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2009 : July 2009 - Fast Moving Fronts : Jörg Rieskamp

## FAST MOVING FRONTS - 2009

July 2009



**Jörg Rieskamp talks with *ScienceWatch.com* and answers a few questions about this month's Fast Moving Front in the field of Social Sciences, general.**



**Article: SSL: A theory of how people learn to select strategies**

Authors: Rieskamp, J;Otto, PE

Journal: J EXP PSYCHOL-GEN, 135 (2): 207-236 MAY 2006

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### SW: Why do you think your paper is highly cited?

The idea that people do not always solve a cognitive problem with the identical cognitive tools has been assumed in various areas of psychology. Even children already have access to different cognitive strategies that could be applied to identical problems. This assumption explains why people sometimes display different behavior in situations that are very similar.

However, when people have various strategies at their disposal, the question arises about how people select strategies. Our article tackles this strategy selection problem by suggesting that people learn to select strategies on the basis of reinforcement learning. The theory is very successful at predicting under which circumstances people select a specific strategy.

### SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

Our investigation brings together two lines of research. The first line of research argues that people make decisions by selecting different strategies from a tool box. The second line of research argues that people make decisions by learning from experience which decisions lead to good outcomes. We brought both lines of research together, by suggesting a learning theory that assumes that the objects of reinforcement are not the single decisions, but rather people's cognitive strategies.

On the basis of the strategies' success or failure, some strategies become more or less likely to be selected. In a nutshell, we have developed a cognitive learning theory that goes beyond pure behavioral reinforcement learning.

### SW: Would you summarize the significance of your paper in layman's terms?

It is often surprising to observe how differently people behave in the same situation; even the same person often shows rather inconsistent behavior. To explain this finding, it can be assumed that people have a repertoire of strategies to solve

judgment and decision problems. When they apply a strategy that focuses on single pieces of information, their choices can be different than if they had applied a strategy that integrates all available information.

To explain which strategy a person is using, we assume that people monitor the success of the strategies they are applying. After they have gained substantial experience with a decision problem, they are most likely to select a strategy that solves the problem well.

**SW: How did you become involved in this research and were any particular problems encountered along the way?**

The research approach that follows from the idea that people are equipped with a repertoire of strategies to solve the problems they face has been criticized repeatedly for not specifying a theory of how strategies are selected. Furthermore, the approach has been criticized for being hard to test against competing approaches, because it does not specify a general theory of strategy selection. To address this criticism I became involved in putting forward a general theory that could describe how people select strategies.

The idea that learning processes could function as a selection device appeared attractive from the beginning of the project. However, there are various learning approaches and learning models that could have been applied for this purpose. The difficulty was in finding a model that would be able to describe the empirical findings accurately without creating a too-complex theory that would face the problem of over-fitting. In the end, we selected a fairly simple model that was able to describe the results quite well.

**SW: Where do you see your research leading in the future?**

My research follows a computational approach that specifies the cognitive mechanisms underlying people's behavior. I am convinced that cognitive models of decision-making lead to better explanations of human behavior and to more precise predictions. These models often make better predictions when taking learning processes into account; that is, assuming that people adapt to the environment they face. Cognitive models can explain why people often make decisions inconsistent with traditional, normative models of behavior.

**SW: Do you foresee any social or political implications for your research?**

Past research has shown that human behavior often does not obey the rules of rationality as they have been stated in traditional economic theory. Our research can explain this finding by arguing that people often select simple strategies that are sufficiently able to solve decision problems. However, the research also shows that when people are provided with learning opportunities, they will select those strategies that perform well for a particular problem. Our research implies that it can often be important to structure a decision situation in a way that people will adapt to it quickly.

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KEYWORDS: NORMAL-FORM GAMES; HUMAN DECISION-MAKING; CATEGORY REPRESENTATIONS; PROBABILISTIC INFERENCE; BOUNDED RATIONALITY; INFORMATION SEARCH; PROTOCOL ANALYSIS; EXEMPLAR MEMORY; INSTANCE THEORY; JUDGMENT TASKS.



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