

***SPUDM26 (THE 26TH
SUBJECTIVE PROBABILITY,
UTILITY, AND DECISION
MAKING CONFERENCE)***

**THE BIENNIAL MEETING OF THE
EUROPEAN ASSOCIATION FOR
DECISION MAKING**



Organizing committee:

Shahar Ayal, Interdisciplinary Center (IDC) Herzliya (Chair)

Rachel Barkan, Ben Gurion University of the Negev

David Budescu, Fordham University

Ido Erev, Technion – Israel Institute of Technology

**Andreas Glöckner, University of Hagen, Germany and Max Planck Institute
for Collective Goods, Bonn**

Guy Hochman, Interdisciplinary Center (IDC) Herzliya

Ilana Ritov, Hebrew University

Shaul Shalvi, University of Amsterdam

Richárd Szántó, Corvinus University of Budapest

Eldad Yechiam – Technion – Israel Institute of Technology



SPUDM 26 Conference Master Schedule

Sunday - August 20 (Yama, David Elazar 10, Haifa, Near Leonardo Carmel Beach)

16:30 – 18:00 Early registration

18:00 – 19:45 Welcome Reception and Light Dinner

19.45 – 20.00 Greetings

20.00 – 20.30 **Maya Bar Hillel**, The unbearable lightness of self-induced mind corruption

20.30 – 21.30 **Andreas Glöckner**, Presidential Address

21.30 –22.00 Desserts

Monday - August 21, Industrial Engineering and Management Faculty, Technion

7.45 Bus from Leonardo and 8.00 Bus from Dan Panorama

8:15 - 8.40 Coffee and registration

8:40 - 8:55 **Avishai Mandelbaum**, Dean of the Faculty of Industrial Engineering and Management, Welcome to the Technion and the big data revolution.

9:00 – 10:30 Paper Session 1

10:30 – 11:00 Coffee Break

11:00 – 12:30 Paper Session 2

12:30 – 14:00 Lunch Break

14:00 – 15:00 Keynote Address 1 – **Ido Erev**, On anomalies, forecasts, and the big data revolution

15:00 – 16:30 Paper Session 3

16:30 – 17:00 Coffee Break

17:00 – 18:30 Paper Session 4

18:30 "Random Matching Dinner" in Haifa restaurants (free-choice, not covered by the conference)

Tuesday - August 22, Industrial Engineering and Management Faculty, Technion

8:00 Bus from Leonardo and 8.15 Bus from Dan Panorama

8:30-9.00 Coffee

9:00 – 10:30 Paper Session 5

10:30 – 11:00 Coffee Break

11:00 – 12:30 Paper Session 6

12:30 – 13:30 Lunch Break

13:30 – 14:30 EADM General Assembly

14:30 – 15:30 Keynote Address 2 - Slater lecture, **Valerie Reyna**, A fuzzy-trace theory of risky decision-making: Healthy, unhealthy, and downright criminal

15:30 – 16:00 Coffee Break

16:00 – 17:30 Paper Session 7

17:30 – 19:30 Posters event and competition

Wednesday - August 23, Industrial Engineering and Management Faculty, Technion

8:00 Bus from Leonardo and 8.15 Bus from Dan Panorama

8:30 – 9.00 Coffee

9:00 – 10:30 Paper Session 8

10:30 – 11:00 Coffee Break

11:00 – 12:30 Paper Session 9

12:30 – 14:00 Lunch Break

14:00 – 15:00 Keynote Address 3 -Slater lecture, **Alvin E. Roth**, Repugnant transactions and forbidden markets

15:30 – 22:00 Mount Carmel tour and conference dinner

Invited Lecture – **Yossi Ben Artzi**, University of Haifa, Collision of Empires and interests: 19th Century Palestine under global, local and national pursuit

Thursday - August 24, Industrial Engineering and Management Faculty, Technion

8:00 Bus from Leonardo and 8.15 Bus from Dan Panorama

8:30 – 9.00 Coffee

9:00 – 10:30 De Finetti and Jane Beattie Awards and winner presentations

10:30 – 11:00 Coffee break

11:00 – 12:30 Paper Session 10

12:30 – 14:00 Farewell Lunch

Time	Sunday, August 20	Monday, August 21	Tuesday, August 22	Wednesday, August 23	Thursday, August 24
8.30 – 9.00		Avishai Mandelbaum	Coffee and registration	Coffee	Coffee
9.00 – 10.30		Session 1 – Symposia	Session 5 – Symposia	Session 8 – Symposia	De Finetti and Jane Beattie Awards and winner presentations
10.30 – 11.00		Coffee Break	Coffee Break	Coffee Break	Coffee Break
11.00 – 12.30		Session 2	Session 6	Session 9	Session 10
12.30 – 14.00		Lunch Break	Lunch Break	Lunch Break	Farewell lunch
			EADM General assembly (13.30-14.30)		
14.00 – 15.00		Keynote address 1 – Ido Erev	Keynote address 2 – Valerie Reyna	Keynote address 3 – Alvin E. Roth	
15.00 – 16.30		Session 3	16-00-17.30 Session 7	15.30 Mount Carmel tour and conference dinner (till 22.00)	
16.30 – 17.00	Early registration	Coffee break			
17.00 – 18.00		Session 4	17.30-19.30-posters event		
18.00-20.00	Welcome Reception and Light Dinner	Random Matching Dinner” in Haifa restaurants		Invited Lecture – Yossi Ben Artzi , University of Haifa, Collision of Empires and interests: 19th Century Palestine under global, local and national pursuit	
	19:45 - Greetings				
20.00 – 20.30	Maya Bar Hillel				
20.30 – 21.30	Andreas Glöckner				
21.30 – 22.00	Desserts				

SUNDAY, AUGUST 20, 2017

Yama, David Elazar 10, Haifa (near Leonardo Carmel Beach)

16.30 - 18.00	Early Registration
18.00- 19.45	Welcome Reception and Light Dinner
19.45- 20.00	Greetings
20.00- 20.30	Maya Bar Hillel , Hebrew University of Jerusalem - The unbearable lightness of self-induced mind corruption
20.30- 21.30	Andreas Glöckner , University of Hagen and Max Planck Institute for Collective Goods - Presidential Address
21.30- 22.00	Desserts

MONDAY, AUGUST 21, 2017

Industrial Engineering and Management Faculty, Technion

7.45
8.00

Bus from Leonardo
Bus from Dan Panorama

8.15 –
8.40

Coffee and registration

8.40 –
8.55

Avishai Mandelbaum, Dean of the Faculty of Industrial Engineering and Management, Welcome to the Technion and the big data revolution.
(Baltimore Auditorium, Bloomfield Building)

Track 1
(Cooper 215)

Track 2
(Cooper 216)

Track 3
(Cooper 112)

Session 1
9.00 -
10.30
Symposia

The psychology of gains and losses: Beyond loss aversion

Organizers: Eldad Yechiam, Thorsten Pachur (ICORE 1*)

Perspectives on overconfidence and its determinants

Organizer: Dan Zakay
Discussant: Klaus Fiedler

Behavioral decision research and climate change

Organizer: David Budescu

Eldad Yechiam - The "approach" effect of losses emerges with experience and exposure

Asher Koriat - Can we tell whether our beliefs and judgments are true or false?

Emily Ho - Using relative judgements to estimate probability distributions of future emissions

Tomás Lejarraga - How the threat of losses makes people explore more than the promise of gains

Dan Zakay - A temporal model of meta- cognitive feelings about the accuracy of retrieved knowledge

Stephen Broomell - The perception of daily temperatures as evidence of global warming

Guy Hochman - Keeping your gains close but your money closer: The effect of prepayment on choice and performance

Tamar Kugler – The dark side of social capital: Interlock network, CEO-board network, and CEO overconfidence

Astrid Kause -Framing climate uncertainty: Frame choices reveal and influence climate change beliefs

Thorsten Pachur - On the psychological origins of buyer-seller differences in pricing

Klaus Fiedler - Speed-accuracy tradeoffs in sample-based decision making

Stephen Lewandowsky – The 'pause' in global warming in historical and conceptual context: Scientific decision making under uncertainty

Wändi Bruine de Bruin -

			Public priorities and expectations for climate change impacts in the United Kingdom	
10.30 - 11.00	Coffee Break			
Session 2 11.00-12.30	Behavioral Finance 1 <i>(Cooper 214)</i>	Decision from Experience <i>(Cooper 215)</i>	Meta-Cognition, Judgments and Preferences <i>(Cooper 216)</i>	Decision Making in the field and society <i>(Cooper 112)</i>
	Doron Kliger- Time-induced stress effect on financial decision making in real markets: The case of traffic congestion	Ori Plonsky - Psychological forest: Integration of social and data sciences to predict human choice behavior	Andrea Isoni - A validation test for self-reported measures of imprecision	Peter Ayton - Decision making up in the air: Effects of pilot status and role assignment on safety critical flight-deck decisions
	Janine Hoffart - Risk-return belief and the affect heuristic	Christin Schulze - By coincidence or by design? Pattern matching and probability maximizing in groups and individuals	Aleksandra Litvinova- Harnessing the wisdom of the inner crowd by exploiting confidence	Sigal Vainapel -Long distance, short odds: Drones, manned aircrafts, and tolerance of enemy collateral casualties
	Orly Sade- Does financial regulation unintentionally ignore less privileged populations	Gail Gilboa Freedman - On the impact of rewarding repentance	Caspar von Schenck- Testing for overconfidence and cognitive dissonance effects in a valuation experiment	Ian Belton – Public judgments about the effect of personal mitigation on criminal sentencing
	Moran Ofir - Borrowers responses to protective mortgage regulation	Manal Hreib - Closed Circuit Television and the parking lot paradox	Chiara Scarampi- Age differences in the effect of metacognition on financial decision-making	Naveh Eskinazi - Economic indicators for assessing trust within the Jewish society in Israel and their effect on welfare
	Sandra Andraszewicz – The effect of	Emuna Eliav - Interrupted	Laura Rebecca Rettig- Generally higher	Michael Sobolev - Beehive: A platform for mobile

	experiencing a historical financial crash – An empirical evidence	search for treasures	but not generally better: How competence and confidence affect estimation	experiments
	Simon McNair- How does consumer vulnerability impact financial outcomes? The mediating and moderating role of psychological characteristics.	Sebastian Olschewski- Taking Risks for Others in Decisions from Experience: Uncertainty and Anti-Social Behavior	Daniel Barkoczi - The wisdom of select cues	Piers Fleming - Personal data privacy behaviour and concern - a survey on the importance of value as a moderator
12.30 - 14.00	Lunch Break			
14.00 - 15.00	Keynote Address 1 - Ido Erev , Technion- Israel Institute of Technology, On anomalies, forecasts, and the big data revolution <i>(Baltimore Auditorium, Bloomfield Building)</i>			
Session 3 15.00-16.30	Behavioral finance 2 <i>(Cooper 214)</i>	Learning <i>(Cooper 215)</i>	Risk Perception <i>(Cooper 216)</i>	Health and medical decisions <i>(Cooper 112)</i>
	Mahmoud Qadan- High holidays: Psychological mechanisms of honesty imprint in real life financial decisions	Robin Hogarth – The wicked learning environment of regression toward the mean	Uri Benzion - The impact of a new defense technology on individuals' precautionary actions and risk perceptions	Tim Rakow - The impact of item comparisons and reference points in communicating risk and uncertainty: Experiments on presenting surgical outcome data
	Hadar Yoana Jabotinsky - Revolving doors and conflict of interest rules in the financial markets: We got it backwards	Doron Cohen - Transfer and learning in basic choice tasks	Philip Millroth- Examining the integrity of evaluations of risky prospects	Efrat Neter - Better ask than tell: Interrogative SMS reminders for enhancing colorectal cancer screening

	Stefan M. Zeisberger – What is risk? How investors perceive risk in return distributions	Kinneret Teodorescu - How to make a learner try? On guidance strategies and give-up behaviors	Oliver Schuermann- The role and plasticity of risk perception in a dynamic decision-making risk task	Idit Shalev – To live or not to live? The effect of mind perception dimensions and strategies of judgement on decision to increase maintain or withdraw li
	Amnon Maltz- The Effect of Categorical Perceptions on Investment Decisions	Efrat Aharonov-Majar – Occasional downpour or constant drip? The impact of adverse events distribution on learning and risk taking	Florian Artinger - Risk preferences in context	Mirjam Annina Jenny -Improving medical decisions in the surgical ward with clinical decision support
	Doron Sonsino - The conflicting links between forecast-confidence and trading propensity	Yefim Roth - To search or not to search? Exploring consumer ‘s sensitivity to different payoff environments	Avi Israel – Does risk-taking behavior influenced by impulsive behavior or by the avoidance of taking action? An experimental study	Yasmina Okan - When context matters: Probability sizes and risk reduction levels moderate graphical display effects
	Amitay Kauffmann- Effort gaps between buyers and sellers and their relation to economic bubbles in experimental asset markets	Elliot Andrew Ludvig - The interaction of rarity and extremity in risky decisions from experience		Abigail Hurwitz – An investigation of time preferences, life expectancy and annuity versus lump-sum choices – Can smoking harm long-term saving decisions?
16.30 - 17.00	Coffee Break			
Session 4 17.00-18.30	Cognitive Processes (Cooper 214)	Brain and Physiological Measures (Cooper 215)	Choices and Preferences (Cooper 216)	Nudge and Applied Decision Making (Cooper 112)

	Niyat Henok - Thinking without thinking: is cognitive processing or physical processing better for transfer and insight?	Gideon Nave - Single dose testosterone administration impairs cognitive reflection in men	Ellen Evers - Elicitation based preference "reversals"	Christoph Kogler - Information processing in tax compliance decisions: A mouse lab web study
	Yvetta Simonyan- Memory-based models of predicting inferences about brand quality	Regina Agnes Weilbacher – The influence of visual attention on memory-based decisions	Mikhail S. Spektor - When the good looks bad: First experimental evidence for the repulsion effect	Barbara Summers - Taxing decisions... – The interaction of ethics and law in tax decision making
	Guillermo Carbonell – Do executive functions influence how we choose a physician online? The impact of comments and ratings on social media	Yael Salzer - Neural feature representations account for errors in the Simon task: an fMRI model-based study	Gustavo Oliveira Aggio - Indeterminacy of choice under indifference: Two suggestions for a complete preference based theory	Piero Ronzani - Moving beyond the stigma: Self-affirmation reduces loss aversion in decision-making among the poor
	Yechiel Klar – Nonselective optimism and pessimism among market experts and non-experts	Iris Ikink - The role of time ambiguity in intertemporal choice	Moshe Glickman - Attentional selection mediates choice bias effects	Erik Stoltenberg Lahm – Nudging decision makers' attention: A meta-analysis
	Reut Blaywais - Seeing the forest or the trees? Motivation matters	Linus Andersson - Brain imaging evidence for a dual-system explanation of heuristic and normative probability judgments	Hadrien Mamou - Individuation of alternatives and relevant descriptions	Štěpán Bahník - Predictors of corruptibility in a new bureaucracy simulation game

	Benjamin Scheibehenne - The cognitive process of number integration: Evidence from the lab and from the field		Oded Nov - Interactive "nutrition labels" for financial products: A novel approach to assisting decision Making under uncertainty	Vedran Lesic - Assessing consumers' perceptions of electricity use: Does providing reference points help?
18.30	"Random Matching Dinner" in Haifa restaurants (free-choice, not covered by the conference)			

1. Sessions with 6 papers will have 15 min each (12 min. talk+3 min. discussion);
Sessions with 5 papers will have 18 min each (15min talk +3min. discussion).
2. The first presenter in each session is the session Chair, who is in charge for the time.

TUESDAY, AUGUST 22, 2017

Industrial Engineering and Management Faculty, Technion

8.00
8.15

Bus from Leonardo
Bus from Dan Panorama

8.30 –
9.00

Coffee

Track 1
(Cooper 112)

Track 2
(Cooper 214)

Track 3
(Cooper 215)

Track 4
(Cooper 216)

Session 5
9.00-10.30
Symposia

Resource allocating decisions: Equity-efficiency tradeoffs (ICORE 2*)

Organizer: Shoham Choshen-Hillel, Tom Gordon-Hecker
Discussant: Tehila Kogut

Economic decisions under ambiguity and psychological decisions from experience

Organizer: Peter Wakker
Discussant: Ori Plonsky

The interplay of intuitive and analytic processing of numerical information in decision-making

Organizer: Zohar Rusou
Discussant: Valerie Reyna

Improving intelligence analysis with decision science

Organizers: David R. Mandel; David Budescu
Discussant: Peter Ayton

Shoham Choshen-Hillel –
Of the workers, by the workers, for the workers: The effect of agency on people's satisfaction with efficient yet inequitable allocations

Dirk U. Wulff - A meta-analytic review of two modes of learning and the description-experience gap

Andreas Glöckner - Exploring processes in risky choice using eye-tracking

David R. Mandel - Effect of meta-information on intelligence analysts' judgments about information accuracy

Tom Gordon-Hecker - Not taking responsibility: Equity trumps efficiency in allocation decisions

Peter P. Wakker - The rich domain of ambiguity explored

Noam Brezis - Intuitive averaging and preferences: A compensatory though normative process

Dhami K. Mandeep - A test of the 'analysis of competing hypotheses' in intelligence analysis

Max Kleiman-Weiner - Constructing social preferences from anticipated judgments: When

Ilke Aydogan - The role of prior beliefs in decisions from experience

Dafina Petrova - What factors influence the shape of the probability

Fergus Bolger - Embedding ACH in a Delphi process: What are the advantages?

	impartial inequity is fair and why?		weighting function?	
	Ori Weisel— Strong reciprocity and selfishness revisited	Orestis Kopsacheilis - Decomposing the description - Experience gap	Dan Raphael Schley - Ordinal and cardinal information processing: A dual process model of decision making	Norman Fenton - Combining judgments with messy data to build Bayesian network models for improved intelligence analysis and decision support
			Zohar Rusou - Pitting intuitive and analytical thinking against each other: The case of numerical evaluation	
10.30 - 11.00	Coffee Break			
Session 6 11.00 - 12.30	Organizational behavior and groups (Cooper 112)	Decision Under risk and uncertainty 1 (Cooper 214)	Individual Differences 1 (Cooper 215)	Games and behavior 1 (Cooper 216)
	Ilanit SimanTov-Nachlieli - How reputations affect negotiation judgments and decisions: The "Big Two" agency and communion dimensions in negotiations	Henning Cordes- On the dynamics of countercyclical risk aversion and experienced emotion	Yoav Ganzach – Intelligence and the rationality of political preferences	Yaakov Kareev - To be the tail of the lions or the head of the foxes?
	Ilana Ritov- Valuation of labor by employee and contractor	Divya Aggarwal- Attitudes to risk and ambiguity:	Patrycja Sleboda- Transitivity of preferences,	Dorothee Mischkowski - From

		Experimental evidence in a developing market using carnival games	individual differences in information processing and strategies applied for selection.	spontaneous cooperation to spontaneous punishment
	Elizaveta Konovalova- Selective information sampling and the in-group heterogeneity effect	Gábor Ruzsa- A model-based analysis of risky decision-making errors and their psychological background in a simulated sequential gambling experiment	Agata Sobkow- The experience-based format of probability improves probability estimates in people with low numeracy	Ilan Fischer - Reciprocal strategy shaping in repeated PD games
	Thomas Karl Alfred Woiczuk – How stable is in-group favouritism?	Michal Livnat-Lerer - Foresighted outcome effect: Expected availability of outcome knowledge to principals affects risk behavior of accountable agents	Jakub Traczyk- Numeracy predicts adaptive strategy selection in risky decision making	Adiel Moyal - Competition Affects Allocations of Resources and Duties
	Florian Wanders - Rebel with a cause: Violate societal norms but abide by local group norms to gain influence	Joakim Sundh- Compound risk judgment in tasks with both idiosyncratic and systematic risk: The “robust beauty” of additive probability integration	Adi Amit – A multi-dimensional approach to non-intuitive decision making: Empirical evidence distinguishing effortful from systematic thinking	Uri Zak – “Better be the head of a dog than the tail of a lion”— is that so? The case of chess tournaments in Israel
	Tamar Gur - Being sad and level-headed: Sadness leads to moderate decisions in	Silke M. Mueller - Triggering intuitive and reflective decision making	Eric R. Stone - Distinguishing the ratio bias from unsystematic error: Situation	Eliran Halali - The psychology of negative brokerage: Understanding

	intergroup conflicts	in situations with varying probability information	and individual-difference effects	divide-and-conquer behavior by third parties
12.30 – 13.30	Lunch Break			
13.30 - 14.30	EADM General Assembly (<i>Baltimore Auditorium, Bloomfield Building</i>)			
14.30 - 15.30	Keynote Address 2 - Slater lecture, Valerie Reyna , Cornell University, A fuzzy-trace theory of risky decision-making: Healthy, unhealthy, and downright criminal (<i>Baltimore Auditorium, Bloomfield Building</i>)			
15.30 - 16.00	Coffee Break			
Session 7 16.00-17.30	Prosocial Behavior (<i>Cooper 112</i>)	Decision Under risk and uncertainty 2 (<i>Cooper 214</i>)	Individual differences 2 (<i>Cooper 215</i>)	Game and Behavior 2 (<i>Cooper 216</i>)
	Tehila Kogut- The effects of case framing on the willingness to commit to organ donation	Joanna Sokolowska- Psychological accuracy of risky choice models based on option-vs. dimension-wise evaluations	Marcel Zeelenberg- Greed, regret, envy and the fear missing out	Sebastian Horn-David and Goliath in old age: Asymmetric competition and resource allocation in younger and older adults
	Marina Motsenok- "Let's help together": The effect of high and low status on simultaneous helping decisions.	Christina Leuker - Risk-reward structures shape attentional processes in decisions under risk	Paweł Niszczoła- Neuroticism and the propensity to invest in foreign securities	Valeria Burdea- Cheap talk and evidence: An experiment
	Xiaofei xie- The helping behavior helps lighten physical burden	Rui Mata- Temporal stability and convergent validity of stated and revealed risk preferences	Renato Frey - Risk preference shares the psychometric structure of major psychological traits	Rene Levinsky- Preferences, beliefs, and strategic plays in games

	Roi Zultan - The welfare implications of social interactions	Patty Jansen- The effects of experiencing a fire in an immersive virtual environment on prevention decisions, mediated by psychological constructs.	Itay Sisso – For whom less is more - Individual differences in choice overload tendencies	Assaf Romm - "Strategic" behavior in a strategy-proof environment
	Hagit Sabato – The association between religiousness and children's altruism: The role of the recipient's neediness	Katya Tentori - Judging forecasting accuracy: How human intuitions meet formal models	Miroslav Sirota - Measuring intuition inhibition without maths	Magda L. Dumitru - Groundless altruism: Why it makes sense to risk one's life for other people's money
	Christopher Olivola- Asymmetric considerations of interpersonal opportunity costs: A fundamental barrier to generosity	Dino Levy - Perceptual organization and choice behavior: From global/local biases to choice biases	Arianna Costantini - Pseudo-inefficacy and volunteer burnout in humanitarian organizations	Ramzi Suleiman - On Gamesmen and Fairmen: Explaining fairness in noncooperative bargaining games
17.30 - 19.30	Posters event and competition (Lobby, Bloomfield Building)			

3. Sessions with 6 papers will have 15 min each (12 min. talk+3 min. discussion); Sessions with 5 papers will have 18 min each (15min talk +3min. discussion).
4. The first presenter in each session is the session Chair, who is in charge for the time.

WEDNESDAY, AUGUST 23, 2017

Industrial Engineering and Management Faculty, Technion

8.00 8.15	Bus from Leonardo Bus from Dan Panorama			
8.30 – 9.00	Coffee			
	Track 1 (Cooper 112)	Track 2 (Cooper 214)	Track 3 (Cooper 215)	Track 4 (Cooper 216)
Session 8 9.00 - 10.30 Symposia	Behavioral ethics: From theory to application Organizers: Guy Hochman, Shahar Ayal (ICORE 3*)	Eye-Tracking Methodologies for Investigating Information Search Organizer: Nathaniel Ashby, Jacob L. Orquin Discussant: Nathaniel Ashby	Methodological approaches to studying the link between memory and decision making Organizers: Bettina von Helversen, Fabio Del Missier,	Mapping choice environments to understand the bounds of rationality Organizer: Timothy J. Pleskac, Joerg Rieskamp, Discussant: Yaakov Kareev
	Margarita Leib - The moral hazard of voluntary job rotation	Martin Meissner - Effort reduction in repeated rule-based choices	Hanna B. Fechner - Cognitive costs of decision-making strategies: A resource demand decomposition analysis	Gael Le Mens - The person versus the situation: A rational Analysis
	Rachel Barkan - Pick your poison: Dishonesty in politics and business	Jacob Orquin - The optional shopping problem	Janina A, Hoffmann - Integrating cue abstraction with retrieval from memory: A learning approach	Ralph Hertwig - Heuristic choice and the structure of the environment
	Amos Schurr - Judging the morality of swerving in	Sonja Perkovic - Random or systematic eye	Bettina von Helversen - Salient but	Joerg Rieskamp - How the environment

	autonomous and regular cars	movements: A new measure for information search analysis	irrelevant information can bias judgments by inducing the retrieval of exemplars	influences information search in decision making
	Shahar Ayal - The implications of confession: Ethical salience or moral licensing?	Erik S. Lahm - Visually nudging Decision Makers' Attention: A Meta-Analysis	Fabio Del Missier - Memory of decisions: Methods and evidence	Tim Pleskac - Why risks and rewards are tied
10.30 - 11.00	Coffee Break			
Session 9 11.00-12.30	Unethical Behavior (Cooper 112)	Incentives (Cooper 214)	Heuristics and Biases (Cooper 215)	Mathematical Models 1 (Cooper 216)
	Terri Seuntjens- Greedy bastards: The desire for more and unethical behavior	Mosi Rosenboim- The break in the linkage between monetary incentives and effort: Are extraordinary high net wage levels really necessary?	Alexei V. Milkov - Base rate neglect as a common fallacy among oil and gas explorers	Philip Newall – It will be worth it, in the end
	Jan Kristian Woike - Promises and dice: Do people keep their word rather than their money?	Ofer Azar – Does relative thinking exist in mixed compensation schemes?	Deborah Marciano - Why do people perceive an illusory negative correlation between choice options' outcomes? Exploring the alternative Omen Effect's mechanism	Emmanuel Kemel – Eliciting attitude towards temporal resolution of risk: Utility versus probability weighting approaches
	Martijn van den Assem- Malleable Lies: Communication and Cooperation in a High	Danae Arroyos- Calvera- Common ratio effect in money and goods	Nathaniel Phillips - FFTrees: An R package to	Jana Bianca Jarecki - A similarity-based account of

	Stakes TV Game Show		create and profit from fast and frugal decision trees	human preferences
		Susann Fiedler - Understanding the interplay of social preferences and incentives via eye-tracking	Elzbieta Aniela Kubinska – On duality and probabilistic foundations of illusion of control	Marc Jekel – A new and unique prediction for cue-search in a parallel-constraint satisfaction network model: The attraction search effect
	Dar Peleg – Any feedback will do: Using the lie detector as a moral enhancer	Anna Dorfman-Merit and CEO-to-worker income inequality: When and how performance justifies inequality	Deborah Y Cohn - Decision heuristics related to workplace relationship management on social media	Sophie Elisabeth Scharf -Coherence-based prediction of information search times in multi-attribute decisions
	Philipp Gerlach- People are more honest than experiments suggest, A meta-analysis on cheating experiments	Thoma Volker- Water supplementation increases performance in decision-making tasks	Shira Mor - Pathways to intercultural accuracy: Social projection processes and core cultural values	Martin Schoemann - The Needleman-Wunsch algorithm: Fixation Sequences as an Indicator of decision processes
12.30 - 14.00	Lunch Break			
14.00 - 15.00	Keynote Address 3 - Slater lecture, Alvin E. Roth , Stanford University, Repugnant transactions and forbidden market (Churchill Auditorium)			

15.30 - 22.00	Mount Carmel tour and conference dinner Invited Lecture – Yossi Ben Artzi, University of Haifa, Collision of Empires and interests: 19th Century Palestine under global, local and national pursuit
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1. Sessions with 6 papers will have 15 min each (12 min. talk+3 min. discussion);
Sessions with 5 papers will have 18 min each (15min talk +3min. discussion).
2. The first presenter in each session is the session Chair, who is in charge for the time.

THURSDAY, AUGUST 24, 2017

Industrial Engineering and Management Faculty, Technion

8.00 8.15	Bus from Leonardo Bus from Dan Panorama			
8.30 – 9.00	Coffee			
9.00 - 10.30	De Finetti and Jane Beattie Awards and winner presentations (Baltimore Auditorium, Bloomfield Building)			
10.30 - 11.00	Coffee Break			
	Track 1	Track 2	Track 3	Track 4
Session 10 11.00- 12.30	Ethics and Morality (Cooper 112)	Effects of format and information (Cooper 214)	Consumer Behavior (Cooper 215)	Mathematical models 2 (Cooper 216)
	Orit Tykocinski - "I swear on my life": The credibility of an oath as a signal of truth	Eyal Gamliel – The role of attention in attribute-framing: Using priming to shift attention to the other half glass	Coby Morvinski- The effect of stated preference on subsequent revealed preference	Rebecca Albrecht - Explaining multiple cue judgment with a mixture model that combines exemplar with cue abstraction processes
	Yochanan E. Bigman – The road to heaven is paved with effort: Perceived effort amplifies moral judgment	Dawn Liu- Intuitive words and analytical numbers: Effects of format on judgements of food labels	Ioannis Evangelidis - The asymmetric impact of context on advantaged versus disadvantaged options	Pele Schramm - Curvature agnostic measurement of multi-attribute subjective value and uncertainty functions
	Uriel Haran- Better Be Wrong than Do Wrong: Honest Advisors Are More Persuasive than Competent Ones	Johannes Leder - The advantage of full feedback information depends on the type of world	Mauricio Mittelman- Usage frequency considerations in	Andrei Radu Teodorescu - Absolutely relative or relatively absolute: Using

		you live in	purchase decisions	computational models to study relativity in human decision making
	Daffie Konis – A Sorrow shared is a sorrow halved: Moral judgments of harm to single versus multiple victims.	Manissa Gunadi - How input vs. output-based framing influences performance	Laura Zimmermann- Exercise your mind - Physical activity alters attribute weighing in consumer choice	Stefan M. Herzog – Reach and speed of judgment propagation in the laboratory
	Shira Elqayam - Utilitarian moral judgment and inference from 'is' to 'ought'		Yaniv Shani - Do consumers "accidentally" place products they own in ?harm's way	Kamil Fulawka - Behavioral consistency as an indicator of sensitivity to changes in probability
	Nigel Harvey -Ethical decision making under uncertainty	Avril Hand - Choosing while losing: Investigating the effect of valence and relative magnitude on the dynamical features of choice	Anna Katharina Spälti, - Endowment effect vs. brand loyalty: A memory retrieval approach	Han Bleichrodt - Resolving Rabin's paradox
12.30 - 14.00	Farewell Lunch			

1. Sessions with 6 papers will have 15 min each (12 min. talk+3 min. discussion); Sessions with 5 papers will have 18 min each (15min talk +3min. discussion).
2. The first presenter in each session is the session Chair, who is in charge for the time.

* The ICORE symposia were supported by the Isreali Center for Research Excellence in [Empirical Studies of Decision Making and the Law](#)

Invited Speakers

Sunday - August 20

Maya Bar Hillel

(The Hebrew University of Jerusalem)

The unbearable lightness of self-induced mind corruption



Age, disease, drugs, and certain environments can corrupt our mental processes. Maya, however, will only speak about the manner in which we all - ordinary healthy, lucid, intelligent, people -- can, and do, knowingly and deliberately corrupt our own mental processes. She will give some "by all means do it yourself at home" personal examples of self-corruption from three areas: perception, memory, and morality.

Maya Bar-Hillel was born and raised in Israel. She received her entire higher education - BA, MA and PhD - at The Hebrew University, which is also the place where she spent her entire academic career, from teaching and research assistant to tenure to professor emerita. By a stroke of luck, it happened to be the place where the local department teachers were folks like Amos Tversky and Danny Kahneman, who therefore became her teachers, mentors, supervisors and inspiration. She is grateful to have spent many a year as a post doc or on sabbatical at MIT, Stanford, Carnegie-Mellon, Princeton, Columbia, and The Russell Sage Foundation; and well over a decade of summers at Decision Research in Oregon, where she relied on the kindness and generosity of Paul Slovic and Baruch Fischhoff. She attended her first SPUDM in 1981, in Budapest, and hopes to continue to attend till 2031 at least...

Presidential address

Andreas Glöckner

(University of Hagen & Max Planck Institute for Research on Collective Goods, Bonn)

Research in Judgment and Decision Making: Methodological Challenges and Theoretical Developments



In the last sixty years, Judgment and Decision Making has been established as a flourishing interdisciplinary field of behavioral research. In the first part of this presidential address, I will reflect upon what I concern the most important current methodological challenges for our field: (a) theory specification and prediction, (b) methodology for reproducible and generalizable findings, and (c) consolidation of empirical findings. Among other things, quantitative estimates for the reproducibility of J/DM findings are presented.

In the second part, I review important theoretical developments in our field. I argue that combining core aspects from the important J/DM views by Kahneman, Gigerenzer, Svenson and others with models from cognitive psychology, specifically formal models of perception and memory, can lead to promising theories. As an example, a fully-specified integrated Coherence-based model for decision making and search (iCodes) will be presented and results from model tests will be summarized.

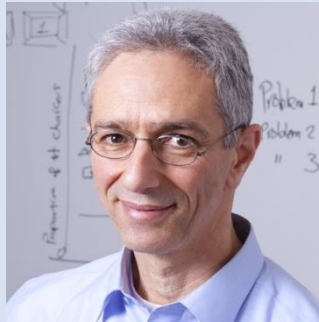
Andreas Glöckner, the current president of EADM, is professor of cognitive psychology (judgment, decision making, action) at the University of Hagen and research fellow at the Max Planck Institute for Research on Collective Goods, Bonn. Andreas Glöckner studied psychology at the University of Heidelberg and at the University of Oregon, Eugene. After receiving his PhD in psychology from University of Erfurt, he was head of the Max Planck Research Group *Intuitive Experts* in Bonn, and professor of psychological assessment, judgment and decision making at the University of Göttingen. His research focusses on decision making and social dilemmas with a special interest in investigating and modelling cognitive processes. Aside from basic cognitive research, Andreas Glöckner also explores implications of these findings for legal institutions and public policy.

Monday - August 21

Ido Erev

(Technion- Israel Institute of Technology)

On anomalies, forecasts, and the big data revolution



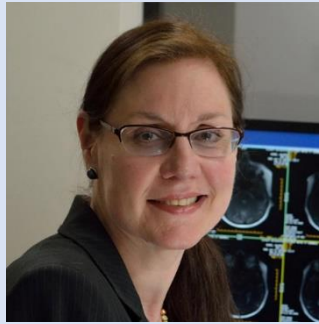
Behavioral decision research highlights interesting choice anomalies, and proposes elegant cognitive models that can explain these phenomena. Yet, it is often easier to predict behavior with theory-free machine learning tools than with the leading cognitive models. One reason for the difficulty in deriving general predictions using cognitive models is that different models are often proposed to explain different phenomena. It is then unclear which model to use to address a new task. The current talk reviews recent research and describes a new choice prediction competition project that try to address this problem.

Ido Erev is the American Technion Society Women's Division Professor of Behavioral Science at the Technion. His work focuses on the impact of economics incentives on choice behavior. It suggests that the initial reaction to a description of the incentive structure reflects overweighting of rare events, but experience reverses this bias.

Tuesday - August 22

Valerie Reyna
(Cornell University)

A Fuzzy-Trace Theory of Risky Decision-making: Healthy, Unhealthy, and Downright Criminal



Recent advances in behavioral and brain research on fuzzy-trace theory are discussed, contrasting decision-making based on meaningful gist versus more precise literal thinking. The theory accounts for central phenomena in decision theory, such as framing biases and the Allais paradox, as described in a formal model of these processes (Broniatowski & Reyna, 2017). The theory also makes a surprising prediction about the origins of these biases and paradoxes, namely, they emerge from childhood to adulthood (Kogut & Slovic, 2016): Children, and adolescent risk takers, are more objective and “rational” than adults (Kwak, Payne, Cohen, & Huettel, 2015). Consistent with the idea that gist-based biases reflect developmentally sophisticated reasoning, unhealthy risk-taking in adolescence was associated with failure to show irrational biases that characterize healthy adults. In addition, both behavioral risk-taking and brain activation—including criminal risk-taking—were correlated with failure to show these biases in adulthood. I explore implications of these results for understanding criminal and non-criminal risk-taking, and for promoting healthy decision-making (Blalock & Reyna, 2016).

Valerie Reyna is Professor of Human Development, Director of the Human Neuroscience Institute, Director of the Magnetic Resonance Imaging Facility, and Co-director of the Center for Behavioral Economics and Decision Research at Cornell University. Her research integrates brain and behavioral approaches to understand and improve judgment, decision making, and memory across the life span, with a special focus on decisions involving risk and uncertainty. She is a developer of fuzzy-trace theory, a model of the relation between mental representations and decision making that has been widely applied in law, medicine, and public health. Dr. Reyna has been elected to the National Academy of Medicine and is a Fellow of the Society of Experimental Psychologists.

Wednesday - August 23

Alvin E. Roth
(Stanford University)

Repugnant transactions and forbidden markets



Why is it forbidden to sell and buy organs? Why is the exchange of kidneys that leads to many successful transplants allowed in some countries such as the US, but not in others like Germany? Which markets or transactions we allow, affects the choices that people have, and how they may pursue their goals. Kidney exchange would seem needlessly complex if we instead allowed kidneys to be bought and sold; but this is illegal everywhere except in the Islamic Republic of Iran. There are many other transactions that are repugnant or forbidden, and this differs between countries. The lecture will investigate the nature of and reasons for repugnance with its implications for the design of markets.

Alvin E. Roth is the Craig and Susan McCaw Professor of Economics at Stanford University. His work focuses on game theory, experimental economics and market design. He shared the 2012 Nobel Memorial Prize in Economics.

List of Posters

(Lobby, Bloomfield Building. 17:30 – 19:30)

1. **Gilles Chatelain**, Tobias Brosch, Stefanie Lena Hille, Ulf J.J. Hahnel

Title: Feel good, stay green: Positive framing offsets the adverse impact of mental accounting on a subsequent pro-environmental behavior

2. **Tehilla Mechera-Ostrovsky**, Sebastian Gluth

Title: The importance of subjective beliefs in memory- based decisions

3. **Tim Otten**, Niels van de Ven

Title: Why do we experience schadenfreude? the effect of schadenfreude on envy.

4. **Koshi Murakami**

Title: Do gamblers think differently? differences in lay beliefs concerning luck between gamblers and non-gamblers

5. **Judith Christiane Schneider**, Sven Nolte

Title: How price paths characteristics shape investment behavior

6. **Rocio Garcia-Retamero**, Dafina Petrova, Adam Feltz, Edward T. Cokely

Title: Measuring graph literacy among diverse individuals: A Meta-analytic evaluation

7. **Łukasz Markiewicz**

Title: The risk – benefit relationship is more rated by risk attitude

8. **Łukasz Markiewicz**

Title: Does an opportunity make a thief? An analysis of the standard economic model of crime's assumptions in a dynamic risk taking context

9. **Inbal Harel**, Tehila Kogut, Marcus Mayorga, Paul Slovic,

Title: The effect of explicit and implicit references to religious beliefs on organ donation decisions

10. **Fabio Marinello**, Elisa Gambetti, Raffaella Nori, Micaela Zucchelli, Fiorella Giusberti

Title: Fast thoughts and metacognitive feelings: the role of cognitive styles.

11. **Ian Belton**, Mandeep Dhani

Title: Biases and debiasing in intelligence analysis

12. **Friederike Brockhaus**, Peter Sedlmeier

Title: Does the representation format of flows influence judgments in Stock&Flow-Systems? the case of iconic signs

13. Lars Wicke, **Mandeep K Dhani**, Ian K Belton, Dilek Onkal

Title: Forecasting accuracy in brainstormed analytic scenarios

14. **Eyal Ert**, Ariel Dinar, Shier Cohen Amin

Title: The effect of Issue linkage on cooperation in bilateral conflicts: An experimental study with relevance to transboundary water

15. **Alexandra Surdina**, Adam Sanborn

Title: Noisy morals: Variability of moral value judgements in a constant environment

16. **Christina Dorothea Botros**

Title: Which decision strategy leads to greater satisfaction? A field experiment disentangling gender effects.

17. **Niels Haase**, Frank Renkewitz

Title: Pacioli or Pascal: The use of probability in solving the problem of points

18. **Mikaela Akrenius**

Title: The interactions of outcome structure and outcome frequency in perceptions of uncertainty

19. **Alida Maria Acosta**, Sebastian Gaigg, Stian Reimers

Title: Preserved socio-economic decision making in autism spectrum disorder: Evidence from the ultimatum game

20. **Rachel Shoham**, Yehuda Pollak

Title: ADHD-associated risk taking is linked to exaggerated views of the benefits of positive outcomes

21. **Nicole Franke**, Marc Jekel, Andreas Glöckner, Arndt Bröder

Title: The effects of salience on information search in decision making

22. **Chaim Salzer**, Nathaniel J.S. Ashby, Eldad Yechiam

Title: When negative tweets increase politicians followers: Influences of negative valence on attention

23. **Arther Kadakure**,

Title: Building bridges between the organisation and its shadow structures: Holistic corporate governance

24. **Lior David-Pur**,

Title: The influence of negative interest rate on financial decision: Behavioral examination

25. **Antonia Krefeld-Schwalb**, Joerg Rieskamp, Nikolas Berkowitsch, Benjamin Scheibehenne

Title: Sequential effects in employee selection: a computational model and an experimental paradigm.

26. **Vladimira Cavojsa**, Eugen Călin Secară, Marek Jurkovic, Jakub Srol

Title: Reception and willingness to share pseudo-profound bullshit: Comparison of Slovak and Romanian samples

27. **Vivien Röder**

Title: The influence of setting and problem solving strategy on the decision of how a stock develops over time depending on in- and outflow

28. **Joerg Mueller,**

Title: Keynesian beauty-contest with short-term and long-term effects: An economic view on pesticide use.

29. **Jozef Bavolar**

Title: Indecisiveness and migration tendencies

30. Johannes Leder, Philina Bartkowiak, Laura Niedermanner

Title: The interplay of ambiguity and social value orientation on social preferences in a time allocation paradigm: Time is money.

31. **María Soria-Oliver,** Jorge S. López, Fermín Torrano

Title: Does mental workload affect decision making in organizational settings? an empirical study with employees of an academic institution.

32. **Stephanie Mertens,** Ulf Joachim Jonas Hahnel, Tobias Brosch

Title: How attribute translations affect purchase decisions in the energy domain

33. **Jorge S. López,** María Soria-Oliver, Fermín Torrano, Begoña Aramayona, Rubén García-Sánchez

Title: An integrated psycho-social model of family decision making about organ donation of a deceased relative

34. **Gustav Almqvist,** Patric Andersson, Leon Nudel, Emilia Wiik

Title: Does it matter who the choice architect is? Determinants of attitudes towards public and private nudging

35. **Dafina Petrova,** Olga Kostopoulou, Edward T. Cokely, Brendan Delaney, Guiliana Mas, Tania Tello Rodriguez, Pedro Ortiz Saavedra, Rocio Garcia-Retamero

Title: How numeracy influences physicians' decision making

36. **Tobias Otterbring,**

Title: Attractive faces alter people's food choices

37. **Ori Plonsky,** Yuval Feldman

Title: The effect of making multiple decisions in sequence on the choice to infringe human rights

38. **Merav Malcman**

Title: Field experiments on tipping in restaurants and for home deliveries: The effects of gifts

39. **Niels Haase,** Tilmann Betsch

Title: Self-report measures of subjective probability: Never use a verbal rating scale!

40. Daniel Edgcumbe, **Volker Thoma**

Title: Effects of neurostimulation on intuitive decision-making tasks are moderated by religiosity

41. **Orian Sharoni,** Moshe Glickman, Dino Levy, Marius Usher

Title: Modeling preference formation of risky decisions using eye tracking Models and Mathematical Psychology

42. **Odelya Mantsura**, Guy Hochman, Shahar Ayal

Title: A vaccine for low vaccination rates: The motivational power of prepayment to promote healthy behavior

43. **Dirk U. Wulff**, Wouter van den Bos

Title: Modeling delay discounting

44. **Martina Salomonsson**, Fabio Del Missier

Title: Choice-supportive memory: A new taxonomy and review

45. **Anat Halevy**, Michal Reifen-Tagar, Guy Hochman and Shahar Ayal

Title: A spillover effect of ideological cheating: when benefiting others goes wrong

46. **Manissa Gunadi**, Christophe Lembregts,

Title: Processing Moving Numbers: How Update Frequency Influences Magnitude Judgments

47. **Shir Etgar**, Yair Amichai-Hamburger

Title: Can different technological devices influence decision-making processes?

