



Program and Abstracts Book

20th Research Conference on Subjective Probability, Utility, and
Decision Making (SPUDM20), Stockholm, August 22-24, 2005
(www.psy.gu.se/spudm20)

The conference is sponsored by
European Association of Decision Making (EADM)
(www2.fmg.uva.nl/eadm)

EADM Organizing Committee
Tommy Gärling, Göteborg University
Henry Montgomery, Stockholm University
Lisa Ordóñez, University of Arizona, Tucson, AZ
Joanna Sokolowska, Polish Academy of Sciences, Warsaw
Danielle Timmermans, Vrije University

Local Organizers
Tommy Gärling, Henry Montgomery, Anna-Lena Erixon,
Peter Loukopoulos (Webmaster), Gustaf Törngren

On behalf of the organizing committee (Lisa Ordóñez, Joanna Sokolowska, and Danielle Timmermans) we welcome you to Stockholm for SPUDM 20. We are confident that your contributions will be great, and we hope that you will enjoy the conference and not regret that you decided to come.

A new feature is the concluding panel discussion that we are pleased to announce. We also honor the memory of Ward Edwards, the pioneer of JDM research. Two symposia are organized by James Shanteau and David Weiss, one focusing on the past contributions by Ward and the other one on their future impact. Larry Phillips will show video recordings of interviews with Ward. Place and time will be announced during the conference.

We thank the other members of the organizing committee and local organizing committee (Anna-Lena Erixon, Peter Loukopoulos, and Gustaf Törngren) and several others for their hard work.

Tommy Gärling
Henry Montgomery

Conference Secretariat

During the conference you will find a conference desk in the Foyer. It is open 08.30-19.00. Local organizers and conference assistants can be identified by their special name badges.

Financial support for the conference was obtained from
The Swedish Research Council
The Bank of Sweden Tercentenary Foundation

Instructions for Session Chairs

As the last speaker in each paper session, you are kindly asked to act as chairperson (as indicated in the program). Ask the next last speaker to chair during your presentation. Please make sure that presenters follow the time limit (15 minutes for presentation and 5 minutes for clarifying questions). Give a discrete time signal after 10 minutes and after 14 minutes. At least 20 minutes should be left at the end of each session for additional questions and discussion.

Preparation Room

A special room (Polstjärnan) equipped with a PC will be available to speakers. Visit this room and check your presentation ASAP. A conference assistant will be there to help you. The PC will have a 3½-inch disk drive, CD drive, and a USB flash drive for uploading.

See last page for Guidelines for symposia, paper presentations, and posters
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Email Access

A PC will be available in the Foyer for email access.

Visitor Information

Visit www.stockholmtown.com for information about Stockholm. Public transport information is available at www.sl.se/english. Restaurant information is provided in your bag. Additional information will be given by the local organizers.

Program overview

Sunday August 21, 2005	
18.00-20.00 Foyer	Registration Non-hosted informal get-together
Monday August 22, 2005	
8.00-9.00 Foyer	Registration
9.00-9.30 Auditorium	Opening and welcome Vice Chancellor Kåre Bremer Head of Psychology Department Lars-Göran Nilsson EADM President Danielle Timmermans Chair: Tommy Gärling
9:30-10:30 Auditorium	Keynote address Thomas Gilovich, Cornell University, Ithaca, NY: Believing what we know we shouldn't Chair: Henry Montgomery
10:30-11:00	Coffee break
11:00-13:00	Parallel paper sessions 1-5
13:00-14:00	Sit-down lunch
14:00-16:00	Parallel paper sessions 6-10
16:00-16:30	Coffee break
16:30-18:30	Parallel paper sessions 11-15
18:30-20:00	Cash bar
Tuesday August 23, 2005	
9:00-10:00 Auditorium	Keynote address Rob Ranyard, Bolton University, UK A critical realist perspective on decisions involving risk and uncertainty Chair: Joanna Sokolowska
10:00-10:30	Coffee break
10:30-12:30	Parallel symposia 1-5
12:30-14:00	Poster session
13:00-14:00	Mingle lunch
14:00-16:00	Parallel paper session 16-20
16:00-16:30	Coffee break
16:30-17:30 Auditorium	De Finetti Prize Lecture Loran Nordgren, University of Amsterdam: Unpacking perceived control in risk perception: The mediating role of anticipated regret Chair: Tillman Betsch
17:30-18:30 Auditorium	EADM membership meeting
20:00-22:00	Reception (Town Hall)
Wednesday August 24, 2005	
9:00-10:00 Auditorium	Keynote address Karl Halvor Teigen, Oslo University: Cognitive and affective consequences of perceived closeness Chair: Tommy Gärling
10:00-10:30	Coffee break
10:30-12:30	Parallel symposia 6-10
12:30-13:30	Sit-down lunch
13:30-15:30	Parallel paper sessions 21-25
15:30-16:00	Coffee break
16:00-17:00 Auditorium	Presidential address John Maule, Leeds University: Re-framing decision framing Chair: Danielle Timmermans
17:00-18:30 Auditorium	Panel discussion: Heuristics and Biases in JDM research: Past, Present, and Future Roles Participants: Maya Bar-Hillel, Thomas Gilovich, Rob Ranyard, Karl Halvor Teigen Chair: Paul Slovic, Decision Research, Eugene, Oregon
20:00-23:00	Conference dinner (Solliden, Skansen, www.skansen.se)

Monday, 22 August, 2005, 11:00-13:00

Paper Session 1 (Location: Auditorium) Risk perception I

- 1.1 (Colman) Strategic ambiguity aversion
- 1.2 (Davies) Rethinking risk: Aspiration as pure risk
- 1.3 (Hanoch) Domain-specificity in experimental measures and recruitment
- 1.4 (Roy) Optimism and attitude towards risk
- 1.5 (Zaleskiewicz) Risk as necessity and risk as pleasure

Chair: Tomasz Zaleskiewicz

Paper Session 2 (Location: Bergsmannen) Probability judgments I

- 2.1 (Baraldi) Overconfidence in predictions of binary sequences
- 2.2 (Leiser) The perception of level of significance
- 2.3 (Hilton) One or many forms of overconfidence?
- 2.4 (Winman) A naïve sampling model of intuitive confidence intervals
- 2.5 (Fox) Belief reversals in relative versus absolute likelihood judgement

Chair: Craig Fox

Paper Session 3 (Location: Spelbomskan) Inference rules

- 3.1 (L Karlsson) Additive Integration of Information in a multiple-cue judgment task
- 3.2 (Elwin) Model-based encoding – Learning from selective feedback
- 3.3 (Lagnado) Integrating temporal and statistical evidence in causal judgement
- 3.4 (A-C Olsson) Multiple-cue judgement in non-linear tasks
- 3.5 (Pohl) Unrecognized problems of the recognition heuristic

Chair: Rüdiger Pohl

Paper Session 4 (Location: Kungsstenen) Group decisions I

- 4.1 (Saito) Team Decision making under emergency
- 4.2 (Mojzisch) The effects of informational access during discussion
- 4.3 (Pulford) Testing the confidence heuristic: Are confident communicators more persuasive?
- 4.4 (Svedsäter) Beyond egocentric fairness
- 4.5 (Harvey) Making decisions for others: The problem of assessing acceptable levels of risk

Chair: Nigel Harvey

Paper Session 5 (Location: Wallenberg) EU theory development I

- 5.1 (Drury) The effects of Prospect Theory in positive and negative change situations
- 5.2 (Schneider) Why reference dependence matters: Goal trajectories and risk exposure
- 5.3 (Roca) Ambiguity Seeking as a result of the status quo bias
- 5.4 (B Weber) Variations on the Allais paradox
- 5.5 (Wakker) Expected utility and Prospect Theory: A field study

Chair: Peter Wakker

Monday, 22 August, 2005, 14:00-16:00

Paper Session 6 (Location: Auditorium) Risk perception II

- 6.1 (O Huber) Successful vs. unsuccessful search for risk defusing operators
- 6.2 (McClelland) Communicating probabilistic information effectively
- 6.3 (Rubel) Imagery and affect in risk assessment
- 6.4 (Soane) The consistency of risk-taking across domains
- 6.5 (E Johnson) Who is more loss averse and why?

Chair: Eric Johnson

Paper Session 7 (Location: Bergsmannen) Probability judgments II

- 7.1 (Keren) Waiting (in vain) for the probabilities to change
- 7.2 (H Olsson) The cognitive substrate of subjective probability
- 7.3 (Villejoubert) Who does use the representativeness heuristic?
- 7.4 (Wallsten) Predicting binary choice probabilities from probability phrase meanings

Chair: Thomas Wallsten

Paper Session 8 (Location: Spelbomskan) Money perception

- 8.1 (Greitemeyer) Debiasing effects of opposite and counter-explanations on price trend perceptions
- 8.2 (Gamble) Perceived inflation in different currencies
- 8.3 (Västfjäll) Feeling your way to the right price: Incidental affect and the construction of prices
- 8.4 (Törngren) Past, present and future: Time horizons in GDP forecasting
- 8.5 (Borcherding) Differences in the construction of buying and selling prices

Chair: Katrin Borcherding

Paper Session 9 (Location: Kungsstenen) Group decisions II

- 9.1 (Harries) Advice, advisor and judge effects in consequential decision making
- 9.2 (van Swol) Perceived importance of information
- 9.3 (Yaniv) Forming a personal opinion based on advice: Egocentric vs objective approaches
- 9.4 (Dalglish) Explaining disagreement among decision makers
- 9.5 (Budescu) Aggregation of opinions based on correlated cues and advisors

Chair: David Budescu

Paper Session 10 (Location: Wallenberg) EU theory development II

- 10.1 (Blavatsky) A stochastic expected utility theory
- 10.2 (Brandstätter) Beyond multiplication: The priority heuristic
- 10.3 (Dewberry) Economic mental models
- 10.4 (Neuhauser) Information integration in the risk-sensitive foraging theory in a naturalistic context
- 10.5 (Tentori) On the psychology of confirmation: Inductive inferences in a probabilistic task

Chair: K. Tentori

Monday, 22 August, 2005, 16.30-18.30

Paper Session 11 (Location: Auditorium) Emotions I

- 11.1 (van Putten) The boundaries of inaction inertia. Decoupling current and forgone opportunities
- 11.2 (Benson) It's about time!: A theory of time pressure
- 11.3 (Figner) Age and gender differences in hot and cold risky decision making
- 11.4 (Sevdalis) The self, the other, and the invaluable university mug
- 11.5 (Pfister) Emotions and mood in the ultimatum game

Chair: Hans-Rüdiger Pfister

Paper Session 12 (Location: Bergsmannen) Probability judgments III

- 12.1 (Sprenger) Proactive interference and judgments of probability
- 12.2 (Nestler) Creeping determinism and processing load
- 12.3 (Hansson) Intuitive confidence intervals: Overconfidence and the role of working memory
- 12.4 (Blank) Towards a tripartite model of the hindsight experience

Chair: Hartmut Blank

Paper Session 13 (Location: Spelbomskan) Financial decision making

- 13.1 (Summers) Unravelling the disposition effect: The effects of sunk cost and emotional commitment
- 13.2 (Hedesström) Naïve risk diversification in investment decisions
- 13.3 (Otto) Similarity-based utility in stock pricing
- 13.4 (Andersson) Does it pay to trust your recognition when picking stocks?
- 13.5 (N Karlsson) The 'Ostrich' effect: Selective attention to information about investments

Chair: Niklas Karlsson

Paper Session 14 (Location: Kungsstenen) Risk perception: Applications I

- 14.1 (Schuh) Risk ratings for global health issues: basic dimensions and cultural differences
- 14.2 (Twyman) Implicit and explicit trust in advice about risk.
- 14.3 (White) When Is A mistake not a mistake? A new account of public trust In organizations
- 14.4 (Wolff) Uncertainty reduction, cognitive and affective factors predicting intentions to obtain a genetic test
- 14.5 (Timmermans) Parents' perceived vulnerability and control in preventing an infectious child disease

Chair: Danielle Timmermans

Paper Session 15 (Location: Wallenberg) EU theory development III

- 15.1 (Busemeyer) Explaining decision weights by attentional processing mechanisms
- 15.2 (Cabantous) Is probability weighting sensitive to the quality of probabilistic information?
- 15.3 (Hadar) Attenuated responsibility as an affect-based de-biasing heuristic
- 15.4 (van de Kuilen) A midpoint technique for easily measuring Prospect Theory's probability weighting
- 15.4 (Chater) Decision by sampling

Chair: Nick Chater

Tuesday, 23 August, 2005, 10:30-12:30

- Symposium 1 (Location: Auditorium) WARD = SP+U+DM: Three perspectives on Ward Edwards' contributions
Convenor: James Shanteau
- Symposium 2 (Location: Bergsmannen) Judgement and decision making in and about football
Convenors: Patric Andersson, Henning Plessner
- Symposium 3 (Location: Spelbomskan) J/DM in criminal justice
Convenor: Mandeep K. Dhami
- Symposium 4 (Location: Kungsstenen) Cognitive capacity and the use of decision strategies
Convenors: Wolfgang Gassmeier, Rui Mata
- Symposium 5 (Location: Wallenberg) Economics of small decisions
Convenor: Greg Barron

Tuesday, 23 August, 2005, 12:30-14:00

Poster session (Location: Foyer)

Tuesday, 23 August, 2005, 14:00-16:00

- Paper Session 16 (Location: Auditorium) Emotions II
- 16.1 (Takemura) Influence of positive affect on eye movement in decision making process
 - 16.2 (Rubaltelli) Joint versus separate evaluation: the effect of affect framing
 - 16.3 (Mazzocco) Priming feelings versus thoughts
 - 16.4 (Weller) A decision neuroscience study of the role of emotion under varying levels of risk and ambiguity
 - 16.5 (E Peters) Numeracy and decision making
- Chair: Ellen Peters
- Paper Session 17 (Location: Bergsmannen) Heuristics and strategies I
- 17.1 (Gloeckner) Parallel processing as fast and frugal alternative of simple serial heuristics
 - 17.2 (Hogarth) Simple models of bounded rationality: Predicting when and why they are effective
 - 17.3 (Karelaia) Consistency or accuracy: How good is a strategy that looks for confirming evidence?
 - 17.4 (Marewski) Ignorance-based reasoning? Applying the recognition heuristic to elections
 - 17.5 (Brehmer) Knowing the price does not necessarily mean knowing the value
- Chair: Berndt Brehmer
- Paper Session 18 (Location: Spelbomskan) Measurement of preferences
- 18.1 (Bolger) Effects of positive biases on decisions to enter a competitive market
 - 18.2 (Bruine de Bruin) Do commonly studied decision-making tasks have external validity?
 - 18.3 (Bleichrodt) A New Type of Preference Reversal
 - 18.4 (Shavit) Bidding patterns among competitive and non-competitive subjects.
 - 18.5 (Bonini) When does a referent problem affect willingness to pay for the target?
- Chair: Nicolao Bonini
- Paper Session 19 (Location: Kungsstenen) Risk perception: Applications II
- 19.1 (Böhm) Mental risk models
 - 19.2 (Goldstein) Risk aversion and loss aversion in retirement investors
 - 19.3 (Narendran) Decision framing, probability and magnitude of pay-off, and personal exposure
 - 19.4 (Meyer) Young and older adults' perceptions of present versus past risks
 - 19.5 (Brun) The perception of food-related risk among tourists
- Chair: Wibecke Brun
- Paper Session 20 (Location: Wallenberg) Time discounting I
- 20.1 (Hassenzahl) From a simple-rule to strategic self-regulation
 - 20.2 (Airoldi) Longitudinal dynamic inconsistency
 - 20.3 (Scholten) Beyond discounting: A trade-off model of intertemporal choice
 - 20.4 (Read) Time discounting based on interest rates and amounts
- Chair: Daniel Read

Wednesday, 24 August, 2005, 10:30-12:30

- Symposium 6 (Location: Auditorium) Ward's last stand: The final collaborative work of Ward Edwards
Convenor: David J. Weis
- Symposium 7 (Location: Bergsmannen) The importance of learning in decision making
Convenors: Jörg Rieskamp, Jerome R. Busemeyer
- Symposium 8 (Location: Spelbomskan) Individual differences in decision making
Convenor: Cornelia Betsch
- Symposium 9 (Location: Kungsstenen) Ecological rationality: How people use heuristics adaptively
Convenors: Konstantinos Katsikopoulos, Lael Schooler
- Symposium 10 (Location: Wallenberg) Judgement, decision making, and motivation
Convenor: Ola Svenson

Wednesday, 24 August, 2005, 13:30-15:30

- Paper Session 21 (Location: Auditorium) Emotions III
- 21.1 (de Hooge) Feeling is for doing: Distinct effects of shame and guilt on cooperative behaviour
- 21.2 (de Vries) In the winning mood: Affect and intuitive decision making
- 21.3 (van den Berg) Are pregnant women making informed choices about prenatal screening?
- 21.4 (Steinberg) Counterfactual inhibition and the regulation of regrets and disappointments
- 21.5 (Ritov) The short lasting pleasure of choice: Decreasing satisfaction with a freely selected option
Chair: Ilana Ritov
- Paper Session 22 (Location: Bergsmannen) Heuristics and strategies II
- 22.1 (Baucells) Cumulative dominance and heuristic performance in binary multiattribute choice
- 22.2 (Del Missier) Screening heuristics in multi-attribute choice
- 22.3 (O W Huber) Does early decision matter? Postdecisional information search and decision stability.
- 22.4 (Willemsen) Choice and reject strategies in binary decision problems
- 22.5 (Witteman) Dual decision making
Chair: Cilla Witteman
- Paper Session 23 (Location: Spelbomskan) Escalation of commitment
- 23.1 (A Peters) Influencing Car Choice Behaviour: Inducing Mental Accounting and Reference Point Effects
- 23.2 (Pfeiffer) Causes and consequences of biased information search in losing courses of action
- 23.3 (Betsch) The Mere Choice Effect
- 23.4 (Yamagishi) A new account for preference reversals between Separate and Joint evaluations
- 23.5 (Ayton) Are children's decisions less susceptible to sunk-cost effects?
Chair: Peter Ayton
- Paper Session 24 (Location: Kungsstenen) Decision making by experts
- 24.1 (Shanteau) Four successes and a failure: Training decision making skills to experts
- 24.2 (Thunholm) Military decision making under uncertainty: Will less uncertainty result in a better decision?
- 24.3 (Smith-Spark) Planning and working memory in medical decision support
- 24.4 (Schink) Diagnostic Procedures for detecting pancreatic cancer and assessing resectability
- 24.5 (Kerstholt) Disability assessments: effects of non-verbal behaviour and experience
Chair: José Kerstholt
- Paper Session 25 (Location: Wallenberg) Time discounting II
- 25.1 (Attema) A new method to elicit time preference
- 25.2 (Diecidue) An empirical test of expected utility theory over time
- 25.3 (Onay) Intertemporal choice under timing uncertainty: An experimental approach
- 25.4 (Öncüler) "Reverse" time inconsistency
Chair: Ayse Öncüler

ABSTRACTS OF KEYNOTES, PRESIDENTIAL ADDRESS, & DE FINETTI PRIZE LECTURE

Keynote address – Gilovich

Tom Gilovich, Cornell University

Believing what we know we shouldn't

Two established research findings point to a previously unexplored source of superstitious beliefs. First, vividly imagining a probabilistic event tends to make that event seem more likely to occur. Second, negative events pack a bigger hedonic punch than positive events of equal magnitude. Together, these findings suggest that because people are drawn to think more about negative possibilities, they will tend to think that certain negative events are more likely to occur than either their positive counterparts or their true objective likelihood. Miller and Taylor, in an influential paper on counterfactual thinking, have explored one element of this phenomenon-how misguided actions generate greater regret than misguided inactions and hence lead to the belief that certain actions are more likely to lead to "ruin" than is actually the case. In this talk, I will generalise their analysis beyond the difference between actions and inactions and show how other determinants of what makes an experience better or worse can distort people's assessments of likelihood. I will present data showing that actions that "tempt fate" or that promote a sense of irony are experienced as particularly aversive, draw disproportionate attention, and are seen as more likely to occur than is normatively justified.

Keynote address – Ranyard

Rob Ranyard, University of Bolton

A critical realist perspective on decisions involving risk and uncertainty

Approaches to the psychology of decision making related to behavioural economics can be characterised as post-positivist enterprises seeking the impossible dream of universal laws expressing constant conjunctions between decision environments and behaviour. In contrast, approaches following naturalistic decision making paradigms can be seen as seeking rich descriptions of decision processes in specific contexts that have seriously limited transferability. Two recent developments in the philosophy of social science seek to transcend a sterile debate between positivism and contextualism: (1) normative naturalism, which proposes that methodological controversies be resolved empirically, for example, by testing theoretical propositions derived from decontextualised experiments in field settings; and (2) the critical realism of Roy Bhaskar, which argues for the identification of contextually contingent explanatory mechanisms based on concepts grounded in intersubjectively shared reality. Using examples from my own and other research on the psychology of decisions involving risk and uncertainty, my main aim is to explore the implications of taking critical realism seriously. Whilst a pragmatic, philosophical attitude to research may often serve decision science well, I expect to conclude that: (1) the philosophy of social science matters; (2) the implications of accepting core concepts such as utility and subjective probability as real entities are profound; (3) critical realism has the potential to advance and unify disparate experimental and naturalistic lines of research; and (4) a diverse range of experimental, process-tracing and observational methods can play important complementary roles in developing critical realist explanations of decisions involving risk and uncertainty.

Keynote address – Teigen

Karl Halvor Teigen, University of Oslo

Cognitive and affective consequences of perceived closeness

In his address to the world congress in Stockholm, 1953, David Katz discussed the psychology of the safety margin, i.e., the psychological effects of being close or not so close to a potential hazard. By doing so, he introduced a fundamental Gestalt principle of perceptual organization into the field of judgement and decision making. The present talk intends to continue these efforts. Closeness (or proximity) and distance can be used in a concrete as well as a more metaphorical sense. We can be physically close to a cliff, or temporally close to a deadline. But we can also feel close to winning in the lottery, if we have a ticket with an adjacent number, and very far from winning the Nobel Prize, if we have trouble in getting our paper accepted by the SPUDM organisers. Closeness can be assessed prospectively, as in the Nobel Prize example, or retrospectively, as in the lotteries.

Presidential address – Maule

John Maule, University of Leeds

Re-framing decision framing

Decision framing concerns how individuals build internal representations of problems and how these determine the choices that they make. Research in this area has been dominated by studies of the framing effect, showing reversals in preference associated with the form in which a decision problem is presented. While there are studies that fail to reveal this effect there is, at present, no theory that can explain why and when the effect occurs. The primary purpose of the presentation is to present a new framework for considering decision framing and to use this framework to interpret past studies and to set an agenda for future research. The author's research as well as the work of others is used to develop a simple information processing model. The model provides the basis for arguing that previous research has taken too narrow a view of how decision problems are internally represented and how these representations are transformed into choice behaviour. In addition, the model is used to highlight the importance of decision content and context.

de Finetti prize lecture – Nordgren

Loran Nordgren (Joop van der Pligt, & Frenk van Harreveld), University of Amsterdam

Unpacking perceived control in risk perception: The mediating role of anticipated regret

Perception of control has been a fundamental construct in research on risk-taking behaviour. It has been shown, for example, that people tend to underestimate risks that are under their control. Despite its importance, surprisingly little attention has been paid to what is actually meant by control. In three studies we argue that the common conceptualization of perceived control is too broad as it fails to distinguish between two distinct aspects of control: command over exposure to the risk itself (volition) and command over the outcome (control). Thus whether the risk is imposed or freely chosen likely differs from, and has different consequences for, the ability to exert influence over a risky behaviour, once it has been initiated. Using a wide variety of risk behaviours (e.g., ecstasy use, unsafe sex), we demonstrate that volition and control exert opposing influence on risk perception: control decreases perceived risk while volition increases perceived risk. This latter prediction is counterintuitive and is explained in terms of the mediating role of anticipated regret: voluntary appraisals elicit anticipated regret, which, in turn, increases perceived risk. This work highlights the dynamic relationship between risk characteristics and anticipated emotion in guiding the perception of risk.

ABSTRACTS OF SYMPOSIA

S01 Shanteau

James Shanteau, Kansas State University

WARD = SP+U+DM: Three perspectives on the contributions of Ward Edwards

"In the beginning, there was Ward" (Helmut Jungermann, former President of EADM). Ward Edwards made fundamental contributions to all three aspects of SPUDM: Subjective Probability, Utility, and Decision Making. The three participants in this symposium will discuss Ward's contributions to these and other fields that make up modern "behavioural decision theory" (a term that Ward originated). The title of this symposium says it all: Ward Edwards made fundamental contributions to all three components of SPUDM. For "SP," he was the first to recognise the distinction between subjective and objective probabilities. Moreover, he became the foremost advocate of Bayesian analyses in both psychology and judgement/decision making. For "U," he was the originator of the SEU (Subjectively Expected Utility) model of economic choice. He also proposed a weighted version of SEU that became the forerunner of Prospect Theory, later made famous by Kahneman and Tversky. For "DM," he contributed to numerous facets of decision making research ranging from Decision Theory and Decision Analysis to Expert Systems and Decision Support Systems. Indeed, there are few areas in which he has not made a fundamental contribution. To start, James Shanteau will introduce the symposium and provide a quick overview of Ward's life. He will then introduce the speakers. Larry Phillips, a student of Ward's, will feature a video tape he made of Edwards discussing the span of his professional career. For instance, Larry will describe the moment that "conservatism" (the forerunner of heuristics and biases) was discovered by Ward. Paul Slovic, also a student of Ward's, will review Edwards' pioneering work starting from the 1950's. Paul will focus on Ward's invaluable contributions to risk analysis, forecasting, risk assessment, risky decision making, and medical decision making. James Shanteau, a postdoc with Ward, will introduce the symposium and provide final comments. James will base his presentation on a tape-recording of a remarkably prophetic "founder's talk" that Edwards gave in 1982 at JDM; Ward discusses the past, present, and future of the field. All three speakers will offer their personal insights into Ward's many contributions, eg, his long-time annual Bayesian Research conference. To augment their comments, the speakers will display photographs, show videotapes, and play audio recordings of Ward. At the end of the symposium, members of the audience will be invited to share their own comments and observations about Ward and his incredibly diverse contributions.

Presenters

James Shanteau, Kansas State University

Larry Phillips, London School of Economics

Paul Slovic, Decision Research

S02 Andersson, Plessner

Patric Andersson, Henning Plessner, Mannheim University & Stockholm School of Economics; Heidelberg University

Judgement and decision making in and about football

Football – like other sports – is an area imbued with a variety of complex tasks of judgement and decision-making (JDM) triggered by intuitive or analytical processes. Some tasks require instantaneous responses (e.g., decisions whether a player is offside or not) that not only stretch the limit of human information-processing capacity but also take place in a stressful environment. Other tasks involve assessment of probabilities (e.g., the likelihood of match-outcomes) and gambling (e.g., betting on match-outcomes). There exist also various beliefs about the nature of football that relate to JDM-literature. For instance, believing that players who have scored goals in consecutive matches are more likely to score next times (i.e., the-hot-hand phenomenon) may shape strategic choices and forecasts on and off the pitch. Given the vast amount of available statistics, the rationality for such beliefs can be rigorously evaluated as well as large sets of judgements and decisions can be analysed. For example, analyses could be performed regarding the predictiveness of simple heuristics versus models taking advantage of almost all information. By addressing features of judgements and decisions in and about football, the symposium aims to illustrate how well JDM-theories and observations from laboratory sessions with students extrapolate to real-life.

Presenters

Peter Ayton, City University, London
Henry Stott & Alex Morton, Warwick University
Martin Kocher & Matthias Sutter, Innsbruck University
Henning Plessner, Heidelberg University

Discussants

Patric Andersson, Mannheim University & Stockholm School of Economics
Mattias Ekman, Stockholm Health Economics, Stockholm

Peter Ayton & Anna Braennberg (City University London)

Footballers' fallacies

In the USA, players, coaches, fans and pundits all believe that when a basketball player has just scored with his last two or three attempts he is "hot" and thereby more likely to score next time he tries than if he had just had two or three misses. However Gilovich et al's classic paper exposed belief in the "hot hand" as a fallacy. "Scoring streaks" do occur—but no more than you would expect by chance. We investigated the validity of professional footballers' beliefs about some of the statistical properties underlying the scoring of goals in football matches. We find that, contrary to the beliefs of professional footballers, a player who has scored in his last few games is no more likely to score in his next few games: belief in the "hot foot" is also a fallacy. Another wildly held view that a goal scored just before half-time has extra impact on the outcome of the game is also revealed to be inconsistent with the facts. A third belief, that teams are more likely to concede a goal immediately after scoring is also shown to be false.

Martin Kocher & Matthias Sutter (University of Innsbruck)

Favouritism of agents - The case of referees' home bias

We study the behaviour of football (soccer) referees in several European leagues. Referees are requested to act as impartial agents. However, they may allocate benefits and rewards in a biased way. Agency theory has long neglected this possible form of malleability of economic agents, but has rather concentrated on agents exerting suboptimal effort levels. Favouritism or biased behaviour of referees can be investigated by examining their decisions on awarding penalties or extra time at the end of a football match. We can confirm a systematic home bias of referees.

Henning Plessner, Ildico Trefzer, Philipp Hess, & Johannes Fischbach (University of Heidelberg)

Can expertise and reflection enhance the accuracy of predicting football results?

Most studies found no differences between experts and non-experts in predicting the results of football matches (e.g., Andersson, Edman, & Ekman, 2005). In addition, Halberstadt and Levine (1999) have found that experts in basketball were better in predicting the outcomes of games when they relied on their spontaneous feelings instead on their deliberate thinking. Thus, expertise and reflection seem not to enhance the accuracy of predicting the outcome of sport events. We argue that these findings are due to the specific qualities of the knowledge on which predictions are based on. According to this view, expertise and reflection should lead to better predictions only when they enable the usage of valuable knowledge. In three experiments, participants made predictions for football results of the German Bundesliga. According to our theoretical assumptions, we varied the mode of judgement (intuitive vs. reflective), the knowledge basis by controlling participants' level of football expertise (high vs. low) and by providing sample observations of teams' prior performance (yes vs. no), and the applicability of this knowledge (forecasting results for the near vs. the distant future). The results of our experiments support our assumption that prediction performance is highest when experts can reflect about applicable knowledge.

Alex Morton & Henry Stott (Warwick University)

Superior forecasting of football matches using action data

Most punters use recent scorelines to gauge the relative strength of association football teams. The evidence for this is that a standard Poisson regression model based on goals scored yields forecasts very similar to the average Bookmaker. Therefore, even with the superior data processing power and unobjectivity achieved with the statistical model it is difficult to gain a significant advantage using such a model. Moreover, due to the large degree of luck inherent to the goal scoring process scorelines provide a very noisy indicator of the actual strength of a team. If additional data on team performance is available such as the number of shots or passes then these can supply a smoother signal of their true form. However, the difficulty is how to combine this "team action data" to predict goal numbers. We propose more sophisticated statistical models for the analysis of correlated count data which can incorporate all the available data to provide convincingly superior forecasts compared to models based on goals data alone.

S03 Dhami

Mandeep K. Dhami, University of Cambridge

J/DM in criminal justice

This symposium presents J/DM research conducted throughout the criminal justice process, from the investigation of an offence, through the defence of a criminal charge, to serving a prison sentence, and forecasting post-release success. Data has been collected from people involved in the justice system, and covers three jurisdictions (Netherlands, UK, and USA). Collectively, the research examines individual differences, support theory, counterfactual thinking, and forecasting, and includes measures of cognitive, emotional, and social responses. The research indicates that those involved in the criminal justice system are prone to errors and biases in J/DM (Kerstholt, Dhami) and manipulation of information or thought structure can effect desirable changes in behaviour (Spellman, Mandel). The presenters will show how J/DM theories can be applied, tested and expanded in the criminal justice context, and how J/DM research can have implications for criminal justice policy and practice. In a synthesizing session, the discussant (van Koppen) will evaluate the ideas presented, and highlight some of the challenges that criminal justice poses for future J/DM research.

