EGPROC 2013 PROGRAM

Kozminski University 59 Jagiellonska St., Warsaw room B5		
FRIDAY 19.04.2013		
	13:30– 14:30	**registration & coffee**
	14:30 – 15:05	**Thorsten Teichert** RFID @ POS – Potential for process-based consumer research
	15:05 – 15:40	**Tadeusz Tyszka** Large risks with low probabilities: perception, misperception, assessment and willingness to undertake prevention
	15:40 – 16:15	**Krzysztof Przybyszewski, Dorota Rutkowska & Michał Żołtak** Framing effects: cognitive effort and the willingness for decision making in risky choice paradigms
	` 18:30	**Dinner**
SATURDAY 20.04.2013		
	8:30-9:00	**Coffee**
	9:00 -9:35	**Ola Svenson & Gabriele Eriksson** Biased Judgments of Collision Speed and the Judgmental Process Behind Them
	9:35-10:10	**Martine Nurek, Olga Kostopoulou, York Hagmayer, Patrick White** Information distortion in medical diagnosis: A consider-the-opposite strategy for debiasing judgments
	10:10-10:45	**Olga Kostopoulou, Andrea Rosen, Thomas Round, Ellen Wright, Brendan Delaney** Supporting diagnosis via computerised systems: early

		reminders vs. late alerts
	10:45-11:20	**Anna Macko** Moral judgment and intentionality of side effect
	11:20-11:35	**Coffee**
	11:35-12:10	**Michael Schulte-Mecklenbeck** Response dynamics in human decision making
	12:10-12:45	**Joanna Sokołowska** Psychological accuracy of risky choice models based on option- *vs.* dimension-wise evaluations
	12:45-13:20	**Anton Kühberger & Thomas Scherndl** Format Matters: Effect of Presentation Format on Information Acquisition Patterns
	13:20 -14:30	Lunch
	14:30-15:05	**Dan Zakay** The Role of Attention in Risk Taking
	15:05-15:40	**Odilo Huber** Disjunction of ambiguous probabilities in economic decisions.
	15:40 – 16:25	**Artur Domurat** When Bayesian estimates are not necessary to make choices satisfying Bayesian rule
	16:25- 17:00	**Białaszek, W., Sawicki, P., Zielonka, Piotr** The perception of uncertain and delayed payoffs
	` 19:00	**Dinner**

ABSTRACTS

RFID @ POS – POTENTIAL FOR PROCESS-BASED CONSUMER RESEARCH

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Automated process data capturing technologies may help researchers to gain a new and enriched understanding of consumers´ decision making behavior. RFID (Radio Frequency Identification) as well as NFC (near field communication) technology seem especially suited for market research applications. The technologies´ core functionalities, namely accurate and immediate automatic data gathering, may trigger the integrating of quantitative and qualitative (marketing) research. We investigate how these technologies might be used to examine research issues of behavioral decision theory and choice modeling by integrating information that details the interaction process between consumers and products.

We discuss three layers of potential impacts of marketing research with RFID/NFC technology: choice-model validation in quasi real-life settings, choice-model improvement by integration of behavioral metrics, and exploration of (novel) contextual factors for new choice models. Time-based and process-based indicators gained with RFID/NFC technology allow to decompose decision processes to validate which consideration sets are formulated and which non-compensatory rules are applied. For choice-model improvement, we investigate how online metrics can be transferred to offline metrics by applying RFID/NFC technology. Finally we explore how new choice models might be derived which capture interdependencies of contextual factors during the decision process. For example, RFID/NFC data may contribute to better understand sequential choices as well as effects of decoys and time-constraints. We set up a multi-level approach of experimental testing in which such premises shall be tested and further refined in due course.

