The „Take the Best" Heuristic and ACT-R

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„Simple heuristics that make us smart"
(Gigerenzer, Todd & the ABC research group,
2000)

Key claims:

- „Adaptive toolbox"
- „fast and frugal"
- „purest form of bounded rationality"
- „ecological rationality"

The „Take the Best"-Heuristic (TTB)

- TTB is an example of „one reason decision making"
- How does TTB work? School Example

Validities	cues	School A	School B
.9	reputation	+	-
.8	students	-	+
.7	neighborhood	+	+

Open questions about TTB

- (When) do people use TTB

- How are the heuristics themselves learned?

- A study that addresses this questions (Bröder 2000)

Empirical results concerning TTB (1)

- TTB is not universally applied
  - Influence of frequency and validity of the cues favoring the non-TTB alternative

24 stimuli; 4 per condition

| High vs low validity	many vs few other cues	
A: M = 1 vs A: M= 1.7	A: M= 1	A: M= 1.79
A: M= 1 vs A: M= 2.5	A: M= 1	A: M= 2.5

Problems with empirical results concerning TTB (1)

- quite trivial, but also theoretical problems:
- Simultaneous display of cues requires NO SEARCH
- No time pressure
- (maxim of quantity)
- ==>more systematic investigation of the conditions that foster TTB is necessary

Empirical results concerning TTB (2) (N=40)
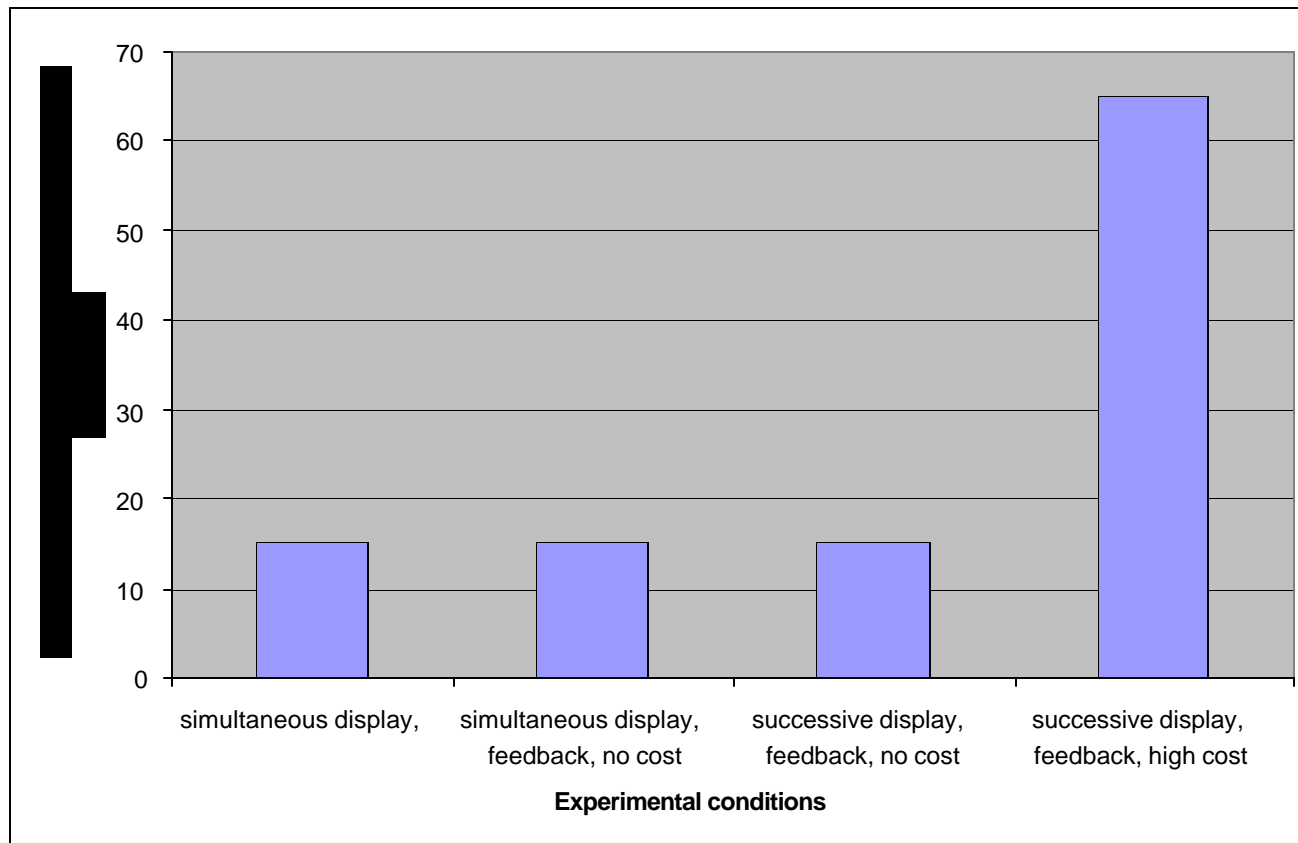
Tentative Interpretation of these results
(to be modeled)

- The combination of high cost of information search, successive cue display and feedback evokes use of TTB because...

- High cost-->restrains search-->"oh, it works, too!"

- The value of TTB is learned „under pressure"

Some things to be considered

- With Böder's stimuli, TTB and a WAM make the same choice in 92% of all cases
- ==> performance is equal
- ==># of looked-up cues per se is no indicator for strategy
- Only cost distinguishes TTB from more sophisticated strategies
- TTB *does* pay off

Model (1)

- Ambition: model increase of TTB use under high cost/ successive display/ feedback condition as opposed to other conditions
- Thereby provide a demonstration of how TTB can be learned

Model (2)

- Mechanism: Production parameter learning
- 2 strategies with initially the same probability of being chosen: TTB and a weighed additive strategy
- Successes and failures of each strategy are recorded
- Successes and failures are equal, but cost/payoff varies (estimated)

Strategy choices of that Model (40 runs)

	successive display feedback no cost	successive display feedback high cost
TTB	50 %	85%
WAS	50%	15%

Strategy choices of that Model: Problems and Implications

- „Problems"

Model decides on strategy a priori, which is at least open to debate (mention alternative model)

Measure of TTB usage is (perhaps!) different than that of Bröder (2000)

The exact nature of the feedback isn't explicitly given in Bröder's paper, so the model had to rely on an (my) interpretation

Strategy choices of that Model: Problems and Implications

• *IMPLICATIONS*!!

A quite basic ACT-R mechanism can capture the quintessence of the learning of the TTB heuristic

Despite the „ecological rationality" of TTB, people seem to apply it only under (very real, financial) pressure („correspondence criteria")

Further investigations:

experiment with situations in which immaterial feedback can have the same effect of distinguishing between TTB and other strategies

Robustness of TTb acquisition