Presenters

José Kerstholt, TNO Human Factors

Barbara A. Spellman, University of Virginia

David R. Mandel, Defence Research and Development Canada, Toronto

Mandeep K. Dhami, University of Cambridge

Discussant

P. J. van Koppen, Netherlands Institute for the Study of Crime and Law Enforcement

José Kerstholt (TNO Human Factors)

Effects of expectation and experience on criminal investigation

Capital offences often involve a large amount of incomplete and ambiguous information. An investigation team can call in a criminal analyst who critically evaluates the information at hand and indicates possible alternative interpretations and missing information. The present study investigated to what extent knowledge of an interpretation of the case affects the judgements of inexperienced and experienced analysts. 40 Analysts (20 inexperienced and 20 experienced) had to evaluate 2 different cases. Preliminary results show that inexperienced analysts are less critical in judging the assignment than experienced analysts. Furthermore, they have a stronger tendency to create a coherent story of the case than experienced analysts. The effect of expectation seems to be that less alternative scenarios are generated and that recommendations to the team focus more on the initial scenario than when the analyst starts from scratch. The results concur with previous findings on hypothesis generation indicating that the number of alternative scenarios is related to the strength of the set of hypothesis and moderated by individual differences (Dougherty & Hunter, 2003).

Barbara Spellman, Elizabeth Tenney, & Hayley M. Dagnis (University of Virginia)

Decreasing convictions by accusing others: Unpacking a "Not guilty" plea

Does a defence strategy that accuses individuals other than the defendant of committing the crime successfully reduce the number of guilty verdicts? Support theory suggests that it should. In our main study, 253 undergraduates read a transcript of a murder trial. The control condition provided standard prosecution and defence arguments. The "Plan B" conditions took advantage of support theory to "unpack" the defence's not-guilty claim into ways the murder could have occurred but the defendant was not guilty, specifically, by having the defence attorney mention ways that another individual or individuals could have committed the crime. Guilty verdicts were drastically reduced from the control (73%) to the Plan B conditions (35%). Confidence in verdict and likelihood/probability of guilt were also different across conditions. Contrary to the predictions of support theory, accusing two or three alternative suspects did not lead to significantly more not guilty verdicts than accusing one (although there was a trend in that direction). Thus, a defence that argues not only that the defendant is not guilty, but also that another specific individual is guilty, can increase the chances of an acquittal for the defendant.

David R. Mandel & Mandeep K. Dhami (Defence Research & Development Canada, Toronto; University of Cambridge)

Prisoners' judgements of blame and fairness: Effects of counterfactual thinking

Two studies examined the effect of counterfactual thinking on sentenced prisoners' judgements of blame and fairness. In Study 1, 90 prisoners were randomly assigned to either a counterfactual- or factual-thinking condition and were directed to think about the events leading up to their arrest, conviction, and sentencing. Then, they rated their degree of self-blame, guilt and shame. The findings supported the hypothesis that upward counterfactual thinking (i.e., thinking about how things might have turned out better) influences judgement of self-blame, and that blame in turn mediates the effect of counterfactual thinking on guilt. In Study 2, 500 prisoners indicated whether they had thought counterfactually about their commission of crime, arrest, conviction, and sentence. Participants also rated the fairness of their trial and sentence and their anger. Study 2 supported the prediction that prisoners who report upward counterfactuals about their trial and sentencing would judge these events and their outcomes as less fair than prisoners who did not report such thoughts. Upward counterfactual thinking about arrest, conviction and sentencing was also associated with stronger feelings of anger. The findings reveal the effect of thinking on judgement and the role that judgement plays in mediating the effect of thinking on emotion.

Mandeep K. Dhami, David R. Mandel, George Loewenstein, & Peter Ayton (University of Cambridge; Defence Research & Development Canada, Toronto; Carnegie Mellon University; City University)

Positive illusions: Prisoners' forecasts of their post-release success

Prisoners' forecasts of their chances of recidivism may affect their responses to imprisonment, release, and reconviction. We examined sentenced US high security and UK medium security prisoners' forecasts of their post-release success and how well they believe they will fare compared to the average prisoner. Both samples of prisoners were highly optimistic about finding accommodation and employment upon release, and their forecasts of recidivism were unrealistically optimistic when compared to official statistics on recidivism. UK prisoners also demonstrated a self-enhancement bias by forecasting that they were significantly less likely to re-offend than other prisoners. The optimism of prisoners' forecasts of recidivism were predicted by only a few of the pre-prison, in-prison, and post-prison factors that have been shown to be associated with recidivism. We discuss the implications of these findings and how prisoners' positive illusions may be reduced.

S04 Gaissmaier, Mata

Wolfgang Gaissmaier, Rui Mata, Max Planck Institute for Human Development

Cognitive capacity and the use of decision strategies

The symposium aims to make contact between decision making research and what is known about basic cognitive mechanisms, focusing on how cognitive capacities mediate the use of decision strategies. A major benefit of grounding theories of decision making on basic models of cognitive processes, such as memory, is to understand what is cognitively plausible. Furthermore, stressing this link acknowledges that behaviour needs to be understood both in terms of external demands and the characteristics of the cognitive system. One will not understand decision-making behaviour without a good theory of how particular task demands tax a cognitive architecture implementing specific decision strategies. The three proposed contributions summarise research illustrating the need to understand task demands as a function of the cognitive systems being taxed. They do so in different manners using some combination of correlational, experimental, and modelling approaches. The contributions converge in showing that cognitive capacity limitations tend to foster the use of simple strategies. However, this is not independent of task characteristics. Moreover, these simple strategies do not always lead to poorer performances; given specific task characteristics some simple strategies outperform more complex and cognitively demanding ones.

Presenters

Arndt Bröder, University of Bonn

Wolfgang Gaissmaier, Max Planck Institute for Human Development

Rui Mata, Max Planck Institute for Human Development

Discussant

Timothy J. Pleskac

Arndt Bröder & Stefanie Schiffer (University of Bonn; University of Aachen)

Which working memory subsystems are involved in multi-attribute decisions?

Simple decision heuristics that work with scarce information are usually employed when information or processing costs are high. The necessity of retrieving complex attribute information from long-term memory (LTM) has been shown to elevate the processing costs and boost the use of these "fast and frugal" heuristics like "Take The Best". However, this effect was confined to verbal as opposed to pictorial attribute information, suggesting the involvement of different working memory substructures in multi-attribute decision making. In a large-scale two-factorial experiment with 151 participants, either verbal or pictorial information for inferences had to be retrieved from LTM. Concurrent secondary tasks either interfered with the Central Executive, the Phonological Loop, or the Visuo-Spatial Sketchpad. Whereas the information format massively affected strategy use, there was no interaction with the type of secondary task, suggesting format-independent further processing of LTM information, which may be attributed to the so-called "episodic buffer". However, the concurrent working memory load generally elevated noncompensatory decision making, irrespective of task type and information format which suggests that limiting factors are access costs rather than processing costs.

Wolfgang Gaissmaier, Lael Schooler, & Jörg Rieskamp (Max Planck Institute for Human Development)

Short-term memory and predictive behaviour in covariation detection

Kareev, Lieberman & Lev (1997) reported the stunning result that people with a lower short-term memory capacity performed better in a covariation detection task. Their explanation was that low spans perceived the correlations as more extreme than they really are because they consider smaller samples from the environment which statistically tend to overestimate correlations. This theoretical explanation has been criticised recently (Juslin & Olson, 2005; Anderson, Doherty, Berg, & Friedrich, 2005). Additionally, Kareev et al. (1997), in fact, did not assess differences in the perception of covariation, but differences in predictive behaviour. We hypothesised that differences in predictive behaviour alone could explain the low capacity advantage. Revisiting the related probability learning literature revealed convergent evidence showing that the most successful predictive behaviour (maximizing) can be related to lower capacities because of its simplicity. Modelling the competing explanations (differences in perception vs. differences in predictive behaviour) in ACT-R (Anderson & Lebiere, 1998) demonstrated that we can disentangle them if the conditional probabilities are reversed after many trials. Data from two experiments, in which the probabilities were reversed midway through the experiment, support our assumption that the difference between high and low spans lies in predictive behaviour and not in perception.

Rui Mata, Lael Schooler, & Jörg Rieskamp (Max Planck Institute for Human Development)

Individual differences in cognitive capacity and the use of decision strategies

One study investigated the relation between individual variability in strategy use and individual differences in cognitive capacity. The experiment (N = 80) varied the structure of the decision environment to favour the use of information intensive or frugal decision strategies. Additionally, a comprehensive assessment of cognitive capacity was conducted, including measures of working memory, short-term memory, knowledge (Gc), reasoning (Gf), speed, and inhibitory function. Overall, our results show that a large portion of participants behaved adaptively by choosing appropriate strategies for a given environment. Strategy use was related only to working memory capacity, with this relation depending on the environment: working memory was predictive of use of more demanding strategies in a compensatory but not in the diminishing-returns (i.e., "noncompensatory") environment. We conclude that individual differences in working memory capacity may be a determinant of strategy use in cognitively demanding environments.

S05 Barron

Greg Barron, Harvard Business School

Economics of small decisions

Many common activities involve 'small' decision problems where people learn about outcomes through experience. Although little time and effort is typically invested in these and similar small decisions, they can be very consequential. The symposium focuses on 'small experience-based' decisions where the decision makers do not have 'objective' prior information concerning the payoff distributions. In selecting among the possible options, they have to rely on the immediate feedback obtained in similar situations in the past. This process leads to an underweighting of rare events in contrast to the overweighting observed in description based decisions. The current studies shed light on the processes underlying small decision making and the search for information, and their application to risk communication and marketing.

Presenters

Ralph Hertwig, University of Basel

Elke Weber, Columbia University

Ido Erev, Technion Technical University, Jerusalem

Greg Barron

Discussant

Jerome Busemeyer

Ralph Hertwig (University of Basel)

Man as an intuitive statistician: Sampling information

The title of a classic article in the late 1960s read "Man as an intuitive statistician." Its authors concluded that the laws of the human mind could be approximately described in terms of the laws of probability theory and statistics. This view—as well as the subsequent view that people are in fact poor intuitive statisticians—interpreted this metaphor in terms of the consistency (or lack thereof) between people's reasoning and a set of formal laws. Perhaps as a consequence of the mind-as-an-intuitive statistician metaphor being narrowly interpreted many current theories of decision-making under risk—like most of the studies designed to test them—do not include processes of sampling or searching of information. In sampling, however, the mind can be viewed as a statistician. I describe a heuristic model of sequential sampling, the priority heuristic that models the way people chose between risky alternatives. One of the key findings related to the priority heuristic is that choices can be explained without assuming that rare events are overweighted. I discuss the implication of this finding in light of prospect theory's decision-weighting function. In addition, I discuss the observation of underweighting of rare events in experience-based risky choices.

Elke Weber (Columbia University)

Implicit and explicit probability judgements in decisions from experience

Recent research has shown that people who make decisions under uncertainty by learning about outcomes and their relative likelihood from personal experience (by repeatedly sampling from each choice option) make choices that are consistent with decision weights that underweight the impact of small probability events. To show that this is an emerging property of the learning and updating process rather than insufficient information about the true probabilities, we show that accuracy of explicit judgements of the probability of outcome events improves as the number of samples increases from less than 20 to 50 and to 100. At the same time, and as predicted by sequential learning models of choice, the underweighting of small probability events does not change as the result of more extensive sampling.

Eyal Ert, Ornit Raz, Ido Erev

Seeing is believing: The positive and negative effects of free sampling

Is free sampling a good idea? Well, it depends. Previous research has demonstrated that sampling is effective in promoting new products, in part by providing information to consumers. The current research extends this line of work by focusing on environments in which free sampling provides only limited information to the consumer. The results show that in this setting, sampling increases the attractiveness of products that appear attractive in most cases, but impairs the attractiveness of products that appear unattractive most of the time. This pattern emerges even when the most likely experience is not a good estimator of the expected utility from the product. For example, the availability of limited free sampling was found to reduce the tendency to buy access to a large database of apartments for rent and sale.

Greg Barron & Jennifer Stack (Harvard Business School)

When to warn?

Many risky behaviours that have a high expected value most of the time carry the risk of a low probability, but large, loss (downloading music from KAZZA, speeding, etc.). The current research examines how the timing of risk communication affects behaviour. While previous research suggests that warnings about a rare but large loss will be overweighted, recent research shows that experience can lead to an underweighting of rare events. Together, these findings suggest that people who learn about the possibility of loss after having positive experience with risk taking may be less affected by the information than those who are warned from the very beginning. This hypothesis is supported in a series of experiments showing that warnings that are received before people can partake in risky behaviour are more effective than those received after risk taking has begun. Several policy implications are discussed.

S06 Weiss

David J. Weiss, Department of Psychology, California State University, Los Angeles

Ward's last stand: The final collaborative work of Ward Edwards

Although Ward Edwards is well known to all students of behavioural decision making as the founder of our field, it is perhaps less well known that Ward continued to make substantial contributions until the very end of his life. His illness reduced his public appearances, but Ward continued his incisive thinking behind the scenes. In this symposium, four of his last collaborators will present ideas that Ward was working on during the last few years. Detlof Von Winterfeldt will discuss new applications of and insights into multi-attribute utility. Barbara Fasolo will recount her and Ward's views into the efficacy of decision technology. David J. Weiss will present a new prescriptive model for selecting an acceptable option that is currently (but only temporarily) available over more attractive prospects whose availabilities are uncertain. Jie Wu Weiss will describe how she and Ward predict the decision an adolescent makes to initiate smoking or drug use using a multi-attribute utility model descriptively.

Presenters

Detlof Von Winterfeldt, University of Southern California

Barbara Fasolo, London School of Economics

David J. Weiss, California State University, Los Angeles

Jie Wu Weiss, California State University, Fullerton

Discussant

Lawrence Phillips, London School of Economics

S07 Rieskamp, Busemeyer

Jörg Rieskamp, Jerome R. Busemeyer, Max Planck Institute for Human Development, Berlin; Indiana University, Bloomington, USA

The importance of learning in decision making

The judgement and decision making literature is dominated by studies of people's behaviour under conditions with no learning opportunities. Without such opportunities, it is an open question as to whether deviations from normative solutions to a decision problem that have been found for once-only decisions can be generalised to repeated decision making. In this symposium, the effect of learning is examined from various perspectives. It will become clear that feedback often has a strong influence and changes people's decisions. However, although learning might substantially improve decisions, people might still not make "optimal" decisions. Why and when learning does not lead to the best possible solutions of a problem is addressed from different perspectives. The symposium examines the effect of learning on confidence-judgements, multi-cue probability learning tasks, two alternative probabilistic inference tasks, and the Iowa gambling task. To explain the various learning effects, we will discuss different cognitive learning models. The symposium will contribute to the discussion as to which fundamental learning mechanisms need to be taken into account when studying repeated decision making.

Presenters

Claudia Gonzalez Vallejo, Ohio University
Jerome R. Busemeyer, Indiana University, Bloomington, Indiana
Rocio Garcia-Retamero, Max Planck Institute for Human Development, Berlin
Jörg Rieskamp, Max Planck Institute for Human Development, Berlin

Discussants

Nigel Harvey, College University London
Thomas S. Wallsten, University of Maryland

Claudia Gonzalez Vallejo & Aaron Bonham (Ohio University; Max Planck Institute)

Revisiting the role of feedback when aligning confidence with accuracy

Two studies address changes in topic learning, via outcome feedback and repetition of correct information. The studies also assess changes in confidence judgements over time as a function of evaluation points. The notion of exactingness, used by Hogarth, Gibbs, McKenzie, & Marquis (1991) to train predictive judgements, was used to provide points and improve the relationship between confidence and accuracy. Results show that performance, as measured by calibration analyses statistics (Yates, 1990, 1994), depended on the manipulated variables and lenient environments produced better calibration.

Eldad Yechiam, Jerome R. Busemeyer, Julie C. Stout, & Antoine Bechara (Indiana University; University of Iowa)

Using cognitive models to map relations between neuropsychological disorders and decision making deficits

Findings from a complex decision making task (the Iowa gambling task) show that individuals with neuropsychological disorders are characterised by decision making deficits, leading to maladaptive risk-taking behaviour. The paper describes a cognitive model which distils the performance in this task into three different underlying psychological components: the first measures the relative impact of rewards and punishments on evaluations; the second estimates the rate that the contingent payoffs are learned; and the third determines the consistency between learning and responding. Findings from ten studies are organised by distilling the observed decision deficits into the three basic components, and locating the neuropsychological disorders in this component space. The results reveal a cluster of populations characterised by making risky choices despite high attention to losses, due to difficulties in creating "emotive patterns". These findings demonstrate the contribution of cognitive models for building bridges between neuroscience and behaviour.

R. Garcia-Retamero, A. Maldonado, A. Catena, U. Hoffrage, A. Herrera, & A. Candido (Max Planck Institute for Human Development, Berlin; Universidad de Granada; Ecole des Hautes Etudes Commerciales, Université de Lausanne)

Causal beliefs and the outcome submaximality effect in cue competition in a decision-making task

Causal beliefs might enable us to learn about a small subset of reliable cues for significant environmental events and to disregard redundant cues. To test this hypothesis, we designed an experiment to analyse whether such beliefs influence cue competition. Participants made decisions based upon four possible cues: two causally linked to the criterion, and two neutral. Two of the four cues had high validity and the other two low validity. The manipulation involved a training phase before the decision phase in which participants learned about two of these four cues. For two groups, the previously trained cues were the causal ones. For another two groups, the previously trained cues were the neutral ones. In a fifth group, participants did not receive pretraining. Additionally, one of the groups in each condition received a submaximal instruction. In sum, we had five experimental groups: The submaximal causal blocking, the causal blocking, the submaximal neutral blocking, the neutral blocking, and the control group. Results show a clear blocking effect in the control and the causal blocking groups. This effect was slightly enhanced in the submaximal causal blocking group, was reduced in the neutral blocking group, and was reversed in the submaximal neutral blocking group. These results demonstrate the prominent involvement of causal beliefs in cue competition.

Jörg Rieskamp (Max Planck Institute for Human Development)

Explaining probabilistic inferences with a reinforcement learning and a neural network model

The assumption that people possess a repertoire of strategies to solve the inference problems they face has been raised repeatedly. The talk examines the inference problem of choosing the alternative with the highest criterion value from among several. For this problem, different inference strategies could be applied, but how do people actually select strategies out of their repertoire? For this selection problem, a simple reinforcement learning model is proposed that assumes that individuals develop subjective expectations of the strategies they have and select strategies proportional to their expectations. The expectations are updated on the basis of subsequent experience. As an alternative, we consider a neural network model, which assumes that learning leads to changes in the networks' connections. The network model can represent different strategies by weighting the structures of the networks' connections differently. Both models were tested in an experiment in which participants repeatedly had to infer which of two alternatives had a higher criterion value. For their inference, they were able to use information from several cues. First, it could be shown that participants were able to improve their inferences substantially with the help of feedback. Second, the reinforcement learning model was the more suitable when compared to the network model in explaining the learning effects.

S08 Betsch

Cornelia Betsch, University of Heidelberg

Individual differences in decision making

Can individual differences explain variance in decision making? What kind of individual differences have predictive power? Does a person-situation fit make a difference? The contributions to this symposium will address these questions.

Presenters

Arndt Bröder, University of Bonn
Cornelia Betsch, University of Heidelberg
Frank Lindow, University of Erfurt
Daniel Schunk, University of Mannheim

Discussant

Cilia Witteman, Radboud University, Nijmegen

Arndt Bröder (University of Bonn)

In search of correlatives of strategy preferences

Marked individual differences in multi-attribute decision making have been reported repeatedly. Surprisingly, systematic studies relating personality traits to strategy differences are relatively rare in decision research. We conducted several experiments in a stock market paradigm and assessed participants' strategies as either compensatory or noncompensatory. In different experiments, numerous personality traits were also assessed through paper and pencil questionnaires. These traits comprised the achievement motive, action orientation, self efficacy, need for cognition, impulsivity, rigidity, self deception, socially desirable responding, openness, conscientiousness, agreeableness, neuroticism, and extraversion. Neither of these variables showed any stable and replicable correlation with the preference for "fast and frugal" versus apparently more deliberate compensatory strategies. Rather than attributing this to a reliability problem, we argue for situational variability of strategies in terms of (a) task demands and (b) personal states (as opposed to traits). Furthermore, we speculate, that the scarcity of decision making studies incorporating personality traits might reflect a file drawer effect of unpublished "nonsignificant" results.

Cornelia Betsch (University of Heidelberg)

Feeling cozy when making decisions: effects of decisional fit.

People differ in their preference for intuitive and deliberate decision modes. Their preference can be assessed with the "Preference for intuition and deliberation (PID)" scale (Betsch, 2004). When decision makers' preferred decision mode fits the actual mode in the decision situation, we propose that the decision maker experiences a "decisional fit", leading to a feeling of coziness and positive affect. In cases of negative outcomes, this fit should result in a bolstering effect, and thus diminish post decisional regret. In Study 1, participants wrote short reports about two past decisions entailing negative outcomes. One decision they made intuitively and one deliberately. We classified participants as dominantly intuitive or deliberate using the PID scale. Intuitives reported less regret after the intuitive decisions compared to deliberate decisions, while deliberate participants regretted their deliberate decisions less than intuitive decisions. In a second study decisional fit was manipulated by assigning pre-classified intuitive and deliberate participants to a time pressure vs. no time pressure condition. This led to the same results: when preferred decision mode fitted the manipulated mode (e.g. when intuitives decided under time pressure), participants regretted the decision less. In both studies experiencing a decisional fit during a decision had a bolstering effect.

Frank Lindow, Nicola Schindler, Nadine Goldschmidt, & Cornelia Betsch (University of Erfurt; University of Heidelberg)

The influence of habitual decision modes and mode priming on decision time

In this study the influences of habitually preferred decision modes (preference for intuitive vs. deliberative mode) and mode priming (affective vs. cognitive priming) on automated processes were investigated. We hypothesised that a congruence between the habitually preferred decision mode and the primed mode ("decisional fit") improves the allocation of cognitive resources. The study used the Stroop paradigm as a dual task paradigm. The participants had to decide, in which colour a word on the computer screen was presented (e.g. the word RED printed in blue colour). This decision task interferes with the suppression of the automatic processes (reading the word). We expected that the processing of interfering information should be facilitated under decisional fit and therefore lead to diminished decision times. As predicted, a congruence between the habitual decision mode (measured by the preference for intuition and deliberation scale, Betsch 2004), and priming significantly reduces the decision time. I.e. subjects with a preference for intuition were faster in the affective priming condition and subjects with a preference for deliberation were faster in the cognitive priming condition. These results underline the assumption that both contextual and individual factors have an influence on automated information processes.

Daniel Schunk & Cornelia Betsch (University of Mannheim; University of Heidelberg)

Explaining heterogeneity in value functions by preferences for intuition and deliberation

The curvature of utility functions varies between people. We suggest that there is a relationship between individual differences in preferred decision mode (intuition vs. deliberation) and the curvature of the individual utility function. If a person habitually prefers a deliberative mode, the utility function should be nearly linear, while it should be curved when a person prefers the intuitive mode. In this study the utility functions of the participants were assessed using a lottery-based elicitation method and related to a measurement of the habitual mode preference for intuition and deliberation. Results confirm that people who prefer the deliberative mode have a utility function that is more linear than for people who prefer the intuitive mode. Our findings suggest a stronger affective bias of subjective values in intuitive than deliberate decision makers. While intuitive decision makers may have integrated sudden affective reactions towards the stimuli into the decision, deliberate decision makers may have abstracted from the affect using rather the stated values.

S09 Katsikopoulos, Schooler

Konstantinos Katsikopoulos; Lael Schooler, Max Planck Institute for Human Development, Berlin

Ecological Rationality: How people use heuristics adaptively

The performance—accuracy, speed, ease of application—of fast and frugal heuristics in different environments has been investigated extensively by analysis and simulations. It is less clear if people use those heuristics that perform well. We report recent empirical research that tackles this question for existing and new heuristics. Pachur and Hertwig examine how people decide to use the recognition heuristic when its ecological validity is low and time pressure is high. They point out that recognition might be used because it is automatically generated. Schooler and Hertwig pick up this point and present a new heuristic, the fluency heuristic, which compares objects based on the speed of recognition. They then show how it is adaptive to use the heuristic when there is forgetting. Katsikopoulos and Reimer consider the recognition heuristic in a social context. When combining individual inferences, groups allocate more impact to members using the recognition heuristic; because groups were more accurate when they recognised less objects, this is adaptive. In a field study, Wallin, Fasolo, and McElreath examine social context further, asking how people are able to identify others with similar consumer preferences. They show that people use heuristics to do this. Finally, Harries discusses the papers.

Presenters

Annika Wallin; Lund University

Thorsten Pachur, Max Planck Institute for Human Development, Berlin

Lael Schooler, Max Planck Institute for Human Development, Berlin

Konstantinos Katsikopoulos, Max Planck Institute for Human Development, Berlin

Discussant

Clare Harries

Annika Wallin, Barbara Fasolo, & Richard McElreath (Lund University; London School of Economics and Political Science; University of California at Davis)

Social information in decision making

When making decisions and judgements and when solving problems, people often look at the behaviour of others to gain additional social information about the task. This talk explores some conditions under which social information improves decision-making. In particular, it is suggested that when people know what others think, or what their preferences are, they are better able to judge how appropriate, that is how ecologically rational, it is to rely on their behaviour. We address test these hypotheses through an experiment (1) and a field study (2). (1) We find that when participants have access to information about how others have made a decision (i.e. what their reasons for the decision were) they use social information differently (they aggregate rather than randomly imitate). (2) We also find that participants are able to predict the preferences of others. Our data suggest that participants' strategies for preference prediction are more often guided by knowledge about common preferences rather than by their own preferences (i.e. 'projecting'). In addition participants are able to identify which of two friends is most able to predict their own preferences. Implications of these results for advice taking and seeking are discussed.

Thorsten Pachur & Ralph Hertwig (Max Planck Institute for Human Development, Berlin; University of Basel)

More on the psychology of the recognition heuristic: The decision not to use it

Exploring the boundary conditions of the recognition heuristic (Goldstein and Gigerenzer, 2002), we examined the influence of three factors on people's use of the heuristic: (a) low recognition validity, (b) time pressure, and (c) definite knowledge of the criterion value. In two experiments, participants judged infectious diseases with regard to their annual incidence rates (which recognition predicts poorly). When there was no time limit for the judgements, participants often decided not to use the recognition heuristic: only about 60% of the judgements were in line with it. When the recognition heuristic was not used (though applicable), response time increased markedly. In Experiment 2 participants performed the inference task under time pressure and indicated for which diseases they knew the incidence rate. Compared to Experiment 1, the proportion of judgements in line with the recognition heuristic was considerably higher. Still, the recognition heuristic was used rarely with recognised diseases that—known to participants—were extremely uncommon. An analysis of the time course of the judgements shows that the decision not to use the heuristic is based on additional knowledge that takes longer to retrieve than recognition knowledge, suggesting that recognition has a privileged status, as it is generated quickly and automatically.

Lael Schooler & Ralph Hertwig (Max Planck Institute for Human Development, Berlin; University of Basel)

How forgetting aids heuristic inference: An exaptive function of forgetting

Some theorists have argued that forgetting is essential to the proper functioning of human memory. Schooler and Hertwig (in press) propose that forgetting may in addition prove beneficial for making inferences that depend on recognition. For example, when asked which of two musicians has sold the most albums, you could use the heuristic that the one you recognise fastest has sold the most. To explore the mechanisms by which forgetting could boost the efficiency of such memory based inferences, we describe a modelling and empirical effort that bridges two research programs that emphasise the adaptive nature of human cognition: The program on fast and frugal heuristics explores cognitive processes that use limited information to make effective decisions (Gigerenzer et. al 1999) and the ACT-R research program (Anderson & Lebiere, 1998), a cognitive modelling framework. We show how the ignorance that forgetting brings can, paradoxically, enhance inferences about real world objects.

Konstantinos Katsikopoulos & Torsten Reimer (Max Planck Institute for Human Development)

The use of recognition in group decision-making

People often use the recognition heuristic to make paired comparisons: "If one of two objects is recognised and the other one is not, then infer that the recognised object has the higher criterion value". This leads to the prediction of the less-is-more effect that less recognition information leads, under certain conditions, to more accurate inferences than more recognition information. We investigate whether the effect is predicted in groups and if members who use the heuristic have more impact in the process of combining inferences. We considered three models of how groups combine individual inferences. All models use the majority rule, but one uses both recognition-based inferences and inferences based on other cues like general knowledge, while the other two only one of these types of inferences. We derived conditions under which the models predict the less-is-more effect. We also ran an experiment with twenty-eight three-member groups. The less-is-more effect was observed and the recognition-based model was the only model that could account for its absence or presence. Consistently, the recognition-based model described group choices better than the knowledge-based model. More specifically, when the two models made opposing predictions, the recognition-based model was more often correct.

S10 Svenson

Ola Svenson, Stockholm University

Judgement, decision making and motivation

Motivation is an old concept in psychology. Human beings have needs they want to or have to meet in order to survive. The needs lead to motivation to reach goal states fulfilling them. The fundamental needs can be categorised in physiological and safety needs, social needs, and psychological needs. In classical decision theory, goals are represented by utility and the fundamental motivation is to satisfy the underlying needs. A decision maker's knowledge and beliefs are integrated in subjective probability. There is also the assumption of process motivation that a decision maker is motivated to maximise subjectively expected utility. The latter assumption about process motivation has been questioned for a long time when findings of satisficing, dissonance reduction, and non-compensatory decision rules have been reported. Some researchers have observed the lack of emotion and affect in decision theory and integrated these concepts into models of human decision making. Other researchers have investigated the effects of a decision maker's emotional and affective states on decision making. The presentations in the workshop will represent three perspectives on judgement, decision making, and motivation. The first presentation by Zakay focuses on probability and heuristics in judgement. The second presentation by Svenson starts with a decision process tracing perspective and attempts to integrate motivation with this kind of approach. The last presentation by Slovic treats how affect can be integrated in decision theory.

Presenters

Dan Zakay, Tel-Aviv University

Ola Svenson, Stockholm University

Paul Slovic, Decision Research, Eugene, Oregon

Dan Zakay (Tel Aviv University)

Motivation and heuristic thinking

Traditionally heuristics are categorised as either cognitive or motivational. In this talk the claim is that actually the utilisation of any heuristic is the product of basic motivations such as the motivation to structure the environment and to save mental resources. The various motivations are categorised and the heuristics reflecting each category are defined. It is also claimed that under certain conditions motivation can inhibit the use of certain heuristics and prevent the formation of biases. Another issue, which will be discussed, is the boundaries of heuristic processes. A definition for such boundaries is offered and tested in regard to perceptual defences, defence mechanisms and "naive physics."

Ola Svensson (Stockholm University)

Decision theory and motivation

There are two main approaches to study human decision making. Process approaches focus on the decision process, how the information is interpreted and reinterpreted, what decision rules are used to reach a decision. Structural approaches do not trace the intervening decision process, but attempt to predict choices based on parameters of the decision problems. What is here called fundamental motivation (the result of thirst, need for social closeness, competition etc) motivates a decision to be made and a particular choice. Process and representation motivation induces a decision maker to process the available information in particular ways (e.g., how to ignore, reinterpret information, what decision rules to apply, what mental representation of the final decision constitutes the goal state). Since the 1950s process approaches of decision research have been quite explicit about process motivation. Standard structural approaches were silent about motivation until the 1990s when an interest in emotion and decision making, at least implicitly, brought fundamental motivation into the field. How can future decision research be developed to explicitly include motivation?

Paul Slovic (Decision Research, Eugene)

The integration of affect into decision theory

Motivation theorists have often criticised expectancy theorists such as Tolman for leaving the organism "lost in thought." Mower and others came to the rescue, postulating imagery linked to positive and negative emotions as the motivating factor that leads to action (approach or avoid). Today, research has been examining the role of positive and negative affect as a major motivational factor underlying many types of judgements and decisions. My presentation will review research linking affect, motivation, and decision making.

