Imprint

Editors

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2021 NeuroPsychoEconomics Conference Program

Conference theme: “Bridging Neuroscience, Psychology, and Economics”

ONLINE VIA ZOOM FROM AMSTERDAM

The conference language is English.

Thursday, June 10, 2021

3:00 PM-3:15 PM CEST: Welcome address and conference outlook
Jan Engelmann, Conference Chair
Associate Professor of Neuroeconomics
University of Amsterdam

3:15 PM-4:15 PM CEST: Keynote speech I
Armin Falk
Professor of Economics
University of Bonn

4:15 PM-5:55 PM CEST: Session I
Track A: Symposium: Attention and behavioral economics
Session chairs: Jan Hausfeld & Dianna Amasino

4:15 PM: Alina Fahrenwaldt, Susann Fiedler, Andreas Glöckner
Fooling whom out of his money? Investigating arousal dynamics in the context of betraying a stranger or an institution

4:35 PM: Jan Hausfeld, Urs Fischbacher
Can the eyes tell lies: an eye-tracking study on dishonest behavior

4:55 PM: Arkady Konavalov, Gökhan Aydogan, Niklas Bürgi, Christian C. Ruff
Strategic sophistication and the role of attention

5:15 PM: Alejandro Hirmas, Jan Engelmann, Evgeny Vasilets
Exogenous attention and loss aversion

5:35 PM: Dianna Amasino, Davide Pace, Joël van der Weele
Fair shares and selective attention
Track B: Symposium: Social neuroeconomics
Session chair: Jan B. Engelmann
4:15 PM: Gabriele Bellucci, Soyoung Q. Park
How to trust when lonely? The effects of loneliness on behaviors and expectations in trusting interactions
4:35 PM: Li-Ang Chang, Lotte Warns, Ava Q. Ma de Sousa, Femke S. Paauwe, Konstantinos Armaos, Christin Scholz, Jan B. Engelmann
The impact of anxiety on the neural correlates of theory of mind
4:55 PM: David Stolz, Laura Müller-Pinzler, Sören Krach, Frieder M. Paulus
Internal control beliefs shape positive affect, neural dynamics, and behavioral preferences
5:15 PM: Anne Saulin, Chih-Chung Ting, Jan B. Engelmann, Grit Hein
Learning prosocial motives
5:35 PM: Laura Müller-Pinzler, Nora Czekalla, Annalina V. Mayer, Alexander Schröder, David S. Stolz, Frieder M. Paulus, Sören Krach
Biases in self-related belief formation and their association with self-conscious affect

Track C: Behavioral economics
Session chair: Xiaomin Li
4:15 PM: Frieder Neunhoeffer
On subscription traps and context-dependent preference reversals: the pigeonholing effect
4:35 PM: Sandro Ambuehl, Axel Ockenfels, Colin B. Stewart
Who opts in?
4:55 PM: Johannes Hoelzemann, Nicolas Klein
Bandits in the lab
5:15 PM: Xiaomin Li, Colin Camerer
Modeling the cognitive process during game plays using hidden Markov models
5:35 PM: Victoria Prowse, David Gill
Strategic complexity and the value of thinking

5:55 PM-6:10 PM CEST: Break

6:10 PM-6:40 PM CEST: Poster session I
All uneven-numbered posters (P01, P03, P05)

6:40 PM-6:55 PM CEST: Social mixer

6:55 PM-7:55 PM CEST: Keynote speech II
Tali Sharot
Professor of Cognitive Neuroscience
Director, Affective Brain Lab
University College London

7:55 PM-8:00 PM CEST: Conclusion of conference day I
Jan Engelmann, Conference Chair
Associate Professor of Neuroeconomics
University of Amsterdam
Friday, June 11, 2021

3:00 PM-4:00 PM CEST: Keynote speech III
Marcel Zeelenberg
Professor of Economic Psychology
Tilburg University

4:00 PM-5:00 PM CEST: **Session II**

**Track A:** Consumer behavior & marketing
Session chair: Luis-Alberto Casado-Aranda

4:00 PM: Sergiu Burlacu, Austeja Kazemekaityte, Piero Ronzani, Lucia Savadori
Blinded by worries: sin taxes and demand for temptation under financial worries

4:20 PM: Ulrike Vollstaedt, Patrick Imcke, Franziska Brendel, Christiane Ehses-Friedrich
Increasing consumer surplus through a novel product testing mechanism

4:40 PM: Luis-Alberto Casado-Aranda, Juan Sánchez-Fernández, Ana-Belén Bastidas-Manzano
Neural insights on the influence of hedonic and utilitarian web layouts on consumer value and choice

**Track B:** Social neuroscience I
Session chair: David Gill

4:00 PM: David Gill, Eduardo Fe, Victoria Prowse
Cognitive skills, strategic sophistication, and life outcomes

4:20 PM: Zakaria Babutsidze, Nobuyuki Hanaki, Adam Zylbersztejn
Nonverbal content and trust: an experiment on digital communication

4:40 PM: Dhiraj Jagadale, Kavita Vemuri
Role of trust on the decision making in centipede game with known and random rounds

**Track C:** Symposium: Social information use and decision-making in the digital age
Session chair: Wouter van den Bos

4:00 PM: Christin Scholz
Neural correlates of large-scale message effectiveness: a mega-analysis

4:20 PM: Björn Lindstrom
A computational reward learning account of social media engagement

4:40 PM: Lucas Molleman
Social influence in adolescence as a double-edged sword

5:00 PM-5:30 PM CEST: Poster session II
All even-numbered posters (P02, P04, P06)

5:30 PM-5:45 PM CEST: Break
5:45 PM-6:10 PM CEST: Interest group roundtables—for informal discussion and networking
- Track A: Behavioral economics & neuroeconomics
- Track B: Consumer behavior & marketing
- Track C: Social neuroscience

6:10 PM-7:10 PM CEST: **Session III**

**Track A: Finance**  
*Session chair: Ann Tank*

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| 6:10 PM | Hakan Ozyilmaz, Guangli Zhang  
The debt payment puzzle: an experimental investigation |
| 6:30 PM | Sheetal Thomas, Mridula Goel, Naresh Peesapaty  
An exploratory study to understand financial behavior of neurotic individuals using handwriting analysis |
| 6:50 PM | Tanja Blascheck, Sven Nolte, Ann Tank  
Disentangling the effects of reporting frequency on earnings predictions and investment behavior of non-professional investors: evidence from a behavioral experiment and an eye tracking study |

**Track B: Social neuroscience II**  
*Session chair: Annika Wyss*

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Mental health: the burden of social stigma |
| 6:30 PM | Annika Wyss, Sebastian Berger, Thomas Baumgartner, Daria Knoch  
Reactions to warnings in the climate commons |
| 6:50 PM | Simeng Wu, Honghong Tang, Peixia Ye, Shen Zhang, Chao Liu  
Neural synchronization of compromise in third party punishment: a tNIRS hyper-scanning study |

**Track C: Neuroeconomics**  
*Session chair: Marco Mandolfo*

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Brain stimulation, risk preferences and risky behaviors |
| 6:30 PM | Marco Mandolfo, Francesco Baisi, Lucio Lamberti  
Neural insights on the influence of hedonic and utilitarian web layouts on consumer value and choice |

7:10 PM-7:20 PM CEST: Announcement of upcoming NeuroPsychoEconomics Conferences:  
Location, conference theme, topics, and people

**2021:**  
University of Lille, France  
Chair: Sophie Lacoste-Badie

**2022:**  
University of Granada, Spain  
Chairs: Luis-Alberto Casado-Aranda and Juan Sánchez-Fernández

7:20 PM-7:30 PM CEST: Award ceremony & Good-bye note  
Jan Engelmann, Conference Chair  
Associate Professor of Neuroeconomics  
University of Amsterdam
Poster presentations

P01  Alejo Ignacio Acuña, Sebastian Morales, Laura Uriarte-Gaspari, Nara Aguirre, Alvaro Cabana, Enrique Cuña, Margarita García, Victoria Gradin
Neural basis of social approach-avoidance conflict decision making in depression and social anxiety

P02  Stephen Alexander Cantarutti, Emmanuel Pothos
Trust in healthcare during the covid-19 pandemic: which factors matter most?

