Choice overload and asymmetric dominance: experiment and theory

Gerardo Infante[1], Stefania Sitzia[2], Robert Sugden[3]

Our paper reports an experiment which uses a new design to test the *choice overload* hypothesis that, if the size of a person's choice set is increased beyond some limit, the (subjective or objective) value of the chosen option is reduced. Testing this hypothesis poses an experimental design problem. Ideally, the options in the choice sets should be ones for which there is an objective criterion of value. However, the value of each option must not be transparent, to ensure that the subject faces a significant search problem. Crucially, this search problem should be capable of priming mental processes actually used by consumers in real-world settings. Designs which implement formal models of rational choice (e.g. by using formally-described lotteries as options) may fail to activate more intuitive decision-making heuristics that are effective in real search problems. In our design, options are 'containers' (shaped like vases or drinking glasses) defined by three dimensions – 'bottom radius', 'top radius' and 'height'; the value of a container is proportional to its capacity. The point of this design is that, although in principle the value of each container can be calculated mathematically from the information provided, subjects are likely to rely on more intuitive judgements about capacity. Our primary interest is not in the specific heuristics that people use to judge the capacity of containers, but in how, in general, people deal with choice problems that require intuitive judgements.

Choice sets contain either N = 5 or N = 25 containers, drawn at random from a larger 'population' of containers. Subjects 'inspect' containers one at time. There is no time limit and no limit to how many times a container can be inspected. We investigate whether subjects make worse choices when N = 25.

We find that subjects are remarkably good at this problem. The average value of the chosen container, and the probability of choosing a container from the top quintile of the choice set, are both higher when N = 25. Most subjects inspect almost all containers; the time taken for each inspection is very short, but high-value containers are typically inspected several times. We are probing deeper into the data. Our provisional finding is that, after controlling for actual capacity, the probability that a container is chosen is greater if it dominates (i.e. is larger on all three dimensions than) at least one other container in the choice set, and less if it is dominated by at least one other container. Our conjecture is that the search process is based on successive pairwise comparisons;

[1] No Affiliation
[2] University of East Anglia.
[3] University of East Anglia.

these comparisons are ordinal (i.e. there is no attempt to estimate the absolute value of any container) and intuitive (this is consistent with subjects inspecting many containers for short amounts of time). Subjects seem to be using a version of the asymmetric dominance heuristic (compare Gaudeul and Sugden, *Economica* 2012 and Sugden and Zheng, *Management Science* 2018).

We have developed a simple theoretical model of decision-making among multi-dimensional objects which have 'objective' values. We model a decision heuristic based only on asymmetric dominance (i.e. choose an option so as to maximise the number of options it dominates; break ties by randomisation). We consider the effect of increases 'to scale' in the size of the choice set, holding constant both (i) the value of the best option and (ii) the expected value of an option chosen at random. We show that the expected value of the chosen option increases with the size of the choice set. Even adding 'bad' options can sometimes improve the final decision. (Contrast Sunstein and Thaler, 2003, p.1196: 'How much choice should people be given? Libertarian paternalists want to promote freedom of choice, but they need not seek to provide bad options, and among the set of reasonable ones, they need not argue that more is necessarily better.') Intuitively: effective decision heuristics require *comparators* that can act as reference points/ guideposts. Options that a person will not in fact choose may still be useful.

Our interpretation is that, in some of the choice overload literature, rational-choice models are being interpreted too literally, i.e. the difficulty of a real-world choice problem is being treated as the difficulty of solving the problem *as it is represented in the rational-choice model* (compare Sitzia and Sugden, *Journal of Economic Methodology* 2011).

JEL: C91, D0