the M.Sc. in Economics summer 2013

**The Psychology of Choice**

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**Experimental Theory and Methods**

Final Exam/ Elective Course/ Master's Course

June 4, 2013

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

**This exam question consists of 3 pages in total including this page.**

## (1) Attention

When faced with a multitude of choice options, information processing becomes a significant player in the choices we make. Processing resources are scarce and consequently not all information that we have access to through our senses reaches our awareness. In the following questions you will be asked to consider which components influence selection for awareness and how these components are related to choice situations.

- a. Theeuwes introduced the additional singleton paradigm as a method for investigating what? Describe the additional singleton paradigm and two main findings of “Theeuwes, J. (1992) “Perceptual Selectivity for Color and Form”, *Perception and Psychophysics*, 51(6), 599–606”

Points that should be included in a model answer:

Minimum

1. That attention can be captured automatically by a salient distractor singleton
2. That the effect is not modifiable by training
3. Description of the method, and stimulus-driven attention and goal-directed attention

Good to include

4. Discussion of automaticity, control and training
5. The relationship between the target and the additional singleton.
6. A description of what is meant by feature contrast.

- b. Discuss evidence in favor of task-based allocation of attention.

Points that should be included in a model answer:

Minimum

1. Description of Simons and Chabris, 1999 study of inattention blindness.
2. Description of Bacon & Egeth, 1994

Good to include

3. The relationship between B&E, 1994 and Theeuwes, 1992
4. Discussion of implications for marketing

- c. Reutskaja et al, 2012 investigated the effects of visual search dynamics of consumer choice. Explain the effects of increasing the set size (i.e. the number of choice options):  
“Reutskaja, E., Nagel, R., Camerer, C.F. and Rangel, A. (2011) “Search Dynamics in Consumer Choice under Time Pressure: An Eye-Tracking Study”, *American Economic Review*, 101(2), 900–926.”

Points that should be included in a model answer:

Minimum

1. Number of items fixated decrease with set size increase
2. Effect on probability to fixate the best item
3. Discussion of the set size effects in relation to memory capacity and to the three models proposed by Reutskaja et al (optimal model, satisficing model, and hybrid model)

Good to include

4. The efficiency of selection across set sizes
  5. The number of items encoded in relation to the percent items encoded
  6. The relationship between eye fixations and encoded information
- d. Explain the principles guiding biased competition as described by Desimone, R. and Duncan, J. (1995) "Neural Mechanisms of Selective Visual Attention", *Annual Review of Neuroscience*, 18, 193–222.

Points that should be included in a model answer:

Minimum

1. Limitations in processing capacity
2. Features that are relevant to behavior bias the competition (top-down)
3. Uniqueness bias the competition (bottom-up)
4. Object similarity determines filtering efficiency

Good to include

1. Objects compete in parallel
2. Receptive fields and increasingly aggregated information neurally

## (2) Heuristics

During the course we have seen that people's evaluation of likelihoods and uncertain values might be affected by different heuristics.

- a. Please explain the three heuristics which we have talked about in the course and provide an example for each of them

Points that should be included in the answer:

- Definition of the Anchoring, Availability and Representativeness Heuristics as e.g. found in the article "Tversky A. and Kahneman, D. (1974) "Judgment under Uncertainty: Heuristics and Biases", *Science*, 185(4157), 1124-1131" on page 1124 (Representativeness), page 1127 (Availability) and page 1128 (Anchoring)
  - This articles also contains numerous examples for all these heuristic
- b. Please explain Experiment 1, i.e. the experimental design, procedure and results, of the article "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" and explain with the help of it the concept of "coherent arbitrariness"

Points that should be included in the answer:

Ariely, D., Loewenstein, G. and Prelec D. describe the experimental design, procedure and results of experiment 1 on pages 75-78 of their article

- c. In their article "Tversky A. and Kahneman, D. (1974) "Judgment under Uncertainty: Heuristics and Biases", *Science*, 185(4157), 1124-1131" Kahneman and Tversky argue that

judgments based on the representativeness heuristic are insensitive to “prior probability of outcomes”. Explain what they mean with this.

