Fast and Frugal Strategy are special cases of a sequential sampling decision process. Thus, it is a rather radical departure under the rubric of top-down models of strategy selection. A slight departure from these models is Lee & Cummins' strategy selection problem and several models have been proposed to account for this process. The earliest are Beach & Mitchell (1978), Christie-Smith and Bettman & Johnson's models (1993), which all go under the rubric of top-down models of strategy selection. A slight departure from these models is Lee & Cummins' Evidence Accumulation Model (Lee & Cummins, 2004), which assumes that a rational decision strategy and a fast and frugal strategy are special cases of a sequential sampling decision process. Thus, it is a rather radical departure from the previous models as the assumption of the repertoire of strategies is absent in the model. Its main assumption is that fast and frugal strategy and a rational strategy can be unified within one process.

The problem of using the right strategy for a particular decision task has been framed as the strategy selection problem and several models have been proposed to account for this process. The earliest are Beach & Mitchell (1978), Christie-Smith and Bettman & Johnson's models (1993), which all go under the rubric of top-down models of strategy selection. A slight departure from these models is Lee & Cummins' Evidence Accumulation Model (Lee & Cummins, 2004), which assumes that both a rational decision strategy and a fast and frugal strategy are special cases of a sequential sampling decision process. Thus, it is a rather radical departure from the previous models as the assumption of the repertoire of strategies is absent in the model. Its main assumption is that fast and frugal strategy and a rational strategy can be unified within one process.

The proposed model has to choose the best choice alternative among several ones. As input data, the model takes (a) a set of alternatives (each represented as a vector of cue values) and (b) the order of cue weights (cue ranking). Cue values are binary (0 and 1), representing a 'low' and a 'high' quantity of a given cue. Cue values are read into the model's working memory with the order of cue weights, and the higher the weight the cue has, the stronger is its activation in memory. The model assumes that there are two properties of working memory which influence the procedural information processing: capacity and focus of attention. Capacity determines how large is the reduction of decision time between successive cue representations (compare Figure 1 and Figure 2), whereas focus determines how large is the reduction of the decision time, when moving from cues with higher validity to those with lower one. The cue first in the ranking already has the activation of one (it is activated on maximum level); the following cues have lower activations, in accordance with formulas shown below. After the cues are represented in working memory with an activation computed on the basis of their place in the cue ranking and the given memory properties, all alternatives are compared with regard to their cue values multiplied by their activations. The alternative which has the highest overall value is chosen (if there is a tie, the choice is made at random).

### Parameters and Formulas

Memory capacity is an overall amount of activation which can be divided among different cue representations, it is denoted as \( a \). Focus is the kind of mapping between the place of a cue in the ranking based on the weights and the amount of memory allocated to that cue and will be represented as \( f \). Formula (1) shows the relation between the amount of activation (\( a \)) accruing to the cue on one hand and focus on the other.

\[
a = \max\left(0, \frac{-n - 1}{n} \frac{S}{c} + \frac{1}{c}\right)
\]

In the formula (1) \( c \) is the activation noise, \( b \) stands for the number of choice alternatives and \( c \) denotes the function which restricts larger of its arguments. The negative values of \( a \) if occurred, are not taken into consideration - they were treated as zero. Note that the smaller the \( n \) is, the more activation is given to the cue. The model chooses the alternative for which the value \( v \) is the highest, where value \( v \) is computed from the formula (2) based on the Weighted Additive rule.

\[
v = \sum_{i=0}^{n} a_{out} c_{out}
\]

The \( k \) stands for the number of cues, \( a_{out} \) is the activation of the \( k \)-th cue and \( c_{out} \) is the value of the \( k \)-th cue. Note that all variables except capacity and focus (i.e., values of the cue, number of the cues and number of alternatives) are not brought into the simulation as parameters, but they are features of the environment. The model's parameter \( M \) is to be varied between 2 and 6 and tested the performance of these two versions in the two different environments. The model's processing capacity indeed interacted with the environment structure. In the compensatory environment, there was no difference in the accuracy of choices made by the high and low capacity versions of the model. However, in the noncompensatory environment, the low capacity version of the model, surprisingly much better choices than the high capacity version of the model (see Figure 3).

### Results of simulations

![Simulation results: interaction between working memory capacity and the type of environment.](image)

#### Discussion

The model proposed above is based on two novel ideas which can help explain the process of strategy selection during decision making. The first idea is that there are no separate strategies chosen and used on the basis of either deliberative or intuitive learning, but all strategies are instances of one process which depends on some cognitive characteristics, which can vary intra-individually. In this perspective, our model shares some features with Lee & Cummins (2004) unifying model of strategy selection. The second idea is the assumption that the selection of strategy is not a real choice, but is only seen as such from the observer's third-person perspective. Both models establish that some decision maker's internal property can be changed and thus result in apparent use of different strategies.

### References