

## Small Group Meeting on Automaticity in Judgment and Decision Making Erfurt, Germany 2008

**Scientific background of the meeting.** Decision making is studied in many scientific disciplines such as philosophy, economics, biology, sociology and psychology. After Ward Edwards imported the economic theory of decision making into psychology in 1954, soon a new field emerged. Psychologists began to study choice and judgment from an interdisciplinary perspective. The field is commonly called "Judgment and Decision Making" (JDM) and is represented by international scientific societies and journals that are named accordingly. This field has strongly increased its reputation and impact across fields during the past decade, as evidenced for example by the fact that the Nobel Prize in economics was awarded to a JDM-psychologist, Daniel Kahneman, in 2002. Notwithstanding the merits of the JDM approach, it seems to be blind on one eye. By putting the conscious before the unconscious horse it neglects the power of automaticity and the genuine intuitive capacities of the brain. The prevailing neglect of automaticity is quite astounding given that psychologists represent the majority group in JDM. Other disciplines do not shy away from seeing automatic processes as an integral part of decision making. The neglect of automaticity in JDM research stands in sharp contrast to the views in other sciences such as evolutionary biology and neuroscience. Even economists and law scientists are starting to explore the unconscious and the role of intuition in judgment and decision making.

The meeting is organized by an interdisciplinary group of scientists that are connected to the JDM group and that share a pronounced interest in interdisciplinary exchange.

The local organizer is **Tilmann Betsch**, a sociologist and psychologist. He is professor for social, economic and organizational psychology at the University of Erfurt and has published journal articles and books on the role of automatic processes in judgment and decision making, such as implicit learning and intuition.

**Robin Hogarth**, a psychologist, is currently President of the European Association of Decision Making (EADM) and ICREA research professor at the University of Pompeu Fabra in Spain. He is author of numerous outstanding contributions to the literature. Recently, he has published an influential book on "Educating Intuition" that highlights the potentials of the unconscious in adaptive choice.

**Christoph Engel**, a law scientist, is head of the Max-Planck Institute for Research on Collective Goods in Bonn and member of the Academic Council to the German Minister of Economics and Labour. He has published more than one hundred articles, chapters and books in different scientific fields including law, economics and psychology. One of his current research projects focuses on the role of intuition in decisions at the court room.

**Arndt Bröder**, a psychologist, is professor for experimental psychology at the University of Bonn. He has been awarded the Heinz-Heckhausen-Prize from the German Association of Psychology for his work on strategy choice in decision making. His research focus is on tracing and modelling the processes of decision making such as information search and information aggregation.

**Andreas Glöckner**, a psychologist, is head of the research group (Nachwuchsforschergruppe) *Intuitive Experts* at the Max-Planck Institute for Research on Collective Goods in Bonn. He focuses on mathematical modelling of automatic decision making and is conducting experimental research on intuition in applied settings such as consumer, economic and legal decision making.

## Scientific Program

### Introduction

*Thursday, 28.2.2008*

18.00-19.30            **Automaticity in judgment and decision making: an overview**  
Robin Hogarth, Universitat Pompeu Fabra

### Part I: Recent developments on automaticity in judgment and decision making

*Friday, 29.2.2008*

09.00-09.45            **The power of intuition and its neglect in JDM research**  
Tilmann Betsch, University of Erfurt

09.45-10.30            **The Mechanisms of Unconscious Judgment**  
Reid Hastie, University of Colorado, Boulder, USA

10.30-11.00            *Coffee Break*

11.00-11.45            **Automatic and not so automatic processes underlying attitude formation and change**  
Eva Walther, University of Trier

11.45-12.30            **Automatic and Conscious Processes in Value Construction**  
Eric Johnson, Columbia University, New York, USA

12.30-15.30            *Lunch Break & Sightseeing*

15.30-16.15            **Marr, Memory and Heuristics**  
Lael Schooler, Max Planck Institute for Human Development, Berlin, Germany

16.15-17.00            **Sequential and Capacity-Constrained: Taking the Constraints on Controlled Thought Seriously**  
Peter Juslin, Uppsala Universitet, Sweden