ABSTRACTS OF PAPERS

Paper Session 1: Risk Perception I

1.1 Colman

Andrew M. Colman, Briony D. Pulford, University of Leicester

Strategic ambiguity aversion

To investigate whether ambiguity aversion influences strategic decisions, 195 undergraduate students played nine games against unknown co-players for up to £81, according to payoffs, awarded to a participant selected by lottery after the experiment. For each game, the participant chose either a known-risk option in which, according to game-theoretic assumptions, the co-player was equally likely to choose any strategy, or an ambiguous option in which the co-player could be any one of several types represented by payoff matrices having different dominant strategies for the co-player. Half the participants were told that the co-player types were equally probable. Half were told that the lottery winner's payoffs would be calculated and the cash handed over a week after the experiment, rather than immediately. Known-risk options were chosen in 59% of games, confirming a significant ambiguity aversion effect in strategic decisions. Participants who knew that the ambiguous co-player types were equally probable were significantly less ambiguity-averse than those without the probability information, this difference being significant only in the one-week-delay condition. Self-rated decision confidence was significantly higher in 2 × 2 than 3 × 3 and 4 × 4 games, and this effect size was large.

1.2 Davies

Greg B Davies, Cambridge University

Rethinking risk: Aspiration as pure risk

There exists no completely satisfactory theory of risk attitude in current normative decision theories. Notions based on utility curvature, loss aversion and decision weights are derivative on psychological effects not directly related to risk attitude; cannot be applied to non-numerical consequences as they require the use of functions translating monetary values to utilities; and do not match our intuitive psychology of risk. I develop a normative theory of Pure Risk which resolves these problems - it is consistent with existing normative decision theories (e.g., SEU), and both internalises and generalises the intuitive notion of risk being related to the chance of not achieving one's aspirations. Pure Risk theory shows that existing models are misspecified because they have assumed that risk attitude can be completely described by other psychological effects without positing any primitive reaction to risk itself. I extend Cumulative Prospect Theory to include this previously missing primitive of rational choice. Effects hitherto modelled as risk aversion or utility curvature in CPT may instead be due to Pure Risk.

1.3 Hanoch

Yaniv Hanoch, Joe Johnson, & Andreas Wilke, University of California, LA; University of Illinois, Urbana-Champaign; Max Planck Institute for Human Development

Domain-specificity in experimental measures and recruitment: Application to risk-taking behaviour

We challenge the prevailing notion that risk taking is a stable trait where individuals show consistent risk taking/aversion behaviour across domains. First, we subscribe to an alternative approach that appreciates the domain-specific nature of risk-taking. More importantly, we recognize heterogeneity of risk profiles among experimental samples, and introduce a new methodology in response. In contrast to the typical usage of a convenient subject pool (i.e., university students), we specifically target relevant subsamples to provide further validation to the domain-specific nature of risk-taking. Our research shows that individuals who exhibit high levels of risk-taking behaviour in one content area (e.g., bungee jumpers taking recreational risks) can exhibit moderate levels in other risky domains (e.g., financial). Furthermore, our results indicate that risk taking among targeted subsamples can be explained within a cost-benefit framework, largely mediated by the perceived benefit of the activity, and to a lesser extent by the perceived risk.

1.4 Roy

Jaideep Roy & Tadeusz Tyszka, Centre for Economic Psychology and Decision Sciences, Warsaw

Optimism and attitude towards risk

Conventional wisdom suggests that optimism should be positively associated with risk taking. However, this has hardly been directly tested in the laboratory. In this paper, we report an experiment regarding risk perception and risk taking. Our data supports the hypothesis that two necessary conditions of the uncertain environment for a positive association between optimism and risk taking are (a) pure chance and (b) imprecise probabilities. Our findings bring forth some interesting implications on risk attitude, risk perception and related issues.

1.5 Zaleskiewicz

Tomasz Zaleskiewicz & Zbigniew Piskorz, Warsaw School of Social Psychology

Risk as necessity and risk as pleasure. The perception of instrumental and stimulating risks

In this paper we propose a new way of differentiating among risks. We assume that an important factor in risk perception is whether people perceive risk taking as pleasure or as necessity to reach a goal. Two studies are presented. The aim of Study 1 was to examine whether different risks can be divided into two categories: the category of instrumental risks (risk as necessity), and the category of stimulating risks (risk as pleasure). The aim of Study 2 was to test whether the perception of instrumental risk is more rational (probability as a basis for risk estimation), and the perception of stimulating risk is more emotional (feeling of fear as a basis for risk estimation). In Study 1 we performed factor analysis and found that risk can be divided into two categories: 1) stimulating risks (e.g., bungee-jumping), 2) instrumental risks (e.g., to take a bank-loan). In Study 2 we carried out analysis of variance to test the assumption that probability is perceived as a most useful dimension in the estimation of instrumental risk, and fear is perceived as a most useful dimension in the estimation of stimulating risk. The main effects of the analysis of variance as well as post-hoc tests confirmed this assumption.

Paper Session 2: Probability judgments I

2.1 Baraldi

Stephan Baraldi, William Montgomery, & Henry Montgomery, Stockholm University

Overconfidence in predictions of binary sequences: A consequence of probability matching?

The rationale of the present study was to examine whether overconfidence is at hand in a task that is stripped off from specific contents in order to minimize response bias resulting from availability of misleading information. Twenty-five participants were presented with sequences of 49 binary symbols and were asked to predict the symbol that would follow after the last presented symbol and also to rate their confidence in this prediction. Each sequence was constructed in line with a certain probability that a given symbol was followed by the same symbol. It was found that participants were quite well calibrated when being 100 % confident, but markedly overconfident for confidence ratings between .60 % and .99 %. The overconfidence was mainly due to the fact that participants sometimes predicted the least probable outcome and still were quite confident that they had made correct prediction. Participants' predictions illustrate the phenomenon of probability matching, which yields suboptimal results for the individual if the goal is to maximize accuracy in the predictions. It is concluded that the present results are in line with the notion that overconfidence follows from fundamental misfits between judgments and the external world.

2.2 Leiser

David Leiser & Dror Lev, Ben-Gurion University

The perception of level of significance: An experimental study of the Texas sharpshooter fallacy

The Texas Sharpshooter (or Clustering Illusion) fallacy consists in the intuition that when a spatial cluster of data points is singled out, it tends to be perceived as being causally based even though, statistically speaking, it could be explained as a random statistical fluctuation. Observers were shown dots scattered within a square, and had to judge the significance of the difference in density of a specified area in the plot, relative to the background. The experiments manipulated various aspects of the display: the size of the dots, the density of points in the focused area, the background density, and the overall number of dots. Our findings indicate that several of these factors influence observers' judgments, over and beyond their effect on the statistical significance. We measured the relative weight of the perceptual factors compared to that of the statistical significance, as measured by the Poisson statistics. We concluded that the perceptual factors do affect judgment but that their effect is relatively small (the proportion of betas in the regression is between 1:2 and 1:4).

2.3 Hilton

Isabelle Regner, Denis Hilton, Laure Cabantous, & Stephane Vautier, University of Toulouse

One or many forms of overconfidence? Miscalibration vs. positive illusions

We examine whether judgmental miscalibration can be considered to be a trait. A first study showed intercorrelations between miscalibration scores using two sets of general-knowledge questions of varying difficulty. Some subpopulations had higher miscalibration scores than others, suggesting that some aspects of academic ability may influence miscalibration. Most participants considered that they were worse-than-average at calibration, suggesting that they found the calibration task very difficult. A second study found little or no correlation between miscalibration and "positive illusions" such as dispositional optimism, unrealistic optimism, a general tendency to consider oneself "better-than-average", and two indexes of dispositional illusion of control. A third study showed that miscalibration was positively related to intolerance of ambiguity. We conclude that the results support the view that judgmental overconfidence in the form of miscalibration is not related to other "positive illusions" but rather linked to a systematic tendency to underestimate conditional uncertainty.

2.4 Winman

Anders Winman, Peter Juslin, & Patrik Hansson, Uppsala University; Umeå University.

A naïve sampling model of intuitive confidence intervals

The naïve sampling model implies that people describe the sample information in an unbiased manner but are naïve in the sense that they uncritically take sample properties as estimates of population properties. Because sample dispersion is a biased statistical estimator, if people report sample dispersion without correcting for this and rely on small samples the implication is too tight intervals and overconfidence. By contrast, probability assessment calls for assessment of a proportion based on a known sample of information. Because sample proportion is an unbiased statistical estimator, there is little or no overconfidence when the same events are assessed by probability assessment. The paper reports experiments that test a practical method for diminishing or even eliminating the overconfidence with interval production that was derived from the naïve sampling model. The results corroborate a crucial prediction by the model, while at the same suggesting a straightforward practical method for minimizing the overconfidence bias when eliciting intuitive confidence intervals.

2.5 Fox

Craig R. Fox & Jonathan Levav, University of California, LA; Columbia University

Belief reversals in relative versus absolute likelihood judgement

According to support theory (Tversky & Koehler, 1994), people judge probability as the ratio of evidence for a hypothesis (e.g. rain next Tuesday) relative to its complement (no rain next Tuesday), with equal and opposite weight to evidence for the focal and alternative hypotheses. We provide evidence that although people tend to be equally influenced by these two sources of information in absolute likelihood judgement they tend to afford more weight to the focal in relative likelihood judgement (e.g., when indicating which of two hypotheses is "more likely"). This gives rise to two forms of "belief reversal" for which we also provide empirical support. First, situations arise in which a more familiar hypothesis (e.g., a Democrat wins the next US presidential election) is assigned a lower probability than a less familiar hypothesis (e.g., a Labour candidate wins the next British Prime Ministerial election) but the more familiar hypothesis is deemed "more likely" than the less familiar hypothesis. Second, a more familiar hypothesis (e.g. Democratic President) is deemed more likely than a less familiar hypothesis (Labour Prime Minister) and the complement of the more familiar hypothesis (non-Democratic President) is also deemed more likely than the complement of the less familiar hypothesis (non-Labour Prime Minister).

Paper Session 3: Inference rules

3.1 L Karlsson

Linnea Karlsson, Peter Juslin, & Henrik Olsson, Umeå University; Uppsala University

Additive integration of information in a multiple-cue judgment task with continuous cues

Cognitive modelling, as opposed to statistical modelling, has not nourished the field of multiple-cue judgment to a desired extent. Linear multiple regression have dominated research on multiple-cue judgment with continuous cues and a continuous criterion. In this study we investigate the relative contributions of explicit abstraction of the cue-criterion relations and memory for concrete exemplars in a multiple-cue judgment task by application of two cognitive process models. The task was an extension of a previous task with binary cues (P. Juslin, H. Olsson., A-C. Olsson, 2003) and involved multiple continuous cues that either combined by addition or multiplication. We have proposed a general process model Sigma (P. Juslin, L. Karlsson, & H. Olsson, submitted). The assumptions in Sigma are that our controlled and explicit thought processes have an architectural constraint enhancing sequential, real-time consideration of multiple pieces of evidence (cues or exemplars). The key prediction is that only in environments where the cues combine by summation can the proper cue-criterion relations be abstracted. As predicted, the results from the experiment showed that explicit abstraction of cue-criterion relations were induced in the additive task, while exemplar memory was induced in the multiplicative task.

3.2 Elwin

Ebba Elwin, Peter Juslin, Henrik Olsson, & Tommy Enkvist, Uppsala University

Model-based encoding – Learning from selective feedback

Most studies of categorization and judgment neglect that often in real environments learning has to benefit from selective, rare, and ambiguous feedback. Assuming that people can both infer abstract knowledge of cue criterion relations and encode concrete knowledge of instances, we analyse two ways of encoding selective feedback: outcome-based encoding storing feedback as observed and model-based encoding assuming that when no external feedback is available people store "intrinsic feedback" based on their abstract knowledge of the task. Simulations demonstrate that, keeping the number of feedback trials constant, model- as compared to outcome-based encoding can boost learning. An experiment verifies that participants that receive selective feedback learn more from the same number of feedback trials than participants with complete feedback and directly supports that people employ model-based encoding.

3.3 Lagnado

David Lagnado, University College London

Integrating temporal and statistical evidence in causal judgement

How do people combine temporal and statistical cues in order to learn about causal structure? We constructed a learning environment in which both sources of information were available. Participants sent test messages to computer networks in order to work out which connections were working. Across four different problems the underlying network structure was held constant but temporal information was varied. In some problems the temporal order in which messages appeared on the computer monitors reflected the true network structure; in other problems it was inconsistent with it. Participants allowed temporal order to guide their causal judgments even when it conflicted with the structure implied by the correlational information. They constructed initial models on the basis of temporal order, and then revised these in the light of the covariational information. However, due to the persisting influence of the temporal order cue these revisions were sub-optimal. These findings show that people do not simply infer causal structure on the basis of statistical associations, but use temporal order as a basic cue. Current psychological and computational models need to be extended to incorporate this dimension, and accommodate people's ability to flexibly combine both temporal and statistical evidence.

3.4 A-C Olsson

Anna-Carin Olsson, Tommy Enqvist, & Peter Juslin, Umeå University; Uppsala University

Multiple-cue judgement in non-linear tasks

Two experiments examined the cognitive processes people use in a non-linear multiple-cue judgment task. The hypothesis was that, while people abstract explicit representations of the cue-criterion relations in a linear task, they are unable to use cue abstraction in the non-linear task. Given that we are provided with multiple representation levels we expected the participants to adaptively shift to exemplar memory in the non-linear task. Experiment 1, however, revealed persistent poor performance in the non-linear task, with no sign of a shift to exemplar memory. In Experiment 2, participants in one condition received instructions stating that the cue-criterion relations cannot be derived from observation and that one needs to memorize exemplars to solve the judgment task. With this instruction performance improved rapidly with dominance for exemplar memory. Cue abstraction at training thus appears to prevent effective storage and later use of exemplar memory, in contrast to assumptions of automatic parallel encoding of exemplars.

3.5 Pohl

Rüdiger Pohl, University of Mannheim

Unrecognized problems of the recognition heuristic

The recognition heuristic postulates that whenever the recognition cue is valid and can be applied, persons should favour a recognized object over an unrecognized one. This behaviour represents a one-cue, noncompensatory decision strategy. The following predictions can be derived from the model: (1) Persons should be sensitive to whether or not the recognition cue is valid; (2) persons should also be sensitive to their own recognition validity; (3) the heuristic should be applied irrespective of whether or not it leads to a correct decision; and (4) the heuristic should be applied irrespective of whether or not further knowledge (above a mere recognition) is available. These predictions were tested in five experiments using paired-comparison tasks with cities and other objects. The main results were (1) that persons could not always differentiate between tasks where the recognition cue was valid and those where it was not, (2) that in most cases persons were insensitive to the recognition validity of their own knowledge, (3) that application of the heuristic depended on whether or not it led to a correct decision, and (4) that decisions were influenced by further knowledge. Thus, the evidence poses some hitherto unrecognized problems for the recognition heuristic.

Paper Session 4: Group decisions I

4.1 Saito

Kiyoko Saito, Bunka Women's University

Team Decision making under emergency

The aim of this research is to analyse factors making teams work effectively under emergency. We assumed that there have system differences between a team which can create a new effective solution quickly and a team which can not. Many researches said that good team has a strong team-leader who can decide a plan for solution and command the plan to members quickly. However, we asserted that this type of a group cannot work effectively if the problem is complex and difficult. We analyse the real process of group decision making under emergency of many teams of amusement park "D-land" and the big difference between a good team and a bad team. There was a big differences of process of group decision making between good teams which could solve the problem and bad teams which could not under emergency. From this research it can be said that "Top-Down system" team can work when the problem is already known or very easy but not work if the problem is complex and difficult. A good team for emergency is "flat type system" and members of the team have strong self efficacy which means they enjoy their work everyday.

4.2 Mojzisch

Andreas Mojzisch, Stefan Schulz-Hardt, Rudolf Kerschreiter, & Frank Vogelgesang, Georg-August-University, Goettingen

The effects of informational access during discussion and dissent on group decision quality

Groups frequently fail to solve so-called hidden profiles. Hidden profiles are group decision tasks in which the correct decision alternative is not identifiable on the basis of the members' individual information and can only be detected by exchanging and integrating the members' unshared information. In most previous hidden profile experiments group members were not allowed to keep their information sheets during discussion and had to discuss information from memory. Only one study (Hollingshead, 1996) varied members' access to information during discussion but found no effect on decision quality. The present experiment examined whether the effect of informational access during discussion on group decision quality in hidden profile situations is moderated by prediscussion dissent. A 2 x 3 factorial design varied informational access (memory vs. access) and dissent (homogeneous decision preferences vs. dissent without a proponent for the correct alternative vs. dissent with a proponent for the correct alternative). Two main effects were obtained: Allowing members to keep their information sheets during discussion improved decision quality. Dissent had a beneficial effect on decision quality, even if no member favoured a correct alternative prior to discussion. If dissent came from a proponent of the correct alternative, solution rates were even higher.

4.3 Pulford

Briony D. Pulford & Andrew M. Colman, University of Leicester

Testing the confidence heuristic: Are confident communicators more persuasive?

The theoretical propositions of the confidence heuristic, proposed by Thomas and McFadyen (1995), were empirically tested using pure coordination games of incomplete information. Working in dyads, 56 participants attempted to determine which face, from an array of 9 photos, looked most like an E-fit. On 8 trials each, one participant was given a very good e-fit likeness of one of the faces (strong evidence), designed to induce high confidence and high accuracy, while the other participant was given a weak e-fit likeness of one or more of the other faces. Participants couldn't see each other's e-fits but were allowed two minutes discussion time before choosing one face. Individual differences such as assertiveness, need for cognition, need for closure and overconfidence were measured. Players disagreed with each other less than 8% of the time, and half of the pairs never failed to reach agreement with each other. The number of times that the person with the strong evidence persuaded the other to agree on the correct face was significantly higher than the number of times the person with the weak evidence persuaded the one with the strong evidence to agree on the incorrect face, thus supporting the concept of a confidence heuristic.

4.4 Svedsäter

Henrik Svedsäter & Lars-Olof Johansson, Göteborg University

Beyond egocentric fairness: Advantageous, disadvantageous and third-party Inequality aversion

Recent models of economic fairness assume that at least some people are motivated to reduce economic differences between themselves and other individuals. In addition to this motive, this paper investigates whether people care also about differences between third parties. An experiment is conducted where individuals make tradeoffs between (i) own payoff and differences in payoffs versus two other subjects, and (ii) own payoff and differences in payoffs between these two subjects. The results indicate that both these types of inequalities have an adverse impact on participants' choices, suggesting that a concern for fairness extends beyond egocentric comparisons of economic distributions.

4.5 Harvey

Nigel Harvey, Matt Twyman, & Clare Harries, University College London

Making decisions for others: The problem of assessing acceptable levels of risk

In a gambling task, Hsee and Weber (1997) found decisions people made for others were less risk averse than those they made for themselves, unless the other person was sitting next to them. They argue that it is easier to empathize with a specific person who is physically present. Without empathy, risk preference is judged closer to risk neutrality. Our aim was to examine whether these findings generalise to non-financial decisions and to activities for which people are risk seeking rather than risk averse. We also wanted to test whether empathy does depend on specificity and presence rather than on the similarity between the self and the other people. People made risk assessments for various activities on the basis of advice, rated the likelihood they would take part in the activities, and, finally, rated the likelihood that a named friend with values the same as or different from their own would take part in them. A self-other difference in risk aversion, akin to the one found by Hsee and Weber, was found only when the friend had values different from those of the decision maker. No self-other differences were found for activities associated with risk seeking rather than risk aversion.

Paper Session 5: EU theory development I

5.1 Drury

Meghann L. Drury & Michael E. Roloff, Northwestern University

The effects of Prospect Theory in positive and negative change situations: How do option frames, power roles, and messages between these roles differ depending on the type of change situation?

Organizational change often calls for reallocating resources. In some cases, this involves budget cuts and reductions in programs and services, which are negative changes, while in others it involves budget increases where increased services are offered. We explore how the frame of outcomes of budget cutting options and how much power individuals possess influence the preferred alternative and the messages that explain why a particular option was chosen in 2 experiments. Results supported our predictions. While there were frame and role effects in the negative change situation of resource depletion (Experiment 1), role effects disappeared in the positive change situation of resource increase (Experiment 2). Power-holders' messages focused on economic outcomes only in negative changes, whereas power-less participants' messages focused on outcomes' fairness only in positive changes. Power-holders offered apologies, but only in negative change situations.

5.2 Schneider

Sandra L. Schneider & Christopher Hudspeth, University of South Florida, USA

Why reference dependence matters: Goal trajectories and risk exposure

The risky choice paradigm has been the dominant approach to risky decision making for decades. This presentation introduces the Ticket Transfer (TT) task, which characterizes risky decision making not as static choices but as active steps taken to improve the status quo by changing exposure to risk. In the TT task, a participant is shown a single lottery. Before making the draw, the participant can increase the value of one ticket in the lottery by \$50. Approximately 70 participants completed the TT task with a randomly ordered group of 40 2-ticket lotteries having expected values ranging from approximately -\$300 to +\$300. A second group completed the comparable risky choice task by responding to 40 choice pairs based on the two possible changes to each of the original lotteries in the TT task. Results demonstrate highly reliable patterns of behaviour from the TT task that are strikingly different from results using the standard risky choice paradigm. Participant commentaries emphasize how results for both paradigms reflect participants' views of how their decisions are likely to change their current status. This focus on change suggests that the goal trajectory paradigm, exemplified by the TT task, may offer advantages over the risky choice paradigm.

5.3 Roca

M. Roca, R. M. Hogarth, & A. J. Maule, A. J., Leeds University Business School; University of Pompeu Fabra

Ambiguity seeking as a result of the Status Quo bias

Research has shown that several factors affect the attitudes individuals display with regard to probabilistic ambiguity. We explore an additional factor omitted in previous studies; possible effects of the status quo bias. Two experiments showed an unprecedented dominance of ambiguity seeking choices when individuals were endowed with ambiguous gambles. The status quo bias was significant both within- and between-subjects, with and without incentives, in the presence of different outcome distributions (of gains), and when the endowment was determined both by the experimenter and the participants themselves. The findings are discussed in terms of their implications for the valuation of probabilistic information, and, in particular, the relevance of properly accounting for the frames of reference under which evaluations to obtain probabilistic information take place as well as the development of a sensible definition of the ambiguity premium. The novelty of the analyses resides in that the different degrees of uncertainty that have been identified in previous research, and thus the value of the difference in information they provide, are treated as a good per-se and are found to be subject to the same psychological processes attributed to physical goods. Finally, the relevance of incorporating these findings into existing models of decision making under uncertainty is discussed.

5.4 B Weber

Bethany Weber, Rutgers University

Variations on the Allais paradox

Three experiments examined the effects of probability magnitude, payout magnitude, gains and losses, and event splitting on the Allais common consequence effect. The studies used a choice titration technique: the highest outcome of the gamble pair was varied using a bisection algorithm until the subjects were indifferent between the two gambles. Choice titration is more sensitive than using the single choice: in single choice, it can appear that the Allais Paradox has been eliminated when subjects are merely becoming more risk-seeking or more risk-averse across both pairs of gambles. Although past research using single choices have found that the Allais Paradox does not occur for small payouts, the present studies found that the Allais Paradox was unchanged for small payouts. However, event splitting eliminated the Allais Paradox even when using choice titration. A reflected Allais Paradox was obtained when all outcomes were reflected across the origin into the domain of losses, while a mixed gamble produced by subtracting a common amount from all outcomes reduced but did not eliminate the paradox. Reducing the probability of all nonzero outcomes also reduced but did not eliminate the paradox, which contradicts explanations of the Allais Paradox in terms of the certainty effect.

5.5 Wakker

Peter P. Wakker, Danielle Timmermans, & Irma Machielse, University of Amsterdam; EMGO, VU Amsterdam; Zorg en Zekerheid health insurance company, Leiden

Expected utility and Prospect Theory: A field study to test their diverging views on risk attitude

The willingness to take supplemental insurance (WTT) was measured from N=476 clients of an insurance company, both before and after the receipt of information about their risks. Each client was visited at home, and interviews took an hour per person on average. Our sample concerned the lower 2/3 income group of Holland, for whom insurance is compulsory so that no selection bias arises. We measured risk attitudes, ambiguity attitudes, and the effects of risk information on risky decisions, and investigated the dependencies between these variables as well as their relations to demographic variables such as age, gender, etc. Surprisingly, risk information enhanced the WTT among risk averse clients and decreased it among risk seeking clients, an effect opposite to regression to the mean. The confirmation bias cannot explain this phenomenon in our data. Also surprisingly, we find a preference for ambiguity rather than aversion, which may not be uncommon in the natural decision situations considered here as opposed to laboratory experiments with artificial urns. Our experiment gives new insights into attitudes to risk and ambiguity, confirming prospect theory and deviating from expected utility, in a natural decision situation with a sample complementary to the student subjects studied in most experiments.

Paper Session 6: Risk perception II

6.1 O Huber

Oswald Huber & Arlette Bär, University of Fribourg

Risky decision behaviour: Successful vs. unsuccessful search for risk defusing operators

In experiments on risky decision making with quasi-realistic scenarios instead of gambles, the majority of decision makers is usually not actively interested in information about probabilities. Often, decision makers search actively for a risk defusing operator (RDO) (an action to be performed in addition to a specific alternative and expected to decrease the risk). Examples in daily life are: insurance, vaccination. In our experiment, we varied as independent variable whether the search for an RDO is successful or not. Central dependent variables are choices and information search behaviour. In order to get also information about the heuristics decision maker use when they do not search for RDOs or the search is not successful, a concurrent thinking aloud procedure was employed additionally. 80 subjects made a choice in each of two risky scenarios. In those cases, where a decision maker successfully searched an RDO for one of the alternatives, this alternative was chosen in more than 90% of the choices. If the subject did not search for RDOs or the search was not successful, the following types of decision behaviour were most frequent: MAXIMIN, MAXIMAX, Least probable Minimum (that alternative is chosen where the negative outcome is less probable).

6.2 McClelland

Alastair McClelland, University College London

Communicating probabilistic information effectively: The influence of presentation format and educational background on Bayesian reasoning

The effects of presentation format and educational background on the probability of correctly solving a Bayesian reasoning task were investigated. Participants were presented with the 'medical problem' in one of four formats: a probability format, an 'unstructured' frequency format and in one of two 'structured' frequency formats (a tree diagram, or a 2 x 2 contingency table). Participants also provided details of their A-level subjects (or equivalent), and were classified as having either a mathematics/science background or an arts/humanities background. The results reveal that presenting probabilistic information in an unstructured frequency format improves the reasoning in individuals with a mathematics/science background, but does not aid individuals with an arts/humanities background. However, both groups benefit from the presentation of the frequency information in a structured manner, with a contingency table being the most effective format. From a theoretical perspective, these findings cast some doubt on the notion that the cognitive system has evolved to deal effectively with unstructured frequency information. From a practical perspective, the results strongly suggest that most effective way of communicating probabilistic information – irrespective of the educational background of the recipient – is in the form of frequency data presented in a contingency table.

6.3 Rubel

Tamy Rubel, Hebrew University, Jerusalem

Imagery and affect in risk assessment

Risk is assessed as higher when risk information is presented in relative frequency terms ("of every 10 patients like him, 1 is expected to be violent"), than when the same information is presented in probability terms ("this patient has a 10% chance of being violent"). Slovic, Monahan and MacGregor (2000) offered an imagery model to explain the difference: The frequency format, being more concrete, creates a more frightening image, which leads to a higher risk assessment. We examined the imagery model through the use of individual differences in imagery. If the model is true, an interaction between the risk format and imagery ability is expected: when frequency terms are used, people who easily produce vivid and fluent images should be more likely to create a frightening image, and hence give higher risk assessments, than people who rarely produce such images. When probability terms are used, the image created should be less frightening, and lead to a smaller difference between the two groups. 196 students answered an individual differences questionnaire examining habitual imagery (Pavio and Harshman, 1983) and a questionnaire examining risk evaluations (Slovic et al. 2000). Risk information was presented in frequency or probability terms. The expected interaction effect between the risk format and imagery ability was found $\{F(1,90) = 4.915, p < 0.05\}$. Results support the imagery model and give further evidence of the role of imagery and emotion in risk assessment.

6.4 Soane

Emma Soane, Sunitha Narendran, & Chris Dewberry, Kingston Business School; Birkbeck College, University of London

The consistency of risk-taking across domains, and the relative contribution of situational and personality variables on the decision to take risks.

This paper considers the relationships between three aspects of decision making (expressed likelihood of taking risk, risk perception and perceived benefits of taking risks), the consistency of the likelihood of decision making across six decision domains (ethical; investment; gambling; health and safety; recreational; social) (Weber, Blais & Betz, 2002). We also examined the influence of personality, as conceptualised by the five-factor model (Costa & McCrae, 1992), on decision processes and the degree of consistency both across domains and within domains. We found that perceived benefits of risks are strongly associated with likelihood of risk taking. There were significant relationships between risk perception and likelihood of risk taking in five of the six domains. 51 participants (25%) were consistently neutral across domains; there were no consistently risk taking or risk averse participants. The remaining 155 (75%) were inconsistent across domains. The consistent group had lower scores in conscientiousness than the inconsistent group. The extent to which the combination of personality factors, perceived benefits and risk perception explain variance in the likelihood of risk taking varies across domains. There were also domain-specific patterns of significant relationships between the decision variables and personality factors.

6.5 E Johnson

Eric Johnson, Simon Gaechter, & Andreas Herman, Columbia University; Nottingham University; University of St. Gallen

Who is more loss averse and why?

In this paper we discuss analysis of two large studies of loss aversion with non-student populations. One is a sample of 360 German speaking respondents who gave selling and choosing prices for 4 auto attributes, a hypothetical choice among lotteries, and actually purchased or sold a small model car. Both samples provided a number of demographic, knowledge, and experience measures. Our basic result is that there are large and systematic differences that are predicted by some theories of loss aversion, and not others. Degree of attribute knowledge decreases loss aversion, attribute important increases loss aversion. There are also strong demographic differences: loss aversion increases with age, and income and decreases with education.

Paper Session 7: Probability judgments II

7.1 Keren

Gideon Keren & Karl Halvor Teigen, Eindhoven University of Technology; University of Oslo

Waiting (in vain) for the probabilities to change

If a bus is known to be ahead of schedule in 1 out of ten cases, 0-10 minutes late in 8 cases, and more than 10 minutes late in 1 out of 10 cases, people correctly use base-rates to estimate that a passenger, who arrives at the station on time, has 90% chance of catching the bus, against 10% chance if he is 10 minutes late. If, however, he arrives on time and waits for 10 minutes, few realize that since $p(\text{early arrivals}) = p(\text{late arrivals})$, his probability now is 50%. In several experiments, we tried to make this problem more transparent to encourage correct answers. For instance, many realize that after ten minutes waiting, the passenger will begin to think that the bus has already gone. Yet, they still estimate $p(\text{early arrivals})$ and $p(\text{late arrivals})$ to be 10%, making the sum 20% rather than 100%. Apparently, people are unable to integrate individual observations with frequency-based probabilities. In contrast with studies of base-rate neglect, we show that base-rates, under such circumstances, induce people to neglect individuating information. The results also supplement previous studies of partitioning, demonstrating how explicit partitions can prevent problem restructuring and "freeze" probability judgments.

7.2 H Olsson

Henrik Olsson, Håkan Nilsson, & Peter Juslin, Uppsala University

The cognitive substrate of subjective probability

Up to date, most research on probability judgment has been focused at explaining judgment phenomena rather than at charting the detailed cognitive processes and representations behind it. As a result the literature consists of a handful of theories that imply different cognitive processes. In the present study, the representativeness heuristic (implemented as prototype-similarity, relative likelihood, or evidential support accumulation (ESAM; D. J. Koehler, C. M. White, & R. Grondin, 2003)), cue-based relative frequency, and exemplar memory (implemented by probabilities from exemplars (PROBEX; P. Juslin & M. Persson, 2002)), are contrasted. Three experiments with different task structures test which theory that best capture the cognitive substrate of subjective probability. In all experiments the exemplar memory based model PROBEX provided the best account of the data both on an individual level and on a group level. The results demonstrate that exemplar theory has to be genuinely considered in future research on subjective probability judgment.