Large risks with low probabilities: Perception, misperception, assessment and willingness to undertake prevention

Tadeusz Tyszka

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While the decision theory has been developed in the last century, less numerous are studies on particular types of risky situations, namely, those with low probabilities and high stakes. Situations of this type contain, e.g. both natural and man-made disasters (e.g. floods, technological hazards, car accidents, economic crises, disease, etc.). Risks of this type are characterised by two features: (a) they occur relatively rarely (probability of their occurring is low), (b) their negative consequences are very high (catastrophic). Such events generally cannot be prevented, but one can (1) try to anticipate them, (2) undertake actions aimed at reducing their negative consequences. In order to minimize possible losses due to large but infrequent risks, the decision makers need (1) accurately perceive the danger, (2) undertake adequate precautionary actions and (3) appropriately react in the case of disaster. Of these three elements, the first one is of particular importance because of its influence on the other two. Thus, studying risks of this type involves two problems (related with each other): how do people estimate low probabilities, and when and why people are willing to protect themselves against risks with low probabilities and high stakes?

Achieving adequate risk perception requires identifying, understanding and reducing the factors responsible for misperception of risk, and elaborating ways of efficient transmission of relevant information to decision makers.
Additionally, the willingness to apply precautionary measures, as well as preference to choose particular ones, is influenced by factors other than risk assessment alone. These are also both interesting for researchers and potentially important for policymakers.
Thus, the main aim of the proposed research is to describe and analyze (1) the mechanisms of typical biases in risk perception and the methods of enhancing accuracy of risk perception in natural catastrophes, and (2) determinants of willingness to protect against such hazards.

Biased Judgments of Collision Speed and the Judgmental Process Behind Them

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Previous studies have shown that people underestimate collision speeds. In this study, we asked participants to imagine that they were driving a car at a speed of 30 kph when a child suddenly rushed into the street. The driver brakes maximally and the car stops just in front of the child. We then asked the participants to imagine that they drove the same scenario at 50 kph and the child appeared at the same place as before. At what speed would the car hit the child? Participants solved these types of problems while thinking out loud. The verbal protocols were then used to find categories explaining how participants' arrived at their solutions. Then, we asked another set of participants to solve the problems and judge how well each category fitted with their own way of solving the problem in a questionnaire.

Information distortion in medical diagnosis: A consider-the-opposite strategy for debiasing judgments

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Background & aim: Predecisional information distortion has been found in lay people and professional groups (salespersons and auditors – Russo et al., 2000). In medical diagnosis, General Practitioners (GPs) were found to alter the diagnostic value of incoming information to support their leading diagnosis (Kostopoulou et al., 2012). The higher their estimated likelihood of the leading diagnosis, the larger was the distortion.

In keeping with the *sequential evolution of preference* method (Russo et al., 1998), GPs evaluated cues in sequence, indicating the extent to which each supported 1 of 2 possible diagnoses. The response scale did not allow them to express, nor encourage them to consider, that a cue might support both options.

The present study employed separate scales for cue evaluation: one for each diagnosis. This allowed us to 1) differentiate and compare predecisional ID with respect to leading and trailing diagnoses and 2) explore the potentially corrective effects of concurrently *considering the opposite* – a debiasing technique yet to be assessed in this context (Larrick, 2004).

Method: We collected data from GPs via a questionnaire. Materials and procedure echoed those of the Kostopoulou et al (2012) study: 96 respondents (experimental group) read 3 patient scenarios (randomised), each with 2 plausible and competing diagnoses. Respondents evaluated sequentially-presented cues in relation to the 2 diagnoses, using separate scales that ranged from 0 (no support) to 10 (strong support). After each evaluation, they provided an estimate of diagnostic likelihood based on all information seen so far.

A control group of 43 GPs evaluated the same cues but in random order (no scenarios). With no opportunity to build a working diagnosis, their mean cue-ratings served as baseline values for calculating distortion in the experimental group. Distortion was defined as bolstering (inflated ratings for the leading diagnosis) and/or denigration (diminished ratings for the competing diagnosis). For each cue, 3 distortion scores were calculated: distortion on the leader, the competitor, and overall (mean of the two).