17.00-17.30            *Coffee Break*

17.30-18.15            **Shifting the Bounds of Rationality: The Efficient Interaction of Automatic and Deliberate Processes in Decision Making**  
Andreas Glöckner, Max Planck Institute for Research on Collective Goods, Bonn

18.15-19.00            **Discussion**

20.00                    *Dinner*

**Part II: Recent developments on automaticity in economics, law, social psychology, and neuro science**

*Saturday, 1.3.2008*

- 09.00-09.45      **Multifinality Without Awareness: How Implicit Goal Activation Affects Preferences and Behavioral Decisions**  
Arie Kruglanski, University of Maryland, USA
- 09.45-10.30      **How social and legal institutions signal the appropriateness of intuition and deliberation**  
Jeffrey Rachlinsky, Cornell Law School, Ithaca, NY, USA
- 10.30-11.00      *Coffee Break*
- 11.00-11.45      **Rationality, Habit and Evolution.**  
Geoff Hodgson, University of Hertfordshire, Hatfield, UK
- 11.45-12.30      **Representation of quantitative decision variables in primates**  
Andreas Nieder, Primate NeuroCognition Laboratory University of Tuebingen, Germany
- 12.30-14.30      *Lunch Break*
- 14.30-16.00      **Summing up from two perspectives**
- Interdisciplinary Perspective**  
Christoph Engel, Max Planck Institute for Research on Collective Goods, Bonn
- Judgment and Decision Making Perspective**  
Arndt Bröder, University of Bonn
- 16.00-16.30      *Coffee Break*
- 16.30-18.00      **Discussion**
- 20.00              *Conference-Dinner*

## **Abstracts**

### **Effectiveness of decision strategies: Some results and questions**

***Robin Hogarth, Universitat Pompeu Fabra, Barcelona, Spain***

Recent years have seen increasing interest in assessing the use of “simple” decision strategies (or heuristics) where by “simple” is usually meant not cognitively taxing. A review of these strategies is made in an attempt to determine the kinds of environments in which they are or are not effective. This also leads to questions about the kinds of decision environments that have not been explored, the meaning of “cognitively taxing,” and the distinctions between automatic and effortful cognitive processes.

### **The Nature of Intuition and its Neglect in Research on Judgment and Decision Making**

***Tilman Betsch, University of Erfurt, Germany***

Herbert Simon (1955, 1982) was among the first to break the illusion that our deliberative mind would function in accordance with normative principles of rationality. The reason is simple. Most of these principles require individuals to consider and integrate a huge amount of information. Due to capacity limitations, individuals are simply not capable of deliberately performing the operations required by normative rules. Note, however, that the notion of bounded rationality was developed with respect to conscious reasoning. The power of the automatic system was largely neglected. This neglect prevailed in subsequent research on intuitive judgment and decision making. Research on intuition is strongly associated with the pioneering work of the Heuristics-and-Biases Program (Kahneman, Slovic & Tversky, 1982). I will consider three types of heuristics to illustrate that intuition (characterized by automatic, parallel processing) is largely neglected by research in the field of judgment and decision making.

### **The Mechanisms of Unconscious Judgment**

***Reid Hastie, University of Colorado, Boulder, USA***

Although all judgment processes involve many unconscious and automatic components, it is possible to order judgment strategies along a continuum from heavily automatic and mostly unconscious to substantially conscious and controlled. But, this continuum obscures the fact that the strategies, on the continuum, vary in several other respects. A typology of judgment strategies will be presented, with a discussion of the extent to which each major strategy involves unconscious versus conscious components and some hypotheses about the conditions under which the more automatic strategies will be superior (in an adaptively rational sense) to more controlled strategies.