Monday August 21, 2017

Session #1 Track 1 (Symposium): The psychology of gains and losses: Beyond loss aversion - Monday 9:00 am - 10:30 pm

(Cooper Building, 215)

The psychology of gains and losses: Beyond loss aversion

Organizers: *Eldad Yechiam (Technion - Israel Institute of Technology); Thorsten Pachur (Max Planck Institute for Human Development)*

Modern theories of how gains and losses affect decision making have mainly relied on the idea that losses receive greater subjective weight than equivalent gains. This notion is known as loss aversion (Kahneman & Tversky, 1979). It has been used to explain diverse behavioral phenomena, ranging from the avoidance of risky lotteries, to the endowment and status quo effects, and even to inequality aversion. Recent studies, however, have observed effects of losses on cognitive processes that occur even when loss aversion (as classically defined) is absent, such as increases in attention and performance with losses, and changes in risk attitude and learning strategies. These findings suggest that while individuals respond differently to gains and losses, the cognitive processes leading to this difference are much more varied than what can be explained by assuming differences in subjective weighting. This symposium presents works highlighting this broader perspective for the underlying processes of gain/loss asymmetries in decision making. Eldad Yechiam will provide an overview of effects of losses on subjective weighting, effort and attention, and will highlight new findings suggesting that losses sometimes lead to an approach behavior and the boundaries of this effect. Tomás Lejarraga will present work on the effect of gains and losses on exploration and their resulting effect on choice. Guy Hochman will present work on how losses following prepayments affect engagement and motivation, and the moderating conditions for this effect. Finally, Thorsten Pachur will present analyses dissecting the endowment effect, which is often attributed to loss aversion, and test predictions from various accounts for discrepancies between buying and selling prices. Contact: yeldad@tx.technion.ac.il; pachur@mpib-berlin.mpg.de

The “approach” effect of losses emerges with experience and exposure

Eldad Yechiam (Technion - Israel Institute of Technology); Nathaniel J.S. Ashby (Technion - Israel Institute of Technology); Guy Hotchman, IDC- The Interdisciplinary Center Herzliya

Previous studies have shown a paradoxical effect where minor losses produced by an advantageous alternative increase the selection from this alternative. This was found in both decisions from experience and decisions from description. In four experiments, we revisit these earlier studies and examine whether this effect is increased with the adaptation to repeated loss, and is therefore contingent on repeated exposure to the losses involved. In Experiments 1 we replicate the effect in decisions from experience and show that minor losses from an advantageous alternative increase the rate of selections from it compared to a less advantageous alternative in terms of expected value. In Experiment 2 we find a similar though smaller effect in Amazon Mechanical Turk. In both Experiment 1 and 2 the effect of losses intensified with experience. In Experiment 3 we examine a decision from experience task in which participants are able to stop getting exposed to the losses from the advantageous option, and find that here minor losses reduce selections from the advantageous alternative producing them. In Experiment 4 we find no equivalent (positive or negative) effects of losses in a one-shot description-based task administered in the lab and in Amazon M-Turk. The findings suggest that the paradoxical “approach” effect of losses is due to increased investment of cognitive resources, but also that it mostly emerges in

decisions from experience involving repeated exposure to the loss. Contact:
yeldad@tx.technion.ac.il

How the threat of losses makes people explore more than the promise of gains

Tomás Lejarraga (Universitat de les Illes Balears); Ralph Hertwig (Max Planck Institute for Human Development – Berlin)

Until recently, loss aversion has been inferred exclusively from choice asymmetries in the loss and gain domains. This study examines the impact of the prospect of losses on exploratory search in a situation in which exploration is costly. Taking advantage of the largest available data set of decisions from experience, analyses showed that most people explore payoff distributions more under the threat of a loss than under the promise of a gain. This behavioral regularity thus occurs in both costly search and cost-free search (see Lejarraga, Hertwig, & Gonzalez, 2012).

Furthermore, a model comparison identified the simple win-stay-lose- shift heuristic as a likely candidate mechanism behind the loss–gain exploration asymmetry observed. In contrast, models assuming loss aversion failed to reproduce the asymmetry. Moreover, the asymmetry was not simply a precursor of loss aversion but a phenomenon separate from it. These findings are consistent with the recently proposed notion of intensified vigilance in the face of potential losses. Contact: tomas.lejarraga@uib.eu

Keeping your gains close but your money closer: The effect of prepayment on choice and performance

Guy Hochman (IDC- The Interdisciplinary Center Herzliya); Shahar Ayal (IDC- The Interdisciplinary Center Herzliya); Dan Ariely (Duke University)

This work examines the effect of prepayment on choice and performance. The results of our first three experiments suggest that participants overvalue prepaid money, and even prefer prepaid money over objectively higher gains. Moreover, this effect was more pronounced when prepayment was more distant from its pure representation in dollars and cents as well as when potential losses were directly linked to specific options rather than framed as a general loss. Our last three experiments suggest ways firms and policy-makers may employ prepayment incentives to achieve greater efficiency and increase motivation and performance. Contact:

ghochman@idc.ac.il

On the psychological origins of buyer-seller differences in pricing

Thorsten Pachur (Max Planck Institute for Human Development, Berlin); Eldad Yechiam (Technion - Israel Institute of Technology); Nathaniel J.S. Ashby (Technion - Israel Institute of Technology)

Trading situations naturally induce a distinction of the involved parties into buyers and sellers. We examine the psychological consequences of the opposing trading perspectives on how people make pricing decisions. Focusing on pricing decisions of monetary lotteries (which have a clearly defined normative value), we conducted a meta-analysis to test whether the buyer and seller perspectives are associated with different levels of accuracy in pricing, and which psychological differences are associated with differences in accuracy. To examine accuracy, we calculated the absolute deviation of the prices from expected values, the rank correlation with expected values, as well as overall variance of the prices, and per-unit variance. Based on 35 articles, we found the endowment effect for monetary lotteries to robust, even (though reduced) under incentivization. More importantly, selling prices deviated less from the lotteries expected values than buying prices, both in absolute and in relative terms. Selling prices also exhibited lower variance per unit. Next, we implemented and compared different accounts of buyer-seller differences, such as loss aversion, probability sensitivity, risk aversion, loss attention, and strategic misrepresentation, by conducting a hierarchical Bayesian modeling analysis with cumulative prospect theory. The results

showed buyer-seller differences in outcome sensitivity (as suggested by a loss-aversion account), response bias (as suggested by a strategic misrepresentation account), and probability sensitivity. The results highlight that the prominent loss-aversion account alone cannot provide a full explanation of the endowment effect, and reveals that strategic misrepresentation has a pervasive effect even under incentivized conditions. Contact: pachur@mpib-berlin.mpg.de

Session #1 Track 2 (Symposium): Perspectives on overconfidence and its determinants - Monday 9:00 am - 10:30 pm

(Cooper Building, 216)

Perspectives on Overconfidence and its Determinants

Organizer: *Dan Zakay (IDC- The Interdisciplinary Center Herzliya, Tel Aviv University)*

Discussant: *Klaus Fiedler (University of Heidelberg)*

The overconfidence effect is the well-established phenomenon that people's subjective confidence in their own ability is greater than their objective (actual) performance. Despite decades of fruitful research on overconfidence and its significance, scholars are still debating about the underlying mechanisms governing this robust behavioral tendency. This symposium will present some key perspectives on overconfidence, followed by a general discussion on its origins and cognitive mechanisms. Asher Koriat will examine the more general issue of whether decision makers are capable of accurately estimating whether their beliefs and judgments are true or false. Koriat's main argument is that people are quite skilled in discriminating between right and wrong responses, and that resolution may derive precisely from experimenters' tendency to sample items representatively. Dan Zakay will introduce a comprehensive model of meta-cognitive feelings based on the assumption that the interaction between retrieval time and amount of retrieved information determines the type of emerging meta-cognitive feeling. Tamar Kugler will focus on overconfidence in the work place to show that CEOs are prone to overconfidence and that strong managerial networks lead to CEO overconfidence. Finally, Klaus Fiedler will explore the metacognitive myopia syndrome, which consists of a massive bias towards gathering overly large samples before making an individual decision. Contact: dzakay@post.tau.ac.il

Can we tell whether our beliefs and judgments are true or false?

Asher Koriat (University of Haifa)

A great deal of research has examined the correspondence between confidence and accuracy, Calibration studies have documented an overconfidence bias for several tasks, but proponents of the ecological approach have argued that this bias is largely a pseudo-phenomenon resulting from experimenters' failure to sample items representatively from their domain. In turn, metacognition research that focused on resolution indicated that people are quite skilled in discriminating between correct and wrong responses, endorsing the former responses with higher confidence than the latter responses. I will argue, however, that the resolution findings, rather than testifying for a general discrimination ability, may derive precisely from experimenters' tendency to sample items representatively. When it comes to resolution, beware of representative samples! Contact: akoriat@univ.haifa.ac.il

A temporal model of meta- cognitive feelings about the accuracy of retrieved knowledge

Dan Zakay (IDC- The Interdisciplinary Center Herzliya, Tel Aviv University)

Retrieved knowledge is vital input for judgments and choices. The optimality of judgments and choices relies heavily on the accuracy of retrieved relevant knowledge. Several meta-cognitive

feelings provide decision makers with information about the accuracy of retrieved knowledge. Meta-cognitive feelings such as "knowing that you don't know", "a feeling of knowing", and "a feeling of confidence" may inform decision makers as to the extent to which they can trust retrieved knowledge and base judgments on it. To date, specific mechanisms have been put forward for each of these meta-cognitive feelings. In the current work, an integrated model is proposed to account for these meta-cognitive feelings as a product of the same mechanism. The model is based on the assumption that the interaction between retrieval time and amount of retrieved information determines the type and intensity of the emerging meta-cognitive feelings. When no information is retrieved until a certain retrieval-time threshold, a feeling of "not knowing" emerges. For a "feeling of knowing" to emerge, the amount of retrieved knowledge over a certain duration must exceed a certain threshold. In general, the more cues are retrieved and the shorter retrieval duration, the higher the degree of confidence. The new model is supported by empirical studies. Theoretical and applied implications are discussed. Contact: dzakay@post.tau.ac.il

The dark side of social capital: Interlock network, CEO-board network and CEO overconfidence

Han Jiang (University of Arizona); Tamar Kugler (University of Arizona); Denton Hatch (University of Arizona)

Overconfidence is negatively linked to information and positively linked to subjective power. Findings suggest that CEOs are prone to overconfidence, which has negative effects on firm performance. We show that strong managerial networks lead to CEO overconfidence. CEOs' managerial networks are divided into external and internal, and provide information supports, and influence (power) supports. Information supports from external and internal networks are substitutable; influence supports derived externally and internally are complementary. We argue that external networks have a curvilinear effect on CEO overconfidence. As the strength of the external network increases, information and power increase. First, increase in the strength of the network leads to increase in information, decreasing overconfidence. As the network continues to strengthen, the effect of information peaks, leaving only power, and causing overconfidence to increase. This curvilinear relation is moderated by internal networks: the friendship network, and the advisory network. As a complementary source of CEO influence, the friendship network intensifies the power effect of the external network, making the inverted U-shaped effect of external network on overconfidence sharper. In contrast, as an alternative information source, advisory network substitutes the informational benefit of the external network, flattening its U-shaped effect. We use data from 197 publicly traded firms in China. Primary data is based on a network survey of the firm's CEO and board, and CEO self-reported ranking of the company's performance. Secondary data provides an objective measure of performance, allowing quantifying the CEO's overconfidence in the firm's performance. The results support our theoretical claims. Contact: tkugler@eller.arizona.edu

Speed-accuracy tradeoffs in sample-based decision making

Klaus Fiedler (University of Heidelberg)

A presumption in decision research is that decision quality must increase monotonically with the amount of relevant information. So, the following research question is of crucial importance for adaptive decision making: If participants in a financial investment game are free to select a strategy that maximizes either the accuracy of single decisions or the number of profitable decisions within the available amount of time, would they succeed in selecting a strategy that maximizes the final payoff? How effectively do they deal with such speed-accuracy tradeoffs? Several parallel experiments conducted with students of psychology (40) and economics (52) and with depressed and control patients (60) demonstrate a massive bias towards gathering too large

samples before making individual decisions, thereby forgoing the chance to gain much more profit from a large number of trading trials. Although the mean accuracy of choices actually increased with increasing sample size, the possible profit would have increased at a much faster rate with the trading frequency in the given time period. The huge waste of possible payoffs was further enhanced when an upper threshold for possible sample size provided a misleading nudging treatment. Although depressed patients were indeed more conservative than psychologists who were more conservative than economists, they all fell prey to the same dramatic conservatism bias. Further experiments showed that trial-by-trial feedback did not ameliorate the conservative bias. Elimination of upper sampling limits did not induce more adaptive strategies. These memorable findings are interpreted as another manifestation of a syndrome called metacognitive myopia – which seems to constitute a major obstacle in the way of rational behavior. Contact: kf@psychologie.uni-heidelberg.de

**Session #1 Track 3 (Symposium): Behavioral Decision Research and Climate Change-
Monday 9:00 am - 10:30 pm**

(Cooper Building, 112)

Behavioral Decision Research and Climate Change

Organizer: *David Budescu (Fordham University)*

Climate change is one of the major problems that we face in the 21st century. It affects people everywhere around the world and a solution will require joint coordinated efforts by multiple stakeholders. Although there is a high level of consensus among scientists' regarding the key facts about climate change and its anthropogenic sources, the public and many policy makers are slow to fully embrace this consensus and are surprisingly slow, and even reluctant to, react to the challenges posed by climate change. How can JDM research contribute in this area? The five papers in this session illustrate the various ways in which behavioral research can begin to address various issues associated with climate change. More specifically: *Broomell et al.* study how daily experiences of local temperature affect perceptions of global climate change; *Budescu et al.* present a new elicitation procedure and use it to elicit emission projections from experts to inform decisions about future policies; *Kause et al.* study the effects of framing information about climate uncertainty on beliefs about climate change; *Lewandowsky* and his colleagues analyze the controversy surrounding the so-called "hiatus in Climate Change"; Finally, *Taylor et al.* study the UK's public priorities and expectations for climate change impacts and analyze their consequences for public policy. Contact: budescu@fordham.edu

Using relative judgements to estimate probability distributions of future emissions

David V Budescu (Fordham University); Emily Ho (Fordham University); Valentina Bosetti (Bocconi University); Detlef van Vuuren (Utrecht University); Klaus Keller (Penn State University)

We propose a new method for estimating subjective probability distributions of continuous variables and describe its application in the climate change context. Expert judges are asked to compare all pairs of possible outcomes and identify in each case which of the two is more likely, and by how much. These comparative judgments generate a reciprocal matrix of ratio judgments from which the target probability distributions can be estimated by several standard methods. We describe two studies in which we used this method with experienced greenhouse gas emission scenario experts making judgments on 2100 emission ranges under specific policies. The results of these studies indicate that the judgments are relatively consistent, insensitive to the partition of the domain of the target variable, while they are sensitive to policy manipulations (pre and post the 2015 Paris agreement). These results and the judges' direct feedback suggest that this method based on indirect pair-wise comparisons is a good candidate for replacing standard

elicitation methods. The estimated probability distributions provide new insights into the experts' perceptions of the likelihood of future emissions ranges. Contact: budescu@fordham.edu

The Perception of Daily Temperatures as Evidence of Global Warming

Stephen Broomell (Carnegie Mellon University); Jon-Francis Winkles (Heinz College, Carnegie Mellon University); Patrick Bodilly Kane (Carnegie Mellon University)

Unlike the scientific definition of global warming (GW), public discussion links the existence of GW to daily temperatures, rather than long-term averages. Previous research found that daily weather is perceived as personal experiences with GW. Additionally, prior beliefs about GW can affect interpretations of such experiences as evidence for the existence of GW. However, previous studies demonstrating that beliefs affect interpretations of experiences were based on correlational designs and relied only on self-reports of remembered personal experiences instead of direct interpretations of weather. We present the first randomized experiment investigating how people interpret daily temperatures in terms of the evidence that it provides about GW, clarifying the psychological causes for different interpretations of the same experiences across individuals. We test the influence of knowledge about (and beliefs in) GW on the interpretation of daily temperatures across two framing conditions labeled *weather* (interpreting a temperature as abnormal weather) and *climate* (interpreting a temperature as evidence of GW). We use Signal Detection Theory to measure a decision-maker's (a) ability to discriminate between temperatures, called *sensitivity* and (b) threshold for describing a temperature as abnormal, called the *decision threshold*. The results replicate previous research finding a *motivational* distortion in interpreting temperatures as evidence of GW and further find that prior beliefs in GW distort decision thresholds while producing no measurable change in sensitivity. In other words, people know when temperatures are abnormally hot, but classify ambiguous events (i.e., less extreme abnormalities) differently based on their beliefs in GW. Contact: broomell@cmu.edu

Framing Climate Uncertainty: Frame Choices Reveal and Influence Climate Change Beliefs

Astrid Kause (University of Leeds, Max Planck Institute for Human Development); Tarlise Townsend (University of Michigan); Wolfgang Gaissmaier (Max Planck Institute for Human Development, University of Konstanz)

When engaging with the public, climate scientists and policy makers face the considerable challenge of communicating uncertain climate predictions. These predictions like probability estimates with upper and lower bounds, are often summarized in simpler but more ambiguous verbal formats. At the same time, research on so-called 'framing effects' shows that the selection of verbal frames for communicating scientific evidence is influenced by underlying preferences of communicators. Such verbal frames also influence listeners' beliefs. Here, we investigate whether verbal summaries of uncertain predictions are subject to framing effects. The example we studied was about winter precipitation in Greater London, which was predicted to increase due to climate change by a central estimate of 15%, with an upper bound of 33%. Somebody who is concerned about the consequences of climate change might frame this upper bound by saying that precipitation 'could increase by as much as 33%', whereas somebody who is not concerned might say that it 'is very unlikely to increase by more than 33%.' In study 1, speakers systematically framed the upper end of an uncertain probability estimate in a more or less concerned way, depending on their subjective perception of the severity of the consequences and their environmental values. Study 2 revealed that more or less concerned frames had a corresponding effect on listeners: When exposed to a more concerned frame of the estimate's upper bound, they perceived consequences to be more severe than when exposed to the less concerned frame. In sum, frame choices reveal and influence climate change beliefs. This may impede the neutral

communication of science and likely contribute to an increasingly polarized debate around climate change. Contact: a.kause@leeds.ac.uk

The 'pause' in global warming in historical and conceptual context: Scientific decision making under uncertainty

Stephan Lewandowsky (University of Bristol and University of Western Australia); James S. Risbey (CSIRO Oceans and Atmospheres, Hobart, Tasmania, Australia); Kevin Cowtan (University of York); Stefan Rahmstorf (Potsdam Institute for Climate Impact Research); Naomi Oreskes (Harvard University)

Public debate of climate change over the past 15 years has variously cited an alleged "pause", "hiatus", or slowdown in global warming during the first decade of the 21st century. Typically labelled the "pause" in warming, this phenomenon also attracted considerable research attention, with more than 200 peer-reviewed articles to date. What explains this intense research interest, given that the currently-available data show no "pause" in warming? We trace the history of research into the "pause" and show how its conclusions were shaped by several sources of uncertainty and ambiguity about the observations. As those sources of uncertainty were gradually eliminated by further research, evidence for an unusual slowing of warming gradually disappeared. We discuss possible reasons why the slowdown attracted so much public and research attention. Contact: Stephan.Lewandowsky@bristol.ac.uk

Public priorities and expectations for climate change impacts in the United Kingdom

Andrea Taylor (Leeds University Business School); Wändi Bruine de Bruin (Leeds University Business School); Suraje Dessai (Leeds University Business School)

Societies worldwide face the challenge of adapting to climate change impacts, such as extreme heat, flooding, and food insecurity. In a UK national survey (n=2007), this paper takes a behavioral decision research to address two research questions (1) What are UK residents' expectations and priorities with respect to climate change impacts? (2) To what extent do expected impact likelihood, anticipated concern about impacts, and beliefs about climate change predict willingness to allocate resources to specific impacts? Survey participants were randomly assigned 10 out of 19 climate change impacts and asked to rate expected likelihood of them occurring, how concerned they would be if they did occur, and how they would allocate finite resources amongst them. Our findings indicate that UK residents tend to prioritize threats related to flooding and food insecurity. Moreover, we find that willingness to prioritize specific impacts for investment tends to be linked to concern about the consequences of the impact, rather than expected likelihood of the impact occurring, or more general beliefs about climate change. Our findings suggest that communications that focus on the consequences of specific impacts, rather than broader information about climate change, may elicit greater support for measures to adapt to them. Contact: w.bruinedebruin@leeds.ac.uk

Session #2 Track 1: Behavioral Finance 1 – Monday 11:00 am – 12:30 pm

(Cooper Building, 214)

Time-induced stress effect on financial decision making in real markets: The case of traffic congestion

Sergey Gelman (Higher School of Economics); Doron Kliger (University of Haifa)

We study the role of stress induced by time constraints on investors' decision making. The need to perform contemporaneous tasks and external interference such as arriving unexpectedly late to

work, might exacerbate acute stress and its impact on decision making. Accumulated laboratory research suggests that time stress may impact financial decisions, mainly in the loss domain. We contribute to the literature studying this issue in real financial markets, as the real markets distinguish themselves from laboratory experiments through repeated situations, aggregation of outcomes and extremely high monetary stakes. We use data on traffic congestion, weather conditions and derivative prices. Our main dependent variable is the slope of the implied volatility function (IVF) of options on RTS futures (cf. Bollen and Whaley, 2004) at the left-hand side of the volatility smile. We find that, controlling for relevant factors, this slope at open of the main trading session is higher subsequent to morning traffic jams, suggesting that investors under stress assign higher weights to extreme loss scenarios. Contact: kliger@econ.haifa.ac.il

Risk-return belief and the affect heuristic

Janine Hoffart (University of Basel); Jana Jarecki (University of Basel); Jörg Rieskamp (University of Basel)

Riskier stocks typically have larger expected returns than less risky stocks. Despite this finding, people often assume an opposing risk-return relationship. This mismatch between the objectively positive risk—return relationship and subjectively believed negative risk—return relationship is commonly explained by the affect heuristic. The affect heuristic describes that people use their affective attitudes towards companies when they judge risks and returns of stocks related to that company. Positive affect leads to high-expected returns and low expected risk. In contrast, negative affect leads to low expected returns and high-expected risks. In Study 1, we investigate the role of different definitions of risk as another contributing factor for the mismatch between the objective risk—return correlation and the subjectively reported risk—return correlation. While in Finance risk is typically defined as the variance of outcomes, in everyday life risk is usually related to losses. Therefore, in Study 1 we designed a questionnaire to understand which question is most suitable to measure risk defined as the variance of returns. In Study 2, we asked a representative sample of Swiss people to judge risks and returns of Swiss stocks as well as their affective attitude towards those stocks. Between subjects, we manipulated how we assessed risk. In one group, we assessed risk by asking people how risky they think the stock is. In the second group, we assessed risk by asking the question of Study 1 that has proven to be the best way of assessing risk—as variance. For both groups, we investigated whether a.) People assume a negative risk—return correlation and b.) Whether this negative correlation could be explained by people's affective attitude towards the stocks. Contact: janine.hoffart@unibas.ch

Does financial regulation unintentionally ignore less privileged populations?

Maya Haran Rosen (The Hebrew University of Jerusalem and BOI); Orly Sade (The Hebrew University of Jerusalem)

In 2014, the Israeli insurance and long-term savings regulator reached out to the Israeli population to help individuals find inactive retirement plans and withdraw inactive funds. We find that the government's effort did not result in withdrawals of the majority of the accounts, and did not reach all subpopulations equally. Provident fund records indicate that those who took financial action and withdrew funds following the campaigns live in localities in the center of the country that have higher socioeconomic characteristics, and they are relatively older. Using survey data we found evidence that those with low financial literacy and confidence in their knowledge of retirement planning and the unemployed were less likely to have been aware of the financial regulatory campaigns. The survey further shows the importance to financial action of confidence in retirement knowledge, gender, age, education and immigration. We conclude that less privileged populations were less likely to have been aware of the campaign, less likely to understand the information, and less likely to have taken action based on the information. Contact: orlysade@huji.ac.il

Borrowers responses to protective mortgage regulation

Yevgeny Mugerman (The Hebrew University of Jerusalem); Moran Ofir (IDC- The Interdisciplinary Center Herzliya)

This paper examines the effects of several protective mortgage restrictions on household choice in the mortgage market. The examined restrictions are: Loan-to-Value (LTV) limits, maturity limits and limits on the share of Adjustable-Rate-Mortgage (ARM). Using a unique and detailed data on mortgage loans between the years 2011-2016 we empirically estimate the impact of these restrictions on household choice and as a result, on the housing market. We find that the examined restrictions affected the household choice, but not always in the patterns the regulators intended to. For example, maturity limits to the maximum period of 30 years, increased significantly the share of 25-30 years loans related to shorter periods loans. As a result, the average duration of mortgage loans increased as well. Overall, we find that all examined restrictions influenced borrowers' choice and in addition affected the housing market and the financial sector stability. Contact: mofir@idc.ac.il

The effect of experiencing a historical financial crash – An empirical evidence

Sandra Andraszewicz (ETH Zurich); Daniel Kaszás (ETH Zurich); Daniel Grosshans (University of Zurich); Stefan Zeisberger (Radboud University); Didier Sornette (ETH Zurich); Christoph Hölscher (ETH Zurich)

The reoccurrence of market crashes, including the most recent global economic crisis from 2008 indicates that current preventive measures are insufficient to mitigate the effects of market instability. Previous literature indicates that experiencing turbulent market conditions has an impact on people's financial risk taking. In this study, we ask people to trade on a simulated historical crash of the Swiss market in January 2015 to investigate individual differences both in their immediate reaction during the crash and changes of behavior in subsequent trading sessions. We observe that in the crash, participants have inconsistent trading strategies, while they behave in a homogenous way during calm periods of the market development. People who experienced a crash decreased their earnings and those who lost money during the crash, decreased their investment in the risky asset in the normal market conditions following the crash. In contrast, the "gainers" increased their trading volume following the crash. Finally, in an investment task following trading, the "gainers" invested significantly less money, compared to the "losers", which could reflect hedging one's earnings from both tasks. Also, we find that men subjectively judge themselves as having higher financial literacy than women, while objectively, there were no gender differences in financial literacy. Improving one's performance across five sessions was positively correlated with the illusion of control. In sum, experiencing a financial crash in a simulated environment has significant impact of people's trading behavior. This effect is more pronounced when a person makes a loss during the crash. Some individual differences indicate the importance of individual traits in decision making during crises. Contact: sandraszewicz@ethz.ch

How does consumer vulnerability impact financial outcomes? The mediating and moderating role of psychological characteristics

Simon McNair (University of Leeds); Arvid Hoffman (University of Adelaide)

"Vulnerable consumers" are those who are at distinct risk of being unable to achieve positive financial outcomes. While regulatory and consumer advocacy groups define "vulnerability" in terms of specific risk factors (e.g. being younger/older; mentally/physically disabled; having low financial literacy), there is limited academic investigation as to the kinds of individual-level characteristics that may vary relative to vulnerability. In a N=360 survey, we aimed to assess how varying degrees of consumer vulnerability might be associated with a range of cognitive and non-cognitive psychological factors with previously established links to financial decision making. Consumer vulnerability was assessed in accordance with 10 pertinent risk factors as identified by the Financial

Conduct Authority (the UK's statutory financial regulatory body), with each respondent given an overall "vulnerability score". Analyses indicated a number of significant correlations between consumer vulnerability and both positive (e.g. amount of saving s) and negative financial outcomes (e.g. being in arrears), as well as with our various psychological characteristics. Further analyses assessed mediation and moderation effects indicating. For instance, personal savings orientation (the tendency towards proactive saving) mediated the effect of vulnerability on both amount of savings, and having been in arrears, while factors such as numeracy, and financial planning tendencies moderated the effect of vulnerability on financial outcomes. Given that we assess psychological characteristics that are malleable, our findings offer some elucidation into specific areas where policies and practices could be targeted in order to better-assist vulnerable consumers. Contact: s.j.mcnaair@leeds.ac.uk

Session #2 Track 2: Decision from Experience – Monday 11:00 am – 12:30 pm
(Cooper Building, 215)

Psychological Forest: Integration of social and data sciences to predict human choice behavior

Ori Plonsky (Technion- Israel Institute of Technology); Ido Erev (Technion- Israel Institute of Technology); Tamir Hazan (Technion- Israel Institute of Technology); Moshe Tennenholtz (Technion- Israel Institute of Technology)

We introduce a synergetic approach incorporating psychological theories and data science in service of predicting human behavior. Our method harnesses psychological decision making theories to extract rigorous features (predictors; independent variables) to a data science algorithm. We demonstrate that this approach can be extremely powerful in a fundamental human choice setting. In particular, a random forest algorithm that makes use of psychological features that we derive, dubbed psychological forest, leads to prediction that significantly outperforms the best available models from a recent choice prediction competition. Our results also suggest that this integrative approach is vital for data science tools to perform reasonably well on the data. We then discuss how social scientists can be informed from using this approach. For example, it can be used in validation of theories and is able to provide insights into which elements of theory are most important. We conclude that integration of social and data science practices is a highly fruitful path for future research of human behavior. Contact: oplonsky@gmail.com

By coincidence or by design? Pattern matching and probability maximizing in groups and individuals

Christin Schulze (Max Planck Institute for Human Development); Wolfgang Gaissmaier (University of Konstanz); Ben R. Newell (University of New South Wales)

We introduce a synergetic approach incorporating psychological theories and data science in service of predicting human behavior. Our method harnesses psychological decision making theories to extract rigorous features (predictors; independent variables) to a data science algorithm. We demonstrate that this approach can be extremely powerful in a fundamental human choice setting. In particular, a random forest algorithm that makes use of psychological features that we derive, dubbed psychological forest, leads to prediction that significantly outperforms the best available models from a recent choice prediction competition. Our results also suggest that this integrative approach is vital for data science tools to perform reasonably well on the data. We then discuss how social scientists can be informed from using this approach. For example, it can be used in validation of theories and is able to provide insights into which elements of theory are most

important. We conclude that integration of social and data science practices is a highly fruitful path for future research of human behavior. Contact: cschulze@mpib-berlin.mpg.de

On the impact of rewarding repentance

Gail Gilboa Freedman (IDC- The Interdisciplinary Center Herzliya); Ido Erev (Technion- Israel Institute of Technology); Yefim Roth (Technion- Israel Institute of Technology)

Our analysis takes the point of view of a leader whose followers can choose between behaviors that the leader classifies as "Good" or "Bad." The leader considers the option of rewarding agents that move from Bad to Good. The influence of such a "Repentance-Rewarding-Policy" is two-sided as it motivates "sinners " to repent but it can also motivate non-sinners to sin, because of the possibility to repent. We highlight the leader's optimal strategy under three types of followers: rational agents; bounded-rational agents that rely on small samples; and experimental subjects. When Bad and Repentance choices are risky, the expected range of situations where rewarding repentance is effective is broader under bounded-rational than under rational agents. Our experiment reveals that typical experimental subjects behave as if they are bounded-rational agents that rely on a small sample; thus, the observed gain for the leader who rewards repentance is higher than her expected gain under a rationality assumption. Contact: Gail.gilboa@idc.ac.il

Closed Circuit Television and the parking lot paradox

Manal Hreib (Technion- Israel Institute of Technology); Ido Erev (Technion- Israel Institute of Technology)

Recent research shows that video surveillance using Closed Circuit Television (CCTV) systems can be very effective in fighting crimes (Jewett, 2007, as cited in Kelly, 2014; Kelly, 2014). However, the exact effect of video surveillance is situation specific; CCTV appears to have almost no effect on violent crimes, a significant effect on vehicle crimes, and it is most effective when used in parking lots. The main goal of the current research is to improve our understanding of the factors that determine the effectiveness of video surveillance in public places. Study 1 examines the relative importance of two likely contributors to the high efficiency of CCTV in parking lots: The high visibility CCTV system, and the high probability of feedback. The results suggest that the probability of feedback is most important. Study 2 tries to use feedback to increase the tendency of daycare teachers to read stories to toddlers. It compares the effectiveness of two methods to provide feedback when the probability of objective reward is low. The results highlight the value of high probability feedback with delay revitalization of the uncertainty. Contact: manalh@campus.technion.ac.il

Interrupted search for treasures

Emuna Eliav (Technion- Israel Institute of Technology); Kinneret Teodorescu (Technion- Israel Institute of Technology)

A popular advice for how to overcome a creativity block is to take some time off the task and distract oneself with unrelated thoughts. In line with this advice, recent studies suggest that interruptions can enhance creativity. The current study tries to shed light on the process and clarify the fundamental conditions for effective interruptions. Using a behavioral economics approach, we point to similarities between creativity blocks and insufficient exploration findings in simplified Rare Treasures environments. While thinking of new ideas is frequently costly, in rare occasions it can lead to the discovery of Treasures – highly rewarding creative innovations. We examine how interruptions affect exploratory behavior in a simplified exploration task and find that interruptions can increase exploration and improve performance when the location of the interrupting task is far from one's current location and when it is not too demanding. Implications to the general

exploratory mechanism hypothesis, mind wandering and creativity studies will be further discussed.
Contact: emn@campus.technion.ac.il

Taking Risks for Others in Decisions from Experience: Uncertainty and Anti-Social Behavior

Sebastian Olschewski (University of Basel); Elliot A. Ludvig (University of Warwick)

In two experiments, we examined the role of uncertainty when making decisions for oneself and on behalf of another person in a decision-from-experience design. Participants repeatedly decided between risky options for themselves and for others from which they had learned about through an earlier sampling phase. We found that participants selected less-risky options for others than for themselves, resembling similar findings in decisions based on description. Whereas this effect is typically attributed to responsibility on behalf of the decider, we found that the reduced risk taking for others was mainly observed from participants independently classified as competitive. In situations where more risk was associated with higher expected value, these competitive participants tended to choose the riskier option for themselves and the safer and lower expected value option for the other group member. In a pre-registered replication, we confirmed this finding and ruled out the possibility that participants did not learn about the properties of the different options through a quiz at the end of the experiment. Furthermore, we found that in distributional decisions under certainty (SVO-Slider), people were much less competitive than in the main task under uncertainty. To conclude, when making decisions for others under uncertainty, competitive behavior was more prevalent than in decisions under certainty. This competitive behavior produces greater apparent risk-aversion when choosing for others compared to oneself in choice with a risk-return trade-off. Contact: sebastian.olschewski@unibas.ch

Session #2 Track 3: Meta-Cognition, Judgments and Preferences - Monday 11:00 am - 12:30 pm

(Cooper Building, 216)

A validation test for self-reported measures of imprecision

Andrea Isoni (Warwick Business School); Robin Cubitt (University of Nottingham); Graham Loomes (Warwick Business School); Anya Skatova (Warwick Business School); Chris Starmer (University of Nottingham); Neil Stewart (University of Warwick); Robert Sugden (University of East Anglia)

Experimental research shows that the preferences that people express in surveys and experiments are often characterized by a considerable degree of noise or imprecision. Focusing on decision-making under risk, we seek to elicit straightforward measures of preference imprecision that can be easily linked to choice behaviour, regarded by many as the gold standard in preference elicitation. We conduct an experiment in which we allow participants to express imprecision in their preferences by reporting that, while they prefer one lottery over another, they are not sure about their preference. In the first part of our experiment, we present participants with tables containing series of paired options in which one is kept constant and the other is made progressively better, in order to identify a range of imprecision. In the second part of our experiment, we build a comprehensive picture of each participant's revealed (but potentially probabilistic) preferences over a circumscribed space of lotteries by asking them to make a large number of repeated choices between pairs of lotteries. Since measures of self-reported imprecision (MoI) cannot be made incentive-compatible, we develop a validation strategy that explores the extent to which our MoI map onto the participants' choice behaviour. For each participant, we are able to identify the relationship between the ranges he/she reports in the first part of the experiment and the choices that she makes in the second. Our preliminary results show that participants are prone to report

that they are not sure about their preferences, but their ranges of imprecision do not correlate closely with the noise revealed by their choice probabilities. Contact: andrea.isoni@wbs.ac.uk

Harnessing the wisdom of the inner crowd by exploiting confidence

Aleksandra Litvinova (Max Planck Institute for Human Development); Stefan M. Herzog (Max Planck Institute for Human Development); Timothy J. Pleskac (Max Planck Institute for Human Development); Ralph Hertwig (Max Planck Institute for Human Development)

The “wisdom of crowds” effect describes the phenomenon whereby aggregating judgments of multiple individuals can lead to a more accurate judgment than that of the average individual. We investigated whether individuals can avail the wisdom of their inner crowd” to improve the quality of their confidence judgments in two-alternative forced choice tasks by either (a) averaging confidence judgments or (b) by relying on the highest confidence judgment (i.e., maximizing). In an ecological simulation analysis, based on a signal detection model of confidence, we investigated how the “wickedness” of the environment (i.e., the degree to which people choose the incorrect answer) affects the performance of averaging and maximizing. Analytical and simulation results show that, irrespective of the environment, averaging consistently improves the quality of confidence judgments. Maximizing, in contrast, is risky: It outperforms averaging in “kind” environments, where people tend to choose the correct answer, but underperforms in wicked environments compared to averaging or randomly choosing one judgment. Consistent with this ecological analysis, we found in three empirical studies that averaging two confidence judgments from the same person is superior to maximizing among them. Furthermore, a decomposition of the mean probability score suggests that repeated confidence judgments from the same person reflect non-redundant knowledge sources in some of the tasks. Our results suggest that as people typically have no metacognitive insight about the wickedness of the environment beforehand, averaging—due to its robustness—should be the preferred strategy to harness one’s conflicting confidence judgments. Contact: litvinova@mpib-berlin.mpg.de

Testing for overconfidence and cognitive dissonance effects in a valuation experiment

Caspar von Schenck (Warwick Business School); Graham Loomes (Warwick Business School); Andrea Isoni (Warwick Business School)

Preferences elicited in economic experiments can depend on the procedure being used. Individuals' stated preferences can reverse from choices to certainty equivalents (CEs). Butler et al. (2014) asked individuals to make a binary choice between two economic lotteries and then state a money amount by which the rejected lottery needs to be improved. This elicits a monetary strength of preference (MSoP). But on average, individuals preferred the improved option at a later stage instead of being indifferent. Therefore, MSOPs show a positive bias: It is unclear if this bias arises from mental evidence accumulated during the choice phase (overconfidence) or an unwillingness to consider mental evidence inconsistent with the choice during the MSOP valuation phase (cognitive dissonance). In a laboratory experiment, both immediate and delayed MSOPs are elicited to filter out overconfidence effects. MSOPs are then compared to direct choices between lotteries, binary choices between sure amounts vs. standard gambles, as well as stated CEs. Different elicitation methods do result in different reported preferences: Choices, CEs, and MSOPs are inconsistent with each other. But no evidence of overconfidence is found and participants report monetary strengths of preference that are inconsistent with a cognitive dissonance hypothesis. Contact: c.d.c.von-schenck@warwick.ac.uk

Age differences in the effect of metacognition on financial decision-making

Chiara Scarampi (University of Bath); Richard Fairchild (University of Bath); Neal Hinvest (University of Bath); Alberto Palermo (EBS Business School)

Due to a decline in cognitive function, decision-making abilities can be compromised with advancing age. This is a significant issue given the increasing pressure to take control over financial and personal wellbeing in old age. A large body of literature has explored the relationship between age and financial choices and the underlying emotional and cognitive processes. However, there are still some gaps in discerning other variables – such as metacognition – which interact with cognitive and emotional processes when making decisions. This research introduces a novel experimental method to investigate metacognition in decision-making tasks and reports the results of an empirical study investigating the age-related effects that metacognition may have on financial choice behavior. It is proposed that high levels of metacognitive ability may compensate for the cognitive decline typically experienced with ageing. The main findings show that young adults have significantly higher cognitive ability, whereas older individuals provide more accurate metacognitive judgements. Furthermore, it emerges from the analysis that some metacognitive components buffer individuals against cognitive decline, providing an alternative route to sound financial decisions. Together, these findings emphasise the importance of studying metacognition in the context of financial decision-making. High metacognitive abilities can enable individuals, and particularly older adults, to reflect on their abilities, on task requirements and on the most appropriate strategies to solve the situation at hand, enhancing in turn competences in making appropriate decisions. Contact: C.Scarampi@bath.ac.uk

Generally higher but not generally better: How competence and confidence affect estimation

Laura Rebecca Rettig (University of Muenster); Thomas Langer (University of Muenster)

In a laboratory experiment, we investigate the effect of self-reported competence on extremeness aversion in the estimation of true values (quantities between 0% and 100%). As expected, we observe a general bias towards the midpoint of the scale (50%) both for questions with low true answers (about 30%) and for high true answers (about 70%). Extremeness aversion is significantly lower for subjects that stated smaller confidence intervals. Surprisingly, we do not find a general effect of the same type for self-stated competence. Only for questions with high answers, the midpoint bias lessens with increasing competence. For questions with low answers, higher competence even shifts the estimate closer to 50%. In sum, we find that higher self-reported competence does not lead to generally less biased but to generally higher estimates. In a second study, we validate and further explore the phenomenon. To eliminate the possibility of question-specific effects, we use a specific design with mirrored questions (e.g. "What is the percentage of population in India that is 14 years or younger [older than 14 years]?") The experimental data confirms our previous results. We further analyse our insights on the determinants of individual bias in a hypothetical group setting (wisdom of crowds) and show that strategically selecting question design and group members based on their self-stated competence can improve accuracy. We argue that a cognitive mechanism underlies our findings that builds on more information being retrieved from memory for higher self-reported competence levels (availability bias). Our results add to existing literature regarding judgmental biases and have practical implications regarding framing for expert judgment by an individual expert or a panel of experts. Contact: laura.rettig@wiwi.uni-muenster.de

The wisdom of select cues

Daniel Barkoczi (Max Planck Institute for Human Development); Shenghua Luan (Max Planck Institute for Human Development)

In their seminal paper examining the efficacy of different weighting-and-adding models, Dawes and Corrigan (1974) concluded that: "The whole trick is to decide what variables to look at and then to know how to add." (p. 105). The "how to add" part has generated much discussion and interest in the past decades, showing that when observations are limited, equal weighting of all variables can outperform differential weighting schemes such as multiple regression in both individual and group contexts (Dawes & Corrigan, 1974; Einhorn & Hogarth, 1975; Hastie and Kameda, 2005). However, little research has been done on "what variables to look at" in the first place or, in other words, how models perform when relying only a subset of information, regardless of the weighting scheme. In the context of group decision making a number of recent studies have shown that selecting the top k out of m members in a group and weighting (equally or differentially) only their inputs can lead to better performance than weighting the inputs from all members (Mannes, Soll & Larrick, 2014). Mannes et al. (2014) referred to this phenomenon as the "wisdom of select crowds". Does the same effect apply in the context of individual decision-making? We investigate the accuracy of weighting-and-adding models that consider not all but a selected subset of available cues. Our analysis of 39 real-world environments shows that such models lead to better accuracy in both paired-comparison and estimation tasks, both for models employing equal-weighting (e.g., Tallying or a unit-weight regression) and differential-weighting (e.g., logistic or linear regression) schemes. We identify a novel cue selection method identify key environmental properties that affect accuracy-gain through cue selection. Contact: barkoczi@mpib-berlin.mpg.de

Session #2 Track 4: Decision Making in the field and society – Monday 11:00 am – 12:30 pm

(Cooper Building, 112)

Decision making up in the air: Effects of pilot status and role assignment on safety critical flight-deck decisions *Peter Ayton (City University of London); Tom Becker (City University of London)*

Most civilian aircraft are flown by a flight-deck crew of two – a captain or pilot in command (PIC) and a co-pilot or second in command (SIC). Regulations require that one person on board is always acting as PIC; this person is legally responsible for the safe operation of that aircraft. However, for every flight each crew member is assigned to be either the Pilot flying (PF) operating the controls or the pilot monitoring (PM). Despite the fact that these roles are taken equally often by the PIC and SIC more accidents and incidents occur when the captain is at the controls of the aircraft than when the co-pilot is. A 1994 review of accidents involving USA carriers (1978–1990) where flight-crew actions or inactions were cited showed more than 80% of all accidents occur when the PIC is the PF. Some have argued that there is an inappropriate authority gradient on the flight-deck and that too often, captains fail to listen and co-pilots fail to speak. Several studies of aircrew performance, incidents and accidents identify inadequate flight crew monitoring and cross-checking as a problem for aviation safety. Industry attempts to improve the monitoring process include in 2003 introducing the term "Pilot Monitoring" to replace the previous more passive "Pilot not Flying". Here we investigate the evidence for the influence of an authority gradient on flight-deck decisions. Firstly, we analyse a set of aviation accidents and incidents attributed to human factors - all events classified as requiring an investigation. We show that, even since 2003, significantly more of these events occur when the PIC is the PF. Secondly, we surveyed 300

professional airline pilots using scenarios designed to uncover evidence of an authority gradient on their decisions. Contact: P.Ayton@city.ac.uk

Long distance, short odds: Drones, manned aircrafts, and tolerance of enemy collateral casualties

Sigal Vainapel (IDC- The Interdisciplinary Center Herzliya); Noa Schori-Eyal (IDC- The Interdisciplinary Center Herzliya); Eran Halperin (IDC- The Interdisciplinary Center Herzliya)

How can changes in modern warfare affect decision making in violent conflicts? Today's warfare is progressing towards unmanned combat systems, such as unmanned aerial vehicles (i.e. drones) that are manually operated by soldiers, usually from a very large distance. However, it is not yet known if, and how, this new technology affects the operators' decision making. This research focuses on individuals' reactions to a military action involving civilian casualties, when carried out by drones compared with manned aircrafts. In two online experiments, American and British participants were asked to imagine themselves as airmen whose mission was to carry out a targeted killing of a militant in Afghanistan or Iraq. Participants were told that as a result of the mission, uninvolved civilians would likely be killed as well. Participants were randomly assigned to imagine themselves as a drone operator stationed in their country of residence, or as a combat pilot stationed in the Middle East. We found an interactive effect of the aircraft condition and participants' political views. When the attack was to be conducted by a drone (compared with a manned aircraft) participants, and especially conservatives, were less willing to carry it out, experienced more negative emotions (e.g., shame and guilt) regarding its collateral casualties, and attributed more responsibility for the decision to the pilot. Furthermore, conservatives experienced less negative emotions than liberals in response to a planned attack by a manned aircraft, but not to a drone attack. The results suggest that drones are not a mere technological military innovation, but can influence the way individual make critical decisions in violent conflict situations. Contact: sigal.vain@gmail.com

Public judgments about the effect of personal mitigation on criminal sentencing

Ian Belton (Middlesex University); Mandeep Dhami (Middlesex University)

Criminal sentencing is a complex and important applied judgment task. Numerous factual cues must be integrated to produce a final sentence, including aggravating factors, which lead to a more severe sentence and mitigating factors, which can produce a more lenient sentence. Personal Mitigating Factors (PMFs) are those which relate to the offender, rather than the offence. Public judgments about sentencing are also important, since the legitimacy of a criminal justice system requires some correspondence between public opinion and sentencing practice. There is currently very little research on public judgments about PMFs and that research is mostly based on self-report data. The present study examined how people's choice of custodial sentence length was affected by the presence of three PMFs: remorse, good character, and addressing addiction. Each individual's judgment policy was estimated separately, using an experimental methodology based on social judgment theory. In line with statistical analysis of real-world sentencing data, addressing addiction was judged to be a more important PMF than either remorse or good character, and all three PMFs had less impact than aggravating factors. However, the relative impact of the three PMFs on judgments about sentence length varied substantially across individuals. In addition, only 36% of individuals' judgment policies included two or three PMFs, which is at odds with current sentencing policy and practice. Correlations between individuals' statistical models and their self-reports also varied widely. The study shows how an idiographic JDM methodology can be used to gain greater insight into sentencing judgments than can be gained from the nomothetic approach typically taken by criminologists and legal researchers. Contact: IB271@live.mdx.ac.uk

Economic indicators for assessing trust within the Jewish society in Israel and their effect on welfare

Naveh Eskinazi (Ben Gurion University of The Negev); Miki Malul (Ben Gurion University of The Negev); Mosi Rosenboim (Ben Gurion University of The Negev); Tal Shavit (College of Management Academic Studies)

Trust and social diversity are important variables that may impact economic decisions. This study focuses mainly on the aspects that can affect the willingness to have a welfare state, and especially trust and generosity. This study combined the traditional and religious groups to form three sub-groups: ultra-Orthodox Jews, traditional Jews and secular Jews, each having different characteristics. Our initial hypothesis that different levels of trust, measured by economic means, are derived from individuals' religious affiliation was refuted. Although there were significant differences in the secular Jews' trust of ultra-Orthodox Jews (measured by the average amounts transferred from player A to player B), there were no differences in the levels of trust that secular Jews showed towards traditional Jews. Instead, we found that the differences exhibited were derived from demographic and social factors, in addition to lack of familiarity and interaction with the segregated, minority population of ultra-Orthodox Jews, whose segregated lifestyle also affects the willingness of secular Jews to share their own resources with this population in general, and to have them receive government assistance in particular. The results show that the willingness for welfare increases as level of trust and the level of generosity (measured by the amount returned from player B to player A in the Trust Game) increases. It was interesting to find that only the trust level between one secular Jew to another, and the generosity level between a secular Jew and an ultra-Orthodox Jew were relevant to the research question and affected the willingness for a welfare state. Contact: naveh.research@gmail.com

Beehive: A platform for mobile experiments

Michael Sobolev (Technion- Israel Institute of Technology and Cornell Tech); Fabian Okeke (Cornell Tech); Deborah Estrin (Cornell Tech)

Beehive is a research platform developed for the study of human behavior using mobile technology. Beehive takes research out of the lab and into the real world. It allows researchers to recruit more participants, collect diverse and objective data and administer smart interventions. In the long term, using Beehive will bring more data, more meaningful results, and successful interventions to improve daily life. In collaboration with other researchers, we conduct several experiments to demonstrate the diverse capabilities of Beehive in addressing digital distraction and stress management. Contact: sobolevmic@gmail.com

Personal data privacy behaviour and concern - a survey on the importance of value as a moderator

Piers Fleming (University of East Anglia); Gareth Edwards (University of East Anglia); Andrew Bayliss (University of East Anglia); Charles Seger (University of East Anglia)

People claim to be concerned about personal data privacy, but this concern is not reflected in their actions – the 'Privacy Paradox'. Here we investigate this paradox and how the personal value of the data is relevant to the concern-behaviour divergence. Low-valued information would likely reduce the importance of protective behaviour, whereas highly-valued information would increase its importance. We anticipate that data valuation could regulate the influence of concern on behaviour. A representative UK sample completed a survey assessing their general privacy concern, the privacy-protection behaviours that they report engaging in, and how they value personal information (e.g. temporally/spatially proximal information vs similar but more distal information). A linear regression to predict privacy behaviours from privacy concern found that people's valuation of both proximal and distal personal data enhanced the statistical model.