Results: Overall distortion across GPs was .5 (*SD*=.53). While significantly different from 0 ($p<0.001$), it seems lower than that reported in the previous study (*M*=1.55, *SD*=1.57) and occupies a smaller proportion of its response scale (5% vs. 7.5%). Mean bolstering was not significant (*M*=.19, *SD*=1.19, $p=.12$), yet mean denigration was (*M*=.8, *SD*=1.11, $p=.02$). The estimated likelihood of the diagnosis that was leading at each step of the process was a small but significant predictor of 1) bolstering, 2) denigration and 3) overall distortion of the next cue (*Beta*=.1, $p<.001$).

Conclusions: Encouraging GPs to consider the extent to which an item of information supports the competing diagnosis might eliminate the bolstering of evaluations to support a focal diagnosis. Task-enforced *consider the opposite* here succeeds where other strategies – e.g., financial incentives (Meloy et al., 2006) – did not. However, forced consideration of the opposite does not necessitate fair consideration of the opposite: denigration of support for the competing diagnosis could maintain the supremacy of the leader.

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Supporting diagnosis via computerised systems: early reminders vs. late alerts

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Background:
Diagnostic support systems are not usually designed on the basis of evidence of how best to support clinical cognition.

Aims:
To assess the effectiveness of two generic approaches to diagnostic support: 1) Early suggestion of diagnostic possibilities to consider, given minimal patient information and the reason for encounter ('Suggesting'). 2) Late alert about diagnoses that may have been missed, given all the information the clinician has gathered during the consultation ('Alerting').

Methods:
We designed 9 detailed scenarios, at different degrees of difficulty, where the patient presented to the GP with one of 3 commonly misdiagnosed complaints: chest pain, abdominal pain and dyspnea. The scenarios were presented to GPs on computer over the Internet, while they were on the phone with a researcher. After reading some initial patient information, GPs could request further information in order to diagnose and manage the patients. 297 GPs participated and were randomly allocated in one of 3 conditions: control (no support), 'Suggesting' and 'Alerting'.

Results:
Average diagnostic accuracy was 63% for control, 69% for 'Suggesting' and 65% for 'Alerting'. 'Suggesting' improved the odds of diagnosing accurately by 34% on average over control (OR 1.34 [95% CI 1.04-1.74] p=0.023). The superiority of 'Suggesting' was observed both in easy and difficult cases. Analysis of information search revealed a significant interaction: although the number of questions testing the competing diagnosis was negatively related to final accuracy (OR 0.79 [95% CI 0.73-0.87] p<0.0001), this relationship was less pronounced in the 'Suggesting' group (OR 0.92, p=0.024).

Conclusions:
The study showed the effectiveness of reminding physicians of alternative diagnoses to consider early on in the consultation. The precise mechanism of how early reminders lead to improved accuracy remains to be shown, however, it could be related to an improved ability to keep a diagnosis in memory, while testing diagnostic alternatives. I would like to spend time discussing this. From a practical viewpoint, we have shown that an appropriately developed computerised system, which integrates with the patient record and would activate automatically once the reason for encounter is entered, has the potential to improve diagnostic accuracy in primary care.

Moral judgment and intentionality of side effects

Anna Macko

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People often face decision problems, where an attractive goal is accompanied by undesirable negative side effect. For example one wants to gain financially, but on the way to achieve this goal one must/may cause some harm to others. In everyday life, most often, harm is rather a side effect of some actions than a goal. When negative side effects result from actions violating moral norms, decisions are called moral decisions. Since the central issue in moral decision making is moral judgment, the first purpose of this study was to find out what determines moral judgment of action's wrongness when action's negative consequences are not agent's goal but a side effect of the main action. The second purpose was to examine what determines perception of intentionality of bringing about side effect harm. Three parameters of the situation were examined – main action's consequences (magnitude of harm), foreseeability (probability) of side effect harm, and the type of incentive to undertake the main action. Additionally, we examined the impact of participants' utilitarian/deontological inclination in moral decision making on moral judgment and perception of intentionality of side effect harm.