### **Automatic and not so automatic processes underlying attitude formation and change**

***Eva Walther, University of Trier, Germany***

Research on attitude formation and change has recently paid special attention to the occurrence of so-called evaluative conditioning effects. Evaluative conditioning is the transfer of valence from an affectively liked or disliked stimulus to a formerly neutral stimulus. Notwithstanding this apparent simplicity of the method and the patent plausibility of the results, both the method and its results have been the subject of a vigorous debate over the last ten years. A good deal of this discussion has focused on the relationship between the affective reaction and contingency awareness (i.e., the awareness of the fact that a conditioned stimulus was paired with an appetitive or aversive stimulus), because this relationship speaks to the processes underlying evaluative learning and to the question of

whether or not evaluative conditioning should be considered a higher-level cognitive process. A framework is presented that tries to integrate and to explain up to now inconsistent data

### **Automatic and Conscious Processes in Value Construction** ***Eric Johnson, Columbia University, New York, USA***

Query Theory (Johnson et al., 2007; Weber et al., 2007) is a model of how preferences are constructed that has both automatic and conscious components. As such it may be an ideal example of the interplay between the two kinds of process. The automatic processes are the results of retrieval from memory. The conscious parts, perhaps, are decisions about what kinds of queries to execute and how to integrate the results of the retrieval. We will present evidence discussing how conscious intervention can make people more patient and less likely to show the endowment effect.

### **Marr, Memory and Heuristics** ***Lael Schooler, Max Planck Institute for Human Development, Berlin, Germany***

A few theorists, ranging from William James to contemporary psychologists, have argued that forgetting should not be seen as a nuisance but as key to the proper working of human memory. In the context of David Marr's functional approach to understanding cognition, I will discuss the rational analysis of memory (Anderson & Schooler, 2000), which holds that much of memory performance, including forgetting, might be understood as adaptation to the structure of the environment. Schooler & Hertwig (2005) proposed that forgetting may in addition prove beneficial for making judgments that depend on whether objects are recognized and the speed of this recognition. For example, you could predict which of two candidates is likely to win an election based on the heuristic that if you recognize one but not the other, then predict the recognized one will win. To explore the mechanisms by which forgetting could boost the efficiency of such memory based inference heuristics, I describe a modeling and empirical effort that bridges two research programs grounded in an appreciation of the adaptive value of human cognition: The program on fast and frugal heuristics explores cognitive processes that use limited information to make effective decisions (Gigerenzer, Todd, & the ABC Research Group, 1999); and the ACT-R research program (Anderson & Lebiere, 1998) that strives for a unified theory of cognition, a language in which to implement cognitive models. This work illustrates how a memory system that is tuned to automatically retrieve information can be exploited for a different purpose, namely making inferences about real objects in the world, based on meta-cognitive judgments about how the memory system responds to stimuli.

### **Sequential and Capacity-Constrained: Taking the Constraints on Controlled Thought Seriously** ***Peter Juslin, Uppsala Universitet, Sweden***

A fairly well-known distinction in cognitive psychology refers to controlled versus automatic cognitive processes. While the capacity constraints of controlled cognitive processing has served as a general rationale for several influential research programs on simplifying heuristics in research on judgment and decision making, detailed explorations of the consequences of these capacity constraints remain rather unusual. In this presentation, I will discuss the consequences of these capacity constraints on controlled cognitive processing for the division of labor between different sorts of knowledge in multiple-cue judgment tasks, but I also illustrate how they provide alternative explanations of several classical phenomena in the heuristics and biases literature, like the conjunction fallacy and base-rate neglect.

**Shifting the Bounds of Rationality: The Efficient Interaction of Automatic and Deliberate Processes in Decision Making**  
*Andreas Glöckner, Max Planck Institute for Research on Collective Goods, Bonn, Germany*

Behavioral decision research has intensively explored deliberate processes in decision making. Accordingly, individuals are often viewed as bounded rational actors who, because of cognitive limitations, use simple heuristics that are successful in certain environments. In recent work, however, it has been shown that human cognitive capacity is less severely limited than has previously been assumed. When automatic processes are considered, one finds that cognitive capacity is not a binding constraint for many decision problems. It is argued that in order to describe decision making comprehensively, models have to account for the interaction between automatic and deliberate processes. Based on the parallel constraint satisfaction (PCS) approach to decision making, the PCS rule is delineated, which specifies this interaction. The model shifts the bounds of rationality considerably and has further evolutionary advantages. Evidence from empirical studies on different probabilistic inference decisions shows that choices, decision times, and confidence judgments are in line with the predictions of the PCS rule. An analysis of the German code of criminal procedure reveals that many of the recommendations for institutions that can be derived from the PCS rule have already been implemented in a process of learning and/or evolution of institutions, which provides further evidence in favor of the model.

