



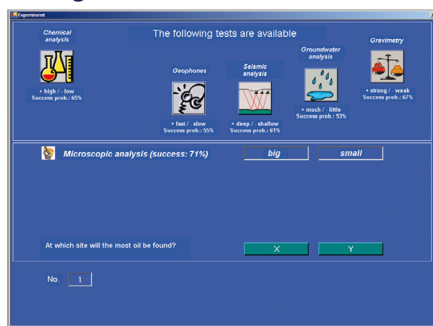
# Adaptive Selection of Strategies

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## Overview

Cognitive psychologists aim to discover the underlying mechanisms of human inferences. Herbert Simon (1956) promoted the idea that human cognition should be understood as an adaptation to the environment. Consequently, different environments should lead to different inference strategies, so that people develop repertoires of strategies to deal with the problems they face (Gigerenzer, Todd, & the ABC Research Group, 1999; Payne, Bettman, & Johnson, 1993). We have examined under which conditions people use which strategies and how the selection of strategies can be described.

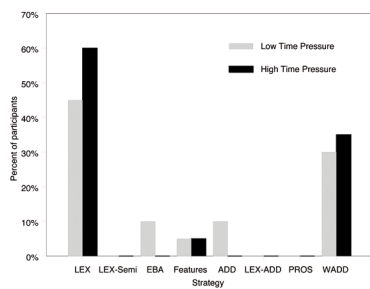
## Solving a Probabilistic Inference Task



- Take The Best (TTB or LEX) – Noncompensatory heuristic noncompensatory lexicographic heuristic that selects the alternative with the highest value on the cue of the highest validity.
- Weighted Additive (WADD) – Compensatory inference strategy determines for each alternative the sum of cue values multiplied by the corresponding validities and selects the alternative with the highest score.

## When Do People Use Simple Heuristics?

- Time Pressure: Heuristics only require little information, making them very adaptive strategies under high time pressure (Rieskamp & Hoffrage, in press).

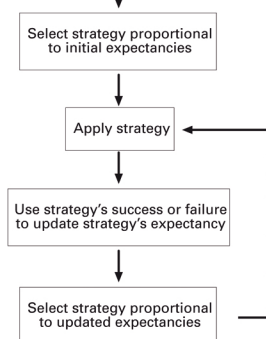


## How Do People Select Strategies: SSL Theory

Core Assumptions of the Strategy Selection Learning (SSL) Theory

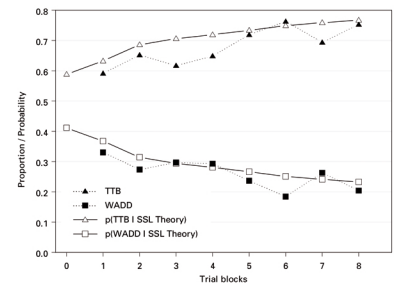
- people possess a repertoire of cognitive strategies
- strategies are selected proportional to their expectancies
- strategies' expectancies are updated through a feedback-learning process

see Rieskamp and Otto, 2006



## Explaining Previous Findings

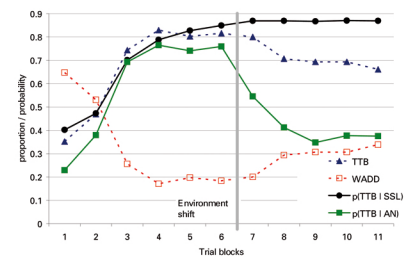
- The SSL theory was successfully applied to describe previous experimental results by Newell and Shanks (2003) or Bröder and Schiffer (2006); for details see Rieskamp (in press).



Experiment 1:  
Bröder & Schiffer, 2006

## Test Against Established Models

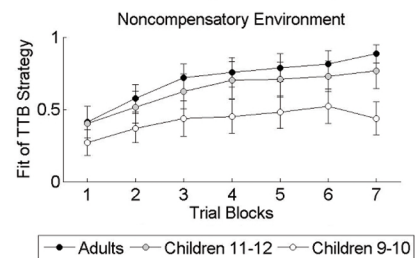
- The SSL theory was tested against an established adaptive network model proposed by Gluck and Bower (1988), see also Rieskamp (2006).



- The SSL theory predicted the inferences of the majority of participants (68%) better than the adaptive network model.

## The Development of Adaptive Strategy Selection

- Are children able to select strategies adaptively?



- Eleven to twelve year olds are already able to select strategies adaptively, whereas nine to ten year olds do not adapt perfectly.

## Summary

- People select strategies adaptively, corresponding to the environment.
- Strategy selection can be described as a learning process as proposed by the SSL theory.

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