P03  Carina Fernandes, Inês Macedo, Fernando Barbosa, João Marques-Teixeira
Temporal dynamics of decision-making: an ERP study of rewards anticipation and processing

P04  Sebastian Morales, Alejo Acuña, Laura Uriarte, Alfonso Pérez, Álvaro Cabana, Victoria Gradin
Avoidance of competition, development of social task of approach-avoidance

P05  Alexander Neverov, Dmitriy Vaskov, Armen Airapetian
The detection to influence the neurobiological drivers that underlie of information-processing styles on economic results of individual agents in conditions of fundamental uncertainty

P06  Laura Uriarte, Alejo Acuña, Sebastián Morales, Gabriela Fernández, Valentina Paz, Alfonso Pérez, Álvaro Cabana, Victoria Gradin
Who do I want in my team: social avoidance of high qualified partners in depression and social anxiety
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Fooling whom out of his money?
Investigating arousal dynamics in the context of betraying a stranger or an institution

Alina Fahrenwaldt, Susann Fiedler, Andreas Glöckner

Abstract

Cheating by self-ascribed honest individuals is subject to scientific debates about the proposed underlying cognitive and attentional processes. While self-concept maintenance theory assumes cheating to be a conscious profit-maximizing behavior which creates cognitive dissonance, the bounded ethicality approach holds that it may be the result of motivated, yet unconscious attentional and reasoning mechanisms. Previous research suggests cheating may be easier when harming an institution compared to a person and may depend on interindividual differences in prosocial traits. We present evidence from a pupil dilation and attention study (N = 101) investigating cheating behavior contingent on cheating the research institute compared to another anonymous participant. We find the hypothesized differences in the propensity of cheating depending on the type of claimant and social value orientation. But, analyzing the experienced arousal, we discover very similar arousal patterns for both contexts. The same holds true for the analysis of biased attention. Meaning, we find more attention to the tempting decision option both when cheating a fellow participant as well as the research institute. These first results indicate that the underlying processes of cheating are not context dependent but rather universal.

1 Corresponding author: Alina Fahrenwaldt, Max Planck Institute for Research on Collective Goods, fahrenwaldt@coll.mpg.de.
Can the eyes tell lies: an eye-tracking study on dishonest behavior

Jan Hausfeld, Urs Fischbacher²

Abstract

In social as well as economic interactions, the assessment of whether another person is lying or not is a key factor when making a decision. We conducted a laboratory study with eye-trackers to investigate how the verifiability of a lie and the respective payoff structure affect both behavior and processing. We find that whether a lie can be detected or not affects the share of people behaving dishonestly, i.e. more people gain higher rewards if a lie cannot be detected. The processing data can distinguish between dishonest and honest choices, and these patterns are not affected the verifiability of a lie. We further explore the power of simple gaze measures: Simple gaze measures can i) reveal deceptive tendencies, ii) predict the underlying incentive structure, and iii) classify deceptive subgroups using only few situations, even in situations where choices are uninformative. Importantly, these gaze measures outperform choices. Last, we vary the positioning of the information which one can lie about and the corresponding payoff. This manipulation has substantial effects: If the payoffs are presented in the top part of the screen, more first fixations are on these payoffs, which, in turn, is associated with more dishonest reports.

² Corresponding author: Jan Hausfeld, University of Amsterdam, j.hausfeld@uva.nl.
Strategic sophistication and the role of attention

Arkady Konavalov, Gökhan Aydogan, Niklas Bürgi, Christian C. Ruff

Abstract

Strategic interactions often involve forming first-order order beliefs (“what move will my opponent make next?”). This type of social inference is a complex process that involves tracking the recent interaction history and forming a best response to the opponent’s future actions. Using a repeated strategic game and an eye-tracker, we sought for evidence of strategic play and belief formation in gaze data. Subjects (N = 46) played a 4-action version of the rock-paper-scissors game with a series of sophisticated automated opponents. All four options were presented on the screen as a circle, and the outcomes were shown via highlighting the chosen options. Additionally, the subjects could freely observe the history of play shown on the sides of the screen. Our results suggest that during the choice period the subjects’ gaze behavior was tracking the recent history of play of the opponent and was related to best responding to the most likely opponent’s action. During the period after choice, but before feedback, the gaze data reveal that the subjects were more likely to focus their predictive attention on potential losses rather than gains. Finally, we find evidence that attention to history of play can potentially predict the subjects’ performance.

3 Corresponding author: Arkady Konavalov, University of Zurich, arkady.konovalov@uzh.ch.
Exogenous attention and loss aversion

Alejandro Hirmas, Jan Engelmann, Evgeny Vasilets

Abstract

Attention has been proposed as an important mechanism that underlies value-based decision-making. Much of prior research using eye-tracking provides correlational results, leaving open the question to what extent the effects of attention on choice are causal. To remedy this, we study the effects of exogenous changes in visual attention on decisions involving risk. In our task, participants decided whether to accept or reject a gamble that can lead to gains or losses at equal probability in an incentivized mixed gambles task. We manipulated attention by increasing the exposure duration of specific outcomes (gains vs losses) across multiple conditions that involved either equal, longer, or shorter presentation durations for gains relative to losses. Our results suggest that the increased exposure to gains decreased the participants' degree of loss aversion (relative overweighting of losses over gains). Moreover, our results show that prolonged exposure to gains increased the consistency of participants' choices, an effect that is stronger for participants with higher scores of trait impulsivity (BIS11). Jointly, these findings suggest that attention plays an important causal role in risky choice, particularly by reducing loss aversion when more attention is paid to gains relative to losses.

4 Corresponding author: Alejandro Hirmas, University of Amsterdam, a.hirmas@uva.nl.
Fair shares and selective attention

Dianna Amasino, Davide Pace, Joël van der Weele

Abstract

Fairness views vary widely from equal splits to libertarian divisions and often serve to justify economic privilege. Previous research has found self-serving biases in divisions: workers randomly assigned a higher pay rate keep more joint earnings regardless of effort (Konow, 2000). Here, we investigate the role of visual attention in self-serving biases. We explore whether a random advantage in pay rate influences information-seeking of merit (task performance) vs. outcome (pay rate x task performance) information. Outcome information supports the lucky high-pay participants keeping more for themselves, whereas merit does not. Further, we restrict the time spent on merit vs. luck to examine the causal impact of attention on allocation biases. Participants (N = 600) and recipients (N = 900) completed real-effort tasks to produce a surplus before being assigned a high (Advantaged) or low (Disadvantaged) pay rate per correct answer. Participants were then paired with opposite pay-rate recipients and divided their jointly-produced surplus. Before making allocation decisions, participants could reveal merit and outcome information in MouseLabWeb (Willemsen & Johnson, 2011). With freely directed attention, participants had 6 s to reveal any information, but with restricted information, we imposed time limits (0.8 s maximum) on merit or outcome information, pushing participants to focus on the less-constrained information. Our data shows that Advantaged participants allocated significantly more (~10%) of the surplus to themselves than did Disadvantaged participants, controlling for effort and demographics. With freely-directed attention, Advantaged participants paid less attention to merit and focused more on luck-informed outcome information compared to Disadvantaged participants (~0.3 s difference). Moreover, attention had a causal effect on allocations. Participants with restricted outcome information looked at merit ~1 s more of the time and gave ~3% less of the surplus to the Advantaged members than those with restricted merit information, a difference driven primarily by Advantaged participants. These findings indicate that participants naturally look more at information that benefits them, and exogenously shifting attention to merit vs. outcome information causally impacts subsequent allocation decisions.

