

Reasoning the Fast and Frugal Way: Models of Bounded Rationality

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Psychological Review
1996, Vol. 103, No. 4, 650–669

0033-295X/96/$3.00

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Humans and animals make inferences about the world under limited time and knowledge. In contrast, many models of rational inference treat the mind as a Laplacean Demon, equipped with un-

limited time, knowledge, and computational might. Following H. Simon's notion of satisficing, the

would suggest that the mind is a supercalculator like a Lapla-

cean Demon (Wimsatt, 1976)—carrying around the collected

works of Kolmogoroff, Fisher, or Neyman—and simply needs a

memory jog, like the slave in Plato's *Meno.* On the other hand, the heuristics-and-biases view of human irrationality would

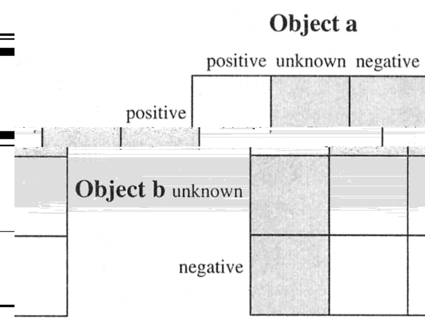
'reasonableness' " (p. 78). They did not report such a test. We

shall.

Initially, the concept of bounded rationality was only vaguely

defined, often as that which is not classical economics, and one could "fit a lot of things into it by foresight and hindsight," as

could be based, that is, knowledge is limited. We model limited knowledge in two respects: A person can have (a) incomplete knowledge of the objects in the reference class (e.g., she recog-



values (facts about cities), or (c) both. For instance, a person who does not know all of the cities with soccer teams may know some cities with positive cue values (e.g., Munich and Hamburg certainly have teams), many with negative cue values (e.g., Heidelberg and Potsdam certainly do not have teams), and several cities

for which cue values wi ll not be known.

Table 1

Cues, Ecological Validities, and Discrimination Rates

edge, time, and computational power. This question is impor-

tant for Simon's postulated link between the cognitive and the variation between recognition of cities and city populations. Let us define the *validity* α of the recognition principle to be the

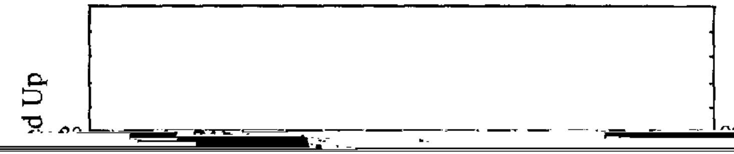
predictors or cues and is commonly seen as an "optimal" way

Brunswik, 1955; Hammond, 1966). Neural networks using the

delta rule determine their "optimal" weights by the same prin-

4 cue values (that is, one fifth of all possible) are searched for.

less than a third of all available cue values.



Results of the Competition: Average Proportion of Correct Inferences

Here the unit-weight and weighted linear models often make the inference that the unrecognized object is the larger one, due to the overwhelming negative evidence for the recognized obrithm then tries the cue that discriminated the time before last.

and so on. The algorithm differs from the Take The Best algo-

rithm in Step 2, which is now reformulated as Step 2′:

Step 2′: Search for the Cue Values of the

smaller and smaller. The reason why the Minimalist algorithm

looks up fewer cue values than the Take The Best algorithm is

that cue validities and cue discrimination rates are negatively

correlated (Table 1); therefore, randomly chosen cues tend to

have larger discrimination rates than cues chosen by cue


.75
100% TTB
.75

ative to the PMM family of satisficing algorithms is the lexico-

graphic rule. The largest evidence for lexicographic processes

seems to come from studies on decision under risk (for a recent

summary, see Lopes, 1995). However, despite empirical evi-

great topic but does not recognize the name of the author, he

makes the inference that it is probably not worth buying. If,

after an inspection of the references, he does not recognize most

of the names, he concludes the book is not even worth reading.

disjunctive algorithms (Einhorn, 1970) and highly complex

Biological systems, for instance, can exhibit systematic in-

essary for the successful performance of the satisficing

ine three species: a, b, and c. Species a inhabits both water and

A New Perspective on the Lens Model

room) need to be justified (Tetlock, 1992). Going with the sin-

gle best reason, the strategy of the Take The Best algorithm, has

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City	Population	Soccer team	State capital	Former East Germany	Industrial belt	Licence plate	Intercity trainline	Exposition site	National capital	University
[redacted]										
Hamm	179,639	–	–	–	+	–	+	–	–	–
[redacted]										
Mainz	179,486	–	+	–	–	–	+	–	–	+
[redacted]										
Herne	178,132	–	–	–	+	–	–	–	–	–
Mülheim	177,681	–	–	–	+	–	–	–	–	–
Solingen	165,401	–	–	–	–	–	+	–	–	–
Osnabrück	163,168	–	–	–	–	–	+	–	–	+
Ludwigshafen	162,173	–	–	–	–	–	+	–	–	–
Leverkusen	160,919	+	–	–	–	–	–	–	–	–
[redacted]										
Oldenburg	143,131	–	–	–	–	–	+	–	–	+
[redacted]										
Darmstadt	138,920	–	–	–	–	–	+	–	–	+
Heidelberg	136,796	–	–	–	–	–	+	–	–	+
[redacted]										
Wolfsburg	128,510	–	–	–	–	–	–	–	–	–
Würzburg	127,777	–	–	–	–	–	+	–	–	+
[redacted]										
Schwerin	127,447	–	+	+	–	–	+	–	–	–
[redacted]										
Recklinghausen	125,060	–	–	–	+	–	+	–	–	–
[redacted]										