Specifically, increases in proximal data valuations increased the concern-behaviour relationship whereas increases in distal data valuation decreased the concern-behaviour relationship. The privacy paradox can be partly explained by the valuations given to proximal data (which indirectly influences behaviour) and the valuations given to distal data (which diminishes the link between concern and behaviour). Our data suggests that the privacy paradox relies on instances where people fail to value proximal data and/or do value distal data, because in these cases unconcerned individuals will still act to protect their private data while concerned individuals will fail to act sufficiently protectively. Contact: p.fleming@uea.ac.uk

Session #3 Track 1: Behavioral Finance 2 – Monday 15:00 pm – 16:30 pm

(Cooper Building, 214)

High holidays: Psychological mechanisms of honesty imprint in real life financial decisions

Doron Kliger (University of Haifa); Mahmoud Qadan (University of Haifa)

Research in psychology has established that religious aspects have a salient effect on individual behavior. Specifically, implicit and subliminal activation of religious ideas promotes honesty. The accumulated evidence for the role of the underlying mechanisms so far has been experimentally based, and no complementary analysis using real-life data has been conducted. This study fills this gap by documenting that internal rewards based on faith, moral, and honesty standards affect individual behavior in real life financial situations. We focus on the ten days of High Holidays (HHs) in Judaism ("ten days of repentance"). Traditionally, on these days, people are granted an opportunity to repair and alter the judgment of their deeds in their favor, by asking for forgiveness and expressing regret. We hypothesize that honesty mechanisms activated on these days (specifically, the perception that action leads to reward-and-punishment) affect people's financial behavior. Corroborating our hypothesis, we find that returns on HHs are abnormally low, as people are less greedy, and implied volatility measures (VIX and VXO; a.k.a. "investors' fear gauge"), as well as realized volatility estimates, are unusually high, as people are more anxious due to waiting for the verdict on their deeds. We back the results by inspecting an increase in Google searches for "Yom Kippur", and "High Holidays" on the event days, and also check robustness by employing various GARCH model specifications. Contact: doron.kliger@gmail.com

Revolving doors and conflict of interest rules in the financial markets: We got it backwards

Hadar Yoana Jabotinsky (The Hebrew University of Jerusalem)

The revolving door phenomenon, in which senior public officials transfer from the public service to the private sector after finishing their term as public officials, and vice versa, is widespread. This gives rise to concern of regulatory capture, which happens when the regulators respond to the wishes of strong interest groups, such as the regulated industry, instead of protecting the interests of the general public. The solution is usually found in conflict-of-interest rules which set cooling-off periods for individuals moving from the public to the private sector. This paper proposes that although revolving doors do incur some costs, they also offer certain positive aspects, and might, if designed correctly, increase the quality of supervision. The main argument of this paper is that due to specific behavioral biases such as the Availability bias and the Lock-In bias, combined with office socialization processes which occur while the individual serves as a public official, regulators who join the private sector tend to comply more with regulatory instructions issued by their previous colleagues than other senior executives. This paper also sheds a light on the less-discussed problems lurking on the other side of the revolving door: moving from the private sector to the

public sector. These problems result from the behavioral biases and socialization processes mentioned above, and which have a lingering effect on the regulators' performance abilities as civil servants. It is these processes that make it easier for the regulators to be captured unwittingly, and creates an opening for the regulated industry to affect the due process of regulation. Contact: hadarjabotinsky@gmail.com

What is risk? How investors perceive risk in return distributions

Stefan M. Zeisberger (Radboud University); Laura Anzoni (University of Zurich)

This paper investigates the determinants of risk perception and investment propensity in a financial context. In a series of experiments, participants are presented with various return distributions with the same expected return but different risk. Our study design allows to separate several different risk measures such as variance of returns, skewness, probability of losing or the maximum possible loss. Our results hint to the probability of losing being the main driver of risk perception and investment propensity. Volatility, which is typically used by researchers, financial advisors and the regulator, does not play a major role. Our insights should allow financial advisors and regulators to support an effective and understandable communication of investment risks to prevent suboptimal investment decisions. Contact: stefan.zeisberger@gmail.com

The Effect of Categorical Perceptions on Investment Decisions

Amnon Maltz (University of Haifa); Ayala Arad (Tel Aviv University)

Is it possible that adding a very small interest rate to one's checking account may affect her investment decisions? We examine this question by asking people in a hypothetical scenario how they would like to invest a bonus. We find that individuals allocate the money less often to a checking account with 0.1% yearly interest than to a checking account with no interest, all else being equal. Alongside this apparent violation of monotonicity, the interest rate generated by the checking account increases choices in riskless investments but not in risky ones. In accordance with subjects' classifications of alternatives, we suggest that these choice patterns stem from a shift in the categorical perception of the choice set: An account with positive interest is more likely to be perceived as a safe low-quality investment than an account with no interest. It is therefore compared to better safe investments, and finally not chosen. Currently running are two more experiments examining this line of thought in an incentive compatible set up with different types of goods. We conclude that categorical-perception, and specifically, which subjective categories are induced by the choice designer, plays a crucial role in the decision process and affect the final choice. Contact: amaltz@econ.haifa.ac.il

The conflicting links between forecast- confidence and trading propensity

Doron Sonsino (College of Management Academic Studies); Yaron Lahav (Ben Gurion University of The Negev); Amir Levkowitz (Ben Gurion University of The Negev)

Confidence in personal forecasts may act as motivator of trading. If two comparable investors, for example, agree that the expected return on some stock is 10% but investor A assigns 90% probability to an interval of plus or minus 5% around this point estimate, while investor B assigns only 30% probability to the same interval, A should reveal stronger willingness to purchase the stock compared to B. The present study, however, shows that at the more general trait-level, personal tendency for forecast-confidence associates with smaller inclination to trade stocks. Individual tendency for forecast confidence was estimated using 8 distinct field-based return forecasting assignments, while personal trading inclination was measured using a 6 items survey questionnaire. By asking subjects to decide on the amount they choose to buy or sell from 4 of the prediction targets, we parallelly illustrate that forecast-confidence indeed boosts trading at the case-specific level in spite of the broader negative confidence- trading link. Simultaneous

estimations of the confidence and trading variables show that the trait level correlation follows from more general personality traits, while confidence in profitability plays direct, causal role in case-specific purchase and sell decisions. Contact: sonsinod@colman.ac.il

Effort gaps between buyers and sellers and their relation to economic bubbles in experimental asset markets

Amitay Kauffmann (Technion - Israel Institute of Technology); Eldad Yechiam (Technion - Israel Institute of Technology); Nathaniel J. S. Ashby (Technion - Israel Institute of Technology); Gal Zahavi (Technion - Israel Institute of Technology)

Economic bubbles are an empirical puzzle because they do not readily fit the notion of an efficient market. We argue that economic bubbles result in part from a conflict and a gap in the allocation of cognitive effort by sellers and buyers. Specifically, we suggest that in experimental asset markets a selling perspective leads to more effort than a buying perspective, as evidenced by greater volume of selling bids than buying bids, and that this predicts buyers' tendency to purchase assets at irrationally high prices. To examine this prediction, we examined 21 experimental asset markets ($n = 165$) where in one condition players could buy and sell and in the other they could either buy or sell (but not both). The results indicated that the volume of selling proposals was 71% higher than the volume of buying proposals for players making concurrent buying and selling decisions. Importantly, bubbles only emerged in markets (sessions) where selling volume was larger than buying volume. Similar findings also emerge in a re-analysis of data from Lei, Noussair, and Plott (2001). The findings therefore suggest that bubbles are the consequence of increased cognitive effort when acting as a seller and diminished effort when acting as a buyer. Contact: kauffmann.amitay@gmail.com

Session #3 Track 2: Learning – Monday 15:00 pm – 16:30 pm

(Cooper Building, 215)

The wicked learning environment of regression toward the mean

Robin M. Hogarth (Pompeu Fabra University); Emre Soyer (Ozyegin University)

The environment in which people experience regression toward the mean inhibits accurate learning and valid intuitions. In predictive tasks, regression effects are only salient in rare cases where cues take extreme values. People often experience regression away from the mean. Furthermore, errors from predictions that ignore regression effects correlate highly with those of optimal predictions. In diagnostic tasks, people fail to recognize regression effects because they are motivated to seek causal explanations. Causes are attributed to easily identifiable factors that make good stories. A simple heuristic can overcome these inferential difficulties. In predictive tasks, a "50/50 rule" that gives equal weight to the cue and the mean of the target variable approximates optimal performance. In diagnostic tasks, the same rule can be used to generate non-causal counterfactuals to challenge possible causal candidates. Contact: emre.soyer@ozyegin.edu.tr

Transfer and learning in basic choice tasks

Doron Cohen (Technion - Israel Institute of Technology); Ido Erev (Technion - Israel Institute of Technology); Ori Plonsky (Technion - Israel Institute of Technology)

Most decisions from experience studies focus on learning (the effect of experience within a certain task), and pay less attention to transfer (the effect of experience drawn from previous tasks). The current study focuses on the role of transfer. A reanalysis of a large dataset used in a recent choice prediction competition shows positive transfer: facing 30 choice tasks in random order, participants' choice rates of the dominant option went from 81% when facing Dominance problems

early, to 96% when the same problems were faced late. Three hypotheses are compared: (1) experience with other tasks helps to discover an optimal strategy. (2) Experience increases the tendency to use an effective shortcut such as an "equal weighting" rule and (3) the effort to discover dominance is affected by previous reinforcement. In Study 2, participants faced 19 problems with no dominant alternative, in which using an equal weighting rule also implied maximization. These were played in random order. In one target problem, either appearing first or last, equal weighting implied choosing a dominated alternative. Results favor the third hypothesis; facing the target problem last triggered negative transfer, as choice rates of the dominant option dropped from 58% (for the group facing it first) to 39% when faced last, without increasing the descriptive value of the equal weighting rule. Results of the two studies suggest this effect is not large, but it can shed light on underlying processes. We improve an existing behavioral model that captures these results. Contact: doronco30@gmail.com

How to make a learner try? On guidance strategies and give-up behaviors

Kinneret Teodorescu (Technion - Israel Institute of Technology)

Truancy, an intentional absence from compulsory education, has been a persistent problem for many years now. The most promising interventions to reduce truancy use some combination of external rewards and punishments by guides. Here I try to shed light on the effectiveness of different guidance strategies in reducing counterproductive give-up behaviors. Truancy is only one example. Other examples include giving-up a new healthy diet, giving-up on learning how to operate a new technology effectively or even giving up on finding true love. In all cases, I will argue, the decision maker first decides whether to give-up or try, and then whether to explore new or exploit familiar giving-up or try options. While exploring "try" options is usually costly, "give-up" behaviors bare immediate satisfaction. However, in the long run, trying could lead to discovery of highly beneficial options while giving-up will maintain sub optimal small pleasures. Two local maxima results are considered: selection of "give-up" options (first order local maxima) and exploitation of suboptimal "try" options (second order local maxima). The results of a simplified game of the "give-up or try" dilemma show convergence to give-up selections. Examination of 5 different guidance strategies suggests that rewarding exploration of new "try" options seems to be the simplest guidance strategy that leads trainees to try more and improve their performance. Punishing both first-order and second-order local maxima also produced similar results, but all other guidance strategies were found to be ineffective or at best to replace one local maxima with another. Implications to real life interventions will be further discussed. Contact:

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Occasional downpour or constant drip? The impact of adverse events distribution on learning and risk taking

Noam Ben-Asher (US Army Research Laboratory); Efrat Aharonov-Majar (Carnegie Mellon University); Cleotilde Gonzalez (Carnegie Mellon University)

Previous research repeatedly demonstrated that positive attitudes towards protective behaviors do not always lead to secure actions (e.g., Webb & Sheeran, 2006). However, most research on this Intention-Behavior gap examined behavior at one point in time, rather than examining repeated choices from experience. Recent research on experience-based choices suggests that individuals' responses to adverse events also reflect sensitivity to sequential patterns, and not only sensitivity to the likelihood of the events (Plonsky, Teodorescu, & Erev, 2015). Following this finding, we propose that delaying protective actions can be sometimes attributed to planning for the best time to execute a protective action and not to procrastination, as previously believed.

We address the role of planning in protective behavior by looking at sequential decisions, where current decision outcome depends on past decisions. Specifically, we examine how the distribution

of adverse events affects individuals' ability to protect against them. In a security task, participants made repeated binary choices between producing or protecting previously produced units from attacks. Due to a production-protection trade-off, the optimal behavior is to protect only before attacks. In a Distributed condition attacks were evenly distributed, and in a Dense condition, clustered attacks followed a long period without attacks. Participants quickly learned to protect exactly before attacks in the Distributed condition; in contrast, in the Dense condition participants were unable to predict the first attack, tending to perform more unnecessary protective actions.

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To search or not to search? Exploring consumer 's sensitivity to different payoff environments

Yefim Roth (Technion- Israel Institute of Technology); Kinneret Teodorescu (Technion- Israel Institute of Technology)

Anecdotal evidence show that in certain domains consumers search more than in others. For example, some consumers invest more effort to find a suitable suite than in searching for a car. Taken to the extreme, it seems that many consumers invest more time in a wedding planning (a one-day decision) relative to a house purchase - often a lifelong decision and certainly, a decision with an impact that lasts longer than one day. In this research, using context free settings, we examine in which range value environments consumers search more. We differentiate between the environments mean payoff (high mean vs. low mean) and volatility (high standard deviation vs. low standard deviation). Counterintuitively, participants search more in the low mean, and less volatile environments. Furthermore, they often do not allocate their search effort effectively, searching equal amount of time or even longer in situations with minor or even negligible benefit for their effort. Our findings highlight important theoretical and practical questions, specifically in which range environments, consumers search more, and how to direct their search efforts towards more important decisions. Contact: rothefim@gmail.com

The interaction of rarity and extremity in risky decisions from experience

Elliot Andrew Ludvig (University of Warwick); Christopher R. Madan (University of Nottingham); Marcia L. Spetch (University of Alberta)

Extreme events, such as lottery wins or major storms, often have two properties confounded—they occur very rarely, and they have very large magnitudes. When making risky decisions from experience, people often behave as if they underweight the probability of such extreme, rare events. When they encounter big, winning outcomes rarely, people end up behaving risk averse, and when they encounter big, losing outcomes rarely, they end up behaving in a risk-seeking manner. In contrast, people sometimes behave as though they overweight extreme outcomes in risky decision from experience—especially when multiple gambles with moderate probabilities are intermingled. In those situations, people are more risk seeking for gains and more risk averse for losses. Here, we set out to disentangle the effects of extremity and rarity on risky choice in decisions from experience. To do so, we had people make repeated choices between safe and risky options, where the risky option sometimes led to a rare (10%) outcome, which was either extreme (highest or lowest in the context) or non-extreme. We found that, in risky decisions from experience, people simultaneously chose as if they underweighted the rare events, but also as if they overweighted extreme outcomes. These two effects seem to be additive and can both be manifest in the same decision situation, though the underweighting of rare events seems more potent. Both these tendencies (to ignore rare events and overweight extreme ones) run counter to the usual tendencies that people exhibit in decisions from description. Contact:

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The impact of a new defense technology on individuals' precautionary actions and risk perceptions

Shosh Shahrabani (The Yezreel Valley College); Eyal Lahav (The College of Management Academic Studies); Uri Benzion (The Western Galilee College)

Background: The study uses unique data collected in Israel in July 2014, during the Protective Edge military operation that the Israel Defense Forces (IDF) conducted in the Gaza Strip, in reaction to the thousands of missiles launched from there into Israel. During this operation, the new Iron Dome anti-missile defense system was used to protect Israelis exposed to missile attacks. The IDF instructed the population that upon hearing an alarm, they must enter the nearest protected area. Aims: 1) to examine the factors correlated with the decision of Israelis exposed to missiles attacks to comply with the IDF instructions, 2) to examine the attitudes toward the new defense technology and the impact of these attitudes on negative emotions, risk perceptions and the decision to comply with the IDF instructions during attacks. Methods: 515 participants completed an internet survey which was sent to a sample of the adult population in several regions in Israel, at the eleventh day of the operation. Results: 57% of the participants reported that they always comply with the IDF instructions during alarms. Participants with stronger positive opinions towards the new system felt lower levels of fear and anger, and believed that their chances of being injured by a missile were lower than had been during previous military operation, compared to those with less positive feelings. In addition, people who complied with defense instructions more carefully were more fearful, angrier at Hamas, and had more positive opinions about Iron Dome. Conclusions: Positive attitudes toward the new defense technology during the operation moderate the levels of negative emotions and risk perceptions and correlate with the intention to comply with defense instructions. Contact: shoshs@gmail.com

Examining the integrity of evaluations of risky prospects

Philip Millroth (Uppsala University); Håkan Nilsson (Uppsala University); Peter Juslin (Uppsala University)

Expected utility theory, the normative benchmark for evaluation of risky prospect, implies that the evaluation is linear in probability, concave in the outcome, and that probabilities and outcomes are multiplied. The present study examines how the evaluations of risky prospects are affected by the availability of comparative anchors. We report an experiment comparing a Within-Subjects Design (WSD), where 20 participants evaluated 36 prospects with a Single-Subject Design (SSD), where each of 720 participants evaluated a single prospect. The results of fitting Cumulative Prospect Theory (CPT; Tversky & Kahneman, 1992) to data showed that in the WSD there was a roughly linear probability weighting function and a concave value function, as suggested by expected utility theory. In the SSD, on the other hand, there was a linear value function and a severely non linear weighting function for probability. The participants thus found it difficult to maintain the linear use of single-event probability disclosed in the WSD when they made evaluations in a SSD without access to comparative anchors. We argue that people may have much of the normative competence captured by expected utility theory, but this competence can only be manifested as normative performance given availability of relevant comparative anchors. We discuss the possibility that this could explain why some economic markets are deemed rational while others are not. Contact: philip.millroth@psyk.uu.se

The role and plasticity of risk perception in a dynamic decision-making risk task

Oliver Schuermann (University of Basel); Timothy J. Pleskac (Max Planck Institute for Human Development); Renato Frey (University of Basel); Ralph Hertwig (Max Planck Institute for Human Development)

Our preferences towards risk determine many of our everyday life decisions. These preferences are constructed by our subjective perception of risk in a given decision. Risk preferences have been investigated thoroughly with the use of behavioral decision-making tasks. However, the influence of risk perception in these tasks has not yet been thoroughly investigated. In the presented paper, we fill this gap by examining the influence of risk perception in the BART, a widely used behavioral risk -preference measure, using subjective perception ratings of participants. In two experiments we tested both the influence of individual difference of risk perception onto behavior in the task as well as the effect of manipulations of risk perceptions onto behavior and perception. Results show how individual differences in risk perception correlate with risky behavior and also, that both the perception of risk in the task as well as risky behavior are influenced by the presentation of risk in the early stage of the task (i.e. the probability of a negative outcome in trial 1). Together these results speak to the important role risk perceptions play in the BART and the plasticity of these perceptions to early experiences within the task. They challenge extant approaches that infer beliefs about risks from observed choice behavior using cognitive models. Moreover, they shed light on recent results that question the reliability of inferring risk preferences from lab oratory-based gambling tasks like the BART. Contact: o.schuermann@unibas.ch

Risk preferences in context

Florian Artinger (Max Planck Institute for Human Development); Gordon D. A. Brown (University of Warwick)

How stable are individuals' preferences for risk? Using the most popular methods to elicit individual risk preferences, the Multiple Price List, we test whether systematic manipulations yield predictable changes in risk preferences. In Psychophysics, it has been shown that the valuation of an object is context-dependent, that is, the valuation is constructed by comparison with other objects. A given range and distribution shape the valuation of an individual object. Using a within subject design where participants repeatedly choose between risky options on different Multiple Price Lists, we can show that elicited risk preferences systematically and predictably vary with the context. The differences obtained between different lists are large, with 34% of participants even switching from risk averse to risk seeking. At the same time, however, participants maintain their relative rank in terms of risk taking propensity in the population across the different manipulations. This suggests that there exists a "relative" stability in terms of risk preferences. Contact: florian.artinger@gmail.com

Is risk-taking behavior influenced by impulsive behavior or by the avoidance of taking action? An experimental study

Avi Israel (Ben Gurion University of The Negev); Mosi Rosenbum (Ben Gurion University of The Negev); Tal Shavit, (College of Management Academic Studies)

The current study tested the effect of cognitive load on risk-taking behavior, which was measured using lottery pricing and time preference questions. The sample consisted of 124 students who were randomly assigned to two cognitive load groups: low load and high load. The results showed that subjects under a high load are more impulsive than those under a low load. However, they also ask for higher risk premium (willing to pay less for a lottery), which is opposite of the predicted more impulsive behavior. We argue that when cognitive resources are loaded, subjects' risky decisions are affected by an avoidance of decision-making rather than impulsive behavior.

Our findings shed light on the influence of everyday distractions on the quality of financial decision making under uncertainty. Contact: isavi@colman.ac.il

Session #3 Track 4: Health and medical decisions – Monday 15:00 pm – 16:30 pm

(Cooper Building, 112)

The impact of item comparisons and reference points in communicating risk and uncertainty: Experiments on presenting surgical outcome data

Tim Rakow (King's College London); Emily Blackshaw (Roehampton University); Christina Pagel (Roehampton University); David S. Spiegelhalter (University of Cambridge)

The mandated public availability of individual hospital's risk-adjusted audit data for children's heart surgery in the UK makes complex and sensitive available to non-specialists, creating a challenging scenario for risk communication. Based on this scenario, three experiments (Ns from 49 to 77) compared different outcome measures for displaying the survival rate (percentage scale vs. the ratio of the predicted/observed rates) and presentation formats (individual hospital vs. all hospitals shown) for outcomes data presented relative to prediction intervals generated by a risk model that adjusts for case mix. We measured participants' comprehension and evaluation of the data that were presented. Our data highlight how easily inappropriate comparisons can influence evaluations of complex data: for instance, both a survival ratio of 1 and the presence of other hospitals seemingly provided reference points that resulted in inappropriately harsh evaluations of some hospitals. By drawing on evaluability theory, we demonstrate how to enhance people's understanding of these complex data while also discouraging inappropriate comparisons, which has implications for risk communication and choice architecture design in a range of contexts. Contact: tim.rakow@kcl.ac.uk

Better ask than tell: Interrogative SMS reminders for enhancing colorectal cancer screening

Efrat Neter (Ruppin Academic Center); Lea Hagoel (Carmel Medical Center)

Objective: To assess whether asking questions about a future behavior changes this behavior (i.e., the "question-behavior-effect", QBE) when applied to a population-level intervention to enhance CRC screening. Methods: In 2013, text-message reminders were sent to a national sample of 50,000 Israeli women and men aged 50-74 following a Fecal Occult Blood Test (FOBT) invitation. Participants were randomized into four intervention groups (interrogative reminders, with or without reference to social context; two non-interrogative reminders, with or without social context) and a no intervention control group. The outcome was FOBT uptake (N=48,091, following attrition) and open-ended, unexpected responses to the SMS. Results: FOBT performance was higher in the interrogative-reminder groups than in the other three (OR=1.11, 95% CI= 1.05-1.19); effect size was small, varying in the different group comparisons from 0.03 to 0.06. Responses were more frequent in the interrogative than the declarative conditions and people who responded included both past-sporadic performers and never-tested. Respondents screened significantly more than non-respondents: six months following the reminders (25.8% vs. 8.8%); a year later (21.7% vs.12.4%); two years later (14.2% vs.10.5%). Conclusion: QBE appears modestly effective in CRC screening, but the absolute number of potential screenees may translate into a clinically significant health promotion change. Contact: neter@ruppin.ac.il

To live or not to live? The effect of mind perception dimensions and strategies of judgement on decision to increase maintain or withdraw li

Idit Shalev (Ben Gurion University of The Negev)

Vegetative and minimally conscious states challenge routine diagnostic and decision of whether or not to withdraw life-sustaining treatment. Based on mind perception evaluations, 815 Mturk participants indicated if they would choose to increase maintain or terminate life support treatment of patients in chronic vegetative state (PVS) in three levels of severity. The participants used either substituted judgment, best interest community norms or judgement based on patient's dignity and individuality. Participants were more likely to withdraw life-sustaining treatment for the patients in the highest severity condition. Whereas decisions regarding increase life support treatment were influenced by perceptions of a patient's ability to plan and act, decision regarding maintain or withdraw life sustaining treatment were influenced by perceptions of a patient's ability to feel or experience. Finally, participants were more likely to support withdraw of life sustaining treatment under the substituted judgement condition as compared to best interest community norms condition. That means that participants assumed patients were interested in ending their life if they were capable to make a decision. Contact: shalev.idit@gmail.com

Improving medical decisions in the surgical ward with clinical decision support

Mirjam Annina Jenny (Max Planck Institute for Human Development); Niklas Keller (Charité-Universitätsmedizin Berlin); Stefan Michael Herzog (Max Planck Institute for Human Development)

Can current impediments to the effective use of clinical decision support tools at the patient bedside be effectively overcome to improve postoperative care? Using best practices from implementation science and machine learning, we developed prediction rules for post-operative care allocation. The resulting rules outperform diagnostic accuracy of physicians, although not all of them adhere to known factors critical to implementation. One rule was more robust to important sources of clinical friction but comparatively less predictive. By developing a new method to construct fast-and-frugal decision trees we succeeded in constructing a simple decision tree that was both robust to clinical friction and as predictive as complex machine learning algorithms. It also outperformed anesthesiologists' subjective impression of how ill patients were based on the score of the American Society of Anesthesiologists (ASA score). Translational data science provides a perspective and a workflow of how to move from a given dataset to actionable and implementable decision support. Contact: jenny@mpib-berlin.mpg.de

When context matters: Probability sizes and risk reduction levels moderate graphical display effects

Yasmina Okan (Leeds University Business School); Eric R. Stone (Wake Forest University); Jonathan Parillo (Wake Forest University); Wändi Bruine de Bruin (Leeds University Business School); Andrew Parke (RAND Corporation)

Graphs are increasingly used and recommended for improving decision making and reducing risky behavior. A key design feature that can influence their effectiveness is whether graphs depict only the number of people affected by a risk ('foreground-only' displays), or also those at risk of harm ('foreground+background' displays). As compared to foreground+background displays, foreground-only displays tend to increase risk aversion (e.g., willingness to get a vaccine), perceived risks, and worry. Existing theoretical accounts predict that such "foreground-only effects" should be moderated by the magnitude of the risks (i.e., probability sizes) and of the risk reduction depicted (e.g., the extent to which the vaccine reduces the risk of suffering a disease). Yet, to date such predictions are untested, as studies have typically focused on scenarios involving relatively low probability risks and large risk reductions. In two experiments, we systematically examined how foreground-only effects varied as a function of a wide range of probability sizes (ranging

from .1% to 40%), and risk reduction levels (20% vs. 80%). Participants were presented with information concerning the risk of contracting a fictitious disease and the effectiveness of different vaccines in reducing this risk. Foreground-only displays were associated with larger risk aversion, risk perceptions, and worry. However, these effects were weaker for larger probabilities and smaller risk reductions. We discuss the contribution of these findings to refining prominent theories of graphical risk communication. We also outline prescriptive implications for effective risk communication and decision support. Contact: y.okan@leeds.ac.uk

An investigation of time preferences, life expectancy and annuity versus lump-sum choices – Can smoking harm long-term saving decisions?

Abigail Hurwitz (The Hebrew University of Jerusalem and College of Management Academic Studies); Orly Sade (The Hebrew University of Jerusalem)

We investigate proprietary data from an Israeli insurance corporation, and exploit its special pricing feature which does not take health conditions (or smoking status) into account in its annuity pricing. We find, contrary to the theory suggesting that smokers have higher discount rates and to the policy pricing mechanism, that smokers do not prefer the lump-sum option. A possible explanation could be that smokers do not perceive themselves as having a shorter lifespan, meaning that they experience a certain degree of self-illusion regarding their own life expectancy. We support this conjecture with a survey that investigated life expectancy perceptions. Contact: abigail.hurwitz@mail.huji.ac.il

Session #4 Track 1: Cognitive Processes – Monday 17:00 pm – 18:30 pm

(Cooper Building, 214)

Thinking without thinking: is cognitive processing or physical processing better for transfer and insight?

Niyat Henok (Kingston Business School); Gaëlle Vallée-Tourangeau (Kingston Business School); Frédéric Vallée-Tourangeau (Kingston University);

The 'Aha!' experience, the sudden burst of insight, has often been explained through an internal cognitive framework. However, external actions may facilitate insight. The role of transfer and material interaction in insight problem-solving was investigated using the Cheap Necklace Problem (CNP). Two versions of the CNP were used: The Standard Version (V1) consisting of four three-linked chains, and the New Variant (V2) compiled of two four-linked chains and two two-linked chains. Across two experiments, participants completed both versions of the CNP in either a low-interactivity condition, high-interactivity condition, or both. In Experiment 1, participants completed the both versions of either using a standard paper-and-pencil questionnaire (low-interactivity) or using physical artefacts (high-interactivity). Performance, measured as successful completion of the task, was substantially better with increased interactivity. All participants demonstrated transfer as they significantly improved in performance and were faster to reach a solution from V1 to V2. Experiment 2 measured the role of transfer and physical processing when the problem presentation changes (low-interactivity to high-interactivity OR high-interactivity to low-interactivity). Transfer was evident with improved performance and improved latencies to solution. However, transfer was greatest for problem-solvers who were presented with the low-interactivity version first, and then experienced the high-interactivity version. Contact: n.henok@kingston.ac.uk

Memory-based models of predicting inferences about brand quality

Yvetta Simonyan (University of Bath); Daniel Goldstein (Microsoft Research)

How are consumers' inferences about product quality related to brand information in memory? Prior literature suggests that, in vast majority of cases, consumers tend to assign higher quality to the products they have seen or heard of before than to those they do not recognize. People's tendency to assign higher value to the objects they recognize has been documented in many areas outside consumer product domain as well. However, people sometimes deviate from this tendency. This work investigates the reasons behind these deviations and suggests a psychological model that builds on the idea that perceived product quality should be viewed not as a point estimate, but as a distribution of beliefs about quality. By modelling inferences, as well as confidence in inferences, via belief distributions, this paper aims at explaining some unsolved phenomena regarding the relationship between quality perceptions, on one side, and recognition and other memory information, on the other. First, it tries to find out whether the belief distributions reflect the relationship between brand quality perceptions and recognition (as well as other memory cues), documented in the marketing literature. Second, using belief distributions, it attempts at explaining why people sometimes infer that an unrecognized brand is of higher quality than a recognized brand. Finally, it investigates whether the belief distributions predict inference and confidence in inferences better than existing models. In an attempt to answer these questions, we conducted lab studies comprising over 35,000 individual inferences. Contact:

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Do executive functions influence how we choose a physician online? The impact of comments and ratings on social media

Guillermo Carbonell (University Duisburg – Essen); Matthias Brand (University Duisburg – Essen)

Social media offer users the opportunity to make choices based on the characteristics of a product or service and also with the comments and ratings of other users. The main goal of this study is to investigate the cognitive mechanisms underlying decision making when using social media. We used a choice-based conjoint design that simulates a physician rating website. In this task, participants chose one physician among four different options in 20 trials. With this technique, we identified the relative impact of the different features offered by social media on the decision of the participants. Additionally, executive functions were measured. Our results suggest that users guide their decisions based on the subjective features provided by social media, such as comments and ratings, whereas other objective features such as specialty and experience were not relevant. On the other hand, participants with higher performance in the executive functions cognitive flexibility and categorization, preferred more systematically objective features, such as availability, experience, and specialty. We propose that the ability to make coherent inferences about possible categories, and to flexibly work with these in a complex task, contributes to recognizing and consistently preferring those features that speak for the (objective) quality of a physician. This research combines different neuropsychological tasks in order to understand a real-life problem such as choosing a physician on the internet, and also contributes to the understanding of decision making with support of social media. We also make suggestions relevant to the fields of recommender systems, information retrieval, and human-computer interaction in general. Contact:

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Nonselective optimism and pessimism among market experts and non-experts

Yechiel Klar (Tel Aviv University); Doron Ravid (University of Chicago); Yael Hallak (Tel Aviv University)

We define *nonselective optimism* as the belief that every option in an attractive group of options is likely to outperform the other options in the same attractive group, and *nonselective pessimism* as

the belief that every option in an unattractive group of options is bound to do worse than the other options in the same unattractive group. Professional stock market experts and non-experts (novices) made predictions about the performance of randomly selected anonymous stocks identified solely by the fact that they belonged to a group of stocks with attractive (unattractive) prospects as compared to other stocks in the same attractive (unattractive) group. Within the attractive group, experts and non-experts alike were non-selectively optimistic in their comparative predictions; within the unattractive group experts - but not non-experts - were non-selectively pessimistic. Nonselective optimism and pessimism based solely on group membership can be accounted for by LOGE theory (Giladi and Klar, 2002). Contact: yklar@post.tau.ac.il

Seeing the forest or the trees? Motivation matters

Reut Blaywais (Ben Gurion University of The Negev)

The construal level theory suggests that four different types of psychological distance affect the way we think. A high level of construal results in interpretations that focus on the abstract schematic and superordinate meaning of the situation, whereas a lower level of construal refers to interpretations that focus on the concrete meaning of stimuli. In this study, we simulated real psychological distance and show that, in contrary to our basic hypothesis, different dimensions of psychological distance affect economic decisions differently: Participants in different psychological distance groups bid different prices in different lotteries. Furthermore, while greater temporal and spatial distance reduced the tendency to ignore explicit opportunity costs, social and hypothetical distance did not. We suggest that since the motivation to invest effort and the cognitive effort necessary to consider opportunity costs declined in the latter situations, participants did not take these costs into account when making their bids. Contact: reutbl@post.bgu.ac.il

The cognitive process of number integration: Evidence from the lab and from the field

Benjamin Scheibehenne (University of Geneva)

The subjective integration of numbers that are encountered sequentially is an elementary judgment process that is highly relevant in research (e.g. in decisions from experience tasks) and in everyday life alike (e.g. when keeping track of spending during a shopping trip). Towards a better understanding of how people perceive and integrate numerical information, participants in a laboratory experiment ($n = 40$) repeatedly estimated the sum of a number sequence briefly presented on a computer screen. Results indicate a systematic bias towards underestimation that could be captured with a compressive power function. The observed underestimation depended on the sequential order in which the numbers were presented but not on the shape of the underlying frequency distribution. Similar results were obtained in a field study where customers in a grocery store ($n = 966$) systematically underestimated the total value of their shopping basket prior to checkout. A model comparison approach revealed that the observed underestimation in the lab study was best captured by a compressed mental number line when evaluating single items while in the field study, the bias rather stem from a systematic error during information integration. The field study further indicated that underestimation increased with age but was not due to a simple rounding strategy or the systematic forgetting of unhealthy items such as sweet or fatty snacks. The results yield novel insights into how people perceive and integrate numbers and they afford novel insights into the cognitive processes underlying economic choices where information is often encountered sequentially. In these tasks, the curvature of people's utility function may reflect perceptual biases rather than individual risk preferences. Contact: benjamin.scheibehenne@unige.ch

Single dose testosterone administration impairs cognitive reflection in men

Gideon Nave (University of Pennsylvania); Amos Nadler (University of Western Ontario); David Zava (ZRT Laboratories LTD); Colin Camerer (Humanities and Social Sciences, Caltech)

The sex steroid testosterone regulates reproductive behaviors such as intra-male fighting and mating in non-humans. Correlational studies have linked testosterone with aggression and disorders associated with poor impulse control, but the neuropsychological processes at work are poorly understood. Building on a dual-process framework, we identified an underlying mechanism for testosterone's behavioral effects in humans: reducing cognitive reflection. In the largest behavioral testosterone administration study to date, 243 men received either testosterone or placebo and took the Cognitive Reflection Test (CRT), that estimated their capacity to override incorrect intuitive judgments with deliberate correct responses. Testosterone administration reduced CRT scores. The effect was robust to controlling for age, mood, math skills, treatment expectancy and 14 other hormones, and held for each of the CRT questions in isolation. Our findings suggest one mechanism underlying testosterone's effects on humans' judgments and decision-making, and provide novel, clear and testable predictions. Contact:

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The influence of visual attention on memory-based decisions

Regina Agnes Weilbacher (University of Basel); Jörg Rieskamp (University of Basel); Ian Krajbich (Ohio State University); Sebastian Gluth (University of Basel)

A recent study indicates that episodic memory biases value-based decision-making (Gluth et al., 2015). The memory bias states that when people forget one of two possible options, they tend to choose the remembered option. This holds true as long as the remembered option has not an extremely low value; in that case the forgotten option is more likely to be selected. In two experiments, we aim to address a possible explanation of the memory bias in value-based decisions: visual attention. It has been shown that visual attention can also bias decisions, as people tend to select options they have looked at longer (Krajbich et al., 2010). In two eye-tracking (within-subject) experiments, participants perform a decision task in which they decide between two food snacks they either see directly (one third of trials) or retrieve from memory (two third of trials). We expect to replicate the memory bias on preferential choices reported in Gluth et al. (2015). Moreover, we predict that attention is mediating this memory bias because i.) people fixate more on remembered options and ii.) options that are fixated more (or longer) are more likely to be chosen. We will also combine the attentional Drift Diffusion Model (Krajbich et al., 2010) with a memory-based sequential sampling model (Gluth et al., 2015) to gain mechanistic insights into the interplay of attention, memory, and decision making. Contact:

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Neural feature representations account for errors in the Simon task: an fMRI model-based study

Yael Salzer (University of Amsterdam); Gilles de Hollander (University of Amsterdam); Leendert van Maanen (University of Amsterdam); Birte U. Forstmann (University of Amsterdam)

In the Simon task, the location of the stimulus, irrelevant to the task, interferes with performance, when the stimulus is contralateral to the response. In the present study, we took a model-based cognitive neuroscience approach to improve our understanding of the mechanism driving the temporal dynamics of the Simon effect. The diffusion model for conflict (DMC) explains this effect by proposing that evidence emerging from parallel-perceptual task-relevant and -irrelevant

processes are superimposed onto a single accumulator. Twenty-eight participants undertook functional magnetic resonance imaging (fMRI) while performing somatosensory and visual Simon tasks. The fMRI data was subjected to a multivariate pattern analysis (MVPA) in regions-of-interest in the visual and somatosensory cortices. The degree to which MVPA predicted every trial as having a left-or-right/house-or-face stimulus presentation, served as a neural proxy to the sharpness of the irrelevant/relevant stimulus feature representation. Similar analysis was conducted for the somatosensory task. In agreement with CMD, it appears that the sensory representation of the task-relevant and -irrelevant stimulus features drive, to some extent, erroneous trials. We conclude that mathematical cognitive models may facilitate to construct a bridge between behavioural and neural data, and work towards revealing the underlying mechanisms of the Simon effect. Contact: salzerit@gmail.com

The role of time ambiguity in intertemporal choice

Iris Ikink (Radboud University); Jan B. Engelmann (University of Amsterdam); Wouter van den Bos (Max Planck Institute for Human Development); Karin Roelofs (Radboud University); Bernd Figner (Radboud University)

Although real-life intertemporal decisions often have imprecise information about the timing of outcomes, standard intertemporal choice paradigms typically provide exact timing information. Therefore, this study investigated how ambiguity about the timing of outcomes influences intertemporal decisions. We developed a novel intertemporal choice task in which subjects made choices between sooner-smaller (SS) and later-larger (LL) rewards in the presence of systematically varying levels of time ambiguity while undergoing fMRI. Trials presented either exact information about outcome delays (e.g., 5 weeks from now), or imprecise information that ranged between 4 weeks (e.g., 3 to 7 weeks from now) and 8 weeks (e.g., 1 to 9 weeks from now). Time ambiguity was introduced to either the SS, LL, or both rewards. Results showed that on average, participants were significantly less likely to choose ambiguous compared to non-ambiguous rewards, indicative of time ambiguity aversion. Neurally, we found significantly decreased activity in ventromedial prefrontal cortex during decisions with (versus without) time ambiguity, consistent with vmPFC's role in subjective value (SV) computations. Increased activation during decisions with (versus without) time ambiguity was observed in the intraparietal sulcus, possibly reflecting increased processing demands under ambiguous conditions. At the behavioral level, three competing SV-models—all incorporating time ambiguity, though via different psychological mechanisms: a simple ambiguity-penalty, changing time perception, or changing noisiness—explain choice equally well. We will present results of a brain-based SV-model comparison, as well as differential brain activations as a function of SV-tracking of ambiguous versus non-ambiguous options. Contact: i.ikink@donders.ru.nl

Brain imaging evidence for a dual-system explanation of heuristic and normative probability judgments

Linus Andersson (Umeå University); Johan Eriksson (Umeå University); Sara Stillesjö (Umeå University); Peter Juslin (Uppsala University); Lars Nyberg (Umeå University); Linnea Karlsson Wirebring (Umeå University)

The conjunction fallacy is the incorrect judgment that a conjunction of two events is more probable than one of its constituent events. The fallacy is often explained as the outcome of a heuristic cognitive system in which judgments are based on similarity. The involvement of a separate system that applies rules of probability has been proposed to be necessary to avoid the fallacy. This so-called dual-systems account is difficult to test with behavioral data alone. Using functional magnetic resonance imaging (fMRI), we demonstrate that judgments, regardless of whether the fallacy was committed or not, mainly engaged a left-lateralized cortical network previously

associated with memory representations and judgments of similarity. Probability judgments where the fallacy was not committed additionally involved a right-sided fronto-parietal network that has been linked to supervisory, analytic control processes. These results constitute neural evidence for a dual-systems explanation of human probability judgments. Contact: linus.andersson@umu.se

Session #4 Track 3: Choices and Preferences – Monday 17:00 pm – 18:30 pm

(Cooper Building, 216)

Elicitation based preference “reversals”

Ellen RK Evers (UC Berkeley – Haas); Michael O'Donnell (UC Berkeley – Haas)

We demonstrate evidence for preference reversals that are distinct from those evinced in prior work. Specifically, in both hypothetical and incentive compatible settings, we find that participants prefer a relatively more utilitarian good when indicating their willingness -to-pay for two products as compared to making choices between the exact same two products. We demonstrate that this is due to participants relying more on their affective responses when making a choice (vs. indicating WTP). The effect is attenuated when participants are told to deliberate. These findings question the notion of stable preferences and violate the assumption of procedure invariance. Contact:

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When the good looks bad: First experimental evidence for the repulsion effect

Mikhail S. Spektor (University of Basel); David Kellen (Syracuse University); Jared M. Hotelling (University of New South Wales)

When choosing among different options, context seems to play a vital role. For instance, adding a third option can increase the probability of a similar dominating option being preferred. This attraction effect is one of the most widely studied phenomena in decision-making research. Its prevalence, however, has been recently challenged by the so-called “tainting hypothesis”, according to which the introduction of an inferior option detracts the attribute space it is located in, decreasing the probability that the dominating option is preferred. In an attempt to test the tainting hypothesis and explore boundary conditions under which dominated options make dominating options look bad, we conducted three pre-registered, partly blinded and partly monetary-incentivized perceptual decision-making tasks with a total of 195 participants and 161,028 trials. Contrary to our initial expectations, we could not replicate the attraction effect in any of these experiments. Instead, we found consistent and robust repulsion effects that became weaker as the distance between the target and the decoy increased. In line with recent criticisms of study design and data-analysis methods of context-effect research as well as large-scale failed replication attempts of the attraction effect, our results highlight the need for carefully designed and statistically-powerful experiments to understand the mechanisms underlying context effects. More importantly, our results contribute to a growing body of literature showing crucial difference between preferential and perceptual decision-making tasks, dismissing the notion that the same low-level processes are responsible for context effects in both task types. Contact:

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Accidentally Bayesian: Preference similarity effects on advice taking

Hang Henry Shen (IÉSEG School of Management); Ye Li (University of California, Riverside)