5 Corresponding author: Dianna Amasino, University of Amsterdam, d.r.amasino@uva.nl.
How to trust when lonely?
The effects of loneliness on behaviors and expectations in trusting interactions
Gabriele Bellucci, Soyoung Q. Park

Abstract

Perceived social isolation (e.g., loneliness) is a major contributing factor to reduced well-being. Approximately 15-30% of people suffer from prolonged feelings of loneliness with severe implications for physical and mental health. Previous work has theorized that loneliness arises as a warning signal to prompt individuals to connect. However, empirical evidence, especially in clinical psychology, suggests that loneliness decreases an individual’s odds of being successfully embedded in a social group. Despite its essential social nature, little experimental work has been done to unearth the effects of loneliness on social behaviors and expectations. Across different studies and with the help of different methodologies (e.g., survey data, economic games and neuroimaging techniques), we investigated the effects of loneliness on socially-relevant expectations of others and elucidated how these effects reverberate in the concomitant social behaviors. In particular, we focused on trustworthiness expectations and trusting behaviors during interactive social paradigms. We show that loneliness has positive effects on prosocial behaviors but negative effects on social expectations of others. Specifically, lonelier individuals trusted more their partners despite expecting them to be less trustworthy. These effects were mediated by extraversion, which mitigated the negative effects of loneliness on trustworthiness expectations. In lonelier individuals, these effects were accompanied by a negative bias toward untrustworthy behaviors of others and reduced neural activity in the orbitofrontal cortex for feedback about their trustworthy behavior. Taken together, these findings demonstrate how loneliness operates and impacts social expectations, social behaviors and their underlying neural, psychological and computational processes. As a result, this work will help understand the early dynamics of different psychiatric conditions strongly predicted by loneliness states (e.g., depression), potentially contributing to better diagnosis, prevention and treatment of clinical disorders.

Corresponding author: Gabriele Bellucci, Max Planck Institute for Biological Cybernetics, gabriele.bellucci@tuebingen.mpg.de.
The impact of anxiety on the neural correlates of theory of mind

Li-Ang Chang, Lotte Warns, Ava Q. Ma de Sousa, Femke S. Paauwe, Konstantinos Armaos, Christin Scholz, Jan B. Engelmann

Abstract

Theory of Mind (ToM) plays a fundamental role in our social life as it enables us to take the perspective of others and understand their beliefs and intentions. Previous fMRI investigations of the neural underpinnings of this social capacity have identified a network consisting of TPJ, mPFC, precuneus, and VLPFC that supports the computations underlying ToM. While many cognitive processes, such as memory and attention, are impaired under anxiety, it is to date unclear how anxiety affects the social cognitive processes involved in theory of mind. We aimed to fill this gap by adapting the false belief task, which participants completed under anxiety while also undergoing fMRI. Specifically, participants read vignettes that involve false beliefs of others while either under threat of shock, or while in a safe control condition. Our fMRI results reveal two main effects: (1) the main effect of belief (belief > outcome) identified the canonical ToM network consisting of bilateral TPJ, dmPFC, precuneus, and bilateral temporal pole; (2) the main effect of threat identified suppressed activity (safe > threat) in bilateral TPJ, bilateral IFG and putamen. A conjunction analysis between the two main effects indicates that activity in bilateral TPJ and IFG reflects false belief processing, and, at the same time, is suppressed by the threat of shock. Functional connectivity analysis identified stronger connectivity in the false belief relative to the outcome condition between the seed in left TPJ and targets in posterior cingulate cortex, left middle temporal gyrus, and dmPFC. Moreover, the connectivity between left and right TPJ was suppressed by the threat of shock. Taken together, our results indicate that anxiety, induced via threat of shock, significantly impacts the integrity of the theory of mind network by specifically suppressing activity and connectivity of the left TPJ.

7 Corresponding author: Li-Ang Chang, University of Amsterdam, l.chang@uva.nl.
Internal control beliefs shape positive affect, neural dynamics, and behavioral preferences

David Stolz, Laura Müller-Pinzler, Sören Krach, Frieder M. Paulus

Abstract

Experiencing events as controllable is essential for human well-being. Previous work on the affective relevance and subjective value of control beliefs conceptualized control as the opportunity to choose, without, however, employing tasks in which choices influenced the presented outcomes. This contrasts with classic psychological theory which suggests that the exertion of internal control requires the belief that one’s actions causally influence the state of the world. We developed a novel experimental paradigm that allows to test how such internal control beliefs impact the affective valuation of task outcomes, neural dynamics and ensuing behavioral preferences. In three consecutive studies we show that dynamics in positive affect increase, with a qualitative shift towards self-evaluative pride, when agents believe they caused a given outcome. We demonstrate that these outcomes engage brain networks processing self-referential information in the cortical midline. Here, activity in the ventromedial prefrontal cortex tracks both outcome valence as well as internal control over outcomes, and covaries with positive affect in response to outcomes. These affective dynamics also relate to increased functional coupling between the ventral striatum and cortical midline structures. Finally, we show that pride predicts preferences for control, even at monetary costs. Our results extend recent models of positive affect and well-being, and emphasize that internal control beliefs drive intrinsic motivation.

8 Corresponding author: David Stolz, University of Lübeck, stolz@snl.uni-luebeck.de.
Learning prosocial motives

Anne Saulin, Chih-Chung Ting, Jan B. Engelmann, Grit Hein

Abstract

Empathy, i.e., sharing another’s feelings, and reciprocity, i.e., reciprocating kindness, are two strong motives for prosocial behavior and decision-making. However, so far, it is unclear which of the two motives is more sustainable over time. Here we use a reinforcement learning approach to investigate how the empathy and reciprocity motives develop when reinforced, and decay over time in the absence of further reinforcement. In the two experimental conditions of the study, the empathy and the reciprocity motives were reinforced with high probability of reinforcement in a first block (80%; acquisition phase) and with low probability of reinforcement in a second block (20%; extinction phase). In the control conditions, the respective motive was randomly reinforced (50% in both phases). We hypothesized that the more sustainable a motive, the less decay it should show in the extinction phase. We observed that the strength of the reciprocity motive closely mirrored the frequencies of reinforcement, i.e., increased in the acquisition phase and decreased in the extinction phase. In contrast, the strength of the empathy motive increased in the acquisition phase, but persevered in the extinction phase. In the analyses, four different variants of the Rescorla-Wagner model were compared. One key parameter of the winning model (w) captured the sustained empathy motive strength. W acts as a motive strength buffer and is thus especially relevant in the extinction phase. This parameter was significantly larger for the empathy motive and follow-up analyses revealed that for this motive, w can also be replaced by a person’s state emotion ratings during the task. This indicates that the emotional response to another’s pain is likely to drive the sustainability of the empathy motive. Together, these results suggest (i) that the empathy motive might be more sustainable than the reciprocity motive and (ii) that differences in motive development over time can be well captured and described in terms of reinforcement learning models.

*Corresponding author: Anne Saulin, University of Würzburg, Saulin_A@ukw.de.*
Biases in self-related belief formation and their association with self-conscious affect

Laura Müller-Pinzler, Nora Czekalla, Annalina V. Mayer, Alexander Schröder, David S. Stolz, Frieder M. Paulus, Sören Krach

Abstract

During everyday interactions people constantly receive feedback on their behavior, which shapes the beliefs they form about themselves. However, this is not a passive process during which information is picked up in an objective manner, rather the idea prevails that belief formation is essentially biased and shaped by affective and motivational states in line with a recent proposal by Bromberg-Martin & Sharot on the value of beliefs. To assess the impact of self-related affective states during the formation of self-related ability beliefs we modeled updates of performance expectations in response to feedback during a cognitive estimation task. We show that updating of self-related ability beliefs was biased towards negative information and this bias was associated with the experience of self-conscious emotions, i.e. embarrassment and pride during the task. Further, the results suggest that individuals who update more negatively and experience stronger embarrassment and less pride process negative information more intensely than positive information as indicated by increased pupil dilation and neural activation within the anterior insula, amygdala, VTA and mPFC. Our results shed light onto a potential mechanism of how affective states could shape the attention towards and the processing of specific information therefore biasing the beliefs people form about themselves.

