

Every day we make various decisions that may result in consequences of different weights. For example, a trivial decision of whether to take an umbrella before leaving home or not becomes meaningful if we expect heavy rainfall. If our personal goal is to make a good impression during an interview for the desired job, the decision to take the umbrella on a cloudy day is simple, and we do not have to deliberate on its costs and benefits. However, if our personal goal is to have a good time with old friends, we may seriously consider whether it is worth carrying the cumbersome umbrella, at the same time accepting the risk of leaving it in a restaurant or getting wet on the way to the meeting.

According to the rational choice theory, which is a normative standard for the rationality of decisions, an individual should consider all consequences weighed by their corresponding probabilities in a consistent and logical manner. In this sense, a decision of whether to take the umbrella or not would require processing all consequences and the chances that they will occur. Such a complicated process would consume time and effort. These resources could be maintained if we base our decisions on simple and fast, but also imperfect, heuristics. Using heuristics can lead to satisfactory decisions that may deviate from normative standards. Nevertheless, making a greater number of fast suboptimal decisions could lead, in the long run, to better outcomes than those resulting from a lower number of time-consuming and effortful optimal decisions (e.g., it is better to take the umbrella without deliberating on it when going to five job interviews and get a job rather than waste time on thinking about the umbrella and miss the job interview).

In the present project, we will investigate this research problem in a series of experiments. We will aim at demonstrating that people are able to adaptively select a choice strategy that maximizes gains and minimizes losses in the long run. We predict that depending on the task structure, numerical abilities, and personal goals, individuals would make a greater number of fast decisions based on heuristics when it pays off. Even if these decisions are not optimal according to normative standards, repeated satisfactory choices made within a limited time will lead to better overall outcomes than optimal choices predicted by rational choice theory. In this sense, the recurring irrationality is adaptively rational.

The research project consists of four tasks. First, we will perform a registered replication of previous research indicating that people with higher objective statistical numeracy, in comparison to people with lower numeracy, adaptively select choice strategy depending on the task structure or environment. In other words, these people do not use more effortful strategies unless it pays: in trivial choice problems they employ fast and frugal heuristic processing, but they engage more elaborate and effortful processing in meaningful problems.

Second, we will conduct a simulation and empirical study to investigate whether a series of faster and suboptimal but satisfactory decisions outperform decisions predicted by rational choice theory. We hypothesize that, within a limited time, more numerate participants will adaptively select a choice strategy to make a greater number of fast suboptimal decisions when choice problems are trivial. Such a strategy of making repeated suboptimal decisions will result in higher payoffs in the long run.

Third, we will replicate previous findings in a study investigating decisions under uncertainty (i.e., when explicit information about probabilities is unavailable). We predict that people with high numeracy, in comparison to people with low numeracy, will be able to learn the importance of the decision they are about to make. In consequence, they will save their time and cognitive resources when making trivial choices but put more effort into meaningful problems.

Last but not least, we will conduct an experiment in which we will manipulate personal goals. If the cognitive mechanism underlying the effect of adaptive suboptimal decisions is related to setting personal goals, we should observe different choices when people are explicitly asked to make satisfactory decisions or to maximize payoffs.