Behavioral Economics

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Homework 4

Due Tuesday 28th February

PLEASE DO QUESTION 1, 2 AND 3 ON SEPARATE SHEETS OF PAPER

Question 1 Consider choices between 4 alternatives $X = \{x, y, z, w\}$. Imagine a decision maker that makes choices using the satisficing procedure: they have a fixed utility function over X (to make things easy assume no ties), and search through their choice set in some order. If they find something above their reservation utility they stop and choose that object. If not they search the whole set and choose the best option. The order in which the DM searches through the available options in a particular choice set is random, with each ordering equally likely. As the experimenter, we observe the same DM making lots of choices. So for each choice set $A \subset \{x, y, z, w\}$, and a in A, we observe $p(a, A)$, or the probability of choosing a from choice set A. Call this a stochastic choice data set. So, for example if the DM chooses x from $\{x, y, z\}$ in $\frac{1}{3}$ of trials, then $P(x, \{x, y, z\}) = \frac{1}{3}$.

1. Imagine that all the alternatives are below the reservation utility. What are *all the possible* values that $p(a, A)$ could take (i.e. is it possible that we could see the DM choose a with probability 1 for some $a \in \{x, y, z, w\}$ in some choice set A? With probability 0? with probability $\frac{1}{2}$?)
2. Imagine that only one object is above the reservation level. What is the answer to the above question?
3. Now what about if there are two objects above the reservation level?
4. Use your answer above to come up with a behavioral rule to identify the objects above reservation utility and those below (i.e. write and prove a statement of the form "if

the DM is a satisficer, then a is above the reservation level if and only if we observe <something>"). Assume that there are at least 2 objects above the reservation level.

5. Use your answer to fill in the blanks in the following: A stochastic choice data set that is generated by a satisficer (with at least 2 objects above the satisficing level) must obey the following: we can identify an 'above reservation' set $U^* \subseteq \{x, y, z, w\}$ using <your answer to question 4> and

   (a) For any choice set A such that $A \cap U^* \neq \emptyset$, $p(a, A) =$<what> if $a \in U^*$ and $p(a, A) =$<what> if $a \notin U^*$

   (b) If $A \cap U^* = \emptyset$ then either $p(a, A) = 0$ or $P(a, A) = 1$, and if we define $C(A) = \{x \in A | p(a, A) = 1\}$ then $C(A)$ must obey GARP

Question 2 Read the following two articles

1. "What Do Laboratory Experiments Tell Us About The Real World?" by Steven Levitt and John List
2. "The Promise and Success of Lab-Field Generalizability in Experimental Economics" by Colin Camerer

(I'll put links to both articles on the course website). These two articles represent two sides of an ongoing debate about the value of laboratory experiments. Now pick one of the following violations of utility maximization that we discussed in class

- Too much choice
- Endowment effect
- Reflection effect
- Preference reversals
- Asymmetric Dominance/Compromise Effects

and write a 3 page essay on whether or not you think this anomaly tells us anything about the 'real world'. In order to do this, you will first have to define how you are interpreting this statement, in light of the two papers I've asked you to read. Next you have to find out what experimental evidence has been accumulated for your chosen violation. In order to do this, you should start with the suggested readings that I have given you in class. You can

then look at the articles that these readings cite. You can also, using google scholar, look at what subsequent articles have cited these readings (just type the name of the article into google scholar, and have a look at the 'cited by' list). Third, you will need to judge how well these experiments address the concerns of Levitt and List (if you think these concerns are justified). You may conclude by discussing experiments that you would like to see run in order to convince you of the validity of the findings

Question 3 In the lectures, I set up the optimization problem for a decision maker who has Shannon Entropy costs of attention in the case there were two states and two acts to choose from. I claimed that, if both acts were chosen, then posterior beliefs would satisfy

$$\begin{aligned} \frac{\gamma^a(\omega_1)}{\gamma^b(\omega_1)} &= \exp\left(\frac{u(a(\omega_1)) - u(b(\omega_1))}{\kappa}\right) \\ \frac{\gamma^a(\omega_2)}{\gamma^b(\omega_2)} &= \exp\left(\frac{u(a(\omega_2)) - u(b(\omega_2))}{\kappa}\right) \end{aligned}$$

1. Prove this result
2. Show that, in the simple case in which $U(a(\omega_1)) = U(b(\omega_2)) = c$, $U(a(\omega_2)) = U(b(\omega_1)) = 0$, and $\mu_1 = 0.5$ the probability of choosing the correct act in each state is given by $\frac{\exp\left(\frac{c}{\kappa}\right)}{1+\exp\left(\frac{c}{\kappa}\right)}$
3. In a recent experiment, I recorded the fraction of correct responses in each state for four different levels of reward. The results of the experiment are given in the following table

Reward ($)	% Correct
2	74.8
10	81.9
20	83.3
30	86.7

   assume $U(\$x) = x$. Is this data consistent with your findings from section 3 (i.e. can the same κ explain behavior at the 4 different reward levels?)
4. If not, are my subjects increasing their attention as rewards increase more quickly or more slowly than the Shannon model predicts?