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On subscription traps and context-dependent preference reversals: the pigeonholing effect

Frieder Neunhoeffer

Abstract

This paper explores a novel menu effect in the context of subscriptions that violates the transitivity principle of rational choice theory. Providers typically capitalize on arranging offers such that a longer but costlier option is chosen over the cheaper but shorter alternative. We find that sizing the shorter subscription down to single-use raises its attraction. This suspects that the presence of a single-use option prompts rational evaluation based on a realistic estimate to use the subscription again. Instead, when both alternatives represent time spans, an irrational mind may discern them along the same category - referred to as pigeonholing - with the consequence that other comparative criteria come to the fore. Two-dimensional models, present in most behavioral theories, fail to explain this type of preference reversal. Inspired by the intuition of transaction utility and the availability heuristic, we propose a generalization of salience theory to capture the effect of pigeonholing.

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Who opts in?

Sandro Ambuehl, Axel Ockenfels, Colin B. Stewart\textsuperscript{12}

Abstract

Payments and discounts incentivize participation in many transactions about which people know little, but can learn more – payments for medical trial participation, signing bonuses for job applicants, or price rebates on consumer durables. Who opts into the transaction when given such incentives? We show theoretically and experimentally that increasing participation payments disproportionately attracts individuals for whom learning about the transaction is harder. They decide based on worse information and more likely regret their decision ex post. The learning-based selection effect is stronger when information acquisition is more costly. Moreover, it outweighs selection on risk preferences in many of our treatments.

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Bandits in the lab
Johannes Hoelzemann, Nicolas Klein

Abstract

We experimentally implement a dynamic public-good problem, where the public good in question is the dynamically evolving information about agents’ common state of the world. Subjects’ behavior is consistent with free-riding because of strategic concerns. We also find that subjects adopt more complex behaviors than predicted by the welfare-optimal equilibrium, such as non-cut-off behavior, lonely pioneers and frequent switches of action.

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Modeling the cognitive process during game plays using hidden Markov models

Xiaomin Li, Colin Camerer

Abstract

This paper proposes a novel method to dynamically model process-data such as mouse tracking or eye-tracking data in strategic games utilizing a class of machine learning model: hidden Markov models (HMM). The HMM model can reveal the underlying mental reasoning processes at different time points during strategic processes. Besides, this model induces a new strategic level system, the result of which is comparable to the estimations using the traditional level-k type approaches. This new level of reasoning method overcomes the main identification problem by estimating the levels on a single trial basis. With further containing the fixation duration data, we developed a continuous-time hidden Markov model (ctHMM), which can be used to predict how exactly time pressure changes choices and strategic results.

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Strategic complexity and the value of thinking

Victoria Prowse, David Gill

Abstract

We measure the strategic complexity of a situation by how long people think on average when they face that situation (where we categorize situations according to the characteristics of play in the previous round). We find that strategic complexity varies significantly across situations, and we find considerable heterogeneity in how responsive subjects’ thinking times are to complexity. We also study how variation in response times at the individual level affects strategic behavior and success. “Overthinking” is detrimental: when a subject thinks for longer than she would normally do in a particular strategic situation, she wins less frequently and earns less.

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Blinded by worries: 
sin taxes and demand for temptation under financial worries

Sergiu Burlacu, Austeja Kazemekaityte, Piero Ronzani, Lucia Savadori

Abstract

Imposing "sin" taxes has been the preferred way governments tried to discourage the overconsumption of temptation goods for decades. However numerous evidence shows that consumers exhibit behavioral biases which can affect their reaction to taxes. This paper investigates a potential bias and how it affects demand for temptation: financial worries associated with poverty have been shown to shift attention towards pressing needs, often at the expense of forward looking decisions. In an online experiment with UK participants, we randomly induce financial worries and ask participants to allocate a budget between basic necessities and temptation goods in an experimental market. We randomly impose "taxes" on temptation by increasing its price. We find that, in the absence of any tax, inducing financial worries lowers demand for temptation, effect stronger for lower income participants. However, when financial concerns are salient, increasing the tax does not lower demand among lower-income participants. While financial worries might protect against over-consumption of temptation in the absence of tax changes, they also might hurt the poor the most when additional taxes are introduced.

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Increasing consumer surplus through a novel product testing mechanism

Ulrike Vollstaedt, Patrick Imcke, Franziska Brendel, Christiane Ehses-Friedrich

Abstract

Our study examines information asymmetry about product quality between buyers and sellers and proposes a novel mechanism to reduce this asymmetry. Product testing organizations like Consumer Reports (US) and Stiftung Warentest (Germany) seek to reduce information asymmetry by providing credible information to buyers. However, limited testing capacity leads to product testing of only a select number of product models, often bestsellers, which can yield suboptimal information for buyers. In our study, we propose a novel, testing capacity-neutral mechanism to select product models for testing based on voluntary information disclosure. To analyze the performance of our proposed selection mechanism, we first develop a new game to derive theoretical, testable predictions. We then use a lab setting to test these theoretical predictions. We show theoretically that a unique Nash equilibrium exists in which our mechanism leads to optimal information equivalent to a world of complete information, while selecting bestsellers does not. Subsequently, we confirm experimentally that our new mechanism increases consumer surplus.

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Neural insights on the influence of hedonic and utilitarian web layouts on consumer value and choice

Luis-Alberto Casado-Aranda, Juan Sánchez-Fernández, Ana-Belén Bastidas-Manzano

Abstract

Despite much of the research on online shopping behavior has evaluated the effect of different elements of web layout on consumer behavior, our understanding of how shopping web elements are processed remains limited. Assessing the processing of web elements using techniques from consumer neuroscience could be a step forward in determining the internal mental processes that determine online shopping. This is the first research that, by means of functional Magnetic Resonance Imaging (fMRI), assess the neural mechanisms underlying the processing of utilitarian (i.e., functional, informative and convenient information about the online product) and hedonic (i.e., items that promote enjoyment, visual experience and interactivity by the consumer) website environments. The results corroborate for the first time the neural processing of hedonic and utilitarian online shopping environments and confirm that the same product can be processed differently depending on the accompanying web environment. Particularly, while more functional web environments engage brain areas related to object recognition and goal direction, hedonic/experiential websites provoke neural mechanisms related to self-relevance, reward and joy. The theoretical and practical implications of these findings for e-retailers and marketing managers are discussed.

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Cognitive skills, strategic sophistication, and life outcomes

David Gill, Eduardo Fe, Victoria Prowse

Abstract

We investigate how childhood cognitive skills affect strategic sophistication and adult outcomes. In particular, we emphasize the importance of childhood theory-of-mind as a cognitive skill. We collected experimental data from more than seven hundred children in a variety of strategic interactions. First, we find that theory-of-mind ability and cognitive ability both predict level-k behavior. Second, older children respond to information about the cognitive ability of their opponent, which provides support for the emergence of a sophisticated strategic theory-of-mind. Third, theory-of-mind and age strongly predict whether children respond to intentions in a gift-exchange game, while cognitive ability has no influence, suggesting that different measures of cognitive skill correspond to different cognitive processes in strategic situations that involve understanding intentions. Using the ALSPAC birth-cohort study, we find that childhood theory-of-mind and cognitive ability are both associated with enhanced adult social skills, higher educational participation, better educational attainment, and lower fertility in young adulthood. Finally, we provide evidence that school spending improves theory-of-mind in childhood.

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Nonverbal content and trust: an experiment on digital communication
Zakaria Babutsidze, Nobuyuki Hanaki, Adam Zylbersztejn

Abstract

We experimentally study the effect of the mode of digital communication on the emergence of trust in a principal-agent relationship. We consider three modes of communication that differ in the capacity to transmit nonverbal content: plain text, audio, and video. Communication is pre-play, one-way, and unrestricted, but its verbal content is homogenized across treatments. Overall, both audio and video messages have a positive (and similar) effect on trust as compared to plain text; however, the magnitude of these effects depends on the verbal content of agent's message (promise to act trustworthily vs. no such promise). In all conditions, we observe a positive effect of the agent's promise on the principal's trust. We also report that trust in female principals is sensitive to the availability of nonverbal cues about their partners.