7.3 Villejoubert

Gaëlle Villejoubert, Diana E. Kornbrot, David R. Mandel, & Stefanie Schmeer, University of Leeds; University of Hertfordshire; Defence Research and Development Canada

Who does use the representativeness heuristic?

This study aimed to establish what heuristic individuals generally use when judging posterior probabilities that, e.g., someone is an engineer given that he spends most of his free time on home carpentry. In two experiments, participants were tested using a modernized version of the Lawyer-Engineer problem. Posterior probability, inverse probability, and representativeness estimates were collected using either direct elicitation or visual-analogue scales. Idiographic methods of analysis were used to establish how often posterior judgements could be reliably predicted from representativeness or inverse estimates. Quite unexpectedly, results show that posterior judgments are seldom based on representativeness considerations. In both experiments, individual regression analyses revealed that few participants provided posterior judgements that could be reliably predicted from either their representativeness estimates or their inverse probability estimates. These results imply that, contrary to what was thought; very few individuals appear to use the representativeness heuristic to estimate posterior probabilities while some others actually rely on judgements of inverse probabilities. This study also illustrates the advantages of idiographic methods of analyses to obtain a clearer overview of strategies generally used. Finally, these results challenge existing theoretical models of cognitive mechanisms underpinning judgements which assume that individuals rely on representativeness or similarity-based considerations.

7.4 Wallsten

Thomas S. Wallsten & Yoonhee Jang, University of Maryland

Predicting binary choice probabilities from probability phrase meanings

This study simultaneously tested the validity of a method for quantifying the vague meanings of self-selected linguistic probability phrases and of a model of how individuals assign descriptive phrases to events and how they decide which of two future events is more likely. Model assumptions are: (i) Individuals' vague impressions of event likelihoods can be represented as distributions over probabilities. (ii) When choosing whether event A or B is more likely, individuals sample their distributions associated with each event and respond according to which sample is greater. (iii) Event distributions are reasonably well represented by the probability signatures of the phrases assigned to the events. (iv) The signatures can be used to predict the binary choice probabilities. Forty-one participants completed 4 tasks consisting of (1) selecting verbal probability lexicons of 5 to 12 phrases, (2) encoding probability signatures for each phrase (Dhmi & Wallsten, in press), (3) using the phrases to describe the likelihoods of future events, and (4) choosing the more likely event from event pairs uniquely constructed for each participant. Suitable probability distributions fitted to the empirical phrase probability signatures successfully predicted the binary choice probabilities for 34 of 41 participants at $\alpha = .05$ and for 28 at $\alpha = .10$.

Paper Session 8: Money perception

8.1 Greitemeyer

Tobias Greitemeyer, Eva Traut-Mattausch, Stefan Schulz-Hardt, & Dieter Frey, Ludwig-Maximilians-University, Munich

The debiasing effects of consider the opposite and counter-explanation on price trend perceptions

In the beginning of 2002, the German Mark was replaced by the Euro, which led to the widely shared impression of dramatic price increases. Recent research by our lab has demonstrated that price trend judgements were biased towards rising prices. In this talk it will be addressed how these biased perceptions in numerical judgements can be corrected. It was tested whether "consider the opposite" as well as "counter-explanation" are useful strategies for debiasing. In three studies, participants compared the prices of two menus in German Mark and in Euro, respectively. In the control conditions, participants received the menus without further instructions. In the experimental condition "consider the opposite", participants were asked to compare the prices of both menus under the opposite perspective of their expectations (that is, price decreases). In the experimental condition "counter-explanation", participants generated arguments why the Euro led to price decreases and, then, compared the prices of both menus. In the control conditions, price trend estimations were systematically biased toward rising prices. In contrast, in both experimental conditions, price trend perceptions were more accurate. Thus, the present research showed that "consider the opposite" and "counter-explanation" are also effective if the evidence leaves no room for different interpretation.

8.2 Gamble

Amelie Gamble & Tommy Gärling, Göteborg University

Perceived inflation in different currencies

In connection with the euro transition in the European monetary union, a number of studies have been conducted to show that the nominal value of money affects its perceived real value. The reported research contributes the related finding that perceived inflation may depend on the nominal value of the currency. Undergraduates predicted the prices of a set of consumer products one year from now. They were told that the inflation was expected to be approximately 3%. Implying that the same price differences in real terms are perceived to increase with the nominal value, it was shown that the predicted percentage increase due to inflation was inversely proportional to the nominal value of the currency in which the prices were expressed. No differences were observed between an unfamiliar fictitious currency and the familiar domestic currency for the same nominal value. How the findings relate to the euro illusion, the money illusion, and the compression effect as well as their implications for the utility function for money will be discussed.

8.3 Västfjäll

Daniel Västfjäll, Ellen Peters, & Chris Starmer, Göteborg University; Decision Research; University of Nottingham

Feeling your way to the right price: Incidental affect and the construction of prices

Affect and emotion play significant roles in market decisions. The focus is its role as information. We altered positive and negative affect through a mood manipulation in order to examine affect's causal role in the construction of prices for a good in a simple experimental market. If buyers and sellers consult their feelings in the process of evaluating the attractiveness of options, then a direct manipulation of feelings through mood may impact stated prices through a misattribution of the mood state to feelings about the good. Participants (n = 142) were randomly assigned as buyers or sellers of a lottery ticket with a 2% chance to win a real 1,000 SEK. The mood induction was introduced as an autobiographical memory task. Half each of buyers and sellers were assigned randomly to either a positive or negative mood condition. Following the mood induction, participants were asked to indicate for each of a series of prices (ranging from 5 SEK to 200 SEK in 5 SEK increments) whether they would be willing to pay it if they were buyers or whether they would be willing to accept it for their ticket if they were sellers. Compared to those in a negative mood, positive-mood buyers were willing to pay more for a ticket and positive-mood sellers required a greater minimum payment in exchange for their ticket. These findings were mediated by self-reported integral affect. Mood also influenced perceptions of the likelihood of winning the lottery.

8.4 Törngren

Gustaf Törngren & Henry Montgomery, Stockholm University

Past, present and future: Time horizons in GDP forecasting

The aim of the present study is to see if well known judgmental biases such as availability and anchoring effects can be traced in forecasts of GDP growth. OECD forecasts for 18 countries between the years 1981 and 2004 were analyzed. Every year was forecasted on four occasions. Correlation analysis was used to test hypothesis of the occurrence of anchoring, availability and other biases. Root Mean Square Errors (RMSE) were calculated for the differences between the outcomes of the year preceding the forecasts (possibly serving as an "anchor") and the outcome of the forecasted years and for the differences between the forecasts and the outcomes. Longtime forecasts (1.5-2 years ahead) were more closely related to the GDP growth computed for the preceding year than with the actual GDP growth for the forecasted year. As the forecasts move closer to the target year, they get more contact with the actual GDP growth for that year and lose contact with GDP growth of the year preceding the first forecasts. Within country correlations indicated almost zero predictability of long time forecasts but a clear dependency of the preceding GDP growth. Thus, these correlations reveal more about the situation when the forecast is made than of future targeted in the forecasts.

8.5 Borchering

Katrin Borchering & Marc Hassenzahl, Darmstadt University of Technology

Differences in the construction of buying and selling prices between utilitarian and hedonic objects

Carmon and Ariely (2000) argued that individuals focus on what they are about to lose, i.e., money in buying and the object in selling situations. Thus, selling prices are specifically influenced by the attitude towards the object (appeal). This can result in a disparity between both prices – an endowment effect (EE). Our previous research found the coupling between selling price and appeal for hedonic objects only. Hedonic objects serve individuals' "be"-goals. They contribute to enjoyment or other self-related aspects. For utilitarian objects, which serve "do"-goals, the inverse pattern was found: Appeal was more related to buying compared to selling prices. The present questionnaire study further explored these findings. It held the object type constant, but varied its description (hedonic, utilitarian) and appeal. Those variations led to noticeable differences in the EE's magnitude. In the utilitarian frame, the EE was only apparent for low appeal descriptions. For high appeal descriptions a small reversed effect was observed. Moreover, the manipulation of appeal had a higher impact on buying prices compared to selling prices. In the hedonic frame, this pattern reversed. These findings suggest a more complex model than assumed by Carmon and Ariely (2002), in which object attributes play a crucial role.

Paper Session 9: Group decisions II

9.1 Harries

Clare Harries, Arpita Mehta, Anoushka Seneviratne, & Paul Shirley, University College London

Advice, advisor and judge effects in consequential decision making

Advice-based judgment and decision making is relatively under-researched. Experiments on combinations of numerical judgments, including aided general knowledge responses, suggest that we overweight our own opinion, underweighting that of others but we are influenced by properties of the advisor, and properties of the advice that could be used as cues to its accuracy. For example, we tend to discount outlying opinions when making forecasts. In three experiments we examined the role of features of advice (expt 1), advisor (expt 2) and judge (expt 3) in giving and taking advice in consequential decision making. Participants were affected differently by outliers, depending on the symmetry of payoffs for the decisions. The influence of similarity and familiarity of advisors affected advice seeking and taking, and confidence differently. Finally, intrapersonal and interpersonal advice giving in consequential decisions revealed different risk attitudes. We interpret our results in terms of motivational differences in advice giving and taking.

9.2 van Swol

Lyn M. van Swol, Northwestern University

Perceived importance of information: the effects of mentioning of information, shared information bias, ownership bias, reiteration, and confirmation bias

Participants were given information for and against the decriminalization of marijuana and discussed the issue in groups. Factors affecting rated importance of information after the group discussion were examined. Participants did not rate information that was mentioned during the discussion as more important than information not mentioned, and participants did not rate shared information they mentioned as more important than unshared information. Participants did rate shared information other group members mentioned as more important than unshared information others mentioned. Participants did not rate their own information as more important than other's information, and information that was repeated was not rated as more important. Participants did perceive information supporting their individual position as more important than information against their position, and this confirmation bias was lessened in groups containing an opinion minority. A comparison of minority and majority members in minority-containing groups found that minority members were more open to information than majority members.

9.3 Yaniv

Ilan Yaniv & Maxim Milyavsky, Hebrew University, Jerusalem

Forming a personal opinion based on advice: Egocentric vs objective approaches

We investigated how people process advisory opinions and what they gain from using them. Participants first provided their initial estimates for a series of questions; next they were presented with 2, 4, or 8 opinions from an ecological pool of advisory estimates, in one experiment, or artificial advice in another; finally they provided their revised estimates. We analysed, first, the revision rules that people use and, second, the sorts of revision rules that increase objective accuracy. We found surprising similarities and differences between the two analyses. While respondents discounted extreme opinions egocentrically, objective revision rules that excluded extreme opinions objectively fared better than those that assigned equal weights to all opinions. Less egocentric revision policies would have yielded greater gains. Normative aspects of the task as well as theoretical insights from the study of attitude change are considered in explaining the results. In conclusion, we contrast the revision of estimates about factual matters (such as, about dates of events) and the revision rules that might be used in combining opinions about matters of taste and preference (e.g., judgments of the attractiveness of pieces of music).

9.4 Dalglish

Len Dalglish, University of Stirling

Explaining disagreement among decision makers using the General Assessment and Decision Making model

The General Assessment and Decision Making (GADM) model posits that people make an assessment of a situation by combining information from the cues of situation factors, as in Social Judgment Theory. To arrive at a decision about a course of action, this assessment or judgment is compared against a threshold for action so that if the assessment is above the threshold action is taken, as in Signal Detection Theory. In child protection agreement between decision makers is an important issue. The GADM model distinguishes between judgmental conflict and decisional conflict. The aim of the study was to isolate the relative contributions of these two types of conflict in explaining disagreement among child protection workers. Eleven child protection workers in a vignette study with 99 actual cases made risk assessments and decisions about removal of the child from the family. An analysis of their pairwise disagreement showed that both threshold differences and differences in the use of the risk scale predicted disagreement. While training in the scaling of risk assessments can reduce its effect on disagreement, differences in threshold cannot be trained away. However, if thresholds are made explicit, workers can better explain why they arrived at a particular decision.

9.5 Budescu

David Budescu & Hsiu-Ting Yu, University of Illinois

Aggregation of opinions based on correlated cues and advisors

We study the process by which Decision Makers (DMs) aggregate probabilistic opinions from multiple, correlated, sources with a special emphasis on the determinants of the DM's confidence. Our model assumes that (a) DM combine the advisors' opinions by weighting them according to the amount of information underlying them, and (b) the DM's confidence increases as a function of a variety of factors that reduce its variance. We report results of three studies that employ a new, and more realistic, experimental paradigm that allows us to control the validity of the cues and their inter-correlations. Many of the models' predictions are supported. The best predictor of the DMs' confidence is the level of agreement among the advisors and, contrary to the model's prediction, the DMs' confidence is not sensitive to the inter-cue correlation. The best predictors of the DMs' confidence are (a) the level of agreement among advisors, (b) the advisors' confidence, and (c) the level of overlap in information available to the advisors.

Paper Session 10: EU theory development II

10.1 Blavatsky

Pavlo Blavatsky, University of Zürich

A stochastic expected utility theory

This paper proposes a new model that explains the violations of expected utility theory through the role of random errors. The paper analyses decision making under risk when individuals make random errors when they compute expected utilities. Errors are drawn from the normal distribution, which is truncated so that the stochastic utility of a lottery cannot be greater (lower) than the utility of the highest (lowest) possible outcome. The standard deviation of random errors is higher for lotteries with a wider range of possible outcomes. It converges to zero for lotteries converging to a degenerate lottery. The model explains all major stylized empirical facts such as the Allais paradox and the fourfold pattern of risk attitudes. The model fits the data from ten well-known experimental studies at least as good as cumulative prospect theory.

10.2 Brandstätter

Eduard Brandstätter, Gerd Gigerenzer, & Ralph Hertwig, Johannes Kepler University of Linz

Beyond multiplication: The priority heuristic

Empirical evidence conflicting with expected utility theory has led to a number of modifications, which however have retained the Bernoullian structure of some function of value times belief, despite little evidence for such a process. We propose a sequential heuristic, the priority heuristic that provides a testable model without introducing complex functions of value and belief. This simple heuristic predicts (i) the Allais paradox, (ii) risk aversion for gains if probabilities are high, (iii) risk seeking for gains if probabilities are low (e.g., lottery tickets), (iv) risk aversion for losses if probabilities are low (e.g., buying insurance), (v) risk seeking for losses if probabilities are high, (vi) the certainty effect, (vii) the possibility effect, and (viii) intransitivities. Unlike modifications of expected utility theory that involve several adjustable parameters, the priority heuristic does not have free parameters. Finally, we use the data from four sets of gambles (Erev, Roth, Slonim, & Barron, 2002; Kahneman & Tversky, 1979; Lopes & Oden, 1999; Tversky & Kahneman, 1992), and test how accurately the heuristic predicts people's choices, compared to previously proposed heuristics and three modifications of expected utility theory: security-potential/aspiration theory, the transfer of attention exchange model, and cumulative prospect theory.

10.3 Dewberry

Chris Dewberry & Sunitha Narendran, University of London; Birkbeck and Kingston University

Economic Mental models: A novel explanation of the way that people evaluate risk, and decide on intended behaviour

A theory of the cognitive process by which people evaluate risk is presented. It is based on the proposition that when individuals evaluate risk, they do so by generating an active and dynamic mental representation of the risk situation, which we label an economic mental model. In this study, verbal protocol analysis is used to examine the cognitive representations and processes used by 53 participants to evaluate the risk of investing in a fictitious financial project. An examination of the protocols provided evidence that participants were using economic mental models to evaluate risk. These economic mental models varied considerably in complexity, and also differed in the way in which the structural elements of the decision scenario were evaluated, the way in which the relationships between these elements were constructed, and the temporal order in which the elements were referred to by the participants. Analysis of the data indicated that many of the participants used the models not only to evaluate risk, but also to select intended behaviour.

10.4 Neuhauser

Jennifer Neuhauser & Bernd Figner, University of Zürich

Information integration in the risk-sensitive foraging theory in a naturalistic context

The risk-sensitive foraging theory (rsft) (Stephens, 1981) is a theory originating in behavioural ecology about risky decisions in animals and has been used only occasionally in human psychology (e.g., Rode, Cosmides, Hell, & Tooby, 1999; Weber, Shafir, & Blais, 2004). According to the rsft, three factors are important when making risky decisions: (a) the expected value of the options, (b) their outcome variability, and (c) the aspiration level of the deciding person. This study investigated how participants integrated these three factors using a functional measurement approach. In a computer game, 98 participants made 54 decisions in varying conditions in the role of a farmer. In each decision, they had to choose between different types of grain to grow crops on a defined field. The options in each task differed in their outcome variability. In the group analysis, all three factors and their interactions showed significant effects. Individual analyses indicated that the majority of the participants made their decisions according to the rsft. The rsft could explain the decisional behaviour of the participants well. Consistencies and discrepancies with the theory will be discussed.

10.5 Tentori

K. Tentori, V. Crupi, N. Bonini, & D. Osherson, University of Trento; Princeton University

On the psychology of confirmation: Inductive inferences in a probabilistic task

Alternative measures of confirmation or evidential support have been proposed to express the impact of ascertaining one event on the credibility of another. We report an experiment that compares the adequacy of several such measures as descriptions of confirmation judgment in a probabilistic context.

Paper Session 11: Emotions I

11.1 van Putten

Marijke van Putten, Marcel Zeelenberg, & Eric van Dijk, Tilburg University; Leiden University

The boundaries of inaction inertia. Decoupling current and forgone opportunities.

Inaction inertia is the effect that “forgoing an attractive action opportunity (initial inaction) decreases the likelihood that subsequent action will be taken in the same domain” (Tykocinski & Pittman, 1998, p. 607). The aim of the present experiments is to investigate the boundary conditions of inaction inertia. For this purpose we turned to recent insights on transaction decoupling (Soman and Gourville, 2001, Van Dijk and Zeelenberg, 2003). These insights show that dissociation, or decoupling of costs and subsequent consumption has a profound influence on decisions. Building on these insights on transaction decoupling we study whether decoupling the missed from the currently considered opportunity decreases the likelihood to fall prey to the inaction inertia effect. Three experiments show that decoupling the missed and current opportunity decreases inaction inertia. In a decision-making context with missed and current opportunities, the likelihood to act on an opportunity is higher (inaction inertia decreases) the less comparable these two opportunities are (Exp. 1), the more relevant the missed opportunity is to the decision maker (Exp. 2) and the less ambiguous the difference size between the missed and current opportunity is (Exp. 3). The results are discussed in view of inaction inertia literature.

11.2 Benson

Lisa Ordóñez, Lehman Benson, Neil Bearden, & Ryan Murphy, University of Arizona, Tucson, AZ

It's about time!: A theory of time pressure

There is a growing body of research about the effects of time pressure and the ways in which individuals cope with time pressure. However, there has been little to no theoretical work on developing a model of what creates time pressure. This paper develops such a theoretical model. We examine the functional relationship between judged time pressure and the amount of time that is available (T_a) and required (T_r) to complete a task. In a laboratory setting, subjects were asked to consider different tasks in which the time available was less than or equal to the time required to complete a task at work. Least square fits indicated that the relative difference model $[(T_r - T_a)/T_r]$ fit mean time pressure ratings better than both the difference ($T_r - T_a$) and ratio (T_r/T_a) models. Individual responses were fit to these same models; the majority of subjects were best fit by the relative difference model.

11.3 Figner

Bernd Figner, University of Zürich

Age and gender differences in hot and cold risky decision making

The role of hot and cold cognitions in risky decision making was investigated using a computerized card game. Applying functional measurement methodology, the game enabled the assessment of both individual risk taking propensity and information integration of the following factors: (a) probability of desired or undesired outcome, (b) amount of gain and (c) amount of loss. In Experiment 1, the game involved step-by-step decisions and immediate feedback to involve hot cognitions. In Experiment 2, the same game did not involve these characteristics and therefore had the character of a judgment task involving predominantly cold cognitions. In both experiments, a motivational questionnaire was used to check the involvement of different degrees of hot and cold processes.

The sample consisted of 180 participants ranging from 14 years to adulthood. The results of Experiment 1 exhibited clear effects of age and gender with younger males showing the highest levels of risk taking. Furthermore, higher risk-taking levels were associated with less complex integration strategies. In Experiment 2, no such associations and no age or gender effects were found. These results are best explained by the assumption that the domain of hot cognitions is primarily responsible for elevated levels of risk taking in youth.

11.4 Sevdalis

Nick Sevdalis, Ashley Bell, & Nigel Harvey, Imperial College London; City University of London; University College London

The self, the other, and the invaluable university mug: erroneous affective forecasts in endowment effect situations

The endowment effect has been attributed to negotiators' mispredictions of their own future preferences and also their mispredictions of other people's future preferences. In three endowment effect studies with real endowment objects and payoffs, we investigated owners' and buyers' affective forecasts about themselves and about their negotiation partners. We found self-other discrepancies in happiness predictions for the prices that the trading pairs actually agreed to trade for. Moreover, owners and buyers overestimated how happy/unhappy their trading partner would feel at the end of the negotiation. Finally, buyers overestimated how unhappy they would feel after purchasing the endowment at a price that exceeded their stated maximum buying price.

11.5 Pfister

Hans-Rüdiger Pfister & Gisela Böhm, University of Lüneburg

Emotions and mood in the Ultimatum game

We assume that emotions and mood influence behaviour in the ultimatum game. Anticipating the feelings of responders after accepting or rejecting an offer might affect the amount proposers offer to share. In negative mood, proposers will reason more analytically and tend to offer less. Responders will experience positive emotions either when rejecting a low offer or when accepting a high offer. In positive mood, we assume that responders focus on the amount of money gained, whereas in negative mood, responders focus on the satisfaction obtained by retaliation. These assumptions were examined in a three-factorial experiment, with induced mood, amount of money available, and amount of money offered as independent variables, and associated emotions as dependent variables. Not surprisingly, a fair share was the most frequent offer, and virtually all offers were accepted. Surprisingly, however, proposers granted higher shares when in negative mood. A significant interaction of amount of money shared and mood condition indicates that responders in positive mood feel better with increasing offers, whereas responders in negative mood feel worse with higher offers. As an explanation, we propose a missed-revenge hypothesis: In negative mood, you prefer to retaliate, and if this becomes unjustifiable, you feel bad.

Paper Session 12: Probability judgments III

12.1 Sprenger

Michael Dougherty & Amber Sprenger, University of Maryland

Proactive interference and judgments of probability: How irrelevant information can bias probability judgments

We used a proactive interference (PI) paradigm to examine the effect of generating irrelevant alternative hypotheses on probability judgments. Two possible effects of generating irrelevant alternative hypotheses on probability judgment were tested: discrimination failure and inhibition failure. The discrimination failure account assumes that participants fail to identify irrelevant alternatives as irrelevant, and leads to the predictions that the magnitude and relative accuracy of participants' probability judgments would decrease as PI increases. The inhibition failure account assumes that participants identify irrelevant alternatives as irrelevant, but fail to inhibit them from working memory. Accordingly, the inhibition failure account leads to the predictions that the magnitude of participants' probability judgments would increase as PI increases, but that the relative accuracy of the probability judgments would be unaffected by the build-up of PI. Three experiments support the discrimination failure account of the effect of PI on probability judgment.

12.2 Nestler

Steffen Nestler & Hartmut Blank, University of Leipzig

Creeping determinism and processing load

Since Fischhoff's (1975) seminal work on creeping determinism a series of (mostly unsuccessful) studies was conducted which tried to reduce or even reverse it. Starting from the early notion of Fischhoff (1975) that once people know the outcome of an event "...they try to make sense of it" and Pezzo's (2003) sense-making model, we hypothesised that people need cognitive resources for this sense-making activity and therefore will not exhibit creeping determinism when under cognitive load. We investigated this prediction in two experiments using a hypothetical scenario. In both, participants had to rehearse either a 8-digit number (high cognitive load) or a 2-digit number (low cognitive load). Results were consistent with our prediction: Under low load participants exhibited creeping determinism and in contrast, under high load participants exhibited no impression of inevitability relative to a no outcome control condition. In general, results indicate that the process underlying creeping determinism is an effortful one.

12.3 Hansson

Patrik Hansson, Peter Juslin, & Anders Winman, Umeå University; Uppsala University

Intuitive confidence intervals: Overconfidence and the role of working memory

Research with general knowledge items demonstrates strong overconfidence with intuitive confidence intervals for unknown quantities. The authors replicated these phenomena in a controlled learning experiment and tested the hypotheses that overconfidence with interval production should be highly correlated with working memory capacity, but little affected by training. The results replicated the overconfidence and confirmed the hypothesised importance of working memory capacity.

12.4 Blank

Hartmut Blank, University of Leipzig

Towards a tripartite model of the hindsight experience

Three studies investigated a tripartite model of the hindsight experience, involving (1) increased foreseeability impressions, (2) increased impressions of outcome necessity, and (3) distorted recollections of prior predictions of an event outcome, and contrasting the default view that these characterizations are equivalent and reflect a unitary hindsight phenomenon. Two studies of the interrelation of (1) and (3), one employing a knowledge quiz design and the other addressing the European Football Championships 2004, showed (a) diverging main effects (e.g., memory distortions but impressions of UNforeseeability), (b) zero correlations of the components within participants, and (c) diverging effects of third variables on them (e.g., more memory distortion for but less foreseeability of a competitor's vs. one's own achievement in the quiz). A third study, on the occasion of the unsuccessful application of the City of Leipzig to host the Olympic Games, simultaneously investigated all three components and again found (a) opposite main effects, (b) low intercorrelations, and (c) diverging effects of third variables (here, commitment to the application) on the components. The results contradict a unitary phenomenon view and support the idea of separate hindsight components.

Paper Session 13: Financial decision making

13.1 Summers

Barbara Summers & Darren Duxbury, Leeds University Business School

Unravelling the Disposition Effect: The effects of sunk cost and emotional commitment

The 'disposition effect' (Sheffrin and Statman, 1985) refers to the situation where individuals are disposed to selling winning shares whilst holding losing ones. Using market trading data Odean (1998) found strong evidence in support of the disposition effect, whilst Weber and Camerer (1998) provide experimental support. Whilst empirical research documents the existence of the disposition effect, to date there has been little empirical research into the causes of it. Selling winners to 'lock in' gains has intuitive appeal, however, it is not immediately obvious why individuals hold losers. In light of this we conduct an experiment designed to investigate two possible explanations of why individuals continue to hold losing shares; the effects of sunk costs and emotional commitment. We find strong evidence of a disposition effect in the data overall, with a 21% reduction in the holding of winners and a 5% increase in the holding of losers. However, whilst individuals buy/hold losers in the presence of a sunk cost and/or emotional commitment, the absence of these effects results in a stronger tendency for individuals to sell losers.

13.2 Hedesström

Ted Martin Hedesström, Henrik Svedsäter, & Tommy Gärling, Göteborg University

Naïve risk diversification in investment decisions

Behavioural studies of portfolio risk diversification typically only focus on how people allocate money between stocks and bonds. However, effective portfolio diversification also requires that the value developments of stocks are not positively correlated. In two experiments undergraduates made hypothetical investment choices. In Study 1 participants chose different portfolios dependent on whether information about previous value development was given at the portfolio level or fund level, even though the value developments were identical. In Study 2 participants chose to combine two funds even when their expected value developments were positively correlated and combining the funds therefore was a more risky choice than selecting only one of the funds. Taken together, the results suggest that non-expert investors may diversify in a heuristic manner, ignoring correlations between stock funds' value developments.

13.3 Otto

P. E. Otto & N. Chater, University of Warwick

Similarity based utility in stock pricing

Influences of context set and reference points are two well documented phenomena which affect the evaluation of alternatives. Applying these phenomena to the question of stock prices, we argue that we might expect influences of 'similar stocks' and 'leading stocks' respectively on the valuation of a specific single stock. In contrast to Daniel, Hirshleifer, and Subramanjan (1998) or Baberis, Schleifer, and Vishny (1998), stock values depend on inter-/intra-group variations and changes over time can be accounted for by relative dynamics. Our model of utility formation is based on expert stock similarity ratings and accounts for the observed under- and overreaction without referring to information asymmetry in the market or assuming qualitatively different information stages. The processing of stock information occurs in relation to other stocks and individual prices fluctuate accordingly. The cognitive evaluation is bound by the internal representation of the information and its structure in the environment. Stock prices reflect how information spreads in the environment as well as how this news is processed cognitively as well as emotionally.

13.4 Andersson

Patric Andersson & Tim Rakow, University of Mannheim; University of Essex

Does it pay to trust your recognition when picking stocks?

We report four studies (N = 319) that examined the success of individual investment strategies based on stock recognition. Participants from the UK, Sweden and Austria indicated which stocks they recognized from companies listed on four European stock exchanges. 'Recognition portfolios' were identified for each participant, and the performance of these was tracked for a two-month competition period. Study 1: Mean profit for the recognition portfolios was 13.3%, but only 13% of recognition portfolios outperformed the market index (21.0% profit). Study 2: Mean profit for the recognition portfolios was 0.2%, with only 6% of recognition portfolios outperforming the market index (1.95% profit). Study 3: Mean return for the recognition portfolios was a loss of 1.70%, with 21% of recognition portfolios outperforming the market index (loss of 0.02%). In each of these studies, recognition portfolios were significantly less profitable than the complementary portfolios of non-recognized stocks. Study 4: Mean profit for the recognition portfolios was again below the market index (0.2% versus 8.0%), and better recognized companies did not yield better returns (recognition-return r of -0.13). Personal investment strategies based upon recognition seem to have poor ecological validity in the stock market.

13.5 N Karlsson

Niklas Karlsson, George Loewenstein, & Duane Seppi, Göteborg University; Carnegie Mellon University

The 'Ostrich' effect: Selective attention to information about investments

We develop a model of selective attention to information and apply it to investors' decisions about whether to obtain information about the value of their portfolio. In our model investors receive information about the aggregate level of the market and then decide whether to look up the value of their personal portfolio. Doing so not only provides additional information, but also increases the psychological impact of information on utility – an impact effect – and increases the speed of a utility reference point adjustment – a reference point updating effect. The main prediction of the model is that investors will check the value of their portfolios more frequently in rising markets but will "put their heads in the sand" when markets are flat or falling. We test and find support for this prediction with three Scandinavian data sets.

Paper Session 14: Risk perception: Applications I

14.1 Schuh

Christina Schuh & Rainer Westermann, University of Greifswald

Risk ratings for global health issues: basic dimensions and cultural differences

Holtgrave & Weber (1993) demonstrated that their (S)CER-Model, developed for the assessment of financial risks, explains risk ratings for health risks better than Slovic's (1987) psychometric approach which was developed for environmental and health risks. Palmer (1996) studied the relationship between dimensions of the SCER-Model and Dake's (1999) worldviews. This study replicates the work of both Holtgrave & Weber and Palmer for new healthy risk situations and tests the benefit of culture theory, which has been questioned by some authors (Sjöberg, 1996). 333 students from all over the world taking part in international student festivals were asked to respond to questions about 13 current global health risks. The questions were about risk dimensions deduced from either the SCER-Model or Slovic's model. The overall risk ratings of the situations and a new version of Dake's worldview scales were also assessed. It is concluded that the abstract dimensions of the SCER-Model explain the overall risk ratings for health risks as well as or better than the dimensions of Slovic's psychometric model. The most important risk dimensions behind the risk ratings for global health risks relate to harm and the probability of harm. There was no empirical evidence for the utility of culture theory in this area of research.

14.2 Twyman

Matt Twyman, Clare Harries, & Nigel Harvey, University College London

Implicit and explicit trust in advice about risk.