Consumers increasingly depend on online word-of-mouth to inform their purchase decisions. Thanks to the recent trend toward adding social network features to online recommendation platforms and vice versa, potential consumers can now see reviewers' profiles and rating histories and use that information to seek out advice from users with similar preferences. This article

examines whether consumers taking advice from an online reviewer will do so according to how similar the reviewer's preferences seem to their own. We formalize preference similarity as the degree to which two consumers both liked or both disliked the same products or experiences and compare advice-taking to a Bayesian standard. We show that consumers make two systematic errors when using online advice to make affective forecasts about potential purchases. First, they tend to underestimate the degree of preference similarity with the reviewer, especially for mutual disliking. Second, they tend to overweigh advice relative to a Bayesian advice-taker, especially for negative advice. Because these errors bias affective forecasts in opposite directions, even offsetting each other out for negative advice, consumers can make surprisingly accurate forecasts. Contact: h.shen@ieseg.fr

Indeterminacy of choice under indifference: Two suggestions for a complete preference based theory

Gustavo oliveira aggio (State University of Campinas)

We have identified a strong difficulty in the canonical preference based choice theory. This theory cannot inform what specific decision occurs in a situation with indifference. Then we have analyzed two possible solutions: (i) we consider relax the assumptions of rationality, like in the problem of intransitivity of indifference and (ii) we have proposed a type of compound lexicographic preferences. Both solutions suggestions are coherent with empirical evidence from neurosciences that rational decisions occur in a dynamical process. Contact: aggio@unicamp.br

Attentional selection mediates choice bias effects

Moshe Glickman (Tel-Aviv University); Konstantinos Tsetsos (University Medical Center Hamburg-Eppendorf); Marius Usher (Tel-Aviv University)

Choice bias and preference reversal effects are among of the most puzzling phenomena that are facing our understanding of human decision-making and its relation to the principle of rationality. Here we demonstrate that attentional selection mechanisms, which allow us to reduce information load, have the side effect of generating choice biases and contextual preference reversals. Three experiments are reported, in which human observers are faced with alternatives that involve rapid sequences (of pairs or triples) of payoffs, and are asked to choose the one they prefer. To monitor attentional selection, we use a dot-probe technique as a secondary task. In the first two experiments, we show that the observers show a risk-seeking bias and a contextual preference reversal (similarity). These effects are well accounted by an attentional mechanism: the observers attend more to higher-values which are congruent with their goal of maximizing their reward. In the third experiment, we further show that the magnitudes of the risk-bias and of the attentional selection are correlated among the participants, indicating a common source. Contact: mosheglickman345@gmail.com

Individuation of alternatives and relevant descriptions

Hadrien Mamou (London School of Economics - Edelstein Center)

Standard decision theory axioms are usually considered as normative axioms of rationality, some of them being fairly uncontroversial: e.g., transitivity of preferences is widely accepted in the literature. Given this axiomatic framework, different normative approaches can be taken with respect to rationality. One view, Moderate Humeanism, claims that as long as some consistency constraints are respected, any preferences should be acceptable. On the other hand, anti-Humeanism claims that there exist irrational preferences, even when considered in isolation. In this paper, I examine Broome's argument that aims to show that Moderate Humeanism is not a sustainable view of decision theory. I will focus more specifically on the argument Broome uses to support his claim, and show that although it may get some traction, it does not undermine

Moderate Humeanism as we know it. Roughly put, Broome uses a counterexample to unconditional re-description of the alternatives or re-individuation of the outcomes. He infers that reckless re-individuation should be restricted by some principles, and argues that Moderate Humeanism cannot accommodate such a principle. After reconstructing Broome's argument (i), I will introduce (ii) what I believe is an implicit claim attached to any decision problem in decision theory: when given the description of a decision problem, we are also given a key assumption: the description is sufficiently relevant: nothing more is needed (and available to the decision theorist/adviser) in order to make a decision. I will suggest that although Broome's criticism does not jeopardize Moderate Humeanism, it does pave the way for a new area of research in decision theory whose aim is to establish permissible and impermissible formal representations of a decision problem. Contact: hadrien.mamou@gmail.com

Interactive "nutrition labels" for financial products: A novel approach to assisting decision making under uncertainty

Oded Nov (New York University); Junius Gunaratne (New York University)

Consumers are prone to make costly decision-making errors when making long-term financial decisions, which require understanding of complex concepts such as uncertainty and trade-offs. While most people are poorly equipped to deal with such concepts, the design of the online environments in which consumers make decisions can potentially help them make better decisions. We developed an interactive information label to assist consumers with financial retirement saving, as an illustrative case. To evaluate the effectiveness of the tool, we exposed 450 experiment participants to one of four user interface conditions in a retirement saving simulator where they made 35 yearly decisions under changing circumstances. We found significantly better ability of participants to reach their goals with the information label. Furthermore, participants who interacted with the label made better decisions than those who were presented with a static information label. Lastly, we found the label particularly effective in helping novice investors. Details of the findings and their policy implications are discussed. Contact: onov@nyu.edu

Session #4 Track 4: Nudge and Applied Decision Making – Monday 17:00 pm – 18:30 pm

(Cooper Building, 112)

Information processing in tax compliance decisions: A mouse lab web study

Christoph Kogler (Tilburg University); Jerome Olsen (University of Vienna)

A scientific paradigm that has played a major role in tax research since the early 1970s defines tax evasion as an individual decision under risk (Allingham & Sandmo, 1972; Srinivasan, 1973). According to this view, taxpayers' decisions to declare taxes honestly or to evade, depend exclusively on taxpayers' income, tax rate, audit probability, and severity of fines. Empirical studies reveal that the effects of audits and fines are not always observable and the effects of income and tax rate are more or less unclear (e.g., Andreoni, Erard, & Feinstein, 1998; Fischer, Wartick, & Mark, 1992; Kirchler, Muehlbacher, Kastlunger, & Wahl, 2010). The present study investigates if tax compliance decisions deviate from the predictions of the Allingham and Sandmo model because most people are not familiar with the concept of expected value and/or are not able to calculate expected values. In an incentivized lab experiment the influence of explicit presentation of expected values on actual compliance decisions and information processing was investigated. The results indicate that presentation of expected values did not boost the level of decisions in line

with the Allingham and Sandmo model in comparison to a control condition. Surprisingly, in case of decisions where tax evasion was the dominant option, explicit presentation of expected values even reduced tax evasion. Non-attendance of information can be excluded as an explanation for these findings, since the process data indicates that in both conditions all the relevant information was attended. In general, the data show that both audit probability and severity of fines have an influence on actual decisions, but participants seem unable to combine information on both factors. Contact: c.kogler@uvt.nl

The interaction of ethics and law in tax decision making

Barbara Summers (University of Leeds); Elaine Doyle (University of Limerick); Jane Frecknall-Hughes (University of Nottingham)

Attitudes to tax avoidance have changed substantially over time, from such behavior being seen as a sensible approach to take, through to a recent UK Chancellor describing some of this behavior as morally repugnant. The latter view is often echoed in the press, and companies like Amazon, Starbucks, Vodafone and Google have drawn public protest about their tax behavior, including demonstrations with banners such as "They're our bucks not Starbucks – Close tax loopholes". Although tax is now discussed in a moral light, moral aspects are not usually explicit in the wording of the law, and many behaviors that give rise to complaint are not illegal. Many firms and individuals obtain advice on tax affairs from tax practitioners.

While tax practitioners have responsibilities to comply with the law, they also act as agents with a professional obligation to their clients, and this may limit the extent to which their personal views can affect advice. Here we explore moral reasoning in tax practitioners building on work in Doyle et al. (2012) and look in more detail at the impact of the professional context on their judgment.

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Moving beyond the stigma: Self-affirmation reduces loss aversion in decision-making among the poor

Piero Ronzani (University of Trento); Lucia Savadori (University of Trento); Luigi Mittone (University of Trento)

The burden of poverty is produced by both material deprivation and social stigma associated to it. The stigma of Poverty has been found to diminish cognitive performance and cause the poor to forego beneficial programs. By reminding the poor of important source of self-worth and pride, self-affirmation alleviated the psychological threat and distraction associated with the deprived condition. Our current study compares loss aversion in positively and negatively self-affirmed poor individuals from Kibera slum in Nairobi, Kenya. Loss aversion might be particularly negative for the poor because it might prevent them from making moderate-risk investments with long term benefits (e.g. education and retirement plan). To induce self-affirmation, we used an oral affirmation procedure, in which participants described a personal experience that made them feel successful or proud (positive self-affirmation condition), a challenging event of their life (negative self-affirmation condition) or nothing (base-line). After this, participants completed a behavioral task where they were asked to accept or reject a series of mixed gambles with equal (50%) probability of winning or losing a variable amount of money. Results showed that the poor who were assigned to the negative self-affirmation condition weighted losses more than three times as much as the gains. However, the subjects who were assigned to the positive self-affirmation condition weighted losses nearly twice as much as gains. Finally, participants assigned to the base-line condition showed a loss aversion in between two treatments. The coefficients between treatments found to be significantly different. We checked for several control variables including fluid intelligence, education and socio-economic characteristics. Contact: piero.ronzani@unitn.it

Nudging decision makers' attention: A meta-analysis

Erik Stoltenberg Lahm (Aarhus University); Jacob Lund Orquin (Aarhus University)

In recent years, behavioral scientists as well as policy makers have found an increasing interest in nudging. However, if policy makers wish to nudge decision makers, they need to capture their attention. An understanding of how to capture attention would therefore benefit many stakeholders and lead to a more effective nudging. To gain a better understanding of attention capture, we conducted a psychometric meta-analysis on the effect of bottom up control. We identified 44 studies related to bottom up control. We categorized bottom up control as an object's distance to the center of the stimulus, the salience of an object, an increase in the surface size of an object, and the amount of clutter surrounding the object. We identified: 17 studies related to a position effect and found that objects closer to the center of an array of objects had a moderate effect on fixation likelihood $r = .33$, CI95 [.21, .45], $I^2 = 58\%$. 12 studies related to the salience of an object; objects with a higher salience had a small effect on fixation likelihood $r = .11$, CI95 [-.04, .26], $I^2 = 60\%$. 7 studies related to surface size; increasing an object's surface size had a moderate effect on fixation likelihood $r = .22$, CI95 [.11, .34], $I^2 = 58\%$. Finally, 8 studies related to increased visual clutter showing a negative effect on fixation likelihood $r = .77$, CI95 [.29, .1], $I^2 = 98\%$. Nudging decision makers to attend specific elements of a message is pivotal to enhance better decisions. Our findings suggest that in order to capture consumers' attention, policy makers should: increase the size of the most important attribute, present important information with a low number of surrounding distractors, key objects should be salient, and they should be positioned close to the center of an object. Contact: lahm@mgmt.au.dk

Predictors of corruptibility in a new bureaucracy simulation game

Štěpán Bahník (University of Economics, Prague); Marek Vranka (Faculty of Arts, Charles University)

Corruption has a considerable negative impact on economic and social development. Since corruption is an illegal and concealed activity, its research at the individual level presents a serious challenge. A potential solution of this problem has been recently offered by laboratory experiments. We present a new paradigm in which the opportunity to act corruptly is embedded in a meaningful task that participants perform in a laboratory. The paradigm consists of a task that participants perform according to simple rules. For their work, participants receive fixed payment, regardless of the quality of their work. However, when they perform the task in violation of the given rules, another party is harmed. In the described setting, participants are motivated to perform their task correctly to not harm the other party. Corruption is introduced seamlessly into this setting by offering participants financial incentive for violating the rules. They can earn an additional reward by performing the task in violation of the rules, which also causes harm to the other party. In line with our expectations, we found that corrupt behavior was associated with the size of a bribe and with lower scores on the honesty-humility scale from the HEXACO personality inventory. Trial-level analysis showed that response times were longer for trials with bribes and even longer for trials with bribes that were accepted, suggesting that acting corruptly requires overcoming an automatic honest response. We take all these findings as suggestive of validity of the present paradigm for studying corruption. Contact: bahniks@seznam.cz

Assessing consumers' perceptions of electricity use: Does providing reference points help?

Vedran Lesic (Leeds University Business School); Wändi Bruine de Bruin (Leeds University Business School); Ines Lima Azevedo (Carnegie Mellon University); Matthew Davis (Leeds University Business School); Tamar Krishnamurti (Carnegie Mellon University)

Consumers often find it hard to assess how much electricity is used by their household appliances. Providing a 'reference point' (or showing how much electricity is used by another appliance, such as a single light bulb) can be a simple yet effective strategy to improve the accuracy of consumers' perceptions of appliances' electricity use. The aim of this study is to test whether the provision of single or multiple reference points improves consumers' perceptions of appliances' electricity use. In a US online survey, 504 participants reported their perceptions of electricity use (in Watts) for nine different appliances (e.g. air conditioner, electric oven, dish washer, etc.) as used over the course of one hour. Participants were randomly assigned to one of five experimental conditions: (i) no reference point, (ii) a single low reference point (light bulb), (iii) a single high reference point (electric dryer), (iv) two reference points, one low and one high (light bulb and electric dryer) and (v) three reference points, including one low, one medium, and one high (light bulb, washing machine and electric dryer). We found that providing one or more reference points (rather than no reference point) influenced the accuracy of perceptions of electricity use across all of the appliances. Specifically, participants who received two or three reference points, or the single low reference point, reported more accurate perceptions of electricity use for specific appliances. Additionally, in conditions with two or three reference points, participants were more confident in their estimates and perceived the task as less difficult. We discuss the importance of incorporating reference points in the design of effective electricity feedback for consumers. Contact: bnvl@leeds.ac.uk

Tuesday August 22, 2017

Session #5 Track 1 (Symposium): Resource allocating decisions: Equity-Efficiency Tradeoffs - Tuesday 9:00am – 10:30pm

(Cooper Building, 112)

Resource allocating decisions: Equity-Efficiency Tradeoffs

Organizers: *Shoham Choshen-Hillel (The Hebrew University of Jerusalem); Tom Gordon-Hecker (Ben Gurion University of The Negev)*

Discussant: *Tehila Kogut (Ben Gurion University of The Negev)*

Equity, the idea that one should be compensated according to his or her respective contribution, is a fundamental principle for resource allocation. People endorse equity in a wide range of contexts, from interpersonal relationships to public policy. However, at times, equity might come at the expense of efficiency. In such cases, individuals must make tradeoffs between equity and efficiency. For example, a manager that can offer a pay raise to only one of two equally deserving employees must decide whether to give the pay raise to one of the employees, or not to give it to any of them. How do people make such tradeoffs, and what psychological factors affect such decisions? In this symposium, we address this question from several perspectives. Choshen-Hillel's talk will suggest that giving decision makers (and employees, in particular) a sense of agency, i.e., a feeling of control over the resource allocation, increases their satisfaction with their peers' better outcomes. Gordon-Hecker's talk will present the idea of inequity responsibility aversion, suggesting that what people pit against efficiency in resource allocation decisions is not the mere concept of inequity, but rather the need to personally specify how inequity is implemented. Kleiman-Weiner's talk will adopt a computational perspective on the tradeoff. Specifically, it will suggest a mathematical model that integrates preferences for efficient and equitable outcomes with an aversion to appear partial. Weisel's talk will focus on efficiency and equity in social dilemmas, and show that the burden of punishing non-cooperators—who drive efficiency and equity down—is shared by a larger set of individuals than previously assumed. Contact: shoham@huji.ac.il; tomgo@post.bgu.ac.il

Of the workers, by the workers, for the workers: The effect of agency on people's satisfaction with efficient yet inequitable allocations

Shoham Choshen-Hillel (The Hebrew University of Jerusalem); Alex Shaw (University of Chicago); Eugene M. Caruso (University of Chicago)

Workers often respond negatively to inequity; they are dissatisfied when people are paid unequally for doing equal work. Satisfying these equity concerns sometimes requires that the organization withholds benefits, which results in inefficiency or waste. Are initiatives that increase benefits to some workers but not others doomed to failure because of an inevitable link between inequity and dissatisfaction? Here we demonstrate that the answer is no. Using realistic scenarios and incentivized lab studies, we track participants' satisfaction with the decisions to give others more than them over time. We demonstrate that giving decision-makers a sense of agency (i.e., involving them in the resource allocation process) increases their satisfaction with inequitable allocations that increase social welfare. Specifically, participants reported higher levels of satisfaction with others receiving more than them when they took part in deciding the outcomes (i.e., they were agentic) than when they did not (i.e., they were nonagentic). This effect of agency on satisfaction persisted over five weeks. Our findings have important implications for organizations and for public policy. They suggest that simple behavioral interventions, such as voting, can create a win-win situation whereby individuals are encouraged to be more generous to

others, increase overall welfare, and be less envious of others' good outcomes—even in the face of inequity. Contact: shoham@huji.ac.il

Not taking responsibility: Equity trumps efficiency in allocation decisions

Authors

Tom Gordon-Hecker (Ben Gurion University of The Negev); Daniela Rosensaft, (Ben Gurion University of The Negev); Andrea Pittarello (University of Groningen); Shaul Shalyi (University of Amsterdam); Yoella Bereby-Meyer (Ben Gurion University of The Negev)

When allocating resources, equity and efficiency may conflict. Some may prefer to maximize the total amount of resources distributed, while others may display inequity aversion, and refute inequity even when such behavior is costly. In the current experiments, we examined whether, in situations where equity and efficiency conflict, people are in equity averse, or alternatively averse to being responsible for determining how inequity is implemented – i.e. who gets what. We term the later inequity responsibility aversion. In four experiments, participants were asked to decide whether to allocate a single reward to one of two equally deserving recipients, or to discard the reward altogether, while their identity is being kept private regardless of their decision. Using vignettes, Experiment 1a & 1b showed that people prefer to discard a reward than to create inequity, as long as they are responsible for the allocation. This tendency diminished if they could use a random device to determine the allocation. Experiment 2 showed that this effect is unique to allocating resources among humans and not among inanimate objects. In Experiment 3 which was behavioral, and where participants were asked to allocate a real voucher for coffee and pastry, we replicated the effect. Our findings suggest that it is the personal responsibility to determine how inequity will be implemented that determines how individuals solve the conflict. When participants are responsible for the way inequity is implemented, they are willing to decrease the overall resources to preserve equity. However, when inequity is created by a random device, participants prefer to increase the overall amount of resources over preserving equity. Contact: tomgo@post.bgu.ac.il

Constructing social preferences from anticipated judgments: When impartial inequity is fair and why?

Max Kleiman-Weiner (Massachusetts Institute of Technology)

From the distribution of wealth across society to the distribution of dessert at the end of a dinner party, humans seem uniquely capable of enlarging the size of the pie and sharing it fairly. We make these decisions guided by normative principles such as efficiency, which says to maximize the total utility of the group and fairness, which says in part that distributions should be both equitable and impartial. We also use these principles intuitively when judging whether others' decisions are fair when considered from an impartial or objective perspective. These principles can often come into conflict. Fair distribution is often done according to preferences for equitable outcomes even though strictly equitable outcomes can lead to inefficient waste. In addition to preferences about the outcome itself, allocators are also sensitive to the attributions others might make about them as a result of their choice. We develop a novel mathematical model where decision makers turn their capacity to infer latent desires and beliefs from the behavior of others towards themselves, anticipating the judgments others will make about them. Using this model, we can construct a preference to be seen as impartial and integrate it with preferences for equitable and efficient outcomes. We test this model in two studies where anticipated attribution of impartiality is ambiguous: when one agent is more deserving than the other and when unbiased procedures for distribution are made available. This model explains both participant's judgments about the partiality of others and their decisions. Our model argues that people avoid inequity not

only because they find it inherently undesirable but also because they want to avoid being judged as partial. Contact: maxhkw@gmail.com

Strong reciprocity and selfishness revisited

Till Weber (University of Nottingham); Ori Weisel (Tel Aviv University); Simon Gächter (University of Nottingham)

Mutual cooperation in social dilemma settings is both efficient and fair. The emergence and maintenance of cooperation, and the accompanying efficiency and fairness, can be explained by the theory of strong reciprocity, which assumes that even in the absence of material incentives, e.g., in one-shot interactions with strangers, some people are willing to pay a cost for cooperating with cooperative others (i.e., are pre disposed towards strong positive reciprocity), and that (only) a subset of these are also willing to pay a cost for punishing non-cooperative others (strong negative reciprocity). We refer to this assumption as the Strong Reciprocators assumption, and test it in this paper. Using a variant of the strategy method, we measure, in an incentive compatible way, participants' disposition towards strong positive reciprocity, and classify them as either conditional cooperators (CC) or unconditional non-cooperators (UCNC). Subsequently, participants play a one-shot direct response public good game either with or without punishment. Consistent with the Strong Reciprocators assumption, UCNC only contribute to the public-good when there is a threat of punishment. CC, on the other hand, contribute to the public good whether punishment is available or not. Surprisingly, and in contrast to the Strong Reciprocity assumption, CC and UCNC are nearly indistinguishable in their disposition towards strong negative reciprocity (i.e., punishment behavior). The 'burden of cooperation' is thus carried by a larger set of people than previously assumed, which can help explain the high levels of efficiency and fairness that are often observed when punishment opportunities are available. Contact:

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Session #5 Track 2 (Symposium): Economic Decisions under Ambiguity and Psychological Decisions from Experience - Tuesday 9:00am – 10:30pm

(Cooper Building, 214)

Economic Decisions under Ambiguity and Psychological Decisions from Experience

Organizer: *Peter P. Wakker (Erasmus University Rotterdam)*

Discussant: *Ori Plonsky (Technion- Israel Institute of Technology)*

Both economists and psychologists noticed that described probabilities, as in Kahneman & Tversky's (1979) prospect theory, are almost absent from practical decisions. It led to decisions from experience (DFE) as the hottest topic in psychological decision theory today, and decisions under ambiguity idemdito in economics. This symposium brings the two together, seeing how each can benefit from the other, with special attention to the most debated issue: over- versus underweighting of rare events. Wulff's meta-analysis of the DFE-DFD gap sets the stage for DFE. Wakker's liberation of ambiguity from Ellsberg's straightjacket sets the stage for ambiguity, allowing its connection with DFE. Aydogan sheds new light on over- versus underweighting in DFE using ambiguity-theory tools from economics, and Kopsacheilis does so isolating the five main culprits, including ambiguity attitudes. All analyses use probability weighting to present their findings, facilitating connections and comparisons. Given the controversial nature of the aforementioned issue, all contributors encourage discussions. Contact: Wakker@ese.eur.nl

A Meta-Analytic Review of Two Modes of Learning and the Description–Experience Gap

Dirk U. Wulff (University of Basel); Max Mergenthaler Canseco (Max Planck Institute for Human Development); Ralph Hertwig (Max Planck Institute for Human Development)

People can learn about the probabilistic consequences of their actions in two ways: One is by consulting descriptions of an action's consequences and probabilities (e.g., reading up on a medication's side effects). The other is by personally experiencing the probabilistic consequences of an action (e.g., beta testing software). In principle, people taking each route can reach analogous states of knowledge and consequently make analogous decisions. In the last dozen years, however, research has demonstrated systematic discrepancies between description - and experienced-based choices. This description–experience gap has been attributed to factors including reliance on a small set of experience, the impact of recency, and different weighting of probability information in the two decision types. In this meta-analysis focusing on studies using the sampling paradigm, we evaluated these and other determinants of the decision–experience gap by reference to more than 70,000 choices made by more than 6,000 participants. We found, first, a robust description-experience gap but also a key moderator, namely, problem structure. Second, the largest determinant of the gap was reliance on small samples and the associated sampling error: free to terminate search, individuals explored too little to experience all possible outcomes. Third, the gap persisted when sampling error was basically eliminated, suggesting other determinants. Fourth, the occurrence of recency was contingent on decision makers' autonomy to terminate search, consistent with the notion of optional stopping. Finally, we found indications of different probability weighting in decisions from experience versus decisions from description when the problem structure involved a risky and a safe option. Contact: dirk.wulff@gmail.com

The Rich Domain of Ambiguity Explored

Peter P. Wakker (Erasmus University Rotterdam); Zhihua Li (University of Warwick); Julia Müller (Westfälische Wilhelms-Universität Münster); Tong V. Wang (Chinese University of Hong Kong)

Ellsberg and others suggested that decision under ambiguity is a rich empirical domain with many phenomena to be investigated beyond the Ellsberg urns. We provide a systematic empirical investigation of this richness by varying both the uncertain events, the outcomes, and combinations of these. In particular, we consider the effect of emotions induced by different sources of uncertainty. Although ambiguity aversion is prevailing, we also find systematic ambiguity seeking, confirming insensitivity (or misperception) of ambiguity. We find that ambiguity attitudes depend on the source of uncertainty (the kind of uncertain event) but not on the outcomes. Ambiguity attitudes are closer to rational for natural uncertainties than for the Ellsberg urns (fewer monotonicity violations and less insensitivity). The Goldstein-Einhorn family of weighting functions performs best for describing ambiguity. Implications for the often discussed over- or underweighting of rare events for decisions from experience are discussed. Contact: wakker@ese.eur.nl

The Role of Prior Beliefs in Decisions from Experience

Ilke Aydogan (Erasmus University Rotterdam)

This presentation points to the importance of prior beliefs in understanding the gap between decisions from description and decisions from experience. Relying on the ideas from (behavioral) economic ambiguity theory, it puts forward a two-stage account that effectively incorporates prior beliefs into the examination of decisions from experience. The two-stage account assumes that (1) the subjective probabilities are estimated in a Bayesian manner, combining prior beliefs with observations, and (2) the estimated probabilities are transformed by source dependent probability weighting. The first stage provides a Bayesian explanation for the commonly found overestimation of infrequent outcomes, and an empirically appealing way to deal with always – or never –

observed outcomes. A source dependent probability weighting in the second stage captures deviations from Bayesian rationality under experienced uncertainty. The two-stage model is tested by reanalyzing the data sets in Glöckner et al. (2016), as well as the famous Technion Prediction Competition data set of Erev et al. (2010). Model comparisons using BIC scores indicate that the two-stage model performs better than the single stage model approximating subjective probabilities with observed relative frequencies. The estimation results show that the two-stage model can accommodate both the classic and the reversed description - experience gap. Contact: aydogan@ese.eur.nl

Decomposing the Description - Experience gap

Orestis Kopsacheilis (University of Nottingham); Chris Starmer (University of Nottingham); Robin Cubitt (University of Nottingham)

Prospect Theory posits that people overweight rare events. However, according to the Description-Experience gap, a recently established empirical finding, this long held tenant is true only when decisions are informed by explicit descriptions of the uncertainty at hand. Conversely, when having to rely on past experiences, decision makers treat rare events as if underweighting them. In this study, we revisit this empirical discrepancy by focusing on its underpinnings. We devise a 5-treatment lab-experiment that allows us to decompose the gap in its most likely factors. Moreover, we elicit decision weights non-parametrically, at the individual level and examine whether this "underweighting hypothesis" in decisions from Experience is in fact real. We find that the only consistently significant factor is "sampling bias", i.e. the fact that subjects in Experience collect samples which tend to under-represent rare events. Notwithstanding, factors beyond this information asymmetry such as the differing presentation format between Description and Experience, the role of ambiguity and the role of memory, although insignificant in isolation, proved influential in pairwise combinations. Finally, our investigation regarding the shapes of weighting functions across all versions of Experience, leads us to propose a new, more conservative formulation of the Description - Experience gap. According to our "relative underweighting hypothesis", decision makers overweight rare events in Experience too, albeit less so than they do in Description. Contact: lexok@nottingham.ac.uk

Session #5 Track 3 (Symposium): The interplay of intuitive and analytic processing of numerical information in decision-making - Tuesday 9:00am – 10:30pm

(Cooper Building, 215)

The interplay of intuitive and analytic processing of numerical information in decision-making

Organizer: *Zohar Rusou (The Open University of Israel)*

Discussant: *Valerie Reyna (Cornell University)*

The prevalence of numerical information in decision making places demands on people and constitutes a major challenge to their ability to make fully informed choices. Numerical information is processed via two parallel and largely distinct processing pathways (Dehaene, 1992), compatible with the distinction between analytical and intuitive thinking. The general consensus is that analytical thinking is more advantageous in numerical processing. However, there are recent findings, demonstrate powerful and fairly accurate intuitive numerical evaluations. This symposium presents five papers discussing the intuitive and analytical processing of numerical information in decision-making. Glöckner et al. show how the effects of positive and negative outcomes (gains and losses) and framing affect risky choices. Usher et al. propose a neural population averaging mechanism underlying estimations of the average of rapid sequences. Petrova et al. present the

influence of cognitive abilities (numeracy, cognitive reflection, and symbolic-number mapping), visual aids, and the affective value of a risky prospect on sensitivity to probabilities. Schley et al. integrate Range-Frequency Theory (RFT) into a new dual-process model of value by examining how the relative differences between options and the rank-order of the options impact the diminishing marginal sensitivity of the value. Finally, Rusou et al. investigate how the interplay between thinking mode (intuitive or analytic) and information load affect the quality of estimations of the average of numerical sequences. Taken together, these talks show that the impact of intuitive versus analytic processing of numerical information is highly malleable and shaped by contextual factors. Contact: zoharrus@gmail.com

Exploring Processes in Risky Choice using Eye-Tracking

Andreas Glöckner (University of Hagen, Max Planck Institute for Research in Collective Goods);

Susann Fiedler (Max Planck Institute for Research in Collective Goods)

Cumulative Prospect Theory (CPT) has been shown to provide a good “as if” theory for predicting risky choices between two-outcome gambles. Still research has in the last years moved beyond analyzing choices only. Models based on more intuitive and also more deliberate mechanisms have been suggested to describe the underlying cognitive processes and some studies have tested process predictions of these models. Prominent approaches are evidence accumulation models such as decision field theory (DFT), simple serial heuristic models such as Lexicographic Rule, and connectionist approaches such as the parallel constraint satisfaction (PCS) model. Recent studies investigating effects of positive and negative outcomes (gains and losses) and risky choice framing will be presented. Results concerning choices, attention, and decision time will be discussed with respect to these models. Contact: andreas.gloeckner@fernuni-hagen.de

Intuitive averaging and preferences: a compensatory though normative process

Noam Brezis (Tel Aviv University); Zohar Bronfman (Tel Aviv University); Michael Brusovansky (Tel Aviv University); Marius Usher (Tel Aviv University)

Making decisions about alternatives whose values fluctuate in time (such as stocks) or about alternatives that require integration over multiple attributes, is normatively thought to require an integration (weighted-averaging) process. Such processes, however, are usually considered to involve analytical thinking that is subject to the limitations of working memory (WM). However, studies in our lab indicate that participants are able to carry out remarkably good estimations of the average of numerical sequences appearing at a rapid rate of 2-4 items/sec and sequence-length of $L=8/16$. Moreover, the accuracy of these estimations improves with the sequence-length, indicating a population-averaging process that improves its accuracy with the number of samples (noise averaging), and stands in contrast with the slower estimations for shorter sequences ($L=4$), which are WM-dependent. Furthermore, we also find that about 70% of the participants can make multi-attribute decisions that require prescribed weights over 2-5 attributes in about 1.5 sec, which are nevertheless compensatory and more accurate than what could be achieved via a Take-The-Best heuristic. We propose that averaging and weighted averaging can be carried out via a neural population averaging. Contact: noambrezis@gmail.com

What factors influence the shape of the probability weighting function?

Dafina Petrova (Universidad de Granada); Jakub Traczyk (SWPS University of Social Sciences and Humanities); Rocio Garcia-Retamero (Universidad de Granada, Max Planck Institute for Human Development)

When choices are affect-rich, people pay less attention to probabilities and exhibit more curved probability weighting functions (PWF). We extend research on probability weighting by investigating the influence of several factors known to impact risky choices: cognitive abilities,

information formats, and affect. In two experiments, we manipulated the affective value of a risky prospect (affect-poor vs. affect-rich) and administered a probabilities task (i.e., playing a game to win a ticket with a given probability). In study 1, participants (N=467) completed measures of numeracy, cognitive reflection, and symbolic-number mapping (i.e., the ability to accurately map numbers onto their underlying magnitudes). In study 2, participants (N=417) were additionally randomized to (1) a visual aids vs. no visual aids condition and (2) a positive frame (e.g., 1 person wins) vs. combined frame condition (e.g., 1 person wins and 99 persons do not win). Participants with more accurate symbolic-number mapping had more differentiated emotional reactions to the various probabilities, which resulted in more linear PWFs. Visual aids decreased the curvature of the PWFs, independently of the affect-richness of the prospect. The combined frame also decreased the curvature of the PWFs by increasing deliberation time. Instructions to "think like an expert gambler" had no effect. From all examined factors, visual aids had the strongest effect. Results generally accord with notions of diminishing emotional sensitivity to numbers and the affect gap in risky choice. People who display inaccurate symbolic-number mapping are less influenced by probabilities in their decisions. Whenever important, visual aids may help increase sensitivity to probabilities. Contact: dafinapetrova@ugr.es

Ordinal and Cardinal Information Processing: A Dual Process Model of Decision Making

Dan Raphael Schley Erasmus University Rotterdam); Bart de Langhe (University of Colorado at Boulder); Andrew Long (University of Colorado at Boulder)

The current research integrates Range-Frequency Theory (RFT) into a new dual-process model of value. Past theories of value suppose that value exhibits diminishing marginal sensitivity (DMS) relative to the input. RFT builds on DMS by not only assuming that individual's process relative differences between options (i.e., cardinal information), but the rank-order of the options (i.e., ordinal information) as well. When applied to value functions, RFT supposes that the distribution of options can produce traditions DMS, as well as constant, or even increasing marginal sensitivity. The current research first confirms the role of RFT in valuation. Next, we offer a numerical-cognition-based explanation for why individuals use ordinal and cardinal information. Specifically, we demonstrate that ordinal information is more easily processed than cardinal information. Because the composition of ordinal and cardinal cues in the judgment environment can change value sensitivity, we argue a novel dual-process model of value that supposes that more automatic processes can produce less or greater sensitivity. Contact: schley@rsm.nl

Pitting intuitive and analytical thinking against each other: The case of numerical evaluation

Zohar Rusou (The Open University of Israel); Dan Zakay (IDC- The Interdisciplinary Center Herzliya, Tel Aviv University); Marius Usher (Tel Aviv University)

Decision makers today are swamped by numerical information regarding vital life issues. This study compared the relative advantage of analytical vs. intuitive numerical processing pathways in numerical average evaluations, while varying information load, complexity of the task and the information presentation formats (simultaneous versus sequential). Thinking manipulation was based on Dehaene's (1992) model, which postulates two pathways for the numerical processing. The complexity level of the task was manipulated by varying the number of items to be averaged. The information presentation format examined were simultaneous vs. sequential. When few numbers were presented, analytical evaluations were found more accurate. But when task complexity increased and a sequential presentation was used, intuitive evaluations were more accurate. The results challenge the common position that analytical thinking is always advantageous in numerical evaluations, suggesting instead that the relative efficiency of each

thinking mode is mediated by task's factors. The cognitive mechanisms that might underlie our results are discussed. Contact: zoharrus@gmail.com

Session #5 Track 4 (Symposium): Improving Intelligence Analysis with Decision Science – Tuesday 9:00am – 10:30pm

(Cooper Building, 216)

Improving Intelligence Analysis with Decision Science

Organizers: *David R. Mandel (DRDC Toronto Research Center); David V. Budescu (Fordham University)*

Discussant: *Peter Ayton (City University of London)*

As Sherman Kent, the father of modern intelligence analysis, noted long ago, most substantive intelligence assessments are human judgments rather than cold, hard facts. Most of those, in turn, are made under conditions of uncertainty and are communicated to decision-makers who face uncertainty, high stakes, and accountability pressures. Amazingly, given these facets, there has been only modest interaction between the intelligence community and (judgment and) decision science. This symposium presents cutting edge decision research that aims to verify and improve the quality of intelligence analysis. Paper 1 by Mandel et al. examines intelligence analysts' ability to reliably infer information accuracy from scale values that encode source reliability and information credibility, two sources of meta-information widely used in intelligence. Drawing on experimental data from analysts, Paper 2 by Dhami et al. assesses the effectiveness of a commonly used structured analytic technique called Analysis of Competing Hypotheses (ACH) that has received surprisingly little research attention. Paper 3 by Bolger examines how ACH could be improved by embedding it within a Delphi process to harness the wisdom of the crowd in a principled manner. Paper 4 by Fenton et al. goes beyond what the intelligence community currently uses by exploring how Bayesian Networks could be leveraged by analytic units to better structure messy data and analysts' knowledge for the purposes of probabilistic hypothesis testing, sense-making, and intervention analysis. These papers progress naturally from a focus on verification of the integrity of existing techniques (Papers 1-2) to a focus on innovations in analytical techniques (Papers 3-4), with final reflections from the Discussant.

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A test of the 'Analysis of Competing Hypotheses' in intelligence analysis

Dhami K. Mandeep (Middlesex University); David R. Mandel (DRDC Toronto Research Centre and York University); Ian Belton (Middlesex University)

Analysis of Competing Hypotheses (ACH) is a technique used in intelligence to help avoid confirmation bias when testing alternative hypotheses. In a between-subjects design, 50 analysts were randomly assigned to be trained in ACH and use it in a simulated hypothesis testing task or not to be trained in ACH. Analysts determined which of four groups a target, described in terms of 12 evidence items, belonged to. The probability of occurrence of evidence item in each group was provided, as was base-rate information for each group in the population. We analysed the process that analysts used to complete the task measured by their written protocols. While both groups generally identified all 4 hypotheses, only 68% of each group identified all 12 evidence items. As they were trained, the ACH group assessed whether evidence was consistent or inconsistent with a hypothesis by scoring each item as highly consistent, consistent, inconsistent, highly inconsistent, or not applicable. Sixty-four percent of the control group also used some form of scoring system to assess the (in)consistency of evidence with each hypothesis. Both groups' assessments of the diagnosticity of the evidence items were correlated with their objective diagnosticity. Eighty percent of the ACH group took account of evidence diagnosticity in their reasoning compared to

32% of the control group. Fifty-two percent of the control group used base-rate information compared to 12% of the ACH group. The majority of both groups balanced out consistent and inconsistent evidence. Compared to the ACH group, the control group showed greater within-individual consistency in their hypothesis testing strategies. In sum, we found little evidence of confirmation bias in analysts, and we noted no clear benefits of using ACH.

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Embedding ACH in a Delphi process: What are the advantages?

Fergus Bolger (Strathclyde University and Minerva Consulting)

Intelligence analysis is often a complex problem-solving process requiring reasoning with a mass of incomplete and uncertain data in an attempt to make sense of current situations and predict future states. There are many well-documented psychological biases that can seriously reduce the quality of intelligence analysis and its consequent usefulness to policy makers. For this reason, there are ongoing efforts to assist intelligence analysis via structured analytic techniques (SATs) that seek to make the process more orderly and transparent, thus reducing bias. One commonly used SAT is the Analysis of Competing Hypotheses (ACH) whereby each hypothesis in a comprehensive set is systematically evaluated against the available evidence. Another way to improve the quality of intelligence analysis is to "crowdsource": in other words, distribute the task amongst several analysts rather than relying on just one, who may have limited information and resources, and a restricted perspective on the problem. A basic form of crowdsourcing is a small group working together on a problem. It has been shown that some of the benefits of having more heads working on a problem are reduced by another set of biases due to social processes, such as dominance by high status individuals and groupthink. Delphi is a technique designed to reap the benefits of crowdsourcing while reducing these negative social influences: groups never meet face-to-face but 'interact' anonymously and iteratively through a facilitator until a conclusion is reached. In this research, we report the results of a study comparing the quality of solutions to intelligence problems solved using ACH in face-to-face versus Delphi groups. Contact: fbolger42@gmail.com

Combining judgments with messy data to build Bayesian Network models for improved intelligence analysis and decision support

Norman Fenton (Queen Mary University of London and Agena Ltd); Anthony Constantinou (Queen Mary University of London and Agena Ltd); Martin Neil (Queen Mary University of London and Agena Ltd)

Bayesian Network (BN) models are an increasingly important decision tool for critical real-world applications. While much research has focused on algorithms for learning the structure and parameters of BN models from data, such 'machine learnt' models require enormous volumes of data to discover the cause-and-effect, or other, relationships of interest. However, in critical applications like intelligence analysis, relevant data is often limited relative to the complexity of the problem. Even when the data are 'big', they tend to be 'messy': poorly structured and do not adhere to causal representations required to construct a BN model. In such situations, we have to rely on a combination of knowledge and data to construct a useful BN that provides meaningful decision support for risk management rather than just 'prediction'. In particular, a useful BN in this context must be able to support 'interventional analysis', which requires knowledge about the 'actions' available to the decision maker. Such information typically needs to be hard coded into the model. Unfortunately, there are limited methods for building useful BNs in such scenarios. We describe a rigorous and repeatable method for building effective BNs using a combination of knowledge and data. While much of the method is based on established work, it is novel in that it provides a rigorous consolidated and generalised framework that addresses the whole life-cycle of BN model development. The BN development process is applicable to any real-world application

domain and challenges decision scientists to reason about models based on what information is really required for inference, rather than based on what data is available and hence, encourages decision scientists to use available data in a much smarter way. Contact: n.fenton@qmul.ac.uk

Session #6 Track 1: Organizational Behavior and Groups – Tuesday 11:00am – 12:30pm

(Cooper Building, 112)

How reputations affect negotiation judgments and decisions: The "Big Two" agency and communion dimensions in negotiations

Ilanit SimanTov-Nachlieli (Ben Gurion University of the Negev); Simone Moran (Ben Gurion University of the Negev); Liron Har-Vardi (Ben Gurion University of the Negev)

Building upon research on the "Big Two", dimensions of social judgment—agency (or the ability-competence dimension) and communion (or the social-moral dimension), in four studies (N = 902) we explore the distinctive and primary role of morality (vs. sociability and agency) in negotiations. Results show that negotiators desire to be perceived by their counterparts for and foremost as moral ("honest, sincere, & trustworthy negotiator"), next as agentic ("intelligent, competent, & skilled negotiator") and least, as sociable ("friendly, likeable, & warm negotiator"). Consistent with such preferences, results confirmed the advantage of having a moral reputation. Although counterparts with moral or sociable reputations are expected to be equally more pro-social than those with agentic reputations, those with a moral reputation are perceived as higher (than sociable) in professionalism, reliability and fairness. Similarly, while agentic reputations induce ability-based trust and sociable reputations induce benevolence- and integrity-based trust, moral reputations induce all three types of trust (ability, benevolence, and integrity) concurrently, and decrease the likelihood of being deceived. When examining actual behaviors, presumably moral counterparts benefit more—receive better offers and counter offers in distributive negotiations, receive more value-creating offers in multi-issue variable-sum (integrative) negotiations, and are evaluated as acting in a greater pro-social manner (even when controlling for their negotiation offers and messages). Theoretical and practical implications are discussed. Contact: ilanit.nachlieli@gmail.com

Valuation of labor by employee and contractor

Ilana Ritov (The Hebrew University of Jerusalem); Amos Schurr (Ben Gurion University of the Negev)

A major concern in today's economic reality is the effect of changing wage-setting choices into contracting decisions, and in particular the extent to which sharing economy in comparison to traditional economy, promotes inequality. We argue that the net value of the labor changes when contracts rather than employment are considered. The goal of setting wages focuses attention on the essence of the work and the foregoing of free time, while the goal of bidding for or selling contracts emphasizes monetary aspects of the transaction. Consequently, we expect the former goal to amplify the value of executing the work, more than the latter. We predict that the very shift from wages to contracts would result in lower net valuation of the work, by the workers as well as the companies. We tested our hypothesis by running an experimental labor market (N=284), randomly assigning half of the participants a laborious task (filling out a questionnaire) for which they would be paid by the experimenter. They could transfer the task to participants who were not assigned it. The transaction was framed either as employing someone else to do the task, or as contracting the questionnaire out to another participant. Thus, in the former case the employee's wages would be traded and in the latter, the contract that enables performing the work (the

questionnaire). The results confirmed our prediction: the net value assigned to performing the task was lower in the 'questionnaire trade' frame than in the 'hire' frame. The obtained findings point to a novel determinant of increase in inequality. The diminished value of work under contract trading relative to traditional employment implies increased importance of endowment, thus widening the gap between the endowed and the un-endowed. Contact: ilana.ritov@huji.ac.il

Selective information sampling and the in-group heterogeneity effect

Elizaveta Konovalova (Pompeu Fabra University); Gael Le Mens (Pompeu Fabra University)

People often perceive their in-groups as more heterogeneous than their out-groups. We propose an information sampling explanation for this in-group heterogeneity effect. Using computer simulations, we analyze a model in which an agent forms beliefs and attitudes about social groups from her experience. Consistent with robust evidence from the social sciences, we assume that people are more likely to interact again with in-group members than with out-group members. This implies that people obtain larger samples of information about in-groups than about out-groups. Because estimators of variability tend to be right-skewed, but less so as sample size is large, sampled in-group variability will tend to be higher than sampled out-group variability. This implies that even agents that process information correctly -- even if they are naive intuitive statisticians -- will be subject to the in-group heterogeneity effect. Our sampling mechanism complement existing explanations for the in-group heterogeneity effect that relied on how information about in-group and out-group members is processed. Contact: elizaveta.konovalova@upf.edu

How stable is in-group favouritism?