Results showed that moral judgment was influenced mostly by the magnitude of side effect harm, but also by probability of harm occurrence and utilitarian attitude. Incentives played only marginal role. Perception of intentionality of side effect harm was determined mainly by the probability of harm occurrence and also by the type of vignette. Utilitarian inclinations turned out to be important only for moral judgment but not for the perception of intentionality of bringing about side effect harm.

Psychological accuracy of risky choice models based on option- *vs.* dimension-wise evaluations

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In 4 experiments, psychological accuracy of risky choice models related to either classical or bounded rationality assumption was investigated. According to the former models, such as Cumulative Prospect Theory, people trade-off outcomes and probabilities and choose the option with the highest weighted sum. In the latter models, such as Priority Heuristic (PH), Minimax, or Maximization of Cumulated Probability of Winning, there is neither trade-off between payoffs and probabilities nor complex information integration. Choice is based on dimension-wise comparisons. These models differ in emphasizing the significance of either the amount or the probability of loss.

Since previous findings do not support either hierarchy, Experiments 1- 2 were designed to test relative importance of these dimensions. Respondents chose one of four 2-mixed-outcome options. In Experiments 3 and 4, the accuracy of compensatory models based on global evaluations and non-compensatory models based on dimension-wise comparisons was investigated. The focus was on reasoning behind different classes of models rather than on distinguishing between specific models within a given class (e.g. PH vs. Minimax). Subjects chose among multi-outcome lotteries with gains and losses. Information acquisition patterns were registered using either a modified (Exp. 1, 3) or the original (Exp. 2, 4) version of Mouselab Web. Choice fraction and process tracing indices were analyzed.

Respondents made more dimension-wise than option-wise transitions. However, other indices, such as the fraction of information searched across options and the ratio of searched information about pay-offs and probabilities, do not support either of the tested models. Choice

strategies used by respondents varied across situations.

Response dynamics in human decision making

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Understanding the cognitive and motor system as an integral part and studying the dynamics how these systems interact has been of recent interest in cognitive psychology as well as in decision making research (Freeman, Dale, & Farmer, 2011; Koop & Johnson, 2011; Spivey & Dale, 2006). The basic idea is to overcome the one-way thinking of the route perception – cognition – action and add a continuous updates of movement by cognitive processes.

In the suggested study we want to unite a paradigm from the above mentioned literature on cognitive dynamics, namely Mousetracking (the continuous monitoring of the mouse position during a task) with the paradigm of decision making from experience (Hertwig & Erev, 2009) that puts a focus on sampling options, in order to make a decision about different probability distributions in gambles.

We hope to (a) demonstrate dynamic changes in mouse movements dependent on the gamble structure used, (b) show temporal changes during the sampling process due to tendencies to switch between options at a certain point and (c) model switching behavior based on deviations from the currently sampled option to the non-sampled option.

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Format Matters: Effect of Presentation Format on Information Acquisition Patterns

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Information search has received increased attention in JDM research and is important for development and evaluation of theories on judgment and choice. However, there is no standard of presentation for information acquisition studies, although there is ample evidence for the impact of contextual factors on information search. Thus, it is still an open question whether process measures are stable and robust to differences in presentation format. In two studies we manipulated whether alternatives were presented in columns, and dimensions in rows or vice-versa, and found an effect of presentation format on the classic measures for search patterns: If dimensions were presented in rows, a more dimension-wise search pattern followed than when

dimensions were presented in columns. Deeper analysis of participants' information search suggests that the difference is mainly due to the reading of information that takes place in the initial stage ('reading stage'). In contrast, there was little evidence that search in the second stage ('processing stage') is influenced. These findings challenge the validity of inferring strategies based on the search index (SI) or strategy measure (SM), since different display format result in different search indices. We opt for the development and adoption of a standard of presentation for information acquisition studies.