People often learn about the levels of risk associated with different activities through advice, and their use and assessment of such advice may depend on factors such as the identity of the advisor, and the perceived quality of that advice. Earle & Cvetkovich (1999) demonstrated that explicit verbal estimates of trust in advisors correlate with perceived shared values between advisor and advisee. Here we apply that finding to a risk communication paradigm. Earle & Cvetkovich's findings were replicated in two experiments, in which participants were given advice about a range of risky activities. However, declared trust in advice sources did not correlate with how much those sources were used in making risk judgments. Relative measures of use and assessment of advisors were also found to bear different relationships to the accuracy of advice. Use of advisors was not reflected in explicit verbal estimates of trust in those advisors.

14.3 White

Mathew P. White & J. Richard Eiser, University of Jena; University of Sheffield

When Is a mistake not a mistake? A new account of public trust in organizations

It is widely believed that public trust in organizations is easier to lose than gain and is therefore asymmetric. Moreover, it has been suggested that this is due to the greater power of negative, over positive, information (i.e. a negativity bias). However it remains unclear whether this asymmetry holds for all aspects of trust. This paper argues that trust relies on different parameters of performance analogous to those identified by Signal Detection Theory, i.e. discrimination ability and response bias. Findings from three studies supported our predictions that failures to correctly identify danger (Misses) do lead to greater decreases in trust than failures to correctly identify safety (False Alarms). In fact False Alarms actually tended to increase trust, in direct contrast to predictions based on the negativity bias account. Moreover, we find evidence that correctly identifying danger (Hits) is associated with greater trust than correctly identifying safety (All Clears). Again this highlights that information valence per se is not sufficient to explain variations in trust. Findings offer hope to organisations keen to build and avoid losing trust because they suggest that not all mistakes lead to "catastrophic" reductions in trust as previously argued.

14.4 Wolff

Katharina Wolff, Karin Nordin, Wibecke Brun, Gunilla Berglund, & Gerd Kvale, University of Bergen; Uppsala University

Uncertainty reduction, cognitive and affective factors predicting intentions to obtain a genetic test

This study investigated factors predicting intention to take a genetic test. It was hypothesised that intentions would be influenced by disease characteristics like penetrance (a mutation carrier's probability of getting ill) and seriousness of the disease, as well as individual characteristics like the tendency to avoid uncertainty. We also tested the sufficiency of Ajzen's (1991) Theory of Planned Behaviour (TPB) by measuring both attitudes, behavioural beliefs, subjective norm and perceived behavioural control as specified according to the theory, as well as affective factors like anticipated regret and affective attitude components. Survey data were collected from a random sample of the Norwegian population. Participants were asked to imagine that they had a relative with an unspecified hereditary disease. Four scenarios were constructed systematically varying seriousness of the disease and penetrance. High penetrance did predict willingness to obtain a genetic test, whilst seriousness of the disease did not. The tendency to avoid uncertainty predicted test taking intentions over and above the variables included in the extended TPB model. Cognitive attitude components and cognitive behavioural beliefs did predict test interest in accordance with the TPB. Subjective norm and perceived behavioural control however did not. Extending the TPB by including affective attitude components did not increase the models' predictive power. A measure of anticipated regret however did increase the models' explained variance.

14.5 Timmermans

DRM Timmermans, L Henneman, R Hirsing, & G van der Wal, EMGO-Institute; VU University Medical Centre

Parents' perceived vulnerability and control in preventing an infectious child disease: A large-scale interview study about perceived risks of vaccination.

The aim is to study parents' perceptions of the risks of vaccination and their beliefs about preventing a Meningococcal C infection in relation to their evaluation of the usefulness of vaccination. 1763 parents were interviewed after their children were vaccinated. 20% perceived the risk of their own child becoming infected before vaccination as lower than that of other children (the 'optimists'), while an equal percentage of parents perceived the risk as higher. Another group of parents (8%) who thought they had some control in preventing the disease, more often considered side-effects of vaccination as being serious than other parents. The latter group and the 'optimists', who differed from other parents regarding educational and ethnic background, evaluated the vaccination campaign as less useful than other parents.

Paper Session 15: EU theorydevelopment II

15.1 Busemeyer

Jerome R. Busemeyer & Joseph G. Johnson, Indiana University; University of Illinois

Explaining decision weights by attentional processing mechanisms

During the past 50 years, a number of paradoxes have led to the downfall of expected utility theory as a viable description of human decision making. Recently, rank-dependent theories of decision making have arisen as the "leading" descriptive approach. A key concept of these theories is the decision weight that is applied to reflect the importance of consequences when evaluating an action. Several researchers have had success in fitting functional forms of weighting to account for empirical data. However, little is known about the source of these decision weights. People probably do not consciously apply complex nonlinear transforms of objective probabilities. From where, then, do these importance weights come? The current work presents a computational model that derives these decision weights from elementary attentional processing mechanisms. This approach provides a way to model the cognitive process that underlies importance weighting, rather than just the resultant weights alone. It is shown how the model produces weights very similar to those captured by several common weighting functions. It is also shown how this cognitive model for weights provides a coherent explanation for many paradoxes, including loss aversion, common ratio and common consequence effects, violations of branch independence and stochastic dominance, and others.

15.2 Cabantous

Laure Cabantous, University of Toulouse

Is probability weighting sensitive to the quality of probabilistic information?

The paper aims to give some new insight into the probability weighting function for losses when the quality of probabilistic information varies in order to understand how decision makers process ambiguous and conflicting probabilistic messages. Venture theory and cumulative prospect theory proposes to model the effect of ambiguity on the probability weighting function. Such a model presents explanations of ambiguity and conflict aversion effects: the more ambiguous or the more conflicting the probabilistic information is, the more distorted the probability is. Probability weighting functions are elicited under three kinds of probabilistic information (a precise and consensual probability prediction, a vague and consensual probability prediction and a conflicting probability prediction) so as to investigate probability weighting functions' sensitivity to the quality of probabilistic information. Data on 30 participants show that, when the amount of ambiguity is small (a .10 range for instance), probability weighting functions and certainty equivalents are sensitive to the quality of information. Second, ambiguity and conflict attitude does not correspond with the observed behaviour in an insurance context.

15.3 Hadar

Liat Hadar & Ilan Fischer, Ben-Gurion University of the Negev; University of Haifa

Attenuated responsibility as an affect-based de-biasing heuristic

Empirical studies reveal an S-shape weighting function, explained by the four-fold pattern of risk attitudes (Kahneman & Tversky, 1979). Heath and Tversky (1991) explain risk attitudes in terms of motivation to obtain credit and to avoid blame associated with the decision's outcome. We hypothesise that attenuating risk attitudes, by manipulating the Decision-Maker's (DM) feeling of responsibility for the decisional outcome, should weaken the credit and blame motivations and result in better calibrated weighting function. Three experiments manipulated the feeling of responsibility under uncertainty: (1) Internal uncertainty - attributed to the DM's cognitive processing capabilities, thus holding him responsible for the decision outcomes. (2) External uncertainty - attributed to missing or low-quality information, thus linking potential suboptimal outcomes to external environmental factors, therefore attenuating the feeling of responsibility. (3) Unknown and delayed decision outcomes - withholding the decision outcomes and attributing them to a third anonymous person reduces one's own feeling of responsibility. Results show that: (i) DM's feeling of responsibility inversely influences the magnitude of risk attitudes and the extent of bias exhibited in the corresponding weighting function. (ii) Encouraging DMs to consider decisions as having neither immediate impact nor personal consequences serves as a simple and effective de-biasing heuristic.

15.4 van de Kuilen

Peter P. Wakker & G. van de Kuilen, University of Amsterdam

A midpoint technique for easily measuring Prospect Theory's probability weighting

A decade of experimentation has convincingly shown that expected utility fails as a descriptive theory of decision under risk. According to prospect theory, an important reason why subjects violate expected utility is that they subjectively distort probabilities when making decisions. Scholars have modelled this phenomenon by introducing a weighting function that transforms the objective probabilities into subjective decision weights. There have been many measurements of such weighting functions, and there are many debates about the proper shape of such functions. Previous measurements were usually based on complex parametric fittings. We introduce a method that, for each pair of probabilities, can immediately and simply infer the midpoint probability in terms of the weighting function units from properly devised choice questions. Thus, we can readily measure weighting functions and draw their graphs from data, without need for numerical analyses or parametric fittings, and requiring fewer choice questions than earlier methods did. A pilot suggested feasibility of the method and face validity of the data. Further data will be collected and presented.

15.5 Chater

Neil Stewart, Nick Chater, & Gordon Brown, University of Warwick

Decision by sampling

We present a novel theory of decision making, Decision by Sampling (DbS) in which, in contrast with traditional models, there are no underlying psychoeconomic scales. Instead, consistent with psychophysics, we assume that an attribute's subjective value is its rank within a small sample of attribute values drawn from memory. We assume that the sample reflects both the immediate distribution of attribute values from the current decision's context and also the background, real-world distribution of attribute values. DbS accounts for: concave utility functions (i.e., risk aversion); losses looming larger than gains; hyperbolic temporal discounting; and distortion of decision weights, with the overestimation of small probabilities and the underestimation of large probabilities.

Paper Session 16: Emotions II

16.1 Takemura

Kazuhisa Takemura, Shiho Morokami, Shigetaka Okubo, & Satoshi Fujii, Waseda University; Tokyo Institute of Technology

Influence of positive affect on eye movement in decision making process

A process tracing experiment using an eye gaze recorder was conducted to examine influence of positive affect on eye movement patterns during consumer decision-making process. An eye-gaze recorder was used to capture the visual search patterns in the decision making process. Fifty-five university students were instructed to choose one between two pretzel brands utilizing eye gaze recorder. They were randomly assigned into one of the cell for 2 affect conditions (Positive affect group and control group) × 2 attribute emphasis conditions (Attribute emphasis condition and control group). The results suggested that positive affect promoted a biased visual search pattern for the decision task, and that decision makers with positive affect tended to use decision heuristics. The interaction effect of affect and attribute emphasis manipulation was also obtained. Theoretical implications of the results were discussed from the decision theoretical point of view. Through the discussions, we proposed a psychometric model of affect heuristic model for the decision making.

16.2 Rubaltelli

Enrico Rubaltelli & Paul Slovic, University of Modena and Reggio Emilia; Decision Research

Joint versus separate evaluation: the effect of affect framing

In this study the paradigm of joint versus separate evaluation was used to assess if a negative framing of the affect attached to an object is judged differently when paired with a positive frame and when judged alone. Negative frame means that positive features of the stimuli were described with a double negation; for example a brand of cereal could be described as “not having high calories”, which is good. However, the positive frame alternative (“cereal brand B has low calories”) is easier to understand because it is more direct; thus it should induce a higher positive affect than the negative frame alternative. As a consequence, the alternative described with a positive frame should have an advantage in the joint evaluation condition but not in the separate evaluation condition. The hypothesis was that under joint evaluation conditions the negative frame alternative should be judged as the worst, while under separate evaluation conditions the two alternatives should be judged as equal. Results confirmed the hypothesis for two out of three pairs of stimuli. In joint evaluation condition the alternatives framed in positive terms were judged more attractive than their counterparts; in separate evaluation condition the two alternatives were judged equal.

16.3 Mazzocco

Ketti Mazzocco, Ellen Peters, Nicolao Bonini, Paul Slovic, & Paolo Cherubini, University of Trento; Decision Research; University of Milano-Bicocca

Priming feelings versus thoughts: When a prime makes an analytically rational choice less preferred

In four studies we investigated whether priming participants to think analytically versus emotionally on a task that includes both analytical and emotional attribute information produces a preference reversal. Subjects were presented with two options, one of which was analytically better (A-option) and the other was emotionally better (E-option). In Study One (n=108) we demonstrated that analytical versus emotional primes presented before a choice influenced the choice made, presumably by orienting participants toward the available analytical versus emotional attribute information (55% of analytically primed participants chose the A-option, versus 25% in the emotional prime condition). Using the same design but a different set of attributes, Study Two (n=120) replicated the results of Study One: 57% of analytically primed participants chose the A-option, versus 35% of emotionally primed participants. In Study Three (n=78) we examined whether the attribute valence played a role in the effect: The prime had an effect only when negative emotional information was presented (80% of analytically primed participants chose the A-option versus 59% in the emotional prime condition). Study Four (n=112) results suggest that the prime has an effect only when the available information is not enough to create a clear representation of the quality of the options.

16.4 Weller

Joshua A. Weller, Irwin P. Levin, Antoine Bechara, & Baba Shiv, University of Iowa

A decision neuroscience study of the role of emotion under varying levels of risk and ambiguity

This study compares the role of emotion in decisions under ambiguity and decisions under risk. Researchers have found that individuals with brain lesions to areas responsible for processing emotions, such as the ventromedial prefrontal cortex (VMPFC), consistently perform poorly in decisions under ambiguity (i.e. when outcome probabilities are unknown). However, earlier studies ignored how these individuals respond to risky decisions when probabilities are known. We compared performance on the IGT, a task designed for decisions under ambiguity, and a risky decision task, the “Cups task”, in a sample of patients with damage to the VMPFC or the somatosensory/insular cortex. Advantageous decision making (i.e. choosing the option with the higher EV) in the Cups task was positively associated with IGT performance. While all lesion patients performed poorly on the IGT, there was differential performance on the Cups task. Patients with somatosensory lesions generally performed poorly on the Cups task, while VMPFC patients’ performance varied as a function of lesion localization. We conclude that decisions under ambiguity are based primarily on anticipatory emotional responses, whereas risky decisions may rely less on emotion and more on cognitive processes.

16.5 E Peters

Ellen Peters, Daniel Västfjäll, Paul Slovic, Ketti Mazzocco, & Stephan Dickert, Decision Research; University of Oregon; Göteborg University; University of Trento

Numeracy and decision making

A series of four studies related the ability to understand and transform probability numbers to judgment and decision tasks. Undergraduate participants responded to a series of tasks ranging from the attractiveness of a bet to framing effects and choices among bowls of beans. On the surface, the tasks were widely different; at a conceptual level each one involved the processing of numbers and the potential influence of affect from the numbers themselves and/or from a competing source. Findings from Studies 1 and 2 were consistent with our hypothesis that high-numerate participants are more likely to retrieve and use appropriate numerical principles and transform numbers presented in one frame into a different frame. Results from Studies 3 and 4 demonstrated that the high numerate drew more affective meaning from numbers and numerical comparisons. Study 3 results revealed that the low numerate were influenced more by competing, irrelevant affective considerations, perhaps because they draw less meaning from relevant numbers. We believe that less numerate decision makers are left with information that is less complete and lacks the complexity and richness available to the more numerate. Actual number ability appears to matter to judgments and decisions in important ways.

Paper Session 17: Heuristics and strategies I

17.1 Gloeckner

Andreas Gloeckner, & Tilmann Betsch, University of Erfurt

Parallel processing as fast and frugal alternative of simple serial heuristics

In recent theoretical work a constructive perspective on decision making as well as the use of parallel processing has been highlighted. However, convincing empirical evidence for both is still rarely to be found. Based on the idea that partially parallel processing is used to structure information to form a consistent picture (good shape, dominance structure), a consistency maximizing model (Thagard & Millgram, 1995) was applied to decisions based on probability cues. Four hypotheses were empirically tested against the Take-The-Best Heuristic (TTB), Equal Weight Rule (EQW) and Weighted Additive Rule (WADD). In line with our hypotheses it was found that participants could make choices very quickly ($M=1.4$ s), and that choices of most participants nevertheless followed WADD. Further it was found that increasing incompatibility in the choices lead to increasing decision-times, demonstrating that constructive processes take longer if the need for structuring increases. Finally and most strikingly it could be shown in two experiments that subjective cue validities are being changed within the decision process. Thus, results challenge simplifying serial decision models (e.g. Todd & Gigerenzer, 2000) and strongly supported a constructive perspective and the use of parallel processing in decision making.

17.2 Hogarth

Robin M. Hogarth & Natalia Karelaia, University Pompeu Fabra, Barcelona

Simple models of bounded rationality: Predicting when and why they are effective

Several studies have demonstrated the remarkable predictive ability of several simple heuristic models (see, e.g., Gigerenzer, Todd & the ABC Group, 1999). However, few attempts have been made to understand why and when these models do or do not predict well. This paper illuminates this issue by exploring how characteristics of models interact with those of tasks to produce different levels of performance. Specifically we use statistical theory to derive probabilities that models identify the best of m alternatives ($m > 2$) characterized by k attributes ($k > 1$). The models include a single variable (lexicographic), variations of elimination-by-aspects, equal weighting, hybrids of the preceding, and models exploiting dominance. We compare all with multiple regression. We identify four environmental factors that affect relative performance: how attributes are weighted; characteristics of choice sets (e.g., correlational structure); whether attributes are continuous or binary; and error. We illustrate the theory with twenty simulated and four empirical datasets. Fits between predictions and realizations are excellent. No single model is "best." By regressing performance of models on environmental characteristics we further clarify which models are suited to which tasks. The relative performance of heuristic models can now be predicted on theoretical grounds.

17.3 Karelaia

Natalia Karelaia, University Pompeu Fabra, Barcelona

Consistency or accuracy: How good is a strategy that looks for confirming evidence?

Experimental evidence suggests that people often do not feel comfortable with making decisions based on a single piece of evidence and that they systematically look for confirming evidence before choosing. Moreover, from a theoretical point of view, confirmation seeking is a good strategy for testing hypothesis (Klayman & Ha, 1987). This paper investigates whether such behaviour is appropriate for multi-attribute binary choice. We compare the performance of a simple heuristic strategy that chooses once two consistent cues have been found with the performance of models that consider either all available cues or only the most important one. We analytically derive the probability that this strategy 1) chooses correctly between two alternatives; and 2) makes a decision without considering all cues. Both probabilities are functions of the level of redundancy in the environment. In a series of simulated three-cue environments involving continuous cues with varying predictive ability and inter-correlation, we show that, in binary choice, a strategy that looks for confirming evidence is quite effective overall. In particular, across different noisy environments with substantial redundancy, this model incorporates the advantages of several other decision strategies.

17.4 Marewski

Julian Marewski, Wolfgang Gaissmaier, Anja Dieckmann, Lael Schooler, & Gerd Gigerenzer, Max Planck Institute for Human Development, Berlin

Ignorance-based reasoning? Applying the recognition heuristic to elections

We wanted to test the recognition heuristic (Goldstein & Gigerenzer, 2002) in a new environment, namely in the 2004 parliamentary elections of the German Federal State of Brandenburg. The recognition heuristic is a simple decision-making strategy for inferring which of two objects, one recognized and another unrecognized, has a larger value on some quantitative criterion. Predicting high values for recognized objects, it can be very accurate. Using a questionnaire, we collected data on citizens' recognition of candidate and party names and asked them to predict the election outcomes. For an environmental analysis, we counted how often candidate and party names appeared on election advertisements and in newspapers before the election. We found very strong correlations among recognition, election outcomes and environmental distributions of names with the latter mediating the relationship between the former two. Aggregated recognition data predicted the election outcome highly accurately. These findings demonstrate the ecological rationality of the recognition heuristic in this environment. People heavily relied on recognition when predicting the election outcomes and were thereby highly accurate. However, despite the correlation with the criterion recognition did not always dominate other information. People sometimes decided selectively against recognition, and people who knew more were thereby more successful.

17.5 Brehmer

Berndt Brehmer, Leif Övborg, Andreas Duit, & Anders Winman, Swedish National Defence College; Risö National Laboratory; Uppsala University

Knowing the price does not necessarily mean knowing the value: effect of having to consider costs in dynamic decision making

Experiments on dynamic decision making using microworlds have shown that participants often use heuristic strategies that are quite costly. This may be because the participants have not had to consider the costs. This hypothesis is tested in three experiments using NEWFIRE, a microworld where participants assume the role of a fire chief with tasks of fighting forest fires. The results show that having to consider the cost of fire fighting led to worse performance in terms of forest lost to fire and to higher cost than when participants did not have to consider costs, that having to consider affected finding a good strategy rather than executing it: when participants had first learned a strategy, having to consider costs had no effect, and that and that it was the negative effect was due to having to consider costs, rather than to any attempt to take exact costs into account: false information about costs had about the same effect as correct information. The negative effect of having to consider costs is interpreted in terms of added demands on information processing. Being required to consider costs is clearly not always beneficial, especially when the task is not familiar, and it is, having to consider the costs of actions does not always lead to more efficient decisions.

Paper Session 18: Preference measurements

18.1 Bolger

Fergus Bolger, Briony D. Pulford, & Andrew M. Colman, University of Durham; University of Leicester

Effects of positive biases on decisions to enter a competitive market

When the conditions of a competitive market are simulated in a game, the number of people deciding to enter each round becomes roughly optimal after a few rounds. This occurs even when there is no communication between players, and the only feedback each round regards the number of entrants. However, in real markets entry is consistently too high, resulting in excessive failure rates. Previous research has suggested that this over-entry is the consequence of entrants believing themselves to be more skilful than other potential entrants, thus more likely to succeed. This hypothesis has not so far been adequately tested because beliefs regarding chances of success relative to others have not been fully manipulated or measured. We report the results of two experiments designed to test this hypothesis and also an alternative hypothesis that it is a different positive bias – entrants' belief in their skill per se rather than relative to competitors – that is responsible for excess entry. The results support the general hypothesis that positive biases are largely responsible for excess entry, with overconfidence in one's own abilities being the best predictor of entry into the market on skill-based rounds: competitors' skills seem largely to be ignored.

18.2 Bruine de Bruin

Wändi Bruine de Bruin, Andrew M. Parker, & Baruch Fischhoff, Carnegie Mellon University; Virginia Polytechnic Institute and State University

Do commonly studied decision-making tasks have external validity?

We examined the external validity of paper-and-pencil tasks commonly used in judgment and decision-making research. Specifically, we tested the relationship between performance on these tasks and real-world decision outcomes, while controlling for cognitive ability. The presented study used a battery of tasks covering a broad range of decision-making skills, including resistance to (risky-choice and attribute) framing, resistance to sunk costs, appropriate confidence, path independence of probability judgments, recognition of social norms, consistency in risk judgments, and accurate application of decision rules. The resulting Decision Making Competence measure for adults (DMC) was based on an earlier and preliminary version for adolescents (Parker & Fischhoff 2005). A convenience sample of 360 adults aged 18-88 completed the DMC, and two measures of cognitive ability. They also self-reported negative real-world decision outcomes, such as getting divorced and declaring bankruptcy. Approximately 2.5 weeks later, 106 participants completed the DMC again. Adults who showed better decision-making competence, as measured with commonly studied paper-and-pencil tasks, reported better real-world decision outcomes, even after controlling for cognitive ability. Overall, these results suggest the external validity of conventional behavioural decision-making tasks, as represented by the eight used here.

18.3 Bleichrodt

Han Bleichrodt & Jose Luis Pinto, Erasmus University, Rotterdam; Pompeu Fabra University, Barcelona

A new type of preference reversal

The classic preference reversal phenomenon is commonly explained by a choice-matching discrepancy. We observed a new type of preference reversal, which is entirely choice-based and, therefore, cannot be explained by a choice-matching discrepancy. Because choice is the basic primitive of decision theory, the preference reversal we observe is more troubling for decision theory. Possible explanations for the reversal we observe are regret effects and the use of ordinal utility functions in evaluating riskless and risky outcomes.

18.4 Shavit

Tal Shavit, Shosh Shahrabani, & Uri Benzion, Ben-Gurion University; The Emek Yezreel College

Bidding patterns among competitive and non-competitive subjects.

This study analyses the subjective valuation of lotteries with respect to buying and selling positions, based on a Second-Price-Auction. Subjects are classified into three groups: competitive, non-competitive and neutral individuals. Classification of subjects as competitive individuals is based on the assumption that in a competitive environment, they will tend to increase their WTP above the "true" value, and reduce their WTA below the "true" value, in order to win the auction. We assume that non-competitive subjects, on the other hand, will tend to behave in the opposite manner. Our results show that, the WTP elicited from the second-price auction is higher than the WTP elicited from the BDM mechanism for the competitive subjects, and lower than the WTP elicited from the BDM mechanism for non-competitive subjects. When subjects were asked to bid the prices for a lottery with small amounts in respect to their initial endowment, they become more competitive. We claim that the Endowment effect is relevant only for a group of subjects, while for others it may be the opposite. The findings of opposite behaviours for competitive and non-competitive subjects emphasize the importance of separating subjects into different groups according to their competitiveness measure when analysing auctions' bidding.

18.5 Bonini

Nicolao Bonini, Ilana Ritov, & Michele Graffeo, Trento University; Hebrew University, Jerusalem

When does a referent problem affect willingness to pay for the target?

We examined the effect of cross-category context on stated willingness to pay for public goods. Previous research focused on the simultaneous evaluation of problems belonging to differentially important categories. In joint evaluations, the relative importance of the categories plays a major role. The present research examined simultaneous evaluation of same-category and cross-category problems, while controlling for the relative importance of the problems. The evaluation of a target problem was not substantially modified when it was judged in the context of another problem from the same domain. In contrast, evaluation of the target problem in the context of a dissimilar problem modified the willingness to pay for the problem, in the direction predicted by contrast: the willingness to contribute for the target was lower in the context of a more important referent problem than in the context of a less important one.

Paper Session 19: Risk perception: Applications II

19.1 Böhm

Gisela Böhm & Hans-Rüdiger Pfister, University of Lüneburg

Mental risk models

The present paper investigates lay mental models about global environmental risks. We assume that such models are structured according to five causally connected levels: attitudes, behaviours, pollution, environmental changes, and negative consequences. Our study pursued four aims: (a) describe lay causal mental models of global environmental risks, (b) compare lay models with an expert model, (c) test whether lay models are structured according to our hypothesised causal levels, and (c) relate mental models to risk judgments. Mental models were elicited by a cognitive mapping technique in which participants indicated which causal links they perceive between 25 provided causal terms. Network analysis reveals that lay models tend to be simple and unconnected. They are significantly less complex than an expert model derived from the climate change literature. A cluster analysis shows that the postulated causal levels constitute structurally equivalent causal terms in lay mental models. Furthermore, overall risk judgments can be predicted from structural properties of mental risk models. The results generally support a model of the risk perception process that assumes risk judgments to be based upon causal mental models about the causes and consequences of risk events.

19.2 Goldstein

Daniel G. Goldstein, Eric Johnson, & William F. Sharpe, London Business School; Columbia University; Stanford University

Risk aversion and loss aversion in retirement investors

While inexperienced investors' savings make up much of the 1.8 trillion dollars held in 401K plans in the United States, it is questionable whether novice investors understand and prefer the risks they are taking with their life savings. Are they overly risk averse and as Prospect Theory predicts, loss averse? In contrast to studies that make inferences about risk attitudes from asset-allocation decisions, we present a new research technique to measure risk-return tradeoffs from investors' specifications of probability distributions of wealth. Based on a diverse sample of several hundred working adults, we estimate risk aversion under a standard Constant Relative Risk Aversion model, and present a novel method for estimating of the loss aversion parameter of Prospect Theory.

19.3 Narendran

Sunitha Narendran & Chris Dewberry, Kingston University and Birkbeck, University of London

The influence of decision framing, probability and magnitude of pay-off, and personal exposure to decision consequences on individual risk evaluation and behavioural intentions in risky decision-making.

A study to identify variables that directly affect risky decision-making and the effect of these variables on risk evaluation and behavioural intentions in an organisational context is presented. Semi-structured interviews of 15 decision-makers in a UK Health Care Trust revealed that the way in which the decision was framed, the probability of the pay-off of outcomes of an option, and the magnitude of the pay-off to the organization of the project succeeding, and the magnitude of the pay-off to the individual of the project succeeding (i.e. exposure) appeared to affect risky decision making. Based on these findings, 16 versions of a fictitious financial decision scenario which allowed for the manipulation of the above variables in order to examine the influence of these variables on risk evaluation and behavioural intentions was constructed. A 2x2x2x2 repeated measures ANOVA showed that all of the above mentioned variables namely framing, probability of project succeeding, magnitude of the pay-off of project succeeding to organization, and magnitude of the pay-off to individual, had main effects on the likelihood of taking a risky decision. In the case of the participant's perception of the risk of investing in the project, framing, probability, and exposure were significant.

19.4 Meyer

Vered Rafeely & Joachim Meyer, Ben-Gurion University of the Negev, Israel

Has life become safer? Young and older adults' perceptions of present versus past risks

In the last fifty years fewer people die as a result of serious diseases (e.g. lung cancer) and in traffic accidents. Are people aware of the decrease in risk over time? This study tested the availability hypothesis pertaining to perceptions of present versus past risks. Because media coverage of traffic accidents has dramatically increased in recent years, people may incorrectly judge present fatality rates in traffic accidents as being higher than past fatality rates. Such a bias was not expected in estimates of death rates for various diseases for which there was no remarkable change in media coverage. We examined the subjective estimates of people who lived in past times, and of people who had not lived in those days. Thirty-four young and 30 older participants estimated death rates of young and older adults resulting from various risk factors. Participants provided death estimates for a recent and for a past year. For all risk factors, except for traffic accidents, both age groups correctly perceived the decrease in risk over time. For traffic accidents, however, both age groups incorrectly estimated higher death rates in the present than in the past. The findings are discussed in terms of the availability heuristic.

19.5 Brun

Wibecke Brun, Svein Larsen, Torvald Øgaard, & Leif Selstad, University of Bergen; Stavanger University; Telemark University College

Why travel when it's safer at home? The perception of food-related risk among tourists

The present study focus on subjective risk judgements associated with various food products. Five commonly debated "new" risk sources, Genetically modified food, Salmonella, Chicken flu, "Mad Cow disease" (CJD), Scrapie, are focused. These risks are receiving substantial attention although they are not known to cause many serious diseases or fatalities. Generally we were interested to see if food related risks were seen as a topic of concern for tourists travelling to Norway. More specifically we were interested to see whether there were any differences in how subjects perceive such risks when travelling abroad compared to being at home. Approximately 2000 tourists travelling in Norway were contacted and asked to fill in a risk questionnaire. Our results indicate that regarding food risks, staying "home" is considered systematically safer than going abroad as a tourist.

Paper Session 20 Time discounting I

20.1 Hassenzahl

Marc Hassenzahl & Katrin Borchering, Darmstadt University of Technology

From a simple-rule to strategic self-regulation: preferences for consumption sequences

Often, alternatives consist of sequences of outcomes. In addition, individuals have particular preferences concerning the trend (improvement) embedded in those sequences. The present paper shows that the construal level of the sequence (abstract, concrete) impacts sequence preferences. In Study 1, participants chose to drink apple juice and vegetable juice in either an improving or declining sequence. Retrospective explanations for the revealed preference showed improving sequence choices to be related to abstract outcome representations and rules ("best for last"). Study 2 manipulated the way individuals thought about outcomes prior to choice. In the abstract condition, participants gave three reasons for their liking or disliking of outcomes. In the concrete condition, participants described the actual experience of outcomes. Abstract thinking led to more preference for improvement. Study 3 asked participants to produce arguments either against improvement or deterioration before choosing between an improving or declining sequence of abstract or concrete outcomes. Only abstract sequence choices were affected by arguments. Abstract sequence choice problems are mainly determined by an improvement rule (belief, norm). However, by making the problem more concrete, the rule loses its influence. For consumption streams, a self-regulatory mechanism striving for appropriateness may take over, leading to a reduced preference for improvement.

20.2 Airoidi

Mara Airoidi, Daniel Read, & Shane Frederick, University of Durham Business School; MIT

Longitudinal dynamic inconsistency

Hyperbolic discounting suggest that people display a specific form of dynamic inconsistency – when choosing between a smaller-sooner and larger-later outcome, people will prefer the larger-later one when both are preceded by a significant delay. As time passes, however, they will become increasingly impatient, and prone to change their mind and choose the smaller-sooner outcome. This prediction, however, is not studied this way. Most studies of dynamic inconsistency use a cross-sectional design – each participant answers several questions simultaneously concerning their preferences for many delayed outcomes. We tested dynamic inconsistency directly, by using a longitudinal design – participants answered several questions concerning their preference for many dated future outcomes at the beginning of the experiment. At later dates, they chose again between the same dated future outcomes that were now closer in time. Contrary to predictions of hyperbolic discounting, twice as many people became more patient than impatient. It appears, therefore, that one of the widely publicised hyperbolic discounting phenomena, only occurs when it is measured the wrong way – using a cross-sectional rather than longitudinal design.