**Multifinality Without Awareness: How Implicit Goal Activation Affects Preferences and Behavioral Decisions**  
*Arie Kruglanski, University of Maryland, USA*

Much recent research in social cognition involves implicit goal priming. It is typically found that such priming (often accomplished outside participants' conscious awareness) prompts goal consistent behavior. However, the mechanism underlying this effect isn't well understood at this time. In this paper I present evidence that effects of unconscious goal priming may be understood in terms of the notion of multifinality, the tendency to perform activities perceived as advancing multiple, currently active, goals. Specifically, activating different implicit goals affects one's tendencies to pursue a given conscious goal. Furthermore, instrumentality of activities matters and an activity instrumental to a goal of a higher magnitude (whether implicit or conscious) tends to override activities instrumental to a goal of lesser magnitude. Finally, the multifinality principle gives rise to dilution effects whereby a multifinal activity's links to the various goals it is assumed to advance is weakened as function of the number of goals.

**How social and legal institutions signal the appropriateness of intuition and deliberation**  
*Jeffrey Rachlinsky, Cornell Law School, Ithaca, NY, USA*

Automated human decision making processes can be astonishingly accurate. In many settings, hunches and intuition can produce high-quality decisions with little or no deliberation or conscious thought. Intuitions and hunches, however, are also the clearest pathway to undesirable judgments. People often rely on intuitive, automated judgment even when it leads them astray. They might do so out of carelessness or malevolence, as when people rely on negative stereotypes concerning groups of people to judge others. Or they may be induced to rely on misleading intuition. Indeed, many marketing devices that lead consumers to make choices that are not in their best interest work precisely by appealing to misleading intuitive forms of judgment. Nike's "just do it" campaign is only the most apparent example of such efforts. Recognizing when our first instinct is best and when intuition is leading to a faulty assessment is a challenging task. One challenge for those who

design social institutions is to identify mechanisms cues that ordinary citizens can use to signal that greater deliberation is essential. One can identify many aspects of social and legal institutions that are intended to flag such efforts. This paper will describe society's efforts to get its members to identify situations in which intuition lead us astray and we should engage in deliberation.

### **Rationality, Habit and Evolution.**

***Geoff Hodgson, University of Hertfordshire, Hatfield, UK***

Leading mainstream economists such as Gary Becker have treated habit as serially correlated behaviour resulting from rational choices. This approach puts rationality before habit but involves assumptions of extensive memory and decision-making capacity. By contrast, another group of authors (William James, John Dewey, Thorstein Veblen) see deliberation as a non-universal outcome of habits, defined in terms of acquired dispositions rather than behaviour. The approach of this second group is more consistent with an evolutionary perspective and the limited computational capacities of the human brain.

### **Representation of quantitative decision variables in primates**

***Andreas Nieder, Primate NeuroCognition Laboratory University of Tuebingen, Germany***

Humans and animals routinely need to make decisions based on the magnitude of stimuli. In the wild, animals are faced with quantitative decisions in foraging situations ("Which food patch contains more food items?") or social interactions ("Does the opponent party outnumber my own party?"). The actual choice behaviour in complex situations, however, needs to remain flexible; decisions are made according to general guidelines, or rules for behaviour. Based on the outcome of quantitative comparisons, animals are able to make informed decisions that guarantee survival (e.g., "If the opponent party outnumbers my own party, then retreat."). This indicates that quantitative and numerical competence does not emerge de novo in evolution but arises from biological predispositions. We investigated the neural foundations of quantitative categories and concepts in behaving macaque monkeys in combined psychophysical/neurophysiological studies. Monkeys were trained to discriminate quantitative information of different types in delayed match-to-sample tasks. We found many neurons in the prefrontal and posterior parietal cortices that encoded their preferred stimulus magnitude during sample presentation, or maintained this quantitative information 'on line' during a memory period. The tuning characteristics of such neurons can explain basic psychophysical effects in dealing with quantities (such distance and size effects). Tuning to the preferred quantity was largely lost whenever the monkeys made judgment errors, indicating the behavioral relevance of quantity-selective neurons. Together, the current data shed light on the question of how the primate brain deals with quantity information to guide decisions.