Thomas Karl Alfred Woiczuk (Pompeu Fabra University); Gaël Le Mens (Pompeu Fabra University)

A large amount of research has found that people tend to treat members of their in-group more positively than member-of their out-group. In this paper, we focus on in-group favouritism, the tendency to allocate more resources to in-group members than to out-group members. We report two three-wave studies that measured the stability of in-group favouritism, within participants, over time. Overall, we find evidence of a high level of heterogeneity in terms of the size of the in-group favouritism and of its stability. In each wave, 30 to 50% of the participants showed in-group favouritism, less than 15% of the participants showed out-group favouritism whereas the rest of the participants did not show either. This finding is consistent with recent research on heterogeneity of in-group favouritism. In both our studies the correlation between levels of in-group favouritism in any two waves was about 0.50 which is lower than the test re-test correlation on Big 5 personality dimensions, but is higher than documented correlations between attitudes and behaviour. Therefore, we can describe it as a 'strong' correlation. At first sight, it suggests stability of in-group favouritism over time but we find evidence of a high level of heterogeneity in terms of the stability of in-group favouritism: a minority of participants had very stable behaviour from wave to wave whereas the majority of participants behaved in a much less consistent way. Our results suggest that a minority of people show a strong and stable level of in-group favouritism. This indicates the possibility of ex-ante predictors of this behaviour. Surprisingly, the most reliable predictor of the stability of in-group favouritism was the score on the 'openness to experience' dimension of the Big 5 personality test. Contact: thomas.woiczuk@upf.edu

Rebel with a cause: Violate societal norms but abide by local group norms to gain influence

Florian Wanders (University of Amsterdam); Astrid C. Homan (University of Amsterdam); Annelies E.M. van Vianen (University of Amsterdam); Gerben A. van Kleef (University of Amsterdam)

Trump made headlines with norm violations long before he entered the oval office. Why is it that someone who so heavily bends norms ends up leading an entire country? Previous research on the

consequences of norm violations does not provide a simple answer: some studies show that violating norms leads to punishment of the transgressor, others show that violating norms leads to increased power and influence. To address this ambiguity, we propose a novel framework according to which norms operate at two levels: the local group level and the overarching societal level. In Study 1, participants read a scenario in which the main character could violate or abide by group norms and violate or abide by societal norms. We predicted and found that violating norms only results in leadership affordance when a person violates overarching societal norms in order to abide by local group norms, but not when violating norms on both levels or when breaking local group norms in order to follow societal norms. Violations of societal norms often come with a cost through which people can signal the underlying quality that they strongly value their group, because they choose to abide by group norms even though they have to violate societal norms to do so. This signal should make people appear especially loyal and suitable for a leadership position and as Study 1 suggests indeed more so than people who abide by both group and societal norms. A recall task in Study 2 provides additional support for our framework of norms operating at multiple levels. These results promise to reconcile conflicting observations on the consequences of norm violations and may help explain why norm violators attain leadership positions. Contact: f.wanders@uva.nl

Being sad and level-headed: Sadness leads to moderate decisions in intergroup conflicts

Tamar Gur (Technion- Israel Institute of Technology and IDC- The Interdisciplinary Center Herzliya); Shahar Ayal (IDC- The Interdisciplinary Center Herzliya); Eran Halperin (IDC- The Interdisciplinary Center Herzliya)

Intractable conflicts constitute an extremely violent and threatening environment which leads to intense emotions, biased judgements and polarized attitudes. Sadness is an emotion often experienced within the context of intractable conflicts, both as a group based and a private emotion, often elicited by the high price of the conflicts continuation. Unlike other emotions (i.e. hope, fear, empathy, anger and hatred) sadness has not been sufficiently studied in the context of intergroup intractable conflicts. In three studies, conducted in the context of the Israeli Palestinian conflict, we examined the effects of sadness on conflict-related decisions. We found that sadness had a depolarizing effect on attitudes and treatment of the outgroup. Sadness was manipulated both as an incidental (studies 1 and 2) and as a context related emotion (study 3). In study 1, sadness was found to moderate the effect of political ideology on willingness to negotiate. In study 2, sadness led to a less polarized resource allocation among the ingroup and outgroup, and in study 3, sadness had the same depolarizing effect shown in study 1 during a turbulent time in the conflict. Contact: tamashki@gmail.com

Session #6 Track 2: Decision Under Risk and Uncertainty 1– Tuesday 11:00am – 12:30pm

(Cooper Building, 214)

On the dynamics of countercyclical risk aversion and experienced emotion

Henning Cordes (University of Münster); Sven Nolte (University of Münster); Judith Christiane Schneider (University of Münster)

Evidence amounts that investors tend to increase their financial risk taking after stock market booms and reduce their financial risk taking after stock market busts. Thus, it seems like their risk aversion is countercyclical. However, clear evidence for countercyclical risk aversion is scarce. Our experimental study extends previous research on countercyclical risk aversion in three ways. First,

we find evidence for countercyclical risk aversion, even though the stock market boom or bust scenarios are less extreme than in previous experiments. Thus, risk preferences are not only affected by extreme events, but by subtler developments as well. Second, countercyclical risk aversion is only a short-term response to the preceding stock market boom or bust: There is a reversal of the effect in the medium-term (i.e., lower risk aversion after a bust and higher risk aversion after a boom), and no effect in the long-term. Thus, long-lasting changes in investment behavior after stock market booms or busts are unlikely to be driven by changes in risk preferences, but rather by changes in return expectations. Third, the effects are mainly driven by participants who experience the stock market boom or bust; passively observing the development only has a small effect on risk preferences. We take this as evidence that experiencing stock market developments induces emotions like hope (after a boom) or fear (after a bust), which affect risk preferences and investment behavior. Contact: henning.cordes@wiwi.uni-muenster.de

Attitudes to risk and ambiguity: Experimental evidence in a developing market using carnival games

Divya Aggarwal (XLRI Xavier School of Management)

The study provides novel evidence on impact of ambiguity on financial decision making by using a series of tailor made controlled experiments under the disguise of a movie theme and executed in a city annual event. The objective of the study is to understand why, how and in what ways ambiguity affects the choices made by people. Even after more than 50 years of research since the Ellsberg paradox, the constructs of ambiguity and ambiguity aversion are ill-defined (Machina & Siniscalchi, 2014). The confusion surrounding the definition of ambiguity construct has made the descriptive branch of research on ambiguity to be in an inconclusive state. The need for more studies is imperative and it can contribute to defining ambiguity construct and its role in decision making. Ambiguity has been characterised with an inability of the decision maker to estimate probabilities about the states, which can impact the occurrence of a future event. The inability can be due to external factors with insufficient or missing or conflicting information or due to internal factors dependent upon the competence of the decision maker. This study aims to understand the impact of different forms of ambiguity by controlling for the competence of the decision maker in designing experiments. Simple carnival games including lucky draw card games, wheel of fortune and Monty hall are used with embedded characteristics of financial assets to elicit impact of ambiguity attitude on decision making involving investment and diversification. Using a representative sample of Indian households of Jamshedpur city, the study analyses ambiguity attitudes and decision making in a developing country context, exploring the well-known behavioural biases of ambiguity aversion and status quo bias. Contact: fb14007@astra.xlri.ac.in

A model-based analysis of risky decision-making errors and their psychological background in a simulated sequential gambling experiment

Gábor Ruzsa (Eötvös Loránd University); Ajna Uatkán (Eötvös Loránd University)

Human decision-making in regard to uncertain monetary pay-offs could be influenced by the outcome of previous decisions through various psychological mechanisms, both cognitive and affective. In a microeconomic model-based approach, we wanted to explore and classify how individuals tend to deviate from the normative risk-taking strategy in relation to preceding gains and losses. We designed a 10×10 turns simulated sequential gambling experiment whereby participants (N=184) could repeatedly gamble any proportion of their fictitious wealth, which was to be doubled in case of a positive outcome and to be lost otherwise. Each of the 10 pseudo-random series of gambles was either of profitable or loss-making type, characterized by either a 2:1 or a 1:2 odds for winning vs losing. Participants were informed that the type of each series would be drawn at random. The mathematically optimal strategy, derived in an expected utility

maximization framework with constant relative risk aversion, served as a benchmark for evaluating participants' behavior. Deviations from the optimal strategy were categorized on 2 dimensions: (1) direction of deviation (excessive risk taking vs. excessive risk avoidance), (2) outcome of the previous gamble (substantial gains / zero or minor gains / substantial losses / zero or minor losses). We performed k-means clustering on a vectorial measure of decision-making errors and defined 6 behavioral clusters, labeled 'rational', 9 'cautious', 'sensitive', 'classic gambler', 'rigid', and 'rigid gambler'. We suggest that these clusters represent characteristic patterns of occurrence for distinctive types of risky decision-making errors, some being due to cognitive biases (such as the gambler's fallacy) and others reflecting maladaptive affective tendencies.

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Foresighted outcome effect: Expected availability of outcome knowledge to principals affects risk behavior of accountable agents

Michal Livnat-Lerer (The Hebrew University of Jerusalem); Raanan Sulitzeanu-Kenan (The Hebrew University of Jerusalem); Tehila Kogut (Ben Gurion University of The Negev)

One way of examining the works of a political system, government institutions and organizations – public and private alike, is through the lenses of the agent theory. The reason lies in the irroorganizational structure - a complex network of principal-agent relationships composed of citizens, elected officials, members of the executive branch, courts, bureaucrats etc. While one serves as a principal in one relationship, he serves as an agent in another. However, one important aspect of the principal agent relationship which hasn't been given any consideration relates to the fact that these relationships typically involve evaluations which rely on outcome knowledge and which are therefore susceptible to outcome bias. Research on outcome bias has hitherto tended to focus on the biased evaluation per se. The current investigation shifts the attention to the effect of anticipated outcome knowledge on foresight judgments and consequently on decisions. This paper reports the results of three experimental studies that test the effect of outcome knowledge availability on behavior and judgments in this context. The first two studies examine real behavior and involve actual monetary gains and losses, and the third one is based on a scenario that describes the same financial dilemma. The results suggest that, when making decisions under outcome-knowledge-based PA relationship, people anticipate the effect of outcome judgments passed by another par ty to which they are accountable, and adjust their behavior by opting for a less risky alternative. Implications of this behavior for public decision-making are discussed.

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Compound risk judgment in tasks with both idiosyncratic and systematic risk: The "robust beauty" of additive probability integration

Joakim Sundh (Uppsala University); Peter Juslin (Uppsala University)

The aim of this study is to explore human judgment of compound risk, specifically in situations with dependency between the individual risks, which tends to be the rule rather than the exception in the real world. A learning task in which participants judged the compound risk of four economic assets was used, in which the compound risk was based on the idiosyncratic risks of each asset and (potentially) a systematic risk component affecting all assets. Results show that people tend to approach compound probability judgments using additive strategies similar to an arithmetic mean, a robust algorithm which is well suited to environments where dependency between risks are to be expected. As a consequence, participants found risk environments which involved a systematic risk component easier to master than when risks were independent, even though the former is more complex from the perspective of probability theory. With training participants generally managed to adapt effective strategies regardless if systematic risk was present or not, although these strategies were prone to overfit and tended to break down if the context changed. In conclusion,

people seem to intuitively approach compound probability judgments using additive algorithms, but when people grow more familiar with a particular environment they adapt more specialized algorithms which supplies more exact judgments at the cost of potential overfit.

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Triggering intuitive and reflective decision making in situations with varying probability information

Matthias Brand (University of Duisburg-Essen); (Silke M. Mueller (University of Duisburg-Essen); Johannes Schiebener (University of Duisburg-Essen)

Two modes of information processing are assumed to interactively guide decision making under risk: a reflective and an impulsive one (e.g. Schiebener & Brand, 2015). Situational as well as interpersonal factors are assumed to determine which of the two modes guides choices. Studies showed that instructions on how the task should be performed can lead to differences in choice behavior (e.g. Thomas & Millar, 2011). To investigate the effect of instructions as triggers for intuitive or reflective processing, 140 participants completed decision tasks with varying gain/loss probabilities. Participants either had simple probability information (dice-game group) or complex probability information (lottery group). Each group performed the task twice in random order: once after having been instructed to "consider very carefully" (reflective) and once after having been instructed to base decisions on "gut feelings" (intuitive). Results showed more advantageous decisions after reflective than after intuitive instructions, which was significant in the dice-game group. Both groups were able to improve the quality of the decisions made, in case the participants were first instructed intuitively and then reflectively. However, the groups showed differential correlations between decision-making performance and measures of cognitive functions and non-symbolic number acuity. The results suggest that reminding people to think carefully before making choices may improve decision quality, but that the involvement of cognitive functions and number processing during decision making may differ depending on the complexity of the probability information and the processing mode. The results are in line with dual process models of decision making and have theoretical and practical implications.

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Session #6 Track 3: Individual Differences 1 – Tuesday 11:00am – 12:30pm

(Cooper Building, 215)

Intelligence and the rationality of political preferences

Yoav Ganzach (Tel Aviv University)

We study the relationship between intelligence and the rationality of political preferences. Intelligence is operationalized as achievement in standard mental ability tests, and rationality is operationalized as consistency between political attitudes and political preferences. Political preferences are measured by party affiliation – support for the Democratic versus the Republican Party in the US – and political attitudes are measured on a conservative-liberal dimension. We analyze three large representative American databases and find that for global political attitudes and for specific social attitudes, but not for specific economic attitudes, intelligence is associated with more attitude-preference consistency. We conclude with a discussion of possible causal processes underlying the observed relationship between intelligence and consistency of political attitudes. Contact: yoavgn@post.tau.ac.il

Transitivity of preferences, individual differences in information processing and strategies applied for selection.

Patrycja Sleboda (SWPS University of Social Sciences and Humanities)

The first goal of the studies was to examine a relation between transitivity of preferences and measures of rationality in Dual Process Theories (DPT). In four studies the relationship between transitivity of preferences and two types of DPT measures CRT and REI-short 24 has been checked. Even though, REI and CRT have been very frequently used in the previous studies, such direct test has not been reported. The second goal was to test the relationship between both DPT measures as well as transitivity of preferences and applied decision strategies. The following characteristics of strategies have been investigated: requirements for trade-offs, maximization vs. satisficing and option-wise vs. attribute-wise information processing. It was expected that preferences' transitivity and DPT measures would be related to option-wise information search rather than to requirements of tradeoffs. Additionally, difficulty of decision, understood as importance of consequences, was investigated as a factor that might influence applied decision strategies and transitivity of preferences. Four studies were carried out, in which the importance of consequences varied from unimportant ones (choice between perfumeries' gift cards) to severe negative health consequences (choice between medical treatment for prostate enlargement). One study employed an abstract frame, i.e. neither option nor attributes had specific modalities. It has been found that REI-R and CRT are good predictors of transitivity of preferences. As it was expected high scores on REI-R and CRT and index of transitivity were reflected in the applied strategies, i.e. option-wise decision strategies. Importance of consequences influenced consistency in applied strategies and transitivity. Contact: psleboda@swps.edu.pl

The experience-based format of probability improves probability estimates in people with low numeracy

Agata Sobkow (SWPS University of Social Sciences and Humanities); Jakub Traczyk (SWPS University of Social Sciences and Humanities); Adrian Matukiewicz (SWPS University of Social Sciences and Humanities); Dafina Petrova (Universidad de Granada); Rocio Garcia-Retamero (Universidad de Granada)

Recent research in risk communication has demonstrated that people have difficulties in understanding numerical information such as the probability of a disease or side effects. These difficulties are especially pronounced in people with low numeracy. In this study, we tested a novel method of presenting information about probability that is based on direct experience of events rather than observing numbers. Participants were randomly assigned to one of two conditions. In the frequency condition, participants were presented with 24 binomial distributions consisting of a target stimulus "X" and a distractor stimulus "7 X 13" in the form of odds (the distribution "7 X 13" was an example of the probability of 35%; the target stimulus "X" was present 7 times in a 20-stimulus distribution). In the experience-based probability condition, participants observed a stream of randomly arranged target and distractor stimuli displayed sequentially at the center of the computer screen. For example, the distribution "7 X 13" was presented as a series of 7 targets and 13 distractors displayed centrally one by one in random order. Participants had to estimate the probability of "X" in each trial and to complete a numeracy test. Presenting probabilities in the experience-based format improved the accuracy of probability estimates in comparison to the frequency format. In particular, the experience-based format significantly improved probability estimates in participants with low numeracy while it made no difference in the group of more numerate participants. We conclude that presenting probabilities in a novel experience-based format helps less numerate people make more accurate judgments.

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Numeracy predicts adaptive strategy selection in risky decision making

Jakub Traczyk (SWPS University of Social Sciences and Humanities); Agata Sobkow (SWPS University of Social Sciences and Humanities); Kamil Fulawka (SWPS University of Social Sciences and Humanities); Jakub Kus (SWPS University of Social Sciences and Humanities); Dafina Petrova (Universidad de Granada); Rocio Garcia-Retamero (Universidad de Granada)

Recent research on numeracy and decision making has documented two contradictory findings. On the one hand, more numerate people tend to make more choices consistent with the principle of expected value (EV) maximization. On the other hand, there is evidence from process-tracing measures that people with high numeracy do not compute EVs, but rather make their decisions based on elaborate heuristic processing (e.g., comparing and transforming probabilities as well as deliberating more on the problem). The present study addresses the question of the cognitive mechanisms underlying decision making under risk and investigates the relative contribution of objective and subjective numeracy to choices. We expected that people high in numeracy may have a broader repertoire of choice strategies, allowing for adaptive decisions depending on the task difficulty. In a study, participants made twelve easy choices (with EV ratios between 5 and 6) and twelve difficult choices (with EV ratios around 1) in binary two-outcome gambles. The results showed that participants with high objective numeracy deliberated more on choice problems that allowed for EV maximization and they made more normative choices. When choices maximizing EV were more difficult and time consuming participants with high objective numeracy switched to a faster and more frugal heuristic strategy. Finally, participants with high subjective numeracy also made more choices consistent with prospect theory. These novel results presented here indicate that more numerate people are able to adapt their choice strategies to the task and environment structure, ultimately demonstrating that different numeric competencies have distinct implications for strategy selection in decision-making processes. Contact: jtraczyk@swps.edu.pl

A multi-dimensional approach to non-intuitive decision making: Empirical evidence distinguishing effortful from systematic thinking

Adi Amit (The Open University of Israel); Sharon Arieli (The Open University of Israel)

Effortful decision-making is often associated with systematic decision-making while effortless-heuristic decision-making is typically associated with holistic, intuitive, decision-making. We present a multi-dimensional definition of intuitive and non-intuitive decision-making and provide empirical evidence that separate the effortful from the systematic dimension. We first support the distinction based on cross-cultural variation. Our findings show that while effortful thinking is regarded positively among all, systematic thinking is regarded favorably in individualistic, but not in collectivistic, cultures (Study 1). Taking a meta-analytic approach to integrate across past research and new findings, we further show that the systematic decision style presents distinct associations from effortful thinking style with both personality traits (Study 2) and personal values (Study 3). The systematic style is positively associated with the trait of conscientiousness and with security values and negatively associated with stimulation values. Effortful thinking is positively associated with the trait of openness to experience and with self-direction values and negatively associated with conformity values. Taken together, our findings call for finer definitions and conceptualizations of intuitive and non-intuitive decision-making and question the notion that holistic thinking is by definition shallow and effortless. Contact: adiam@openu.ac.il

Distinguishing the ratio bias from unsystematic error: Situation and individual-difference effects

Eric R. Stone (Wake Forest University); Andrew M. Parker (RAND Corporation)

People often perceive the occurrence of events to be less likely when the likelihood of the event is expressed in ratios consisting of smaller numbers versus larger numbers, an effect known as the

ratio bias. This work presents a theoretical framework for the conditions that need to be met for the ratio bias to occur. In doing so, we contrast effects on the ratio bias to those on unsystematic error, which have often been confounded in previous research. In four experiments, we test a number of situational and individual-difference effects. We find that the ratio bias is weaker 1) when both sets of numbers are relatively large than when both sets of numbers are relatively small; 2) for scenarios involving lottery tickets than for scenarios involving drawing balls from a bin; and 3) when a physical display depicting the numbers is provided to participants. Each of these effects reduced the ratio bias without reducing unsystematic error. Further, we show that most of these results are well-explained by the presence of diminishing marginal impact of quantities, combined with reasoning about the numerator and denominator separately. In contrast, we show that unsystematic error is reduced 1) when people reason on the basis of proportions rather than on the basis of the numerator and denominator individually; 2) when individuals score higher on the rational scale of the Rational-Experiential Inventory; and 3) when individuals are of higher numeracy. For each of these factors, we show that any reduction on the ratio bias specifically occurred as a byproduct of a general reduction on error. We use these results to distinguish causes of error generally from those on the ratio bias specifically, and discuss the implications for our understanding of when the ratio bias occurs. Contact: estone@wfu.edu

Session #6 Track 4: Games and Behavior 1 – Tuesday 11:00am – 12:30pm

(Cooper Building, 216)

To be the tail of the lions or the head of the foxes?

Yaakov Kareev (The Hebrew University of Jerusalem); Judith Avrahami (The Hebrew University of Jerusalem); Werner Gueth (Max Planck Institute for Collective Goods)

People often face the dilemma of whether to join a more prestigious group, within which their own status will be lower, or a less prestigious group within which their own status will be higher. A similar dilemma is whether to join a high-prize competition, one that is likely to draw better competitors, or a low-prize one, which is likely to draw competitors of lower ability. Some sages advised “Be the tail of the lions and not the head of the foxes”, but other sages gave advice to the contrary. To study behavior in such situations, we devised a game in which three competitors, differing in their exogenously determined quality, simultaneously choose which of two competitions to join. The competitions differed in the prizes offered to the winners. The pattern of choices was in line with the predictions of Impulse Balance and differed sharply from the mixed Nash equilibrium. Contact: yaakov.kareev@mail.huji.ac.il

From spontaneous cooperation to spontaneous punishment

Dorothee Mischkowski (University of Hagen); Andreas Glöckner (University of Hagen); Peter Lewisch (University of Vienna)

Rand, Greene and Nowak (2012) presented findings supporting their hypothesis concerning the intuitive nature of cooperation by showing that cooperative behavior is related to shorter decision times. Elaborating on their work, we tested the generality of their findings, by investigating the relation between response time and punishment behavior. In two lab studies (N = 277) participants played a public goods game (PGG) in groups of four. After each round, a punishment option was given to each player (second-party punishment) with a cost-to-impact ratio of 1 to 4. We measured dispositional social preferences up to 24 hours before the lab session and captured the affective responses towards the cooperation behavior of the other players after the PGG. Similar to a spontaneous cooperation effect, we find that the invested resources to punish decrease with increasing decision time. The underlying motives of spontaneous punishment,

however, differ from those driving spontaneous cooperation. The latter is moderated by Social Value Orientation (SVO) in that it is only valid for prosocials, who gain positive utility from increasing other persons' welfare. The effect of spontaneous punishment, though, is independent of SVO. Rather, we find a significant three-way interaction in that spontaneous punishment is only valid for above-average contributors that are highly upset. Even though the mere behavior of spontaneous punishment follows a pattern similar to that of spontaneous cooperation, the different moderators underlying both effects point out the different motivations. Spontaneous cooperation is driven by dispositional prosociality whereas spontaneous punishment is rather driven by the recent group interaction and is used in an affect regulative manner of high contributors.

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Reciprocal strategy shaping in repeated PD games

Ilan Fischer (University of Haifa); Sebastian Goerg (Florida State University); Andreas Glöckner (University of Hagen)

To study the reciprocal shaping of strategic behavior, we monitor the choices made under both natural and experimentally manipulated prisoner's dilemma games. Results show that human participants: (i) increase the extent of both cooperation and similarity in the selected choices along repeated encounters with the same partner, (ii) are endowed with a cooperative predisposition towards opponents with similar strategies, (iii) condition their level of cooperation on the game's similarity threshold, derived from the payoff matrix. Further examining a heterogeneous population of simulated agents provides novel insights into the capacity and limitations of reciprocal strategy shaping. The simulations show that the interaction with opponents of two intermediate similarity ranges has the power to result in a payoff maximizing strategy. Contact: ifischer@psy.haifa.ac.il

Competition Affects Allocations of Resources and Duties

Ilana Ritov (The Hebrew University of Jerusalem); Adiel Moyal (The Hebrew University of Jerusalem)

Throughout history, since the era of the hunter-gatherers and up to the modern period, individuals have encountered situations in which they choose how to divide resources between themselves and others, and situations in which they choose how to split labor between themselves and others. Other situations that are common since the beginning of history are competitions between individuals. In the current research, we aim to explore how taking part in a competition affects the participants' prosocial behavior regarding giving and allocation decisions, beyond the competitive situation. We further examine whether the competition affects winners and losers differently. Our findings support the hypothesis that competition diminishes prosocial concerns in subsequent, although ostensibly unrelated, situations. In the first experiment, we found the effect of the competition between two individuals spilled over to the subsequent dictator game and led to less generous allocations, in the second experiment this effect caused the participants to allocate themselves a smaller part of a fixed joint workload, and finally, in the third experiment, it reduced the number of questions the participants solved for the benefit of other participants. A significant difference between winning and losing competitors was found only in Experiment 1- the winners transferred less money than the losers. From these findings, we can conclude that taking part in a competition affects subsequent prosocial behaviour unfavourably. Therefore, despite the fact that competition may sometimes lead to better and more desirable outcomes in specific domains, it is important to consider the long-term effects of the competitive environment.

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"Better be the head of a dog than the tail of a lion" - is that so? The case of chess tournaments in Israel

Uri Zak (The Hebrew University of Jerusalem); Yaakov Kareev (The Hebrew University of Jerusalem); Judith Avrahami (The Hebrew University of Jerusalem)

In various contexts, people have a choice between joining a prestigious competition and a less prestigious one. Typically, their relative position is likely to be low in the former, and high in the latter, presenting them with a dilemma. This study is one the first to examine, empirically, such choices and their implications in a situation involving decisions made by Israeli chess players. Players of medium ranking often are given a choice: Competing against stronger opponents in the main tournament (being "the tail of a lion"), or competing against weaker opponents in the secondary tournament (being "the head of a dog"). Contact: uri.zak@mail.huji.ac.il

The psychology of negative brokerage: Understanding divide-and-conquer behavior by third parties

Eliran Halali (Bar-Ilan University); Nir Halevy (Stanford University); Mickael Bouhnik (Bar-Ilan University); Andrew Pearlmutter (Stanford University)

Divide-and-conquer behavior (DCB) is a common and persistent feature across human and primate groups. Despite recent insights about the psychological underpinnings of other kinds of unethical behavior, little is known about the psychology of DCB, in part because empirical research focused almost exclusively on positive forms and functions of brokerage in groups. Four studies examined situational antecedents and motivational underpinnings of DCB, the effects of DCB on cooperation among its targets, as well as the characteristics of individuals who engage in DCB. Studies 1-3 used a novel experimental paradigm, the Divide-and-Conquer Game, and showed that: (a) a considerable portion of third parties engage in DCB for personal advantage despite the negative externalities it produces for others; (b) the adverse consequences of DCB for others inhibit negative brokerage relative to both betting on others' decisions and engaging in positive brokerage; (c) eliminating the risk associated with DCB dramatically increases its incidence; and (d) the mere possibility of DCB by a third party is sufficient to significantly suppress cooperation rates among the targets of DCB. Study 4 showed that the values and traits of harmful brokers (who engage in DCB) differ from those of helpful brokers (i.e., conciliators and intermediaries). Specifically, harmful brokers value power and devalue benevolence, and tend to be lower in agreeableness and conscientiousness compared to other brokers. These findings shed light on the dark side of brokerage and enhance our understanding of why, how, and when individuals undermine cooperation in groups. Contact: halalie@biu.ac.il

Session #7 Track 1: Prosocial Behavior – Tuesday 16:00-17:30

(Cooper Building, 112)

The effects of case framing on the willingness to commit to organ donation

Tehila Kogut (Ben Gurion University of The Negev); Inbal Harel (Ben Gurion University of The Negev); Paul Slovic (University of Oregon)

We examine how presentations of organ donation cases in the media may affect people's willingness to sign organ donation commitment cards, to donate the organs of a deceased relative, to support the transition to an "opt-out" policy, or to donate a kidney while alive. We found that providing identifying information about the prospective recipient (whose life was saved by the donation) increased the participants' willingness to commit to organ donation themselves, to donate the organs of a deceased relative, or to support a transition to an "opt-out" policy. Conversely, identifying the deceased donor tended to induce thoughts of death rather than about

saving lives, resulting in fewer participants willing to donate organs or to support measures that facilitated organ donation. A study of online news reveals that identification of the donor is significantly more common than identification of the recipient in the coverage of organ donation cases—with possibly adverse effects on the incidence of organ donations. Contact: kogut@bgu.ac.il

“Let’s help together”: The effect of high and low status on simultaneous helping decisions.

Marina Motsenok (The Hebrew University of Jerusalem); Andrea Pittarello (University of Groningen); Ilana Ritov (The Hebrew University of Jerusalem); Stephan Dickert (Queen Mary University of London)

Three studies examine the effect of social status in simultaneous helping behavior. We find that low status participants behave more prosocially when paired with high status counterparts than when alone. The reverse pattern occurs for high status individuals: They help more when alone than when paired with low status counterparts. Results are robust when the target of help is both a specific person (Study 1), and a general entity (“Save the children”, Study 2). Importantly, this occurs only when status is earned and not when it is randomly determined (Study 3).

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The helping behavior helps lighten physical burden

Xiaofei Xie (Peking University); Xilin Li (Peking University)

It is often believed that helping behaviors benefit the recipients at the expense of the performers. However, we propose that costly helping behaviors could alleviate feelings of physical burden experienced by the performers. In support of the proposal, we found in two studies that both imaginary and real helping behaviors led the performers to perceive physically challenging tasks as less demanding, perceive a steep mountain road as less steep and a heavy carton as lighter. These results challenge the conventional wisdom that helping behaviors always come at the cost of the helper, and corroborate a growing body of literature showing that helping others could benefit oneself. Contact: xiaofei@pku.edu.cn

The welfare implications of social interactions (218)

Tomer Grossman (Ben Gurion University of The Negev); Ro'i Zultan (Ben Gurion University of The Negev)

We extend the study of social preferences—preferences over social outcomes—to study preferences for social interactions. While models of social preferences are successful in explaining behavior in social situations, the welfare implications of preferences for social interactions that do not affect behavior remain understudied. We compare different situations that are identical with regard to people's choices and outcomes, and test whether participating in positive social interactions increases welfare. We consider three dimensions of the social interaction: warm glow (helping others), social warmth (being helped), and positive reciprocity (mutual help). We measure welfare by eliciting the willingness to accept (WTA) for forgoing the social interaction. We find that people indeed have clear preferences over the social content the same outcome reached through the same actions. People attach a higher value to situations involving helping. We do not find evidence that mutual helping increases welfare. Contact: roi.zultan@mail.huji.ac.il

The association between religiousness and children's altruism: The role of the recipient's neediness

Hagit Sabato (Ben Gurion University of The Negev); Tehila Kogut (Ben Gurion University of The Negev)

Research examining adults' pro-social behavior suggests a modest but consistent link between pro-social behavior and religiousness. However, religious-people's pro-sociality may be dependent on the characteristics of the helping target. Specifically, the recipient's neediness is an important variable in the decision to give, among the major religions. Religion is a part of the cultural and the broader social context in which children are raised. Thus, norms and values of giving, and specifically giving to needy others, are expected to shape religious children's pro-social behavior from an early age. Such influences are expected to increase as children grow and internalize the norms of their society. In the current study, we examine the role of participants' religiousness and the recipient's neediness in children's pro-social behavior, suggesting that religiousness is related to children's greater sharing, only when the recipient is in need. Examining the behavior of children (second and fifth graders) from religious and non-religious households in the dictator game, we found that the extent of sharing did not differ significantly between the two groups when the recipient was not described as needy. However, when the recipient was presented as a poor (needy) child, sharing was significantly greater among the religious group.

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Asymmetric considerations of interpersonal opportunity costs: A fundamental barrier to generosity

Christopher Olivola (Carnegie Mellon University); John Han (Carnegie Mellon University)

Altruistic decisions are typically thought to result from an explicit internal conflict between self-serving and other-regarding motives. We show, however, that such decisions are also governed by an implicit consideration bias. Specifically, we demonstrate that people naturally consider the opportunity costs of being generous (i.e., their own forgone gains), but neglect the opportunity costs of being selfish (i.e., others' forgone gains), leading to an asymmetry in the perceived benefits of being selfish vs. generous. Consequently, subtly reminding people of their forgone gains if they choose to be generous (a "self-nothing" reminder) has no effect (as these considerations are naturally salient), whereas reminding them of others' forgone gains if they choose to be selfish (an "other-nothing" reminder) significantly boosts generosity by increasing the (otherwise limited) consideration given to others' needs. We document this "other-nothing" effect across eleven different studies. First, we demonstrate the robustness of the effect to various contexts, manipulation formats, and payoff sizes. Next, we rule out experimenter demand as a driver of the effect. Finally, we show that the other-nothing effect operates by countering people's natural asymmetric consideration of their own (over others') forgone payoffs. Specifically, we show (via multiple forms of process data) that the effect operates by "putting a break" on the default tendency to focus on one's own outcomes and by providing "added information" regarding others' potential for gone outcomes. We conclude by discussing the implications of our results for ongoing debates about whether altruism is intuitive or reflective. Contact: olivola@cmu.edu

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

Joanna Sokolowska (SWPS University of Social Sciences and Humanities)

In 4 experiments, psychological accuracy of compensatory (e.g. CPT) and non-compensatory (e.g. PH) risky choice models was investigated. The latter models differ in emphasizing significance of the amount or the probability of loss. Since previous findings do not support either hierarchy, relative importance of these dimensions was tested in Experiments 1- 2. In Experiments 3-4, the accuracy of both kinds of models 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. 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.

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Risk-reward structures shape attentional processes in decisions under risk

Christina Leuker (Max Planck Institute for Human Development); Timothy J. Pleskac (Max Planck Institute for Human Development); Thorsten Pachur (Max Planck Institute for Human Development); Ralph Hertwig (Max Planck Institute for Human Development)

Theories of risky decision-making typically treat payoffs and probabilities as independent attributes that determine the value of an option and ultimately choice. Yet, in many natural environments risks and rewards are tied such that larger rewards are less likely (Pleskac & Hertwig, 2014). How does this ecological invariant influence risky choice? We hypothesized that the correlation between risks and rewards could be conducive for ignoring part of the information, that is, the use of non-compensatory processing strategies. Alternatively, following the independence assumption, people could give equal weight to payoffs and probabilities, and combine them in a compensatory fashion (Payne et al., 1988). To test these hypotheses, we manipulated risk-reward structures of monetary gambles to be either negatively or positively correlated, or uncorrelated (between-subjects). After exposure to one of these environments, participants chose repeatedly between nondominated gambles under time pressure. Eye-tracking data from this task suggests that when risks and rewards were correlated (negatively or positively) across prospects many participants shifted their attention to mainly one attribute – the payoff information. We show that this non-compensatory processing was an adaptive strategy as it resulted in a similar proportion of expected-value maximizing choices as more compensatory processing strategies.

Our results challenge traditional theories of decision making under risk, which typically treat payoffs and probabilities as independent attributes determining the value of an option. In situations in which processing capacities need to be invested effectively, the mind seems to exploit risk-reward structures and process payoffs and probabilities dependently.

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Temporal stability and convergent validity of stated and revealed risk preferences

Rui Mata (University of Basel); Renato Frey (University of Basel); David Richter (German Institute for Economic Research); Juergen Schupp (German Institute for Economic Research); Ralph Hertwig (Max Planck Institute for Human Development)

Debates surrounding how to conceptualize and measures individuals' propensity to take risk have a long history in economics and psychology. Crucially, there are unresolved empirical issues in the field partly stemming from the variety of methods available. Two main types of assessment tools for risk preference exist which are associated with two divided traditions in psychology: The first employs behavioral measures to infer revealed preferences from choices between options with varying degrees of risk (e.g., lotteries); the second approach employs self-report measures to elicit stated preferences in response to hypothetical or real-world scenarios. To date, little is known about the temporal stability and convergent validity of these two classes of measures. We tackle this research gap by reporting 1) a meta-analysis showing that stated preference measures show considerable temporal stability of up to a decade that are comparable those of other major psychological traits (e.g., Big Five personality traits), and 2) new experimental data using an age-heterogeneous sample from a large representative panel that completed self-reports and lottery measures in different formats (description, experience; N = 951) to document a clear lack of convergent validity between stated and revealed preference measures. We discuss implications for conceptualizing and measuring individual and age differences in risk preferences.

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The effects of experiencing a fire in an immersive virtual environment on prevention decisions, mediated by psychological constructs.

Patty Jansen (Eindhoven University of Technology); Chris Snijders (Eindhoven University of Technology); Martijn Willemsen (Eindhoven University of Technology)

Risks can be prevented from happening or their impact can be reduced if people take the right prevention measures. A potentially effective way to influence people's risk prevention behavior is through letting them experience a risk themselves (cf. Weinstein, 1989). A suitable way to simulate such realistic experiences is through an immersive virtual environment (IVE). In this study, we analyze the effects of experiencing a fire in an IVE on prevention decisions, mediated by psychological constructs such as knowledge, vulnerability, severity, self-efficacy, and locus of control. We confront participants with a fire in an IVE (n=242) and compare this to a more traditional prevention method: an information sheet. Our hypothesized model is tested with a Structural Equation Model (SEM). Results show that the IVE, compared to the information sheet condition, had the desired and expected effects on vulnerability, severity, and self-efficacy and an unexpected negative effect on knowledge. Furthermore, experiencing a fire in an IVE has a significant positive effect on actual prevention decisions. However, the effect of IVE on prevention decisions was only partly mediated by knowledge and vulnerability, and not mediated by the other constructs. Our results give reason to reconsider the implicit assumption in most previous IVE research that eventual effects of IVE on individuals' behavior are likely to be mediated by constructs such as vulnerability, severity, self-efficacy, and knowledge. In addition, our recommendation for research on the effects of IVE is, if at all possible, to always also study the intended behavior as well. Contact: p.c.p.jansen@tue.nl

Judging forecasting accuracy: How human intuitions meet formal models

Katya Tentori (University of Trento); Vincenzo Crupi (University of Turin); Paolo Dragone (University of Trento); Stefano Fait (Dipsco); Andrea Passerini (University of Trento)

Most of the scoring rules that have been discussed and defended in the literature are not ordinally equivalent, with the consequence that, after the very same outcome has materialized, a forecast x

can be evaluated as more accurate than y according to one model but less accurate according to another. A question that naturally arises is therefore which of these models better captures people's intuitive assessment of forecasting accuracy. To answer this question, we developed a new experimental paradigm for eliciting ordinal judgments of accuracy concerning pairs of forecasts for which various combinations of associations/dissociations between the Quadratic, Logarithmic, and Spherical scoring rules are obtained. We found that, overall, the Logarithmic model is the best predictor of people's accuracy judgments, but also that there are cases in which these judgments – although they are normatively sound – systematically depart from what is expected by all the models. These results represent an empirical evaluation of the descriptive adequacy of the three most popular scoring rules and offer insights for the development of new formal models that might favour a more natural elicitation of truthful and informative beliefs from human forecasters. Contact: katya.tentori@unitn.it

Perceptual organization and choice behavior: From global/local biases to choice biases

Tal Sela (Tel Aviv University); Dino Levy (Tel Aviv University)

A key tenet of choice models is to account for biases and idiosyncratic preferences. Previous studies demonstrated that psychological constructs such as framing, and emotions are important factors mediating choice biases, and some proposed that perceptual biases and idiosyncratic preferences are related. We examined whether a distortion in a perceptual domain would be associated with choice biases. We show that manipulating visual perception via Global/Local presentations can influence value-based choices. Using hierarchical numerical stimuli as a mixed gamble, we found that when monetary losses appear at the global level of the stimuli, subjects tend to take the lottery less often. Moreover, we show that subject's tendency to focus on the whole or its parts, was related to her risk preferences. We then generalize our results, and show that subjects' variability in Global/Local processing style, measured in a perceptual task, was correlated with their risk preferences, measured in a gambling task. These results emphasize that perceptual biases are linked to choice biases, have implications for the conceptualizations of risk perception, and suggest to integrate constructs such as perceptual organization into normative models of choice. Contact: dinolevy@post.tau.ac.il

Session #7 Track 3: Individual Differences 2 – Tuesday 16:00-17:30

(Cooper Building, 215)

Greed, regret, envy and the fear missing out

Marcel Zeelenberg (Tilburg University)

This research focuses on the relation between experiences of greed (with regret and envy as benchmarks) and the social phenomenon of Fear of Missing Out (FoMO). Przybylski, Murayama, De Haan, and Gladwell (2013, p.1) define FoMO as "a pervasive apprehension that others might be having rewarding experiences from which one is absent, FoMO is characterized by the desire to stay continually connected with what others are doing." Social media provide users with ways to be continually connected, and therefore to be aware of what others are doing. They also enable their users to share updates about their own activities. Here we extend our previous research on greed (and regret and envy) to obtaining social experiences, and especially to the fear of missing out on them. We believe that greedy people are particularly likely to fear missing out on rewarding social experiences. FoMO is related to various negative outcomes such as distraction due to phone use while driving, a lower overall life satisfaction (Przybylski et al., 2013), and alcohol related harm such as blackouts (Riordan, Flett, Hunter, Scarf, & Conner, 2015). In order to protect individuals

from these negative consequences, it is important to investigate what factors, such as greed, contribute to FoMO. In two studies (N1 = 306 MTurk; N2 = 176 Dutch undergraduate students) we examined the relative contribution of greed to FoMO, in the context of two competing psychological factors that may contribute to it, namely anticipated regret and envy. We found support for all three measures in explaining FoMO. These findings concerning fear of missing out will be discussed in relation to theories of greed, regret and envy. Contact: marcel@uvt.nl

Neuroticism and the propensity to invest in foreign securities

Paweł Niszczoła (Poznań University of Economics and Business)

In this study, I investigate whether variation in neuroticism – a higher-order personality trait – has an adverse effect on the decision to invest in foreign securities. I explore this hypothesis on both the country level (using cross-country observational data) and individual level (using the responses of university students that were given a hypothetical investment scenario). Additionally, I explore whether the predicted relationship is exacerbated when uncertainty (in financial markets) or anxiety (in individuals) is high. The country-level analysis reveals that investors from high-neuroticism countries generally invest less in foreign equities (but not debt securities) than investors from other countries, and that this tendency is more pronounced when investing in culturally dissimilar countries, or in times of high uncertainty. The hypothesized relationship is also present in the responses of male students in a high-anxiety state. This is in accordance with previous research that has shown greater stress-reactivity in males than in females, and an exacerbation of this relationship for higher levels of neuroticism. Given that professional investors are predominantly male, and work under high stress, this explains to some extent why investors have such a strong bias towards domestic securities. Contact: pawel.niszczoła@ue.poznan.pl

Risk preference shares the psychometric structure of major psychological traits

Renato Frey (University of Basel); Andreas Pedroni (University of Zürich); Rui Mata (University of Basel); Jörg Rieskamp (University of Basel); Ralph Hertwig (Max Planck Institute for Human Development)

Several conceptual issues regarding the construct of risk preference persist because there have been few attempts to integrate multiple risk-taking measures from different measurement traditions: The stated-preference tradition capitalizes on people's introspective abilities and relies on self-reported propensity measures; the revealed-preference tradition assumes that only incentivized behavior is indicative of person's risk preference; and in clinical applications people's risk-taking behaviors are assessed with "frequency measures". It remains unknown to what extent a general factor of risk preference, akin to the general factor of intelligence, captures shared variance across measures and traditions, and to what extent risk preference can be thought of as a stable trait. We adopted a psychometric approach and collected 39 risk-taking measures from each of 1,507 participants (109 participants completed the battery again after 6 months), and found that propensity measures and frequency measures correlated relatively strongly with each other. Yet, there was a clear gap between these measures and the incentivized behavioral measures. The latter neither correlated very strongly with each other and also showed low rank-order consistency. A bi-factor model indicated that a general factor accounted for about half of the explained variance, thus suggesting a very similar psychometric structure as the one of major psychological traits, such as intelligence or psychopathology. Moreover, the general risk-preference factor proved to have substantially increased test-retest reliability compared to the individual risk-taking measures. In sum, our integrative approach suggests that the construct of risk preference exhibits features that are indicative of a psychological trait. Contact: renato.frey@unibas.ch

For whom less is more - Individual differences in choice overload tendencies

Itay Sisso (The Hebrew University of Jerusalem); Ilana Ritov (The Hebrew University of Jerusalem)

Recent research reveals mixed evidence regarding the Choice Overload phenomenon (namely, that people derive less satisfaction from their choice when made from a larger set). We examine a few personality traits as moderators of the effect (Maximizing vs. Satisficing tendencies, Regulatory Focus etc.) and discuss their mechanism vis-à-vis choice set size. We show, as hypothesized, that a predisposition to prevention focus (i.e. a tendency to be driven by the looming possibility of failure) positively moderates the choice overload effect. While people high on prevention focus are more satisfied with a choice made from a smaller set of options (choice overload effect), people low on prevention focus are more satisfied when choosing from the larger set. Regarding promotion focus (i.e. being driven by gains rather than non-losses) we found a significant negative moderation, but only regarding the satisfaction measured two weeks after the choice.

Furthermore, in contradiction to previous claims in the literature, we find that maximizers (people who strive for 'the best', rather than for 'good enough') exhibit the opposite of the choice overload effect (i.e. are more satisfied when choosing from a larger set). We develop a new scale – Forgone Alternatives Aversion (FAA), which measures the tendency to feel dissatisfaction when one forgoes desired options (even when choosing the best one, which differentiates it from regret). We show that it is highly correlated to Fear of Missing out (FoMO - a pervasive apprehension that others might be having rewarding experiences from which one is absent) and other related constructs. Finally, we show that people who exhibit high levels of FAA (and FoMO) tend to experience choice overload (while people low on it experience the opposite). Contact: itaysisso@gmail.com

Measuring intuition inhibition without maths

Miroslav Sirota (University of Essex); Lenka Kostovičová (Slovak Academy of Sciences); Marie Juanchich (University of Essex); Amanda Marshall (Ludwig-Maximilians-Universität); Chris Dewberry (Birkbeck, University of London)

The Cognitive Reflection Test (CRT) measures intuition inhibition – the cognitive ability to resist compelling but incorrect intuitions. It rapidly became popular for its impressive power to predict how well people reason and make decisions. Despite the popularity of the CRT, four issues complicate its interpretation and threaten its continued use. First, the numerical nature of the CRT confounds reflection ability with mathematical ability. Second, the statistical and psychometric properties of the CRT are imperfect. Third, an increasing proportion of participants are already familiar with the CRT. Four, and most importantly, the test entangles the ability to suppress initial intuition (i.e., error detection) with the ability to correct the wrong initial answer (i.e., error correction). In this talk I will introduce a new measure – CRT-Verbal – that we developed to overcome these issues by using verbal problems with low familiarity, which has excellent psychometric properties, and low cognitive cost of error correction. I will discuss the implications of these findings for research in thinking and reasoning, decision-making and moral cognition.