20.3 Scholten

Marc Scholten & Daniel Read, Instituto Superior de Psicologia Aplicada; University of Durham Business School

Beyond discounting: A trade-off model of intertemporal choice

Most current models of intertemporal choice are discounting models: Given several options with delayed outcomes, people are assumed to compute a discounted value for each option and choose the option with the highest discounted value. Such models cannot explain several anomalies in intertemporal choice, such as: Intransitivity, subadditivity (there is more discounting over an interval that is divided into shorter subintervals than over an interval that is left undivided) and superadditivity (there is less discounting over an interval that is divided into VERY short subintervals than over an interval that is left undivided). In this paper we develop a trade-off model of intertemporal choice, estimate its parameters from several data sets, and demonstrate that the estimates agree with theoretical expectations.

20.4 Read

Daniel Read, Mara Airoidi, & German Loewe, University of Durham Business School; London School of Economics

Time discounting based on interest rates and amounts

We report a large scale (N=1800) study of time discounting in which the description of the trade-off rate was varied -- either as an interest rate (interest-only condition), as a return in money (money-only) or both (interest+money). Both the form of the discount function and the amount of discounting was strongly influenced by this variation. Discounting was lower in the interest-only condition than in the interest+money condition, which itself yielded less discounting than the money-only condition. Moreover, while one classic hyperbolic discounting result (subadditive discounting) was found in the money-only condition, there was no hint of such an effect in the interest+money condition, and an opposite 'antihyperbolic' effect in the interest-only condition. We discuss the implications of these results for psychological models of discounting, and for how researchers should consider the methodological decisions they make.

Paper Session 21 Emotions III

21.1 de Hooge

Ilona E. de Hooge, Marcel Zeelenberg, & Seger M. Breugelmans, Tilburg University

Feeling is for doing: Distinct effects of shame and guilt on cooperative behaviour

All of us know that important decisions are often fuelled by emotion. Decision researchers have recently started to acknowledge this. However, they often limit themselves to the valence dimension of emotion: the overall positivity or negativity. Emotions differ on many other dimensions as well. The recently proposed feeling-is-for-doing approach states that two emotions with the same valence, but differences on other dimensions, should manifest themselves differently in behaviour (Zeelenberg & Pieters, 2005). In the present experiment, we tested this with two negative moral emotions: shame and guilt. We predicted that guilt increases and shame decreases cooperation. We also expected these effects to be moderated by the Social Value Orientation of the decision maker, such that these effects are stronger for proselves than for prosocials. Participants either described an experience of intense guilt, intense shame or a regular weekday (control condition). Next, they played a give some social dilemma game, which was our dependent measure. The results show the expected effect of emotion, with guilt inducing cooperation and shame decreasing cooperation, with the expected stronger effects for proselves. This shows that distinct emotions have marked different influences on decisions and behaviour that cannot be captured by a valence approach.

21.2 de Vries

Marieke de Vries, Cilia L. M. Witteman, & Rob W. Holland, Radboud University, Nijmegen

In the winning mood: Affect and intuitive decision making

Nonconscious processes can be advantageous for decision making. Little is known however, about the self-regulatory processes that facilitate intuitive, nonconscious decision making. Here, we focus on the facilitating role of positive affect. In a positive mood, people seem to respond more intuitively to the environment. Taking this one step further, we suggest that a positive mood facilitates intuitive decision making. In study 1, we first measured each participant's mood state. Then, participants played the Iowa Gambling Task (Bechara et al., 1994, 1997), a card-game in which they can win or lose money by picking cards from four different (two advantageous, two disadvantageous) decks. Bechara and colleagues have shown that participants began to choose advantageously before they explicitly realised which strategy worked best. We extended their experiment with a mood measure, and found that positive affect was significantly associated with better performance in an early stage of the game. In study 2, we manipulated mood. Then, participants played the Iowa Gambling Task. We found that a positive mood resulted in better decisions in the early, critical stage of the game than a negative mood. Together, these results provide support for the idea that a positive mood facilitates intuitive decision making.

21.3 van den Berg

Matthijs van den Berg, VU Medical Center

Are pregnant women making informed choices about prenatal screening?

Prenatal screening should enable pregnant women to make informed choices. An informed decision is defined as being based on sufficient, relevant information and consistent with the decision maker's values. This study aims to assess to what extent pregnant women make informed choices about prenatal screening, and to assess the psychological effects of informed decision making. The study sample consisted of 1159 pregnant women who were offered the nuchal translucency measurement or the maternal serum screening test. Level of knowledge, value consistency, informed choice, decisional conflict, satisfaction with decision, and anxiety were measured using questionnaires. Of the participants, 83 % were classified as having sufficient knowledge about prenatal screening, 82% made a value-consistent decision to accept or decline prenatal screening, and 86% made an informed decision. Informed choice was associated with more satisfaction with decision, less decisional conflict (this applied only to test acceptors), but was not associated with less anxiety. Although the rate of informed choice is relatively high, substantial percentages of women making uninformed choices due to insufficient knowledge, value inconsistency, or both, were found. Informed choice appeared to be psychologically beneficial. The present study underlines the importance of achieving informed choice in the context of prenatal screening.

21.4 Steinberg

Noa Steinberg & Orit Tykocinski, Ben Gurion University

Counterfactual inhibition and the regulation of regrets and disappointments

Retroactive pessimism is a tactic that people use in order to regulate negative emotions following failure. To find solace, people may decide that the failure was inevitable, and that in fact they never had a chance to succeed. The experience of negative outcomes triggers the generation of thoughts about how things could have turned out differently "if only... These counterfactual thoughts, which suggest that success was in fact quite possible, must be inhibited if one is to find comfort in accepting the inevitable. A conceptual analysis of the nature of counterfactual thoughts associated with regrets and those associated with disappointments illustrate a fundamental and important difference. Because disappointments are often the result of events outside our control the counterfactual thoughts elicited are more likely to focus on external uncontrollable events. In contrast, counterfactual thoughts associated with regret are more likely to implicate the misguided actions we took, and the wrong choices we have made. Unlike thoughts which implicate external forces, we can learn a lot from regret related counterfactuals and become better prepared to face similar challenges in the future. In view of the above it was hypothesised that evidence for retroactive pessimism, a defence mechanism which involves discarding counterfactuals, will be found for disappointments, but not for regrets. This hypothesis and the proposed process of counterfactual inhibition were examined in three experiments.

21.5 Ritov

Ilana Ritov, Hebrew University, Jerusalem

The short lasting pleasure of choice: Decreasing satisfaction with a freely selected option

Emotional reactions, such as regret and disappointment are associated with the comparison of an obtained outcome with what might have been. Past research revealed that these counterfactual comparisons affect one's pleasure with the outcome, at least in the short term. However, whether these effects are transient or long lasting is unknown. The present research addressed this question by investigating the time course of outcome evaluation, employing both experimental designs and a longitudinal correlational study. In a set of experiments participants' satisfaction immediately upon receiving a small gift was compared to their satisfaction with the gift several weeks later. In choice, but not in random assignment, satisfaction with the received gift decreased over time. The longitudinal study examined students' choice of undergraduate major, comparing evaluation of options before the choice to their evaluation one to three years after. Results show that students who experienced difficulty in deciding what to study, viewing more than one option as highly attractive, report decreased satisfaction 2-3 years later. Taken together, the findings of the different studies are compatible with the assumption that options one chooses to forgo may affect one's evaluation of the selected option in the long as well as in the short term.

Paper Session 22 Heuristics and strategies II

22.1 Baucells

Manel Baucells, Juan Antonio Carrasco, & Robin M. Hogarth, UPC; ICREA & Pompeu Fabra University, Barcelona

Cumulative dominance and heuristic performance in binary multiattribute choice

In multi-attribute decision making, several studies report high performance rates of simple heuristic models such as Elimination by Aspects (DEBA). This phenomenon can be illuminated by noting that DEBA is guaranteed to make the correct decision in the presence of simple and cumulative dominance. Moreover, although the presence of simple dominance decays quite rapidly as the number of attributes increases, that of cumulative dominance decays slowly. Indeed, the high persistence of cumulative dominance is the key explanatory factor underlying the success of these simple models. In addition, it permits calculating lower bounds on the probability that DEBA chooses the best alternative as well as upper bounds on the expected loss of using DEBA.

22.2 Del Missier

Fabio Del Missier & Donatella Ferrante, University of Trento; University of Trieste

Screening heuristics in multi-attribute choice

When a choice problem is composed of a huge number of options, the decision maker may adopt screening strategies to narrow down the alternatives. These procedures have been divided into the two broad types of inclusion and exclusion. Relying on choice heuristics research, we hypothesised that in environments characterized by high-dispersion weights, decision makers will use screening strategies that are initially selective on a single attribute, regardless of the type of procedure and the presence of dominated options. We also explored the impact of the number of options and of the order in which they are presented. We conducted a process tracing study, adopting the phased narrowing procedure, the MouseTrace program, and an apartment rental agent/consumer scenario. The results supported our basic hypothesis: regardless the screening procedure and the decision environment, the participants acquired the information in a very selective way during the first narrowing stage, while focusing on the most important attribute. They chose good options with a very limited amount of search. The results show that decision makers apply simple and effective screening heuristics in decision environments with high-dispersion weights. Unexpectedly, the common inclusion-exclusion asymmetry affecting the consideration set size disappeared when the options were sorted by utility.

22.3 O W Huber

Odilo W. Huber, University of Fribourg

Does early decision matter? Postdecisional information search and decision stability.

Two experiments (210 subjects) test the hypothesis that in decisions in quasi-naturalistic risky situations do not necessarily start a postdecisional process protecting the decision but subjects rather remain open for the processing of new information if they are enabled. In experiment 1 subjects decided after a basic description of the situation. In experiment 2 subjects after the presentation of the basic description could ask up to 2 questions to which they got corresponding answers from a pool of standardized answers before they surprisingly had to decide. Later, subjects unanticipatedly could search for additional information and alter their decision. In control conditions it could be asked for as many as wanted information before the decision. The results generally confirmed the hypothesis: While information search did not differ between conditions in experiment 1, in experiment 2 predecisional limited search reduced total information search by 20%, indicating that decisions only have a certain effect on the total process if predecisional information search is made possible. Decisions were altered in 25% of decisions in experiment 1 vs. 17% in experiment 2.

22.4 Willemsen

Martijn C. Willemsen & Gideon Keren, Eindhoven University of Technology

Choice and reject strategies in binary decision problems

Asking participants, presented with a binary choice, to accept or reject an option constitute complementary strategies. However, Shafir (1993) demonstrated that choice and reject are not necessarily complementary. We extend this research by examining the compatibility between decision strategy (accept/reject) and option valence (positive/negative), asking participants directly which strategy they would use. Several experiments were performed in which participants were presented with a binary decision between two desirable/good (e.g. two holidays, two win-only gambles) or two undesirable/poor (e.g., two different medical treatments, two loose-only gambles) options. The results show that the compatibility between task and valence is asymmetric: For positive options, choice strategies are strongly preferred over reject, whereas for negative options, reject and choice strategies are considered to be equally appropriate. An additional process tracing experiment, using the MouselabWEB tool to monitor the information acquisition process, indicated that only for negative options, the decision processes underlying reject tasks are genuinely different from those in an accept task. Combined, these experiments suggest that for binary decisions, accepting constitutes a default decision strategy, and that only for poor options a reject strategy might sometimes overrule this default strategy.

22.5 Witteman

Cilia L.M. Witteman & Pieter Koele, Radboud University, Nijmegen; University of Amsterdam

Dual decision making

Some people use more intuitive decision strategies than others. These differences are conceptualised as performed by dual cognitive processes, of the intuitive system and the reasoning system, respectively. Intuitive thinking is typically fast, parallel, associative and automatic, and deliberation is typically slow, serial, rule-governed and controlled. Individual preference for intuitive or deliberate decision making strategies interacts with demands of the decision situation. In some situations intuitive decision making is appropriate; in others more deliberate decision making seems called for. We aim to find out whether personal differences in decision making style are validly and reliably measured by different instruments, and whether these style differences are traceable in behavioural measures in different decision situations. Our method is to perform a series of experiments, in which we measure participants' preferences for intuitive or deliberate decision making using existing self-report questionnaires, and collect behavioural decision making indices. We will present and discuss our results. So far, we have found correlations between intuitive decision making style and confidence in the decision, and negative correlations between response time and correctness for people who prefer intuitive decision making.

Paper Session 23 Escalation of commitment

23.1 A Peters

Anja Peters, Peter de Haan, & Roland W. Scholz, Swiss Federal Institute of Technology, Zürich

Influencing car choice behaviour: Inducing mental accounting and reference point effects

The purchase of new passenger cars is a very decisive factor in reducing CO₂ emissions from road transport, as each car is driven 160'000 km on average regardless of fuel efficiency. We investigate the design of incentive schemes to influence consumers to buy more fuel-efficient cars. Here, changes in the consumer's perception of the vehicle's effective price are relevant. Psychological research on the subjective value of money has shown that mental accounting and reference point effects play a crucial role. To quantify these effects in the case of car choice behaviour, we conducted an experimental study with driving school students, a consumer group of likely first-time car buyers. Participants were asked to choose between cars differing in fuel-relevant car parameters, sales price, and, depending on relative fuel-efficiency, tax rebates or supplemental taxes (so-called "bonus-malus" schemes). To quantify the potential total effect of bonus-malus schemes for a whole country, the mental accounting and reference point effects are integrated in a car choice model taken from literature. Modelling results indicate that the concrete design of incentive schemes may promote psychological processes that could double the scheme's efficacy. Implications for car choice modelling and for the design of bonus-malus schemes are discussed.

23.2 Pfeiffer

Felix Pfeiffer & Stefan Schulz-Hardt, University of Goettingen

Escalation of Commitment: The causes and consequences of biased information search in losing courses of action

According to the self-justification hypothesis, persistence in losing courses of action (escalation of commitment) is an attempt to justify one's previous expenses. Due to this attempt, people should also be biased towards information that justifies their previous decision. Based on two experiments, we offer an alternative view of biased information search in escalation situations: Since people experience supporting arguments to be stronger and more credible than conflicting arguments ("prior belief effect"), they expect information in favour of continuation to be of higher quality than information in favour of withdrawal if they support the initiated course of action. A search bias towards continuation is the consequence. This bias, however, immediately disappears if people no longer have an idea of concrete arguments presented by the different information sources. Hence, rather than indicating an attempt for self-justification, the bias is an unintended by-product of the attempt to select the subjectively best information.

23.3 Betsch

Tilmann Betsch, Frank Lindow, Julia Heesch, & Jeanette Tischer, University of Erfurt

The Mere Choice Effect

In three studies participants received two lotteries and had to decide which one they wished to play first. The lotteries were identical with regard to their expected value. Immediately after their decisions participants had to judge both lotteries on several evaluative dimensions. The results provide convergent evidence for a mere choice effect on judgments. After choices were made, evaluations reflected an interaction of two factors: self-esteem and whether the chosen alternative was associated with the representation of the self or not. High-self-esteem participants showed assimilation effects in their evaluations if the chosen alternative was associated with representations of the self. They evaluated the chosen alternative more positively than the non-chosen alternative. Moreover they liked the chosen alternative better than participants from a control group who were not asked to select among the lotteries. Conversely, low-self-esteem participants showed contrast effects if the chosen alternative was associated with the self. They judged the chosen alternative more negatively than the non-chosen alternative. Moreover they liked the chosen alternative less than control participants. This pattern of assimilation and contrast effects reversed if the chosen alternative was not associated with self representations.

23.4 Yamagishi

Kimihiko Yamagishi & Yoshiro Kunitake, Tokyo Institute of Technology

A new account for preference reversals between separate and joint evaluations

We propose a descriptive model of cognitive processes that underlie preference reversals between Joint Evaluation (JE) and Separate Evaluation (SE). In SE, decision makers assess each choice alternative in isolation. In JE, multiple choice alternatives are valued concurrently. Hsee (1996) showed that preferential orderings in two multiattribute alternatives shift between JE and SE when their attribute values have tradeoffs. Hsee's account for such preference reversals, namely "Evaluability Hypothesis," postulates that the "evaluability" of each attribute changes between JE and SE. However, no previous research has empirically measured evaluability. We attempted empirical estimations of evaluability, and our contribution lies in articulating cognitive processes hypothesised by the Evaluability Hypothesis. Our "Evaluative Weighting Model" allowed us to estimate evaluability parameters under SE-JE preference reversals. The Evaluative Weighting Model detected shifts in the evaluability parameters between JE and SE. The Evaluability Hypothesis claims that a hard-to-evaluate attribute attracts much attention in JE, whereas an easy-to-evaluate attribute is weighted heavily in SE. These prescriptions were only partially followed by our parameter estimates. Since the parametric changes between JE and SE showed systematic deviations from Hsee's explanations, we offer an alternative account of SE-JE preference reversals.

23.5 Ayton

Peter Ayton, Bhavini Patel, & Kulsum Patel, City University of London

Are children's decisions less susceptible to sunk-cost effects?

The sunk cost effect is a maladaptive economic behaviour which is manifested in a greater tendency to continue an endeavour once an investment in money, effort, or time has been made. Arkes and Blumer (1985) suggested that a major contributor to the sunk cost effect is people's desire not to appear to be wasteful and their overgeneralisation of a "Don't waste" rule. While numerous instances of the effect have been observed in adult humans it has been argued that, despite opportunity, the sunk cost effect does not occur in lower animals and that this result is attributable to the reduced ability of lower animals to generalise abstract rules (Arkes and Ayton, 1999). Here, in a series of scenario-based studies, we provide evidence that children's susceptibility to the sunk cost effect increases between 5 and 10 years of age. Older children but not younger children were also influenced by how close a project was to completion. Older children's decisions, but not younger children's, also discriminated between the source of an asset (gift or prize) when deciding whether to invest their own money in order to exploit it.

Paper Session 24 Expert decisions

24.1 Shanteau

James Shanteau, Brian Friel, & John Raacke, Kansas State University

Four successes and a failure: Training decision making skills to experts

Five studies will be described, each of which attempted to train experts to make better decisions. Four were successful: (1) helping soil judges to ignore irrelevant materials in soil; (2) getting nurses to distinguish essential from non-essential patient cues; (3) using Bayes nets and influence diagrams to improve managers' decisions about product innovation; and (4) training air traffic controllers to use better decision strategies. However, one study was unsuccessful: (5) attempting to train accountants to ignore sunk costs. The lessons learned from these five studies of training will be discussed.

24.2 Thunholm

Peter Thunholm, Swedish National Defence College, Stockholm

Military decision making under uncertainty: Will less uncertainty result in a better decision?

The purpose was to study the effects of providing complete information on the enemy forces situation to a military brigade level planning team. Participants in this experiment were 99 army captains attending a course at Swedish Defence College. The participants formed 16 brigade teams, with an appointed brigade commander. Independent variable was Level of information on the enemy situation, high or normal. Half of the teams (Condition 1) had an almost complete view of the enemy situation and an ability to get updates in real-time or near real-time. The other half (Condition 2) had a normal level of information on the enemy situation. The task was to produce a decision on a plan for the brigade. The scenario was an urban battlefield scenario with a high tech attacker and a low-tech defender. T-tests indicated that although teams in Condition 1 experienced a significantly lower level of uncertainty than teams in Condition 2, this did not result in higher decision quality. Teams experiencing lower levels of uncertainty also evaluated fewer alternative courses of action in the decision-making process. The results indicate that providing a planning team with more (relevant) situation information does not necessarily result in decisions of higher quality.

24.3 Smith-Spark

James H. Smith-Spark, David W. Glasspool, Ayelet Oettinger, Pete Yule, & John Fox, Cancer Research, UK; Edinburgh University

Planning and working memory in medical decision support

Many decisions are made in the context of plans of action, where they may interact or conflict with other planned actions or anticipated events. Decision making in planning makes heavy demands on working memory. This has been well documented using the Tower of London and Tower of Hanoi tasks. In contrast, its involvement in solving more practical problems is under-investigated. In this experiment, participants were asked to generate plans to reduce the risk of a patient contracting a hypothetical disease. External representations play a significant role in reducing cognitive load, with well-designed interfaces removing much of the burden on memory and freeing capacity for planning itself. Levels of support were therefore manipulated within a graphical user interface. Problems varied in memory load, introducing different levels of constraints, dependencies, and interactions. The participants receiving most support made significantly more interactions with the interface and generated more successful plans. No significant differences in working memory span emerged between the support conditions, thus eliminating span differences as a potential explanation of the results. Providing interface support would appear to permit memory offloading and the reallocation of resources to planning processes, leading to the formulation and execution of more effective plans. Practical applications are discussed.

24.4 Schink

Tania Schink, Michael Böhmig, Chin Hur, Inga Koch, Klaus-Dieter Wernecke, & Uwe Siebert, Humboldt University, Berlin; Harvard Medical School

Decision Analysis on diagnostic procedures for detecting pancreatic cancer and assessing resectability

We compared the performance of various imaging procedures in assessing diagnosis and resectability in patients with suspected pancreatic cancer (PC). We examined data from a prospective study of 204 patients with suspected PC who were enrolled at the Charité-University-Hospital from 08/1999-11/2001 and underwent each of the following six diagnostic examinations: ultrasound (US), magnetic resonance imaging (MR), computed tomography (CT), endoscopic ultrasound (EUS), fluorodeoxyglucose-positron-emission-tomography (PET), and endoscopic-retrograde-cholangio-pancreaticography (ERCP). We constructed a decision tree to predict diagnostic and resectability accuracy using the conditional probabilities derived from our study and evaluated 44 strategies comprising strategies based on single tests and combinations of two tests. As both correct diagnosis and resectability assessment are crucial for an adequate treatment plan, we sought to maximize the number of patients having both the diagnostic and resectability state correctly classified. In the base-case analysis, all six strategies with MR as first test were under the best seven. The strategy 'MR followed by ERCP for positive results' performed best, correctly classifying 78% of patients closely followed by 'MR alone' with 77% of patients correctly classified. Our analysis suggests performing MR first is the best strategy for patients with suspected PC in a high prevalence, specialized medical centre setting. Depending on patient characteristics and clinical considerations, positive results should be confirmed by ERCP or CT.

24.5 Kerstholt

José Kerstholt, TNO Human Factors

Disability assessments: effects of non-verbal behaviour and experience

Through social insurance, workers receive compensation when they are losing (part of) their income due to disability. The present study analysed to what extent non-verbal behaviour affected doctors' disability assessments and whether this effect was different for experienced and inexperienced doctors. An experiment was conducted with 23 medical doctors (12 male and 11 female), who were required to assess disability of a videotaped client. Two different actresses, with different non-verbal (assertive or meek), but exactly the same verbal behaviour played the client. The results showed that only female doctors considered the assertive client less disabled than the meek client. There was no effect of experience on the assessment of disability. It is suggested that doctors only took subjective aspects, such as dealing with pain, into account when the client's behaviour corresponded with not being able to work. It is not clear why the effect of impression was only found for female doctors. A possible explanation is that only female doctors used non-verbal cues in assessing disability.

Paper Session 25 Time discounting II

25.1 Attema

Mohammed Abdellaoui, Arthur Attema, & Han Bleichrodt, CNRS-GRID, ESTP & ENSAM-Paris; Erasmus University, Rotterdam

A new method to elicit time preference

In this paper we report the results of an experiment in which time preference was elicited. The first aim of this paper is to give a method to elicit time weights in a nonparametric way. The second aim is to test the descriptive validity of different models of discounting over multiple periods. The main novelty of the paper is that we adjust discounting behaviour for utility without making parametric assumptions about the utility function. An important finding is that assuming linear utility does not seem to be very problematic. Hyperbolic discounting models seem better able to explain the results than the constant-rate discounted-utility model. Further, the gain-loss asymmetry diminishes somewhat when comparing utilities.

25.2 Diecidue

Mohammed Abdellaoui, Enrico Diecidue, & Ayse Öncüler, CNRS, ENSAM, ESTP; INSEAD

An empirical test of Expected Utility Theory over time

Empirical studies show that individuals generally overweight small probabilities and underweight large ones (Kahneman & Tversky, 1979). This phenomenon is captured by an inverse S-shaped probability weighting function in risky choice models. This paper proposes to analyse the shape of the weighting function in the domain of intertemporal choice under risk. We elicit time and risk preferences simultaneously. Our goal is to test if individuals treat probabilities linearly (as predicted by expected utility theory) in choice over time or whether a nonlinear transformation of probabilities would be a better fit. We find that the further the outcomes are in time, the less the probabilities attached to the outcomes are transformed. We provide psychological explanations for the findings, we analyse their implications for the elicitation of time and risk preferences, and we discuss a descriptive theoretical framework of risky choice over time.

25.3 Onay

Selçuk Onay & Ayse Öncüler, INSEAD

Intertemporal choice under timing uncertainty: An experimental approach

Most of the real life decisions require trade-offs among costs and benefits occurring at different points in time and, often, decision makers do not know exactly when these future costs and benefits will accrue. Notwithstanding, until now, behavioural studies on intertemporal choice largely ignored the effects of uncertainty regarding the timing of payoffs on the choice behaviour of individuals in those decisions into which time enters. In order to close this gap, in this article we tried to shed some light on the effects of introducing uncertainty in the time domain and studied how people make intertemporal tradeoffs and discount future payoffs when the timings of these future payoffs are not known with certainty at the time the decision is made. First we examined the timing uncertainty problem analytically to provide a benchmark for the experimental analysis. Next, in a series of within subject design experiments, we have shown that individuals do not behave as predicted by any of the existing intertemporal choice models which assume additive separability across time periods and linear probability functions. Finally, based on the systematic patterns revealed by our data, we propose some new directions in modelling of intertemporal choice behaviour.

25.4 Öncüler

Ayşe Öncüler & Serdar Sayman, INSEAD

"Reverse" time inconsistency

Time-inconsistent preferences refer to cases where individuals state preferences for a particular option in the future, but as the date approaches, they shift to some other alternative. Previous experimental findings on dynamic inconsistency are all in the same direction: a decision maker prefers a later and superior prospect over an earlier and inferior one at the outset, but prefers the earlier one as it becomes imminent. In this paper, we provide evidence for an interesting contradiction. A person may sometimes exhibit a time inconsistency in the opposite direction, planning to choose a smaller-earlier reward to a larger- later one (both in the distant future), but switching to the latter as they draw nearer. This intertemporal preference pattern, to our knowledge, has not been reported before. We use the term "reverse time inconsistency" to designate this phenomenon, and present evidence from a number of empirical studies. Our findings suggest that reverse time-inconsistency is not an artefact, or does not take place only in special contexts. We provide a speculative discussion about possible reasons for this divergence in responses.

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P01 Aagaard

Lisbeth Aagaard, City University, London

Age differences explored in the susceptibility to the Sunk Cost Effect

The sunk cost effect is an irrational economic behaviour, which is manifested in a greater tendency to continue an endeavour once an investment of time, money, or effort has been made (Arkes & Blumer, 1985). Only a handful of exploratory studies have been carried out to investigate age differences in the susceptibility to the sunk cost effect and findings have been mixed. Baron, Granato, Spranca, and Teubal (1993) found no relationship between age and the propensity to commit the sunk cost fallacy. In contrast, studies by Krouse (1986) and Webley and Plaisier (1998) indicated that older children were less able to ignore prior costs when considering future costs and benefits. However, Klaczynski and Cottrell (2004) found that the younger the participant the greater the effect of past costs on future expenditure. It is the aim of the present study to further investigate age differences in the manifestation of the sunk cost effect whilst controlling for methodological issues such as small sample sizes, high demand on imaginary abilities, and reasoning about unrealistic monetary investments, which may have influenced results from earlier studies.

P02 Abele

Susanne Abele & Garold Stasser, Erasmus University Rotterdam; Miami University

Social Implications of coordination: Matching versus mismatching

The value associated with an action often depends on what others do. Sometimes, matching others' actions is mutually beneficial (e.g., reciprocated romantic choice). In other contexts, avoiding others' actions (mismatching) is mutually beneficial (e.g., team members choosing tasks). Successful tacit coordination is thought to foster positive regard for an anonymous partner. However, matching and mismatching may have different social implications. Doing the same thing underscores social unity and shared characteristics whereas doing different things differentiates individuals. We investigated the effects of matching and mismatching on social perceptions by having participants play a simple coordination game for ten rounds. We varied the coordination requirement (matching versus mismatching), the coordination success (successful versus unsuccessful) and the earnings associated with the outcome of the game (high versus low). After playing, participants rated their partner's intelligence, how much they liked their partner. Players who successfully coordinated liked their partner more than those who were unsuccessful. The effect of coordination success on liking was pronounced under high reward. Also, players who were trying to match liked their partners more than those who were trying to mismatch. Player also rated their partners as smarter when they successfully coordinated than when they did not.

P03 Andersson

Patric Andersson, Mannheim University, Germany; Stockholm School of Economics

Overconfident but yet well-calibrated and underconfident: A research note on the link between different measures of calibration

Recently, studies in economic and financial literature have tried to empirically relate overconfidence to stock-trading by using transaction data and the overconfidence-measurement of Russo & Schoemaker (1992), henceforth R&S. Given its limited number of items, such a measurement might, however, lead to weak conclusions, as research shows that overconfidence is dependent on samples of items, response-format, and individual differences. Based on observations from 48 students, this paper investigates how different ways of measuring overconfidence are related. Besides answering the R&S-measurement, the students stated (1) expected course-performance and associated confidence, (2) 90-% interval of expected course-performance, (3) expected exam-scores and associated confidence, and (4) confidence in receiving credit on the exam. 59% of all intervals regarding the R&S-measurement fell outside the correct answers. 55% of the students expecting to perform above average did that. Expected course-performance and exam-scores matched the actual ones. 87% of the students gave intervals covering actual course-performance. Mean confidence in receiving credit equalled almost the percentage of awarded credit. R&S measurement correlated only with expected exam-scores ($r_s = -0.29$) and confidence in expected course-performance ($r_s = 0.43$). The paper concludes that the students tended, at the same time, to be overconfident, well-calibrated, and underconfident.

P04 Rohde

Arthur Attema, Han Bleichrodt, Kirsten I.M. Rohde, & Peter P. Wakker

Maastricht University & Erasmus University

Measuring and quantifying deviations from stationary time preferences

Because of the many empirically observed violations of stationarity, the central condition of the constant discounting model, alternative discounting models have become popular, primarily the hyperbolic discounting model. Prelec (2004) introduced a theoretical measure of non-stationarity, which allows for comparisons of subjects according to their degree of deviation from stationarity. This measure uses the second derivative of the logarithm of the discount function, which is hard to obtain in practice. We show that, surprisingly, this index can be inferred directly and very easily from observed preference, and that simple graphs of the index can immediately be obtained from data, even using only paper and pencil and no calculation device. The main novelty in our measurement method is that neither assumptions nor information about utility of outcomes is required to measure time preference. We introduce a new index, the hyperbolic factor, which precisely captures hyperbolic measures and can also be easily inferred from preference data. In an experiment, we measure the various indexes of deviations from stationarity and order subjects according to how much they deviate from stationarity. A pilot study confirmed the feasibility of our measurement method.

P05 Bagassi

Maria Bagassi & Laura Macchi, University of Milan

Pragmatic approach to decision making under uncertainty: The case of the disjunction effect

The disjunction effect (Tversky and Shafir, 1992) occurs when decision makers prefer option x (versus y) when knowing that event A occurs and also when knowing that event A does not occur, but they refuse x (or prefer y) when not knowing whether or not A occurs. This form of incoherence violates Savage's (1954) sure-thing principle, one of the basic axioms of the rational theory of decision-making. The phenomenon was attributed to a lack of clear reasons for accepting an option (x) when the subjects are under uncertainty. Through a pragmatic analysis of the task and a consequent reformulation of it, we show that the effect does not depend on the presence of uncertainty, but on the introduction into the text-problem of non-relevant goals, in both the notorious Gamble problem and the Hawaii problem.

