Homework assignment 1

Problems

1. Give a real life example of how firms exploit *the attraction effect* in their marketing strategy. Give also an example of *the compromise effect.*

2. *Satisficing I.* Consider the following "decision-scheme" named satisficing by Herbert Simon. Let $v(x)$ be a function that assigns a real nunber to every element $x \in X$, and let v^* be a threshold of satisfaction. Finally, denote by O a particular ordering of the elements in X.

The decision-maker uses the following choice procedure. Given a non-empty subset $A \subseteq X$, the decision-maker arranges the elements of this set in a list according to the ordering O (that is, he replicates the ordering O skipping elements in X that are not in A). He then chooses the first element in this list that has a v-value at least as large as v^*. If there is no such element in A, the decision-maker chooses the last element on the list.

Show that this procedure satisfies independence of irrelevant alternatives (IIA).

3. *Satisficing II.* Consider the following variation on the satisficing procedure described above. Suppose X is a population of university graduates who are potential candidates for a job. Given a particular set of candidates, a decision-maker counts the number of candidates. If the number is smaller than five, he orders them alphabetically. If the number is above five, he orders them by their social security number. Whatever ordering is used, the decision-maker chooses the first candidate whose undergraduate average is above 85. If there ar enone, he chooses the last student on the list.

Show that this procedure violates IIA.

4. *Weak Axiom of Revealed Preferences.* Let C be a choice correspondence that selects from each non-empty subset $S \subseteq X$, a subset of elements (so that more than one element may be chosen). Formally, for every $S \subseteq X$, $C(S) \subseteq X$. Interpret the set of chosen elements $C(S)$ as the set of alternatives in S that the decision-maker cannot rule out as inferior to other alternatives in S. In this setting, the IIA property is usually referred to as the *Weak Axiom of Revealed Preferences* (WARP): A choice correspondence x satisfies WARP if for any $S \subseteq X$ and $y \in S$, the element y is chosen from S ($y \in C(S)$) if there exists $x \in c(S)$ (another element chosen from S) such that $y \in C(T)$ for some T that contains both x and y. In other words, if the element y is chosen when x was available, then y should also be chosen when x was available and chosen. The intuition is, that x cannot be better than y.

The following are two properties of choice correspondences:

(α) Removing unchosen elements does not affect the choice: if you chose x from some set S (with at least one other element other than x), and you now remove some elements other than x from this set, then x will also be chosen from the new, shrunken set (formally: for any non-empty $S, T \subseteq X$, if $x \in T \subseteq S$ and $x \in C(S)$, then $x \in C(T)$)

(β) Suppose you choose both x and y from some set S. If you now add elements to S and choose x from the new, larger set, then you must also choose y from this set (formally: for any non-empty $S, T \subseteq X$, with $T \subseteq S$, if $x, y \in C(T)$ and $x \in C(S)$, then $y \in C(S)$)

Show that a choice correspondence satisfies these two properties simultaneously if and only if it satisfies WARP (see the previous question for a definition of WARP).

Hint: This proof also proceeds in two steps. First, you show that if a choice correspondence c satisfies WARP, then it must also satisfy α *and* β. *Second, you show that if c satisfies both* α *and* β, *then it must also satisfy WARP.*

5. Consider a decision-maker who needs to choose between options with two attributes. For example: different investments - the rate of return, the date it will be received; apartments - distance from work, monthly rental, vacations - duration, cost, etc. Suppose that the decision-maker has two rankings of the available options, one according to the first attribute and one according to the second. Suppose also that the decision-maker first chooses the two options that are top ranked according to both attributes. If the two options are the same, he chooses that option. Otherwise, he postpones his decision. Show that the procedure that selects the two options violates WARP.

6.* (EXTRA CREDIT QUESTION) *Weak Axiom of Revealed Preferences.* Let C be a choice correspondence that selects from each non-empty subset $S \subseteq X$, a subset of elements. I.e., for every $S \subseteq X$, $C(S) \subseteq X$. Interpret the set of chosen elements $C(S)$ as the set of alternatives in S that the decision-maker cannot rule out as inferior to other alternatives in S. In this setting, the IIA property is usually referred to as the Weak Axiom of Revealed Preferences (WARP): A choice correspondence x satisfies WARP if for any $S \subseteq X$ and $y \in S$, the element y is chosen from S ($y \in C(S)$) if there exists $x \in c(S)$ (another element chosen from S) such that $y \in C(T)$ for some T that contains both x and y. In other words, if the element y is chosen when x was available, then y should also be chosen when x was available and chosen. The intuition is, that x cannot be better than y.

Show that C satisfies WARP if and only if there exists a preference relation on X that allows for indifferences such that $C(S)$ is the set of most preferred elements in S according to this preference relation.

Hint: The answer proceeds in two steps. First, you show that choosing the most preferred elements (there could be ties here) leads to a choice correspondence that satisfies WARP. Second, you define a "candidate" preference relation (e.g., if you choose x from {x,y} than either you prefer x to y, or you are indifferent between them), show that it is complete and transitive and that the choice from any set of elements cannot be inferior to any other element in the set according to the preference relation you defined.

Readings

Choose one of the following papers to read. Prepare a short "Power Point" (or any other program for presentations) of the paper as if you were the author and had to present it in a conference. When preparing the slides focus on explaining the motivation of the authors in terms of how it relates to a systematic departures from rational choice. In addition, be sure to explain the authors' methodolgy and their findings (in your own words).

1. Sheena S. Iyengar (2007): "Order in Product Customization Decisions: Evidence from Field Experiments", Mimeo, Columbia University.

2. Sheena S. Iyengar and Mark Lepper (2000): "When Choice is Demotivating: Can One Desire Too Much of a Good Thing?" *Journal of Personality and Social Psychology*, **79**, 995-1006.

3. John T. Gourville and Dilip Soman (2007): "Extremeness Seeking: When and Why consumers Prefer the Extremes", Working Paper, Harvard Business School.

4. Itamar Simonson (1990): "The Effect of Purchase Quantity and Timing on Variety-Seeking Behavior," *Journal of Marketing Research,* **27**, 150-162.