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Pseudo-inefficacy and volunteer burnout in humanitarian organizations

Arianna Costantini (Verona University); Andrea Ceschi (Verona University); Riccardo Sartori (Verona University); Anna Maria Meneghini (Verona University)

Burnout can contribute to diminished personal accomplishment, depersonalization and relationship difficulties in a variety of social settings. The resulting costs of burnout become particularly problematic among humanitarian workers, whose work environment requires constant exposure to those in need of help as well as coordination of emergency situations. While much research has been devoted to investigating how individual traits may increase vulnerability to burnout, it is unclear to what extent burnout is related to cognitive decision-making biases common in the

valuation of human lives. Drawing on the notion that vital aid that could be provided is sometimes withheld due to an illusion of ineffectiveness (i.e., pseudo-inefficacy), we investigated whether such a tendency is related to burnout among 235 humanitarian workers. Results showed that the exhaustion due to burnout significantly correlates with pseudo-inefficacy. This study provides insights into how cognitive biases influence burnout and sheds light on the relationship between pseudo-inefficacy, warm glow feelings, and the exhaustion component of burnout in volunteers. Contact: arianna.costantini@univr.it

Session #7 Track 4: Game and Behavior 2 – Tuesday 16:00-17:30

(Cooper Building, 216)

David and Goliath in old age: Asymmetric competition and resource allocation in younger and older adults

Sebastian Horn (Max Planck Institute for Human Development); Judith Avrahami (The Hebrew University of Jerusalem); Yaakov Kareev (The Hebrew University of Jerusalem); Ralph Hertwig (Max Planck Institute for Human Development)

Competition among humans is ubiquitous, but surprisingly little is known about adult-age differences in strategic competitive decisions. We analyzed the allocation of limited resources in younger ($M = 27$ years) and older ($M = 70$ years) decision makers in the classic game of "Colonel Blotto" (Borel, 1921). Weaker agents canst and a chance of winning occasionally against stronger agents in asymmetric competitions waged over several fields if they follow the normative strategy to give up on some fields and concentrate resources on the remaining ones. But how sensitive are younger and older players to their relative strengths and how does aging affect resource allocation in competitive games? In this project, we investigate how experience may help older adults to selectively distribute available resources and to what extent other cognitive variables (such as fluid abilities and numeracy) account for age-related differences in economic competition games.

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Cheap talk and evidence: An experiment

Valeria Burdea (University of Nottingham); Maria Montero (University of Nottingham); Martin Sefton (University of Nottingham)

We investigate the effect of cheap talk on individuals' perception of partially-informative evidence. To do so we use a sender – receiver game with asymmetric information and bi-dimensional states. In this setting, the informed party (the sender) must disclose one of the two state-dimensions with the goal of convincing the receiver that the state is good. We vary whether in addition to the disclosure action, the sender also has the possibility to communicate with the receiver by sending her a message regarding the values of the two dimensions. From a normative perspective, in the presence of hard evidence cheap-talk should have no bearing on receivers' decisions. Our results show that cheap-talk messages prime more mistakes in the appraisal of the evidence provided, leading to a negative impact on players' welfare. The main driver of this effect appears to be receivers' increased skepticism. This refers to the fact that receivers reject more often when messages are present for any given disclosed state-dimension value. This finding seems particularly relevant in light of the advent of the "post-truth" phenomenon when objective facts are becoming less and less important in shaping public opinion.

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Preferences, beliefs, and strategic plays in games

Rene Levinsky (Charles University); Jianying Qiu (University Nijmegen); Rudolf Kerschbamer (University Innsbruck)

We examine strategic plays in games while controlling for distributional preferences and beliefs. We elicit players' distributional preferences before they play a series of two-person strategic games. We also elicit players' belief about the opponent's strategies. Our control of distributional preferences does not rely on any particular parametric forms; it is rather based on revealed preferences. The payoff vectors in strategic games are the same as the payoff vectors in the distributional preferences task. This allows us to examine whether preferences elicited in a static scenario - dictator game-like situations - predict choices in strategic games. The first-order beliefs combined with the payoff features in some of normal form games allows us to examine how beliefs might enter preferences directly, as suggested by psychological game theories. Finally, since players in strategic games know their opponent's choices in distributional preferences tests, our design allows us to examine whether this information is used in making own choice. In particular, we explore indirect reciprocity, i.e. do players behave nicely to people who are nice to others? Experimental results show that rational equilibrium prediction performs no better than randomness, whereas there is a strong consistency of choices in distributional preferences task with the choices in strategic games, both at the population level and at the individual level. We also find supporting evidence that beliefs could enter preferences directly. Finally, there is some evidence that people are nice to people who are nice to others. Contact: rene.levinsky@cerge-ei.cz

"Strategic" behavior in a strategy-proof environment

Assaf Romm (The Hebrew University of Jerusalem); Avinatan Hassidim (Bar-Ilan University); Ran I. Shorrer (Penn State University)

We present direct field evidence (from the Israeli Psychology Master's Match) of preference misrepresentation under deferred acceptance. A large fraction of highly educated participants, who had been informed about the strategy-proof nature of the mechanism in numerous ways, failed to play truthfully: they ranked a non-funded position above a funded position in the same program. This is despite being informed that rank-ordered lists are never made public, that funding is a positive signal of ability, and that funding comes with no strings attached. Preference misrepresentation is associated with weaker applicants. A laboratory experiment documents a strong negative causal relationship between applicants' expected desirability and preference misrepresentation. Contact: assaf.romm@mail.huji.ac.il

Groundless altruism: Why it makes sense to risk one's life for other people's money

Magda L. Dumitru (University of Liege); Gitte H. Joergensen (University of Connecticut)

In a study where participants were asked to make a series of assessments in distinct circumstances, we show that altruistic agents may incur disadvantages in the name of values they do not believe in (i.e., saving money) as long as they believe in the overarching category (e.g., it is a 'good deed' to recover other people's money). Whereas previous research mostly targeted ultimate benefits (i.e., whether or not altruistic agents incur real disadvantages), the axiological basis of altruistic acts (i.e., whether or not they have the same worth to self and to others) has remained unchallenged. Here, we explored "groundless altruism" by asking participants to rate their agreement with the statement 'Money is worth risking my life for' before and after presenting them with an altruistic scenario. There was a dramatic increase in the proportion of 'yes' responses from the first to the second rating. Moreover, as predicted by the cultural group selection theory, the status of the agent (low-rank police employee v s. secret agent) was largely irrelevant. These findings suggest that social constructs such as categorisation have the potential to significantly

influence human behaviour in various domains from moral psychology to work ethics to language learning. Contact: magda.dumitru@gmail.com

On Gamesmen and Fairmen: Explaining Fairness in Noncooperative Bargaining Games

Ramzi Suleiman (Triangle Research & Development Center, University of Haifa, Al Quds University)

Experiments on bargaining games have repeatedly shown that subjects fail to use backward induction, and that they only rarely make demands in accordance with the subgame perfect equilibrium (SPE). In a recent article, we proposed an alternative model, termed "economic harmony" in which we modified the individual's utility by defining it as a function of the ratio between the actual and aspired payoffs. We also abandoned the notion of equilibrium, in favor of a new notion of "harmony", defined as the intersection of strategies, at which all players are equally satisfied. We showed that the proposed model yields excellent predictions of offers in the ultimatum game, and requests in the sequential CPR dilemma game. Strikingly, the predicted demand in the UG is equal to the famous Golden Ratio (≈ 0.62 of the entire pie). The same prediction was recently derived independently by Schuster (Scientific reports, 2017). In the present paper, we extend the solution to bargaining games with alternating offers. We show that the derived solution predicts the opening demands reported in several experiments, on games with equal and unequal discount factors, and game horizons. Our solution also predicts several unexplained findings, including the puzzling "disadvantageous counteroffers", and the insensitivity of opening demands to variations in the players' discount factors, and game horizon. Strikingly, we find that the predicted opening demand in the alternating offers game, is also equal to the Golden Ratio. Contact: suleiman@psy.haifa.ac.il

Wednesday August 23, 2017

**Session #8 Track 1 (Symposium): Behavioral ethics: From theory to application –
Wednesday 9:00-10:30**

(Cooper Building, 112)

Behavioral ethics: From theory to application

Organizers: *Guy Hochman (IDC- The Interdisciplinary Center Herzliya); Shahar Ayal (IDC- The Interdisciplinary Center Herzliya)*

The rapidly growing field of behavioral ethics shows that dishonest acts are highly prevalent among ordinary people who nevertheless perceive themselves as highly moral. When considered cumulatively, these seemingly innocuous and ordinary unethical behaviors cause considerable societal damage. Research in behavioral ethics has made tremendous advances in characterizing many contextual and social factors that promote or hinder dishonesty. These findings have prompted the development of interventions to curb dishonesty and to help individuals become more committed to ethical standards. This symposium presents recent works that shift research in behavioral ethics from a descriptive approach to a more prescriptive and applicable one. Leibet al. will demonstrate how voluntary job rotation can promote corruption European Union employees. Barkan et al. will present work showing that contrary to popular belief, N.Y. businessmen are more prone to dishonest behavior than D.C. politicians, and that former are also less sensitive to moral reminders. Schurr et al. will demonstrate how defaults can affect the way in which people evaluate the morality, estimated harm and expected retribution of drivers of autonomous cars. Finally, Ayal et al. will suggest that while confessing on prior unethical behavior is effective tool to reduce immediate dishonest behavior, this effect is eliminated and even backfires overtime.

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The moral hazard of voluntary job rotation

Margarita Leib (University of Amsterdam); Jörg Gross (Leiden University); Theo Offerman (University of Amsterdam); Shaul Shalvi (University of Amsterdam)

Job rotation is the reassignment of employees to different organizational teams and tasks. Typically, job rotation is forced on employees to increase their exposure to various norms and roles. The procedure has a positive side-effect, by decreasing the risk of ongoing collusion and coordinated fraud, forced job rotation can serve as an anti-corruption tool. Some organizations however, like the European Union, encourage employees to rotate but provide them with the freedom of not rotating. Here, we test whether such voluntary rotation can lead to adverse effects. Since job rotation allows corrupt people to find a partner in crime, it might stimulate rather than decrease corrupt behavior. We test this hypothesis using a dyadic die rolling task in a large scale of experiment (N=372). We found that whereas the overall corruption level did not differ much across treatments, providing people with the opportunity to voluntarily rotate leads to the emergence of unethical dynamics. In such settings participants responded to their partner's level of dishonesty and were more likely to mimic the partner's behavior. We further found evidence for unethical free riding. Honest participants were less likely to seek a new partner (by asking to rotate) when paired with a lying partner. Moreover, the likelihood with which honest people asked to rotate dropped as a function of the amount of profit the partner generated. Apparently, those honest people felt comfortable about their own honest behavior while disregarding the profits conferred on them by their partner's lies. Our results suggest there is much complexity in honesty. They further suggest that organizations providing freedom to their employees should do so with caution.

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Pick your poison: Dishonesty in politics and business

Rachel Barkan (Ben Gurion University of the Negev); Shahar Ayal (IDC- The Interdisciplinary Center Herzliya); Dan Ariely (Duke University)

According to the Federal Bureau of Investigation (FBI), white-collar crime is estimated to cost the United States more than \$300 billion annually. The FBI formal website defines white-collar crime as "synonymous with the full range of frauds committed by business and government professionals." While deceit and corruption are elements in both the stereotypes of businessmen and politicians, people seem to believe that politicians are worse. In fact, a big part of Trump's presidential campaign was based on the premise that a New York businessman is better than the corrupt Washington D.C. politicians. We present two studies. Study 1 captures people's beliefs, indicating they perceive politicians to be significantly more corrupt than businessmen. Study 2 compares actual cheating behavior of young adults in D.C. (e.g., lobbyists, political assistants) to that of young adults in N.Y. (e.g., Wall Street brokers, businessmen). The findings show that, contrary to the general intuition, D.C. politicians cheated less compared to N.Y. businessmen who cheated more. Importantly, D.C. politicians cheated less when a relevant moral reminder was presented but N.Y. businessmen were insensitive to moral reminders. Contact: barkanr@som.bgu.ac.il

Judging the morality of swerving in autonomous and regular cars

Amos Schurr (Ben Gurion University of the Negev); Chil Uliel (Ben Gurion University of the Negev); Simone Moran (Ben Gurion University of the Negev)

Self-driving cars shed new light on the trolley problem whereby individuals decide whether to intervene and save a group of people, by killing one. We explore and demonstrate the role of defaults in determining the perceived morality, estimated harm and expected retribution of drivers driving autonomous versus regular cars who face a trolley-like problem. We find that the decision to swerve and run over one instead of five individuals is deemed more moral and as deserving more lenient retribution when it requires overriding the default compared to passive acceptance, or when driving a regular car with no externally determined default. Contact: samos@post.bgu.ac.il

The implications of confession: Ethical salience or moral licensing?

Shahar Ayal (IDC- The Interdisciplinary Center Herzliya); Francesca Gino (Harvard Business School); Nina Mažar (Rotman School of Management); Rachel Barkan (Ben Gurion University of the Negev)

The effect of confession was examined in four studies. In two intuition studies people predicted a temporal "V" pattern where the likelihood of 'sin' increases before confession, decreases immediately after confession, and then rises again. Two behavioral studies demonstrated the expected high-low-high fluctuations in cheating around the time of confession. Decrease in cheating reflects the effect of ethical salience. Increase in cheating may reflect either licensing or baseline behavior. Interestingly, and contrary to licensing, when participants expected to engage in confession, the general level of dishonesty was lower. Thus, fluctuations seem to reflect a shift between baseline and ethical salience. Contact: s.ayal@idc.ac.il

Session #8 Track 2 (Symposium): Eye-Tracking Methodologies for Investigating Information Search – Wednesday 9:00-10:30

(Cooper Building, 214)

Eye-Tracking Methodologies for Investigating Information Search

Organizers: Nathaniel Ashby (*Technion – Israel Institute of Technology*); Jacob Lund Orquin (*Aarhus University*)

Discussant: Nathaniel Ashby (*Technion – Israel Institute of Technology*)

Eye-tracking methodologies allow unhindered insight into information search, providing researchers direct access to the decision processes involved in preference formation. However, eye-tracking methodologies also provide researchers with many degrees of researcher freedom (e.g. how fixations are classified, what data is removed), which can make it difficult for eye-tracking research to be replicated. This symposium presents three papers that harness the power of eye-tracking methodologies to investigate the intricacies of information search, and a meta-analysis investigating the relative importance of the main drivers of eye movements in decision making research. Meissner et al. present research outlining the effects of experience on visual search effort. They find that effort is reduced with experience while retaining decision quality. Orquin et al. present a series of studies and a meta-analysis investigating the influence of the number of options in product search. They find that more options only lead to marginal increases in search effort indicating that consumers often rely on incomplete information when making choices. Perkovic et al. compare a standard index of information search (Payne index) to a novel one that accounts for random search (Systematicity index). They report that the Systematicity index is better able to capture underlying search processes. Lahm and Orquin present a meta-analysis investigating the main factors driving eye movements in decision making. They find that characteristics of visual environment, such as the position, visual salience, and surface size of information, have a large influence on what is fixated during decision making.

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Effort Reduction in Repeated Rule-Based Choices

Martin Meissner (University of Southern Denmark); Andres Musalem (Duke University); Ricardo Montoya (University of Chile); Joel Huber (Duke University)

We explore processes of effort reduction in repeated choice tasks. Decision makers are asked to follow a set of lexicographic rules that are tedious, but easy to get right. Eye tracking reveals the processes that most efficiently lead to effort reduction with task experience. Major efficiency gains come from learning the locations and meaning of information in the choice tasks, and from limiting repeated attention to needed information. Smaller gains come from focusing fixations on needed information and spending less time per fixation. Rewards for greater speed proportionately generate these gains but do not decrease accuracy, and even greater effort reduction emerges when a trial period permits learning. Contact: mmeissner79@gmail.com

The Optional Shopping Problem

Jacob L. Orquin (Aarhus University); Sonja Perkovic (University of Leeds); Martin P. Bagger (Aarhus University); Peter M. Todd (Indiana University)

As shoppers, we generally prefer to spend as little time as possible searching for products, but we also do not want to settle for inferior options. The more we search the better options we find, but the more time we have to spend. How much should we search to be optimal? Based on this challenge we derive an optimal shopping model (OSM) that maximizes the ratio of product quality to search effort. The OSM shows that shoppers must search marginally more when the set of options is larger, and when the time to begin the search is longer. We test the assumptions and

predictions of the OSM in five eye tracking studies. In Study 1, we show that visual search is random as assumed by the OSM. In Study 2, 3, and 4 we show that shoppers search marginally more options when the set is larger and when the waiting time is longer. In Study 5, we meta-analyze eye tracking studies conducted in real world environments and find that shoppers search marginally more when the set is larger. Our findings suggest that shoppers are not optimal, searching too few options under time pressure, but too many when not under time pressure. While not optimal, shoppers are, however, consistent with the predicted directions of the OSM, searching marginally more options as a function of the set size and searching more options when waiting time is longer. Contact: jalo@mgmt.au.dk

Random or systematic eye movements: A new measure for information search analysis

Sonja Perkovic (University of Leeds); Nicola J. Bawn (Centre for Decision Research, University of Leeds); Gulbanu Kaptan (University of Leeds)

We propose a new measure for explaining information search and compare it to the Payne index (PI), thus far the most popular measure for information search in process-tracing studies. The systematicity index (SI) explains information search in terms of systematicity or the proportion of non-random search, i.e. search that is compensatory (alternative-wise) or noncompensatory (attribute-wise) corrected for chance. The PI, on the other hand, shows the proportion of compensatory and noncompensatory search ignoring random search. We predict that the SI will be higher in environments where information is visually well-organized compared to environments where it is disorganized. We test the SI in a discrete choice experiment with four within-subjects conditions (compensatory, noncompensatory, systematic, and unsystematic visual grouping) using eye-tracking technology. The results show a higher SI in the systematic compared to the unsystematic condition. The PI, however, is close to zero in both conditions. The compensatory and noncompensatory conditions show similar SI but differ on PI. Our experiment shows that the SI is useful for calculating the amount of systematic information search in process-tracing studies and can shed light on processes not captured by the PI. Contact: bnsp@leeds.ac.uk

Visually nudging Decision Makers' Attention: A Meta-Analysis

Erik S. Lahm (Aarhus University); Jacob L. Orquin (Aarhus University)

In recent years, behavioral scientists as well as policy makers have found an increasing interest in nudging. However, if policy makers wish to nudge decision makers, they need to capture their attention. An understanding of how to capture attention would therefore benefit many stakeholders and lead to a more effective nudging. To gain a better understanding of attention capture, we conducted a psychometric meta-analysis on the effect of bottom up control. We identified 44 studies related to bottom up control. We categorized bottom up control as an object's distance to the center of the stimulus, the salience of an object, an increase in the surface size of an object, and the amount of clutter surrounding the object. We identified: 17 studies related to a position effect and found that objects closer to the center of an array of objects had a moderate effect on fixation likelihood $r = .33$, CI95 [.21, .45], $I^2 = 58\%$. 12 studies related to the salience of an object; objects with a higher salience had a small effect on fixation likelihood $r = .11$, CI95 [- .04, .26], $I^2 = 60\%$. 7 studies related to surface size; increasing an object's surface size had a moderate effect on fixation likelihood $r = .22$, CI95 [.11, .34], $I^2 = 58\%$. Finally, 8 studies related to increased visual clutter showing a negative effect on fixation likelihood $r = .77$, CI95 [.29, .1], $I^2 = 98\%$. Nudging decision makers to attend specific elements of a message is pivotal to enhance better decisions. Our findings suggest that in order to capture consumers' attention, policy makers should: increase the size of the most important attribute, present important information with a low number of surrounding distractors, key objects should be salient, and they should be positioned close to the center of an object. Contact: lahm@mgmt.au.dk

Session #8 Track 3 (Symposium): Methodological approaches to studying the link between memory and decision making – Wednesday 9:00-10:30

(Cooper Building, 215)

Methodological approaches to studying the link between memory and decision making

Organizers: *Bettina von Helversen* (University of Zurich); *Fabio Del Missier* (University of Trieste and University of Stockholm)

Memory serves various important functions in judgment and decision making. Without long-term memory, it would be impossible to retrieve previous experiences, making it difficult to evaluate the attribute values of the options at hand. Without working memory, it would be impossible to compare different options because comparing requires mentally manipulating information about the options. Semantic memory can play various roles, providing both knowledge and global judgments about previously encountered options. Despite the importance of memory processes, tracing their contribution to decision-making can be challenging, as memory processes cannot be observed directly and are often interwoven with the decision process. In order to tackle this problem, researchers have developed a variety of methodological approaches. The goal of this this symposium is to feature methodological approaches to studying the link between memory and decision making, in order to compare their merits and limitations and discuss how they could be combined. The methodologies presented include experimental paradigms, computational modeling, and eye tracking. Specifically, the first contribution uses a computational architecture to specify the demands of decision strategies on different cognitive capacities (e.g., memory retrieval and working memory updating). The second contribution employs simulations to test whether computational models of strategy learning can serve as explanations of empirical findings. The third study relies on eye tracking to trace memory retrieval during a judgment process, and the fourth contribution presents a taxonomy and experimental investigation of memory distortions after choice. Contact: b.vonhelversen@psychologie.uzh.ch; delmisfa@u-nits.it

Cognitive costs of decision-making strategies: A resource demand decomposition analysis

Hanna B. Fechner (University of Zurich); *Thorsten Pachur* (Max Planck Institute for Human Development); *Lael J. Schooler* (Syracuse University)

Several theories of cognition distinguish between processing strategies that differ in terms of the mental effort associated with their use. But how to measure the effort, or cognitive costs, associated with a strategy? Here we compare the cognitive costs of decision-making strategies. Previous analyses have mainly focused on the number of attributes considered and the type of information aggregation (e.g., Payne, Bettman, & Johnson, 1993). We propose an approach based on the Adaptive Control of Thought–Rational (ACT-R) cognitive architecture that allows one to quantify the strategies' time costs for using specific cognitive resources and takes into account interactions between processing operations, as well as the possibility of parallel processing. Using this resource demand decomposition analysis (RDDA), we quantified, decomposed, and compared the time costs of two prominent strategies for decision making: take-the-best (TTB) and tallying (TALLY). Although TTB often ignores information and is therefore usually considered simpler than TALLY, in both ACT-R simulations and an empirical study we found that under increasing cognitive demands (imposed by a concurrent tone-counting task loading working memory) the response times of TTB sometimes systematically exceeded those of TALLY. As revealed by the RDDA, this pattern is driven by TTB's higher requirements compared to TALLY in terms of working memory updating, memory retrieval, and coordination of mental actions. The results demonstrate that despite TTB's frugality it can be cognitively more costly than a compensatory strategy. More

generally we illustrate that claims about and assessments of the simplicity of strategies need to consider the overall cognitive system in which their implementation is embedded.

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Integrating cue abstraction with retrieval from memory: A learning approach

Janina A. Hoffmann (University of Konstanz); Rebecca Albrecht (University of Basel); Bettina von Helversen (University of Zurich)

When making a judgment, such as evaluating the food in the cafeteria, it has been argued that people select among two kinds of judgment strategies: a capacity-limited abstraction of knowledge and a similarity-based retrieval of past instances. To disentangle these strategies, past research has usually investigated which strategies describe judgments best at the end of learning, assuming that people consistently pursue the same strategy over time. The question of how strategies evolve over time and change as a function of learning has received less attention. The current work aims to fill this gap by formulating a learning model that develops a preference for one over the other strategy over time, thereby adjusting the relative importance of different cues and past exemplars during learning. In simulations, we explored how well the learning model captures important findings in judgment research. Replicating empirical results, we found that the learning model picks up linear relationships faster than nonlinear ones and weighs knowledge abstraction more heavily than exemplar retrieval in these linear tasks. Furthermore, it also shows more accurate predictions beyond the training range in linear than nonlinear tasks. In sum, these results suggest that a learning model integrating knowledge abstraction and exemplar retrieval may provide a suitable tool for understanding learning processes in human judgment.

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Salient but irrelevant information can bias judgments by inducing the retrieval of exemplars

Bettina von Helversen (University of Zurich); Agnes Scholz (University of Zurich)

Some judgments require ignoring information. For instance, when inferring the quality of an applicant for a specific position, the decision maker should only consider the attributes of the applicants that are relevant for the decision (e.g., their language abilities) but ignore irrelevant attributes such as the persons' name. Past research, however, indicates that seemingly irrelevant attributes can influence judgments. One explanation is that irrelevant attributes automatically activate memories about similar past instances (i.e. former applicants), which then are integrated into the judgment process. The aim of the current study was to investigate this hypothesized link between the retrieval of specific exemplars in memory and the influence they exert on judgments. To this goal, we used a new method, based on the recording of eye movements, that allows for assessing which information is retrieved from memory. In accordance with research showing that when people retrieve information from memory they look back to the location where they encoded it, we measured whether participants retrieved previously encountered exemplars during judgments. Our results show that participants were more likely to retrieve an exemplar when it matched the test item on an irrelevant attribute. In addition, irrelevant attributes influenced judgments in the direction of the retrieved exemplar. However, first analyses suggest only a small link between gaze behavior and judgment bias, suggesting that retrieval does not necessarily affect judgments. These results provide first insights into how memories about exemplars are integrated into the judgment process when assessing memory retrieval online.

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Memory of decisions: Methods and evidence

Fabio Del Missier (University of Trieste and University of Stockholm); Martina Salomonsson (University of Trento); Mimi Visentini (University of Trieste); Timo Mantyla (Stockholm University)

Although many decisions are based on past experiences, only a few studies have focused on memory of decision-related information after choice. Yet, inaccurate memory can lead to suboptimal related future decisions and the mere fact of making a choice may affect memory. Moreover, the large majority of existing studies has mainly focused on a single type of memory distortion after choice (misattribution of values to decision options) and used recognition as the memory test, and this raises doubts on the generalizability of the findings. Starting from a new taxonomy of memory distortions after decision making, we designed a study combining free recall and cued recall with the following aims: (1) documenting the existence and relative frequency of different kinds of memory distortions after choice; (2) appraising whether these distortions have a self-serving nature (i.e., they favor the chosen option) or not; (3) understanding how the length of delay between choice and recall affects memory distortions; (4) gaining insight into the nature of distortions and elucidating the role of encoding vs. retrieval processes. The findings show that at least four kinds of distortions take place after a choice (selective forgetting, fact distortion, misattribution, and false memory), that they worsen over time, and that they partly depend on reduced accessibility of memory traces at retrieval. We did not find convincing evidence for self-serving distortions. Theoretical and applied implications of the results will be discussed but, starting from the lessons learned, we will specifically discuss methodological aspects related to research designs and memory testing in the investigation of memory of decisions.

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Session #8 Track 4 (Symposium): Mapping choice environments to understand the bounds of rationality – Wednesday 9:00-10:30

(Cooper Building, 216)

Mapping choice environments to understand the bounds of rationality

Organizers: *Timothy J. Pleskac (Max Planck Institute for Human Development); Joerg Rieskamp (University of Basel)*

Discussant: *Yaakov Kareev (The Hebrew University of Jerusalem)*

Judgment and decision making research often follows the premise that the information processing capacities of human decision makers are limited. This has led to extensive work on how attentional, learning, memory, and affective processes, shape the judgments and decisions people make. At the same time, the field often adopts the premise that human decision makers are adaptive. That is, their cognitive systems reflect and exploit statistical regularities in the choice environment. Yet, it is safe to say that while the toolboxes of decision scientists are well equipped for developing and testing theories of information processing, they are rather meager in terms of doing the same for choice environments. The aim of this symposium is to highlight recent advances in understanding environmental structures that impact the judgments and decisions people make. We will review some of the prominent structures such as the relationship between risks and reward, power-law distributions, non-compensatory cues, and dominance, and how they shape the choice process. We will also examine how an ecological approach to judgment and decision making can move beyond simply describing the environment to which the people adapt, but lead to a more complete explanation for judgment and decision making regularities including rank-dependence in evaluating outcomes, heuristic use, and information search. These theories of boundedly rational decision makers are necessary not only as we move beyond domain general

theories of judgment and decision making, but also as we seek to engineer choice environments that help people make better decisions.

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The person versus the situation: A rational Analysis

Jerker Denrell (University of Warwick); Gael Le Mens (Universitat Pompeu Fabra); Elizaveta Konovalova (Universitat Pompeu Fabra)

A large amount of research has documented the tendency to attribute the causes of others' behaviors to their personality rather than to the situation. Prevailing explanations invoke motivated cognition (the motivation to preserve a view of a 'just-world'), attention (the actor is more salient than the situation) or information processing (person attributions are automatic, situational attributions are effortful). I will show that this 'fundamental attribution error' can be the outcome of a completely rational inference mechanism. In our model a Bayesian agent computes her posterior on two hypotheses (H1: Behavior is due to the person; H2: Behavior is due to the situation). Our key assumption is that under H1 behavior is consistent across situations whereas under H2 behavior varies more across situations. An agent observes two instances of behavior of a target person. We compute the Bayesian posterior on the two hypotheses given the evidence. We find that even if the priors on the two hypotheses are 50%, the posterior favors H1 (the person attribution) most of the time. This implies that most rational agents will attribute behavior to the person rather than the situation. Contact: gael.le-mens@upf.edu

Heuristic Choice and the Structure of the Environment

Ralph Hertwig (Max Planck Institute for Human Development); Jan Woike (Max Planck Institute for Human Development); Thorsten Pachur (Max Planck Institute for Human Development); Eduard Brandstätter (Johannes Kepler Universität Linz)

It is almost an article of faith that heuristics impose an accuracy–effort trade-off: The less cognitive effort required by a heuristic, the more compromised its performance. Yet, there is an alternative, according to which less effort can lead to better, comparable, or worse performance, depending on the environment in which a heuristic is used—that is, the ecological rationality of strategies. Such demonstrations, however, have predominately focused on inference tasks with undisputed normative benchmarks. Less is known about heuristics' ecological rationality in the quintessential world of economic rationality, preferential choice under uncertainty. Extant investigations of the performance of preferential heuristics focused on the world of risk, with outcomes and probabilities known. But how successful are preferential choice heuristics when facing uncertainty? We conducted simulations in which heuristics and expectation-based models sequentially accrue experience of the structure of the choice ecology (thereby decreasing uncertainty) by sampling from a wide range of distributions of outcome value and probabilities. The simulations yielded several insights. For instance, under high levels of uncertainty there are indeed heuristics that are more successful than expected value theory itself—assuming that expected value theory, like its competitors, sequentially learns the structure of the world. Second, we identify environmental properties that are conducive to the successful performance of specific heuristics. For example, with increasing complexity of the choice option (i.e., number of possible outcomes), a compensatory heuristic that ignores the experienced relative frequencies of outcomes can, *ceteris paribus*, outperform (a sampled-based) expected value theory.

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How the environment influences information search in decision making

Joerg Rieskamp (University of Basel); Janine Hoffart (University of Basel); Gilles Dutilh (for University of Basel)

The probabilities with which rewards occur and the magnitude of the rewards typically show a negative relationship in real life: Larger rewards are less likely than smaller rewards. In Study 1 of this study, we show that people also make the assumption in psychological decision-making experiments that probabilities and rewards are negatively correlated. In Study 2, we explore whether a violation of the probability- reward regularity influences people's search effort when they search for information under uncertainty. To do so, we study sampling behavior in an experience-based probability judgment task. In this task, participants sample outcomes from unknown gambles until they feel confident to estimate the reward probabilities. Between subjects, we manipulate the probability-reward relationship of the gambles such that the rewards and probabilities were positively or negatively correlated, or not correlated at all. In this task, a negative correlation mimics the probability -reward relationship present in real life. We find that people drew fewer samples in the ecologically representative condition where larger rewards were less likely than smaller rewards than in the other two conditions. These findings suggest that the direction of a correlation between rewards and probabilities has an impact on people's search effort. However, people's performance (i.e. deviance of responses from objective probabilities) does not differ between conditions. Summarized, our results offer an explanation of why people often rely on small samples in experience-based decision-making tasks.

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Why risks and rewards are tied

Tim Pleskac (Max Planck Institute for Human Development); Larissa Conradt (Max Planck Institute for Human Development); Ralph Hertwig (Max Planck Institute for Human Development); Christina Leuker (Max Planck Institute for Human Development)

Decisions that are made under uncertainty are a vexing problem as one typically seeks to choose between prospects based on the desirability of the possible outcomes and the likelihood of their occurrence. However, in these situations the likelihoods are unknown. One adaptive solution for this problem is to use the risk-reward heuristic inferring that probabilities are inversely related to the magnitude of the payoffs. However, a heuristic is only adaptive if it relies on a frequent and recurrent ecological relationship. While risk-reward relationships are an established property of economic markets it is unclear to what extent they are present in other environments. We show that in general competition for limited resources is a sufficient ecological mechanism to couple reward size with the probability of success. The result is a consequence of a well-known ecological model known as the ideal free distribution of competitors. According to this model, the number of competitors in a resource patch is proportional to the total amount of resources. We show that this property implies a risk-reward relationship and establishes important boundary conditions for the relationship. For instance, our model predicts degradation in the risk- reward relationship when the system is out of equilibrium. Moreover, the model predicts how a range of factors distorts the relationship. For instance, computational limitations among the competitors lead to a shallower risk- reward relationship and smaller rewards being tied with a larger range of probabilities. We will show how human data on their beliefs in the risk-reward relationship reflects these properties. We will close discussing the implications of our ecological model of risk-reward relationships for adaptive theories of choice. Contact: pleskac@mpib-berlin.mpg.de

Greedy bastards: The desire for more and unethical behavior

Terri Seuntjens (Tilburg University); Marcel Zeelenberg (Tilburg University); Niels Van de Ven (Tilburg University); Seger Breugelmans (Tilburg University)

Greed is often argued to be bad and unethical; it is seen as a reason behind financial scandals, fraud, and corruption. The assumption that greed elicits unethical behavior is widespread, but has to the best of our knowledge never been tested. Three studies tested the idea that greedy people act more unethical. Study 1 found, in five samples ($N = 3413$), that greedy people have more favorable attitudes towards different transgressions and more often self-report that they engage in transgressions (e.g., cheating on tax; lying in own interest; cheat on partner, illegally downloading movies). Moreover, this study found that the relationship between greed and unethical behavior is mediated by self-control. Study 2 ($N = 172$) found further support for the relationship between greed and unethical behavior by showing that greedy people are more likely to accept bribes in an incentivized corruption game. Lastly, Study 3 ($N = 302$) further looked at self-control as a possible mediator for the relationship between greed and unethical behavior. Indeed, self-control mediated the relationship between greed and unethical behavior. More specifically, greedy people are more likely to transgress, because they find the benefits of transgressing more desirable, making it harder for them to resist the temptation and refrain from transgressing.

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Promises and dice: Do people keep their word rather than their money?

Jan Kristian Woike (Max Planck Institute for Human Development); Patricia Kanngiesser (Free University Berlin)

Promises can generate trust and scaffold cooperation. Yet, it has been claimed that words are cheap talk and easy to be broken in the absence of punishment, and that most people tend to lie (at least a little), when it improves their personal gain. We used a novel, integrative approach to study the effect of promises on cheating behavior ($N=776$): Participants first played a variant of the dice-rolling game in two conditions. In the control condition, participants chose between a higher and a lower payment rate without further consequence. In the promise condition, participants could only choose the higher payment rate when they promised to truthfully report their dice rolling results. We show that over-reporting in the promise condition was lower than in the control condition and further, that over-reporting correlates with demographic and personality variables. After the dice rolling game participants played a novel two-dimensional sender-receiver game, in which they played the role of sender and had the opportunity to add a voluntary promise, affirming the correctness of their message. A second group of participants were randomly assigned to the receiver role and acted upon a sender's message with consequences for both players' payoffs. We analyze the effect of the senders' promises on the receivers' behavior, the relation between senders' behavior in the sender-receiver game and the dice-rolling game, as well as correlations with personality measures and the PANAS scale. Findings are supported by qualitative data such as open explanations given by participants. Our results show that promises reduce cheating and lying behavior even when it means losing money.

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Malleable Lies: Communication and Cooperation in a High Stakes TV Game Show

Martijn van den Assem (Vrije Universiteit Amsterdam); Uyanga Turmunkh (University of Michigan); Dennie van Dolder (University of Nottingham)

We investigate the credibility of non-binding pre-play statements about cooperative behavior, using data from a high-stakes TV game show in which contestants play a variant on the classic Prisoner's Dilemma. We depart from the conventional binary approach of classifying statements as promises or not, and propose a more fine-grained two- by-two typology inspired by the idea that lying aversion leads defectors to prefer statements that are malleable to ex-post interpretation as truths. Our empirical analysis shows that statements that carry an element of conditionality or implicitness are associated with a lower likelihood of cooperation, and confirms that malleability is a good criterion for judging the predictive power of cheap talk. Contact: m.j.vanden.assem@vu.nl

Any feedback will do: Using the lie detector as a moral enhancer

Dar Peleg (Tel Aviv University), Shahar Ayal (IDC- The Interdisciplinary Center Herzliya) Guy Hochman (IDC- The Interdisciplinary Center Herzliya) & Dan Ariely (Duke University)

This study examined how feedback on the results of a lie detection test affects the subsequent moral behavior of its recipients. Participants completed a perceptual task in two blocks, in which they could cheat to maximize their personal rewards. Between the blocks, treatment was manipulated in 3 between-subject conditions. In the first two conditions, participants underwent a lie detector test and received mock feedback that was either positive (suggesting they were honest in the first block) or negative (suggesting they were dishonest). In the third, control condition, participants underwent a filler task and did not receive any feedback. The results suggest that participants who received negative feedback exhibited honest behavior in the second block, whether they cheated or not on the first block. Similar results were obtained for the participants in the positive feedback condition, but the effect was smaller than in the negative feedback condition. By contrast, participants in the control condition continued to cheat at the same level on the second block. Taken together, this pattern of results may imply that the function of lie detector tests is not only to correctly detect lies, but also to serve as a deterrent that encourages people to behave according to a higher moral standard. Contact: dar.peleg@gmail.com

People are more honest than experiments suggest, A meta-analysis on cheating experiments

Philipp Gerlach (Max Planck Institute for Human Development); Kinneret Teodorescu (Technion-Israel Institute of Technology); Ralph Hertwig (Max Planck Institute for Human Development)

Philosophers have long speculated about the conditions under which humans behave dishonestly. In more recent times, researchers have begun to experimentally investigate these conditions. This article reviews four experimental paradigms that tempted participants to profit from misreporting private information and then measured the degree to which participants could not resist. Meta-analytical integration of more than 29,000 individual observations from 93 die roll tasks, 84 matrix tasks, 124 coin flip tasks, and 147 cheap talk games (sender-receiver games) revealed great variety in the rates of dishonesty between and within the experimental paradigms: Whereas some experiments indicated that all participants misreported to their maximal advantage other experiments suggested that participants claimed even less than what would be expected from honest reporting. We present the results of several meta-regression analyses that assessed when people behaved dishonestly, showing that participant characteristics (e.g., gender, study major) as well as experimental aspects (e.g., the form of the incentive, laboratory settings, experimental deception) play a major role in dishonest behavior. Overall, the results suggest that the current experimental literature on dishonest behavior strongly over-estimated the "true" rate of dishonesty in the population. Contact: pgerlach@mpib-berlin.mpg.de

The break in the linkage between monetary incentives and effort: Are extraordinary high net wage levels really necessary?

Miki Malul (Ben Gurion University of The Negev); Mosi Rosenboim (Ben Gurion University of The Negev); Daniel Shapira (Ben Gurion University of The Negev)

An average worker in some US companies needs to work more than a year to earn his CEO's daily wage. We posit that the level of effort any individual can invest is bounded and hence cast doubt on the well-accepted economic notion that extremely high gaps in net wages and wealth distribution are the lesser evil because they ensure economic efficiency. Considering the notion of bounded effort may totally change the results of many studies, enriching the general public discussion about the need for the existence of extreme wage levels that so far overlooks the limited power of economic incentives. Contact: Malul@som.bgu.ac.il

Does relative thinking exist in mixed compensation schemes?

Ofer Azar (Ben Gurion University of the Negev)

Several earlier studies have shown that people exhibit "relative thinking": they consider relative price differences even when only absolute price differences are relevant. The article examines whether relative thinking exists when people face mixed compensation schemes that include both fixed and pay-for-performance components. Such compensation schemes are prevalent in many occupations (e.g., salespeople and managers) and therefore are an important practical issue. Surprisingly, the ratio between the pay-for-performance and the fixed compensation does not affect effort, meaning that no relative thinking is found. Another experiment shows that this is not due to reciprocity that cancels out relative thinking. In a third experiment subjects make similar decisions without incentives and the results suggest that the different context (compensation schemes instead of price comparisons) and not the introduction of financial incentives (which were not used in previous studies) is the reason that relative thinking disappears. The results have implications for designing incentive schemes in firms and for designing experiments.

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Common ratio effect in money and goods

Danae Arroyos-Calvera (University of Warwick); Andrea Isoni (University of Warwick); Graham Loomes (University of Warwick); Rebecca McDonald (University of Warwick)

The common ratio effect (CRE) is a widely replicated violation of expected utility theory (EUT). This paradox, first documented by Allais (1953), motivated the development of alternative models to accommodate it, such as prospect theory, regret theory or Rubinstein's similarity model. The reversal is robust when the payoffs are money amounts, but many of our day-to-day decisions do not involve money. Given that the theories mentioned are not designed to be restrictive with regards to the type of consequence, any systematic pattern observed in money ought to be replicated with non-monetary consequences. In this study, we test for the CRE using questions about lotteries with monetary and non-monetary consequences (i.e., consumer goods). Our design allows us to explore choice patterns for consequences that differ in nature, but that participants stated were equivalent in value. To our knowledge, this is the first study to elicit incentive compatible answers to these questions and to make a tied comparison between monetary and non-monetary consequences. We aimed to replicate the classic CRE, test for it with goods (varying the similarity of the consequences), and compare participants' behavior patterns across consequences types. A preliminary study (full data collection is planned for April 2017) suggests the CRE persisted for money, but it was greatly weakened for similar goods and disappeared for

dissimilar goods. A strong tendency for people to choose the risky alternative even in the scaled up question with goods may be at least partially driving this. Because people may find it hard to compare multidimensional goods, they may need to focus on the payoff dimension, almost entirely disregarding probabilities, and will then be likely to choose the better payoff.