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Role of trust on the decision making in centipede game with known and random rounds

Dhiraj Jagadale, Kavita Vemuri

Abstract

Mutual trust is an essential and existential process to help humans engage in financial and social transactions. Typically, the decision-making process in economic transactions is influenced by existing trust between parties, trust that develops through a collaborative process, or trust guaranteed by a third party. Game theory-based tasks like Trust games, investment games, and Centipede games have been used to understand how behavioral trust is built, how it evolves, and how it breaks. In this paper, we present results from a study on trust between players in an extension-form game, centipede. As per game theory, Nash equilibrium based on backward induction has been used to explain the player’s strategy in the Centipede game. But actual behaviour deviates from Nash equilibria. To test this and the strength of mutual trust in known and random number of rounds, the payoffs in the centipede game were set up to present a loss from the previous “take” node, if the decision is to “pass”. The behavioural data was supported by measurement of the skin conductance response and was used to infer stress from trust level changes for game conditions and events. Results show that the number of turns increased when the mutual trust was high, but only for the known round condition, supporting our hypothesis. The mutual trust showed no correlation to general trust, but it was correlated with players’ risk propensity. The phasic skin conductance response was higher for the decisions made during random ending games and for opponent take compared to self-take. Uncertainty in random ending may have developed anxiety in players. The findings highlight trust to be situational and the decision for cooperative or competitive gameplay is influenced by uncertainty. Second, the viability of skin conductance response to understand psychophysiological changes in decision-making tasks.

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Neural correlates of large-scale message effectiveness: a mega-analysis

Christin Scholz

Abstract

Successful persuasive messages like marketing or public health campaigns can have immense financial and societal impact. Communication neuroscience has identified meaningful correlations between neural responses to (un)successful messages in small study samples and message effectiveness in changing attitudes and behaviours in large groups of people who did not undergo neuroimaging (out-of-sample message effectiveness). This work can contribute to theories explaining which messages are successful and why but remains limited. Individual studies offer low statistical power given small sample sizes (N~20-60), feature limited topical scope (e.g. focusing on specific topic domains or campaigns) and produced incomparable findings due to idiosyncratic analysis pipelines that differ both in which neural metrics are analyzed and how. We conducted a mega-analysis, pooling and re-analysing raw data from 15 fMRI studies on the neural correlates of out-of-sample message effectiveness. This approach offers a manyfold increase in statistical power, the ability to test the domain-generality of effects by including stimuli across domains and campaigns and produces comparable results across datasets using one common analysis pipeline. We ask two questions: 1. Are there domain-general neural correlates of out-of-sample message effectiveness? 2. Do study-level features moderate the relationship between neural responses to messaging and out-of-sample message effectiveness? Our database consists of 15 datasets from 4 labs (496 participants, 669 messages), featuring 19,644 message exposures during fMRI and corresponding indicators of out-of-sample message effectiveness. Included studies varied widely in their topic domains from health to marketing campaigns to Youtube videos. We constructed a multi-level model of the relationship between neural signals in response to individual message exposures (ns) and out-of-sample message effectiveness (me) and investigated interactions between the effects of neural signal and two study features on message effectiveness, namely stimulus modality (static vs. dynamic) and type of outcome measure (self-report vs. behavior).

\[ me \sim ns \times \text{type modality} + ns \times \text{type outcome} + (1 + ns | \text{study/participant}) \]

Results show domain-general relationships between out-of-sample message effectiveness and neural processes at the levels of perceptual, executive, and higher-order psychological processes. Importantly, some effects are qualified by study-type interactions. As such, this work can contribute to domain-general theories of persuasive message effectiveness.

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A computational reward learning account of social media engagement

Björn Lindstrom

Abstract

Social media has become a modern arena for human life, with billions of daily users worldwide. The intense popularity of social media is often attributed to a psychological need for social rewards (likes), portraying the online world as a Skinner Box for the modern human. Yet despite such portrayals, empirical evidence for social media engagement as reward-based behavior remains scant. Here, we apply a computational approach to directly test whether reward learning mechanisms contribute to social media behavior. We analyze over one million posts from over 4000 individuals on multiple social media platforms, using computational models based on reinforcement learning theory. Our results consistently show that human behavior on social media conforms qualitatively and quantitatively to the principles of reward learning. Specifically, social media users spaced their posts to maximize the average rate of accrued social rewards, in a manner subject to both the effort cost of posting and the opportunity cost of inaction. Results further reveal meaningful individual difference profiles in social reward learning on social media. Finally, an online experiment (n = 176), mimicking key aspects of social media, verifies that social rewards causally influence behavior as posited by our computational account. Together, these findings support a reward learning account of social media engagement and offer new insights into this emergent mode of modern human behavior.

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Social influence in adolescence as a double-edged sword

Lucas Molleman

Abstract

Social learning is fundamental to human development, helping individuals adapt to new circumstances and cooperate in groups. During the formative years of adolescence, the social environment shapes people’s socio-cognitive skills needed in adulthood. Yet, peer influence during this pivotal developmental stage is generally associated with risky and unruly conduct, with eminent negative long-term effects on adolescents’ educational, economic and health outcomes. Here we show, in contrast to this traditional view, that the impact of peers on adolescents’ behaviour can also be markedly positive. Exposure to disobedient peers provoked rule breaking, and selfish peers reduced prosocial behaviour, particularly in early adolescence. However, compliant peers also promoted rule-following and fair peers increased prosociality. A belief formation task further revealed that early adolescents tend to assimilate social information, while older adolescents prioritise personal views. Our results suggest that these developmental patterns reflect a decline in an underlying domain-general factor of social sensitivity during adolescence, and highlight early adolescence as a key window for peer-based interventions to improve developmental trajectories.

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The debt payment puzzle: an experimental investigation
Hakan Ozyilmaz, Guangli Zhang

Abstract

This paper studies the sources of suboptimal allocations observed in credit card repayments using a diagnostic laboratory experiment. We find that optimization ability and limited attention are jointly insufficient to explain the puzzle. Moving beyond existing results, we find that the inherent negative frame of the debt payment problem interferes with subjects’ ability to optimize and hinders learning. We show that subjects predominantly rely on the irrelevant balance information while forming their decisions, regardless of how vividly the balance information is displayed. Using additional treatments, we find that the debt frame increases subjects’ focus on the irrelevant balance information.

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An exploratory study to understand financial behavior of neurotic individuals using handwriting analysis

Sheetal Thomas, Mridula Goel, Naresh Peesapati

Abstract

Individuals who exhibit facets of neuroticism like anger, depression and self-consciousness tend to experience greater challenges in financial decision making. Handwriting analysis can be used to identify these facets and understand the financial behavior of such persons. In this study handwriting features are mapped to the facets of neuroticism as specified in Big Five Personality Traits Model. Logistic regression was applied to identify handwriting features that map with financial behavioral statements, which were used to display the different facets of neuroticism. Several handwriting features were found to be significantly related to financial behavior statements. Identifying investor’s handwriting features that map with neuroticism can help financial advisors in recommending products that are less risky. Understanding and exploring the psychological needs of their potential customers will enhance the effectiveness of financial advice, as it will also guide individuals to make choices suited to their personality leading to financial satisfaction.

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Disentangling the effects of reporting frequency on earnings predictions and investment behavior of non-professional investors: evidence from a behavioral experiment and an eye tracking study

Tanja Blascheck, Sven Nolte, Ann Tank

Abstract

Earnings reports convey meaningful and relevant information about a company’s past performance as well as expected future cash-flows. We explore a novel layer of the debate how frequent earnings should be announced, how differences in reporting frequency can lead to different (visual) perception of the underlying data. We study two aspects of more frequent reporting: the size of reported earnings’ values, and the number of earnings announcements that investors need to process. These two aspects are immediately reflected in the visual representation of earnings in a bar chart by the scaling (of the vertical axis) and the number of data points (on the horizontal axis). Since visual features oftentimes dominate initial perception, we hypothesize and test in an eye-tracking experiment that scaling and the number of data points affect investors’ (non-deliberate) attention and mental effort when processing the bar charts. We then test in a behavioral experiment whether this effect is strong enough to also be reflected by investors’ future earnings predictions and investments, and a stock’s perceived attractiveness. We find that more data points (which is induced by switching from yearly to quarterly reporting frequency) has a positive effect on prediction accuracy, and that adapting the scale (which is also induced by switching from yearly to quarterly reporting frequency) influences the perceived attractiveness of an investment alternative. Interestingly, we find that both effects – on prediction accuracy and on the perceived attractiveness of an investment alternative – have contrary effects on investment behaviour. While prediction accuracy is negatively correlated with the amount subjects were willing to invest, the perceived attractiveness is positively correlated to the amount subjects were willing to invest. In our second experiment, we will provide evidence that these effects are indeed channeled by our participants’ initial visual perception of the earnings charts. We will track gaze data to directly measure the visual attention paid to different areas of the chart, and compute saccade lengths to proxy for the mental effort required to process the chart.