P06 Bereby-Meyer

Yoella Bereby-Meyer & Brit Grosskopf, Ben-Gurion University of the Negev, Israel; Texas A&M University, USA

Overcoming the Winner's Curse: An adaptive learning perspective

Decision makers in competitive situations tend to ignore valuable information about the decisions of their opponents and consequently fall prey to the winner's curse. Past research has shown, using the "Acquiring a Company" task, that people do not overcome the bias even after they receive extensive feedback. We suggest that the persistence of the winner's curse is due to a combination of two factors: variability in the environment that leads to ambiguous feedback (i.e., choices and outcomes are only partially correlated) and the tendency of decision makers to learn adaptively. We show in two experiments, that by reducing the variance in the feedback, either by averaging the payoff, or by reducing the probability of getting a positive reward while bidding, thereby increasing the correlation between choices and outcomes, performance can be significantly improved

P07 Berg

Nathan Berg, Centre for Adaptive Behaviour and Cognition, Max Planck Institute for Human Development, Berlin; School of Social Sciences, University of Texas at Dallas

On the impossibility of normative valuations of information based on its intrinsic properties

What makes one piece of information more valuable than another? The answer is an emphatic, "It depends." This paper analyses the problem of how to rank costly information in the context of a simple binary choice problem with discrete-valued predictors. Information-ranking criteria commonly used in the judgment and decision making literature such as predictive success, discrimination, conditional prediction and statistical validity, are shown to produce inconsistent rankings despite their intuitive appeal. The proof of weak logical links among metrics for assessing the value of information demonstrates that context-specific features of the decision-making environment determine which rankings thrive in competition. For example, the size of information costs relative to payoffs for different types of correct prediction determines how ecologically successful decision rules trade off accuracy against discrimination when selecting signals to condition on. Thus, ecological rationality is better than universal consistency axioms or metrics derived solely from the intrinsic attributes of information sets as a basis for making normative claims about how to choose and use information. This provides much wider scope for institutions, both formal and informal, to influence the cost and consequent value of information.

P08 Cillo

Han Bleichrodt, Alessandra Cillo, & Enrico Diecidue, Erasmus University Rotterdam, INSEAD, INSEAD

Eliciting the regret function through the Trade-off Method

In the last twenty five years, nonexpected utility theories have been developed to account for the empirical violations of the classical expected utility paradigm. Regret theory (Bell 1982, Loomes & Sugden 1982, 1987) is one of the most popular nonexpected utility theories. According to regret theory, an individual - when evaluating risky prospects - incorporates regret (or rejoice) that she will experience by comparing the outcomes she gets with the ones she could have gotten having chosen the alternative prospect. This feeling is modelled through the regret function. In this paper, we present a quantitative elicitation of the regret function through the trade-off method (Wakker & Deneffe 1996), one of the most robust methods for eliciting individual utility functions. We test whether the regret function has a convex shape as the theory predicts.

P09 Blom-Kemdal

Anna Blom Kemdal & Ulrika Ivarsson, Lund University

Intuitive decision making by leaders of small businesses

The concept of "intuition" has not received a lot of attention in academic psychology, and there is still not a broad agreement on what it is and what it might be good for. An explorative study was made in order to find out what intuition is perceived to be by the people who use it. Is intuition something that leaders of small businesses find important? Do they use it in their own decision making? Are they satisfied with using intuition? How do they define intuition? Are there any differences between more and less successful companies, or between male and female leaders, in the use of intuition? These are some of the questions we tried to answer. A questionnaire study was conducted with 55 participants (39 male and 16 female), all of them owning their own small business in a small town in Sweden. They were asked questions about how much they use decision making, what other concepts (e.g. rationality, emotions, luck) they associated intuition with and how good they thought their own intuition was. The results showed that the businesses that had leaders with more use of intuition made a better economic profit than businesses whose leaders used less intuition. Another result was that there were no differences between men's and women's use of intuition, suggesting that the common belief about "female intuition" might be a myth, at least in the area of business-related decision making.

P10 Cojuharencu

Irina Cojuharencu, University Pompeu Fabra

A naturalistic study of remembered utility

Determinants of overall evaluations of temporally extended experiences became subject to scientific inquiry with the appearance of the notion of remembered utility (Kahneman, Wakker & Sarin, 1997). The present work tests empirically established regularities about remembered utility but, most importantly, explores the content of lay intuitions with regard to its determinants and possible meanings in interpersonal communication. The study of lay intuitions is performed with performance-based incentives and controlling for the saliency of the experience. We build a typology of intuitions and investigate the extent to which people intuit certain scientific findings. Experiences are shown to be complex perceptual objects. We discuss the implications that the structure of perception has for the evaluation of experiences and the communication of preferences over them, and propose new avenues for research.

P11 Cowell

Frank A Cowell & Guillermo Cruces, London School of Economics

Perceptions of risk: An experimental approach

We investigate the structure of individuals' rankings of uncertain prospects in terms of risk and their relationship to individual preferences. We examine three interlinked propositions that are fundamental to the standard economic approach to risk: (i) that risk-rankings respect the principle of mean-preserving spreads; (ii) that rankings by risk are simply the reverse of ranking by preference over distributions with a given mean; (iii) that risk-rankings are independent of whether the individual is personally involved in the gains/losses associated with the uncertain prospects. To do this we use a set of questionnaires implemented through the Virtual Laboratory, a novel experimental setting for the study of normative issues in experimental economics. The experimental design allows the identification of the effect of different types of questionnaire on the likelihood of answers in accordance to the theoretical axioms. It also helps identify the individual characteristics that might affect perceptions of risk. We find that a non-negligible minority of our respondents reject the mean-preserving spreads principle. Moreover, there are significant differences between rankings by preference and risk. We fail to find any effect of personal involvement in risk comparisons.

P12 D'Addario

Marco D'Addario, Gabriella Passerini, Valentina Sala, Laura Macchi, & Maria Bagassi, Università degli Studi di Milano Bicocca

An illusory conjunction fallacy: a pragmatic approach

In a recent study (2004) Tentori, Bonini and Osherson showed that the majority of subjects evaluate $\text{Prob}(X \text{ and } Y) > \text{Prob}(X)$, thus proving a conjunction fallacy. The results of our experiments show that the answers of the subject, that should prove a conjunction fallacy, are caused by the problems used by the authors, which are not in conformity with the conversational rules: the elimination of the pragmatic anomalies from the texts used by Tentori, Bonini and Osherson leads to the elimination of the conjunction fallacy.

P13 Dartzalopoulou

Penny Dartzalopoulou & Fergus Bolger, University of Durham

Effects of mood on consumers' confidence, optimism and pessimism

Research has documented significant seasonality and noise in the Index of Consumer Sentiment (ICS). Our hypothesis is that these features are largely due to commonly experienced events- such as the weather and news items- affecting the mood of consumers, which then influence economic expectations as measured by the ICS. In this study it was examined how mood affects consumer confidence (as measured by the ICS), optimism and pessimism. The findings revealed significant correlations between mood and consumers' confidence on a personal level, and also significant correlations between mood and optimism regarding someone finding an amount of unexpected money in the near future. The results are compatible with previous research and provide evidence for the importance of mood in surveys that measure consumers' behaviours and attitudes.

P14 Davies

Greg B Davies & Stephen E Satchell, Trinity Hall, Cambridge University; Trinity College, Cambridge University

The Behavioural components of risk aversion

Risk aversion in EUT is relatively easy to characterise - it amounts to the concavity of the utility function. In CPT the certainty equivalent and risk premium of any gamble may be affected by loss aversion and decision weights, as well as the curvature of gains and losses. We introduce two variants of the risk premium - the total risk premium relative to objective expected value, and the subjective risk premium relative to perceived expected value - and derive general solutions to these for CPT. Employing Pratt's methodology we derive local approximate solutions and the sufficient conditions for risk aversion for each of these, and provide analogues to the Pratt-Arrow coefficients, showing how risk attitude depends on each behavioural component. We revise and extend earlier results of Levy and Levy (2002), which examined decision weights in isolation. Finally, we use an example of the distribution of US equity returns to illustrate how both the objective and subjective risk premia depend on CPT parameters. Behavioural models allow us to decompose risk measurement into more meaningful effects than has hitherto been possible, and also to be more precise about what the effects of a given change in behaviour will be.

P15 de Kwaadsteniet

Leontien de Kwaadsteniet, Cilia Witteman, & Nicole Krol, Radboud University, Nijmegen

The influence of experience on diagnostic decision making

We will present a free recall experiment with psycho-diagnosticians of different levels of experience. We expect that experience will not only increase task-relevant knowledge, but that it will also change diagnosticians' memory structures in a way which makes this knowledge more readily accessible. This change will lead to faster processing of client information, at a less detailed and more abstract level. Our 150 participants, with different levels of experience, were presented with an intake report. After reading it carefully, they were asked to write down what they recalled from the report. We measured the time they spent reading, the number of information items they remembered correctly and the number of items they incorrectly reported to have been presented. We will present the results and discuss the implications for diagnostic decision making processes.

P16 Engelberg

Elisabeth Engelberg, Stockholm School of Economics; Mannheim University

Determinants of rational and affective styles of consumer decision making: Money talks

The present study investigated the relation between rational and affective decision making styles, respectively, to money attitudes. A total of 142 undergraduate students filled out a questionnaire. Items were developed to measure decision making in consumer situations as based on rational thought and in response to affective/emotional reactions. Construct validity for the two scales was supported by correlations with subscales of the Decision Making Styles Inventory (DMSI; Nygren, 2000). Money attitudes were measured with items developed by Furnham (1984) that were factor analysed yielding three factors: (1) view on money as a symbol of prestige and status, (2) lack of self-efficacy in managing money, and (3) view on money as security. Two multiple regression analyses were performed. The analysis for rational style as the criterion variable showed a significant result, $F(1, 127) = 11.74, p < .0001, R^2 = .22$, and that all three factors made a significant contribution. The analysis for affective style showed a significant result, $F(1, 127) = 11.15, p < .0001, R^2 = .21$, and that the first money attitude factor was the most powerful predictor. Results suggest that beliefs about money determine the adoption of decision making style as discernable in self-reports on consumer behaviour.

P17 Fischer

Ilan Fischer & Oriel Sullivan, University of Haifa; Ben Gurion University

The evolution of time-use vectors: Using genetic algorithms to model complex decisions

Time use vectors are formal descriptions of activity choices (such as paid work, unpaid work, and leisure activities) performed along the diurnal cycle. They are behavioural solutions that attempt optimizing personal preferences and external constraints. The present study uses a Genetic Algorithm (GA) based computer simulation to reconstruct empirically-observed behaviours, and model the joint impact of individual preferences and externally imposed constraints. Seeding the simulation with random data and three empirically derived probabilistic decision rules, we produced an archetypal society with the same essential characteristics of time-use as those revealed in the empirical data itself. While we do not yet regard any of the converged data sets as specific forecasts, the simulated data offers important insights for the study and modelling of complex decision making. It shows that complex patterns reflected in time-use behaviour can be captured by a GA that models the joint function of personal preferences and externally imposed pressures. The combination of a relatively simple 'bottom-up' approach with the utilization of accessible empirical data seems capable of producing meaningful forecasts, furthering our understanding of the dynamic nature of complex decision making.

P18 Forrest

Damien Forrest, Khibza Hussain, Samaira Khan, & Nigel Harvey, University College London

Judgemental control performance: constraints on transfer

People often have to use their judgement to decide how to alter some feature of a situation to ensure that a desired outcome is obtained. For example, for certain diseases doctors need to determine the dosage of some drug that will be sufficient to control the patient's symptoms without causing too many side-effects. This research aims to answer two questions in relation to judgemental control performance. First, what system characteristics predict performance and learning? Second, under what conditions does transfer occur between task variants? Participants were presented with a computerized task, based on a simple nonlinear equation. Transfer was investigated using two levels of system complexity (degree of non-linearity) crossed with two frames (a medical and a satellite task). Participants were required to gain control over the system's output (i.e. stabilise the patient's heart rate or reach and maintain a prescribed orbital path) by controlling the level of an input to the system. Participants were able to learn to control the systems at both levels of complexity. Transfer from one level of system complexity to another within a task frame was found for both frames. However, transfer across task frames occurred only at the low level of task complexity. The research suggests that the complexity of cues in the task environment directly influences task performance, but does not necessarily predict transfer across frames. Transfer across frames suggests an understanding of the underlying structure relationship defining the task environment. The transfer within frames maybe explained in terms of the degree of similarity of the task variants within a frame.

P19 Gross

Amira Galin, Miron Gross, Sigal Sapir, & Irit Kela-Egozi, Tel Aviv University

The Endowment Effect in individual and group negotiations of academic chores trade-off (A.C.T.O.)

The present study aimed to investigate the Endowment Effect in teams, when negotiating intangible items, such as intellectual resources and time invested in academic chores. The first stage of the study has shown the existence of the Endowment Effect when individuals were engaged in similar negotiations. The investigation focused on the trade-off negotiated by students between advanced courses and seminars, which we term the Academic Chores Trade-Off (A.C.T.O.). The results clearly showed the existence of the Endowment Effect also when 3-members teams negotiated the above intangible items (A.C.T.O.). Moreover a significant enhancement of the Endowment Effect was observed when teams replaced individuals as the negotiating agents. These findings and consequent important applications are being analysed and discussed.

P20 Garcia-Retamero

Rocio Garcia-Retamero & Esther López-Zafra, Max Planck Institute for Human Development, Berlin; University of Jaén (Spain)

Choosing a leader partner: Factors that influence class-mate preferences

Several authors pointed out that there are different factors that have a significant influence on leadership emergence (see Eagly & Karau, 2002 for a review). Specifically, Avolio and Bass (2002) suggested that transformational leaders, that is, leaders that are established as role models by gaining the trust and confidence of the group members, are able to transmit their own emotions about their expectations, work, and vision to their followers. However, so far, the relationship between transformational leadership and emotional intelligence has not been tested empirically. Even more, in an informal context such as a classroom environment, emotional intelligence and leadership style might also have an important role on whether a certain partner is preferred over the rest. To test these hypotheses, we run an experiment. The main aim of our study was to analyse whether individuals high on emotional intelligence emerged more frequently as leaders and whether they were more transformational on their leadership style. Our results showed that those participants that were high both on comprehension and regulation of emotions emerged as leaders more frequently and scored higher on transformational leadership. We emphasize the role of emotional intelligence and transformational leadership on both a constructive group dynamic and the emergence of a leader in an informal context.

P21 Gloeckner

Andreas Gloeckner, University of Erfurt

The empirical validity of TTB for memory based decisions

Gigerenzer and colleagues put forward the adaptive toolbox model and particularly the Take-The-Best Heuristic (TTB) as model for decisions which are based on probability cues. Recently it has been shown, that TTB is not a valid model to describe decisions which are based on direct information presentation. However, by now only few experiments were carried out to test the validity of TTB for inferences from memory. Three experiments were conducted to investigate this question using the city-size paradigm and ecologically valid stimulus material. In the first experiment it was found that with implicit time-pressure most participants did use compensatory decision rules instead of TTB (61% vs. 39%) also for inferences from memory. In the second experiment the introduction of high explicit time-pressure by using a countdown bar lead to a clear increase in choices that followed TTB (21% vs. 79%). In the third experiment time-pressure was manipulated between subjects. Under low (12s) and medium (6s) time-pressure experiment 1 and under high time pressure (3s) experiment 2 could be replicated, leading to the conclusion that the validity of TTB as predominant heuristic for inferences from memory should be questioned and that alternative parallel processing models better account for the evidence.

P22 Haberstroh

Susanne Haberstroh & Cornelia Betsch, International University Bremen; University of Heidelberg, Germany

Attribute weight and evaluation in decisions under certainty – independent concepts?

In prescriptive decision theories, such as the Multi-Attribute Utility Theory (MAUT), the optimal decision is generated in four steps: (1) Evaluate each alternative on each attribute, (2) Assign relative weights to the attributes, (3) Combine the attribute weights and evaluations to yield an overall evaluation of each alternative, (4) Choose the alternative with the highest overall evaluation. In MAU Theory, evaluation of an alternative on a given dimension and the weight of the dimension are assumed to be independent concepts. We will present two experiments, which cast doubt on this assumption. In a questionnaire study, the importance of dimensions in everyday decisions was manipulated experimentally. In the second experiment, we employed a computer-based decision tool (ADELE) for a complex decision scenario. In both data sets we find that the evaluation of attributes is influenced by the weight of the dimension: The more important the dimension is, the more pronounced are the evaluations of attributes. A positive (negative) attribute is judged more positive (negative), if the underlying dimension is important than when it is less important. We will discuss these data with respect to the predictive power of MAU-theory.

P23 Hagmayer

York Hagmayer & Steven A. Sloman, University of Goettingen; Brown University

Causal models of decision making: Choice as intervention

Causal considerations are obviously relevant for making good decisions. Actions should only be taken if they increase the probability of a desired outcome, but if they are merely correlated with the outcome. Nevertheless, traditional decision theories like evidential expected utility theory do not have the means to distinguish amongst different types of evidential relations. As a result, they fail to distinguish cases where a choice influences consequences from cases where a choice does not affect consequences even though they are correlated. Therefore a causal model theory of choice is introduced built on the causal Bayes net framework. The theory claims that people decide using causal models of the decision situation. Causal models differentiate between causal relations and the spurious relations implied by these causal relations. Choice must be represented as an intervention. Based on the causal model the consequences of the available options are computed. Decisions are based on the resulting causal expected utilities. Predictions of the theory were tested in three experiments using Newcomb's Paradox. Participants received identical evidential relations which either reflected direct causal relations or were implied by other causal relations. The results supported the theory. Participant's decisions were based on causal models rather than evidential relations.

P24 Hausmann

Daniel Hausmann & Damian Läge, University of Zürich

Demanding on subjectively certain judgements: How desired level of confidence influences the stopping rule of information search

Judgements and decisions under uncertainty are frequently linked to a prior sequential search for relevant information, followed by a rule how to use this information when choosing one of the alternatives. The relevance of the stopping rule has until now received little attention in judgement and decision-making research. We report two experiments in which a threshold model with the desired level of confidence (DLC) was tested against other models. Experiment 1 shows that the termination of the information search in each participant can only be explained through the consistent deployment of an individual DLC. Experiment 2 shows that the DLC, once set, is flexibly adapted to the changed parameters of the situation. A criterion model with the moderating variable "desired level of confidence", whose degree is influenced by situation-specific factors, can better account for a person's judgement process than an unspecific judgement heuristic or decision rule.

Keywords: decision-making, information search, stopping rule, sufficiency principle, degree of confidence, "Take The Best" heuristic, probabilistic cue, validity.

P25 Hiemisch

Anette Hiemisch & Rainer Westermann, University of Greifswald

Decision conflicts and dominance structuring

Two studies investigated variables moderating the extent of dominance structuring. Students of business administration had to choose a new employee for a software company among four candidates. Realistic application documents were presented on a computer and the candidates differed in regard of six job-relevant attributes. In Study 1 (N = 62) half of the subjects expected to have to justify their decision in a discussion with a professional business manager. While both groups engaged in dominance structuring, the manipulation had no effect, neither on the revaluation of attributes, nor on the time spend to examine the application documents. Study 2 (N = 35) applied the concept of regulatory focus. Subjects with a promotion focus showed pronounced dominance structuring. However, memory for the attributes of the chosen candidate was better for subjects with a prevention focus. The results are discussed applying different conflict models of decision making.

P26 Huysentruyt

Marieke Huysentruyt & Daniel Read, London School of Economics; Durham Business School

Insurance decisions of the very poor: a field study

It is often assumed that it is irrational to buy an extended warranty. However, psychologists point to the importance of anticipatory emotions, and have highlighted the emotional benefits, such as peace of mind, that insurance brings and that might well justify its extra cost. Our research aims to adjudicate between these points of view. In particular, we look at the insurance decisions of the very poor, because these people are heavily targeted by insurance companies, and are the heaviest consumers of extended warranties and other small-scale insurance products. We investigate whether these people buy insurance because of its monetary value, or because of the emotional benefits it brings. We conducted a field study of 160 unemployed residents of the poorest municipality in Belgium. They were interviewed at the unemployment office by members of a non-profit organisation who they knew well and trusted. Each respondent made a hypothetical choice of one washing machine from a set, and then stated: (a) The fair price for an extended warranty for 1 through 5 years, (b) The likelihood the washing machine would break down in each year, (c) The cost of repairing the machine once, (d) Whether they would buy insurance at their stated fair price. Overall, estimated fair prices were higher than the actuarial value of the insurance. For short-term insurance, the estimated fair price was correlated with cost of repair and the probability of breakdown, but for longer-term insurance, it was correlated with only the cost of repair. This suggests, in line with other research, that people are less sensitive to probabilities than costs when evaluating judgements about risk.

P27 Jacklin

Rosamond Jacklin, Nick Sevdalis, & Charles Vincent, Imperial College, London

Heuristics, biases and ...gallstones: how do surgeons decide to remove your gallbladder?

Surgeons, in conjunction with their patients and colleagues, have to make risky and irreversible choices, often under conditions of uncertainty about outcomes. Identifying common decisions encountered in the process of providing surgical care (together with contextual information, underlying judgments and relevant cues) helps develop an overview of a care pathway from a decision making perspective. In this study, an interview was structured around the pathway through secondary care taken by patients with symptomatic gallstones. 10 experienced surgeons answered questions about what decisions are taken with such patients at all stages of their care. Details of cues relevant to each decision were elicited. The information collected was used to construct a "decision map" of the process of care for these patients, incorporating decision nodes, probability judgments and relevant cues. Despite being considered a relatively straightforward and routine surgical problem, the study revealed a surprisingly high degree of complexity in the care pathway in terms of the number of decisions involved. In addition, there was considerable variability between individuals as to the number of decisions elicited, which cues were considered useful and the explicit personal rules that were applied.

P28 Jacobs

Eefje Jacobs, Johan Goethals, Hans Vertommen, & Geert Vervaeke, Catholic University, Leuven

Analysis of prison staff decision-making in relation to conditional release

Scientific research on conditional release decision-making processes in prisons is at present focused on two topics: conditional release decision making by parole boards and accuracy of decision making. The latter relates to prediction research. Conditional release decision making of parole boards is essentially focused on the effects of decision making processes (outcome) and not on the decision making processes itself. Secondly we can conclude that primarily decisions of final judges are studied and less those of advisers. Finally, dynamics of the decision-making processes are not studied at all. The aim of this study is to examine the actual parole decision-making processes of the prison staff committee by studying the practical field. Considering the complexity of the field we started with an exploratory study and gathered data through document analysis, observation and interview. Results show that these meetings of conditional release are a terminal point in a chain of decision-making processes starting way before. Moreover the psychosocial service plays the most important role in preparation and advising. This leads us to the conclusion that future research should focus on these members and study their decision-making process to get a complete and accurate picture.

P29 Kamleitner

Bernadette Kamleitner, University of Vienna

"Sunk utility": Fearing to lose what one does not even have. Behavioural consequences of elaborating on non-possessions.

Several studies show that increased elaboration on a product can lead to a sense of ownership before actually owning the product. Deriving utility from a good before possession - 'sunk utility' - is proposed as the underlying mechanism. It is argued that 'sunk utility' induces anxiety to lose the imagined possession and stimulates increased efforts towards getting a good not actually possessed. Results of an experiment with 136 participants show that 'sunk utility' can be evoked by mental elaboration. 'Sunk utility' leads to an increased willingness to pay and to an increased willingness to use credit in order to obtain the good.

P30 Kaufmann

Martina Kaufmann, University of Erfurt

Information integration and the power of the sample

There is ongoing debate on the principle of information integration in judgement and decision making. The literature provides empirical support for both summation and averaging models. The present study investigates information integration in explicit attitude formation. Participants received return samples of several fictitious shares (attitude objects) which varied in their average, sum, number (Exp.1) and variability (Exp.2) of returns. As dependent variables, evaluative judgements toward the shares and perceived reliability of the return samples were assessed. The evaluative judgements reflected the averaging principle and an effect of size (number) and variability of the value sample. There was no impact of the sum of return values (no summation principle). Results provide evidence that the effects of the sample are mediated by its perceived reliability. Larger sample size and smaller sample variability lead to higher perceived reliability of the return sample and to a more positive evaluative judgement, based on it. We assume that sample size and variability cause a weighting of the global (averaged) value of the entity. Therefore we propose an extension of the weighted averaging model (e.g. Anderson, 1981) by including a global weighting parameter.

P31 Kleinveld

J. H. Kleinveld, VU Medical Centre

Attitude change towards prenatal screening: A differentiation and consolidation effect:

Does the attitude towards prenatal testing change when women are confronted with a decision about whether or not to have prenatal screening done? And how do these attitudes change after they have realised their choice? Women were offered prenatal screening or no screening in a randomised controlled trial. Questionnaires were filled in before prenatal screening was offered, after the offer and after the test result was known or at a comparable point in time. Attitudes towards testing their unborn child were measured using a self developed Attitude Scale.

Women showed differentiation in the direction of the decision they intended to make. Attitudes of women who were not certain of their decision and had had the test done became more positive, while scores of women who had no test done became slightly more negative. Women who acted as they intended, showed maintenance of their attitudes. When facing a decision about prenatal screening, attitudes change in the direction of the intended decision. If for some reason, women act in opposite to what they had planned, attitudes again move slightly in the direction of the realised decision. This is in line with Differentiation and Consolidation theory.

P32 Kobbeltvedt

Therese Kobbeltvedt, Wibecke Brun, & J. C. Laberg, University of Bergen; The Norwegian Defence Leadership Institute

Complex decision making and sleep deprivation

Cadets' planning and judgements were experimentally examined in four simulated rescue operations during military ranger training. We examined the effects of sleep deprivation (SD), affect, time pressure, and need for cognition (NFC) on cadets' planning of a rescue operation, and their self-judgements of security, probability of success, and quality of their plans. Rescue experts judged the cadets' plans with respect to the same three dimensions. In addition, time on task and number of procedural errors were recorded. The results suggest that NFC is related to better performance among sleep-deprived individuals, that procedural knowledge is fairly resilient to SD and time pressure, and that self-judgements seem more fine-graded than expert judgements.

P33 Kunz

Justus Julius Kunz & Michael Metz, University of Erfurt

Let's give Ellsberg some feedback - The effects of feedback based decision making on the Ellsberg Paradox

Since there seems to be a lack of empirical evidence for the existence of the well known Ellsberg Paradox the primary aim of this study was to examine whether the Paradox can be replicated. The second aim of the study was to investigate the role of feedback in the Ellsberg task. Moreover, we varied decision mode as an independent variable. Presentation of the Ellsberg task (description-based versus feedback-based decision situation) and decision mode (deliberative versus intuitive) were manipulated in a 2 X 2 factorial design. The results were unexpected as the Ellsberg Paradox could not be replicated under any condition. The manipulation of the cognitive mode did not show any effect. A follow-up study controlling for a slight change made to the original setting of the Ellsberg Task led to the same result. Decision makers faced with the paradigm do not seem to violate the expected utility theory as Ellsberg would have expected them to do. Thus the question whether the paradox can be replicated has to be doubted at this point.

P34 Kurzenhäuser

Stephanie Kurzenhäuser, University of Basel, Switzerland

Information pamphlets about cancer screening: Easier to understand with natural frequencies?

Several studies using text problems showed that natural frequency format facilitates statistical thinking, and it was suggested that the beneficial effects of this format should also transfer to other domains. The present study is one of the first attempts to test whether understanding of written risk communication – here, pamphlets informing about benefits and risks of mammography screening – can be improved by using the natural frequency format, as compared to a percentage format. Forty-seven women (age 40 – 70) read one of two versions of a pamphlet, one presenting statistical information as natural frequencies, the other as percentages. Understanding was measured by recall for nine statistics mentioned in the text, and by subjective comprehension. There was only a small effect of statistical format on learning from the pamphlets. Natural frequencies improved recall for four out of nine statistics about mammography screening, such as the reduced mortality rates due to the screening. There was no effect of format on subjective comprehension. Both versions of the pamphlet were evaluated positively, but one third of the women indicated a dislike for precise numerical information in mammography pamphlets, which could explain the overall low recall level in the study.

P35 Kurzenhäuser

Stephanie Kurzenhäuser & Katherina Eitel, University of Basel

Dietary decision-making: Simple strategies for choosing lunch

Dietary guidelines and health campaigns try to promote healthy eating by improving nutrition knowledge. Yet little is known about how nutrition knowledge is translated into everyday eating behaviour. This study aims to describe the strategies that students use when they choose lunch at the university canteen and to what extent information about the nutritional value of the food is relevant to them. 150 students received a questionnaire directly after they had chosen one of six main courses and were asked to explain how they arrived at their choices and what information from the environment they had taken into account (e.g., price, choices made by friends). Students reported relatively simple strategies, the majority either relied on just one cue or combined two to three cues in an elimination model. Affective information about the general attractiveness of a food was the most frequent type of cue used. Nutrition-related information ranked only fourth in overall reported frequency, but was mentioned more often by students who aimed to control body weight. Learning more about people's strategies in everyday dietary decision-making will allow us to better understand when nutrition knowledge is applied and how healthy eating can be promoted more effectively.

P36 Lan

Cherng-Horng Lan & Nigel Harvey, University College London

How would Savage frame Ellsberg's two-colour problem?

Savage's states-of-the-world representation of Ellsberg's two-colour problem (i.e., four disjoint combinations of the possible outcomes of drawing a ball from each urn) is opaque in the original phrasing of the questions. Hence it is of theoretical interest to investigate whether ambiguity avoidance (or the violation of the sure-thing principle) will be sustained when the four disjoint states of the two-colour problem are made explicit. Six studies were carried out to address this question by highlighting the correspondence between payoffs and the four states in each option. This was done either by rephrasing the questions (e.g., risky option: winning £100 on drawing a red ball from the risky urn and a black ball from the ambiguous urn or on drawing a red ball from each urn, otherwise nothing; ambiguous option: winning £100 on drawing a black ball from the risky urn and a red ball from the ambiguous urn or on drawing a red ball from each urn, otherwise nothing) or by presenting a table, which explicated the payoff-event matrices. The results show that, unlike the original two-colour problem, in which ambiguity avoidance was prevalent, the modified presentations weakened ambiguity avoidance and encouraged participants to obey the sure-thing principle.

P37 Öhlmer

Daniel Lunneryd & Bo Öhlmer

Influence of values on decision making – the case of farmers' choice of organic production

The profitability of Swedish farms is decreasing drastically. Many Swedish farmers face the decision if they should continue as farmers and, if so, what to produce. Farmers' value structure differs, but little is known about their values and the influence of values on this type of decisions. The aim is to explain the influence of values on unique decision making, using the case of farmers' choice of production alternatives. Literature and case studies are used in order to generate a hypothetical model. Data are collected by a questionnaire. The hypothetical model is estimated with path analysis, the Maximum Likelihood estimator and simultaneous equation modelling. The value structure affects the choice of information sources, intensity in information search as well as way of processing information, forecasting and evaluating consequences. The higher the problem is evaluated, the higher the probability of implementing the choice. Farmers and their advisors have to be aware of the influence of the value structure on the decision making process, so they can compensate for illogical influence of the values. Also values other than to maximize profits have to be considered. The advisors have to be aware of their clients' value structure to be able to advise them.