Points that should be included in the answer can be found on page 1124 (right column) in the article “Tversky A. and Kahneman, D. (1974) “Judgment under Uncertainty: Heuristics and Biases”, Science, 185(4157), 1124-1131” under the heading “insensitivity to prior probability of outcomes”

- d. What are the 3 biases that Kahneman and Tversky describe in association with the availability heuristic in the article “Tversky A. and Kahneman, D. (1974) “Judgment under Uncertainty: Heuristics and Biases”, Science, 185(4157), 1124-1131”

Points that should be included in the answer can be found on page 1124 (right column) in the article “Tversky A. and Kahneman, D. (1974) “Judgment under Uncertainty: Heuristics and Biases”, Science, 185(4157), 1124-1131” under the heading “insensitivity to prior probability of outcomes”.

### **(3) Framing**

Explanations and predictions of people’s choices are often founded on the assumption of human rationality. The definition of rationality has been much debated, but there is a general agreement that rational choices should satisfy some elementary requirements of consistency and coherence. In the following questions you will be asked to describe systematic violations to the requirement of consistency, and trace these violations to the psychological principles that govern the perception of decision problems and the evaluation of options.

- a. Kahneman and Tversky introduced the idea of framing of choice options (or acts) as a way of investigating the violation of which assumption of rationality?

Points that should be included in the answer:

1. Predictable shifts of preference when the same problem is framed in different ways
2. How effects of perspectives on perceptual appearance effect the framing of preferences
3. That dependence of preference on formulation of decision problems is a significant concern for the theory of rational choice

- b. Consider the following framing of acts experiment and results from Tversky and Kahneman (1981): *Imagine that you face the following pair of concurrent decisions. First examine both decisions, and then indicate the options you prefer.*

*Decision (i). Choose between:*

- A. A sure gain of \$240 [84 percent]
- B. 25% chance to gain \$1000, and 75% chance to gain nothing [16 percent]

*Decision (ii). Choose between:*

- C. A sure loss of \$750 [13 percent]*
- D. 75% chance to loss \$1000, and  
25% chance to loss noting [87 percent]*

Discuss the design, results, and intuition of this experiment.

Points that should be included in the answer:

Minimum

1. The different contributions to risk aversion in decision (i) and to risk seeking in decision (ii)
2. The relative attractiveness of the sure gain in (i) and to the relative attractiveness of the sure loss in (ii)

Good to include

3. How the shape of the value function contributes to point 1 above

How the weighting of probabilities contributes to point 2 above

- c. Tversky and Kahneman (1981) combined the experiment above in the following way:

*Choose between:*

- A&D. 25% chance to win \$240, and  
75% chance to lose \$760 [0 percent]*
- B&C. 25% chance to win \$250, and  
75% chance to lose \$750 [100 percent]*

Discuss the difference in the two framings and why everyone now chooses B&C.

Points that should be included in the answer:

Minimum

1. When the prospects are combined then the dominance of the B&C option becomes obvious
2. That the respondents apparently failed to entertain the possibility that the conjunction of two seemingly reasonable choices could lead to an untenable result

Good to include

3. A discussion on how this framing effect relates to the complexity of practical problems of concurrent decisions (e.g. portfolio selection)

- d. In the experiment above the outcomes have been elementary, such as gains or losses in a single attribute. In many situation, however, an action gives rise to a compound outcome, which joins a series of changes in a single attribute, such as a sequence of monetary gains or losses, or a set of concurrent changes in several attributes.

Give a simple example where the evaluation of compounded outcomes matters.

Points that should be included in the answer:

1. The idea of minimal psychological account, defined as an outcome frame
2. The relationship the set of elementary outcomes that are evaluated jointly and the manner in which they are described
3. The notion of neutral or normal reference outcomes