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Mental health:  
the burden of social stigma  
Peter Zweifel

Abstract

The burden of mental health has two facets, social and psychological. Social stigma causes individuals who suspect to be suffering from a mental condition to conceal it, importantly by seeking care from a non-specialist provider willing to diagnose it as physical disease. In this way, social stigma adds to both the direct and indirect cost of mental health. A microeconomic model depicting an individual who searches for an accommodating provider leads to the prediction that individuals undertake more search in response to a higher degree of social stigma. However, this holds only in the absence of errors in decision-making, typically as long as mental impairment is not too serious. While government and employers have an incentive to reduce the burden of social stigma, their efforts therefore need to focus on persons with a degree of mental impairment that still allows them to avoid errors in pursuing their own interest.

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Reactions to warnings in the climate commons
Annika Wyss, Sebastian Berger, Thomas Baumgartner, Daria Knoch

Abstract

People receive daily environmental warnings, but little is known about their effect on behavioral responses, or how affect and cognition underlie behavioral change. We conduct a preregistered online experiment, where group members can harvest financial resources from a common pool while risking collective overexploitation causing an actual environmental externality. We find that warnings are effective and that self-conscious emotion guilt – but not worry, anger, powerlessness, or hope – promotes sustainable behavioral change. We show that expectations of others’ cooperation steer behavioral change and that people with high feelings of guilt and environmental values respond sustainably, independent of their belief of others’ cooperation. This underlines the importance of work on the joint affective and cognitive mechanisms underlying environmental behavior, and suggests that guilt-inducing warnings may qualify as an effective strategy to promote cooperation in the climate commons and highlight the potential of institutional rules enhancing cooperation in large-scale public goods.

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Neural synchronization of compromise in third party punishment: a fNIRS hyper-scanning study

Simeng Wu, Honghong Tang, Peixia Ye, Shen Zhang, Chao Liu

Abstract

People need to confront difference in attitudes, intentions, and social or moral standards with other members in group decision-making. How people deal with these differences and what the underlying neural correlates remains unclear. Here we try to explore people deal with the difference between themselves and others’ behavior in face-to-face group-based third-party punishment (TPP) with functional Near-Infrared Spectroscopy (fNIRS) based hyper-scanning. We hypothesize that individuals would compromise in such a situation to avoid indulging agents’ unfair behaviors and this kind of compromise will be reflected on the changes of behavioral punishment and neural synchronization in the DLPFC and TPJ. We also hypothesize that patterns of compromise will be different for attempted unfairness and actual unfairness. 122 college students were recruited and paired into 61 dyads according to the difference of decision preference in TPP. They played as pairs of third parties and made punishment as a group to offers generated by anonymous proposers. If their punishments are the same in a trial, the punishment would be taken effect on the proposer, that is, both of them and the proposer would lose monetary units according to their punishment points; otherwise, the punishment would not be taken effect, and the proposer would be indulged that all of them lose nothing. We manipulated the intention and outcome of proposers which resulted in three within-subject types of offers with 54 trials (18 trials each type): Unfair Intention and Fair Outcome (UF) (i.e., attempted unfairness, that the proposer intended to make unfair offers but failed), Unfair Intention and Unfair Outcome (UU), and Fair Intention and Fair Outcome (FF). Two optode probe sets, covering the bilateral TPJ and bilateral DLPFC. We identified a frequency band of interest (i.e. a frequency band from 0.034 Hz to 0.167 Hz, corresponding to the period between 6 s and 29 s) to put into the wavelet transform coherence analysis to calculate the neural synchronization when making punishment decisions. The difference of punishment between the third-party dyads decreased in both UF and UU conditions, and the sum of punishment increased in the UU condition, which suggested that dyads compromised to decrease their difference to avoid indulging the proposers’ unfair behaviors. More importantly, we identified different behavioral patterns of compromise between UF and UU condition. That is, one third party (leader) held on his choice across time, another third party (follower) decreased the punishment to approach the leader in the UF condition but increased the punishment in the UU condition. Neurally, synchronization of rTPJ (ch 6) increased over time in UF condition; whereas, synchronization of ITPJ (ch 4) increased over time in the UU condition.

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Brain stimulation, risk preferences and risky behaviors

Ruixin Jia, Marco A. Palma, David Wright, Bin Mai, Manuel Hoffmann

Abstract

Excessive risk-taking or risk-averse preferences may be detrimental to decision making. Overall, too extreme preferences for risk may lead to harmful consequences for individuals in the long-run in multiple domains, such as health, finance, education or cybersecurity. Currently, the internet plays a critical role in our life, for example for distance education, virtual clinic, online banking, etc. With the rise of those interactions and the internet, cybersecurity became a major industry with $156.5 billion in 2019 in global market size while simultaneously being an important domain where risk-preferences may matter. We study the effect of exogenous transcranial direct current brain stimulation on risk preferences and behaviors. More specifically, we evaluate the effectiveness of brain stimulation to regulate risk preferences in the lab and in a risky environment where subjects make close to real-life cybersecurity decisions. Non-invasive brain stimulation, such as transcranial direct current stimulation may assist individuals with preferences for excessive risk-taking or risk-aversion by improving unwise decision-making. In order to study the effect of non-invasive brain stimulation on risk preferences, we use the Bomb Risk Elicitation Task to elicit revealed preferences in the laboratory. In addition, we use a math test with popup message choices to imitate an applied risky cybersecurity environment where forgoing safety updates, such as antivirus updates can increase the likelihood of costly computer systematic crashes. We hypothesize that the exogenous stimulation will alter individual risk preferences and subsequently individual choices in the risky cybersecurity environment change. Given the ambiguity in the literature, we attempt to fill the gap by altering risk preferences exogenously using transcranial direct current stimulation to examine the changes in risk behavior in a cybersecurity environment. Our contribution to the literature is testing the combination of economic decision making and cybersecurity awareness under brain stimulation context. This is a novel research question that uses a laboratory experiment to measure risk preferences and a reality simulating risk task involving a cybersecurity issue that affects almost every citizen of the world.

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Neural insights on the influence of hedonic and utilitarian web layouts on consumer value and choice

Marco Mandolfo, Francesco Baisi, Lucio Lamberti

Abstract

Immersive virtual environments (IVEs) represent virtual settings that simulate the physical world. Users interacting in such virtual venues commonly display behaviours like the ones that would occur in the physical world. However, little is known about how affective states experienced while browsing IVEs may in turn influence the interactive behaviour. The present research investigates how affect in terms of arousal and valence generated by IVEs influences browsing time and interaction frequency. Three studies analyse various facets of affect in IVEs. Study 1 investigates the cognitive facet and shows that browsing time is positively affected by arousal. Study 2 analyses neurophysiological responses and demonstrates consistent results with Study 1. It further shows that neurophysiological correlates of arousal and valence positively influence interaction frequency. Study 3 delves into personal interest, a recurring factor emerged in the two previous studies, and investigates its interaction with arousal. Findings show that in a high arousal IVE, highly interested users are more likely to browse longer than low-interested users. Overall, the results show that behavioural realism evoked in IVEs does involve both users’ actions and affective states. Managerial implications in terms of design guidelines to foster positive affect in IVEs are drawn.