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Understanding the interplay of social preferences and incentives via eye-tracking

Susann Fiedler (Max Planck Institute for Research on Collective Goods); Andreas Glöckner (Fernuniversität Hagen)

In the recent past research in behavioral economics and psychology inspired a lively debate about the mechanisms underlying decisions involving other regarding preferences. Even though persons fully understand a situation and its payoff structure, their subjective evaluation of the involved payoffs and the corresponding weighting of information may vary drastically. Utilizing eye-tracking we examine the information search and processing under 3 different incentive conditions in order to disentangle the various mechanisms and motive structures possibly at play in allocation decisions. The recorded gaze behavior was analyzed for its sequential patterns and information search effort. The results show that individual social preferences are a strong driver of information search even when incentives are created to work against them, but that cognitive processes are the result of an interplay between the situational incentives as well as the inter-individual differences in social preferences. Interestingly, our data suggest, that especially inequality aversion and welfare concerns only evolve after considering more basic information which reflect altruistic or selfish behavior, which could indicate that social preferences may possibly be dividable into primary and secondary motives. Contact: susann.fiedler@gmail.com

Merit and CEO-to-worker income inequality: When and how performance justifies inequality

Anna Dorfman (Tel Aviv University); Nir Kaftan (Tel Aviv University); Daniel Heller (Tel Aviv University)

Former President Obama has identified the widening economic inequality as the “defining challenge of our time. Although income inequality is on the rise, it is nevertheless often legitimized and accepted. Guided by the distributive justice and equity norm literatures, we propose an important legitimizing factor of inequality within organizational hierarchies (CEO-to-Worker) is merit. Since CEOs are often perceived as more capable and talented than other employees, the CEO-to -Worker income inequality may seem as legitimate. Thus, we propose that when merit is perceived as high, it buffers negative reactions to inequality. In two experiments, we examined how merit influences tolerance toward inequality (Experiment 1) and how inequality and merit interact to influence people’s attitudes towards companies (Experiment 2). We found that information about high (vs. low) merit led to more tolerant perceptions of inequality. Additionally, when merit was high, people ignored information about inequality when making judgments regarding a company. Contact: annadorfman@post.tau.ac.il

Water supplementation increases performance in decision-making tasks

Thoma Volker (University of East London); Patsalos Olivia (University of East London); Caroline Edmonds (University of east London)

Previous research has shown that dehydration and water supplementation affects mood and cognitive performance in both adults and children on a variety of tasks. This study investigated potential effects of water supplementation, hydration status, and thirst on thinking and decision-making tasks. Twenty-nine participants undertook a battery of tests on two separate occasions after having fasted from the previous night. On one occasion, they were given 500ml of water prior

to testing. Water supplementation was found to improve performance on the judgment and decision tests, including measures of heuristic thinking, when thirst and hydration status (urinary osmolality) were controlled. Performance on a Stroop task was also moderated by water-intake, and correlated to overcoming heuristic thinking. Contact: v.thoma@uel.ac.uk

Session #9 Track 3: Heuristics and Biases – Wednesday 11:00-12:30

(Cooper Building, 215)

Base rate neglect as a common fallacy among oil and gas explorers

Alexei V. Milkov (Colorado School of Mines)

Oil and gas explorers routinely estimate the probability of success (PoS) for their exploration prospects and the amount of petroleum the prospects may contain in the case of success. These assessments are often inaccurate because explorers use judgmental heuristics under the influence of cognitive and motivational biases, and are prone to logical fallacies. Base rate neglect is a logical fallacy displayed when people ignore the base rate information and focus on specific information. I studied data from recent exploration activities of some companies and found that base rate neglect may be a common fallacy among oil and gas explorers. For example, explorers sometimes ignore the recent success rate in the play/basin (base rate) and have a portfolio with average PoS for prospects significantly higher or lower than the base rate would suggest. Explorers also may ignore the field size distribution and creaming curve in the play/basin and have prospects with modelled maximum or mean volumes significantly exceeding the volumes in recent discoveries (base rate). As a result, exploration companies have portfolios that do not deliver on promise or as planned. The base rate neglect fallacy can be corrected through a comprehensive evaluation of previous exploration results in the play/basin and more rigorous exploration assurance. Contact: amilkov@hotmail.com

Why do people perceive an illusory negative correlation between choice options' outcomes? Exploring the alternative Omen Effect's mechanism

Deborah Marciano (Hebrew University of Jerusalem); Eden Krispin (Hebrew University of Jerusalem); Sacha Bourgeois-Gironde (Université Paris 2 and Institut Jean-Nicod); Leon Y. Deouell (The Hebrew University of Jerusalem)

In situations of choice between uncertain options, we sometimes get feedback on both the outcome of the chosen option and the outcome of the unchosen option ("the alternative"). We recently showed that when presented first, the outcome of the alternative creates biased expectations regarding the outcome of the chosen option (Marciano-Romm et al., 2016): people perceive an illusory negative correlation between the outcomes of the two options when the two outcomes are in fact uncorrelated, a bias coined the "Alternative Omen Effect" (ALOE). Here we investigate whether the ALOE could be explained by prior beliefs regarding outcomes distribution. We tested whether the ALOE is a manifestation of 1) the Limited Good Hypothesis (Foster, 1965) according to which people see the world as a zero-sum game, and assume that resources there means no or less resources here and/or 2) a more specific assumption that laboratory tasks are programmed as zero-sum games. In the original computerized task, the situational evidence might have been too weak to overcome these assumptions: subjects had to infer the lack of correlation between the chosen and alternative outcomes from the trials history only. In the present study, the lack of correlation between outcomes was made visible to the eye: subjects had to draw colored beads from two real, distinct cloth bags. Despite the unequivocal situational evidence, we found a strong ALOE. These findings confirm that the ALOE is a robust bias that replicates across tasks, and show that it cannot be explained by preconceptions regarding outcomes distribution. We

offer two other potential mechanisms: the Novelty Seeking Hypothesis, and the Limited Luck Hypothesis. Contact: dvorah.marciano@gmail.com

FFTrees: An R package to create and profit from fast and frugal decision trees

Nathaniel Phillips (University of Basel); Hansjoerg Neth (University of Konstanz); Jan Woike (Max Planck Institute for Human Development); Wolfgang Gaissmaier (University of Konstanz)

Fast and frugal decision trees (FFTs) are simple decision algorithms that allow people to make efficient and effective classification decisions based on limited information. But despite their successful use in many applied domains, from emergency rooms to financial markets, there is no widely available tool that allows anyone to easily create FFTs from data. We fill this gap by introducing the R package FFTrees. FFTrees allows anyone to create, visualise, and implement FFTs from data with minimal programming. In addition to creating trees, the package uses icon arrays to quickly convey to the user how FFTs make decisions, and highlights cases where trees do well, and when they do poorly. In this talk, we explain how FFTs work and provide a 5 step tutorial for using the FFTrees package to create trees catered to specific decision domain. We then conduct a simulation across a variety of real-world datasets to show that FFTs created by FFTrees can predict data as well as complex algorithms while remaining simple enough for anyone to actually understand and benefit from. Contact: nathaniel.phillips@unibas.ch

On duality and probabilistic foundations of illusion of control

Elzbieta Aniela Kubinska (Cracow University of Economics); Marcin Czupryna (Cracow University of Economics); Lukasz Markiewicz (Kozminski University)

In this presentation, we consider the illusion of control by using Bayesian updating as the rationality model. First, the illusion of control may have two concurrent sources, "prior" and "impact," which are individual traits. The first one yields biases due to prior assumptions on the level of control and the second one produces biased Bayesian processing due to engagement in the process generating outcomes. We propose three methods for identifying these two sources and a method for their factorization. The proposed model of processing, where different priors are applied, is validated in the experiment. We analyze their influence on the illusion of control at the individual level for different levels of objective control. Contact: elkubinska@gmail.com

Decision heuristics related to workplace relationship management on social media

Deborah Y Cohn (New York Institute of Technology); Joshua E Bienstock (New York Institute of Technology)

The aim of this research is to uncover unwritten workplace social media decision rules of business professionals, entrepreneurs, and employees. Decision rules or heuristics are an efficient cognitive process that provide a shortcut to decision making by allowing the decision maker to consider a subset of all of the information that might be available for a particular decision. In the case of workplace social media decisions, relationship rules provide guidance concerning when (not) to connect, (disconnect) maintain connections within workplace relationships. Our research provides new insights into the cognitive processes of navigating workplace relationships on social media. Because of the personal nature of the research question, the nondirective, nonjudgmental approach of phenomenological interviews (e.g., Hirschman 1994) was chosen for this research. We conducted 27 in-depth interviews with business professionals and entrepreneurs in small businesses in a large metropolitan area in the Northeast USA. We examined the rules related to efforts to keep personal contacts separate from business contacts as well as the rules for allowing worlds to collide (Ollier-Malaterre et al. 2013). A social media rulebook taxonomy to manage social media decisions emerged from the qualitative data. Our research explores a series of critical incidents or triggers and provides new insights into the cognitive processes associated with

decisions surrounding the use of social media to build, maintain and break relationships in the workplace. We explored the unspoken social media rulebooks of professionals in order to develop a set of guidelines to further inform businesses in setting up their own guidelines to lead to greater harmony and reduced conflict in the workplace. Contact: dcohn02@nyit.edu

Pathways to intercultural accuracy: Social projection processes and core cultural values

Shira Mor (Tel-Aviv University); Claudia Toma (Université libre de Bruxelles); Martin Schweinsberg (Organizational Behavior Uni); Daniel Ames (Columbia Business School)

The present research examines intercultural accuracy—people's ability to make accurate judgments about outgroup values—and the role of social projection processes. Across four studies, Westerners showed overall low levels of intercultural accuracy but were slightly more accurate in predicting collectivistic than individualistic values of the Chinese. In parallel to the observed effects on accuracy, Westerners projected their values on the outgroup. This tendency was associated with greater accuracy and the relationship between projection and accuracy depended on the overlap in values between American and Chinese. In Study 4 we examined the causal direction of this process by manipulating projection and found that projection facilitated accuracy. Important for the study of intergroup relations, accuracy was positively associated with interest in future relationships with the Chinese. Contact: shiramor@taux.tau.ac.il

Session #9 Track 4: Mathematical Models 1 – Wednesday 11:00-12:30

(Cooper Building, 216)

It will be worth it, in the end

Philip Newall (Technical University Munich); Mike Peacey (New College of the Humanities)

Most descriptive intertemporal choice models proceed by altering the exponential discount function, to a hyperbolic function or other forms. We proceed differently, by assuming that intertemporal choice errors are driven by exponential discounting until a given future date, S , the "Subjective time horizon." Utilities beyond S are incorrectly given zero weight (when $S < T$, the agent's "Objective time horizon"). We explore this model's correspondence with the empirical literature on intertemporal choice errors. Crucially, all errors are moderated by S , with errors disappearing as S approaches T . First we demonstrate that only a finite number of intertemporal choice errors are possible in this model. Two errors involve only a single intertemporal prospect (which is either incorrectly favoured or avoided compared versus inaction). Six further errors involve choosing a smaller sooner over a larger later reward. A simple consumption model demonstrates that setting $S < T$ never benefits the agent. We further show that temporal inconsistency can be explained via a diminishing cost of increasing S at further delays. The cost of increasing S further explains within-agent variation in intertemporal choice, via size, loss, and length effects. Debiasing is moderated via S , providing a mechanistic explanation for previous experimental findings from the literature. Contact: pnew@tum.de

Eliciting attitude towards temporal resolution of risk: Utility versus probability weighting approaches

Emmanuel Kemel (HEC Paris & CNRS); Mohammed Abdellaoui (HEC Paris & CNRS); Enrico Diecidue (INSEAD); Ayse Öncüler (ESSEC Business School)

Most economically important decisions like consumption, savings, investment, portfolio management, and production, among others, typically involve that risk resolves over time. We owe to Kreps and Porteus (1978), henceforth KP, the first intertemporal model that could account for

attitude towards temporal resolution of risk (TRR) under an expected-utility oriented framework.

The present paper proposes an elicitation method of attitudes towards TRR involving a tradeoff between the winning probability of immediately resolved lotteries and the timing of resolution of the corresponding delayed lotteries. The first contribution of the paper is to show that our method allows for a simple and direct elicitation of KP's model. Although this utility-oriented approach can clearly detect attitudes towards TRR, it cannot circumvent violations of EU such as nonlinear probability weighting. In particular, it cannot allow attitudes to depend on the magnitude of the winning probability as observed in our experiment and in earlier investigations. Therefore, the second contribution of our paper consists in capturing attitudes towards TRR while assuming a more descriptive model. Specifically, we follow the idea that probability weighting could represent a natural carrier of attitude towards the timing of risk resolution. Our empirical results, based on a total of 136 individual computer-assisted interviews show that the large majority of subjects exhibit preference for an early resolution of risk. We also show that attitude towards the timing of risk resolution is intimately related to probability weighting. The weight assigned to a probability decreases monotonically with its delay of resolution. This suggests that subjects behave as if they discounted delayed probabilities. Contact: kemel@hec.fr

A similarity-based account of human preferences

Jana Bianca Jarecki (University of Basel); Jörg Rieskamp (University of Basel)

This paper proposes that preferences form based on similarity comparisons. Standard theories of preference formation assume that preferences result from a linear integration of subjective attribute values and attribute weights. We investigate whether preferences are generated based on comparisons with previously experienced similar experiences. Accordingly, preferences result from the similarity between a present object and previously experienced positively or negatively evaluated objects, resembling ideas of exemplar-based inferential judgment and categorization processes. Using cognitive modeling and computer simulations we identified a preference learning task to optimally contrast the standard linear-weighting and the similarity-based view on preferences. Predicting the preferential choices of 33 participants in the resulting four-attribute unsupervised preference learning task showed that, for 20 of 33 participants, the out-of-sample predictions made by the exemplar-similarity-based preference model outperformed the linear-weighting model. These results show how individuals' past experiences in a preferential domain can strongly impact preferential decisions in the future. Contact: jj@janajarecki.com

A new and unique prediction for cue-search in a parallel-constraint satisfaction network model: The attraction search effect

Marc Jekel (FernUniversität in Hagen); Andreas Glöckner (FernUniversität in Hagen, MPI Bonn); Arndt Bröder (Universität Mannheim)

A common assumption of many established models for decision making is that information is searched according to some pre-specified search rule. While the termination of search is influenced by the content of the information---usually specified as a stopping rule---the direction of search is independent of the valence of the retrieved information. In contrast to pre-specified search rules, we propose an extension to the parallel constraint satisfaction network model of decision making which assumes that search of concealed information is influenced by the valence of available information in the decision situation. Specifically, people are predicted to search concealed information of the more attractive alternative given the available information. This attraction search effect was consistently demonstrated in two studies with participants choosing between two options based on partially revealed probabilistic information. The effect was found for environments with varying costs for information search although the magnitude of the effect decreased with decreasing monetary search costs. A reanalysis of five published studies shows that

the attraction search effect is also prevalent in earlier work. With the Parallel Constraint Satisfaction Model for Decision making and search (PCS-DM+S), we propose a fully specified formal network model that can predict the size of the effect very well.

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Coherence-based prediction of information search times in multi-attribute decisions

Sophie Elisabeth Scharf (University of Mannheim); Marc Jekel (FernUniversität in Hagen); Arndt Bröder (University of Mannheim)

The newly proposed parallel constraint satisfaction model for decision-making and search (PCS-DM+S, Jekel, Glöckner, & Bröder, 2017) is an extension of the former empirically validated PCS-DM. Like its predecessor, it assumes an automatic and iterative spread of activation through a network representing the relevant information of a multi-attribute decision task. When all information is integrated into a coherent representation of the decision situation, the option with the highest activation and therefore representing the most attractive option is chosen. The new feature of PCS-DM+S is that it allows for the prediction of information search as well as the prediction of information search times. The search direction in this model depends on the joined influence of cue validities and the preference for one option based on the already available information. It therefore makes the unique prediction that the available information influences the direction of information search. This prediction has received empirical support. The other new feature of PCS-DM+S is the prediction of information search times, a dependent variable that has to date not been investigated. It predicts search times via the number of iterations it takes the model to stabilize for a search decision. In order to test this unique prediction, data from Jekel et al. (2017) and one additional experiment were reanalyzed. In all data sets, model iterations were correlated positively with information search times. The ability to predict a new dependent variable increases the scope of the model and therefore puts it at a theoretical advantage compared to other currently existing decision-making models. Contact: soscharf@mail.uni-mannheim.de

The Needleman-Wunsch algorithm: Fixation Sequences as an Indicator of decision processes

Martin Schoemann (Technische Universität Dresden); Stefan Scherbaum (Technische Universität Dresden); Frank Renkewitz (University of Erfurt)

The aim of any process tracing study is to infer cognitive processes from observable behavior. In the JDM domain, the measurement of gaze behavior is one widely used approach to accomplish this aim. Scanpath theory proposes to base the inference of cognitive processes on similarities between fixation sequences. Recent methodological developments of process tracing in JDM research advances the application of the Needleman-Wunsch algorithm (NWA) to determine such similarities. Since in JDM exist only two studies applying the NWA on gaze data, our validation study investigates whether the NWA provides a meaningful measure of similarity on which the inference to identical or different decision processes can be based. We conducted a standard risky choice paradigm in a one-factorial within subject design with three instructed decision strategies (priority heuristic, expected value, minimax). Results revealed that the NWA detects both systematic differences and commonalities in fixation sequences, and classifies those sequences into meaningful subsets from which we can assume that they are driven by the same decision process. Therefore, we have shown that the NWA provides an applicable measure of similarity between gaze pattern, that incorporates the sequential property of gaze behavior rather than ignoring it. Contact: martin.schoemann@tu-dresden.de

Thursday August 24, 2017

Session #10 Track 1: Ethics and Morality – Thursday 11:00 am – 12:30 pm

(Cooper Building, 112)

"I swear on my life": The credibility of an oath as a signal of truth

Orit Tykocinski (IDC- The Interdisciplinary Center Herzliya); Lesley Terris (IDC- The Interdisciplinary Center Herzliya); Ehud Lehrer (Tel Aviv University)

The act of taking an oath could be construed as sending a signal of truthfulness or commitment. However, anyone can take an oath whether or not they are speaking the truth. Thus, the credibility of an oath depends on the subjective assessment of the receiver as to how the oath-taker perceives the consequences of a false oath. To assess the credibility of the oath-signal, recipients may rely on social cues to decipher the sincerity of the source. The goal of our research was to test the hypothesis that the effect of an oath as a truth-signal may be moderated by stereotypical characteristics of the oath-taker which are known to both the sender and the receiver of the signal. Participants were asked to assume the role of a customer deliberating the purchase of an antique Roman coin of a questionable provenance from a dealer whose ethnic origin was either stereotypically-consistent ("Sephardi") or stereotypically-inconsistent ("Ashkenazi") with the act of taking an oath. We found that the act of swearing to the coin's authenticity had no effect on buyers' intentions when the dealer ethnicity was unknown. However, the act of taking an oath decreased the willingness to buy the coin from the "Ashkenazi" dealer, and had the opposite effect when the dealer was "Sephardi". This pattern was not affected by the respondents' own ethnic origin. The value of the oath is not self-evident. Its credibility and effects depend on the subjective assessment of the receiver as to how the oath-taker perceives the consequences of a false oath. An oath may be effective even if recipients do not believe that the insinuated punishment for perjury is in any way a viable option. It is enough that they are sufficiently convinced that the swearer holds such beliefs. Contact: oritt@idc.ac.il

The road to heaven is paved with effort: Perceived effort amplifies moral judgment

Yochanan E. Bigman (The Hebrew University of Jerusalem); Maya Tamir (The Hebrew University of Jerusalem)

If good intentions pave the road to hell, what paves the road to heaven? We propose that moral judgments are based, in part, on the degree of effort exerted in performing the immoral or moral act. Because effort can serve as an index of goal importance, greater effort in performing immoral acts would lead to more negative judgments, whereas greater effort in performing moral acts would lead to more positive judgments. We tested these ideas in three studies. In Study 1 we found that perceived effort intensified judgments of both immoral and moral agents. Immoral agents were judged more negatively, and moral agents more positively when they exerted a lot (vs. a little) effort. In Study 2 we found that the effect of effort on moral judgment was independent from the actual execution of the moral or immoral behavior. Agents who did not perform a moral behavior that was easy to preform were judged more harshly than agents who did not perform a moral behavior that was hard to perform. Finally, in Study 3 we found that the effect of effort on moral judgment was mediated by attributions of goal importance, even when controlling for perceived intentions. When agents exerted high (vs. low) effort, participants believed that the moral behavior was more important to them, and therefore, judged them as more moral. We discuss the possible implications of effort as a causal motivational factor in moral judgment and social retribution. Contact: yochanan.bigman@mail.huji.ac.il

Better Be Wrong than Do Wrong: Honest Advisors Are More Persuasive than Competent Ones

Uriel Haran (Ben Gurion University of The Negev); Shaul Shalvi (University of Amsterdam)

People like receiving advice, and often actively seek it in an attempt to improve their judgment accuracy or their likelihood of making a correct decision. Seekers of advice expect advisors to be both competent and honest, but cannot know with certainty how accurate the advice they receive is. Suspecting that the advice is either erroneous or deceitful should result in discounting, or even in complete disregard of the advice. But would the same advice be treated differently under different types of suspicion? Four experiments tested the hypothesis that suspecting deceit results in greater discounting of advice than suspecting error. Participants made various estimations and received advice which they suspected may be either erroneous or deceitful. We found that advice takers suspecting deceit used the advice less than did those who suspected error, which resulted in suboptimal estimation performance. Moreover, although the type of suspicion affected the use of advice, it did not influence participants' willingness to seek it or their evaluations of its quality. Finally, we uncovered the role of uncertainty attribution in underlying the effect of suspicion. We increased chance uncertainty, which is associated with random error, by randomly alternating between advisors, while keeping the reason for suspicion constant. The intervention increased the use of potentially deceitful advice. The results suggest that people place an implicit premium on advisors' honesty, and demonstrate the importance of establishing their reputation for their success. Contact: uharan@bgu.ac.il

A Sorrow shared is a sorrow halved: Moral judgments of harm to single versus multiple victims.

Daffie Konis (Tel Aviv University and The open university of Israel); Uriel Haran (Ben Gurion University of The Negev); Kelly Saporta (The Open University of Israel); Shahar Ayal (IDC- The Interdisciplinary Center Herzliya)

We describe a bias in moral judgment in which the mere existence of other victims reduces assessments of the harm suffered by each harmed individual. Three experiments support the seemingly paradoxical relationship between the number of harmed individuals and the perceived severity of the harming act. In Experiment 1a, participants expressed lower punitive intentions toward a perpetrator of an unethical act that hurt multiple people and assigned lower monetary compensation to each victim than did those who judged a similar act that harmed only one person. In Experiment 1b, participants displayed greater emotional involvement in the case of a single victim than when there were multiple victims, regardless of whether the victims were unrelated and unaware of each other or constituted a group. Experiment 2 measured the responses of the victims themselves. Participants received false performance feedback on a task before being informed that they had been deceived. Victims who were deceived alone reported more negative feelings and judged the deception as more immoral than did those who knew that others had been deceived as well. Taken together, these results suggest that a victim's plight is perceived as less severe when others share it, and this bias is common to both third-party judges and victims.

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Ethical decision making under uncertainty

Nigel Harvey (University College London); Mengxin Wang (University College London); Leonardo Weiss-Cohen (University College London)

Trolley dilemmas are the 'fruit flies' of studies of ethical decision making. However, they are regarded unrepresentative of real ethical decision making. There are two reasons for this: the problem frame is not typical of ethical decisions that people face and the decisions are not made under uncertainty. Here we report one of the first studies to introduce uncertainty into the switch

dilemma and the footbridge dilemma. In the first case, people assessed the likelihood that they would flip a switch that would direct a trolley towards a single person instead of towards five people. In the second case, other people assessed the likelihood that they would push a man off a bridge into the path of a trolley to stop it continuing towards five people on the track. If the switch was not flipped or the fat man was not pushed, the five people had some % chance (0, 20, 40, 60, 80, unknown) of escaping in time; if the switch was flipped or the fat man was pushed, the single person or the fat man had those same % chance levels of surviving. In both tasks, the probability of acting was directly related to the ratio of the expected number of deaths from not acting to the expected number of deaths from acting. This implies that people took a utilitarian (outcome-based) approach. However, all probabilities of acting were lower in the footbridge dilemma. This implies that people took deontological (act-based) considerations into account as well.

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Session #10 Track 2: Effects of Format and Information – Thursday 11:00 am – 12:30 pm

(Cooper Building, 214)

The role of attention in attribute-framing: Using priming to shift attention to the other half glass

Eyal Gamliel (Ruppin Academic Center); Hamutal Kreiner (Ruppin Academic Center)

People evaluate objects framed positively as better than the same objects framed negatively. This attribute-framing Bias can be explained by Kahneman's WYSIATI principle: Framing the message shifts recipients' attention to one aspect of the attribute while neglecting the complementary aspect. Previous accounts suggested that the positive/negative valence primes activation of corresponding favourable/unfavourable associations. This research used direct and indirect priming to shift attention to the complementary frame. In two experiments participants were presented with either positive or negative attribute-framing scenarios, and rated their evaluation of the objects presented. Experiment 1 directly manipulated attention to the complementary information by asking participants to calculate the complementary outcomes following the scenario, and before rating the relevant objects. This direct manipulation of attention eliminated the attribute-framing effect. Similar elimination was found in a control balanced condition that presented both the positive and the negative frames, whereas typical attribute-framing effect was found in a control condition that asked participants to transform the percentages in the scenarios to absolute numbers (to control for quantitative thinking enhancement). Experiment 2 indirectly manipulated attention to the complementary frame in neutral prime scenarios presented prior to the target scenario. This indirect manipulation of attention reduced attribute-framing effect compared to the large framing effect found for two control conditions: no priming and transforming percentages in the prime neutral scenarios to absolute numbers. These findings confirm the important role of attention in eliciting attribute-framing bias. Contact: eyalg@ruppin.ac.il

Intuitive words and analytical numbers: Effects of format on judgements of food labels

Dawn Liu (University of Essex); Marie Juanchich (University of Essex); Miroslav Sirota (University of Essex); Sheina Orbell (University of Essex)

Nutritional information about food is presented to help consumers make healthy food choices. However, the effectiveness of food labels requires that people understand them and make rational decisions based on their information. The presentation of quantities such as Guideline Daily Amounts (GDAs) can take verbal (e.g. 'low') and numerical (e.g. '2%') formats, which can result in different interpretations that may not correspond with official guidelines. Furthermore, differing

formats may act as cues to process information more intuitively, inviting heuristic biases in judgement (e.g. relying on one salient cue), or analytically, favouring rational decision-making (e.g. weighing all given information). Past research suggests that verbal probabilities are processed more intuitively than numerical ones. We tested if the effect of format on intuitive and analytical processing could be extended to GDA quantities. Experiment 1 (N = 82) found that participants' translations of verbal GDA quantities into numerical values displayed wide inter-individual variance and did not match interpretational guidelines. Experiment 2 (N = 93) found that participants who judged whether different GDA percent ages of a nutrient fit within a daily consumption allowance were affected by GDA format at different quantity levels and nutrient types. Participants' response times varied across numerical quantities but not verbal ones, and they made more errors with small verbal quantities than small numerical ones. These results suggest more intuitive processing of verbal quantities than numerical ones. Experiment 3 (ongoing data collection) assesses whether a concurrent cognitive load will affect participants' performance with a numerical formats more than verbal ones. Contact: dliuxi@essex.ac.uk

The advantage of full feedback information depends on the type of world you live in

Johannes Leder (University of Bamberg); Ute Schmid (University of Bamberg)

Research of experience based decision making shows that relying on limited information when making decisions is adaptive, resulting from the fact that new information is not overshadowed by past experience. The present study tested the hypothesis, that in a dynamic environment with a one-time change, full feedback is advantageous in the first learning phase since it allows quicker information aggregation about options and requires less exploration and therefore results in better decisions. The hypothesis was tested in an experimental study (N=82). Participants played multiple games where they made repeated decisions between two options. The amount of feedback (partial vs. full) varied between subjects, the direction of change (better vs. worst), and speed of change (gradual vs. sudden) varied within subjects. Results showed a significant interaction effect of feedback and phase, showing that feedback type only led to better choices in the first learning phase but not in the second. Comparing a Bayesian updating model with fixed parameters to the observed behavior shows a better fit for participants who obtained full feedback decisions compared to participants in the partial feedback condition in the first phase but not in the second phase of the experiment. The present experiment extends previous knowledge by showing that the type of feedback and its effect on choice is dependent on the stability of the environment.

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How input vs. output-based framing influences performance

Manissa Gunadi (Erasmus University Rotterdam); Bram Van den Bergh (Erasmus University Rotterdam)

Should people be told to perform 10,000 steps as fast as they can, or to complete as many steps as they can in 24 hours? Similarly, should workers be told to write two reports as fast as they can, or to work 9-to-5? Admittedly, tasks and their specifications could be structured differently, which in turn could influence people's motivation and performance in the task. The examples above allude to a greater phenomenon that points to the question: how could we best motivate people? In this paper, we examine if the two different framing modes above lead to differences in performance. They differ in the variability and specificity of expected output (i.e. quantity) and expected input (i.e. duration). In the first option, the expected output is fixed (i.e. 10,000 steps), but completion time is variable (i.e. as fast as you can). In the second option, target quantity is unspecified (i.e. as many steps as you can), but expected duration is specified (i.e. 24 hours). Three studies provide empirical support to our account. Stipulating expected output (i.e. quantity)

leads to higher motivation compared to specifying expected input (i.e. duration). Contact: gunadi@rsm.nl

Choosing while losing: Investigating the effect of valence and relative magnitude on the dynamical features of choice

Avril Hand (National University of Ireland, Galway); Denis O'Hora (National University of Ireland, Galway)

Framing decision options as gains or as losses affects how we evaluate those options. The current study assessed the effects of gain- and loss-framing on the acquisition of outcome values across decisions and on the dynamics of computer mouse responses to those decisions. In a series of 36 decisions per block, four arbitrary symbols were presented, two of which were assigned high points (e.g., 20) and two of which were assigned low points (e.g. 5). Participants (N=86) learned to choose high values and avoid low values when values were positive and to choose low values and avoid high values when they were negative. Loss-framed outcomes (i.e., negative valence) were learned faster and more reliably. Response trajectories following acquisition were slower, more curved and exhibited greater vacillation when choosing between two poor outcomes. These effects were stronger when poor outcomes were negatively valenced. Contact: a.hand1@nuigalway.ie

Session #10 Track 3: Consumer Behavior – Thursday 11:00 am – 12:30 pm

(Cooper Building, 215)

The effect of stated preference on subsequent revealed preference

Coby Morvinski (IDC- The Interdisciplinary Center Herzliya); Silvia Succardo (Carnegie Mellon University); On Amir (UC San Diego)

How would individuals behave when allowed to privately take their own compensation from a bowl of money? In a series of incentive-compatible laboratory experiments requiring individuals to choose their own compensation after performing a real-effort task, we contrast two supposedly equivalent measures of demanded compensation and find a robust mismatch. That is, we find that people who take their compensation after stating their desired earnings end up with a higher compensation than those who simply take the money from the bowl without prior statement. Our findings suggest that the preference revealed by the amount of money taken does not necessarily reflect one's fundamental preference; rather, it seems to be constructed and to be affected by supposedly irrelevant factors. These findings have direct implications for theory and practice concerning preference measurement in research, markets, and policy making, as well as potential implications for wage setting and negotiations. Contact: cobym@idc.ac.il

The asymmetric impact of context on advantaged versus disadvantaged options

Ioannis Evangelidis (Bocconi University); Jonathan Levav (Stanford University); Itamar Simonson (Stanford University)

The effect of introducing a new alternative on preference for existing options in a choice set has been one of the most extensively studied areas in decision-making. Well-cited research on "context effects" has demonstrated that a new option can influence preference by increasing the choice share of the more similar (target) option. Research on context effects has been influential because of its practical implications and because it documents violations of important normative choice principles, including value maximization, regularity (Luce 1977), independence of irrelevant alternatives (IIA; Arrow 1963; Ray 1973) and similarity (Tversky 1972). Despite substantial prior research regarding context effects on choice, there remains uncertainty about when particular context effects will or will not be observed. In this research, we propose a hierarchical decision-

making framework that accounts for at least part of the empirical variability in context effects. We refer to the stronger option in the binary set (i.e., the higher-share option) as the “advantaged option,” and to the weaker option in the binary set (i.e., the lower-share option) as the “disadvantaged option.” Our basic prediction is that context effects resulting from the addition of a third option to a set are observed more frequently when the added option is adjacent to the alternative that is “disadvantaged” rather than advantaged” in the two-option set. In 19 studies with a total of over 8,000 respondents, we test and find support for our analysis as it applies to asymmetric dominance and extremeness aversion. Theoretical and practical implications are discussed. Contact: ioannis.evangelidis@unibocconi.it

Usage frequency considerations in purchase decisions

Mauricio Mittelman (Universidad Torcuato Di Tella); Dilney Gonçalves (IE University); Eduardo B. Andrade (Brazilian School of Public and Business Administration at FGV)

Consumers often ignore considerations that are important for their purchase decisions, such as opportunity costs (Frederick et al. 2009) and hedonic adaptation (Wang, Novemsky, and Dhar 2009). We add to these findings by showing that although consumers acknowledge that usage frequency is, and should be, a critical consideration in their purchase decisions, the frequency with which a consumer expects to use a product is often overlooked during the decision-making process. Four studies document this effect. The relative lack of salience of usage frequency cues in the purchase context needed to trigger the deliberate (rather than the spontaneous) process that the consideration of usage frequency calls for, help explain the phenomenon.

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Exercise your mind - Physical activity alters attribute weighing in consumer choice

Laura Zimmermann (London School of Economics and Political Science); Amitav Chakravarti (London School of Economics and Political Science)

Across five studies we find that physical activity (PA) leads to improved decision-making in unrelated decision domains. We demonstrate that PA - both measured and manipulated - leads consumers to weigh different pieces of information more appropriately and improves reliance on relevant information. In studies 1-3 we find that PA affects how people make desirability-feasibility trade-offs in consumer decisions. Usually, decision-makers tend to overly contrite on the desirability considerations, often at the expense of feasibility considerations. Our findings indicate that PA leads consumers to focus less overly on desirability and consider feasibility criteria more in choices that require trade-offs. In studies 4 and 5 we find that regular PA seems to improve a decision-maker's ability to rely on relevant vs. irrelevant information. When faced with irrelevant information, people find it difficult to ignore irrelevant information, and typically “dilute” their judgments (i.e., their judgments are lower). Two studies reveal that PA aids people's ability to focus on relevant information and ignore irrelevant information in product judgments. Across these sets of studies, it appears that PA leads decision-makers to weigh different pieces of information more appropriately. The results remain unchanged after controlling for various confounding variables including demographics (e.g. education and income), affect and personality traits (e.g. conscientiousness). Our findings have important implications since they extend the benefits of PA to a novel and important domain - attribute weighing in consumer decision-making and shed light on potential remedies against bias when people tend to underweight the importance of feasibility attributes and overweight irrelevant information. Contact: l.zimmermann1@lse.ac.uk

Do consumers “accidentally” place products they own in harm’s way?

Yaniv Shani (Tel Aviv University); Gil Appel (Tel Aviv University); Roni Shachar (IDC- The Interdisciplinary Center Herzliya); Shai Danziger (Tel Aviv University)

How does the launch of a new iPhone influence consumers’ behavior toward the iPhone they own? Analyzing consumer listings of second-hand iPhones on a major e-commerce website, we find an increase in the number of damaged relative to used iPhones listed for sale after the launch of a new iPhone offering only a minor design improvement over the owner’s iPhone. Furthermore, we find the increase in the number of damaged iPhones listed for sale takes time to develop. By contrast, when the new iPhone offers a major technological improvement over the owner’s iPhone, the number of used relative to damaged iPhones listed for sale increases. Next, in a controlled experiment, we find that owners without a warranty on their iPhone are more willing to place it in harm’s way when exposed to a new iPhone offering a minor design improvement than when exposed to a new iPhone offering major technological improvements. These findings suggest consumers may take less care of their iPhone when they want to purchase a new iPhone but have difficulty justifying the upgrade. In such cases, the “fortuitous” damage that may happen to consumers’ owned phone helps them justify the purchase. Contact: shanivya@tau.ac.il

Endowment effect vs. brand loyalty: A memory retrieval approach

Anna Katharina Spälti (Tilburg University); Mark J. Brandt (Tilburg University); Marcel Zeelenberg (Tilburg University)

Consumers are often faced with a dilemma: to stay loyal to their current brand or to switch to a new brand. In hope of overcoming the effects of brand loyalty, stores often allow customers to interact with products from a different brand to increase the brand’s desirability. Using the example of purchasing a new cell phone, we investigate whether “playing” with a cell phone of a different brand creates an endowment effect that can override a brand loyalty effect. We also test how memory retrieval processes are affected by both endowment (manipulated) and brand loyalty (measured) and the role they play in the construction of preferences. 157 university students were randomly assigned to use one of three smartphones from different brands and then indicated their preferences for the smartphones. Participants endowed with a smartphone consistent with their own brand (compatible condition) significantly preferred and were more likely to first think about the endowed smartphone compared participants endowed with a smartphone inconsistent with their own brand (incompatible condition). Participants’ phone preferences and memory retrieval orders were moderated by brand loyalty. Participants with low brand loyalty were more likely show an endowment effect and first think about the endowed phone in the incompatible condition compared to those with high brand loyalty. Our research provides insight into the effectiveness of using an “endowment” strategy to override brand loyalty effects and sheds initial light on how memory retrieval processes can help explain individual differences in preference formation.

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Explaining multiple cue judgment with a mixture model that combines exemplar with cue abstraction processes

Rebecca Albrecht (University of Basel); Janina Anna Hoffmann (University of Konstanz); Jörg Rieskamp (University of Basel); Imothy J. Pleskac (Max Planck Institute for Human Development); Bettina von Helversen (University of Zurich)

Exemplar and cue-abstraction models are well-established tools to understand categorization and judgment processes. However, many models in this area are limited by paying little attention to (1) the finding that judgments are often the result of a mixture of exemplar and cue-abstraction processes and (2) that in case of exemplar processes an outcome could be the results of a competitive retrieval process of exemplars in memory. We developed a new exemplar-based competition model with cue-abstraction (CX-COM) that addresses these both limitations. CX-COM assumes that first past exemplars compete for retrieval and second the resulting judgments from the retrieved exemplars are adjusted following a cue-abstraction process. We tested the new model in two experimental studies. Study 1 tested whether cue-based adjustments occur. Study 2 assessed the competitive exemplar retrieval component, which predicts that variability in judgments increases with the difference in judgment values of competing memory items. Additionally, we conducted a quantitative analysis by building a framework of seven cognitive models that allow for maximal discrimination between model components. We find that the CX-COM model is best suited to explain human judgments. Quantitatively the model provides the best fit. In Study 1 we find adjustment patterns predicted by exemplar models including a cue-abstraction process. In Study 2 we find across-item variability predicted by a competitive memory component. Our research shows the importance of considering variability in addition to mean judgments in judgment research. Contact: rebecca.albrecht@unibas.ch

Curvature agnostic measurement of multi-attribute subjective value and uncertainty functions

Pele Schramm (University of California)

The Thurstonian model assumes that a paired comparison pick is the result of comparing value estimates of the two options, each estimate drawn from a separate Gaussian distribution, and choosing the greater estimate. When one assumes constant variance of the Gaussians, the Thurstonian model reduces down to the probit model, where the probability of choosing option A over option B is equivalent to the standard normal cdf of the difference in value between A and B. This model has been used by econometricians for multiattribute decisions, for the most part under the assumption that an options value scales linearly with its attributes. This can be problematic, since much of the literature has already demonstrated that subjective value rarely scales linearly with respect to continuous attributes. The proposed solution is to instead fit with multivariate polynomials, which have been proven to serve as good approximations to functions on a closed interval. It is also possible to measure an uncertainty function (corresponding to the variance of the Thurstonian Gaussians) when adding a likert rating task and assuming a monotonic, nonlinear relation between the reaction time and the uncertainty in value of the option in the likert task. Similar assumptions are made for paired comparison reaction times and Likert ratings. MCMC or optimization methods can be used to estimate the relevant parameters. Various ways to rigorously combine multiple people's data will also be discussed. Applications to real datasets will be presented, with domains ranging from Psychophysical tasks to Probabilistic and Delay discounting. Contact: pschramm@uci.edu

Absolutely relative or relatively absolute: Using computational models to study relativity in human decision making

Andrei Radu Teodorescu (University of Haifa); Rani Moran (University College London); Marius Usher (Tel-Aviv University)

Compelling evidence exists for relative information processing in human decision making in general and for speeded human decision making in particular. By definition, relative processing is not sensitive to absolute values of choice alternatives. However, relative processing is essential for capturing context effects such as similarity and compromise effects and allows slowing down response times for harder decisions to maintain adequate accuracy. However, evidence from decentralized decision making in social colonies suggests evolutionary advantages for value sensitive processing. We present a specialized experimental paradigm allowing for independent manipulations of the absolute and relative properties of the values characterizing choice alternatives. A-priori model predictions are derived through computational simulations demonstrating that while relative models are insensitive to absolute value changes that maintain relative properties, absolute models are insensitive to contextual effects. Our results demonstrate contextual effects as well as a surprising sensitivity of human decision makers to absolute value information, even when that information is irrelevant to performing the task. Subjects choose the brighter of two gray patches faster when overall brightness is higher. Model fits confirm that these results contradict many leading decision models. Existing and novel models able to capture our results are suggested and tested, leading to two seemingly incompatible interpretations of the cognitive mechanism underlying value sensitivity. One interpretation attributes value sensitivity to an intrinsic handicap of neuronal processing while the other suggests a mechanism chosen by natural selection to capture some true correlations in the environment.

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Reach and speed of judgment propagation in the laboratory

Stefan M. Herzog (Max Planck Institute for Human Development); Mehdi Moussaïd (Max Planck Institute for Human Development); Juliane E. Kämmer (Max Planck Institute for Human Development); Ralph Hertwig (Max Planck Institute for Human Development)

A large body of research has demonstrated that judgments and behaviors can propagate from person to person. Phenomena as diverse as political mobilization, health practices, altruism, and emotional states exhibit similar dynamics of social contagion. The precise mechanisms of judgment propagation are not well understood, however, because it is difficult to control for confounding factors such as homophily or dynamic network structures. We introduce a novel experimental design that renders possible the stringent study of judgment propagation. In this design, experimental chains of individuals can revise their initial judgment in a visual perception task after observing a predecessor's judgment. The positioning of a very good performer at the top of a chain created a performance gap, which triggered waves of judgment propagation down the chain. We evaluated the dynamics of judgment propagation experimentally. Despite strong social influence within pairs of individuals, the reach of judgment propagation across a chain rarely exceeded a social distance of three to four degrees of separation. Furthermore, computer simulations showed that the speed of judgment propagation decayed exponentially with the social distance from the source. We show that information distortion and the overweighting of other people's errors are two individual-level mechanisms hindering judgment propagation at the scale of the chain. Our results contribute to the understanding of social contagion processes, and our experimental method offers numerous new opportunities to study judgment propagation in the laboratory. Contact: herzog@mpib-berlin.mpg.de

Behavioral consistency as an indicator of sensitivity to changes in probability

Kamil Fulawka (SWPS University of Social Sciences and Humanities, Wroclaw Faculty of Psychology); Jakub Traczyk (SWPS University of Social Sciences and Humanities, Wroclaw Faculty of Psychology); Tomasz Zaleskiewicz (SWPS University of Social Sciences and Humanities, Wroclaw Faculty of Psychology)

According to cumulative prospect theory (CPT) people overweight small, and underweight medium to large probabilities, which is best described by an inverted, S-shaped probability weighting function (PWF) that reflects the level of sensitivity to changes in probability. PWF is more curved when decisions elicit intense affect (i.e. integral affect) and more linear for decision makers with high numeracy (the ability to understand and process probability and statistics). Recently, Patalano et al. (2015) showed that numeracy is positively correlated with CPT's goodness of fit to the data collected with the certainty equivalent method. Except noting that highly numerate participants integrated values and probabilities in a more consistent manner, authors do not provide any additional comments on the matter. We believe that this behavioral consistency, defined here as a residual variance, is also an indicator of sensitivity to changes in probability. In our study, participants (N = 88) placed bets from fixed range (0 – 500 points) on different levels of the probability of winning or losing (0% to 100%; 132 trials, 66 in loss domain). Half of them received feedback after each trial. Since loss domain with immediate feedback is a context with highest level of the integral affect, we predicted that in this setting behavioral consistency should be the lowest. Results provided support for our claim, as residual variance for this condition was the highest. We also observed significant effect of numeracy (even after controlling for fluid intelligence). Our results suggest that behavioral consistency may be another manifestation of sensitivity to probability change, as it depends both on decision context and numeracy level, similarly as curvature of probability weighting function. Contact: kfulawka@swps.edu.pl

Resolving Rabin's paradox

Han Bleichrodt (Erasmus School of Economics); Peter Wakker (Erasmus School of Economics); Chen Li (Erasmus School of Economics); Yu Gao (Politecnico di Milano); Jason Doctor (USC); Daniela Meeker (USC)

Controversies and confusions have arisen as to whether Rabin's classical paradox really violates expected utility and, more generally, reference dependence, partly due to different terminologies in different fields. By providing the proper theoretical model, we resolve the confusions and make it possible to identify the causes of this long-standing paradox. Further, through use of proper experimental stimuli, we make it possible to test the empirical relevance of these causes. Based on direct and indirect (excluding all other causes) evidence, we identify violations of reference independence as the true culprit. Thus, Rabin's paradox provides a positive message, underscoring the importance of reference dependence. Contact: bleichrodt@ese.eur.nl

Poster Abstracts

Feel good, stay green: Positive framing offsets the adverse impact of mental accounting on a subsequent pro-environmental behavior

Gilles Chatelain (University of Geneva); Tobias Brosch (University of Geneva); Stefanie Lena Hille (University of St. Gallen)

To counteract global climate change, people will need to act environmentally friendly over a longer time period and across different domains. It is therefore essential to better understand how individuals cognitively organize past eco-friendly deeds and relate upcoming behaviors to past ones. Predicting a mental bookkeeping of past behaviors and taking into account their characteristics, the concept of mental accounting seems like a promising approach to clarify this issue and particularly under what conditions an initial pro-environmental behavior promotes or prevents a subsequent one. In this context, recent research on mental accounting and cognition suggests one's self and affect as probable moderators to offset possible negative effects of mental accounting, such as a licensing effect. Using an online questionnaire, we presented participants specific advertisements related to the protection of the environment, which were either positively, negatively or neutrally framed. We then asked the participants to rate the likelihood of showing a second eco-friendly behavior after hypothetically having performed a first one. The second behavior was either similar or non-similar to the first one.

Supporting a mental accounting mechanism, we observed, that people were less likely to keep acting pro-environmentally if the subsequent behavior was similar to the initial one. As assumed, this was only true for individuals from the negative or neutral framing condition but not in the positive framing condition. Our findings support the notion, that positive framing of a message can offset undesired balancing effects caused by mental accounting. This questions for example the often used negative framing of messages in environmental advertising.

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The Importance of Subjective Beliefs in Memory- Based Decisions

Tehilla Mechera-Ostrovsky (University of Basel); Sebastian Gluth (University of Basel)

Many preferential choices necessitate retrieving relevant information from memory. Previously (Gluth et al., 2015, Neuron), we showed that people prefer remembered over forgotten options even when the forgotten options were more likely to be better. We proposed that people compare recalled items to a reference value that is below the average value of all options, and thus exhibit a memory bias on choices. In the present, on-going, and pre-registered experiment, we test a mechanistic explanation for the existence of this memory bias: People may believe that they remember options of high value better than options of low value and may thus discount values of forgotten options. We quantify people's memory bias using the memory-and-choice task from Gluth et al. (2015), and we assess to what extent the subjective belief of their own memory performance is driven by an option's value. We anticipate a successful replication of the memory bias and predict a positive correlation between an option's value and the estimation of memory performance. Finally, we expect to find a positive correlation across participants between the subjective belief of own memory and the memory bias. We expect to finish collecting and analysing data until the start of the conference. Our results will answer the question of whether the bias in memory-based decisions can be linked to a bias in beliefs about memories.

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Why do we experience schadenfreude? The effect of schadenfreude on envy.

Tim Otten (Tilburg University); Niels van de Ven (Tilburg University)

Schadenfreude is a pleasurable emotion caused by the misfortune of others, while envy is a painful emotion caused by the good fortune of others. Past studies have shown that people who were malicious envy of someone, experienced more schadenfreude when the envied person experienced a misfortune. The present study aims to shed light on a possible function of schadenfreude; does it serve as a signal to oneself that the envied individual is no longer better off and thus envy is no longer needed? We investigate this by testing whether envy is reduced after one experiences schadenfreude towards the envied person who suffered a misfortune. This study used a fabricated interview of a MTurk worker to elicit envy among the MTurk participants (N = 535). Subsequently, schadenfreude was elicited by means of a fabricated personal story-including a misfortune -posted by said MTurk worker on an Internet Forum. After participants read this personal story, envy was measured once more, as well as experienced schadenfreude. We indeed found that envy decreased after schadenfreude was experienced. Interestingly, we found no evidence for the hypothesis that more intense schadenfreude led to a greater reduction in envy. These results improve our understanding of the function of schadenfreude and its behavioral consequences. When a misfortune happens to an envied person it appears to reduce the action tendencies associated with both benign and malicious envy. However, the exact nature of the relationship between schadenfreude and reduced envy is not yet fully clear, and more research is needed to be really sure that schadenfreude reduces envy. Contact: t.m.otten@tilburguniversity.edu

Do gamblers think differently? Differences in lay beliefs concerning luck between gamblers and non-gamblers

Koshi Murakami (Kobe Yamate university)

When individuals are not good at grasping coincidence events in the gambling mechanism, they take particular note of lay beliefs in luck, such as those involving "strength of luck" and "luck is like resources that decrease when used" (Luck Resource Belief, Murakami (1995)). Among the lay beliefs in luck, that concerning "strength of luck" is often specific for gambling behavior. We conducted a survey that compared gamblers and non-gamblers, and examined whether this way of thinking is related to gambling addiction. An Internet survey was completed by 550 people. The survey items included the frequency of gambling, the South Oaks Gambling Screen (SOGS) score to measure pathological gambling, and 30 items to measure lay beliefs in luck. A cluster analysis based on gambling frequency extracted three clusters (non-, moderate-, and heavy-gambler groups). The SOGS score was highest in the heavy-gambler group. Differences were seen in three items: 1) a belief in differences in luck among individuals; 2) a belief in the "flow of Tsuki (luck)"; and 3) conscious behaviors regarding luck. For all three, the scores of the moderate- and heavy-gambler groups tended to be higher than those of the non-gambler group. Regarding "strength of luck" and "strength of luck in gambling", the heavy-gambler group perceived that they had the strongest luck, followed, in order, by the moderate- and non-gambler groups. However, a relationship with the SOGS score was seen only for "strength of luck in gambling". It is easy to see how these three factors could lead to sustained gambling behavior. Those who felt that their "strength of luck in gambling" was strong tended to be pathological gamblers. This supports a previous study. Contact: koushi@unryu2000.com

How price paths characteristics shape investment behavior

Judith Christiane Schneider (University of Muenster); Sven Nolte (University of Muenster)

Many investors rely on price paths to form beliefs about investment alternatives. In a controlled laboratory experiment we strip paths of potential relevant information by providing subjects with full information via a different channel. Our experiment is based on a simple static investment task.