The Role of Attention in Risk Taking

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Unlike Prospect theory March and Shapira proposed a different model according to which risk taking level is determined by the direction of attention of the decision maker and the decision context. Attention can be directed towards survival or towards achievement and the situation can be near a "survival point" or near the "achievement point". The model was not validated empirically so far. An empirical test based on presenting scenarios to participants was conducted. Attention and decisions' contexts were manipulated. The
level of risk taken by participants was analyzed. The findings provided empirical support to the March & Shapira model.

Disjunction of ambiguous probabilities in economic decisions.

Odilo Huber
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Experimental studies show that in economic decisions ambiguous information about sink costs, future investments or predicted success are discounted. Two online - experiments investigate whether the degree of ambiguity play a role in the disjunction. Experiment 1 with 700 university student participants online varied two independent variables: type of scenario (business vs. recreational hedonic situation), and degree of predicted success probability ambiguity (no vs. low vs. high). Ambiguity was operationalized as information originating from two different sources. It was predicted that increasing ambiguity should decrease the willingness to invest in a project gradually, i.e. that ambiguity is a quantitative and not a qualitative (ambiguous vs. unambiguous) factor. The decisions confirmed the main hypothesis; also, in post-experimental justifications ambiguity was mentioned more with higher differences in presented probabilities. Experiment 2 with 600 university student participants additionally varied the mean of the two presented probabilities (70%, 50%, 30%). The decisions revealed that both the mean probability as well as the grade of ambiguity impacted decisions, confirming experiment 1. However, as predicted, in both experiments probability ambiguity influenced decisions only in the economic scenarios, while in the hedonic scenarios no effect was observed.

When Bayesian estimates are not necessary to make choices satisfying the Bayes' rule?

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Using natural frequencies instead of conditional probabilities makes Bayesian problems more comprehensible and facilitates learning the Bayesian inference. The presented studies were aimed at finding out to what extent the Bayes' rule is satisfied when making choices in natural context instead of estimating probabilities directly.

The computer simulations were used, that comprised tasks with two stages: learning the data and making a choice. An example of such a task was the problem of revealing a diamond (h_1) instead of a stone (h_2), choosing between two colours: yellow (D_1) and green (D_2). In the first stage, the participants observed the frequencies of diamonds ($P(h_1)$) and stones ($P(h_2)$) among seven figures. By clicking them, one could learn relative frequencies of appearance of yellow or green backgrounds of the diamonds ($P(D_1|h_1)$, $P(D_2|h_1)$) and stones ($P(D_1|h_2)$, $P(D_2|h_2)$). The second stage was to make a choice between two cards, yellow or green, in order to uncover a diamond. The choice was expected to result from comparison of the two Bayesian estimates, $P(h_1|D_1)$ and $P(h_1|D_2)$, and the colour with a greater chance should be selected.

Study 1 showed that most choices satisfied the Bayes' rule. One could conclude that people are generally intuitive Bayesians when making choices. Nevertheless, as the result seemed to be too optimistic (in the context of numerous studies showing the fallacies of the Bayesian reasoning), the study was replicated and participants were additionally asked for verbal explanations of their decision making process.

Study 2 generally confirmed the results of Study 1, revealing that most choices were consistent with the Bayes' rule again. However, the verbal reports uncovered that the Bayesian inference was employed less frequently, and quite often a strategy which was used did not require converting conditional frequencies (estimating $P(h_1|D)$, given $P(D_j|h_1)$). Intriguingly, the strategy still led to correct choices in terms of the Bayes' rule anyway. These ambiguous results raise a more general question of the conditions in which calculating the Bayesian estimates is not necessary to make choices satisfying the Bayesian rule.