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Neural basis of social approach-avoidance conflict decision making in depression and social anxiety

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Abstract

Approach-avoidance conflict (AAC) occurs when we have to make decisions that can lead to both rewarding and aversive outcomes. AAC has been implicated in the pathophysiology of Major Depression (MD) and Social Anxiety (SA), but few studies have investigated this relationship on a neural level. When AAC includes social threat and rewards, it is called social AAC (sAAC). Given that people with MD and SA suffer from social impairments, sAAC is of interest in these populations. We used fMRI to study brain activity during sACC, in participants with MD, SA, or both disorders (MD/SA, n=52) and matched healthy controls (n=41). In our task, players are thought to be categorized as a one/two/three/four or five star players, depending on how good they are responding trivia questions (with five stars players being the best). Participants are actually categorized as three star players. On every trial, participants choose between two possible options, with which category of co-player they would like to make a team. From a material point of view, choosing the higher category (approach) is better than choosing the lower one (avoidance), since this makes a stronger team. However, conflict arises because approach decisions increase the chances for the participant being the worst one in the team, which relates to upward social comparisons and guilt processes. The MD/SA group reported higher negative emotions, such as embarrassment and guilt, during the task. At a neural level, for the avoidance > approach contrast, we found across participants activations that spanned the middle/anterior cingulate cortex (ACC) and medial prefrontal cortex, reflecting that avoidance decisions encompass a more thoughtful and less automated process. The same contrast showed between group differences in the ACC. This difference related to controls showing higher activity for avoidance in relation to approach, while for the MD/SA group the opposite was observed. The ACC has been related to conflict detection and resolution. Therefore, findings suggest more automatic decisions for approach vs. avoidance in controls compared to MD/SA participants. Findings, highlight the neural substrates that underlie social approach avoidance biases in MD and SA.

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Trust in healthcare during the COVID-19 pandemic: which factors matter most?

Stephen Alexander Cantarutti, Emmanuel Pothos

Abstract

The objective of this paper was to determine the key factors underlying trust in light of the COVID-19 global pandemic. Participants were recruited from ten countries around the world and asked to complete a two-part questionnaire. The first part of the study asked participants to rate their country’s healthcare system on a scale from 1-5, according to ten trust-related factors (Butler 1991), translated specifically to pertain to healthcare. The second part of the questionnaire asked participants to rate their country’s healthcare system on a scale from 1-5, according to 4 key pillars of trust: benevolence, reliability, competence and predictability. According to participants’ ratings, correlation analyses were run between the trust factors and trust pillars. These ratings were aggregated per country to determine how impactful each factor was in predicting individuals’ trust. Countries were grouped by geographic region to arrive at localized, international comparisons of trust relationships. To determine statistical significance, correlation results were subsequently converted to z-scores and compared to both global and regional means. Results determined that honesty, consistency and reasonableness were the most impactful factors underlying trust across the entire population. All other findings are detailed in the main text. With this study, we were able to determine the most impactful factors underlying trust, both at a global and national level. We were also able to determine intraregional differences in trust patterns across Northern Europe, Southern Europe, North America and Asia. We motivate the research of trust forward by better understanding its key underlying factors, globally and nationally.

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Temporal dynamics of decision-making: an ERP study of rewards anticipation and processing

Carina Fernandes, Inês Macedo, Fernando Barbosa, João Marques-Teixeira

Abstract

Decision-making is a fundamental aspect of adaptive behavior. At a neural level, decisions are preceded by sequential affective, integrative, and motivational processes. First, affective processes potentiate anticipation of gains and losses, inducing positive and negative arousal that motivate behaviors of approach and avoidance, respectively. Second, the output of the affective anticipation is integrated with further evaluative considerations (integration processes). Finally, the result of this integration feeds in motivation processes that promote subsequent actions (approach versus avoidance) and motor responses. In this study, we analyzed the dynamics of decision-making through an electrophysiological version of the Monetary Incentive Delay (e-MID) Task that elicited several ERPs that may be neural correlates of the above-mentioned processes. Specifically, to study anticipation processes we analyzed the Cue-P3; to study integration processes we analyzed the Contingent Negative Variation (CNV), and to study motivation processes we analyzed the Lateralized Readiness Potential (LRP) and Target-P3. We also studied feedback processes through the feedback-related negativity (FRN) and the Feedback-P3. Twenty-eight participants (20-40 years old) performed the e-MID task during EEG recordings, and the ERPs of interest were elicited by events presented during gain, loss, and neutral trials. The results were analyzed in a within-subjects design. The results showed that the Cue-P3 was significantly reduced after neutral than after gain/loss cues, and the same pattern of results was found to the CNV and to the Target-P3. We did not find an effect of condition to the LRP nor to the FRN. However, FRN amplitudes were significantly larger after gains than non-gains, as well as after losses than non-losses. Regarding the Feedback-P3, we found larger amplitudes gains/losses compared to neutral feedback. Additionally, gains elicited a significantly larger P3 than the other conditions. Our results consistently showed that the ERPs are larger for trials with incentives rather than neutral trials. Such results showed that the e-MID task allows tapping into the several processes that precede and succeed in decision-making. Considering that several pathological conditions may disrupt one or several of the processes analyzed, this methodology may have great relevance to study the time course of decision making in several fields of research.

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Avoidance of competition, development of social task of approach-avoidance

Sebastian Morales, Alejo Acuña, Laura Uriarte, Alfonso Pérez, Alvaro Cabana, Victoria Gradin

Abstract

Major depressive disorder (MDD) is a highly prevalent mental disorder, estimated to affect more than 100 million people worldwide, leading to severe impairment in more than 50% of cases, and associate with high rates of suicide, and has been ranked as the leading cause of disability worldwide (WHO | Depression and Other Common Mental Disorders 2017; Bromet et al., 2011). Currently, there are no fully effective treatments, people who have had a depressive episode usually relapse at least once, and about 10% of people with depression suffer from it chronically (NICE, 2019). The precise biological mechanisms underlying the disorder are currently unknown, which hinders the development of treatments (Woody & Gibb, 2015). Approach-avoidance theories have been proposed as a useful theoretical framework for understanding emotional processes and associated behaviors, and would be of vital use in understanding mental health disorders such as depression (Corr, 2013). This theory proposes the existence of two systems, an approach system and an avoidance system that regulate the behavior of individuals. Approach behaviors are those that allow to go towards a reward. Avoidance behaviors involve the individual's defense/self-protection and are usually activated in the presence of aversive or threatening stimuli (Aupperle et al., 2011). Crucially, some situations simultaneously involve both stimuli that may be aversive and rewarding stimuli. For example, a student who takes an exam represents a rewarding stimulus as it brings him closer to the goal of graduating, but it can also be threatening and intimidating as he submits to evaluation by teachers. In these cases, we are confronted with an approach-avoidance conflict (Aupperle et al., 2011; Carver & White, 1994). It has been proposed that alterations in the approach and avoidance systems could lead to suboptimal decision-making processes and in extreme cases to psychopathologies such as depression. In the case of depression, it has been postulated that this disorder is characterized by a diminished or underactive approach system, related to feelings of anhedonia and lack of motivation, and on the other hand, by an over-activated avoidance system, which leads people to sacrifice opportunities in order to avoid stimuli they consider aversive. People with depression tend to seek less to relate to others and to avoid social interactions, because they perceive negatively situations that other people do not see as such, this causes them to have weaker social networks (Aupperle et al., 2011; Ironside et al., 2020a; Smith et al., 2021). From this theoretical framework, it has been highlighted the importance of developing social experimental tasks that allow measuring approach-avoidance preferences in social situations. (Kirlic et al., 2017). Our study seeks to contribute in that direction. For this study we proposed to develop a social approach-avoidance task and to apply it to a first behavioral study.