The results indicate that subjects are still influenced by informationally irrelevant paths and that this behavior cannot be simply attributed to a belief that patterns from the past will be resemble d in the future. We identify reference point, loss aversion, trend, and spread as important path characteristics that determine how a path is evaluated. In a linear regression model, we find support for the impact of these path characteristics.

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Measuring Graph Literacy among Diverse Individuals: A Meta-analytic Evaluation

Rocio Garcia-Retamero (University of Granada); Dafina Petrova (University of Granada); Adam Feltz (Michigan Technological University); Edward T. Cokely (University of Oklahoma)

Graphical displays can facilitate communication of complex information and are used widely in media and formal communication. Unfortunately, not everyone is graph literate—i.e., many people are not able to extract data and meaning from graphical representations of quantitative information. The Objective Graph Literacy Scale was created to differentiate between individuals who do and do not benefit from visual displays. Five years after its publication the scale has been used in numerous studies. We used meta-analytic methods to re-assess the validity of the Objective Graph Literacy scale. We conducted a systematic search of empirical studies that used the scale. We selected studies that (1) used relevant performance measures, including risk comprehension, accuracy of risk estimation, and/or recall and (2) investigated the effect of visual aids (e.g., comprehension of information presented in graphs). The search returned 15 studies conducted in 17 groups of participants (N=3,498). The studies included demographically diverse samples of participants from 48 countries. Despite large heterogeneity between studies, the scale was consistently related to performance. The average correlation coefficient across all studies was $r=.38$, 95 % CI [.30, .46], $p<.001$, indicating a moderate effect size for the relationship between graph literacy and performance on graph-related tasks. The psychometric sensitivity of the Objective Graph Literacy scale tended to be similar across different age groups and populations (patients vs. medical professionals). Taken together these results indicate that the Objective Graph Literacy Scale is a strong and robust predictor of performance on diverse graph-related tasks in populations of varying cultural, educational, and demographic backgrounds.

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The risk - benefit relationship is mode rated by risk attitude

Łukasz Markiewicz (Kozminski University)

While the positive Risk – Benefit relationship is a fact, human judgements often demonstrate a negative relationship. Alhakami and Slovic (1994) proposed the “affect heuristic” as an explanation: DMs make inferences about R&B from the affect associated with an activity: if it is liked (disliked), people tend to judge its risk as low (high) and benefits as high (low), causing the inverse R – B relationship. Affect, however, also stems from risk attitude. The current study tests whether risk preference is a moderator of the R-B relationship: the negative R–B relationship is expected for risk avoiders, but NOT risk seekers.

Since risk preference is domain specific (Weber et al., 2002, 2006) two distinct domains were chosen for H verification. In two studies participants judged Rs & Bs of activities ranging in safety: either different sports (golf to parachuting) or different investment forms (bank accounts to stock s). Two different measures of risk preference (affective based Risk Implicit Association Test, deliberative based instrumental risk taking scale) were significant moderators of R – B relationship. Subjects with higher (lower) risk preferences had more positive (negative) R – B correlations.

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Does an opportunity make a thief? An analysis of the standard economic model of crime's assumptions in a dynamic risk taking context

Łukasz Markiewicz (Kozminski University)

The standard economic model of crime introduced by Becker (1968) assumes that a perpetrator decides to engage in unethical behavior only if its utility is higher compared to alternative behaviors. Therefore, increasing the probability of negative actions being revealed, increasing the severity of negative consequences, or decreasing payoffs of unethical actions should decrease the frequency of various adverse actions. We test these assumptions of the model in a dynamic game modeled on the Columbia Card Task, modified to measure degree of ethical risk taking depending on changes in a situation's parameters (the payoff of an unethical decision, probability of being caught and severity of punishment). Contact: markiewicz@kozminski.edu.pl

The effect of explicit and implicit references to religious beliefs on organ donation decisions

Inbal Harel (Ben Gurion University of The Negev); Tehila Kogut (Ben Gurion University of The Negev); Marcus Mayorga (Decision Research); Paul Slovic (Decision Research & University of Oregon)

Research suggests that religiosity (among major Western religions) is negatively associated with the willingness to support organ donation. Religious people's tendency to be less willing to become organ donors stems mainly from prevalence of myths and misperceptions concerning religion's stance on organ donation. In three studies, we examine the effect of explicit and implicit references to religion on organ donation decisions among Jewish and Christian subjects. We found that explicit reference to religious beliefs decreased willingness to support organ donation issues (e.g. willingness to donate the organs of a deceased relative) only for people who identify themselves as religious, but not for non-religious people. However, exposing people to implicit religious primes decreased support for organ donation among both religious and non-religious participants. Finally, information about how religion supports organ donation increased willingness for organ donation (compared to information on the conflict between religion and organ donation or control) especially among religious people. Contact: inbalh86@gmail.com

Fast thoughts and metacognitive feelings: the role of cognitive styles.

Fabio Marinello (University of Bologna); Elisa Gambetti (University of Bologna); Raffaella Nori (University of Bologna); Micaela Zucchelli (University of Bologna); Fiorella Giusberti (University of Bologna)

When facing a problem for which intuitive and analytical thinking processes generate conflicting responses, the disposition to rely on an intuitive rather than analytical solution is often affected by several individual characteristics, such as cognitive styles, and metacognitive components like the Feeling of Rightness (FoR) or the Feeling of Error (FoE). However, it's still unclear how cognitive styles may affect the functioning of these metacognitive processes, that can thwart or ease an accurate reflection on problems. In this study, the Cognitive Style of 148 participants (42 males, Mean age = 23.82, SD = 4.96) was assessed through the Rational-Experiential Multimodal Inventory (REIM; Norris & Epstein, 2011; Monacis et al., 2016), distinguishing between a Rational Style and an Experiential Style. Successively, participants were presented a sequence of Cognitive Reflection tasks (CRT; e.g. Frederick, 2005) they had to solve as fast as possible. For each problem, response time, accuracy, FoR and FoE were collected as dependent variables. The performances of people with a prevailing Rational Style versus a prevailing Experiential Style were compared: while not revealing significant differences in response times ($F_{1,147} = .41, p = .52$), participants with a prevailing Rational style showed greater accuracy ($F_{1,147} = 13.58, \text{partial-}\eta^2 = .085, p < .001$), a minor FoE ($F_{1,147} = 11.90, \text{partial-}\eta^2 = .075, p < .01$), and a higher FoR

($F_{1,147} = 11.48$, $\text{partial-}\eta^2 = .073$, $p < .05$). Results are discussed in a Dual Process perspective. Contact: f.marinello@unibo.it

Biases and debiasing in intelligence analysis

Ian Belton (Middlesex University); Mandeep Dharmi (Middlesex University)

Cognitive biases may appear along the whole of an intelligence analyst's analytic workflow (i.e., capturing requirements, planning analysis, obtaining data, processing it, interpreting outputs, and communicating conclusions). Biases may occur when analysts work individually or in collaboration. We reviewed over 300 sources on cognitive biases and debiasing strategies applicable to intelligence analysis. We grouped existing debiasing strategies into (a) psychological research-based interventions, (b) structured analytic techniques (SATs), and (c) computer-based tools. Some of the psychological research-based strategies (e.g., teaching logical/statistical rules, considering alternatives, raising awareness of bias, and graphical presentation of data) have been shown to reduce bias, although few eliminated it. Very few of the SATs and computer-based tools (with the exception of Analysis of Competing Hypotheses and serious games, respectively) have been empirically tested. Despite this, the intelligence community rarely relies on psychological-based interventions, and instead trains analysts to use structured analytic techniques and analytic technology. Further research is needed to confirm the location of bias across the analytic workflow, test relevant debiasing strategies, and develop novel strategies. Contact: IB271@live.mdx.ac.uk

Does the representation format of flows influence judgments in Stock&Flow-Systems? The case of iconic signs.

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We examined judgments in Stock&Flow-Systems (SF-Systems). Such systems are omnipresent, you find them in your personal life, in economy, in nature etc. An example is a water tub containing water (stock). The amount of water in the tub changes in dependence of the water flowing in (inflow) and draining out (outflow). When participants are to deal with such tasks, they show (sometimes extremely) poor performance (e. g. Booth Sweeney & Sterman, 2000 Cronin, Gonzalez & Sterman, 2009). Up to now, almost no manipulations concerning the tasks led to increased S F-performance. Changing the representation of the flows (kind of pictogram/ iconic signs instead of line graphs) increased the performance significantly (Brockhaus et al. 2013). The present study also changed the iconic signs and the pattern of flows in the SF-tasks. Is it still possible to increase SF-performance when iconic signs are used instead of line graphs? And is there a difference in SF-performance in dependence of the detailed design of the iconic signs? We used regression analysis to test these questions. In the conditions including differently designed iconic signs, we found $r_p = .24$ ($p = .03$) and in the condition with stick-figures $r_p = .21$ ($p = .04$). R^2 was .144. When the flow is represented by iconic signs subjects perform better judgments about the stock. Contact: friederike.brockhaus@psychologie.tu-chemnitz.de

Forecasting accuracy in brainstormed analytic scenarios

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Decision-making to tackle security threats is based on an analysis of how a current situation may evolve over a given time frame and/or how a specific situation may come about at some time in the future. Intelligence analysts use qualitative methods to construct plausible scenarios and identify potential outcomes. Structured analytic techniques (SATs) have been developed to help analysts avoid bias and apply critical thinking. However, most have not been empirically tested. We explored the effectiveness of the brainstorming technique (Heuer & Pherson, 2014). Participants

were 40 students at Bilkent University. They first received a 30 minutes tutorial on the technique. Then, they were instructed to use the technique to generate scenarios that might follow in the next 6 months if [at that time] "the Turkish government decides to ban all Syrian refugees from entering Turkey, effective immediately." The first scenario generated by each participant was analysed to measure the number, nature and accuracy of the forecasts. On average, participants provided 4.40 forecasts (SD = 3.72) in their first scenario. Forty-four percent of forecasts were in the political/immigration domain. Nearly half of forecasts referred to a negative outcome. Sixty-one percent of forecasts mentioned the outcome only (with no cause). The majority of forecasts were general, and many were accompanied by uncertainty language (e.g., 'will', 'can', 'might'). Forty-four percent of forecasts were found to be accurate. Although the brainstorming technique enables analysts to generate scenarios and forecasts relatively simply and quickly in a variety of domains, the general, negative, and outcome-focused nature of forecasts may bias decision-makers and make it difficult to identify effective interventions. Contact: m.dhami@mdx.ac.uk

The effect of issue linkage on cooperation in bilateral conflicts: An experimental study with relevance to transboundary water

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Environmental bilateral conflicts, such as in international environmental agreements, or transboundary water negotiations, often involve more than one conflictive issue that requires solution. The theoretical economic literature suggests that linking issues of conflict might open new opportunities for cooperation. Yet the experimental literature in economics has focused almost exclusively on single issue, modeled as a single game (e.g., prisoner dilemma game). We present a new experimental setting of bilateral conflicts that involve two issues, in which each issue is modeled as a different prisoner dilemma game. The effect of issue linkage on cooperation is evaluated by comparing two treatments: one in which the two games are played sequentially (isolated treatment) and one in which they are played simultaneously (linked treatment). Specifically, in the linked treatment each agent observes the payoffs from playing the different paths across the two games (e.g., cooperate in game 1 but defect in game 2) and then act accordingly by committing to one of these paths. The experimental findings show that issue linkage increase the level of mutual-cooperation and decrease the level of mutual defection in the prisoner dilemma games. Contact: eyal.ert@mail.huji.ac.il

Noisy morals: Variability of moral value judgements in a constant environment

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What we value defines who we are – moral values are known to make up a part of our sense of identity. Yet, at the same time, moral judgments are known to vary in response to external change: People's moral decisions can be biased by imposing time constraints. Choosing a morally bad option inspires people to make up for it in the future, while a morally good choice legitimises a subsequent immoral action – phenomena known as moral licensing and cleansing. Overall, moral choice appears to be responsive to changes in the environment. But do moral judgments change over time when people do neither learn nor do anything new? Are our moral values consistent over time, or are we different people from moment to moment? Using a mixed effect modelling approach, we studied repeated responses to the moral foundations questionnaire [Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of personality and social psychology*, 101 (2), 366]. Comparing models with diagonal and full covariance matrices capturing a full spectrum of foundations versus foundation types, we found that a dual-type model not allowing for inter-type interactions is the best fit. We conclude that morality is fundamentally noisy, with a structure encompassing at least two separate underlying

stochastic processes: One process responsible for judgments related to harm and fairness, and another influencing moral judgments involving loyalty, authority, and purity.

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Which decision strategy leads to greater satisfaction? A field experiment disentangling gender effects.

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We make decisions all the time. Sometimes we wonder how to decide best, that is: what strategy to use. Which strategy will lead to (my) greatest satisfaction? This is the question this study asks. An online field experiment was conducted in which over the course of a week participants had to make and document ten decisions of their choice, however thereby adhering to one of three strategies (between subjects): deciding by principle, by reasons, or by intuition. After each decision, they rated their satisfaction with the decision just made, as well as they gave several retrospective overall evaluations after the field phase. On the repeated measures satisfaction DV a surprising difference between gender manifested: while for females there was no difference on satisfaction between all three strategies, males were most satisfied deciding by principle and least satisfied deciding by intuition. On the global retrospective rating of the decision strategy they had had to use, however, both males and females were more satisfied with the strategy of deciding by reasons than by principles. Yet, females saw a much bigger difference between the two strategies than males. The results indicate that there might be a gender difference as to strategy preference in everyday decision making. Moreover, the overall evaluation of strategy satisfaction and the repeated evaluation of general decision satisfaction does not align for both genders. While females prefer deciding by reasons as a strategy overall, strategy use did not make a difference to their satisfaction after each decision made. Males on the other hand were more satisfied with their repeated decisions when deciding by principle, but did not see a difference between strategies overall. This pattern shall be investigated further. Contact: botros@leuphana.de

Paciolior Pascal: The use of probability in solving the problem of points

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In the problem of points, the stakes of an unfinished game of chance need to be divided between two players. Participants were presented with different versions of an unfinished game (different scores vs. different outcome probabilities at the time of interruption; between-subjects) and either a task to divide the stakes or a structurally equivalent task to bet on one of the players winning if the game were continued. We additionally varied whether the outcome probabilities were provided explicitly. In the division task, we identified four distinct strategies: outcome probabilities, ratio of rounds won, equal split of the pot, and leader takes all. In the betting task, we also observed either a reliance on the ratio of rounds won or the outcome probabilities and additionally to disregard either and to simply follow the higher payoffs. Moreover, individuals were predominantly risk seeking. It is unclear what determined the choice of strategy. Framing the problem of points as a betting task did not generally increase the use of probability in solving it. The reliance on the ratio of rounds won might reflect a misunderstanding of probability or calculation error as it increased when outcome probabilities were harder to calculate. Providing explicit winning odds only increased their use to some degree. Contact: niels.haase@uni-konstanz.de

The interactions of outcome structure and outcome frequency in perceptions of uncertainty

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Traditional research on risky choice has focused on predefined outcome likelihoods with independent distributions. Yet, in real life outcomes often correlate and are perceived in the

context of a structured environment. The current study extends the classical binary (certain vs. risky option) choice paradigm to risky outcomes whose frequencies are presented visually (as proportions of outcomes in a grid) and whose structural predictability (as strength of visual patterns in the grid) is varied. Both outcome frequency and outcome structure have a significant effect on choices, suggesting multiple processing mechanisms underlying perceptions of uncertainty. A tentative model of the interactions between structural and frequentist uncertainty in estimating outcome likelihood is proposed and possible applications and implications for further research discussed. Contact: makreniu@indiana.edu

Preserved socio-economic decision making in Autism Spectrum Disorder: Evidence from the ultimatum game

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Autism Spectrum Disorder (ASD) is defined by impairments in social interactions, yet little is known how those with ASD make socio-economic decisions. We show that on the Ultimatum Game individuals with ASD demonstrate normative decisions, rejecting unfair monetary offers from others on the basis of instinct rather than rational thought. Contact: alida.acosta.1@city.ac.uk

ADHD-associated risk taking is linked to exaggerated views of the benefits of positive outcomes

Rachel Shoham (The Hebrew University of Jerusalem); Yehuda Pollak (The Hebrew University of Jerusalem)

People with ADHD are often engaged in risky behaviors (e.g. dangerous driving, substance abuse and gambling) which is commonly interpreted as reflecting risk seeking tendency. However, evidence suggests that people with ADHD show similar patterns of risk choice when options are equal in their expected value, and tend to erroneously choose the less favorable outcome when the options differ in their expected values. In this research, a new tone is established shifting attention from attitude to perception, using Weber's behavioral decision theory as the conceptual framework. Via a model emphasizing the interplay between perceptions and attitudes regarding the benefits and risks of alternatives we sought to understand the mental processes underlying ADHD-related increased engagement in risk-taking behaviors. Results supported the link between ADHD symptoms and increased risk-taking behaviors. This link was found to be mediated by differences in benefit perception, rather than in risk perception and attitude. These findings emphasize the role of benefit perception in facilitating risk taking by people with ADHD symptoms, suggesting that interventions should be extended to strategies that take into account the individuals' perceptions. Contact: rachelishoham@yahoo.com

The effects of salience on information search in decision making

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Most models of decision making assume that the direction of information search is independent of the valence of available cue values. In conflict with this assumption, recent studies have demonstrated an attraction search effect in that information search is directed towards the more attractive option based on already available information in a decision situation. Using a hypothetical stock market game, we investigate whether perceptual salience moderates the size of the attraction search effect. Specifically, we expect the attraction search effect to increase when concealed cues belonging to the more attractive option are made more perceptually salient (direct effect) and also if a cue speaking for the favored option is highlighted (indirect effect). Confirmation of these hypotheses would motivate an extension of the Parallel Constraint

Satisfaction model for Decision Making and Search (PCS-DM+S) to capture bottom-up factors like visual salience. Contact: nicole.franke@fernuni-hagen.de

When negative tweets increase politicians' followers: Influences of negative valence on attention

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Increased attention towards organizations or individuals such as celebrities and politicians greatly influences profits and chances of achieving social and political goals. Although most organizations and individuals usually attempt to attract attention towards themselves by displaying positive behavior, studies have shown that negative valence may have a very powerful effect on increasing attention- even more so than positive valence. In the current study, we analyze the valence of tweets mentioning U.S. politicians, U.K. politicians, and a non-politician population on a scale of -1 to +1 as well as record changes in number of followers over the duration of two months. By measuring the valence of tweets mentioning political figures and their correlations with number of followers, the current study shows that negative valence towards a politician on the twitter social network has a positive correlation with both the accumulated number of followers during a period of one month, and the change in the number of followers during this period. This study therefore captures a real-world example of how spreading negative information may have an opposite result of that we intended. Contact: yeldad@ie.technion.ac.il

Building bridges between the organisation and its shadow structures: Holistic corporate governance

Arther Kadakure (University of Cape Town)

Organizations are driven by two parallel structures that are persuaded by heterogeneous conceptual focus. Organizations are largely driven by profit-based objectives yet the shadow organization is driven by collective personal goals of employees. Traditional corporate governance frames have propagated an epistemic disposition that shadow organizations should be subdued instead of creating synergy between the two. The purpose of the paper is to establish an epistemologically grounded understanding of holistic corporate governance through the Actor-network theory (ANT) perspective. The paper will use the sociology of translation as a lens to create a philosophical argument in analyzing this phenomenon. The paper will use desktop research in developing this conceptual argument. This academic output will benefit human resources, public relations, corporate affairs professionals and academics.

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The influence of negative interest rate on financial decision: Behavioral examination

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This study behaviorally investigates the influence of negative interest rate on the financials behavior of individuals, particularly market decision. Negative Interest Rate Policy (NIRP) introduced recently by several countries. The idea of NIRP isn't explained by classic financial and economic theories, which are all built on the assumption of positive expected return. Traditionally, investors are risk averse and require a positive incremental return for every level of risk taken. The rationale for this policy is clear, attempt to retain growth. However, the influence of this new policy on the financial decision of individuals is not clear.

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Sequential effects in employee selection: a computational model and an experimental paradigm

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Past choices can influence subsequent choices in employee selection. Previous approaches rather described sequential effects with feedback learning or the misperception of randomness. However, in the selection of job candidates also the accumulation of the moral impact of previous choices might influence subsequent choices. We investigated that specific question by additionally making two major methodological contributions to the current literature on sequential effects. First, we developed an experimental paradigm for measuring sequential choices in employee selection and second, we implemented a widely applicable computational model, the Dependent Sequential Sampling Model DSSM, for explaining these effects. The DSSM incorporates previous choices in the starting point of an evidence accumulator in every choice. A compensation-consistency parameter governs the individual strength and direction of the sequential effect, ranging from maximal consistency with the choices to maximal compensation of previous choices. Additionally, to the temporal distance and the evidence of previous choices. By using this methodological approach, we uncovered sequential effects in employee selection. Furthermore, participants (N=600) were especially motivated to compensate for morally dubious choices. Contrarily, many participants showed less sequential choice behavior if their previous choices had been of high moral value. These results support the assumption of asymmetric compensation of morally dubious choices, sometimes referred to as the moral cleansing hypothesis. Beyond these specific insights into the employee selection, our methodological approach provides promising opportunities for testing and analyzing sequential effects in a large range of different applied domains.

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Reception and willingness to share pseudo-profound bullshit: Comparison of Slovak and Romanian samples

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Bullshit, defined as pseudo-profound statements, recently gained scientific attention (Pennycook, Cheyne, Barr, Koehler, & Fugelsang, 2015). This initial study found out that the propensity to judge bullshit statements as profound was associated with a variety of conceptually relevant variables (e.g., intuitive cognitive style, supernatural belief, etc.). No cross-cultural adaptation has been attempted so far. This paper explores the relations proposed by Pennycook et al. (2015) using participants from two Eastern European countries: Slovakia and Romania. A sample consisted of 121 participants (28 male, 93 female) with ages between 17 and 65 ($M = 21.88$, $SD = 6.53$). Bullshit receptivity was assessed using the three scales: the 30 items Bullshit Receptivity Scale, 10 Deepak Chopra Twitter items; The 10 item Mundane scale, and the 10 item Motivational Scale. Analytic thinking was measured by expanded Cognitive Reflection Task and cognitive abilities by Vienna Matrix Test. Epistemically suspect beliefs were measured by Core Knowledge Confusion scale, The Santa Clara Strength of Religious Faith Questionnaire, Paranormal belief, Belief in complementary and alternative medicine and frequency of use, and Generic Conspiracist Beliefs scale. The collected data is consistent with what was presented in Pennycook et al. (2015) regarding variables related to belief (e.g. paranormal belief, CAM, conspiracy ideation) and ontological confusion. However, our results indicate that intelligence and analytic thinking (style) may not be as strongly related to bullshit receptivity, as the initial study suggests. Observed differences between Slovak and Romanian sample might incite further investigation in cultural differences in susceptibility to, and spread of, pseudo-profound bullshit.

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The influence of setting and problem solving strategy on the decision of how a stock develops over time depending on in- and outflow

Vivien Röder (Technische Universität Chemnitz)

Complex dynamic systems are a part of our everyday lives. Deciding on how a certain stock develops depending on the in and out flows is relevant for our personal bank account as well as for the GDP or the global warming. Nevertheless, even simple dynamic problems (stock flow tasks) have been shown to lack understanding even among highly educated individuals (Booth Sweeney & Sterman, 2000; Cronin, Gonzalez & Sterman, 2009). Attempts to increase the understanding of such dynamic problems through a different representation format or embedding the tasks in different contexts did not yield a resounding success. In this study, I examined the influence of the setting and the applied problem solving strategy on the decision of how a stock develops over time. While different contexts within the tasks had been addressed before, I looked at three different settings for data collection: individual think aloud setting with paper pencil, group setting with paper pencil and individual setting online. Furthermore, participants were assigned to one of two conditions in which they were prompted to use either a conventional or a general problem solving strategy when confronted with the tasks. Besides setting and problem solving strategy I looked at the influence of other variables such as gender, mathematic score in school, motivation and time used to solve the problems. Solution rates of the stock flow tasks are compared between the groups and in light of previous findings. Contact: vivien.roeder@psychologie.tu-chemnitz.de

Keynesian beauty-contest with short-term and long-term effects: An economic view on pesticide use

Joerg Mueller (Justus-Liebig-University)

Farmers use pesticides to protect their crops against plant diseases. In public debates, farmers are accused of using pesticides improperly due to short-term considerations regardless of economic and ecologic long-term effects. They can choose among a small number of alternative preparations. The preparations differ in terms of costs and benefits. Using cheap pesticides is tempting because it promises savings, but with a threat of low effectiveness and negative environmental impacts. Besides this, there is the risk of long-term damage through the formation of resistant pathogens as a result of using cheap pesticides. Resistance formation leads to the loss of alternative preparations in the future. The occurrence of resistances depends on the number of farmers choosing cheap pesticides. Consequently, the excellence of using cheap pesticides depends on the decisions of other farmers. Therefore, the described situation is a Keynesian beauty-contest with short-term and long-term effects. An incentive compatible lab experiment with 65 farmers was conducted. They had two alternatives: pesticide A was a cheap preparation with uncertain outcome and a threat of resistance formation. Pesticide B was an expensive preparation with a certain, moderate outcome. The outcome of A was depending on the proportion of farmers choosing A. The experiment contained two treatments, differing in the thresholds for the resistance formation for pesticide A. Contrary to the claim in the public debate, the results show that farmers waive short-term payoffs in favor of long-term benefits and most farmers do not use pesticides improperly. In addition to the expectation of higher short-term payoffs, negative long-term effects and the risk attitude are important factors for the proper use of pesticides.

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Indecisiveness and migration tendencies

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Indecisiveness is mainly related to negative correlates in daily decision making including students' career decision-making. However, its role in other real-life decisions has rarely been investigated. The aim of the present study was to examine the role of indecisiveness in the plans of university

students concerning living abroad. The study was interested in the relationship between indecisiveness and migration tendencies as well as the unique contribution of indecisiveness in addition to factors previously found to be related to migration – the Big Five factors, rootedness and risk-taking tendency. 375 Slovak university students (mean age 22.9, 75% females) completed measures of the Big Five factors (I ASR-B5, Trapnel & Wiggins, 1990), risk-taking tendency (DOSPERT, Blais & Weber, 2006), rootedness (Rootedness scale, McAndrew, 1998) and indecisiveness (Indecisiveness scale, Frost & Shows, 1993) and indicated the immigration tendencies and thoughts. They included plans to go abroad after finishing university studies, thinking about different possibilities related to living abroad (short-term, long-term stay) and perceived skills of how to manage leaving the home country and living abroad (migration self-efficacy). The Big Five factors, rootedness and risk-taking tendency were found to be significant predictors of different aspects of migration plans and thoughts while indecisiveness explained significant additional variance only rarely. This was mainly found in migration self-efficacy where indecisive participants reported lower confidence in their ability to manage the migration experience. An investigation of graduates is needed as their decisions about leaving their home country are not as far ahead in the future. Contact: jozef.bavolar@upjs.sk

The interplay of ambiguity and social value orientation on social preferences in a time allocation paradigm: Time is money

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The present study examines the influence of situation and personality on prosocial behavior. In an online experiment, N = 185 psychology students of two German universities (M_Age = 22.02, SD_Age = 4.47, 81% female) had to decide about the allocation of their own working time and working time of another anonymous participant. Agency and ambiguity were manipulated between subjects, and social value orientation was measured using the SVO Slider measure. The manipulation of agency was carried out via the same procedure as used by Choshen-Hillel and Yaniv (2011) and ambiguity was manipulated via by introducing the word "maybe", e.g., work "for - maybe - 19 minutes". Participants had to decide between a welfare maximizing option, the prosocial option, and an equality maximizing option which was in line with self-interest. Results show that agency and social value orientation influenced the amount prosocial choices; furthermore, when the situation was ambiguous social value orientation was an important predictor of the prosocial choice, but not when ambiguity was low. The results of this study point to the importance of ambiguity in social interaction and a possible explanation, why the prosocial behavior observed in many laboratory studies is lacking in daily interaction and real world behavior. Contact: johannes.leder@uni-bamberg.de

Does mental workload affect decision making in organizational settings? an empirical study with employees of an academic institution?

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BACKGROUND: The complexity of current organizations implies a potential overload for workers. For this reason, it is of interest to study the effects that mental workload has on the performance of complex tasks in professional settings and, specifically, on decision making. OBJECTIVE: To empirically analyze the relation between the quality of decision making, on the one hand, and the expected and real mental workload, on the other. METHODS: Ex-post facto prospective design with a sample of 176 professionals from a higher education organization. Expected mental workload (Pre-Task WL) and real mental workload (Post-Task WL) were measured with the unweighted NASA Task Load Index (TLX) (Hart & Staveland, 1988); difference between real WL and expected

WL (Differential WL) was also calculated; quality of decision-making was measured by means of the Decision-Making Questionnaire (DMQ) (Soria-Oliver, 2010), which includes DMQ-Total Scale and DMQ-Task, DMQ-Subject and DMQ-Context Strategies Subscales scores. RESULTS: MANOVA showed that general quality of decision-making and Pre-Task WL are related ($F=3.382$; $p=.003$), following a pattern compatible with an inverted U curve, with slight variations depending on the specific dimension of decision-making that is considered. There were no verifiable relations between Post-Task WL and decision making. MANOVA also showed that subjects who see expected WL matched the real WL showed worse quality in decision making than subjects with high or low Differential WL ($F=4.515$; $P=.013$). CONCLUSIONS: The relations between mental workload and decision making reveal a complex pattern, with evidence of nonlinear relations. Contact: maria.soria@unir.net

How attribute translations affect purchase decisions in the energy domain

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The mitigation of climate change calls for a substantial decrease in energy demands. The promotion of energy efficient appliances is an effective measure to realize this decrease, as it reduces individuals' energy consumption without the need for significant changes in their daily behavior. A promising approach to promote the adoption of energy efficient appliances are so-called attribute translations, which are supposed to guide consumers towards sustainable purchase decisions by highlighting varying aspects of energy consumption, such as the incurring operating costs or carbon dioxide emissions. To investigate the processes underlying the effects of attribute translations on purchase decisions, we conducted a computerized experiment in which 181 participants engaged in a series of choices between two washing machines. Using the process tracing tool MouseLabWEB (Willemssen & Johnson, 2011), we recorded participants' choices along with how long and how often they inspected each of the product attributes that were presented. This process information served as a proxy measure for the amount of attention participants directed towards each attribute. Our analyses show that energy efficient appliances were chosen up to 43 percent more often when the mere physical information of energy consumption was complemented by additional 'translations'. Change towards the more energy efficient product option was predicted by the duration and frequency of acquisitions of attributes both related and unrelated to energy consumption. The results suggest that attribute translations promote sustainable purchase decisions by drawing consumers' attention away from attributes without environmental significance and towards attributes reflecting the environmental performance of a product. Contact: stephanie.mertens@unige.ch

An integrated psycho-social model of family decision making about organ donation of a deceased relative

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BACKGROUND: Organ transplantation remains limited by the gap between organ availability and the number of patients who would potentially benefit from receiving a transplant. Family refusal constitutes a great limitation to organ procurement and decreases organ availability in a relevant percent of cases. The existing knowledge about family decision would benefit greatly from the elaboration of a global framework that may integrate results and help to clarify unclear, contradictory or interactive findings. OBJECTIVES: To build on the basis of the existing evidence and psycho-social referents a conceptual framework which may help to systematize and inter-relate those process related to family decision making about deceased organ donation. RESULTS:

An integrated model of family decision making is presented. The model includes factors related with different aspects that coalesce in family decision process like the circumstances of death, the characteristics and dynamics of deceased family, the expressed knowledge by relatives of the deceased wishes about donation, relatives own attitudes toward organ donation and health staff care, information and organ donation request procedures. The model also considers the following theoretical and empirical contributions are to structure factors relationships: decision making under stress and dual-process approach; altruism and prosocial behavior; grief and bereavement; persuasion and attitude change. Model is reflected in a graphic representation in which relationships between factors and family decision, by one, side, and factor inter-relations are presented. CONCLUSIONS: Our integrated model of family decision making about organ donation of a deceased relative can enhance the existing empirical knowledge about family decision process. Contact: jorge.lopez@unavarra.es

Does it matter who the choice architect is? Determinants of attitudes towards public and private nudging

Gustav Almqvist (Stockholm School of Economics); Patric Andersson (Stockholm School of Economics); Leon Nudel (Stockholm School of Economics); Emilia Wiik (Stockholm School of Economics)

Nudging has evoked great interest among politicians and public officials. Nudge units now operate around the world. Recent research has focused on studying the general population's attitude towards this phenomenon. General support for nudges has been found among the American (Jung & Mellers, 2016), Danish, French, German, Hungarian, Italian, British (Reisch & Sunstein, 2016), and Swedish (Hagman et al., 2015) populations. Building on this body of work, we argue the public-private dichotomy has been a somewhat underemphasized aspect in prior studies. A survey was conducted to investigate (1) whether attitudes towards specific nudges would be affected by the awareness of a public (a governmental agency) alternatively private (a company) choice architect and (2) to what the attitudes could be explained by various psychometric constructs. Consistent with prior research, our Swedish respondents (n=172) were generally supportive of nudges. Preliminary analysis indicates a main effect of transparency upon the support for a nudge, while constructs like individualism and hierarchical orientation emerged as significant moderators. Respondents tended to support nudges initiated by private rather than public choice architects. The findings will be validated with a sample that is more representative of the general Swedish population. Contact: jorge.lopez@unavarra.es

How numeracy influences physicians' decision making

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Low numeracy prevents many patients from understanding essential information about risks and benefits. Less is known about how numeracy influences physicians' decisions and how effectively physicians communicate risks and benefits. In two experimental studies, we investigated (1) how physicians adapt their risk communication to accommodate the needs of patients with low numeracy, and (2) how physicians' own numeracy influences their risk communication and decision making. In study 1, General Practitioners (GPs, N=151) read a description of a patient seeking advice on cancer screening. GPs on average preferred to use visual aids rather than numbers when communicating information to a patient with low (vs. high) numeracy. GPs who had low numeracy themselves were less likely to offer complete and meaningful risk communication (e.g., mention

important risks). In Study 2, physicians in training (N=173) read statistical information about risks and benefits from screening. Physicians who held strong positive beliefs about screening (e.g., that screening is always a good choice) showed worse comprehension of the evidence and were more likely to recommend the screening, even when it was not life-saving. Numeracy had the reverse, protective effect, which was of similar size: it predicted better comprehension and recommendations. In conclusion, many physicians appear to tailor risk communication appropriately for patients with low numeracy. However, a substantial minority of physicians with low numeracy are likely to misunderstand risks and benefits and unintentionally mislead patients. Fostering numeracy in professionals could help reduce belief-based advice to patients, and practise truly evidence-based decision making (see riskliteracy.org). Contact: dafinapetrova@ugr.es

Attractive faces alter people's food choices

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Faces in general and attractive faces in particular attract attention better than almost any other stimuli and are frequently used in marketing, advertising, and packaging design. However, few studies have examined the effects of attractive faces on people's choice behavior. In one survey and four subsequent experiments, the author examines whether exposure to attractive (versus unattractive) faces increases individuals' inclination to choose and consume either healthy or unhealthy foods. Directly contradictory to the beliefs held by marketing professors, but consistent with visceral state theories, exposure to attractive (versus unattractive) opposite-sex faces made people more motivated to choose and consume unhealthy rather than healthy foods. This effect was moderated by various variables linked to impulsiveness, and only influenced individuals scoring high (versus low) on such impulsiveness-related constructs. However, the effect did not generalize after exposure to attractive same-sex faces, and only increased the desire to acquire the most rewarding product, even in a product category that is commonly viewed as rewarding. As pictorial exposure is sufficient for the effect to occur, these findings have broad and important implications for marketing, advertising, and public health. Contact: toot@mgmt.au.dk

The effect of making multiple decisions in sequence on the choice to infringe human rights

Ori Plonsky (Technion- Israel Institute of Technology and the Israel Democracy Institute); Yuval Feldman (Bar Ilan University and the Israel Democracy Institute)

In many cases, decision makers who make decisions that require balancing between public interests and human rights, such as parole judges or governmental clerks, make multiple similar decisions in sequence. Normatively, there should be no difference between decisions made in isolation and decisions made in the context of other similar decisions. This is particularly true with respect to decisions with such high stakes as those involving potential impairment of human rights. Yet, behavioral decision making research documents robust differences between decisions made in isolation and decisions made in sequence. Two studies examined for such differences in the context of appeals made by the army to issue administrative restraining orders (which also dislocate a person from his home) as a preventative measure against a person who may disrupt the public order and engage in ideologically-motivated political violence. Study 1 shows that whereas most people tend to approve the issuing of this order when they are faced with a single scenario, the approval rate of this rights-infringing action drops significantly when the same scenario is faced as part of a sequence of similar scenarios. Study 2 aims to uncover some of the mechanisms underlying this effect. It suggests that early on participants tend to switch their decisions from the previous trial, but later in the experiment they tend to repeat their last decision. Contact: oplonsky@gmail.com

Field experiments on tipping in restaurants and for home deliveries: The effects of gifts

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Researchers have shown that different techniques can increase the tip amount. Examples include: introduce yourself by name; squat down next to the table; stand physically close to the customer; touch the customer; smile; write a patriotic message on the check. The proposed study will involve a field experiment that will examine the effect of gifts given by the restaurant (and various control variables) on the tip amount and tip percentage (tip size). We will test a number of causes that might impact the tip amount and tip percentage, and include a variety of manipulations where different complimentary dishes are given to the customers at different times during the meal. This will facilitate further examination into how the specific situations created by the manipulations in each experimental treatment influence tip size. Contact: meravm@colman.ac.il

Self-report measures of subjective probability: Never use a verbal rating scale!

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Recent evidence indicates that instruments for the assessment of subjective probability do not just differ due to scale-inherent characteristics, but also as a function of the error in the underlying representations. In three experiments subjects encoded the same two ranges of objective probabilities as sequences of option-outcome pairs and judged subjective probability either on a verbally labeled 7-point rating scale or in the form of percent estimates. The two ranges were presented within- subjects and shared one common stimulus. In Experiment 1 we observed that under highly error-prone conditions imprecise representations, rather than the stimulus distribution, can result in apparent context effects on the rating scale. In Experiment 2 we found that an anchor in the stimuli can tether judgments on the rating scale to the scale's midpoint but in turn result in inconsistent judgment functions on the percent format that are an expression of regression toward the mean. In Experiment 3 we discovered that imprecise representations change the way the rating scale is used while percent estimates remain consistent. We conclude that a verbal rating scale does not allow a meaningful quantification or meaningful comparisons between experimental conditions even in within-subjects designs and should not be used in research on subjective probability. The percent format captures the underlying representations reliably and consistently but is very sensitive to noise and can lead to classic regression fallacies.

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Effects of neurostimulation on intuitive decision-making tasks are moderated by religiosity

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Transcranial direct current stimulation (tDCS) was used to investigate whether stimulating the left dorso-lateral pre-frontal cortex (DLPFC) modulated performance on a number of judgment and thinking tasks. Although there were no simple main effects for stimulation, performance on a battery of heuristics-and-biases tasks, was moderated by religiosity: non-religious participants scored higher in the active-tDCS condition than religious people compared to sham. Other thinking tasks were not influenced by tDCS. These results support theoretical approaches that stress a role for analytic thinking dispositions in overcoming intuitive responses. Contact: v.thoma@uel.ac.uk

Modeling preference formation of risky decisions using eye tracking Models and Mathematical Psychology

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Risky decision making is subject to a number of violations of normative choice, which are accounted by a number of descriptive models. These models, however, are not process models. In

our study, we examine the time-course of risky choices (lotteries), by tracking the eye- trajectories of the participants, who choose between the lotteries (win x with probability p). We find that eye-trajectories predict the choice beyond what is predicted by purely economic models. We fit the data via a number of traditional models (PT, EU), as well as a novel process model, which is constrained by eye-trajectories. In this process model, the preferences are integrated from the representations of the amounts and of the probabilities, with the current attended attribute (amount or probability) receiving a higher weight. The model allows us to understand the role of attention in generating preference and in making decisions. Contact: oriansharoni@gmail.com

A vaccine for low vaccination rates: The motivational power of prepayment to promote healthy behavior

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Many interventions are designed to bridge the gap between targeted and actual health behavior by encouraging people to adopt healthier behavior. In line with this goal, the current study tested the effectiveness of incentive timing on influenza vaccination rates in healthcare workers. In Study 1, we asked 442 healthcare workers whether receiving an incentive before or after getting a flu shot would be more effective (relative to the controls, who were only asked to get a vaccination). The findings suggested that people intuitively believe that an incentive will help, but consider that there will be no effect for incentive timing. These results were compared to real behavior in Study 2, a natural field study in a hospital on a sample of 362 healthcare workers. There was either no incentive to get a vaccination (Control Condition), or two conditions involving an incentive. In the Post-Payment Condition, workers received a bonus if they got vaccinated whereas in the Prepaid condition, they received a bonus up front, but had to forego it if they did not get a vaccination. The results clearly showed that prepayment led to higher vaccination rates than in the Control or Post payment conditions, even in workers with low vaccination rates in the previous 5 years. These results highlight the potential of harnessing the motivational power of prepayment to promote healthy behavior. Contact: odelman100@gmail.com

Modeling delay discounting

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In a recent article, Ericsson and colleagues (2015) compared traditional utility-discounting models with a set of heuristic models of intertemporal choice using a cross-validation approach. Consistent with earlier reports, Ericsson and colleagues concluded that heuristic models (specifically their novel intertemporal choice heuristic or ITCH model) explain intertemporal choices better than discounting models do. More surprisingly, their results showed that all discounting models performed nearly at chance level, and did not outperform even the baseline model. In this article, however, we demonstrate that these conclusions are premature. Specifically, we reanalyzed the Ericsson et al. (2015) data under different, arguably more appropriate, conditions and found that models of both classes are rather good at predicting choice. Our analysis highlights that modelers of delay discounting data must pay close attention to auxiliary assumptions, individual differences, and in case of a cross-validation approach the loss function used to evaluate models. We conclude that the jury is still out on which (type of) model is best and end by making suggestions towards conducting more informative model comparisons. Contact: dirk.wulff@gmail.com

Choice-supportive memory: A new taxonomy and review

Martina Salomonsson (University of Trento); Fabio Del Missier (University of Trieste)

Although the literature on the impact of memory and biases on decisions is extensive, research on the effects of decision making on memory is sparse and scattered across domains. Choice-supportive memory bias has been observed in several of these studies and could significantly affect future choices. Nonetheless, to the best of our knowledge, no systematic attempt has been made to categorize and review the literature, and appraise the evidence in support of this phenomenon. Thus, starting from a theory-driven and empirically grounded taxonomy for choice-supportive memory bias and distortion after decision making, we review the current status of the scientific understanding of the topic. Our taxonomy categorizes memory distortions into four distinct groups: misattribution, fact distortion, false memory, and selective forgetting. After assessing the impact of various potentially moderating factors in the relevant studies, such as the length of the delay between the choice and the memory test, the type of memory test, the valence of the attributes and/or scenarios, and the attribute align ability (i.e., whether each item is directly comparable to one listed for the other option), we evaluate the evidence for each type of distortion and conclude that the support for the phenomenon is solid in relation to misattribution when recognition memory is assessed, but significantly weaker for the other three types of distortions in our taxonomy, and when free recall is used to assess memory. Finally, we identify gaps in the current knowledge and interesting avenues for future research.

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A spillover effect of ideological cheating: when benefiting others goes wrong

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Each and every day, life provides us with situations that involve a conflict between our positive self-image as honest people and the desire to increase personal gains. The choices we make in these situations, can lead to the development of what recent research in behavioral ethics coined as "Ethical Dissonance", a psychological tension arising from the inconsistency between one's moral values and behavioral misconduct. As research shows, this tension can be resolved by justifications of the unethical behavior, such as cheating to benefit others. This study aims to investigate the interplay between ideology and ethical dissonance and proposes a dark side to benevolent behavior such as donating to charity. More specifically, it examines when and how ideology might contribute to a diffusion of the ethical dissonance, thus facilitating unethical behavior. Results reveal a spillover effect of altruistic cheating on subsequent self-serving unethical behavior. After being given a chance to cheat to benefit others, people tended to cheat more for themselves. However, this spillover effect does not work in the opposite direction: After being given a chance to cheat for themselves, people did not cheat less to benefit others. Identifying ideological forces that promote unethical behavior would help us develop a more moral-supportive environment. Contact: anati41@gmail.com

Processing Moving Numbers: How Update Frequency Influences Magnitude Judgments

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Consumers' lives are pervaded with quantitative information. Increasingly, this information is dynamic and updates recurrently. While people used to only evaluate static quantitative information, recent developments allow for dynamic representations in which numbers are regularly updated. For example, Fitbit health trackers display the number of steps that updates in accordance to one's movement. Kickstarter, the global crowdfunding site, displays up-to-date

funding metrics for each project on their webpage. In this paper, we examine how update frequency of such dynamic figures affects how people form judgments about the figure's magnitude. We demonstrate that people perceive an identical numerical value as larger when it stems from a more frequently updated source than from a less frequently updated source, although update frequency is irrelevant for magnitude judgments. This, in turn results in an over-prediction of future data-points. We also document process evidence and moderate this effect by shifting people's attention to the size of increase or step-size. Contact: gunadi@rsm.nl

Can different technological devices influence decision-making processes?

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Dual process theories of reasoning suggest that thinking and decision making are based upon two processes: first, "system 1", is an associative, intuitive, holistic, and heuristic way of thinking. The second, "system 2" is a rational, rule-based and analytic process. This research aims to explore whether different technological devices can impact the use of these processes during judgments and decision makings. Compared to other technological devices, smartphone uses were related to decreased and fragmented attention, shorter answers to surveys, lower responsible investment behaviors, and increased hasty customers' behavior (Benartzi, 2016; Mavletova, 2013; Oulasvirta, Tamminen, Roto, & Kuorelahti, 2005; Wang, Malthouse & Krishnamurthi, 2015). Thus, we hypothesized that smartphone consumption activated the use of system 1. In a line of studies, participants were asked to answer different types of questions using smartphones or computers. In Study 1, participants been asked to report in which device they were using to answer the questionnaire. Results implied that replying by smartphones emerged higher intuitive and heuristic thinking (as measured by CLT), and greater biases in thinking, compared to reacting using computers. Study 2 replicated this results pattern under experimental conditions, in which participants were randomly assigned to answer the questionnaire using a smartphone or using a computer. This pattern of results indicate that smartphone use may be related to greater activation of system 1, and have an influence on decision making processes. Such an effect has great meaning in our daily lives, as well as for researches that using online studies.

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