P38 McColl

Andy McColl, University of Durham Business School

Choice, framing & cognition

Risky choice framing effects have received some considerable attention in the decision-making literature. These effects are dependent upon several arguably problematic assumptions (people are risk averse for gains and risk seeking for losses; options in a dichotomous choice dilemma are seen as formally equivalent; human decision-making can be successfully modelled upon a gambling analogy – the aleatory principle). None of these assumptions are sufficient to fully account for risky choice framing. Instead, we propose that people relax the aleatory principle in informationally rich and ecologically valid tasks, and make decisions consistent with image theory constructs (Beach, 1990) mediated by individual differences. Image theory does not rest upon the aleatory principle, and encompasses a wider conceptualisation of framing than prospect theory (Kahneman & Tversky, 1979), or Probabilistic Mental Models (PMM), (Gigerenzer et al., 1991). Need for Cognition examines the propensity for individuals to engage in effortful and analytical thought, those scoring less

P39 McKenzie

Craig R. M. McKenzie, University of California, San Diego

Further tests of an information leakage account of attribute framing effects

Levin and Gaeth (1988) found that describing ground beef as "75% lean" rather than "25% fat" led participants to rate it as leaner, of higher quality, and less greasy. Evidence is presented that supports an "information leakage" account of this framing effect: Subjects were more likely to describe ground beef as being "75% lean" (rather than "25% fat") when the beef was believed to be relatively lean than when it was believed to be relative fatty. Furthermore, subjects presented with the "75% lean" frame were more likely than those presented with the "25% fat" frame to infer that the beef was relatively lean. Thus, a speaker's choice of frame "leaks" relevant information to the listener -- in this case, whether the speaker believes the beef is relatively lean or relatively fatty -- and listeners "absorb" this information. The information leakage account explains the framing effect as the result of reasonable inferences by listeners. Interestingly, though, the effect almost disappeared when the different frames were presented in the context of an advertisement (rather than a conversation), indicating that listener's inferences are not "automatic." Instead, listeners were sensitive to the source of the frame.

P40 Miron-Shatz

Talya Miron-Shatz & Eduard Brandstätter, Hebrew University, Jerusalem; Johans Kepler University, Linz

Does living in Israel make one unhappy? Judgement processes of well-being

This study explored the processes by which people estimate their own happiness and that of others. A discrepancy emerged between the importance ratings assigned to aspects and the beta weights of these ratings (per se or multiplied by ratings of self-satisfaction with the aspect) as predictors of overall happiness. This indicates that people do not estimate accurately the utility they get from various aspects of their lives. For example, while financial status was rated very important to happiness, the beta weight for free income as predictor of overall happiness was miniscule. We suggest that judgments of happiness can be modelled by heuristics which simplify the cumbersome multiplication of importance and actual happiness ratings. Individual judgments of happiness are prone to the focusing illusion and to effects of self-enhancement. Israelis rated their self-satisfaction with security as significantly higher than the equivalent satisfaction for Israelis in general. Israeli self-satisfaction with security was also higher than what Austrians estimated it would be. People rated the importance of and satisfaction from eudaimonic aspects (e.g., doing meaningful things) higher than that of hedonic aspects (e.g., having a job). This suggests that meaning and self-realization should play a more central role in the measurement of well-being.

P41 Muehlbacher

Stephan Muehlbacher & Erich Kirchler, University of Vienna

The social dilemma of tax evasion: the role of prior effort in a public good game

According to findings on source dependence (Loewenstein & Issacharoff, 1994) working hard for one's own income should lead to higher valuation of the salary. A higher valuation and thus a steeper value function should increase the risk-seeking tendency in the loss domain (Kahneman & Tversky, 1979). Therefore, after a job involving high effort reluctance to pay taxes out of pocket should be especially high. While "classical" sunk costs theory (Arkes & Blumer, 1985; Thaler, 1980) makes similar predictions, there is also evidence for a "reverse" sunk costs effect resulting in risk-aversion, especially when these costs have been of behavioural nature, such as effort (Zeelenberg & van Dijk, 1997). A shift of the reference-point can explain the findings of a lower risk-seeking tendency due to behavioural sunk costs. The psychology of windfall gains (Arkes et al, 1994) supports a similar prediction of higher risk seeking in gambles involving low (or no) effort income. In the paper to be presented we report findings of a public good game, where half of participants in each session earned their endowments by effortful tasks and the other half received their endowments as windfall gain.

P42 Nilsson

Håkan Nilsson & Henrik Olsson, Uppsala University

Attention! Why learning paradigm influence subjective probability judgements

It has been found that when making judgments, people trained in an inference learning paradigm rely on prototypical features while people trained in a categorization learning paradigm rely on the diagnosticity of features. This has been taken as evidence that the two learning paradigms create qualitatively different cognitive representations. The present study addresses the question of whether the findings supporting this claim generalise to a design where, in contrast to previous studies, both learning tasks are probabilistic. The results showed that several of the findings previously attributed to differences in cognitive representation can be explained by how attention is focused in the different learning tasks. This suggest that single system models of judgment can account for the results in both the categorization learning task and the inference learning task.

P43 Olivola

Christopher Y. Olivola & Daniel M. Oppenheimer, Princeton University

How conceptions of randomness affect memory for random and non-random events

We examined how conceptions of randomness and non-randomness affect memory for random and non-random events. Memory is a fallible process involving active reconstruction of past events through the use of schemata (Bartlett, 1932). As a result, the process of encoding and recalling events from memory is analogous to the formation of judgments and forecasts, and may thus be subject to the same heuristics and biases. In this paper, we provide novel evidence that, when encoding and recalling sequences of random and nonrandom events, people use their beliefs about randomness (e.g., by relying on representativeness judgments), to reconstruct these sequences. In doing so, they exhibit biases similar to those that have been demonstrated in judgment and prediction. Participants memorized sequences of events that they were told were random or non-random, and then attempted to recall each sequence. Accuracy was affected by the beliefs that participants had about the randomness of the events they memorized. Taken together, these results provide evidence that our memory for events is malleable and subject to our beliefs about the extent to which the structure underlying the generation of events is random or non-random. Implications in the domains of both memory and judgment are discussed.

P44 Hongphisanvivat

Jaratpan Ongnununtakul & Somdee Hongphisanvivat, Thammasat University, Thailand

Modelling consumer socially responsible behaviours: An integrated approach

This study aims to propose a comprehensive yet parsimonious model of consumer social responsibility to capture the current consumer social responsibility phenomenon among Thai consumers. Data are collected in December 2004 by mall-intercept surveys of 471 Thai consumers in Bangkok. Socially responsible behaviours studied include buying environmental-friendly products, conserve energy and resources, recycling, not buying counterfeits or smuggled goods, buy domestic products, donating, and lobbying others to consume socially responsibly, etc. Structural equation modelling (LISREL) technique is employed to assess construct validity and test the model. Additional information is obtained by regression analysis. There are several significant findings. First, media influences directly increase consumer knowledge and indirectly strengthen attitude through social norm. Second, knowledge and attitude independently influence consumer socially responsible behaviours. However, the impact of knowledge is greatly affected by marketing variables; whereas, attitude is less affected. Third, the influence of attitude is mediated by social norm, contradictory to the Theory of Reasoned Action where attitude and social norm separately influence behavioural intention. Therefore, to encourage consumers to be more socially responsible, favourable marketing variables need to be provided first. Then, external influences like mass media should also be used to activate social norm and subsequently heighten consumer attitude.

P45 Pahl

Sabine Pahl, University of Erlangen

The effects of considering self or other in a competitive context: Would I bet on beating you?

People bet more money on winning in a knowledge quiz when questions are easy than when they are difficult. Moore & Kim (2003) have shown that this effect is reversed when participants take the perspective of their opponent. The present research examined the effects of activating self- or other-representations and of task difficulty on money bets. Participants answered either easy or difficult quiz questions and subsequently bet money on themselves beating an opponent. Study 1 manipulated self-activation through a self-description task and other-activation through a perspective-taking task. Participants bet more money in the self- than in the other-condition, and than in a control condition. Study 2 activated unspecific self- or other-concepts through a pronoun circle task and found that people in the self-condition bet more money than people in the other-condition. Participants in both Studies also bet more money on an easy than on a difficult quiz. Contrary to Moore & Kim, the difficulty effect was not reversed. After taking the perspective of an opponent, the effect remained and was indistinguishable from a control group. However, self-activation triggered higher bets. Results are discussed with regard to egocentric processes.

P46 Passerini

Gabriella Passerini & Laura Macchi, University of Milan-Bicocca

A pragmatic approach to the ratio bias

The ratio bias is an interesting phenomenon according to which probabilities, described in terms of ratios of small numbers, influenced subjects judgements differently from the same probabilities described in terms of larger numbers. Previous literature shown surprising findings, suggesting that people judge the occurrence of an event of low probability as less likely when its probability is represented by a ratio of smaller (e.g. 1 in 20) than of larger (e.g. 10 in 200) numbers. In the present work we conduct 6 experiments to indicate Ratio Bias phenomenon from a pragmatic perspective. The aim of the research is to develop a critical review of previous researches and to show that the cause of this phenomenon isn't the different formulation of the same ratio, but the construction of the text that lead subjects to produce answers consistent to the phenomenon. As predicted, the results of our experiments demonstrated that the elimination of the critical aspects of the text elicit objective answers, in contrast with what previous researches had shown.

P47 Pedron

Francesca Pedron & Donatella Ferrante, University of Trieste

Message framing and safety promotion in workplace: Risk perception and behaviour intentions

Prospect Theory proposes that people respond differentially to factually equivalent messages depending on how these messages are framed (Tversky & Kahnemann, 1981). Previous finding revealed that exposure to loss frame promotes detection behaviour (Meyerowitz, Wilson & Chaiken, 1991); but the influence of gain frame on preventive behaviours is inconsistent. The aim of this research is to examine the influence of message framing on intentions to perform safe behaviours in the workplace. We use two types of material: one about immediate risk, easier to understand, and one about cumulative risk, more difficult to understand and generally underestimated (Slovic, 2000). Affective reactions, risk perception and attitudes were measured immediately following the delivery of framed information. Behavioural intention to perform detective (complying with a screening) and preventive (request material and attending a conference) behaviours were collected with a redeemable coupon. Follow-up interviews were also collected. Obtained results shown that negative frame heightened risk perception and concerns about risk in workplace. Moreover, framing information seems affect intentions both for detection and prevention behaviours.

P48 Pleskac

Timothy J. Pleskac, University of Basel

Modelling sequential risk taking: Manipulations of learning

Laboratory-based gambling paradigms used for the clinical assessment of risk propensity require decision makers to employ learning and choice processes. Wallsten, Pleskac, and Lejuez (2005) modelled these processes and found that participants systematically misunderstood one such task. This paper evaluates, refines, and extends to a new paradigm these stochastic models. Data from the new gambling paradigm show that requiring participants to simultaneously learn about and complete the task only reduces its ability to identify individuals engaging in risky drug use. Results also support the conclusions that participants correctly represented the stochastic properties of the task, evaluated options prior to responding, and exhibited a trial-dependent bias in responding. Although prospect theory's weighting function accounted for behaviour between conditions, the value function correlated with risky drug use outside the laboratory. This approach has implications for improving both clinical assessment and theories of risky behaviour.

P49 Quesada

Jose Quesada, Nick Chater, Phillip Otto, & Cleotilde Gonzalez, Warwick University; Carnegie Mellon University

An explanation of decoy effects without assuming static, numerical attributes

Similarity and preference theories face similar problems but their methodologies vary enormously. In this paper, we illustrate how decoy effects, well known in the context of preferences, can also arise in similarity judgments between semantic (non-numerical) stimuli. People had to choose from a set of new stories the closest to a reference story, and were strongly influenced in their judgments by "decoy" stories. We discuss the consequences of the assumptions made by the JDM and similarity communities in explaining context effects.

P50 Reutskaja

Elena Reutskaja, Universitat Pompeu Fabra

Components of satisfaction in choice

Whereas classical economics argues that choice is always beneficial, recent studies indicate that large choice sets can be both extremely costly and demotivating. This paper explores the nature of satisfaction from choice as a function of characteristics of choice sets. Experimental evidence from four studies demonstrates that satisfaction is an inverted U-shape function of the number of alternatives. Moreover, visual presentation of the choices in terms of colour and form as well as individual characteristics of consumers affect satisfaction. Customers experience higher satisfaction when the alternatives in large choice sets are different in colour, whereas for the small sets customers may be more satisfied from alternatives in different forms. The studies also demonstrate that perception of variety is culturally-influenced. Consumers from Eastern Europe prefer greater variety than those from Western Europe. In addition, individuals who are aware of the existence of choice sets different from theirs are less satisfied with variety than those who do not possess such knowledge.

P51 Romu

Tom Romu, Marcus Johansson, & Carl Martin Allwood, Lund University

How can the level and realism of frequency (global) judgements be explained?

Research on the realism in judgements of the correctness of one's own memory performance has found that frequency judgements (estimates of overall accuracy) are given at a lower level than item specific confidence judgements. This holds both for general knowledge questions and for eyewitness memory. In contrast to previous explanations of this effect (e.g., an effect of a biased selection of items used), Liberman (2004) presented empirical support for that the level of the frequency judgements is due to that the participants do not correct for random guessing. Using two-alternative general knowledge questions, Liberman found that instructing the participants about the effect of random guessing led to a significant increase in the percentage of questions the participants considered to be correct. In the present study ($n = 112$) we analysed the effects of the three factors Instruction (similar to Liberman's), Format (whether the frequency judgements were given in absolute numbers or in proportions) and Difficulty level (easy/hard questions) on the level of the frequency judgements and on their realism (frequency judgement level – accuracy). We found that all three factors had a significant main effect on both measures. In addition, there were no interaction effects. Our results suggest that the level and the realism of frequency judgements are both affected by different factors.

P52 Rubaltelli

Enrico Rubaltelli, Ilaria Baghi, & Marcello Tedeschi, University of Modena

Decision utility and experienced utility: the importance of affect vs. quantitative attributes

Kahneman et al. (1997) defined two aspects of utility: decision utility and experienced utility. Not always decision utility and experienced utility are coherent; often individuals choose an alternative that is not the one they experience as the best.

In the present work we described that the influence of affect on the choice is stronger when an object has to be chosen than when the same object has already been used. In study one, participants in the decision utility condition choose more often the product described by high affect value and cheap price than the other one. Vice versa in the experienced utility condition participants choose more often the product described by low affective value and expensive price than the other one. Affect was manipulated changing the person giving the gift to the participants (boy/girlfriend vs. uncle/aunt). Price was manipulated using two different prices. In study two, we compared two different response tasks: choice versus rating. Results confirmed the hypotheses. In the rating condition, preferences were more influenced by the quantitative variable (price of the product) than by the affective value attached to the objects.

P53 Savadori

L. Savadori, S. Pighin, E. Barilli, R. Rumiat, & K. Tentori, University of Trento; University of Padova

Using comparison scenarios to increase risk comprehension

Increasing the comprehension of statistical information is a very important issue in physician-patient communication in view of improving informed consent and shared decision making. The efficacy of a verbal risk ladder technique on the individual ability to perceive the differences between risk levels presented in a numerical format (eg. 1 in 110, 1 in 770, 1 in 5390) was tested through a laboratory experiment. Following the paradigm adopted by Kunreuther, Novemsky & Kahneman (2001), the verbal risk ladder technique provides individuals with comparison scenarios located on the probability scale at two comparison points. The scenarios varied in the semantic relatedness with the target risk. Three-hundred-sixty individuals from the general population participated in the study. Results showed that both the infection scenario and the car.

P54 Shah

Anuj Shah, Leonard Green, & Joel Myerson, Washington University, St. Louis; Princeton University

Similarities and differences in the discounting of delayed rewards by humans and pigeons

Similarities and differences in the discounting of delayed rewards by humans and pigeons. It is usually assumed that adjusting-amount and adjusting-delay procedures provide equivalent estimates of the subjective value of delayed rewards. Recent data, however, suggest that humans discount delayed rewards more steeply on adjusting-delay procedures than on adjusting-amount procedures (Holt, Green, & Myerson, 2004), consistent with the delay/speed-up asymmetry reported by Loewenstein (1988). Temporal discounting plays an important role in theories of animal foraging just as it does in behavioural economics. Therefore, the present study examined whether adjusting-amount and adjusting-delay procedures also yield different estimates of discounting of delayed food rewards in pigeons. Temporal discounting functions obtained with both the adjusting-delay and adjusting-amount procedures were better fit by hyperbolic functions than exponential decay functions. Regardless of the form of the discounting function, however, there was no significant difference between the degree of temporal discounting obtained with the adjusting-delay and adjusting-amount procedures. The present results suggest that despite similarities in temporal discounting by pigeons and humans (e.g., in the mathematical form of the human and pigeon discounting functions), pigeons (unlike humans) do not show a delay/speed-up asymmetry when choosing between immediate and delayed rewards.

P55 Soliman

Abdrabo M. Soliman & Robert H. Logie. University of Aberdeen; University of Edinburgh

Working memory limitations and complex decisions under levels of uncertainty

In two experiments, doctors (at two levels of expertise) made hypothetical decisions for real-life medical problems for patient babies in ICU wards. In Experiment 1, storage capacity of working memory was loaded by increasing the amount of information in each scenario and participants were asked to remember as much information as possible while making choices. In Experiment 2, the Central Executive (CE) component of working memory (WM) was loaded by asking participants to perform a secondary task (random number generation) while making decisions. In both experiments, participants were making decisions with respect to three levels of uncertainty (low, medium and high). The results revealed that; (i) expertise played a prominent role in making medical decisions under uncertainty in terms of the amount of risk to be taken and decision time, (ii) the doctors were strongly influenced by the level of uncertainty under which they made decisions, (iii) increasing the level of risk increased decision time, which varied with the level of expertise, (v) overloading the storage capacity of working memory influenced decision time but did not influence risk taking, (vii) imposing demands on the CE component of WM strongly resulted in doctors taking more risky decisions, and increased decision time and (viii) the affect of the CE load varied with expertise and level of risk.

P56 Staaks

Janneke Staaks & Gideon Keren, Technical University of Eindhoven

Components of trust underlying clinical and statistical frames.

The main hypothesis of this presentation is that trust is conceived and interpreted differently in a clinical or statistical context. Trust consists of two main components: One, based on inter-personal confidence, in which intentions (for promoting common interests) play an indispensable role. A secondary component concerns competence and the reliability associated with it. We propose that trust in the clinical context is mainly based on the former component. In contrast, trust in the statistical context is seen more as reliability (in its technical meaning). The major difference between trust and reliability is that intentions constitute an essential component of the former but not of the latter. We report experiments conducted to test the meanings underlying trust, in a statistical and clinical context. Using different methodologies, our experiments consistently show that matters of trust are more compatible with a clinical context, whereas matters of reliability are more compatible with a statistical context. In the final discussion, these differences are linked to the conceptual differences between clinical and statistical information, and the manner in which they are processed.

P57 Sevdalis

Nick Sevdalis & Nigel Harvey, Imperial College London; University College London

“So, how does it feel like?” Interference effects in judgements of experienced post-decisional emotions

Not very much is known about the transition from pre-decisional affective anticipations to post-decisional affective experiences. In a first experiment, we asked participants to recall a decision of theirs that resulted in bad outcomes and to report their current emotional reactions to that decision. Half of the participants completed a diary detailing events contemporaneous with the recalled decision. Diary completion lowered the negative affect that participants reported. Arguably, diary completion helped participants to realise that, other than their convictions, various influences shaped the decisions. Equally plausible, however, is that interposing a task between recalling the decision and reporting the emotions it triggers displaced the cues used for assessment from working memory. In a second experiment, therefore, we included a group of participants who solved some easy anagrams after the recall and before reporting their emotions. Solving anagrams had the same effect as completing diaries. A third experiment ruled out the possibility that affect judgements are influenced by mood changes brought about by solving anagrams. We conclude that cognitive tasks of any sort interfere with the processing required by judgements of affect. With less processing, affect judgements remain closer to their default value in the centre of the rating scale.

P58 Steinmann

Florian Steinmann & Patrick Riepl, University of Basel

Can experts predict laypeople's partial ignorance: Vicarious recognition through the fluency heuristic

Assuming bounded rationality, the recognition heuristic is a useful strategy for laypeople to make decisions under limitations. This phenomenon draws widely from the less-is-more-effect. Experts seem to suffer from a “curse of knowledge” by being typically unable to exploit such simple mechanisms. However, can experts predict laypeople's partial ignorance and thus their inferences based on the recognition heuristic? Specifically, will they be able to use vicarious recognition without succumbing to the false consensus bias? In our study we addressed this question by using the fluency heuristic. We hypothesised that, the faster the retrieval time of an item for experts the more likely they are to infer that laypeople would recognize it. Data confirmed that the fluency heuristic can be interpreted as one important factor used by experts to make correct inferences about laypeople's knowledge and thus preventing the false consensus bias.

P59 Stucki

Lorenz Stucki & Bernd Figner

Information integration in HIV risk perception: A comparison of Sweden and Switzerland

The present study deals with information integration in students' risk perception of contracting HIV and AIDS. A questionnaire study was conducted in order to assess the perceived risk of contracting HIV of 228 Swiss and 131 Swedish students. The investigation concerned the manner of integration of information about (a) the number of sexual partners and (b) the safety of sex on the basis of varied condom use. A further goal was the comparison of Swiss and Swedish students. The results indicated that both factors were taken into account following a multiplicative rule. The perceived risk differed from the normative solution which would predict a linear increase. A great increase in risk perception was found from twice safe to once unsafe intercourse. In contrast, there was just a small further increase from once to twice unprotected sex. Swiss students estimated the risk in the same way as Swedish students did, but on a higher level. These results suggest that when making assessments of risk, all given information was taken into account and helped to form the risk perception. The step from safe to unsafe sex was associated with a marked increase in risk perception.

P60 Summers

Barbara Summers, Darren Duxbury, Robert Hudson, & Kevin Keasey, Leeds University Business School

How do investors cope with risk and time horizon?

Investors need to decide how best to manage their investments given their risk attitude and the time horizon of their investment. Empirical research has not so far focused on individual attitudes and behaviour, so we investigate these issues here in three studies. Study 1 asks masters level finance students to indicate how they would split an investment across cash, bonds and shares and how this choice would vary if they were investing for someone who was less (more) willing to take risk than themselves and for someone younger (older) than themselves. Study 2 repeats this using respondents from the International Institute of Banking & Financial Services' (IIBFS) Financial Well-being Survey (FWS), which provides a panel of participants with a wide range of ages and levels of wealth. Study 3 uses FWS panel data to investigate individuals' actual investment behaviour. Thus studies 1 and 2 address attitudes to investing, which are compared in Study 3 to actual investment behaviour. Our results show that while individuals feel that the proportion of shares in the risky assets of a portfolio should vary with risk attitude, actual portfolios do not show this variation. In relation to time horizon, we find that while individuals feel that older investors should have more conservative portfolios, inspection of actual portfolios shows the opposite to be true, even after allowing for asset accumulation, particularly in housing. These findings are the subject of further research.

P61 Tape

Thomas G. Tape & Thomas R. Stewart, University of Nebraska; State University of New York, Albany

Evaluating the properties of the Logistic Brunswick Lens Model Equation

Recent modifications to the Brunswick lens model have been proposed to allow analysis of dichotomous judgments using logistic regression models. However, inconsistencies between predicted and measured accuracy have been observed. We sought to better understand the properties of the logistic lens model and the source of the inconsistencies. We applied a decomposition approach to derive an exact form of the logistic lens model equation in terms of covariances and then compared it to the simpler, published logistic lens equation. To examine the practical implications of the logistic lens model, we did 1000 simulated analyses by randomly varying the judgments of a published logistic lens analysis. The median discrepancy between approximate and exact achievement was 2% with a 95th percentile of 6% and maximum of 17%. The base-rate of the judgments in each simulation was the most important factor contributing to the size of the discrepancy. In the context of the environmental model, the discrepancy tended to be larger when the judgment model more closely matched the environment model. We therefore recommend using the simpler, approximate form of the logistic lens model equation only after the size of the resulting discrepancy has been empirically demonstrated to be small.

P62 Thomas

Kevin Thomas, University of Plymouth

Considering the relevant and irrelevant: Anchoring and adjustment in judgements of task duration

Two experiments tested the hypothesis that the anchoring and adjustment heuristics are used when judging upcoming task duration. High or low anchor values representing the extreme durations of an identical (Experiment 1) or totally different task to the judgement task were selected by participants before judging task duration. Results revealed that the relevance of the anchor to the judgement task moderated bias, with the low anchor value concerning the same task leading to temporal underestimation, and this high anchor resulting in overestimation. Conversely, there was no evidence of time judgement bias being influenced by the irrelevant anchor values. These findings are discussed in the context of the relevance of anchor values in determining bias in judgements of task duration, and the theory of the planning fallacy cognitive judgement phenomenon.

P63 Traeger

Christian Traeger, University of Heidelberg

Intertemporal uncertainty revisited - on welfare, risk and certainty additivity

In this paper a general class of representations for preferences conforming with the von Neumann-Morgenstern (vNM) axioms, time consistency and additivity of welfare over time on certain outcomes (certainty additivity) is derived. The latter axiom allows a special definition (gauge) of welfare which is motivated to be more natural than the usually assumed vNM-utility one. Different representations are derived by gauging a general representation theorem. While time and uncertainty aggregators generally depend on the gauge, an invariant quantity is specified that distinguishes between risk aversion and intertemporal substitutability. For temporal lotteries a relation between risk aversion, intertemporal substitutability and the preference for early resolution of uncertainty is derived. Moreover the different perspective on welfare brings along a suggestion of a new measure of risk aversion in the multicommodity case. Finally the setup gives new ground for choosing precautionary decision rules in a risky setting

P64 Verlaine

Michel Verlaine, GRID ENSAM ESTP, Paris

Robust portfolio selection with generalised preferences: A methodology for private banking.

This paper is a first attempt to develop a methodology, consistent with non-linear probability weighting, to construct portfolios for Private Banking customers. Empirical evidence suggests that decision makers transform probability kernels in a non-linear way (Kahneman and Tversky (1992), Prelec (1998)). This has led to the concept of probability weighting function. Standard finance theory, and notably portfolio theory, has not yet dealt with such behaviour. Part of the reason is that such behaviour is considered non rational. It is first shown how to estimate the preferences from individual customers' data. The paper then shows that probability weighting may be very rational. Indeed, it may be derived from the maximization of a measure of uncertainty (entropy) given observed data. It is then shown how a dynamic continuous time portfolio choice problem can be easily solved. It is assumed that probability weighting stems from robust behaviour in face of parametric uncertainty. With this interpretation, risk behaviour determines the functional form of the utility function, whereas probability weighting stems from an information treatment recipe. In fact, our decision maker chooses parameters that maximize a maximum entropy likelihood function. The decision maker internalizes the fact that the observed likelihood is one of many possible. Finally, the subjectively robust parameters can then be used to derive the optimal policy rule of a dynamic continuous time portfolio model.

P65 Visschers

Vivianne Visschers, Ree Meertens, & Nanne de Vries, Maastricht University

Measuring risk perception directly and indirectly

Several scholars have suggested that human risk perception is the result of two processes: a conscious, controlled process and a primary affective process. A questionnaire is suitable to measure the former; however, it may be less useful to measure the latter. Therefore, we used an adjusted version of the Extrinsic Affective Simon Task (EAST) to measure the primary affective risk perception in two studies. In the first study, the EAST and a questionnaire were used to measure the effects of different versions of a risk communication. The results showed that the respondents had a high primary affective risk perception, as measured by the EAST. However, the questionnaire data did not show a high conscious, controlled risk perception. Furthermore, the EAST did not show differences in risk perception between the different risk communications. Conversely, the questionnaire results displayed an effect of risk communication version on the conscious, controlled risk perception. A second study was conducted to investigate whether an EAST can measure risk perception specifically, or that it is only capable of measuring a more general evaluative dimension. We discuss the value of using, next to a questionnaire, a more direct measure to assess risk perception, like the EAST.

P66 Volz

K. G. Volz, R. I. Schubotz, M. Raab, L. Schooler, G. Gigerenzer, & D. Y. von Cramon, Max-Planck-Institute for Human Cognitive and Brain Sciences, Leipzig; University of Flensburg, Germany; Max-Planck-Institute for Human Development, Berlin

The recognition heuristic and the brain

Many significant decisions must be made with limited time, knowledge, and/or computational power. In order to reach an optimal decision despite these limitations, people use fast and frugal heuristics. Heuristics are defined as useful mental shortcuts; each of them specialized for a certain class of problems. The recognition heuristic (RH), for example, is applied in situations in which we need to rank two alternatives by some criteria such as which city has the higher population. If one alternative is recognized and the other is not, then the RH states to infer that the recognized object has the higher criterion value. Thus, the RH exploits only one piece of information, recognition, while no recall of knowledge beyond recognition is attempted. Cognitive neuroscience can complement behavioural findings on the RH with regard to the latter issue: results showing that the RH relies on brain areas known to specifically reflect recognition memory but not on brain regions underlying recollection memory would provide an important source of convergent evidence that decisions made according to the RH are indeed based on only one piece of information, recognition. Following this idea, the present functional Magnetic Resonance Imaging study investigated this very issue.

P67 Weiskopf

Phoebe Weiskopf & Barbara Spellman, University of Virginia

The Linda problem: Not really a problem at all

In Tversky and Kahneman's (1983) famous Linda problem, people often commit the conjunction error by declaring Linda more likely to be both a bank teller and feminist than simply a bank teller. Participants were presented with a traditional description of Linda followed by 100 identical smiley faces. They indicated faces representing bank tellers (B) and faces representing bank tellers and feminists (BF). Participants then summarized their marks in one of two subtly different ways, either stating: how many people were bank tellers and how many were bank tellers and feminists (Label Condition) or how many worked in a bank and how many worked in a bank and were feminists (Description Condition). Participants in the Description Condition, which highlighted people's characteristics rather than group membership, were significantly less likely to treat the groups (B vs. BF) as mutually exclusive and, therefore, were less likely to commit the conjunction error. According to this interpretation, the Linda problem involves neither conjunction nor error.

SYMPOSIUM GUIDELINES

Each presentation room for parallel sessions and symposia will be equipped with a PC (with Microsoft PowerPoint software) with projector as well as an overhead projector. To ensure the smooth running of the conference, all speakers are to upload their presentations on to the designated computer BEFORE the beginning of the session in which they are scheduled to present (i.e., NO LATER THAN THE BREAK PRIOR TO THE SPEAKER'S SESSION BUT PREFERABLY EARLIER). Each presentation room will be staffed with conference assistants to assist you when uploading presentations. Use the preparation room (Polstjärnan) to check that your slides work. Each PC will have a 3½-inch disk drive, CD drive, and a USB flash drive for uploading of speaker presentations. Symposium organiser(s) are free to organise their 2-hour symposium slot in terms of order and time of presentations, and when to allow questions and discussion. They will, of course, also be responsible for ensuring that presenters keep to the time limits so that the 2-hour time limit for symposia is not exceeded.

PAPER PRESENTATION GUIDELINES

Each presentation room for parallel sessions and symposia will be equipped with a PC (with Microsoft PowerPoint software) with projector as well as an overhead projector. To ensure the smooth running of the conference, all speakers are to upload their presentations on to the designated computer BEFORE the beginning of the session in which they are scheduled to present (i.e., NO LATER THAN THE BREAK PRIOR TO THE SPEAKER'S SESSION BUT PREFERABLY EARLIER). Each presentation room will be staffed with conference assistants to assist you when uploading presentations. Use the preparation room (Polstjärnan) to check that your slides work. Each PC will have a 3½-inch disk drive, CD drive, and a USB flash drive for uploading of speaker presentations. The last speaker in each 2-hour session is also that session's chair and timekeeper (as indicated in the program); there are 4-5 oral presentations per session. Presenters will have 15 minutes for their talks followed by 5 minutes for clarifying questions. Speakers are strongly encouraged to stick to this time limit as a courtesy to other speakers in the same session. Time will permit further specific questions and general discussion after all speakers have made their presentations.

POSTER GUIDELINES

All presenters must be by their posters ready to answer any questions other conference delegates may have during the scheduled session. Presenters are also strongly encouraged to place their posters on display as soon as possible, preferably on the first day, to allow conference delegates to peruse the posters at their convenience. Each presenter will be allocated a dedicated panel of size 850 mm (width) by 1800 mm (height) on which to display the poster. Pins and tape will be available to mount each poster. Posters should not be removed prior to the end of the dedicated poster session, although they may be left on display after this time. Note, however, that all posters will be removed and disposed of by 18:00, Wednesday 24 August, 2005.