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The detection to influence the neurobiological drivers that underlie of information-processing styles on economic results of individual agents in conditions of fundamental uncertainty

Alexander Neverov, Dmitriy Vaskov, Armen Airapetian

Abstract

In the article, the authors allocated information processing styles and how these related with the economic decision-making results. The article’s goal is the detection to influence the neurobiological drivers that underlie of information-processing styles on institutional framework of economic situation. On first step the highlighted the styles of working with information. The each participant read a volume of economic information about the rules of 10-iteration economic decision-making process lab experiment. The rules consisted in the format of one A4 paper, 14-point Times New Roman, on a computer screen, with the 367 logical elements. The content of the information were a formalized rules of forthcoming economic activity. All information was relevant for future economic situation. The working time with the information was not limited. Information during processing was dividing into 12 blocks, according to the semantic load of each of them. The measurements were carrying out on a screen with a resolution of 1920×1080 image with instructions on Russian or English 1094×773 pix using Tobii Pro Studio Enterprise Edition v3.4.8. In the second step, a 10-iteration economic decision-making process lab experiments under conditions of fundamental uncertainty were implementing. The economic decision making included buying and selling the different goods with a time limit of work in each period. The main goal of the work for the participants was profit maximization. Before the experimental session, all participants knew that after the experimental session they will get guaranteed reward 200 rubles and if finish state will be more as the start state (20.000) participants can get bonus money. To highlight the styles of work with information, clustering of all timestamps among all respondents was carried out by Ward's method. By the results of analysis of the eye-tracking recordings, all participants were allocating into four different groups, which has demonstrated different styles of work with economic information. The most successful in decision making were the respondents who clearly expressed the characteristics of the fourth style of working with information. Authors concluded that the information processing styles matter for economic results in the conditions of fundamental uncertainty.

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Who do I want in my team:
social avoidance of high qualified partners in depression and social anxiety

Laura Uriarte, Alejo Acuña, Sebastián Morales, Gabriela Fernández, Valentina Paz, Alfonso Pérez, Álvaro Cabana, Victoria Gradin

Abstract

Social interactions have a great impact on an individual’s well-being and are critical in mental disorders. Approach-avoidance theories postulate that a healthy balance between these drives is essential for daily life. However, in mental disorders such as depression and social anxiety, there might be imbalances. Excessive avoidance is a key feature in both social anxiety and depression. This behavior leads to the loss of opportunities, which means material and social costs for the individual, and contributes to the maintenance of the symptoms, lack of social support and isolation. When it comes to studying social avoidance, one limitation is to recreate interactive scenarios in order to immerse the participant in a social context. In this study we developed an interactive social decision making task that allows measuring social avoidance, and tested this task in participants with varied levels of depression and social anxiety symptoms. In this task, participants chose to form a team with co-players from different categories (ranked in 1, 2 or 3 stars according to their performance on a time estimation task). The task was developed in a way that making a team with a high category co-player was always the most profitable option. However, this was also the most challenging option, because participants (who were always ranked as 1-star players) had to play with someone better at the task. This situation could trigger upward social comparisons. We hypothesized that people reporting higher depression and social anxiety symptoms were more likely to avoid making a team with a high category co-player, even though that meant sacrificing a higher profit. It was found that participants reporting higher depression and social anxiety symptoms were the ones who more frequently chose the low category option, and therefore the ones who gained less points. Also, they reported more guilt, nervousness and shame when choosing the high category option. This task emulates real life situations in which people suffering from depression and/or social anxiety end up losing opportunities and paying material costs because of avoidance. This study aims to provide insight into the mechanisms that underlie social avoidance.

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2022 Call for submissions

We are happy to announce that submissions are now open for the 2022 NeuroPsychoEconomics Conference at the University of Lille, France. The conference will be held on Zoom on June 9-10, 2022. The conference chair is Sophie Lacoste-Badie.

The deadline for submissions is Monday, April 15, 2022, 11:59pm CET.

The conference theme of 2022 is:

“Transferring Knowledge from Neuroscience, Psychology, and Economics to Management, Marketing, Finance, and MIS”

Topics preferably combine problems in economics, psychology, and/or neuroscience, and include (but are not restricted to):

- **Linking choice data and decision processes.** Understanding the neurobiological drivers that underlie behavior and decision making. For example, studies that link behavior to response times, neural activity (e.g., EEG or fMRI), gaze patterns (e.g., eye tracking), or click patterns (e.g., Mouselab).

- **Investigating the underlying mechanisms of decision processes** by means of fundamental tools from economics, psychology, neuroscience, mathematics, and statistics (including formal modeling).

- **Applying integrative approaches to broaden our understanding of the key features of decision processes**, such as understanding how people make decisions (e.g., economic decisions) or how the brain calculates costs and benefits, especially with regard to cognitive, affective, motivational, or social factors.

- **Applying the principles of affective, cognitive, and social neuroscience research** to research questions in management & organizational behavior, marketing & consumer behavior, financial decision making, law, information systems, or translational medicine.

- **Discussing possible ethical/legal issues** that emerge from such applications.

- **Methodological presentations** on state-of-the-art investigations in decision neuroscience. For example, fMRI, TMS, DTI, EEG/ERP, genetics, and endocrinological studies.

Both empirical and conceptual submissions are welcome.

**Competitive paper submissions**

- Competitive papers for the 2022 NeuroPsychoEconomics Conference must be submitted by April 15, 2022, 11:59pm CET. The link to the online submission tool can be found at http://www.jnpe.org (under “Conference” and “Submissions”). Please do not submit your competitive paper by email but only through the online submission tool.

- Competitive paper submissions can either consist of a full paper of up to 40 double-spaced pages or an extended abstract of up to 1,500 words.

- **Full paper submissions** (up to 40 double-spaced pages) must include a short abstract of no more than 350 words and conform to the author guidelines of the American Psychological Association (APA). When submitting your paper, you will be asked to indicate whether or not you intend to publish the full paper, if accepted, in the *Journal of Neuroscience, Psychology, and Economics* (ISSN 1937-321X).
• **Extended abstract submissions** (up to 1,500 words) will go through an expedited review process and should go beyond a research proposal (i.e., empirical extended abstracts should present information on data and results, conceptual extended abstracts should clearly state their theoretical contribution). Extended abstract submissions must also include a short abstract of no more than 350 words, in addition to the extended abstract of no more than 1,500 words.

• In submitting a competitive paper, the submitter affirms that, if accepted, at least one co-author will register for the 2022 NeuroPsychoEconomics Conference and appear at the conference to present the paper.

**Poster submissions**

• Poster proposals for the 2022 NeuroPsychoEconomics Conference must be submitted by **April 15, 2022, 11:59pm CET**. The link to the online submission tool can be found at http://www.jnpe.org (under “Conference” and “Submissions”). Please do not submit your poster proposal by email but only through the online submission tool.

• Poster proposals will go through an expedited review process. Your poster proposal is an extended abstract (up to 1,500 words) that describes the research presented on the poster, and a short abstract (up to 350 words).

• If your proposal gets accepted, posters to be presented at the conference may have a maximum size of 120 cm (height) x 90 cm (width).

• The best posters may be invited for presentation in a special session at the conference (5-10 minute verbal presentation).

• In submitting a poster proposal, the submitter affirms that, if accepted, at least one co-author will register for the 2022 NeuroPsychoEconomics Conference and appear at the conference to present the poster.

**Symposium submissions**

• Symposium proposals for the 2022 NeuroPsychoEconomics Conference must be submitted by **April 15, 2022, 11:59pm CET**. The link to the online submission tool can be found at http://www.jnpe.org (under “Conference” and “Submissions”). Please do not submit your symposium proposal by email but only through the online submission tool.

• In symposium sessions, a number of presentations (usually between two and six) discuss a common topic, with the goal of shedding new insights on this topic.

• Symposium proposals are single-blind reviewed (meaning submitter and presenter information are disclosed in the proposal) and are judged on overall quality, innovativeness, and fit with the NeuroPsychoEconomics Conference.

• A symposium proposal is one single document that must include the following: (1) title of the symposium, (2) complete names, affiliations, and emails of all participants, (3) a short abstract summarizing the symposium topic, and (4) a 3-6 page overview of the symposium including (a) a brief discussion of why the symposium topic should be of interest to the attendees of the NeuroPsychoEconomics conference, and (b) a short abstract (up to 350 words) of each individual talk.

• In submitting a symposium proposal, the submitter affirms that, if accepted, all presenters involved in the symposium session will register for the 2022 NeuroPsychoEconomics Conference and appear at the conference to present their work.

*We look forward to your submissions and seeing you at the conference!*
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